Criminal Records Report

Records retrieved from Unified Database on: 7/10/2025

Retrieved on behalf of Whitaker Bell
Requestor: Renee Rubert
Matter: Babajide Afolabi Ogunseinde MD 01449

DRIVING VIOLATIONS:

RECORD 1:

Name: **Babajide Afolabi Ogunseinde**
DOB: **1976**, Born **48** years ago
Charge Count: **1**
Gender: **MALE**
Docket: **21002819**
Case Type: **Traffic**
Summons: **L068400**
Violation State Code: **TX**

Violation Date: **03/25/2021**
Violation Statute: **NOTAVAILABLE**
Violation Description: **NotAvailable**
Adjudicated Date: **04/08/2021**
Adjudicated Statute: **547.613**
Adjudicated Description: **Improper Window Tint or Material Obstructing Windshield or Side or Rear Window**
Adjudicated Acd Code: **E70**
Disposition: **Dismissed**
State Specific:
- AgencyName: **LPD**
- Type: **T**
- ViolationType: **TRAFFIC**
- ViolationLocation: **W LOOP 281**
- AccidentFlag: **false**
- FinePaid: **0.00**
- FineBalance: **0.00**
- DMVReportDate: **0000-00-00**

Court Code: **Longview-Muni**
Court Municipality: **LONGVIEW**
Court County: **GREGG**
Uncomputed Statute Indicator: **YES**
Downgrade Indicator: **N**
Address: **1027 Riverwood Dr, Longview, TX 75604-6228**

UNIFIED DATABASE RESULTS

No Records were retrieved for this individual. This may mean the records have been expunged, or that the person has no recorded criminal history.

No Results Found

We're sorry, there were no Results found for people named **BABAJIDE AFOLABI OGUNSEINDE** who have used SSN: **XXX-XX-1593** born on **04/16/1976** in the United States.

No Results Found

We're sorry, there were no Results found for people named **OGUNSEINDE** who have used SSN: **XXX-XX-1593** born on **04/16/1976** in the United States.

FRAUDSNIFFR

No Results Found

We're sorry, there were no Results found for people who have used SSN: **XXX-XX-1593** born on **04/16/1976** in the United States.

LOCAL RECORDS:

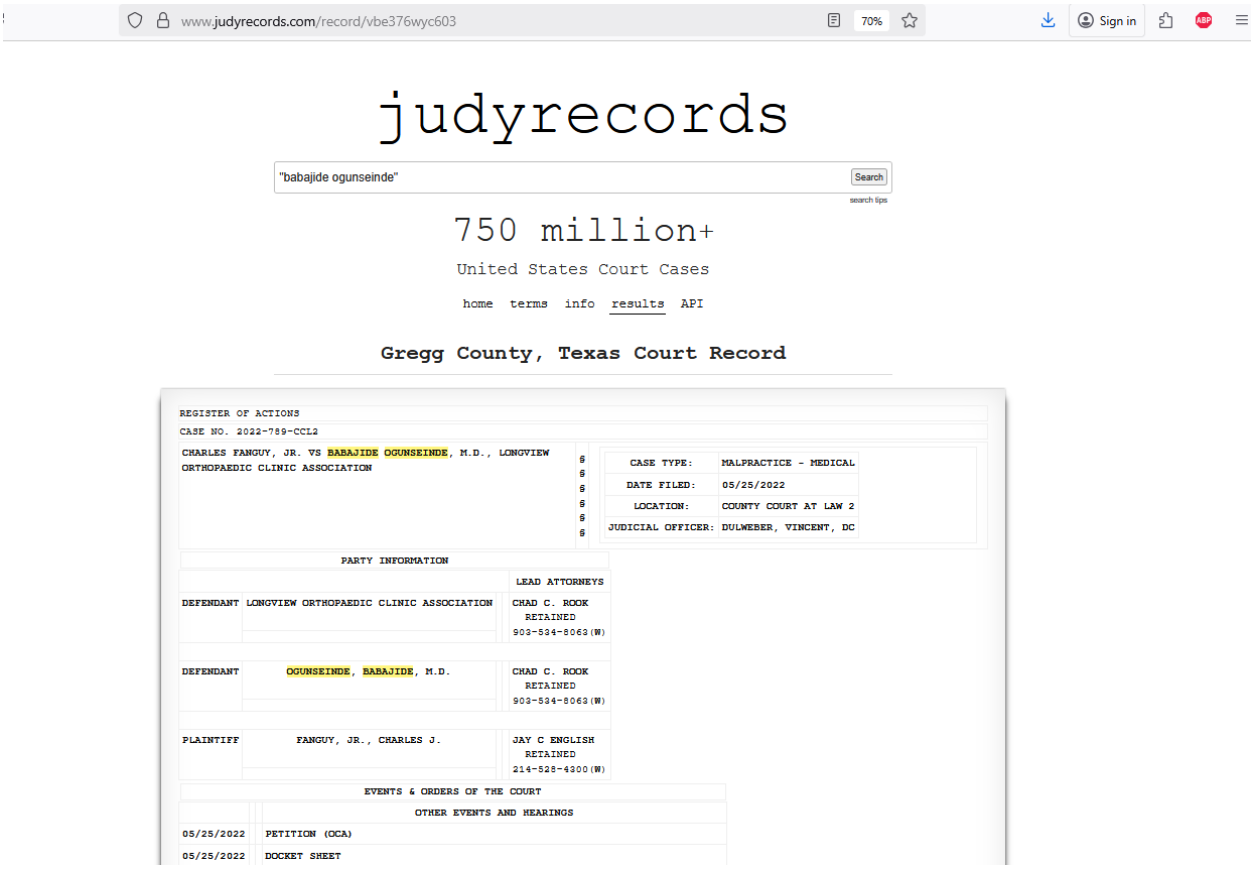
Requestor asked for records from Subject's time in Nigeria. According to the US State department, Nigeria does not have a central database of criminal records at either the local or federal levels at this time.

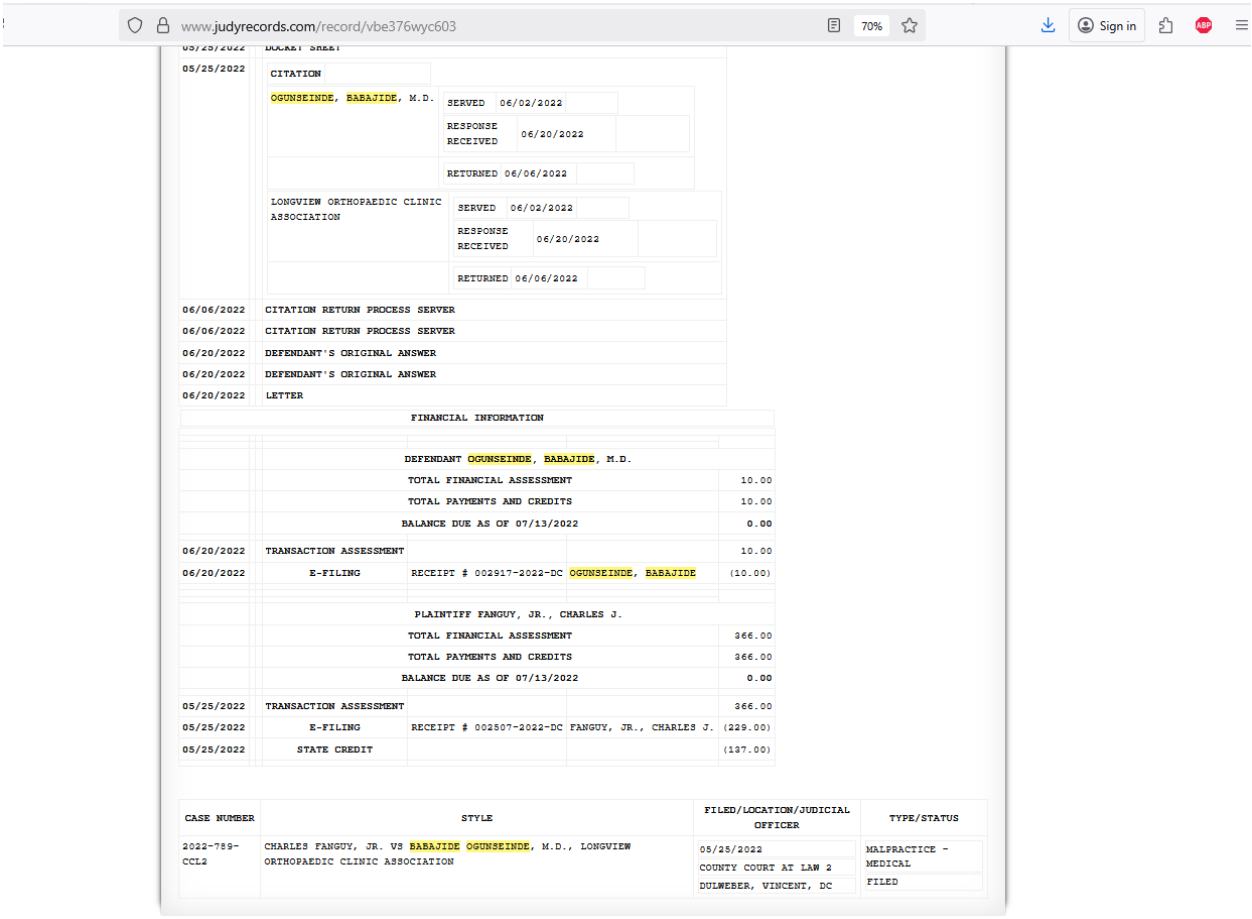
https://travel.state.gov/content/travel/en/us-visas/Visa-Reciprocity-and-Civil-Documents-by-Country/Nigeria.html

RECORD 1:

The following record was confirmed using Subject's name, location, and occupation.

https://www.judyrecords.com/record/vbe376wyc603





www.judyrecords.com/record/vbe376wyc603

05/25/2022	CITATION		
	OGUNSEINDE, BABAJIDE, M.D.	SERVED 06/02/2022	
		RESPONSE RECEIVED 06/20/2022	
		RETURNED 06/06/2022	
	LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION	SERVED 06/02/2022	
		RESPONSE RECEIVED 06/20/2022	
		RETURNED 06/06/2022	
06/06/2022	CITATION RETURN PROCESS SERVER		
06/06/2022	CITATION RETURN PROCESS SERVER		
06/20/2022	DEFENDANT'S ORIGINAL ANSWER		
06/20/2022	DEFENDANT'S ORIGINAL ANSWER		
06/20/2022	LETTER		

FINANCIAL INFORMATION

	DEFENDANT OGUNSEINDE, BABAJIDE, M.D.		
	TOTAL FINANCIAL ASSESSMENT		10.00
	TOTAL PAYMENTS AND CREDITS		10.00
	BALANCE DUE AS OF 07/13/2022		0.00
06/20/2022	TRANSACTION ASSESSMENT		10.00
06/20/2022	E-FILING	RECEIPT # 002917-2022-DC OGUNSEINDE, BABAJIDE	(10.00)
	PLAINTIFF FANGUY, JR., CHARLES J.		
	TOTAL FINANCIAL ASSESSMENT		366.00
	TOTAL PAYMENTS AND CREDITS		366.00
	BALANCE DUE AS OF 07/13/2022		0.00
05/25/2022	TRANSACTION ASSESSMENT		366.00
05/25/2022	E-FILING	RECEIPT # 002507-2022-DC FANGUY, JR., CHARLES J.	(229.00)
05/25/2022	STATE CREDIT		(137.00)

CASE NUMBER	STYLE	FILED/LOCATION/JUDICIAL OFFICER	TYPE/STATUS
2022-789-CCL2	CHARLES FANGUY, JR. VS BABAJIDE OGUNSEINDE, M.D., LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION	05/25/2022 COUNTY COURT AT LAW 2 DULWEBER, VINCENT, DC	MALPRACTICE - MEDICAL FILED

RECORD 2:

The following record was confirmed using Subject's name, location, and occupation.

https://www.judyrecords.com/record/uildg9fe368

www.judyrecords.com/record/uildq9fe368

DEFENDANT KEITH OSWALT LOGGING, L.L.C. BILLY D ANDERSON
RETAINED
903-579-7500(W)

DEFENDANT WHITE, BILLY FRANK BILLY D ANDERSON
RETAINED
903-579-7500(W)

PLAINTIFF EBARB, SHANNON LYNN S. PATTON
RETAINED
903-758-6151(W)

PLAINTIFF GAGE, PATSY LYNN S. PATTON
RETAINED
903-758-6151(W)

EVENTS & ORDERS OF THE COURT
OTHER EVENTS AND HEARINGS

12/28/2020 LETTER
LETTER TO CLERK

12/28/2020 PLAINTIFF'S ORIGINAL PETITION (OCA)
PLAINTIFF'S ORIGINAL PETITION

12/28/2020 CITATION
KEITH OSWALT R/A KEITH OSWALT LOGGING LLC

12/28/2020 CITATION
BILLY FRANK WHITE

12/28/2020 CITATION
EMAILED TO ATTORNEY ON THIS DAY
KEITH OSWALT LOGGING, L.L.C. SERVED 01/07/2021
RETURNED 01/14/2021

12/28/2020 CITATION
EMAILED TO ATTORNEY ON THIS DAY
WHITE, BILLY FRANK SERVED 01/07/2021
RETURNED 01/14/2021

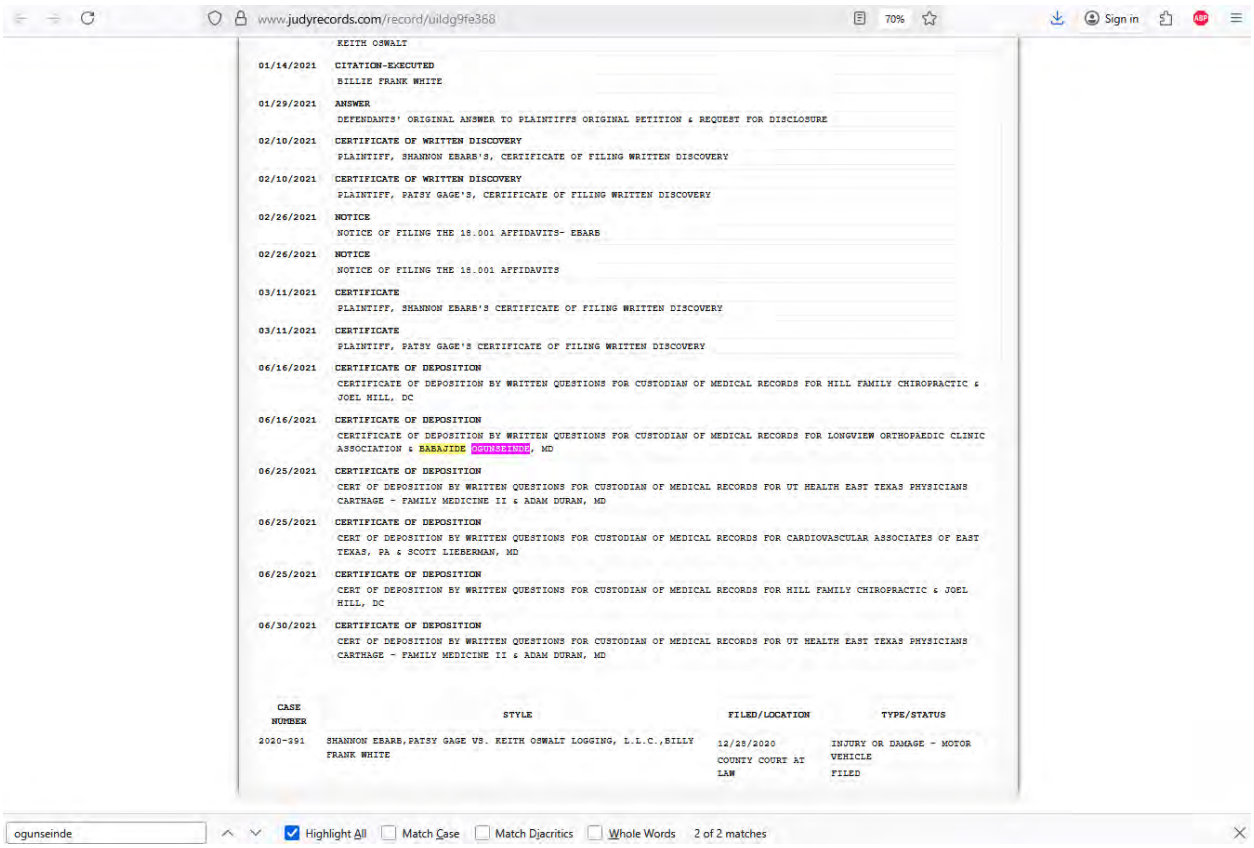
01/14/2021 CITATION-EXECUTED
KEITH OSWALT

01/14/2021 CITATION-EXECUTED
BILLIE FRANK WHITE

01/29/2021 ANSWER
DEFENDANTS' ORIGINAL ANSWER TO PLAINTIFFS ORIGINAL PETITION & REQUEST FOR DISCLOSURE

02/10/2021 CERTIFICATE OF WRITTEN DISCOVERY
PLAINTIFF, SHANNON EBARB'S, CERTIFICATE OF FILING WRITTEN DISCOVERY

oqunseinde Highlight All Match Case Match Diacritics Whole Words 2 of 2 matches



www.judyrecords.com/record/uildg9fe368

KEITH OSWALT

01/14/2021	CITATION-EXECUTED BILLIE FRANK WHITE
01/29/2021	ANSWER DEFENDANTS' ORIGINAL ANSWER TO PLAINTIFFS ORIGINAL PETITION & REQUEST FOR DISCLOSURE
02/10/2021	CERTIFICATE OF WRITTEN DISCOVERY PLAINTIFF, SHANNON EBARB'S, CERTIFICATE OF FILING WRITTEN DISCOVERY
02/10/2021	CERTIFICATE OF WRITTEN DISCOVERY PLAINTIFF, PATSY GAGE'S, CERTIFICATE OF FILING WRITTEN DISCOVERY
02/26/2021	NOTICE NOTICE OF FILING THE 18.001 AFFIDAVITS- EBARB
02/26/2021	NOTICE NOTICE OF FILING THE 18.001 AFFIDAVITS
03/11/2021	CERTIFICATE PLAINTIFF, SHANNON EBARB'S CERTIFICATE OF FILING WRITTEN DISCOVERY
03/11/2021	CERTIFICATE PLAINTIFF, PATSY GAGE'S CERTIFICATE OF FILING WRITTEN DISCOVERY
06/16/2021	CERTIFICATE OF DEPOSITION CERTIFICATE OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR HILL FAMILY CHIROPRACTIC & JOEL HILL, DC
06/16/2021	CERTIFICATE OF DEPOSITION CERTIFICATE OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION & BABAJIDE OGUNSEINDE, MD
06/25/2021	CERTIFICATE OF DEPOSITION CERT OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR UT HEALTH EAST TEXAS PHYSICIANS CARTHAGE - FAMILY MEDICINE II & ADAM DURAN, MD
06/25/2021	CERTIFICATE OF DEPOSITION CERT OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR CARDIOVASCULAR ASSOCIATES OF EAST TEXAS, PA & SCOTT LIEBERMAN, MD
06/25/2021	CERTIFICATE OF DEPOSITION CERT OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR HILL FAMILY CHIROPRACTIC & JOEL HILL, DC
06/30/2021	CERTIFICATE OF DEPOSITION CERT OF DEPOSITION BY WRITTEN QUESTIONS FOR CUSTODIAN OF MEDICAL RECORDS FOR UT HEALTH EAST TEXAS PHYSICIANS CARTHAGE - FAMILY MEDICINE II & ADAM DURAN, MD

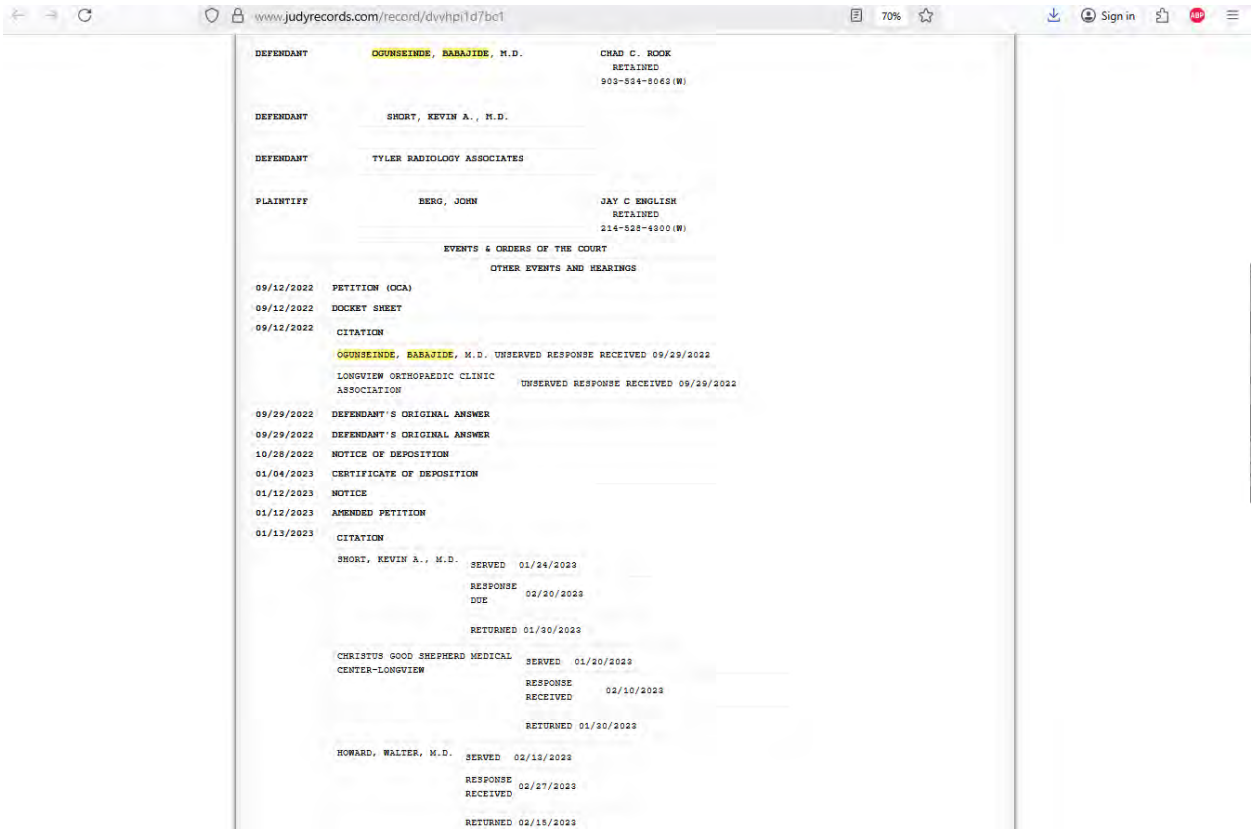
CASE NUMBER	STYLE	FILED/LOCATION	TYPE/STATUS
2020-391	SHANNON EBARB,PATSY GAGE VS. KEITH OSWALT LOGGING, L.L.C.,BILLY FRANK WHITE	12/28/2020 COUNTY COURT AT LAW	INJURY OR DAMAGE - MOTOR VEHICLE FILED

ogunseinde Highlight All Match Case Match Diacritics Whole Words 2 of 2 matches

RECORD 3:

The following record was confirmed using Subject's name, location, and occupation.

https://www.judyrecords.com/record/dvvhpi1d7bc1



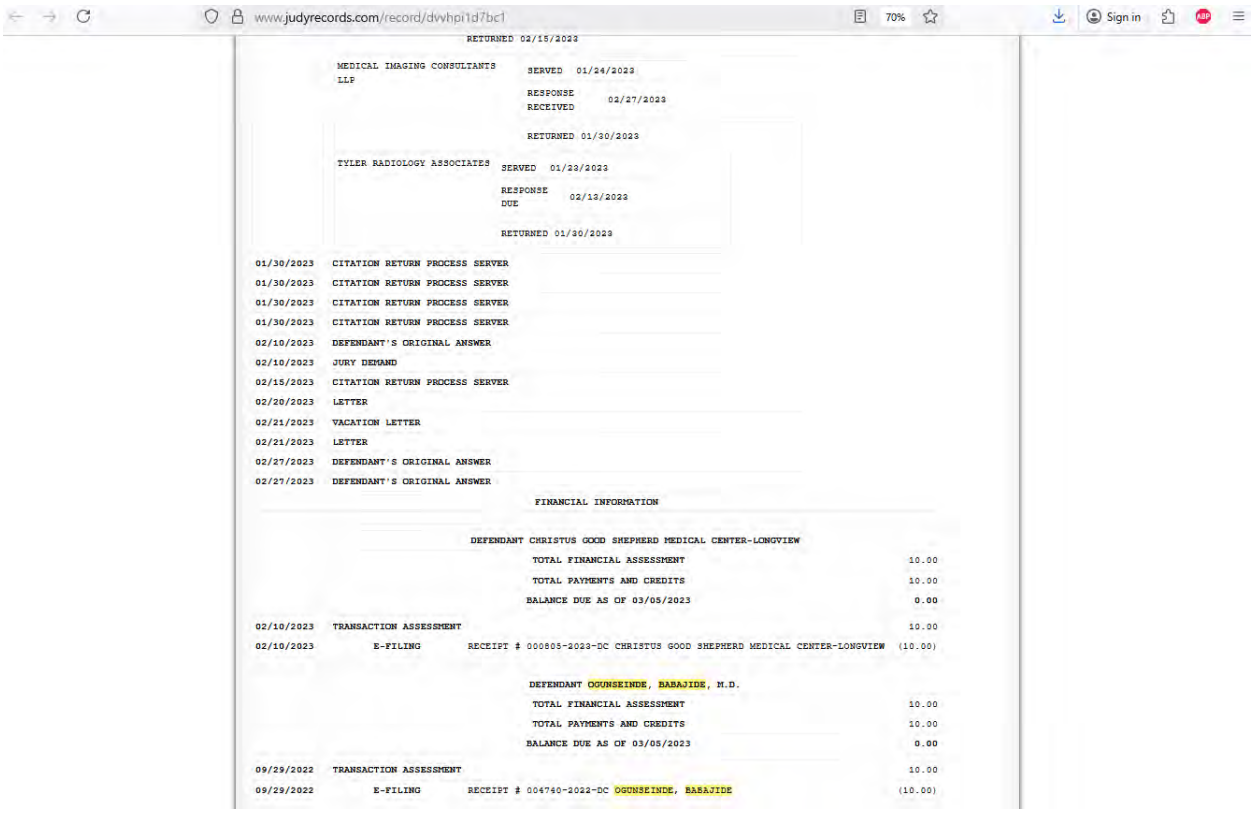
www.judyrecords.com/record/dvwhpi1d7bc1

DEFENDANT	OGUNSEINDE, BABAJIDE, M.D.	CHAD C. ROOK RETAINED 903-534-5063(W)
DEFENDANT	SHORT, KEVIN A., M.D.	
DEFENDANT	TYLER RADIOLOGY ASSOCIATES	
PLAINTIFF	BERG, JOHN	JAY C ENGLISH RETAINED 214-528-4300(W)

EVENTS & ORDERS OF THE COURT

OTHER EVENTS AND HEARINGS

09/12/2022	PETITION (OCA)		
09/12/2022	DOCKET SHEET		
09/12/2022	CITATION		
	OGUNSEINDE, BABAJIDE, M.D.	UNSERVED RESPONSE RECEIVED 09/29/2022	
	LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION	UNSERVED RESPONSE RECEIVED 09/29/2022	
09/29/2022	DEFENDANT'S ORIGINAL ANSWER		
09/29/2022	DEFENDANT'S ORIGINAL ANSWER		
10/28/2022	NOTICE OF DEPOSITION		
01/04/2023	CERTIFICATE OF DEPOSITION		
01/12/2023	NOTICE		
01/12/2023	AMENDED PETITION		
01/13/2023	CITATION		
	SHORT, KEVIN A., M.D.	SERVED 01/24/2023	
		RESPONSE DUE 02/20/2023	
		RETURNED 01/30/2023	
	CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW	SERVED 01/20/2023	
		RESPONSE RECEIVED 02/10/2023	
		RETURNED 01/30/2023	
	HOWARD, WALTER, M.D.	SERVED 02/13/2023	
		RESPONSE RECEIVED 02/27/2023	
		RETURNED 02/15/2023	



www.judyrecords.com/record/dvvhpi1d7bc1

RETURNED 02/15/2023

MEDICAL IMAGING CONSULTANTS LLP — SERVED 01/24/2023; RESPONSE RECEIVED 02/27/2023; RETURNED 01/30/2023

TYLER RADIOLOGY ASSOCIATES — SERVED 01/23/2023; RESPONSE DUE 02/13/2023; RETURNED 01/30/2023

01/30/2023	CITATION RETURN PROCESS SERVER	
01/30/2023	CITATION RETURN PROCESS SERVER	
01/30/2023	CITATION RETURN PROCESS SERVER	
01/30/2023	CITATION RETURN PROCESS SERVER	
02/10/2023	DEFENDANT'S ORIGINAL ANSWER	
02/10/2023	JURY DEMAND	
02/15/2023	CITATION RETURN PROCESS SERVER	
02/20/2023	LETTER	
02/21/2023	VACATION LETTER	
02/21/2023	LETTER	
02/27/2023	DEFENDANT'S ORIGINAL ANSWER	
02/27/2023	DEFENDANT'S ORIGINAL ANSWER	

FINANCIAL INFORMATION

DEFENDANT CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW

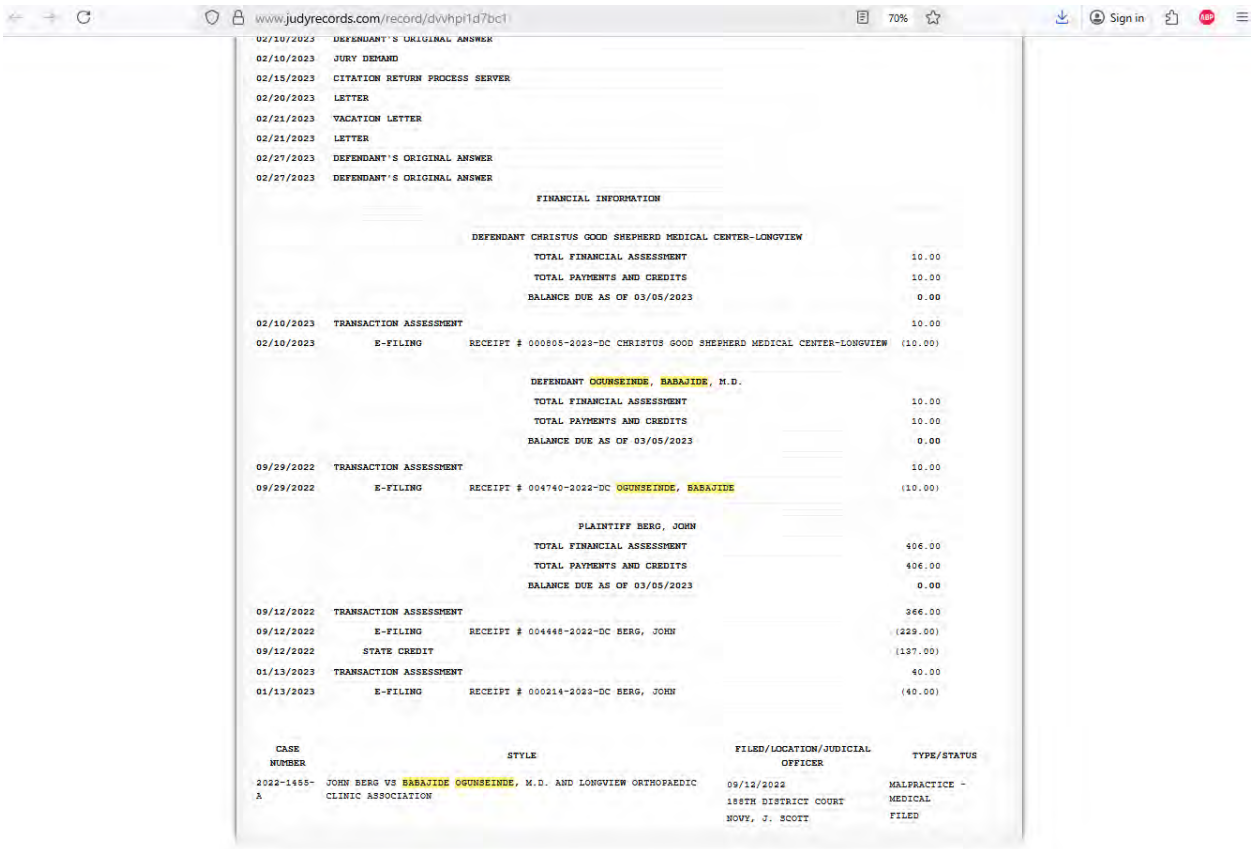
TOTAL FINANCIAL ASSESSMENT	10.00
TOTAL PAYMENTS AND CREDITS	10.00
BALANCE DUE AS OF 03/05/2023	0.00

02/10/2023	TRANSACTION ASSESSMENT		10.00
02/10/2023	E-FILING	RECEIPT # 000805-2023-DC CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW	(10.00)

DEFENDANT OGUNSEINDE, BABAJIDE, M.D.

TOTAL FINANCIAL ASSESSMENT	10.00
TOTAL PAYMENTS AND CREDITS	10.00
BALANCE DUE AS OF 03/05/2023	0.00

09/29/2022	TRANSACTION ASSESSMENT		10.00
09/29/2022	E-FILING	RECEIPT # 004740-2022-DC OGUNSEINDE, BABAJIDE	(10.00)



www.judyrecords.com/record/dvvhpi1d7bc1

02/10/2023 DEFENDANT'S ORIGINAL ANSWER
02/10/2023 JURY DEMAND
02/15/2023 CITATION RETURN PROCESS SERVER
02/20/2023 LETTER
02/21/2023 VACATION LETTER
02/21/2023 LETTER
02/27/2023 DEFENDANT'S ORIGINAL ANSWER
02/27/2023 DEFENDANT'S ORIGINAL ANSWER

FINANCIAL INFORMATION

DEFENDANT CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW

TOTAL FINANCIAL ASSESSMENT	10.00
TOTAL PAYMENTS AND CREDITS	10.00
BALANCE DUE AS OF 03/05/2023	0.00

02/10/2023	TRANSACTION ASSESSMENT		10.00
02/10/2023	E-FILING	RECEIPT # 000805-2023-DC CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW	(10.00)

DEFENDANT OGUNSEINDE, BABAJIDE, M.D.

TOTAL FINANCIAL ASSESSMENT	10.00
TOTAL PAYMENTS AND CREDITS	10.00
BALANCE DUE AS OF 03/05/2023	0.00

09/29/2022	TRANSACTION ASSESSMENT		10.00
09/29/2022	E-FILING	RECEIPT # 004740-2022-DC OGUNSEINDE, BABAJIDE	(10.00)

PLAINTIFF BERG, JOHN

TOTAL FINANCIAL ASSESSMENT	406.00
TOTAL PAYMENTS AND CREDITS	406.00
BALANCE DUE AS OF 03/05/2023	0.00

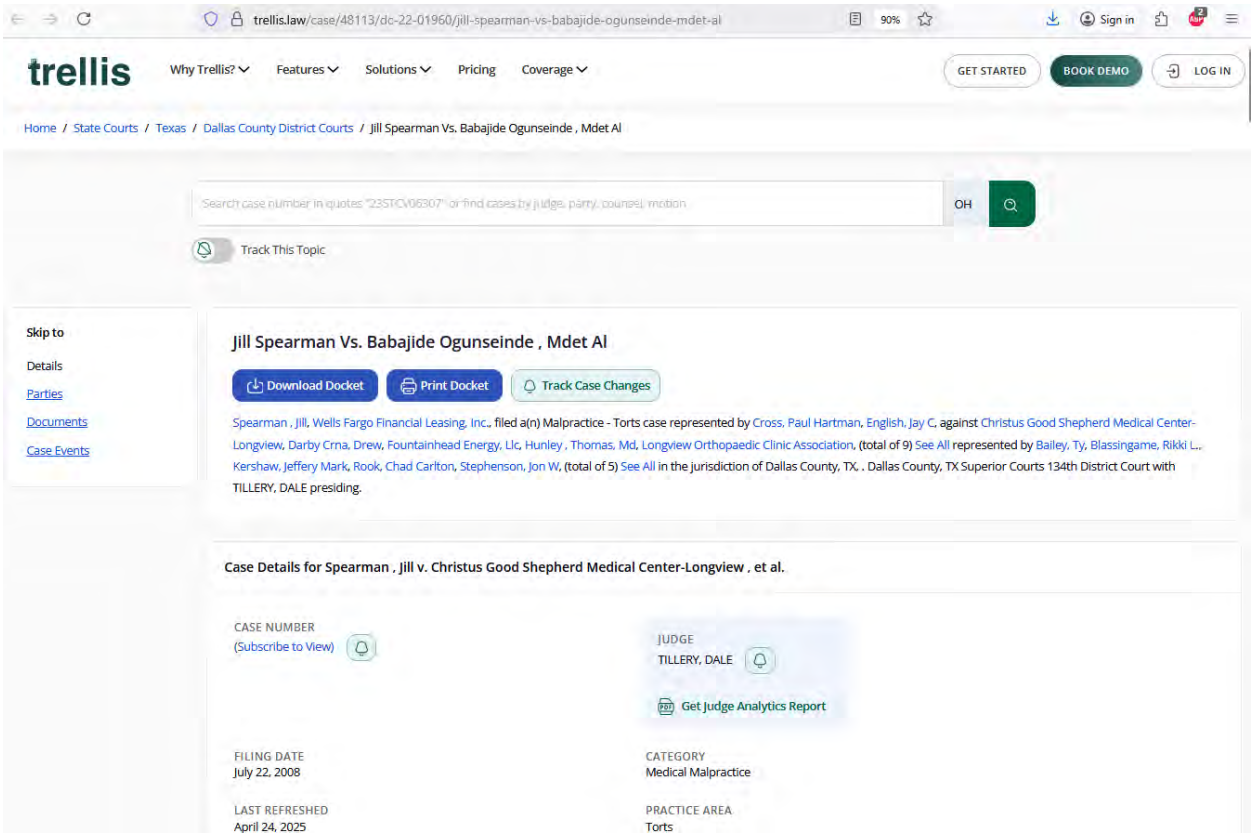
09/12/2022	TRANSACTION ASSESSMENT		366.00
09/12/2022	E-FILING	RECEIPT # 004468-2022-DC BERG, JOHN	(229.00)
09/12/2022	STATE CREDIT		(137.00)
01/13/2023	TRANSACTION ASSESSMENT		40.00
01/13/2023	E-FILING	RECEIPT # 000214-2023-DC BERG, JOHN	(40.00)

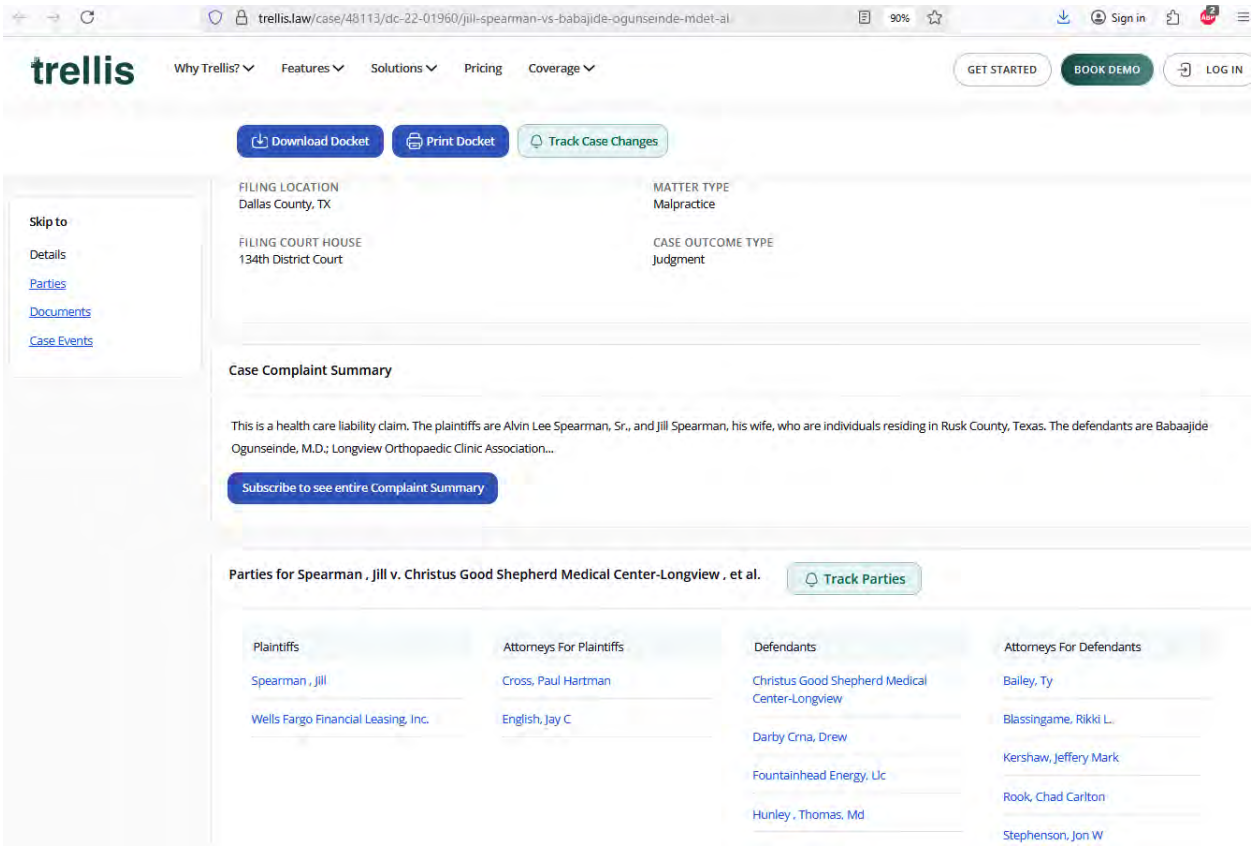
CASE NUMBER	STYLE	FILED/LOCATION/JUDICIAL OFFICER	TYPE/STATUS
2022-1455-A	JOHN BERG VS BABAJIDE OGUNSEINDE, M.D. AND LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION	09/12/2022 188TH DISTRICT COURT NOVY, J. SCOTT	MALPRACTICE - MEDICAL FILED

RECORD 4:

The following record was confirmed using Subject's name, location, and occupation.

https://trellis.law/case/48113/dc-22-01960/jill-spearman-vs-babajide-ogunseinde-mdet-al




trellis.law/case/48113/dc-22-01960/jill-spearman-vs-babajide-ogunseinde-mdet-al
90%
Sign in
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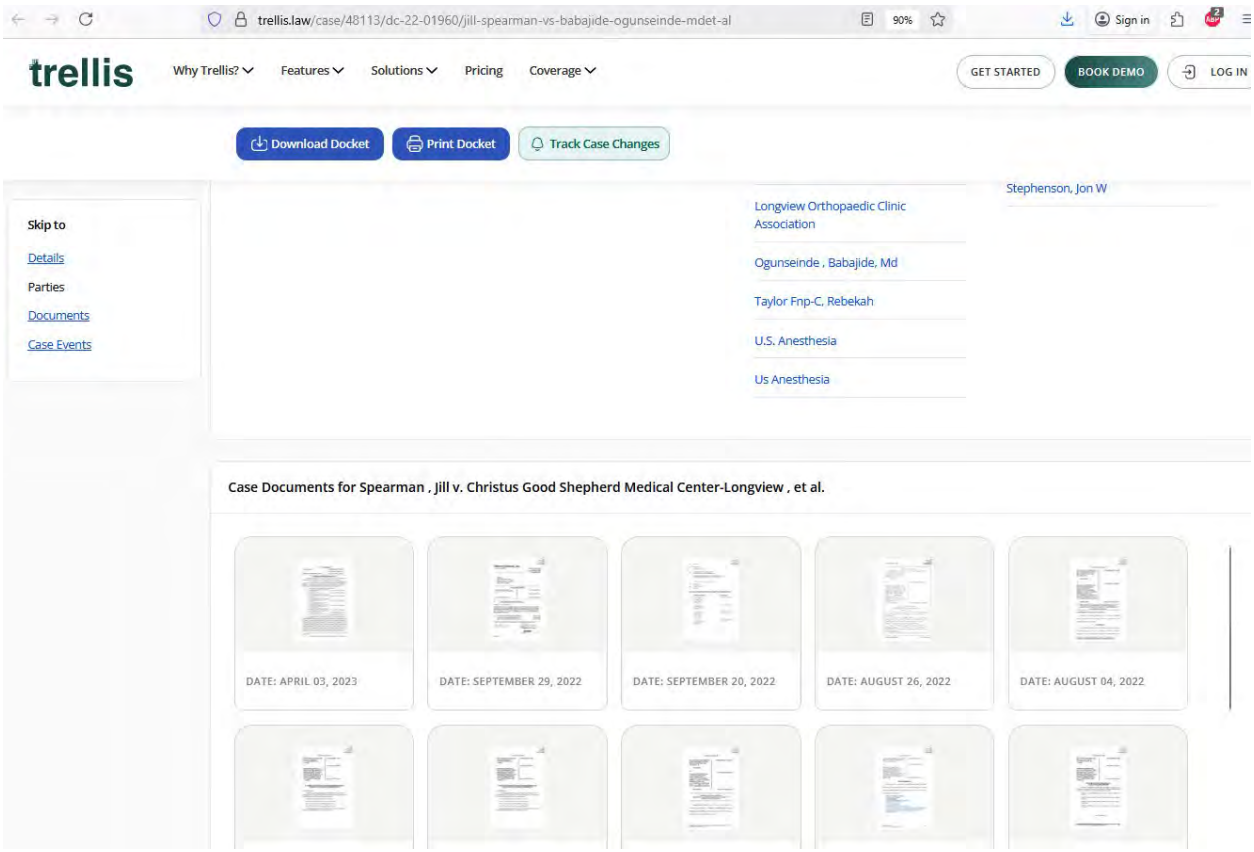
Why Trellis?
Features
Solutions
Pricing
Coverage
GET STARTED
BOOK DEMO
LOG IN
Download Docket
Print Docket
Track Case Changes
Skip to
Details
Parties
Documents
Case Events
FILING LOCATION
Dallas County, TX
MATTER TYPE
Malpractice
FILING COURT HOUSE
134th District Court
CASE OUTCOME TYPE
Judgment
Case Complaint Summary
This is a health care liability claim. The plaintiffs are Alvin Lee Spearman, Sr., and Jill Spearman, his wife, who are individuals residing in Rusk County, Texas. The defendants are Babaajide Ogunseinde, M.D.; Longview Orthopaedic Clinic Association...
Subscribe to see entire Complaint Summary
Parties for Spearman , Jill v. Christus Good Shepherd Medical Center-Longview , et al.
Track Parties
Plaintiffs
Spearman , Jill
Wells Fargo Financial Leasing, Inc.
Attorneys For Plaintiffs
Cross, Paul Hartman
English, Jay C
Defendants
Christus Good Shepherd Medical Center-Longview
Darby Crna, Drew
Fountainhead Energy, Llc
Hunley , Thomas, Md
Attorneys For Defendants
Bailey, Ty
Blassingame, Rikki L.
Kershaw, Jeffery Mark
Rook, Chad Carlton
Stephenson, Jon W


trellis.law/case/48113/dc-22-01960/jill-spearman-vs-babajide-ogunseinde-mdet-al
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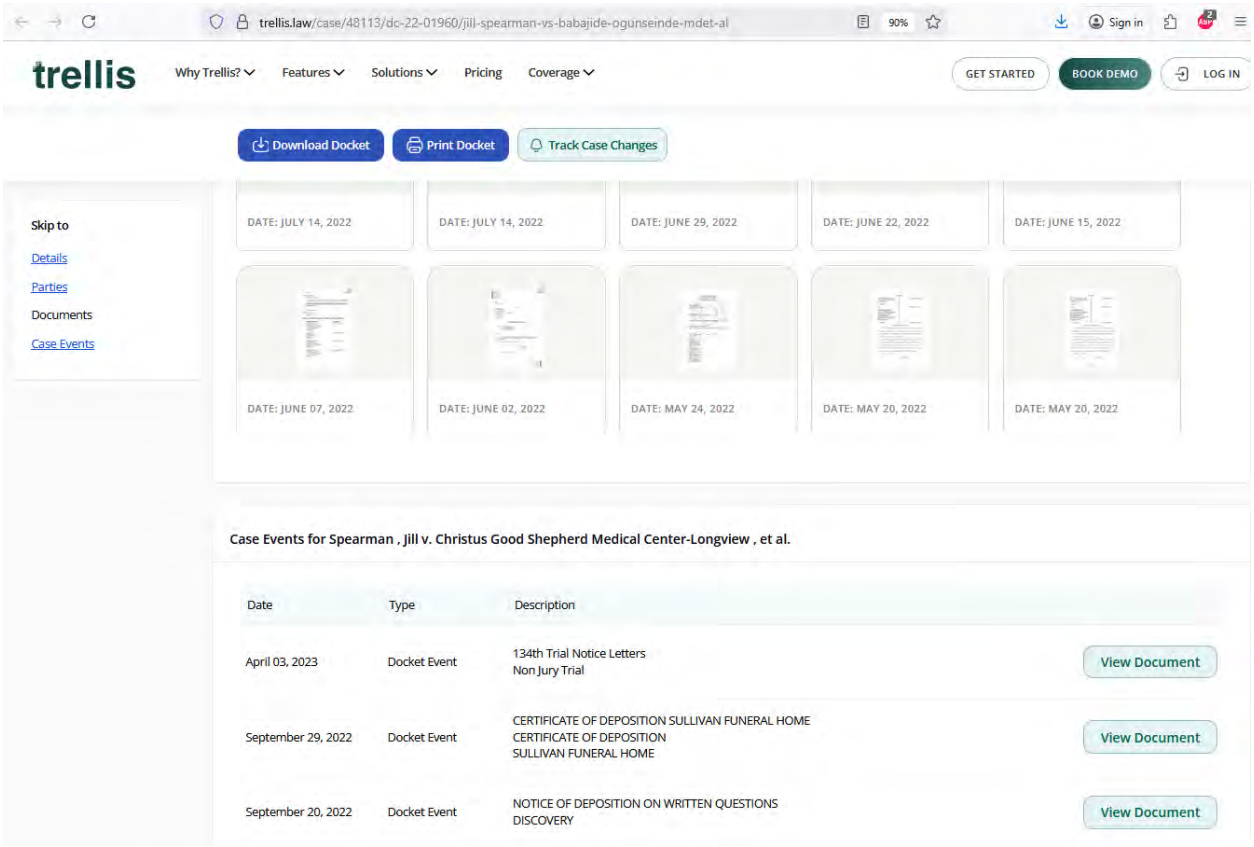
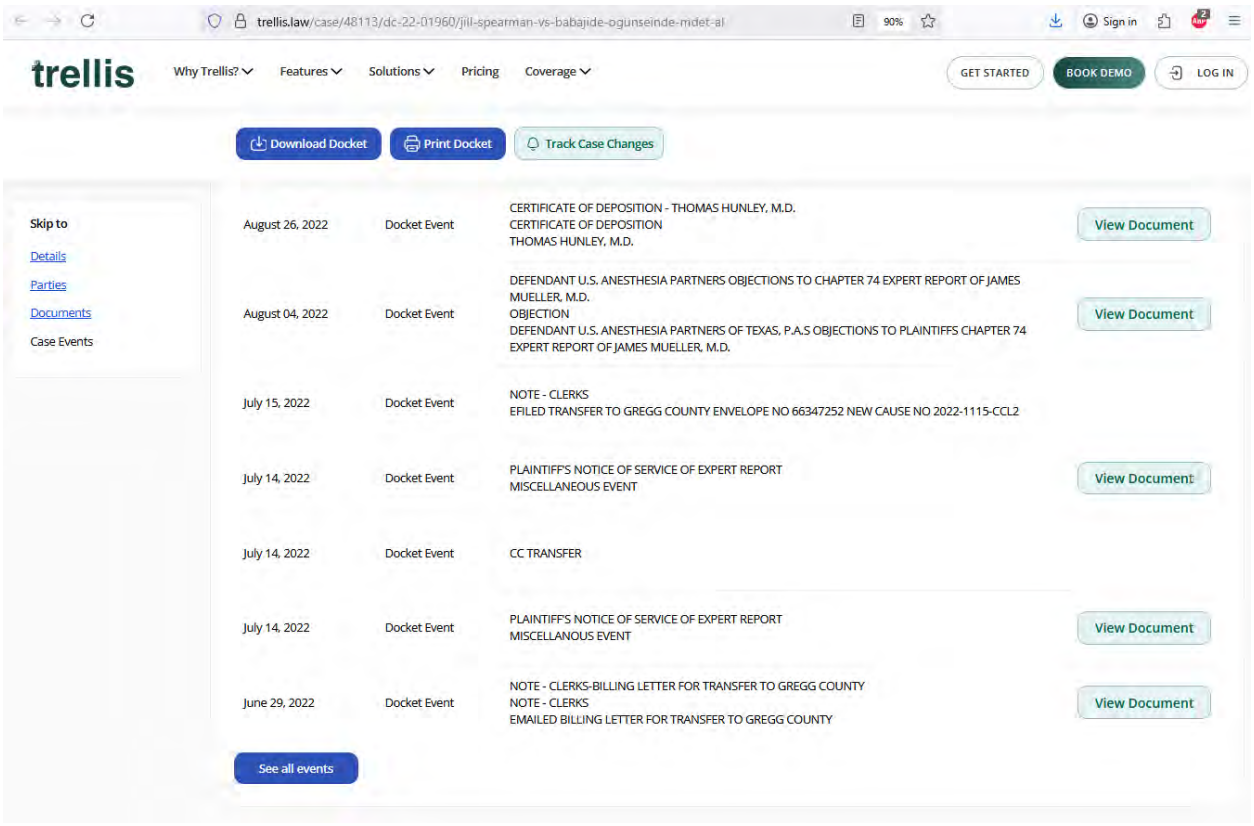
Why Trellis?
Features
Solutions
Pricing
Coverage
GET STARTED
BOOK DEMO
LOG IN
Download Docket
Print Docket
Track Case Changes
Skip to
Details
Parties
Documents
Case Events
Longview Orthopaedic Clinic Association
Ogunseinde , Babajide, Md
Taylor Fnp-C, Rebekah
U.S. Anesthesia
Us Anesthesia
Stephenson, Jon W
Case Documents for Spearman , Jill v. Christus Good Shepherd Medical Center-Longview , et al.
DATE: APRIL 03, 2023
DATE: SEPTEMBER 29, 2022
DATE: SEPTEMBER 20, 2022
DATE: AUGUST 26, 2022
DATE: AUGUST 04, 2022


trellis.law/case/48113/dc-22-01960/jill-spearman-vs-babajide-ogunseinde-mdet-al
trellis
Why Trellis?
Features
Solutions
Pricing
Coverage
GET STARTED
BOOK DEMO
LOG IN
Download Docket
Print Docket
Track Case Changes
Skip to
Details
Parties
Documents
Case Events
DATE: JULY 14, 2022
DATE: JULY 14, 2022
DATE: JUNE 29, 2022
DATE: JUNE 22, 2022
DATE: JUNE 15, 2022
DATE: JUNE 07, 2022
DATE: JUNE 02, 2022
DATE: MAY 24, 2022
DATE: MAY 20, 2022
DATE: MAY 20, 2022
Case Events for Spearman , Jill v. Christus Good Shepherd Medical Center-Longview , et al.
Date
Type
Description
April 03, 2023
Docket Event
134th Trial Notice Letters
Non Jury Trial
View Document
September 29, 2022
Docket Event
CERTIFICATE OF DEPOSITION SULLIVAN FUNERAL HOME
CERTIFICATE OF DEPOSITION
SULLIVAN FUNERAL HOME
View Document
September 20, 2022
Docket Event
NOTICE OF DEPOSITION ON WRITTEN QUESTIONS
DISCOVERY
View Document


trellis.law/case/48113/dc-22-01960/jill-spearman-vs-babajide-ogunseinde-mdet-al
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Sign in
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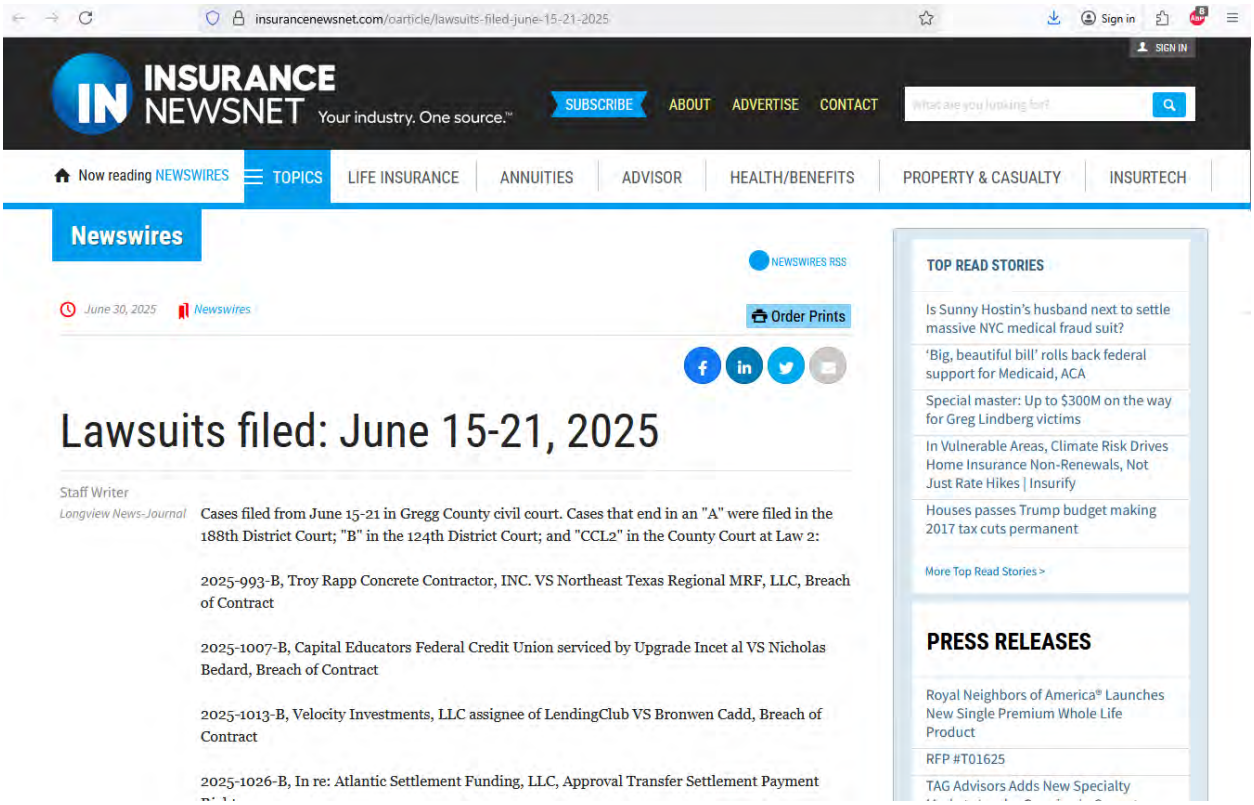
Why Trellis?
Features
Solutions
Pricing
Coverage
GET STARTED
BOOK DEMO
LOG IN
Download Docket
Print Docket
Track Case Changes
Skip to
Details
Parties
Documents
Case Events
August 26, 2022 Docket Event CERTIFICATE OF DEPOSITION - THOMAS HUNLEY, M.D. CERTIFICATE OF DEPOSITION THOMAS HUNLEY, M.D. View Document
August 04, 2022 Docket Event DEFENDANT U.S. ANESTHESIA PARTNERS OBJECTIONS TO CHAPTER 74 EXPERT REPORT OF JAMES MUELLER, M.D. OBJECTION DEFENDANT U.S. ANESTHESIA PARTNERS OF TEXAS, P.A.S OBJECTIONS TO PLAINTIFFS CHAPTER 74 EXPERT REPORT OF JAMES MUELLER, M.D. View Document
July 15, 2022 Docket Event NOTE - CLERKS EFILED TRANSFER TO GREGG COUNTY ENVELOPE NO 66347252 NEW CAUSE NO 2022-1115-CCL2
July 14, 2022 Docket Event PLAINTIFF'S NOTICE OF SERVICE OF EXPERT REPORT MISCELLANEOUS EVENT View Document
July 14, 2022 Docket Event CC TRANSFER
July 14, 2022 Docket Event PLAINTIFF'S NOTICE OF SERVICE OF EXPERT REPORT MISCELLANOUS EVENT View Document
June 29, 2022 Docket Event NOTE - CLERKS-BILLING LETTER FOR TRANSFER TO GREGG COUNTY NOTE - CLERKS EMAILED BILLING LETTER FOR TRANSFER TO GREGG COUNTY View Document
See all events

RECORD 5:

The following record was confirmed using Subject's name, location, and occupation.

https://insurancenewsnet.com/oarticle/lawsuits-filed-june-15-21-2025



insurancenewsnet.com/oarticle/lawsuits-filed-june-15-21-2025

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Newswires

June 30, 2025 Newswires

Order Prints

Lawsuits filed: June 15-21, 2025

Staff Writer
Longview News-Journal

Cases filed from June 15-21 in Gregg County civil court. Cases that end in an "A" were filed in the 188th District Court; "B" in the 124th District Court; and "CCL2" in the County Court at Law 2:

2025-993-B, Troy Rapp Concrete Contractor, INC. VS Northeast Texas Regional MRF, LLC, Breach of Contract

2025-1007-B, Capital Educators Federal Credit Union serviced by Upgrade Incet al VS Nicholas Bedard, Breach of Contract

2025-1013-B, Velocity Investments, LLC assignee of LendingClub VS Bronwen Cadd, Breach of Contract

2025-1026-B, In re: Atlantic Settlement Funding, LLC, Approval Transfer Settlement Payment

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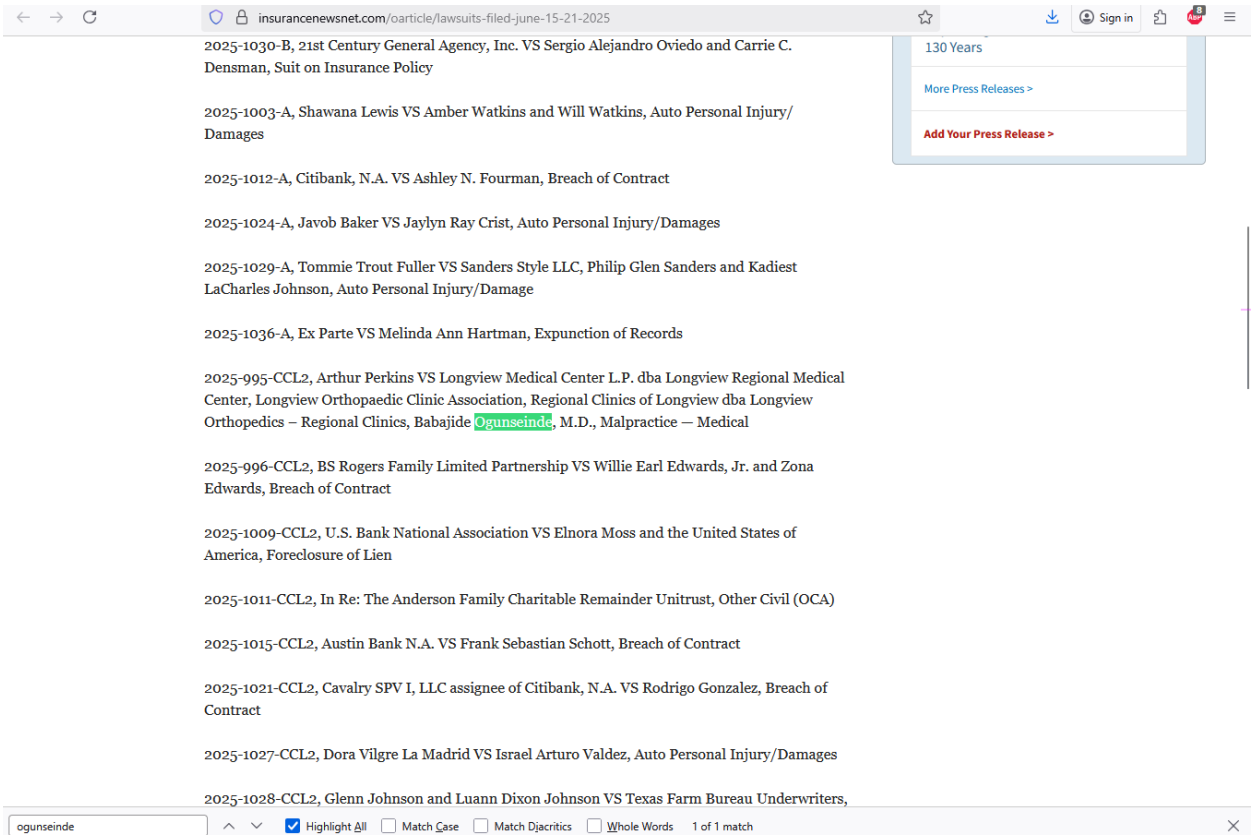
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2025-1030-B, 21st Century General Agency, Inc. VS Sergio Alejandro Oviedo and Carrie C. Densman, Suit on Insurance Policy
2025-1003-A, Shawana Lewis VS Amber Watkins and Will Watkins, Auto Personal Injury/ Damages
2025-1012-A, Citibank, N.A. VS Ashley N. Fourman, Breach of Contract
2025-1024-A, Javob Baker VS Jaylyn Ray Crist, Auto Personal Injury/Damages
2025-1029-A, Tommie Trout Fuller VS Sanders Style LLC, Philip Glen Sanders and Kadiest LaCharles Johnson, Auto Personal Injury/Damage
2025-1036-A, Ex Parte VS Melinda Ann Hartman, Expunction of Records
2025-995-CCL2, Arthur Perkins VS Longview Medical Center L.P. dba Longview Regional Medical Center, Longview Orthopaedic Clinic Association, Regional Clinics of Longview dba Longview Orthopedics – Regional Clinics, Babajide Ogunseinde, M.D., Malpractice — Medical
2025-996-CCL2, BS Rogers Family Limited Partnership VS Willie Earl Edwards, Jr. and Zona Edwards, Breach of Contract
2025-1009-CCL2, U.S. Bank National Association VS Elnora Moss and the United States of America, Foreclosure of Lien
2025-1011-CCL2, In Re: The Anderson Family Charitable Remainder Unitrust, Other Civil (OCA)
2025-1015-CCL2, Austin Bank N.A. VS Frank Sebastian Schott, Breach of Contract
2025-1021-CCL2, Cavalry SPV I, LLC assignee of Citibank, N.A. VS Rodrigo Gonzalez, Breach of Contract
2025-1027-CCL2, Dora Vilgre La Madrid VS Israel Arturo Valdez, Auto Personal Injury/Damages
2025-1028-CCL2, Glenn Johnson and Luann Dixon Johnson VS Texas Farm Bureau Underwriters,
ogunseinde
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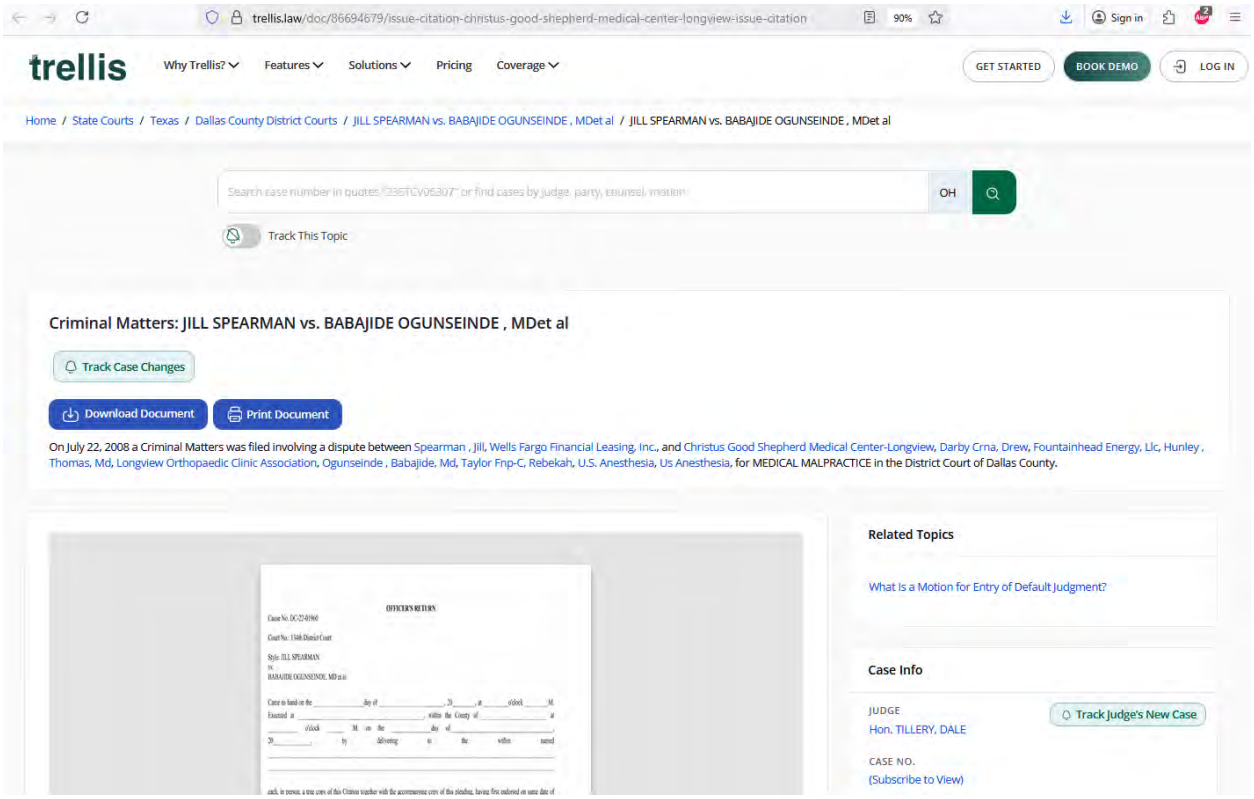
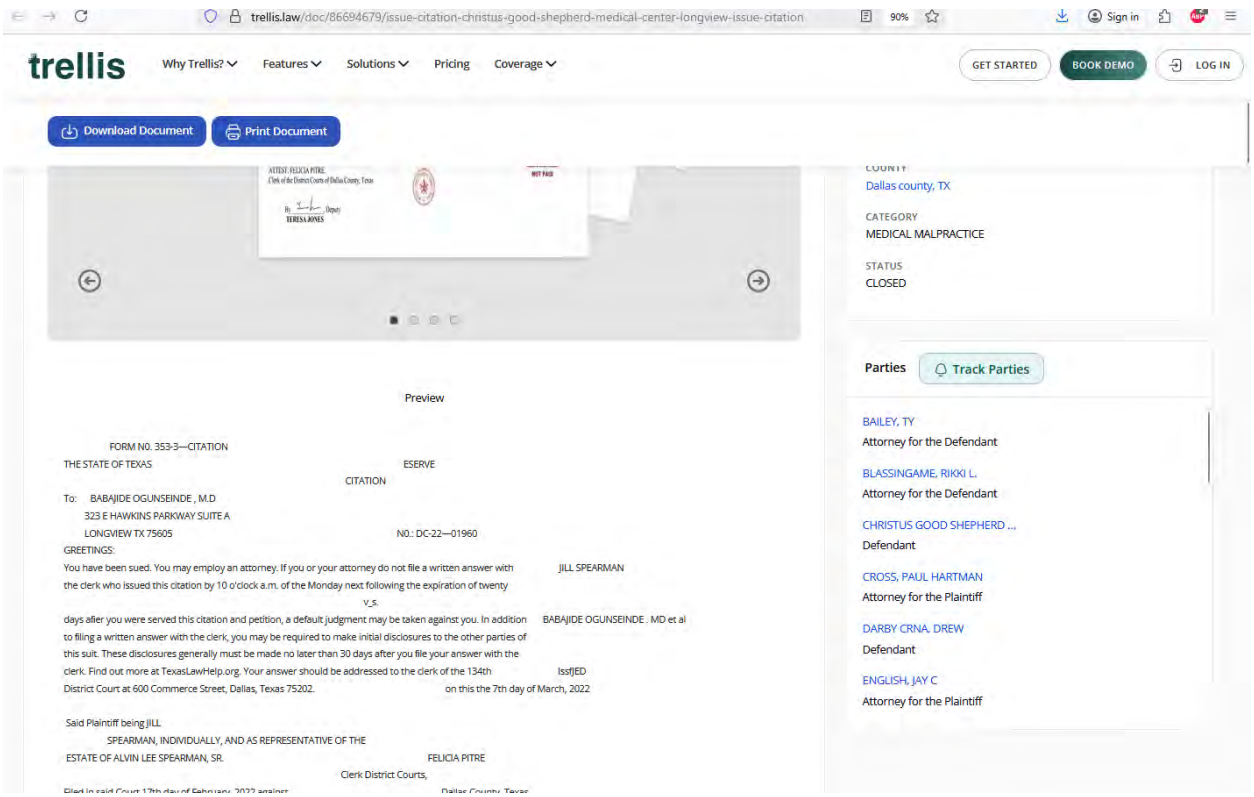
Match Case
Match Diacritics
Whole Words
1 of 1 match

RECORD 6:

The following record was confirmed using Subject's name, location, and occupation.

https://trellis.law/doc/86694679/issue-citation-christus-good-shepherd-medical-center-longview-issue-citation

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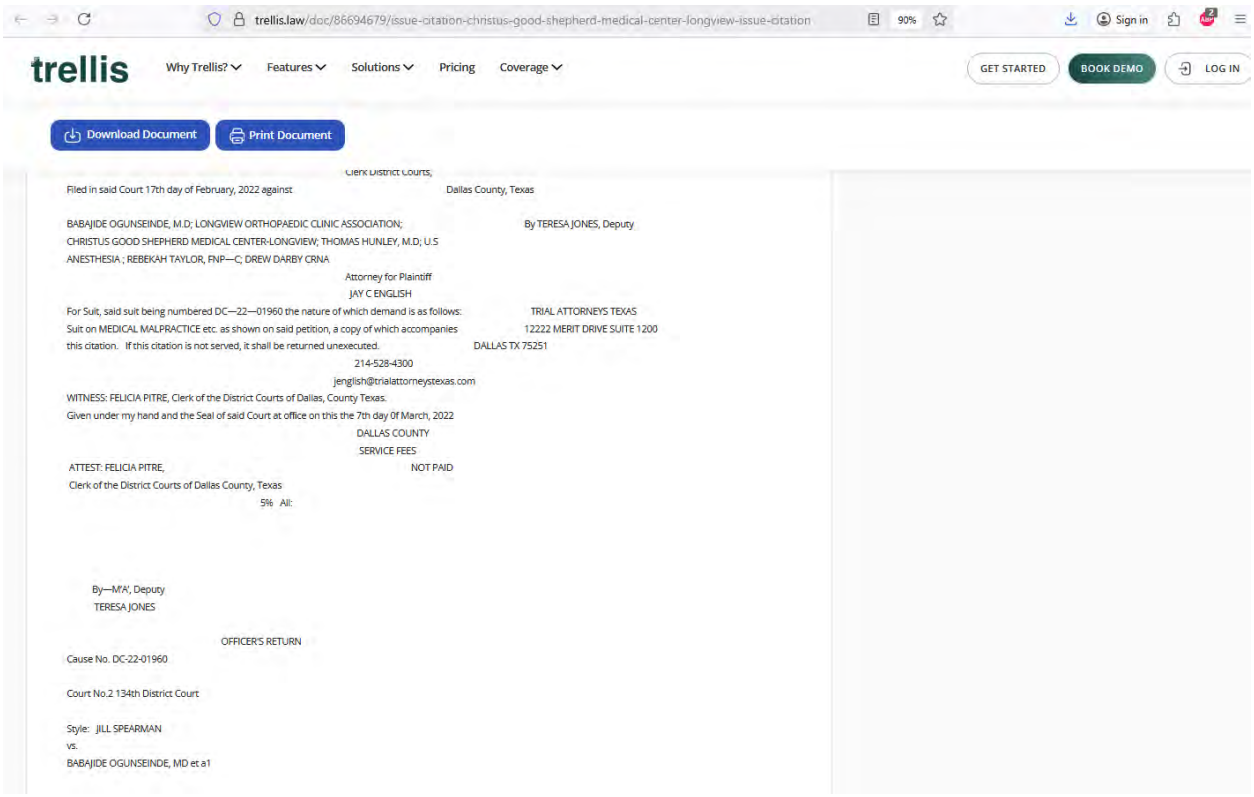
FORM NO. 353-3—CITATION
THE STATE OF TEXAS
ESERVE
CITATION
To: BABAJIDE OGUNSEINDE , M.D
323 E HAWKINS PARKWAY SUITE A
LONGVIEW TX 75605
NO.: DC-22—01960
GREETINGS:
You have been sued. You may employ an attorney. If you or your attorney do not file a written answer with the clerk who issued this citation by 10 o'clock a.m. of the Monday next following the expiration of twenty
JILL SPEARMAN
V_S-
days after you were served this citation and petition, a default judgment may be taken against you. In addition to filing a written answer with the clerk, you may be required to make initial disclosures to the other parties of this suit. These disclosures generally must be made no later than 30 days after you file your answer with the clerk. Find out more at TexasLawHelp.org. Your answer should be addressed to the clerk of the 134th District Court at 600 Commerce Street, Dallas, Texas 75202.
BABAJIDE OGUNSEINDE . MD et al
Issfjed
on this the 7th day of March, 2022
Said Plaintiff being JILL
SPEARMAN, INDIVIDUALLY, AND AS REPRESENTATIVE OF THE
ESTATE OF ALVIN LEE SPEARMAN, SR.
FELICIA PITRE
Clerk District Courts,
Dallas County, TX
CATEGORY
MEDICAL MALPRACTICE
STATUS
CLOSED
Parties
Track Parties
BAILEY, TY
Attorney for the Defendant
BLASSINGAME, RIKKI L.
Attorney for the Defendant
CHRISTUS GOOD SHEPHERD ...
Defendant
CROSS, PAUL HARTMAN
Attorney for the Plaintiff
DARBY CRNA, DREW
Defendant
ENGLISH, JAY C
Attorney for the Plaintiff



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Clerk District Courts,
Filed in said Court 17th day of February, 2022 against Dallas County, Texas

BABAJIDE OGUNSEINDE, M.D; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; By TERESA JONES, Deputy
CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW; THOMAS HUNLEY, M.D; U.S
ANESTHESIA ; REBEKAH TAYLOR, FNP—C; DREW DARBY CRNA

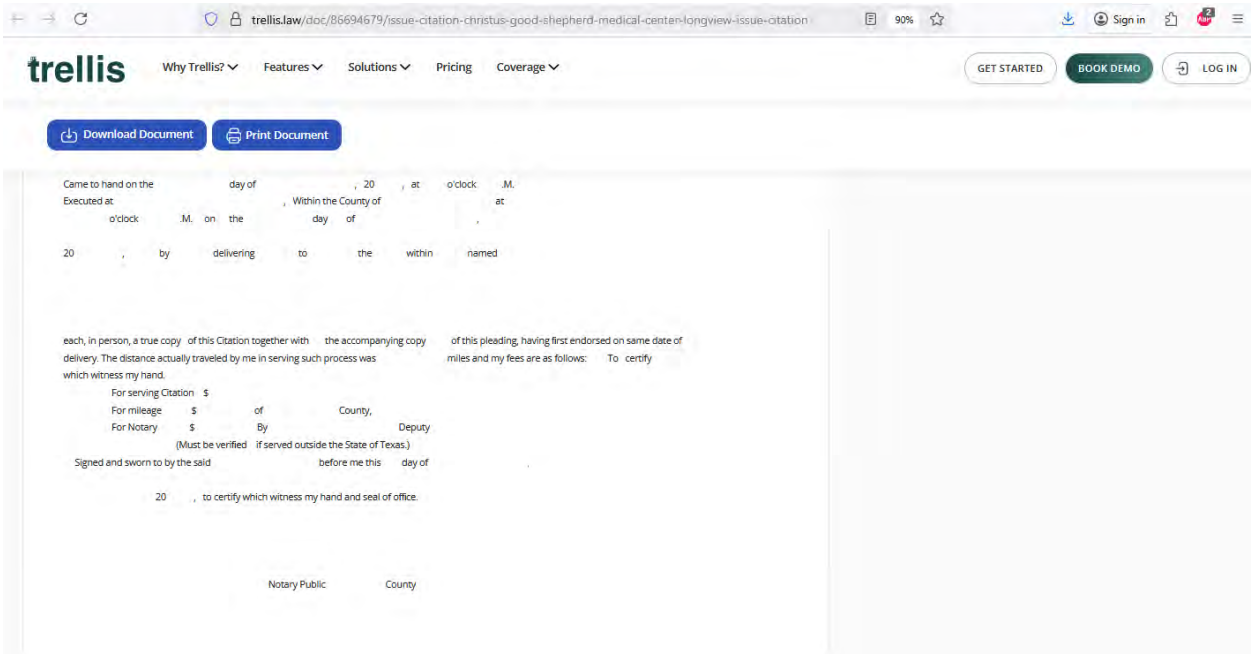
Attorney for Plaintiff
JAY C ENGLISH
For Suit, said suit being numbered DC—22—01960 the nature of which demand is as follows: TRIAL ATTORNEYS TEXAS
Suit on MEDICAL MALPRACTICE etc. as shown on said petition, a copy of which accompanies 12222 MERIT DRIVE SUITE 1200
this citation. If this citation is not served, it shall be returned unexecuted. DALLAS TX 75251
214-528-4300
jenglish@trialattorneystexas.com
WITNESS: FELICIA PITRE, Clerk of the District Courts of Dallas, County Texas.
Given under my hand and the Seal of said Court at office on this the 7th day 0f March, 2022
DALLAS COUNTY
SERVICE FEES
ATTEST: FELICIA PITRE, NOT PAID
Clerk of the District Courts of Dallas County, Texas
5% All:

By—M'A', Deputy
TERESA JONES

OFFICER'S RETURN
Cause No. DC-22-01960

Court No.2 134th District Court

Style: JILL SPEARMAN
vs.
BABAJIDE OGUNSEINDE, MD et a1



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Executed at , Within the County of at
o'clock .M. on the day of ,

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delivery. The distance actually traveled by me in serving such process was miles and my fees are as follows: To certify
which witness my hand.
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For mileage $ of County,
For Notary $ By Deputy
(Must be verified if served outside the State of Texas.)
Signed and sworn to by the said before me this day of

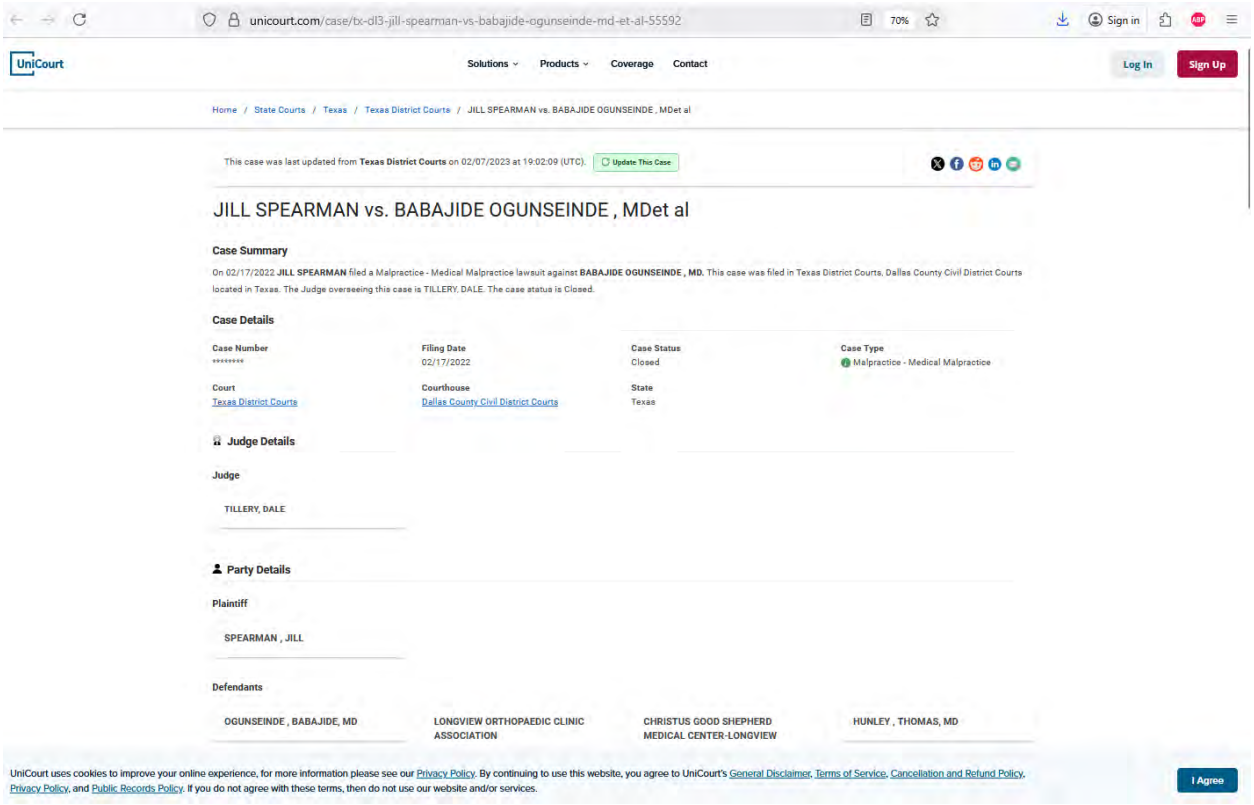
20 , to certify which witness my hand and seal of office.

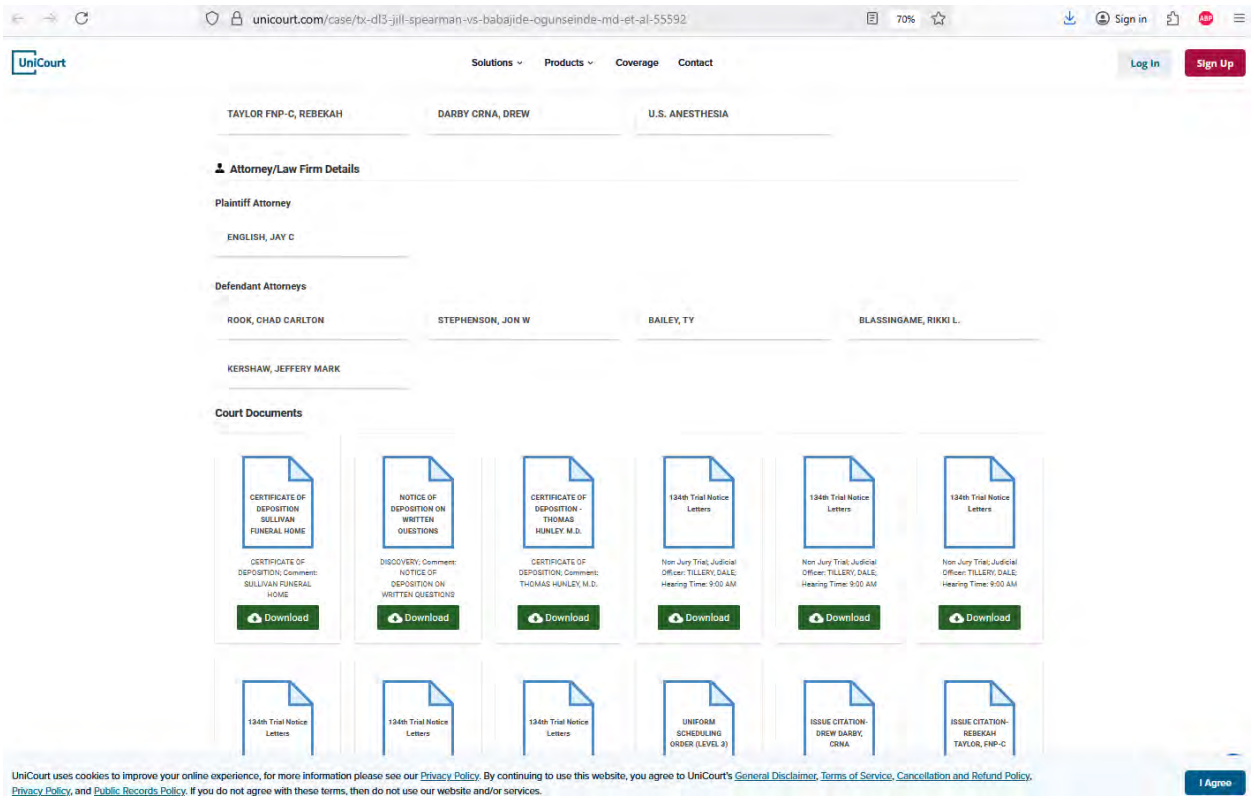
Notary Public County

RECORD 7:

The following record was confirmed using Subject's name, location, and occupation.

https://unicourt.com/case/tx-dl3-jill-spearman-vs-babajide-ogunseinde-md-et-al-55592

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TAYLOR FNP-C, REBEKAH
DARBY CRNA, DREW
U.S. ANESTHESIA
Attorney/Law Firm Details
Plaintiff Attorney
ENGLISH, JAY C
Defendant Attorneys
ROOK, CHAD CARLTON
STEPHENSON, JON W
BAILEY, TY
BLASSINGAME, RIKKI L.
KERSHAW, JEFFERY MARK
Court Documents
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NOTICE OF DEPOSITION ON WRITTEN QUESTIONS
CERTIFICATE OF DEPOSITION - THOMAS HUNLEY, M.D.
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ISSUE CITATION- REBEKAH TAYLOR, FNP-C
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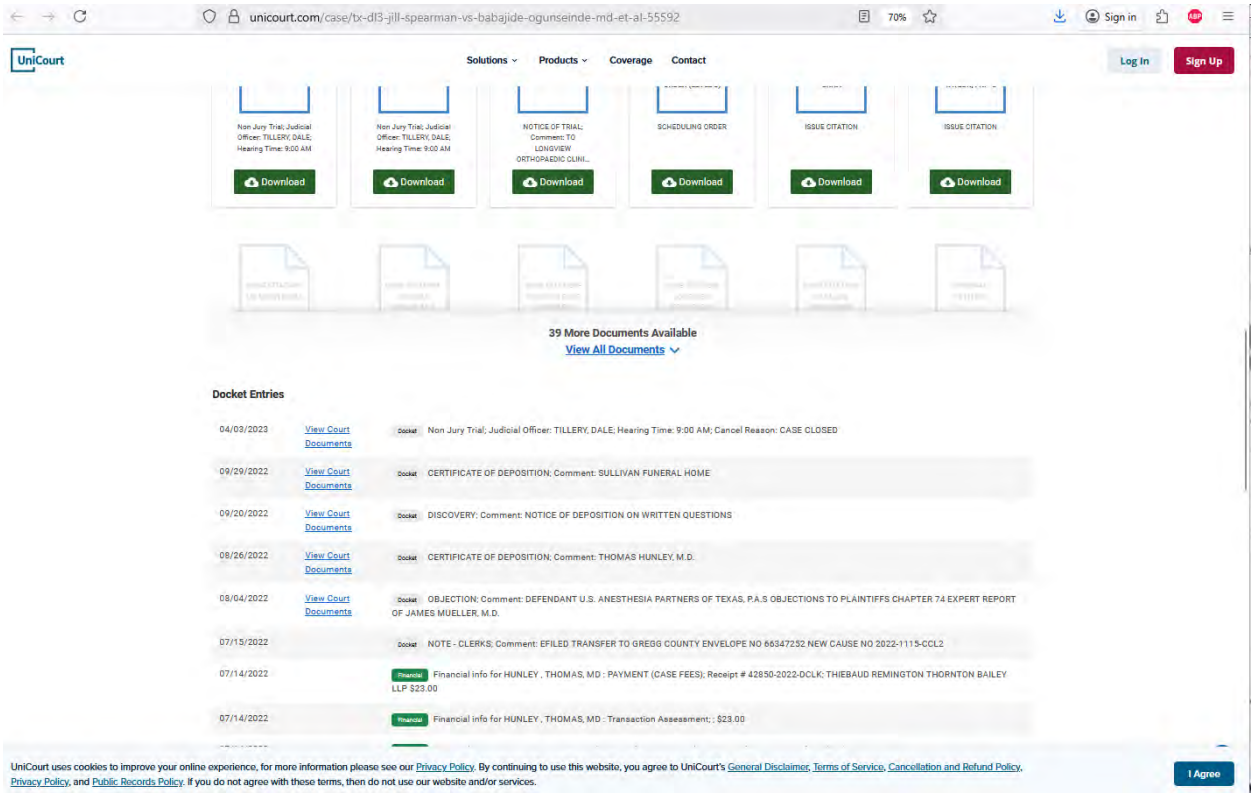
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09/29/2022 View Court Documents CERTIFICATE OF DEPOSITION; Comment: SULLIVAN FUNERAL HOME
09/20/2022 View Court Documents DISCOVERY; Comment: NOTICE OF DEPOSITION ON WRITTEN QUESTIONS
08/26/2022 View Court Documents CERTIFICATE OF DEPOSITION; Comment: THOMAS HUNLEY, M.D.
08/04/2022 View Court Documents OBJECTION; Comment: DEFENDANT U.S. ANESTHESIA PARTNERS OF TEXAS, P.A.S OBJECTIONS TO PLAINTIFFS CHAPTER 74 EXPERT REPORT OF JAMES MUELLER, M.D.
07/15/2022 NOTE - CLERKS; Comment: EFILED TRANSFER TO GREGG COUNTY ENVELOPE NO 66347252 NEW CAUSE NO 2022-1115-CCL2
07/14/2022 Financial Info for HUNLEY , THOMAS, MD : PAYMENT (CASE FEES); Receipt # 42850-2022-OCLK; THIEBAUD REMINGTON THORNTON BAILEY LLP $23.00
07/14/2022 Financial Info for HUNLEY , THOMAS, MD : Transaction Assessment; : $23.00
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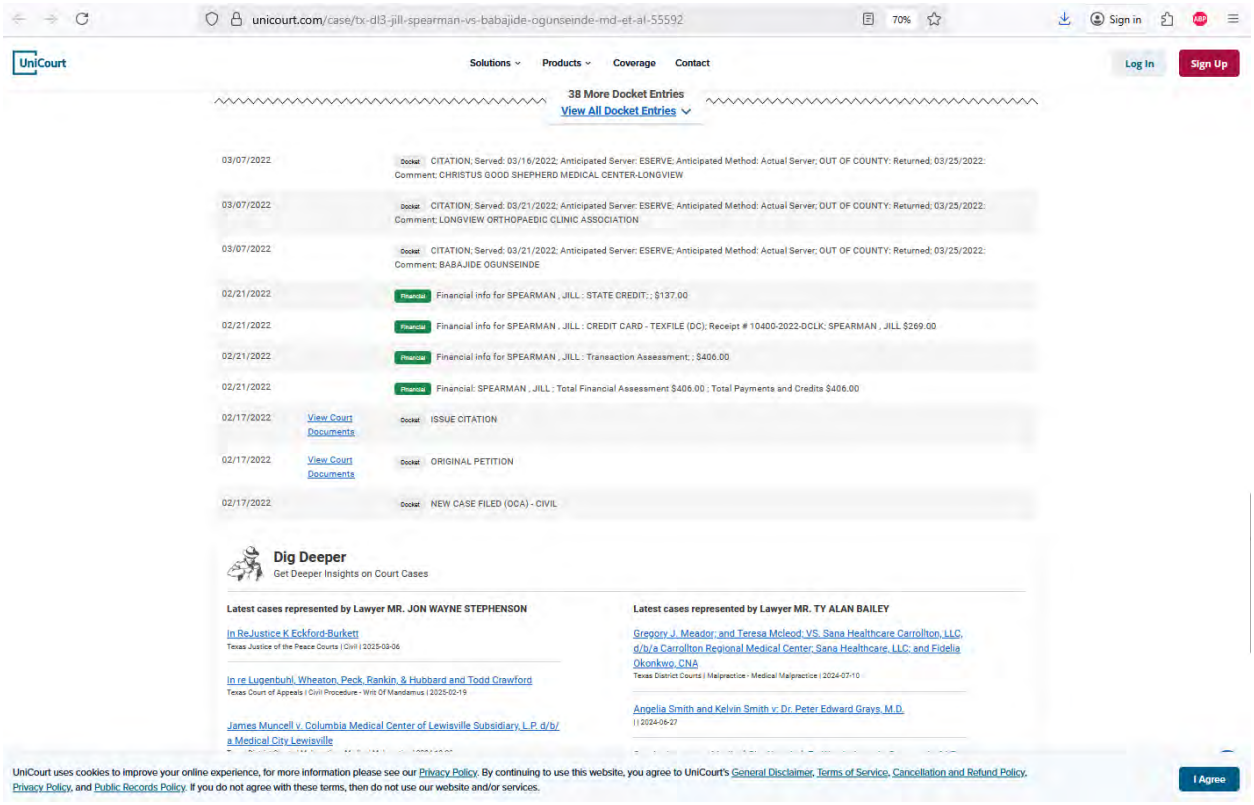
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03/07/2022 Docket CITATION; Served: 03/16/2022; Anticipated Server: ESERVE; Anticipated Method: Actual Server; OUT OF COUNTY: Returned: 03/25/2022; Comment: CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW
03/07/2022 Docket CITATION; Served: 03/21/2022; Anticipated Server: ESERVE; Anticipated Method: Actual Server; OUT OF COUNTY: Returned: 03/25/2022; Comment: LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION
03/07/2022 Docket CITATION; Served: 03/21/2022; Anticipated Server: ESERVE; Anticipated Method: Actual Server; OUT OF COUNTY: Returned: 03/25/2022; Comment: BABAJIDE OGUNSEINDE
02/21/2022 Financial Financial info for SPEARMAN , JILL : STATE CREDIT: ; $137.00
02/21/2022 Financial Financial info for SPEARMAN , JILL : CREDIT CARD - TEXFILE (DC); Receipt # 10400-2022-DCLK; SPEARMAN , JILL $269.00
02/21/2022 Financial Financial info for SPEARMAN , JILL : Transaction Assessment: ; $406.00
02/21/2022 Financial Financial: SPEARMAN , JILL ; Total Financial Assessment $406.00 ; Total Payments and Credits $406.00
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02/17/2022 View Court Documents Docket ORIGINAL PETITION
02/17/2022 Docket NEW CASE FILED (OCA) - CIVIL
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Latest cases represented by Lawyer MR. JON WAYNE STEPHENSON
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Texas Justice of the Peace Courts | Civil | 2025-09-06
In re Lugenbuhl, Wheaton, Peck, Rankin, & Hubbard and Todd Crawford
Texas Court of Appeals | Civil Procedure - Writ Of Mandamus | 2025-02-19
James Muncell v. Columbia Medical Center of Lewisville Subsidiary, L.P. d/b/a Medical City Lewisville
Latest cases represented by Lawyer MR. TY ALAN BAILEY
Gregory J. Meador; and Teresa Mcleod; VS. Sana Healthcare Carrollton, LLC, d/b/a Carrollton Regional Medical Center; Sana Healthcare, LLC; and Fidelia Okonkwo, CNA
Texas District Courts | Malpractice - Medical Malpractice | 2024-07-10
Angelia Smith and Kelvin Smith v. Dr. Peter Edward Grays, M.D.
| | 2024-06-27
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RECORD 8:

The following record was confirmed using Subject's name, location, and occupation.

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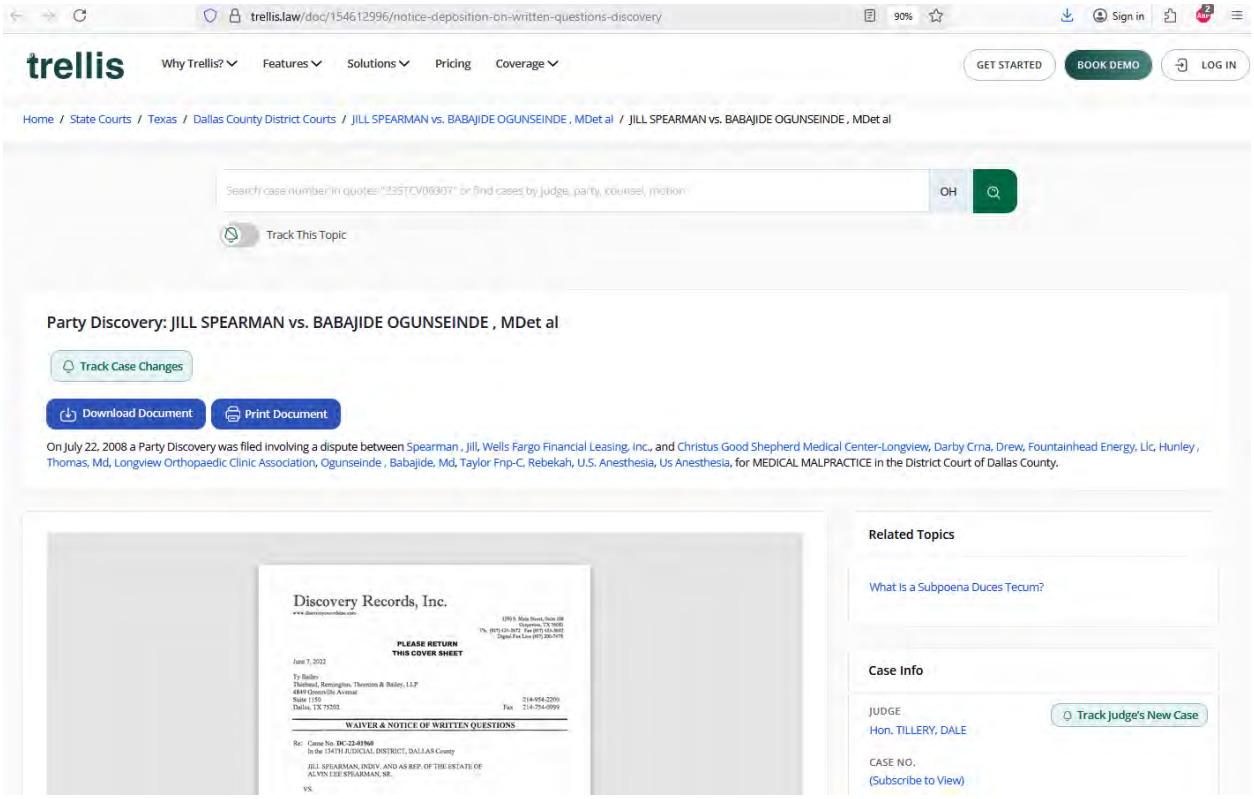

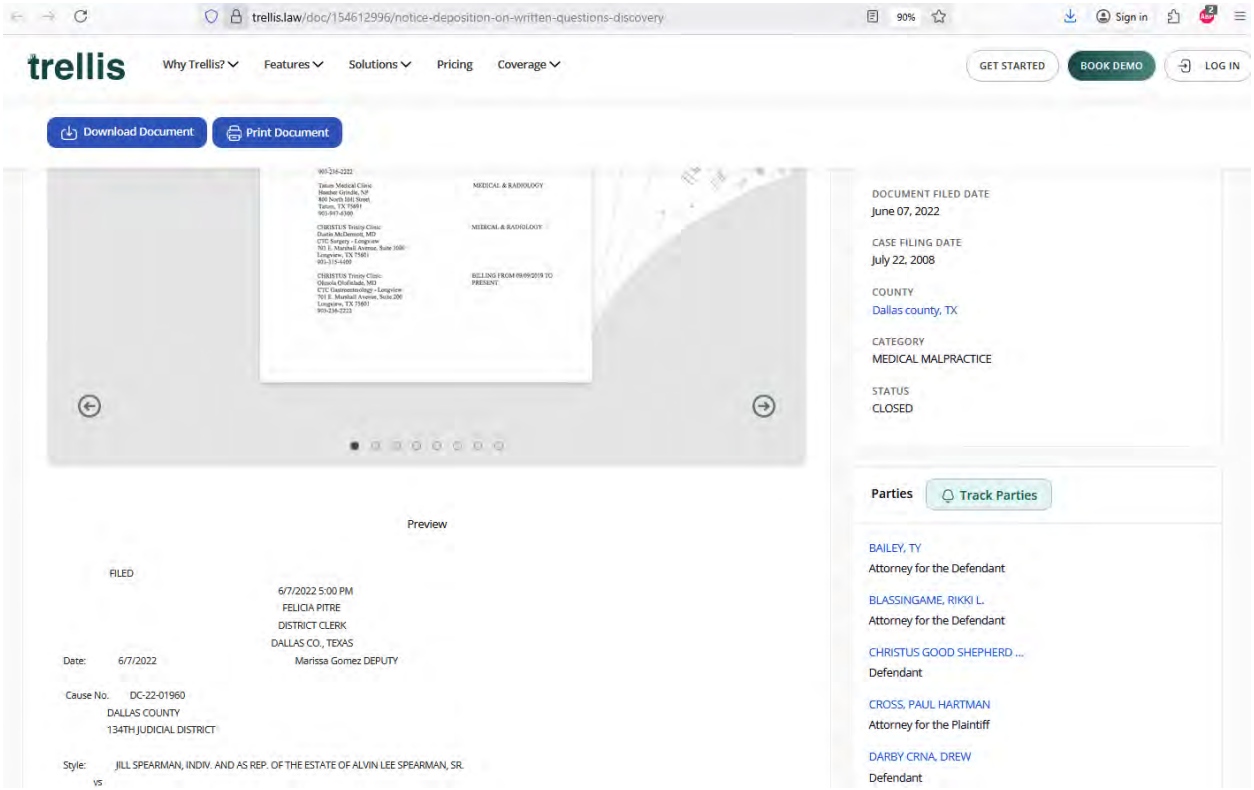
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CASE FILING DATE
July 22, 2008
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Parties
Track Parties
BAILEY, TY
Attorney for the Defendant
BLASSINGAME, RIKKI L.
Attorney for the Defendant
CHRISTUS GOOD SHEPHERD ...
Defendant
CROSS, PAUL HARTMAN
Attorney for the Plaintiff
DARBY CRNA, DREW
Defendant
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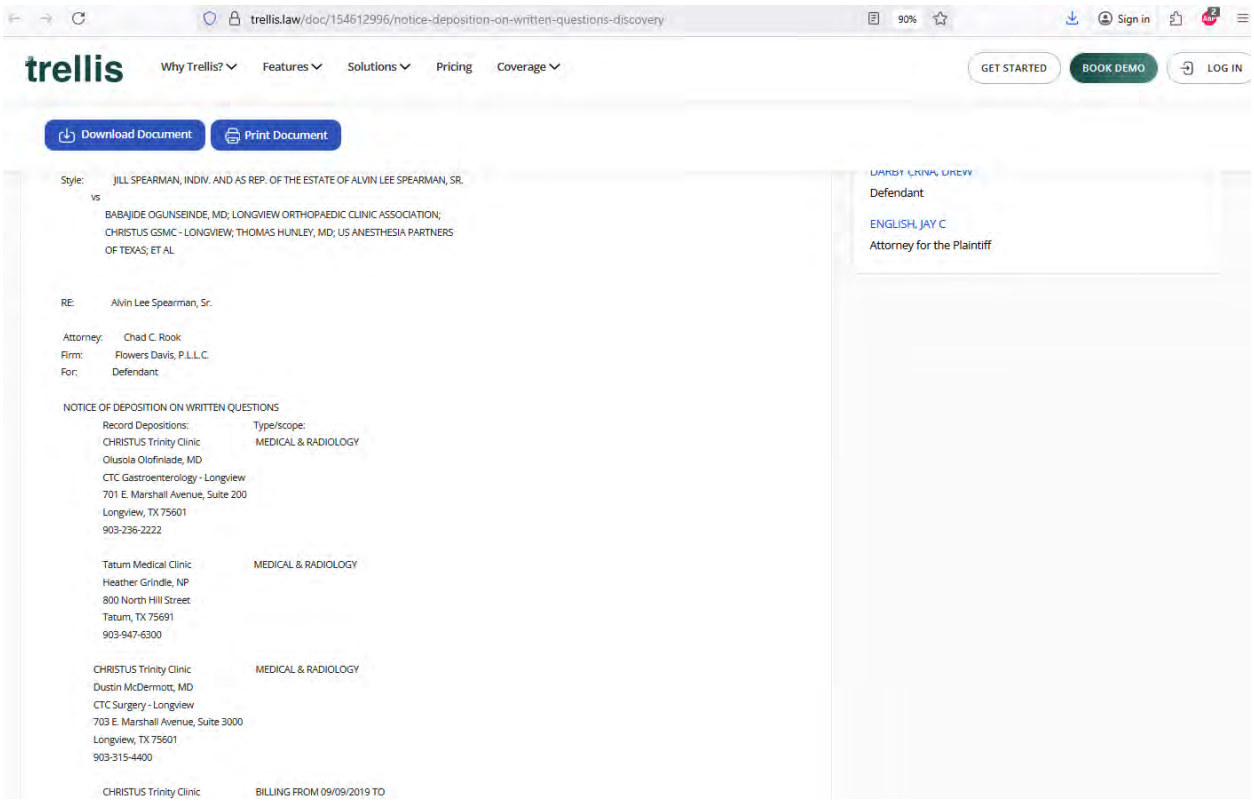
DISTRICT CLERK
DALLAS CO., TEXAS
Date: 6/7/2022
Marissa Gomez DEPUTY
Cause No. DC-22-01960
DALLAS COUNTY
134TH JUDICIAL DISTRICT
Style: JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
vs



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Style: JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
vs
BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS OF TEXAS; ET AL

RE: Alvin Lee Spearman, Sr.

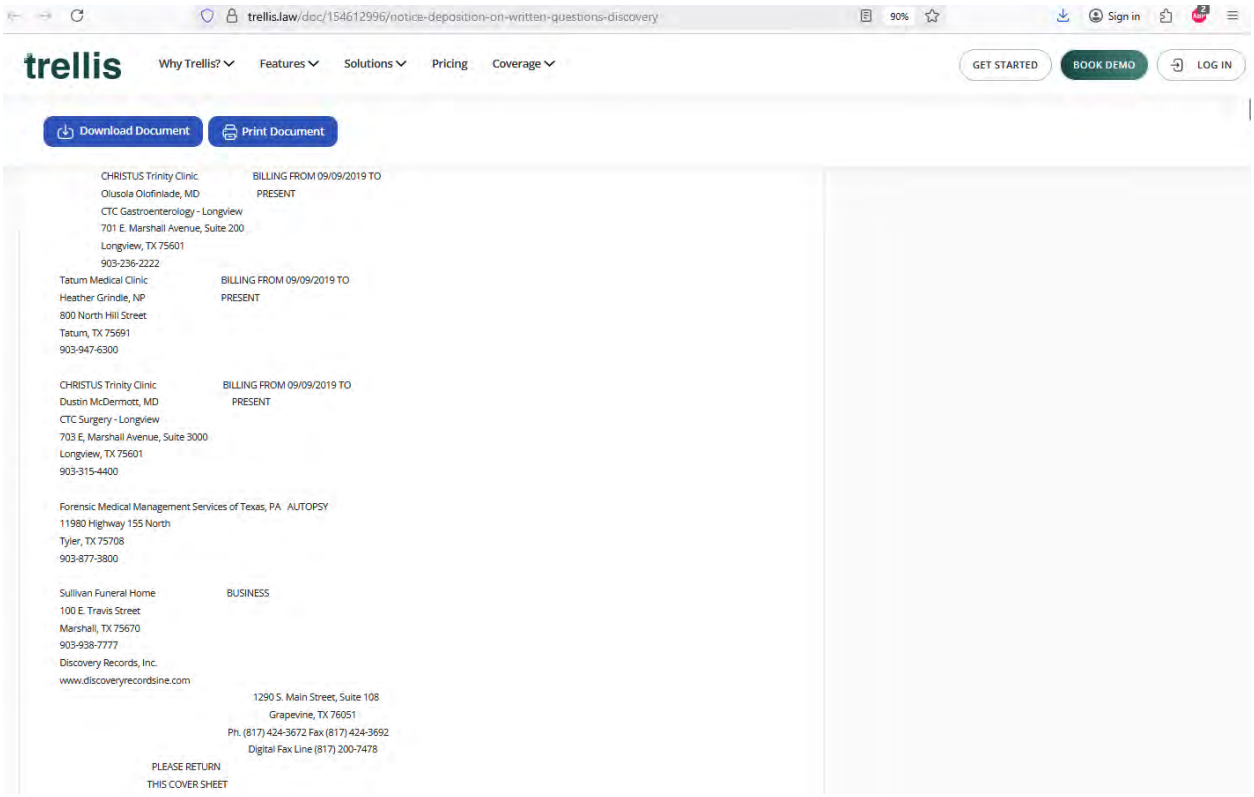
Attorney: Chad C. Rook
Firm: Flowers Davis, P.L.L.C.
For: Defendant

NOTICE OF DEPOSITION ON WRITTEN QUESTIONS

Record Depositions:	Type/scope:
CHRISTUS Trinity Clinic Olusola Olofinlade, MD CTC Gastroenterology - Longview 701 E. Marshall Avenue, Suite 200 Longview, TX 75601 903-236-2222	MEDICAL & RADIOLOGY
Tatum Medical Clinic Heather Grindle, NP 800 North Hill Street Tatum, TX 75691 903-947-6300	MEDICAL & RADIOLOGY
CHRISTUS Trinity Clinic Dustin McDermott, MD CTC Surgery - Longview 703 E. Marshall Avenue, Suite 3000 Longview, TX 75601 903-315-4400	MEDICAL & RADIOLOGY
CHRISTUS Trinity Clinic	BILLING FROM 09/09/2019 TO

DARBY CRNA, DREW
Defendant

ENGLISH, JAY C
Attorney for the Plaintiff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Olusola Olofinlade, MD
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200
Longview, TX 75601
903-236-2222
BILLING FROM 09/09/2019 TO PRESENT
Tatum Medical Clinic
Heather Grindle, NP
800 North Hill Street
Tatum, TX 75691
903-947-6300
BILLING FROM 09/09/2019 TO PRESENT
CHRISTUS Trinity Clinic
Dustin McDermott, MD
CTC Surgery - Longview
703 E. Marshall Avenue, Suite 3000
Longview, TX 75601
903-315-4400
BILLING FROM 09/09/2019 TO PRESENT
Forensic Medical Management Services of Texas, PA
11980 Highway 155 North
Tyler, TX 75708
903-877-3800
AUTOPSY
Sullivan Funeral Home
100 E. Travis Street
Marshall, TX 75670
903-938-7777
BUSINESS
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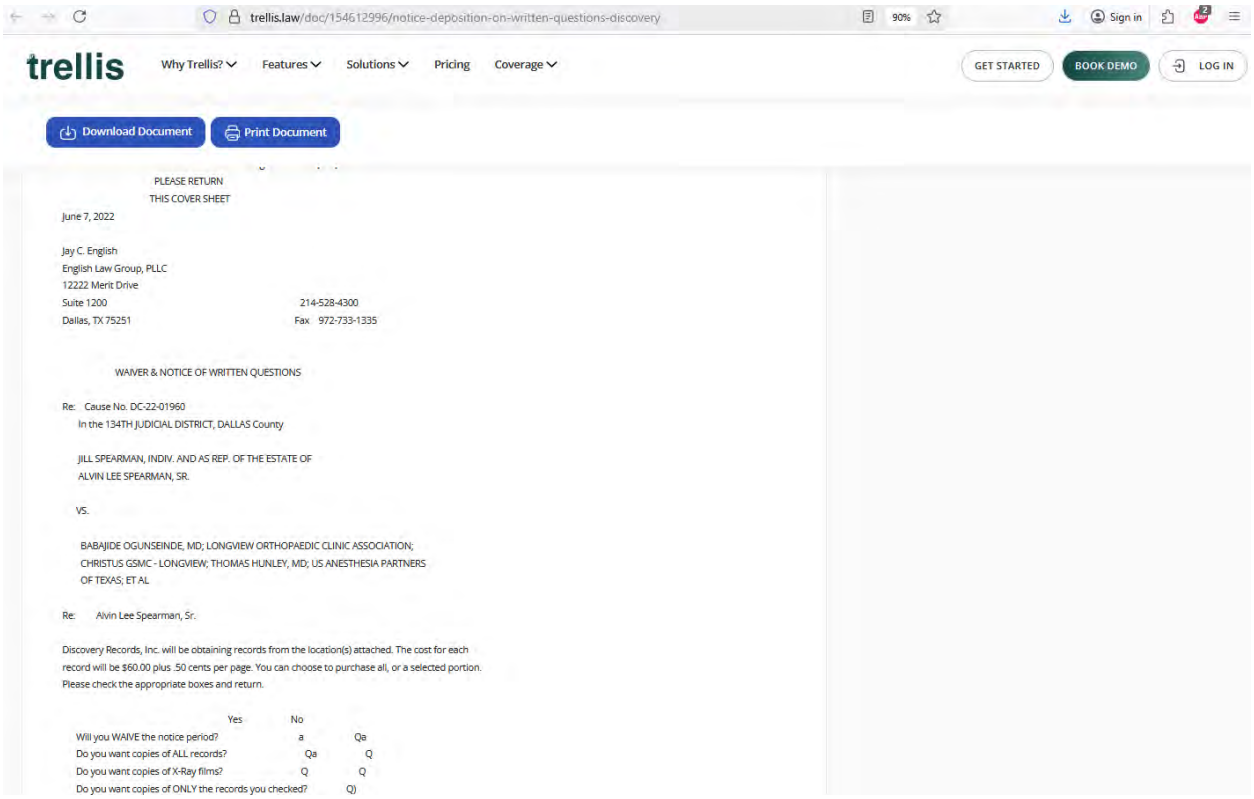

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June 7, 2022

Jay C. English
English Law Group, PLLC
12222 Merit Drive
Suite 1200 214-528-4300
Dallas, TX 75251 Fax 972-733-1335

WAIVER & NOTICE OF WRITTEN QUESTIONS

Re: Cause No. DC-22-01960
In the 134TH JUDICIAL DISTRICT, DALLAS County

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF
ALVIN LEE SPEARMAN, SR.

VS.

BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION;
CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS
OF TEXAS; ET AL

Re: Alvin Lee Spearman, Sr.

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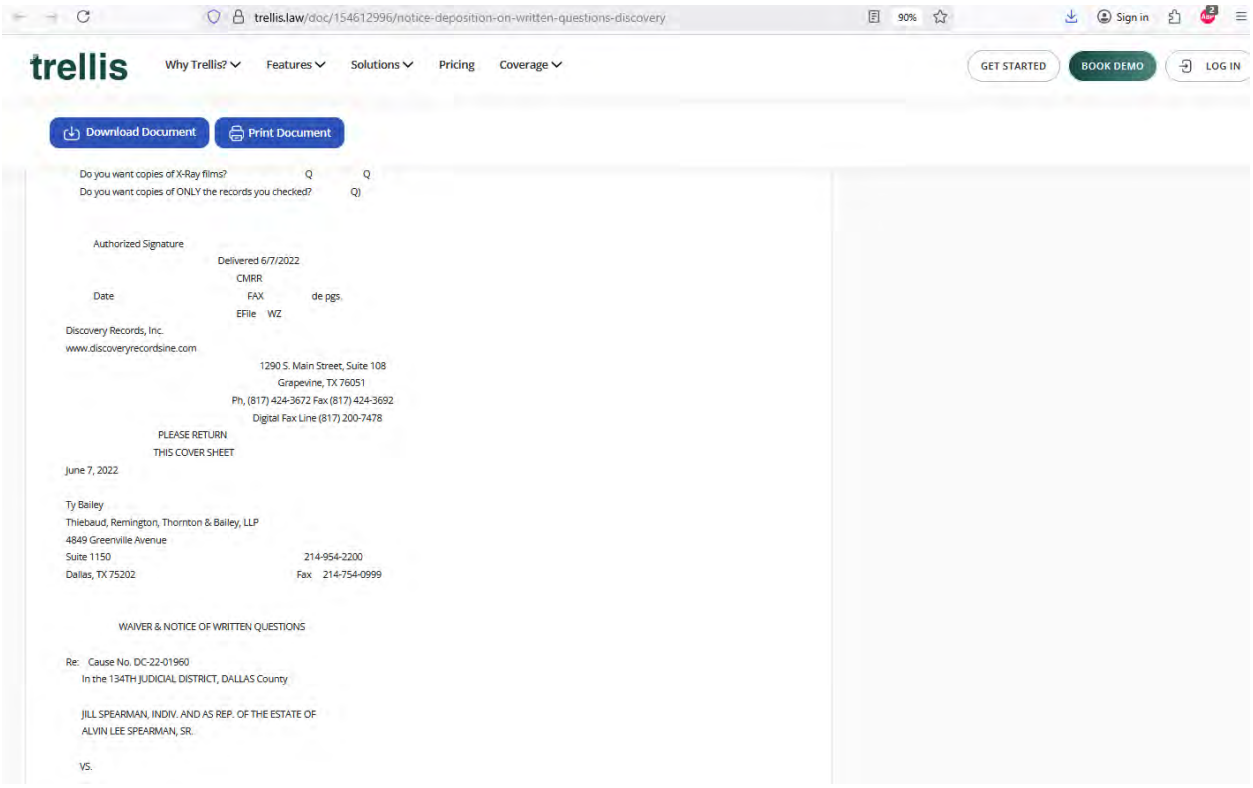

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June 7, 2022

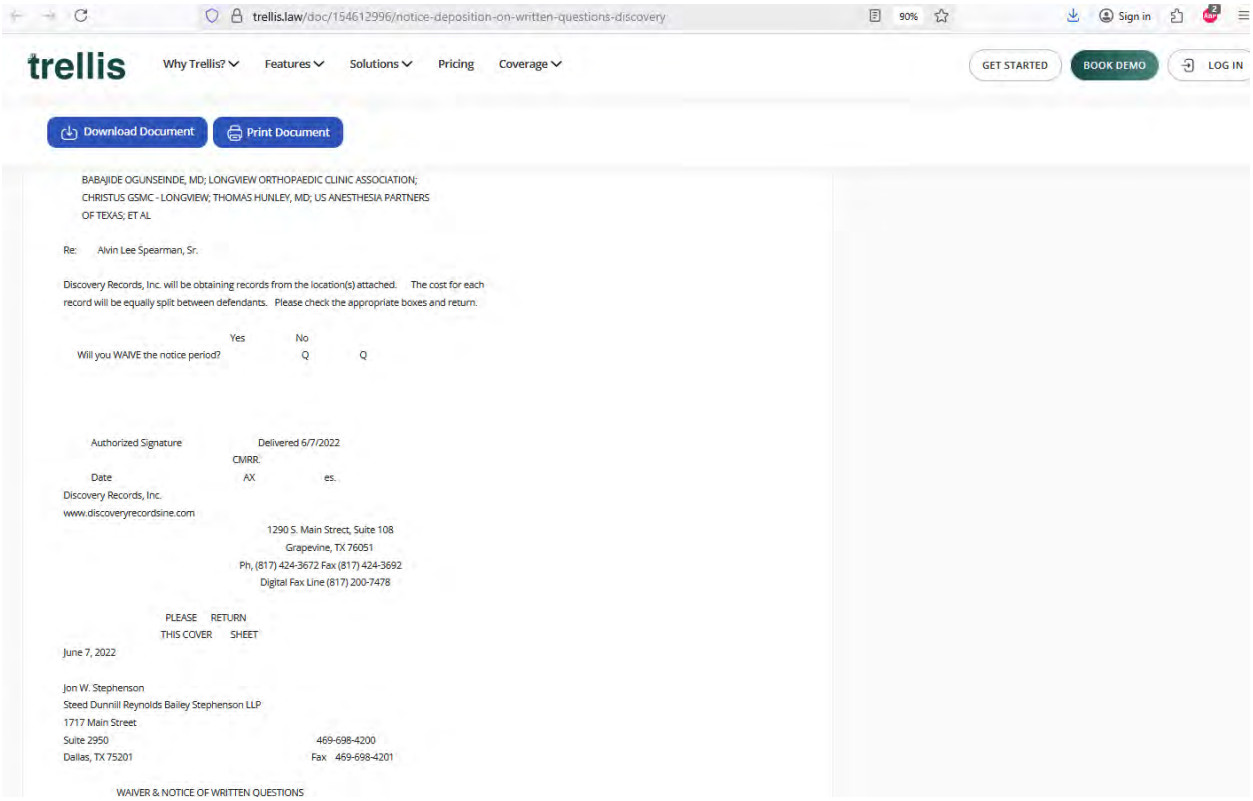
Ty Bailey
Thiebaud, Remington, Thornton & Bailey, LLP
4849 Greenville Avenue
Suite 1150 214-954-2200
Dallas, TX 75202 Fax 214-754-0999

WAIVER & NOTICE OF WRITTEN QUESTIONS

Re: Cause No. DC-22-01960
In the 134TH JUDICIAL DISTRICT, DALLAS County

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF
ALVIN LEE SPEARMAN, SR.

VS.



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BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION;
CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS
OF TEXAS; ET AL

Re: Alvin Lee Spearman, Sr.

Discovery Records, Inc. will be obtaining records from the location(s) attached. The cost for each record will be equally split between defendants. Please check the appropriate boxes and return.

Yes No
Will you WAIVE the notice period? Q Q

Authorized Signature Delivered 6/7/2022
CMRR
Date AX es.

Discovery Records, Inc.
www.discoveryrecordsine.com

1290 S. Main Strect, Suite 108
Grapevine, TX 76051
Ph, (817) 424-3672 Fax (817) 424-3692
Digital Fax Line (817) 200-7478

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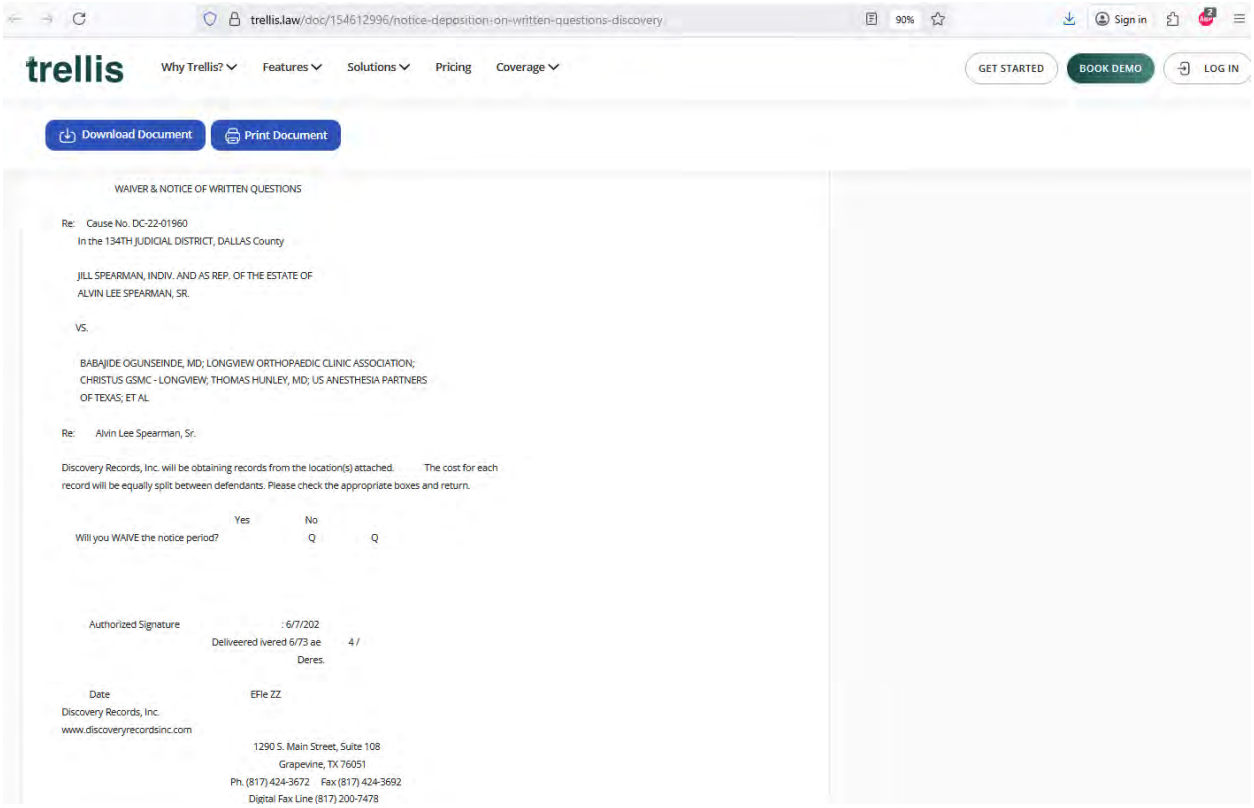
June 7, 2022

Jon W. Stephenson
Steed Dunnill Reynolds Bailey Stephenson LLP
1717 Main Street
Suite 2950 469-698-4200
Dallas, TX 75201 Fax 469-698-4201

WAIVER & NOTICE OF WRITTEN QUESTIONS



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WAIVER & NOTICE OF WRITTEN QUESTIONS

Re: Cause No. DC-22-01960
In the 134TH JUDICIAL DISTRICT, DALLAS County

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF
ALVIN LEE SPEARMAN, SR.

VS.

BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION;
CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS
OF TEXAS; ET AL

Re: Alvin Lee Spearman, Sr.

Discovery Records, Inc. will be obtaining records from the location(s) attached. The cost for each record will be equally split between defendants. Please check the appropriate boxes and return.

	Yes	No
Will you WAIVE the notice period?	Q	Q

Authorized Signature : 6/7/202
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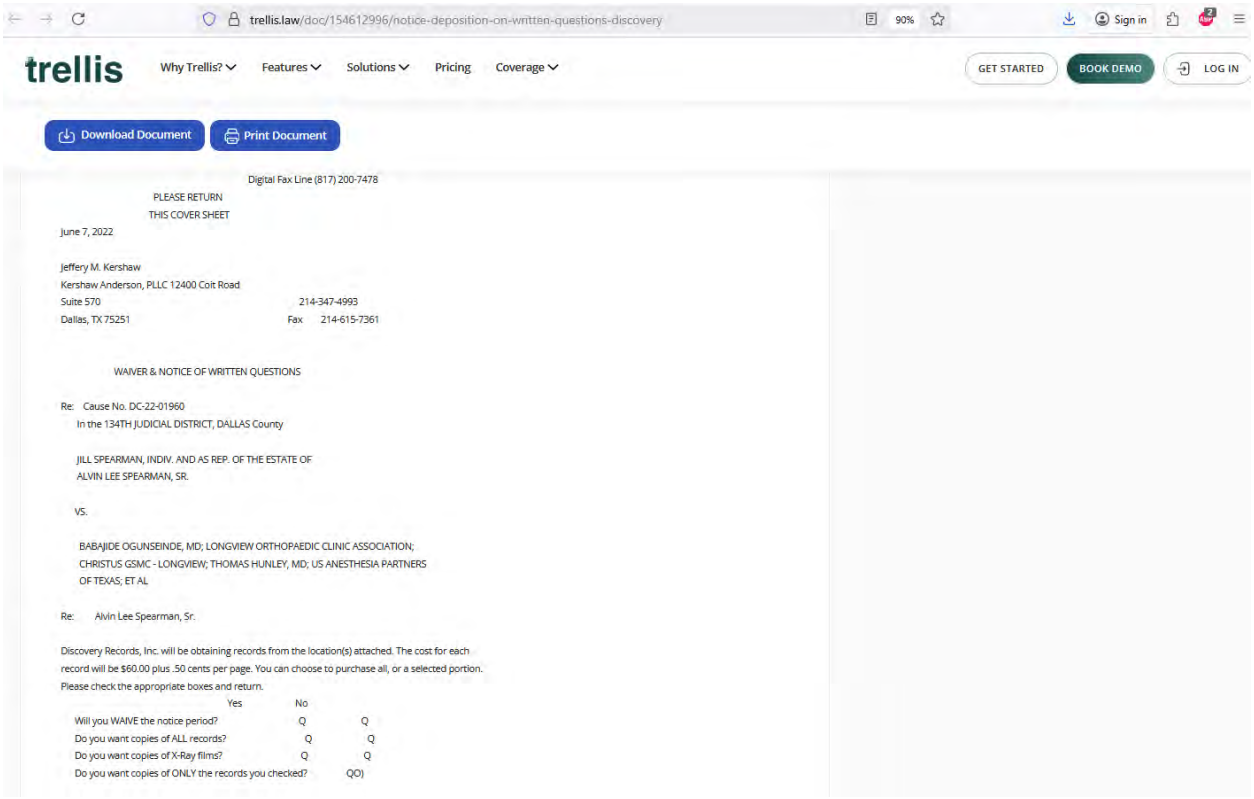
Deres.

Date EFle ZZ

Discovery Records, Inc.
www.discoveryrecordsinc.com

1290 S. Main Street, Suite 108
Grapevine, TX 76051
Ph. (817) 424-3672 Fax (817) 424-3692
Digital Fax Line (817) 200-7478



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Jeffery M. Kershaw
Kershaw Anderson, PLLC 12400 Coit Road
Suite 570 214-347-4993
Dallas, TX 75251 Fax 214-615-7361

WAIVER & NOTICE OF WRITTEN QUESTIONS

Re: Cause No. DC-22-01960
In the 134TH JUDICIAL DISTRICT, DALLAS County

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF
ALVIN LEE SPEARMAN, SR.

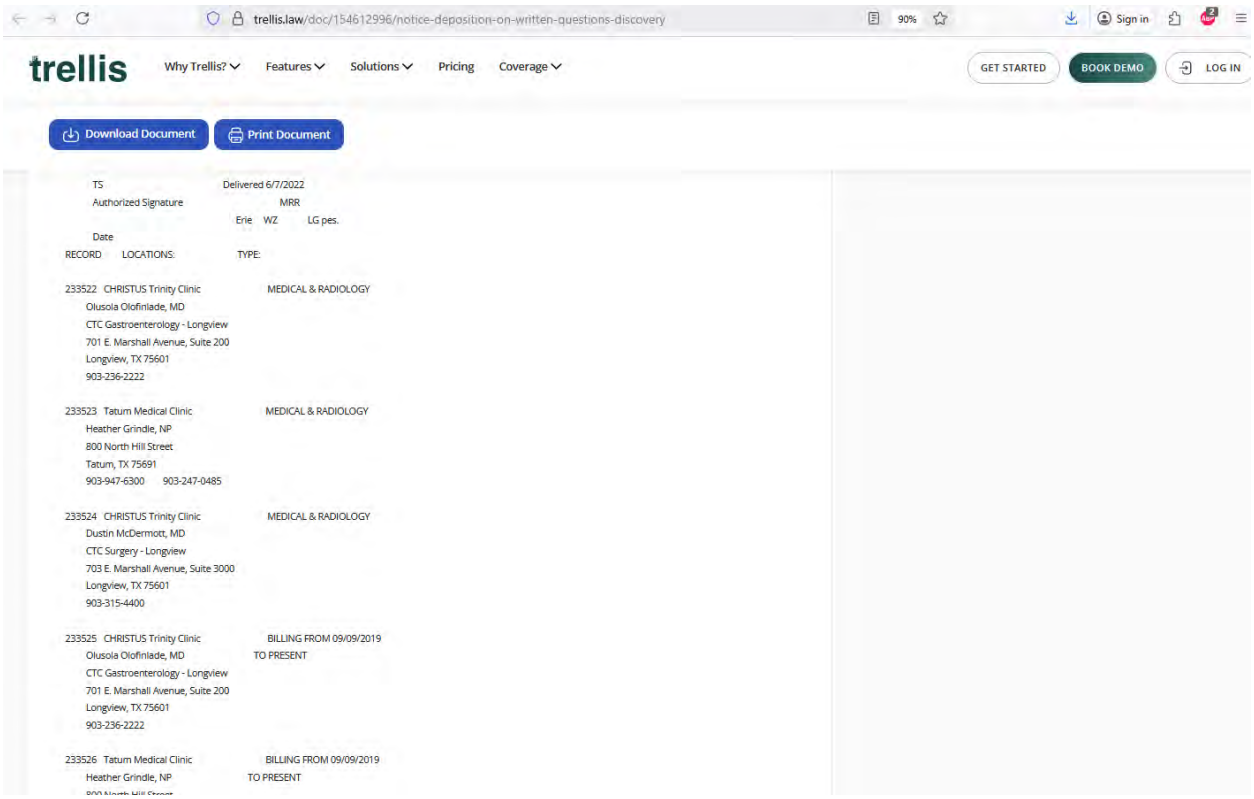
VS.

BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION;
CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS
OF TEXAS; ET AL

Re: Alvin Lee Spearman, Sr.

Discovery Records, Inc. will be obtaining records from the location(s) attached. The cost for each record will be $60.00 plus .50 cents per page. You can choose to purchase all, or a selected portion. Please check the appropriate boxes and return.

	Yes	No
Will you WAIVE the notice period?	Q	Q
Do you want copies of ALL records?	Q	Q
Do you want copies of X-Ray films?	Q	Q
Do you want copies of ONLY the records you checked?	QO)	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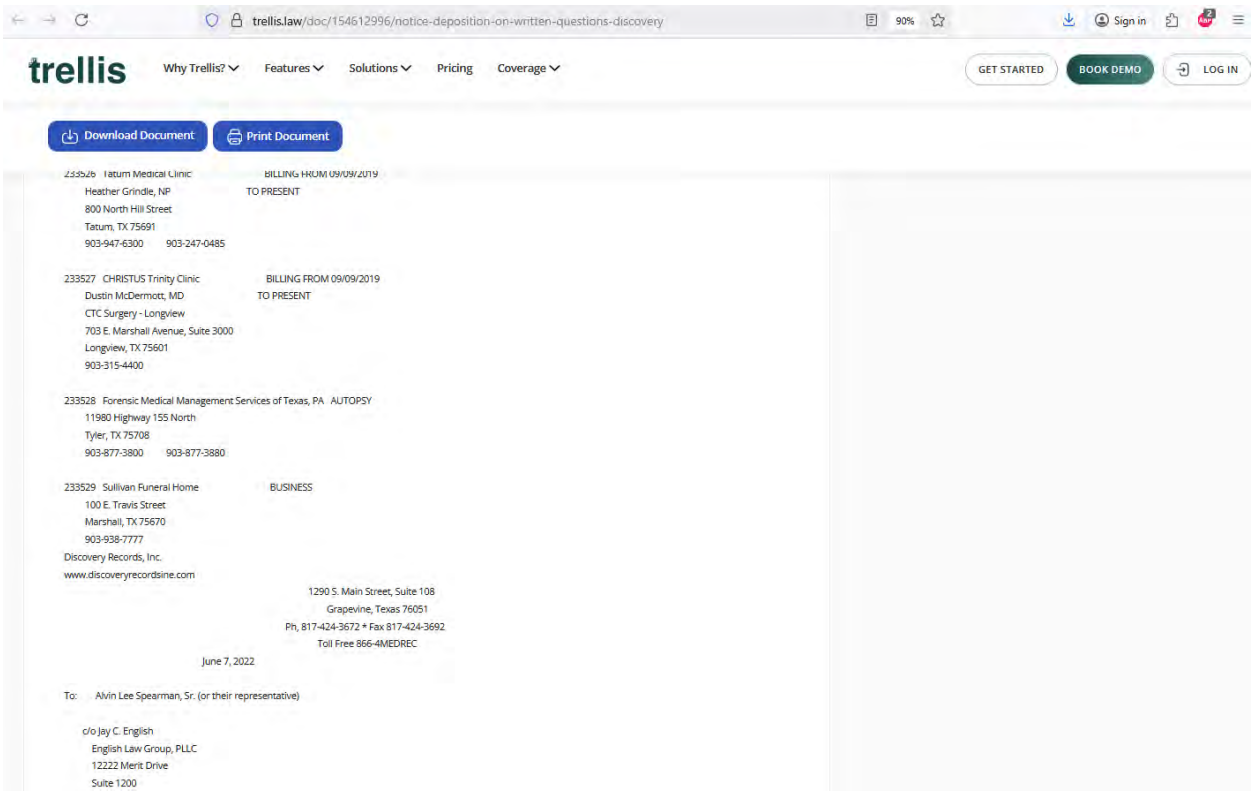
Date
RECORD LOCATIONS: TYPE:
233522 CHRISTUS Trinity Clinic
Olusola Olofinlade, MD
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200
Longview, TX 75601
903-236-2222
MEDICAL & RADIOLOGY
233523 Tatum Medical Clinic
Heather Grindle, NP
800 North Hill Street
Tatum, TX 75691
903-947-6300 903-247-0485
MEDICAL & RADIOLOGY
233524 CHRISTUS Trinity Clinic
Dustin McDermott, MD
CTC Surgery - Longview
703 E. Marshall Avenue, Suite 3000
Longview, TX 75601
903-315-4400
MEDICAL & RADIOLOGY
233525 CHRISTUS Trinity Clinic
Olusola Olofinlade, MD
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200
Longview, TX 75601
903-236-2222
BILLING FROM 09/09/2019 TO PRESENT
233526 Tatum Medical Clinic
Heather Grindle, NP
BILLING FROM 09/09/2019 TO PRESENT



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233526 Tatum Medical Clinic BILLING FROM 09/09/2019
Heather Grindle, NP TO PRESENT
800 North Hill Street
Tatum, TX 75691
903-947-6300 903-247-0485

233527 CHRISTUS Trinity Clinic BILLING FROM 09/09/2019
Dustin McDermott, MD TO PRESENT
CTC Surgery - Longview
703 E. Marshall Avenue, Suite 3000
Longview, TX 75601
903-315-4400

233528 Forensic Medical Management Services of Texas, PA AUTOPSY
11980 Highway 155 North
Tyler, TX 75708
903-877-3800 903-877-3880

233529 Sullivan Funeral Home BUSINESS
100 E. Travis Street
Marshall, TX 75670
903-938-7777

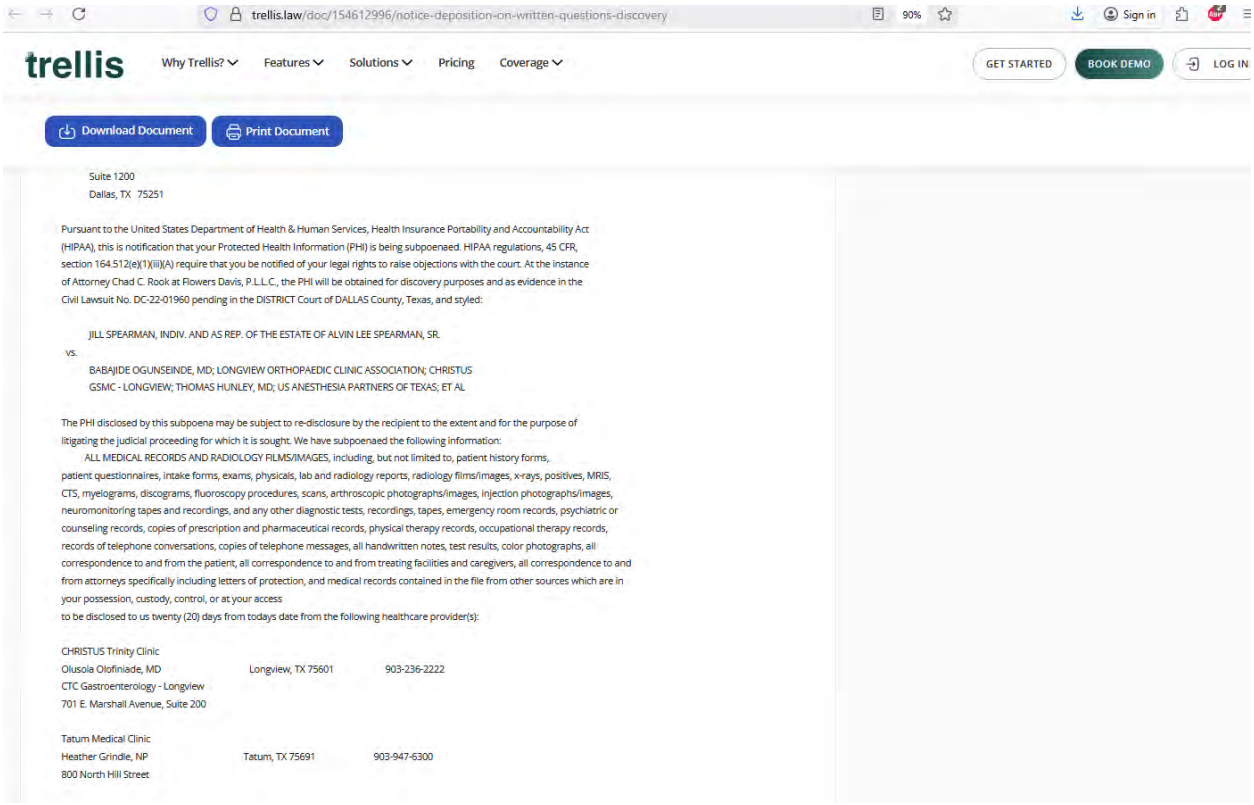
Discovery Records, Inc.
www.discoveryrecordsine.com

1290 S. Main Street, Suite 108
Grapevine, Texas 76051
Ph, 817-424-3672 * Fax 817-424-3692
Toll Free 866-4MEDREC

June 7, 2022

To: Alvin Lee Spearman, Sr. (or their representative)

c/o Jay C. English
English Law Group, PLLC
12222 Merit Drive
Suite 1200



Suite 1200
Dallas, TX 75251

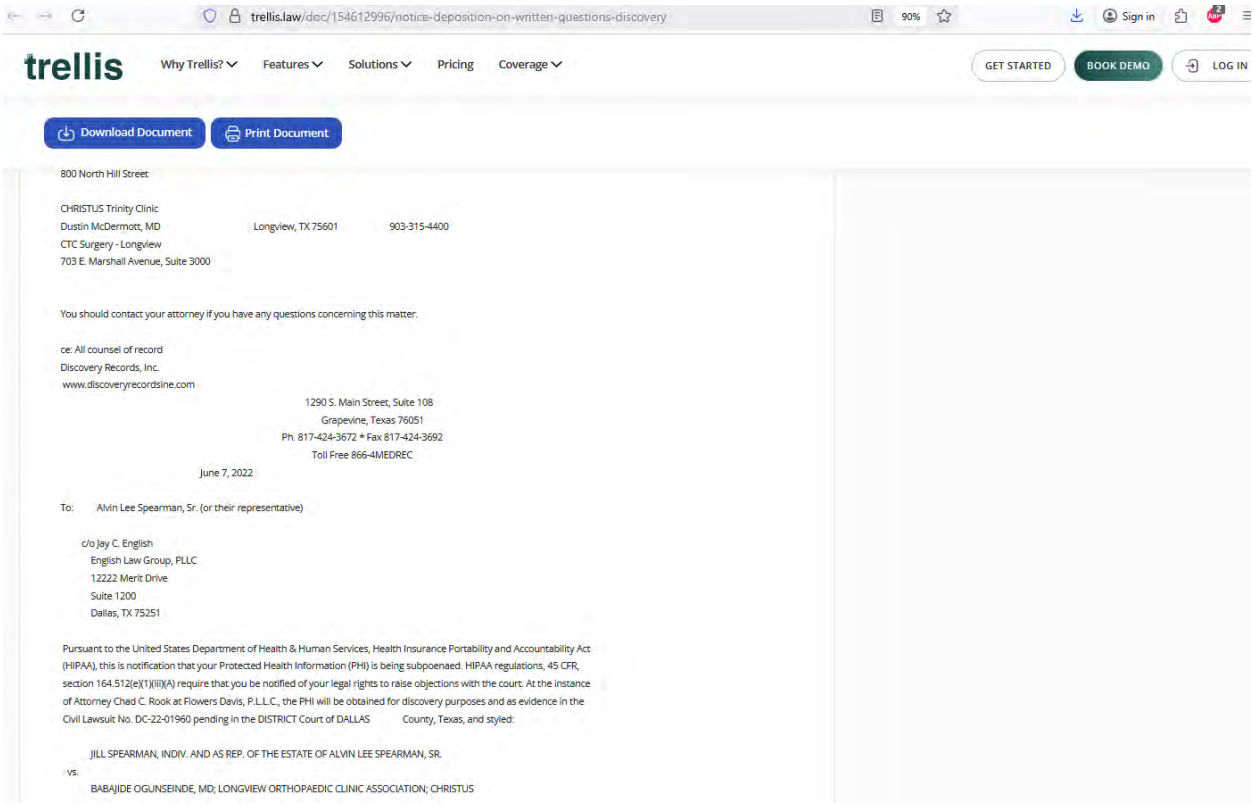
Pursuant to the United States Department of Health & Human Services, Health Insurance Portability and Accountability Act (HIPAA), this is notification that your Protected Health Information (PHI) is being subpoenaed. HIPAA regulations, 45 CFR, section 164.512(e)(1)(iii)(A) require that you be notified of your legal rights to raise objections with the court. At the instance of Attorney Chad C. Rook at Flowers Davis, P.L.L.C., the PHI will be obtained for discovery purposes and as evidence in the Civil Lawsuit No. DC-22-01960 pending in the DISTRICT Court of DALLAS County, Texas, and styled:

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
vs.
BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS OF TEXAS; ET AL

The PHI disclosed by this subpoena may be subject to re-disclosure by the recipient to the extent and for the purpose of litigating the judicial proceeding for which it is sought. We have subpoenaed the following information:
ALL MEDICAL RECORDS AND RADIOLOGY FILMS/IMAGES, including, but not limited to, patient history forms, patient questionnaires, intake forms, exams, physicals, lab and radiology reports, radiology films/images, x-rays, positives, MRIS, CTS, myelograms, discograms, fluoroscopy procedures, scans, arthroscopic photographs/images, injection photographs/images, neuromonitoring tapes and recordings, and any other diagnostic tests, recordings, tapes, emergency room records, psychiatric or counseling records, copies of prescription and pharmaceutical records, physical therapy records, occupational therapy records, records of telephone conversations, copies of telephone messages, all handwritten notes, test results, color photographs, all correspondence to and from the patient, all correspondence to and from treating facilities and caregivers, all correspondence to and from attorneys specifically including letters of protection, and medical records contained in the file from other sources which are in your possession, custody, control, or at your access
to be disclosed to us twenty (20) days from todays date from the following healthcare provider(s):

CHRISTUS Trinity Clinic
Olusola Olofiniade, MD Longview, TX 75601 903-236-2222
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200

Tatum Medical Clinic
Heather Grindle, NP Tatum, TX 75691 903-947-6300
800 North Hill Street



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800 North Hill Street

CHRISTUS Trinity Clinic
Dustin McDermott, MD Longview, TX 75601 903-315-4400
CTC Surgery - Longview
703 E. Marshall Avenue, Suite 3000

You should contact your attorney if you have any questions concerning this matter.

cc: All counsel of record
Discovery Records, Inc.
www.discoveryrecordsine.com

1290 S. Main Street, Suite 108
Grapevine, Texas 76051
Ph. 817-424-3672 * Fax 817-424-3692
Toll Free 866-4MEDREC

June 7, 2022

To: Alvin Lee Spearman, Sr. (or their representative)

c/o Jay C. English
English Law Group, PLLC
12222 Merit Drive
Suite 1200
Dallas, TX 75251

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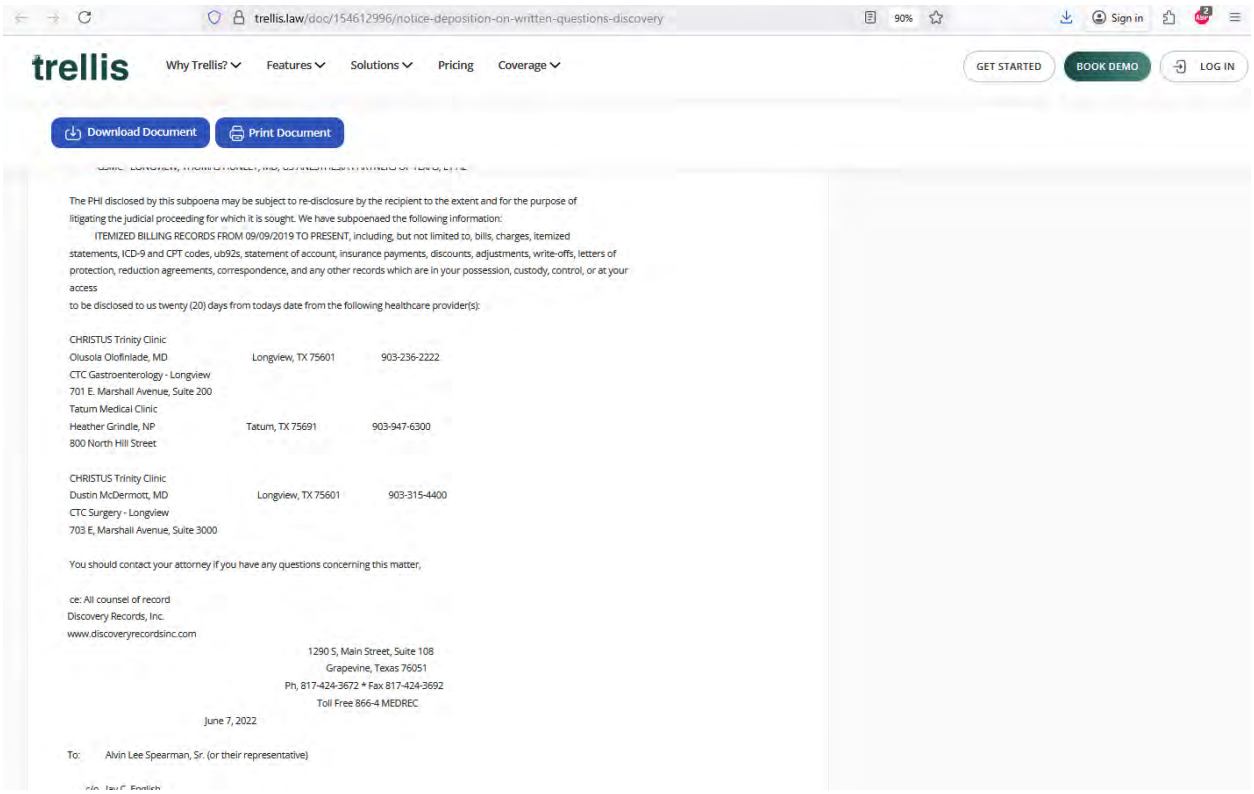
JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
vs.
BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS



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The PHI disclosed by this subpoena may be subject to re-disclosure by the recipient to the extent and for the purpose of litigating the judicial proceeding for which it is sought. We have subpoenaed the following information:

ITEMIZED BILLING RECORDS FROM 09/09/2019 TO PRESENT, including, but not limited to, bills, charges, itemized statements, ICD-9 and CPT codes, ub92s, statement of account, insurance payments, discounts, adjustments, write-offs, letters of protection, reduction agreements, correspondence, and any other records which are in your possession, custody, control, or at your access

to be disclosed to us twenty (20) days from todays date from the following healthcare provider(s):

CHRISTUS Trinity Clinic
Olusola Olofinlade, MD Longview, TX 75601 903-236-2222
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200
Tatum Medical Clinic
Heather Grindle, NP Tatum, TX 75691 903-947-6300
800 North Hill Street

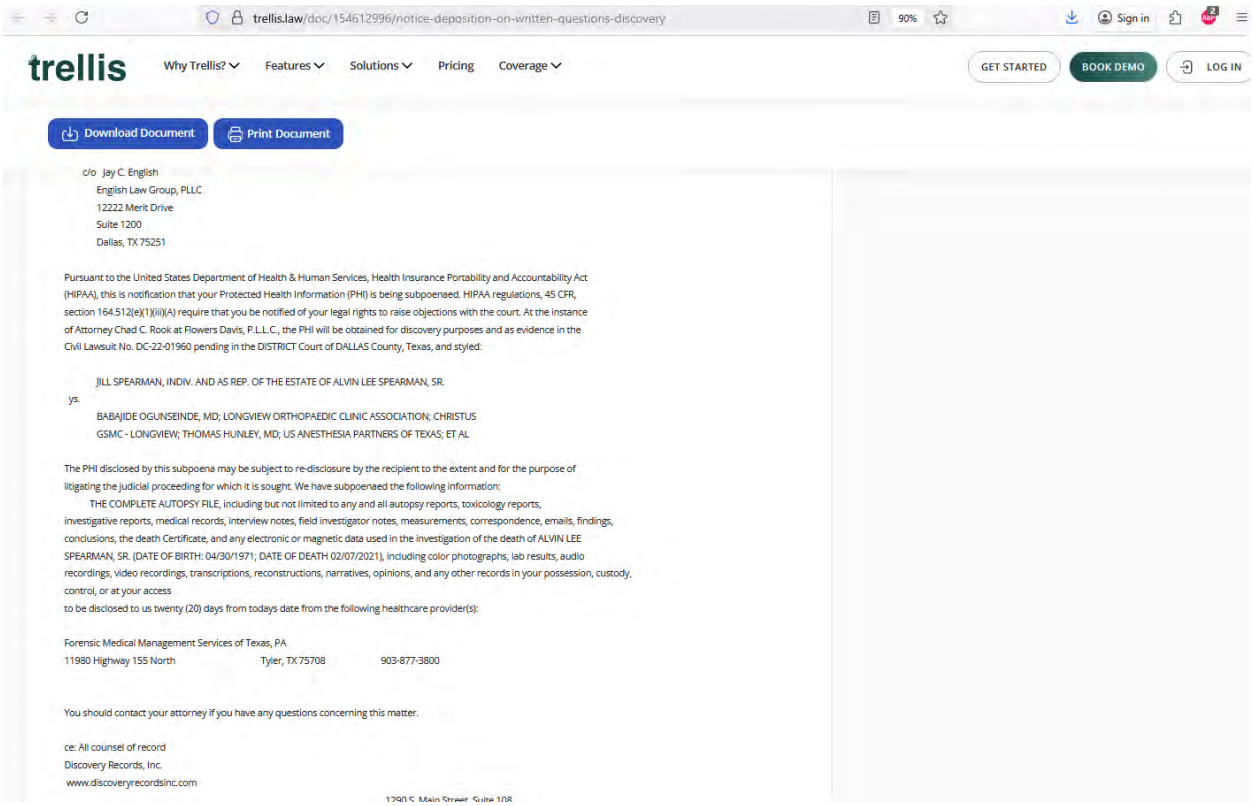
CHRISTUS Trinity Clinic
Dustin McDermott, MD Longview, TX 75601 903-315-4400
CTC Surgery - Longview
703 E, Marshall Avenue, Suite 3000

You should contact your attorney if you have any questions concerning this matter,

cc: All counsel of record
Discovery Records, Inc.
www.discoveryrecordsinc.com
1290 S, Main Street, Suite 108
Grapevine, Texas 76051
Ph, 817-424-3672 * Fax 817-424-3692
Toll Free 866-4 MEDREC

June 7, 2022

To: Alvin Lee Spearman, Sr. (or their representative)



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c/o Jay C. English
English Law Group, PLLC
12222 Merit Drive
Suite 1200
Dallas, TX 75251

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JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
ys.
BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS OF TEXAS; ET AL

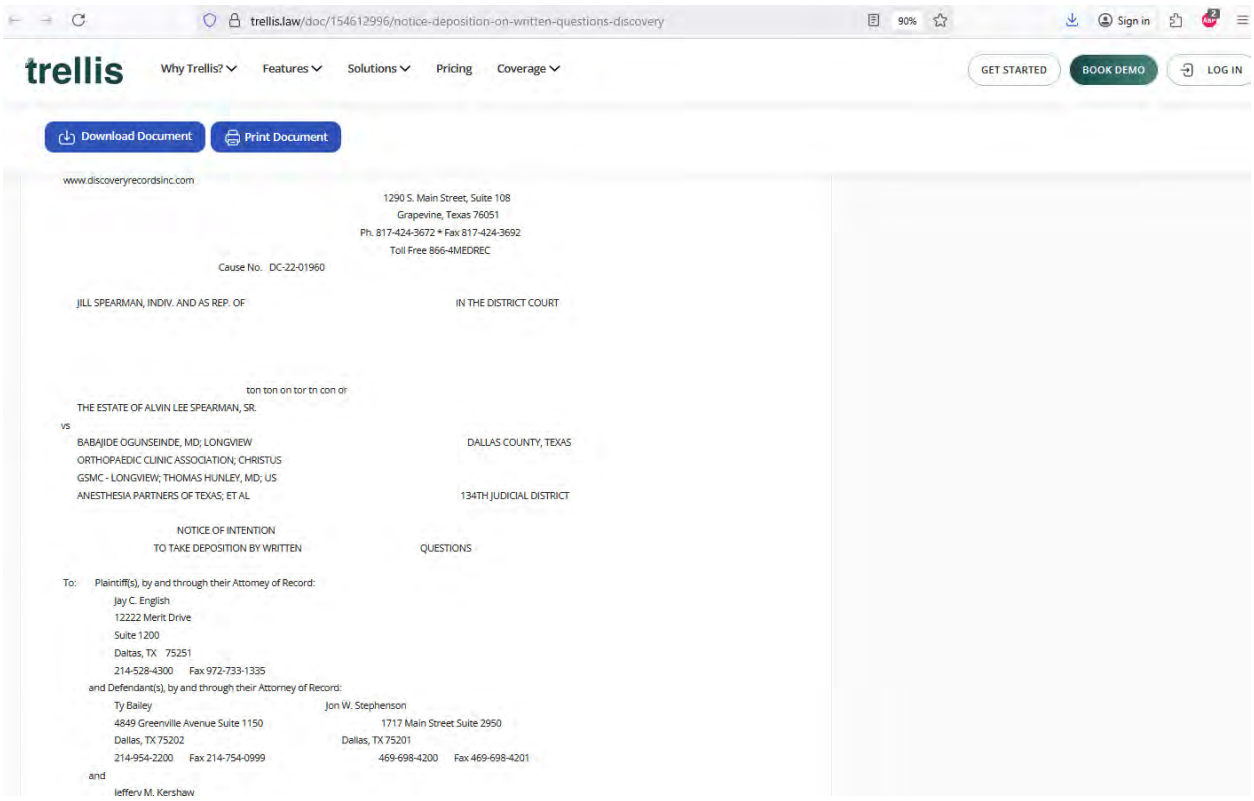
The PHI disclosed by this subpoena may be subject to re-disclosure by the recipient to the extent and for the purpose of litigating the judicial proceeding for which it is sought. We have subpoenaed the following information:
THE COMPLETE AUTOPSY FILE, including but not limited to any and all autopsy reports, toxicology reports, investigative reports, medical records, interview notes, field investigator notes, measurements, correspondence, emails, findings, conclusions, the death Certificate, and any electronic or magnetic data used in the investigation of the death of ALVIN LEE SPEARMAN, SR. (DATE OF BIRTH: 04/30/1971; DATE OF DEATH 02/07/2021), including color photographs, lab results, audio recordings, video recordings, transcriptions, reconstructions, narratives, opinions, and any other records in your possession, custody, control, or at your access
to be disclosed to us twenty (20) days from todays date from the following healthcare provider(s):

Forensic Medical Management Services of Texas, PA
11980 Highway 155 North Tyler, TX 75708 903-877-3800

You should contact your attorney if you have any questions concerning this matter.

cc: All counsel of record
Discovery Records, Inc.
www.discoveryrecordsinc.com

1290 S. Main Street, Suite 108



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Cause No. DC-22-01960

JILL SPEARMAN, INDIV. AND AS REP. OF THE ESTATE OF ALVIN LEE SPEARMAN, SR. — IN THE DISTRICT COURT

vs

BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS OF TEXAS; ET AL — DALLAS COUNTY, TEXAS

134TH JUDICIAL DISTRICT

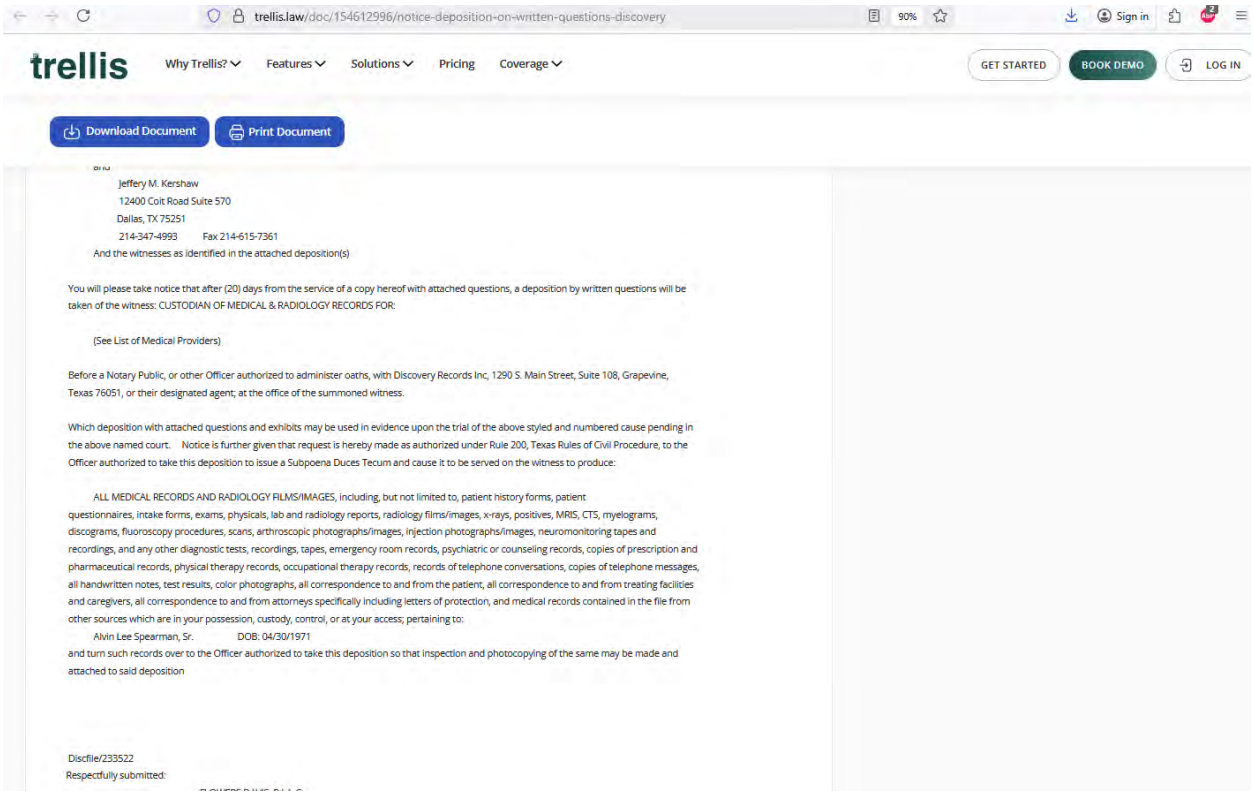
NOTICE OF INTENTION
TO TAKE DEPOSITION BY WRITTEN QUESTIONS

To: Plaintiff(s), by and through their Attorney of Record:
Jay C. English
12222 Merit Drive
Suite 1200
Dallas, TX 75251
214-528-4300 Fax 972-733-1335

and Defendant(s), by and through their Attorney of Record:
Ty Bailey
4849 Greenville Avenue Suite 1150
Dallas, TX 75202
214-954-2200 Fax 214-754-0999

Jon W. Stephenson
1717 Main Street Suite 2950
Dallas, TX 75201
469-698-4200 Fax 469-698-4201

and
Jefferv M. Kershaw



Jeffery M. Kershaw
12400 Coit Road Suite 570
Dallas, TX 75251
214-347-4993 Fax 214-615-7361
And the witnesses as identified in the attached deposition(s)

You will please take notice that after (20) days from the service of a copy hereof with attached questions, a deposition by written questions will be taken of the witness: CUSTODIAN OF MEDICAL & RADIOLOGY RECORDS FOR:

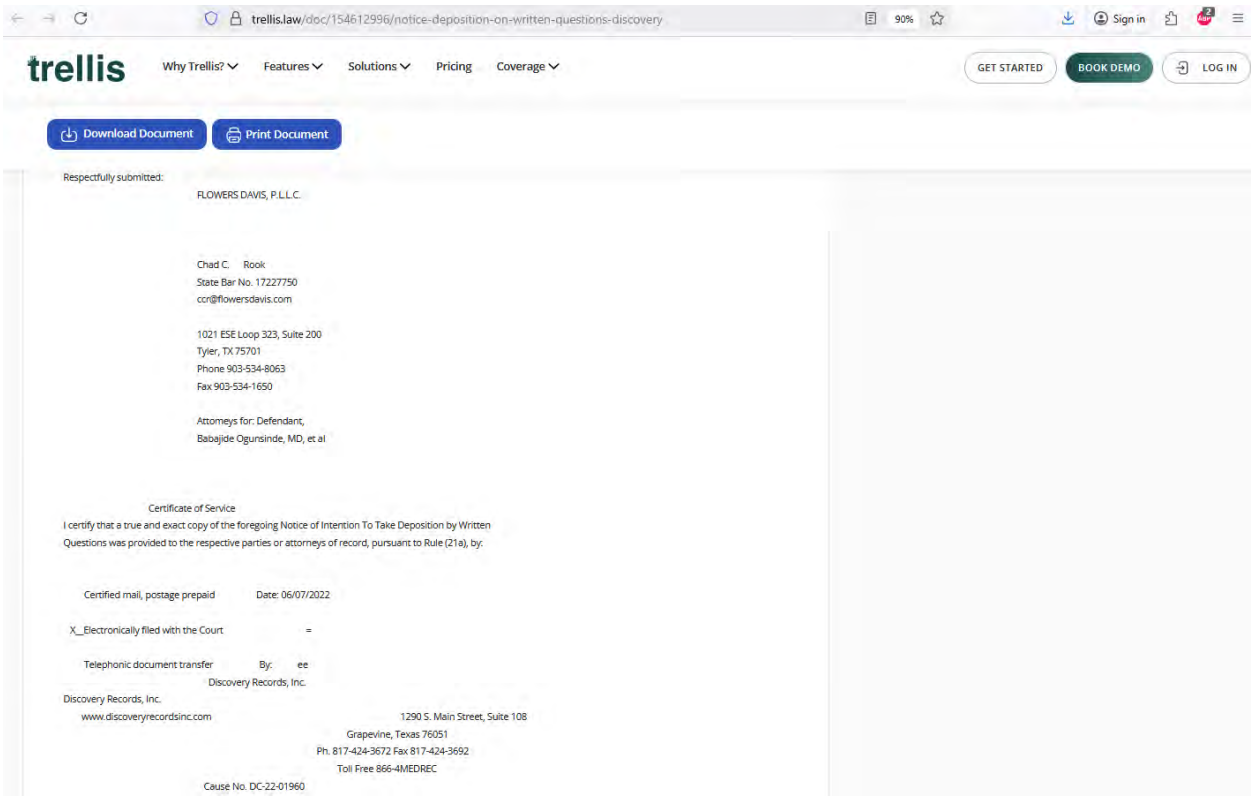
(See List of Medical Providers)

Before a Notary Public, or other Officer authorized to administer oaths, with Discovery Records Inc, 1290 S. Main Street, Suite 108, Grapevine, Texas 76051, or their designated agent; at the office of the summoned witness.

Which deposition with attached questions and exhibits may be used in evidence upon the trial of the above styled and numbered cause pending in the above named court. Notice is further given that request is hereby made as authorized under Rule 200, Texas Rules of Civil Procedure, to the Officer authorized to take this deposition to issue a Subpoena Duces Tecum and cause it to be served on the witness to produce:

ALL MEDICAL RECORDS AND RADIOLOGY FILMS/IMAGES, including, but not limited to, patient history forms, patient questionnaires, intake forms, exams, physicals, lab and radiology reports, radiology films/images, x-rays, positives, MRIS, CTS, myelograms, discograms, fluoroscopy procedures, scans, arthroscopic photographs/images, injection photographs/images, neuromonitoring tapes and recordings, and any other diagnostic tests, recordings, tapes, emergency room records, psychiatric or counseling records, copies of prescription and pharmaceutical records, physical therapy records, occupational therapy records, records of telephone conversations, copies of telephone messages, all handwritten notes, test results, color photographs, all correspondence to and from the patient, all correspondence to and from treating facilities and caregivers, all correspondence to and from attorneys specifically including letters of protection, and medical records contained in the file from other sources which are in your possession, custody, control, or at your access; pertaining to:
Alvin Lee Spearman, Sr. DOB: 04/30/1971
and turn such records over to the Officer authorized to take this deposition so that inspection and photocopying of the same may be made and attached to said deposition

Discfile/233522
Respectfully submitted:



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Respectfully submitted:

FLOWERS DAVIS, P.L.L.C.

Chad C. Rook
State Bar No. 17227750
ccr@flowersdavis.com

1021 ESE Loop 323, Suite 200
Tyler, TX 75701
Phone 903-534-8063
Fax 903-534-1650

Attorneys for: Defendant,
Babajide Ogunsinde, MD, et al

Certificate of Service

I certify that a true and exact copy of the foregoing Notice of Intention To Take Deposition by Written Questions was provided to the respective parties or attorneys of record, pursuant to Rule (21a), by:

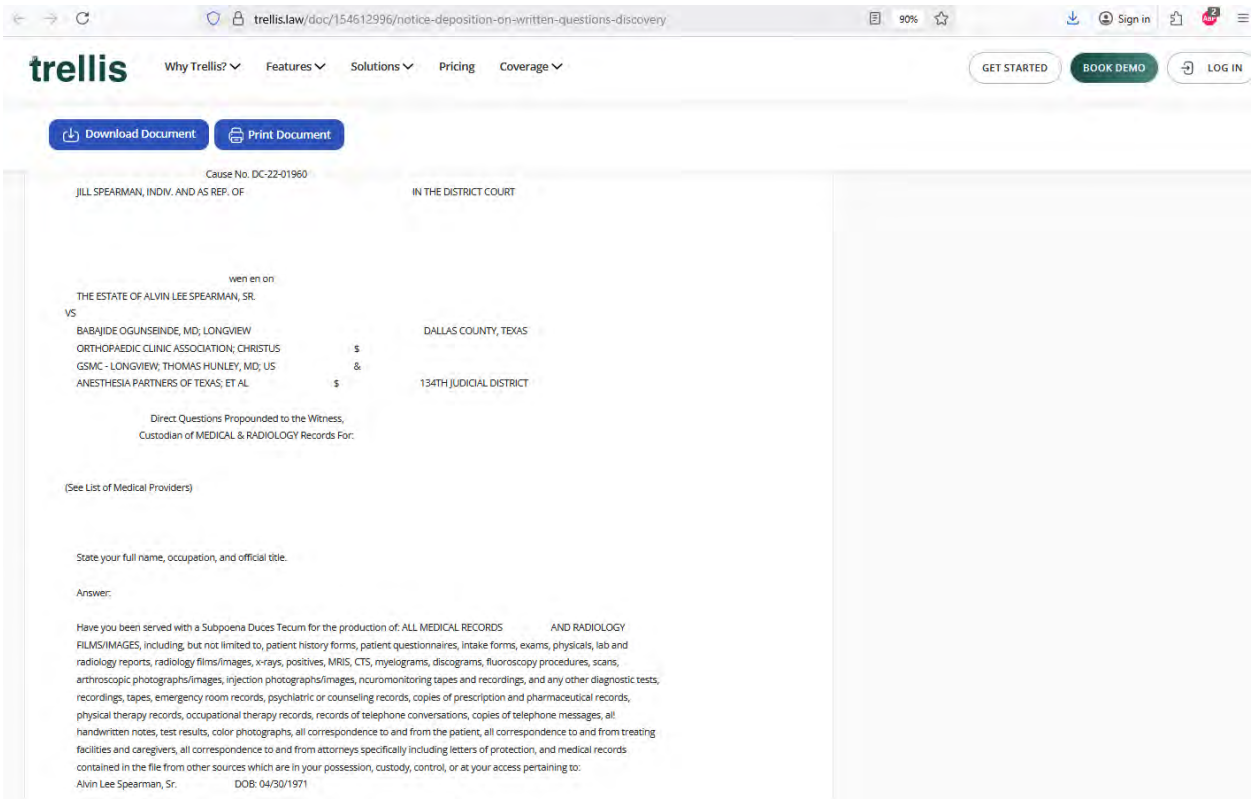
Certified mail, postage prepaid Date: 06/07/2022

X_Electronically filed with the Court =

Telephonic document transfer By: ee
Discovery Records, Inc.

Discovery Records, Inc.
www.discoveryrecordsinc.com 1290 S. Main Street, Suite 108
Grapevine, Texas 76051
Ph. 817-424-3672 Fax 817-424-3692
Toll Free 866-4MEDREC

Cause No. DC-22-01960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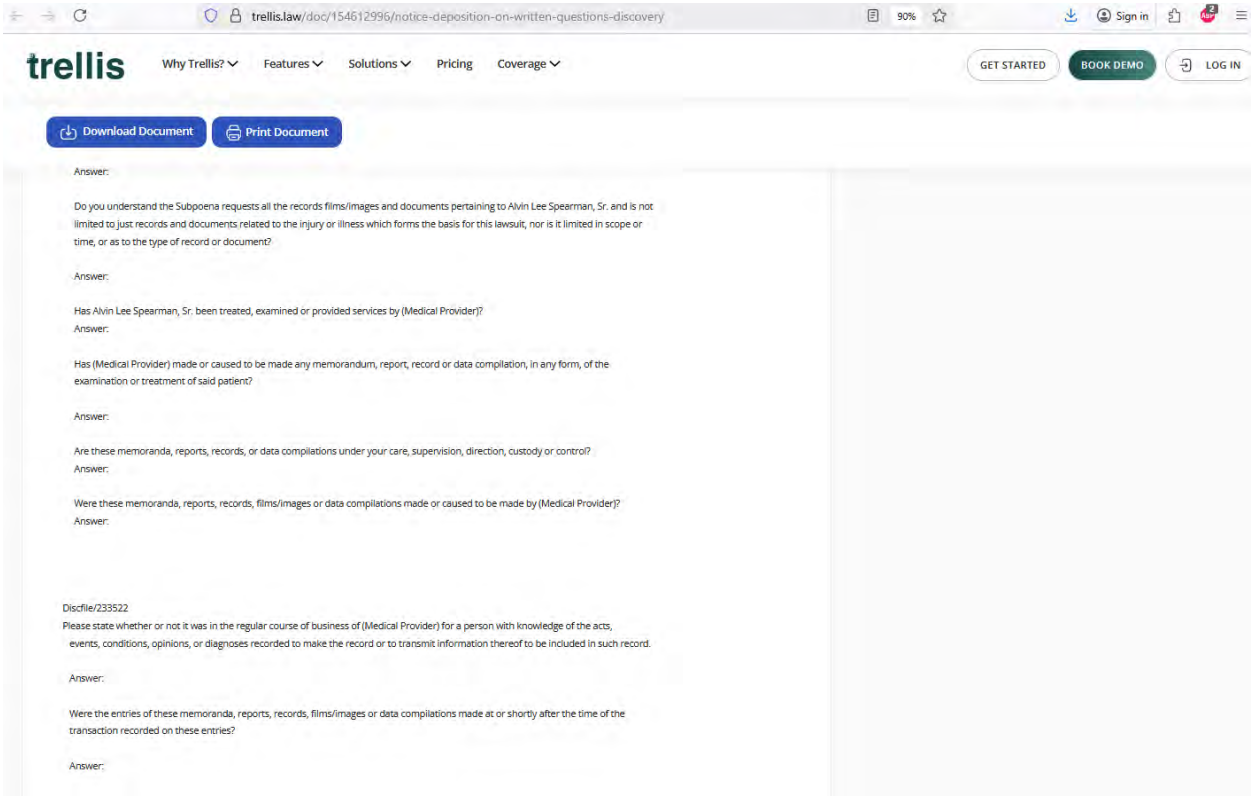
Cause No. DC-22-01960
JILL SPEARMAN, INDIV. AND AS REP. OF
IN THE DISTRICT COURT
wen en on
THE ESTATE OF ALVIN LEE SPEARMAN, SR.
VS
BABAJIDE OGUNSEINDE, MD; LONGVIEW
ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS
GSMC - LONGVIEW; THOMAS HUNLEY, MD; US
ANESTHESIA PARTNERS OF TEXAS; ET AL
DALLAS COUNTY, TEXAS
134TH JUDICIAL DISTRICT
Direct Questions Propounded to the Witness,
Custodian of MEDICAL & RADIOLOGY Records For:
(See List of Medical Providers)
State your full name, occupation, and official title.
Answer:
Have you been served with a Subpoena Duces Tecum for the production of: ALL MEDICAL RECORDS AND RADIOLOGY FILMS/IMAGES, including, but not limited to, patient history forms, patient questionnaires, intake forms, exams, physicals, lab and radiology reports, radiology films/images, x-rays, positives, MRIS, CTS, myelograms, discograms, fluoroscopy procedures, scans, arthroscopic photographs/images, injection photographs/images, ncuromonitoring tapes and recordings, and any other diagnostic tests, recordings, tapes, emergency room records, psychiatric or counseling records, copies of prescription and pharmaceutical records, physical therapy records, occupational therapy records, records of telephone conversations, copies of telephone messages, all handwritten notes, test results, color photographs, all correspondence to and from the patient, all correspondence to and from treating facilities and caregivers, all correspondence to and from attorneys specifically including letters of protection, and medical records contained in the file from other sources which are in your possession, custody, control, or at your access pertaining to:
Alvin Lee Spearman, Sr. DOB: 04/30/1971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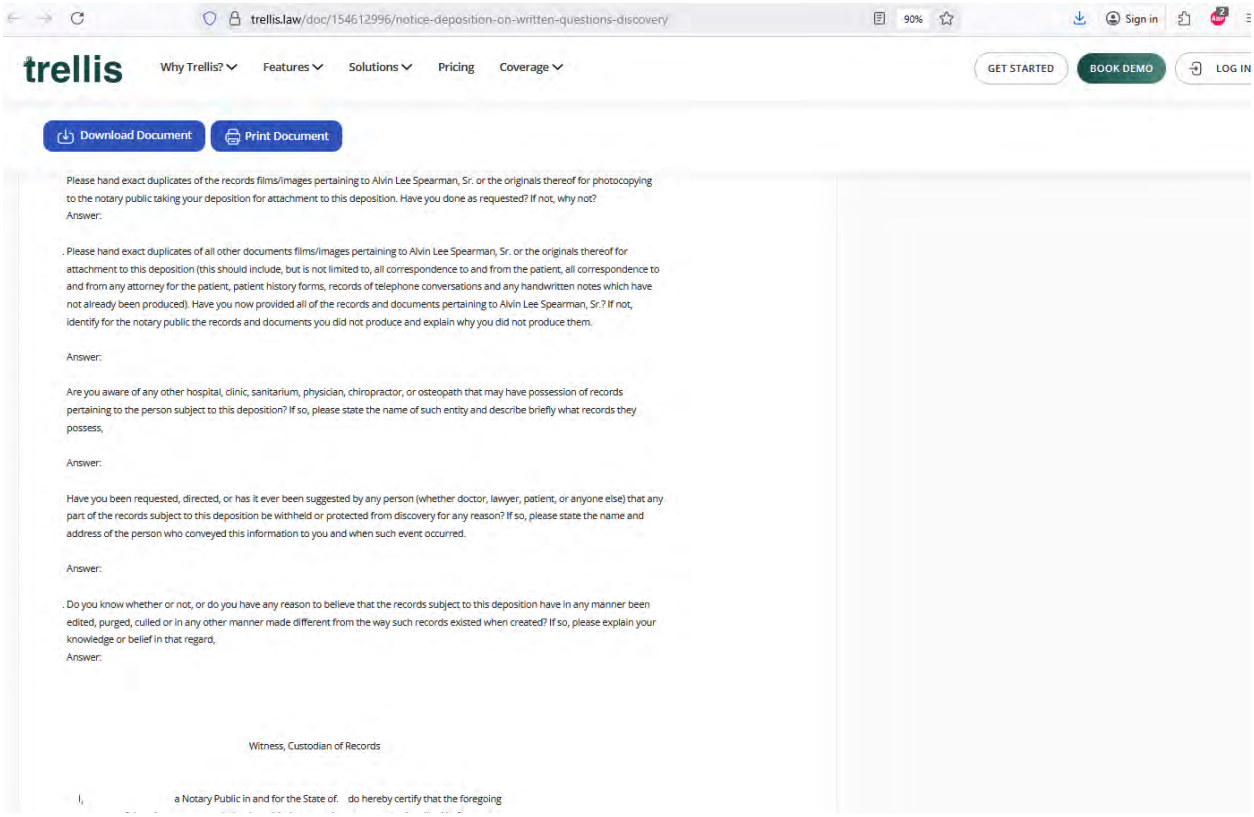
Answer:
Do you understand the Subpoena requests all the records films/images and documents pertaining to Alvin Lee Spearman, Sr. and is not limited to just records and documents related to the injury or illness which forms the basis for this lawsuit, nor is it limited in scope or time, or as to the type of record or document?
Answer:
Has Alvin Lee Spearman, Sr. been treated, examined or provided services by (Medical Provider)?
Answer:
Has (Medical Provider) made or caused to be made any memorandum, report, record or data compilation, in any form, of the examination or treatment of said patient?
Answer:
Are these memoranda, reports, records, or data compilations under your care, supervision, direction, custody or control?
Answer:
Were these memoranda, reports, records, films/images or data compilations made or caused to be made by (Medical Provider)?
Answer:
Discfile/233522
Please state whether or not it was in the regular course of business of (Medical Provider) for a person with knowledge of the acts, events, conditions, opinions, or diagnoses recorded to make the record or to transmit information thereof to be included in such record.
Answer:
Were the entries of these memoranda, reports, records, films/images or data compilations made at or shortly after the time of the transaction recorded on these entries?
Answer:



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Please hand exact duplicates of the records films/images pertaining to Alvin Lee Spearman, Sr. or the originals thereof for photocopying to the notary public taking your deposition for attachment to this deposition. Have you done as requested? If not, why not?
Answer:

. Please hand exact duplicates of all other documents films/images pertaining to Alvin Lee Spearman, Sr. or the originals thereof for attachment to this deposition (this should include, but is not limited to, all correspondence to and from the patient, all correspondence to and from any attorney for the patient, patient history forms, records of telephone conversations and any handwritten notes which have not already been produced). Have you now provided all of the records and documents pertaining to Alvin Lee Spearman, Sr.? If not, identify for the notary public the records and documents you did not produce and explain why you did not produce them.

Answer:

Are you aware of any other hospital, clinic, sanitarium, physician, chiropractor, or osteopath that may have possession of records pertaining to the person subject to this deposition? If so, please state the name of such entity and describe briefly what records they possess,

Answer:

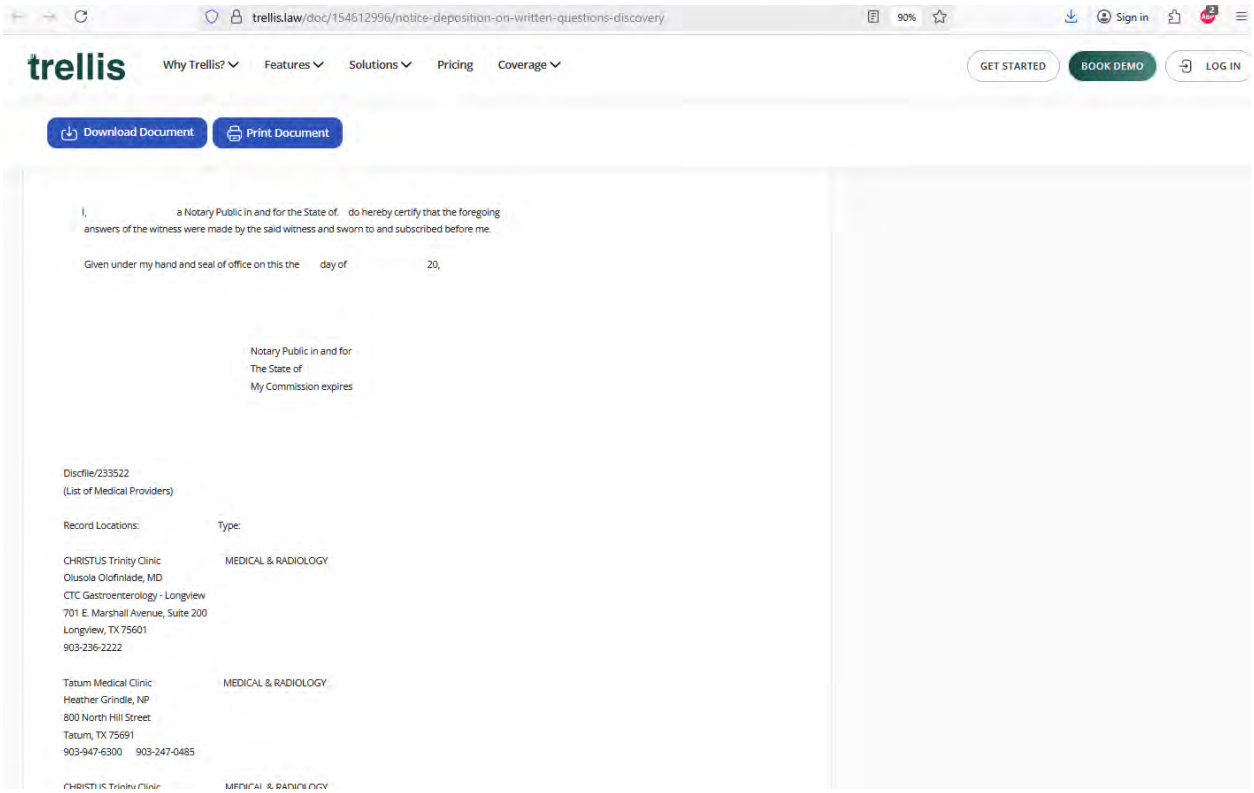
Have you been requested, directed, or has it ever been suggested by any person (whether doctor, lawyer, patient, or anyone else) that any part of the records subject to this deposition be withheld or protected from discovery for any reason? If so, please state the name and address of the person who conveyed this information to you and when such event occurred.

Answer:

. Do you know whether or not, or do you have any reason to believe that the records subject to this deposition have in any manner been edited, purged, culled or in any other manner made different from the way such records existed when created? If so, please explain your knowledge or belief in that regard,
Answer:

Witness, Custodian of Records

I, a Notary Public in and for the State of. do hereby certify that the foregoing



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I, a Notary Public in and for the State of. do hereby certify that the foregoing answers of the witness were made by the said witness and sworn to and subscribed before me.

Given under my hand and seal of office on this the day of 20,

Notary Public in and for
The State of
My Commission expires

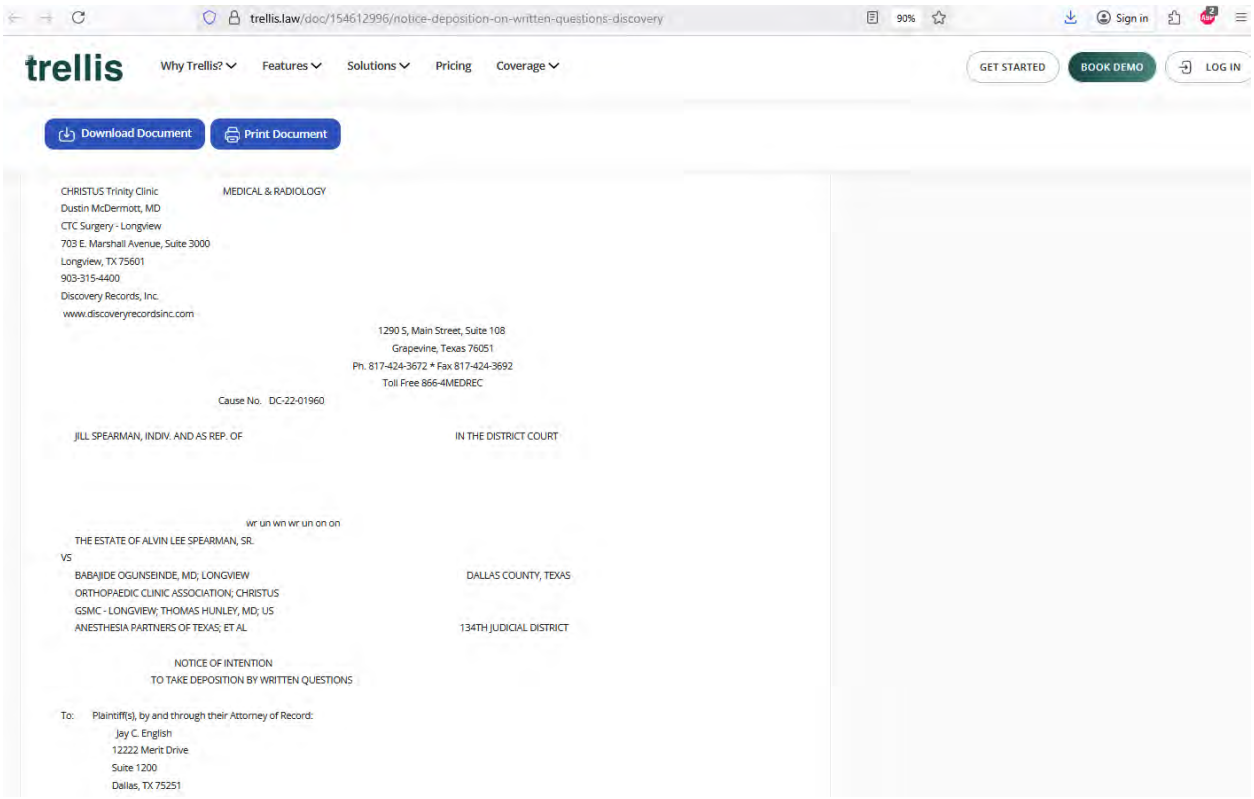
Discfile/233522
(List of Medical Providers)

Record Locations: Type:

CHRISTUS Trinity Clinic MEDICAL & RADIOLOGY
Olusola Olofinlade, MD
CTC Gastroenterology - Longview
701 E. Marshall Avenue, Suite 200
Longview, TX 75601
903-236-2222

Tatum Medical Clinic MEDICAL & RADIOLOGY
Heather Grindle, NP
800 North Hill Street
Tatum, TX 75691
903-947-6300 903-247-0485

CHRISTUS Trinity Clinic MEDICAL & RADIOLOGY



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CHRISTUS Trinity Clinic MEDICAL & RADIOLOGY
Dustin McDermott, MD
CTC Surgery - Longview
703 E. Marshall Avenue, Suite 3000
Longview, TX 75601
903-315-4400
Discovery Records, Inc.
www.discoveryrecordsinc.com

1290 S. Main Street, Suite 108
Grapevine, Texas 76051
Ph. 817-424-3672 * Fax 817-424-3692
Toll Free 866-4MEDREC

Cause No. DC-22-01960

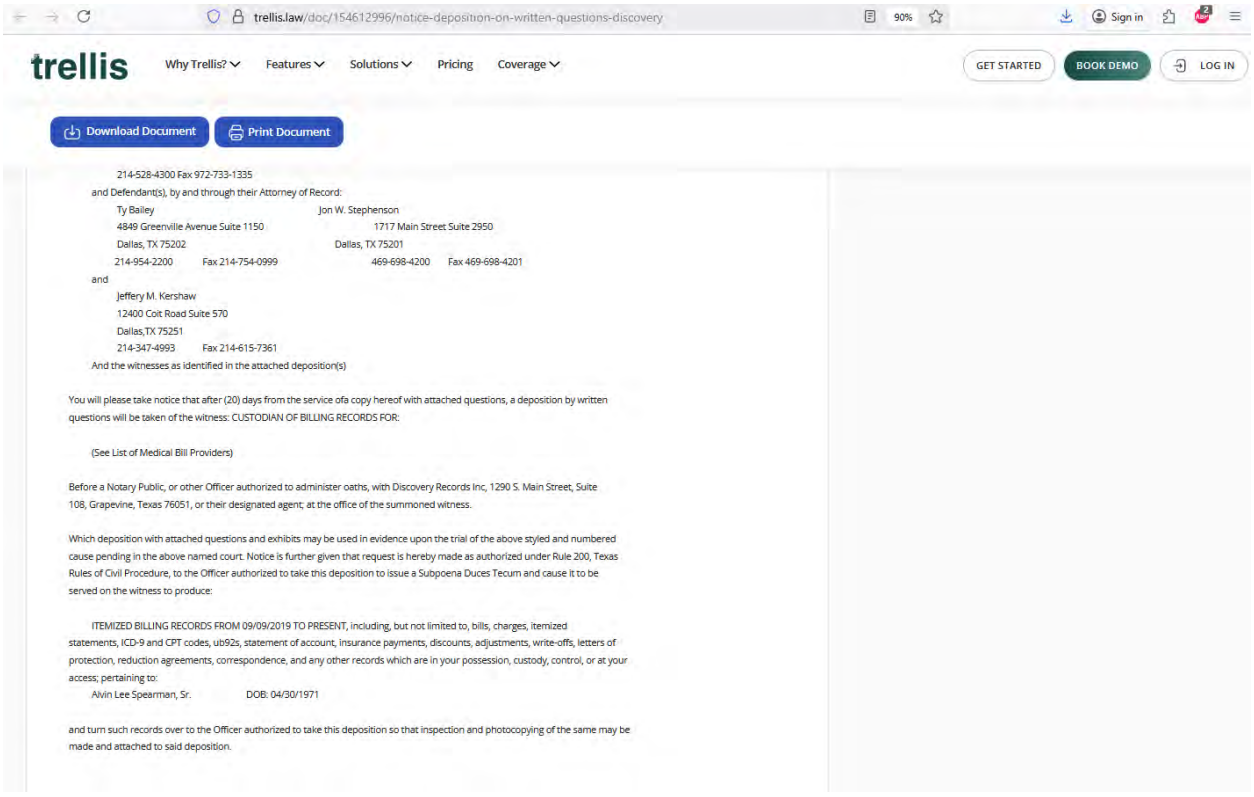
JILL SPEARMAN, INDIV. AND AS REP. OF IN THE DISTRICT COURT

wr un wn wr un on on

THE ESTATE OF ALVIN LEE SPEARMAN, SR.
VS
BABAJIDE OGUNSEINDE, MD; LONGVIEW DALLAS COUNTY, TEXAS
ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS
GSMC - LONGVIEW; THOMAS HUNLEY, MD; US
ANESTHESIA PARTNERS OF TEXAS; ET AL 134TH JUDICIAL DISTRICT

NOTICE OF INTENTION
TO TAKE DEPOSITION BY WRITTEN QUESTIONS

To: Plaintiff(s), by and through their Attorney of Record:
Jay C. English
12222 Merit Drive
Suite 1200
Dallas, TX 75251



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214-528-4300 Fax 972-733-1335
and Defendant(s), by and through their Attorney of Record:
Ty Bailey Jon W. Stephenson
4849 Greenville Avenue Suite 1150 1717 Main Street Suite 2950
Dallas, TX 75202 Dallas, TX 75201
214-954-2200 Fax 214-754-0999 469-698-4200 Fax 469-698-4201
and
Jeffery M. Kershaw
12400 Coit Road Suite 570
Dallas,TX 75251
214-347-4993 Fax 214-615-7361
And the witnesses as identified in the attached deposition(s)

You will please take notice that after (20) days from the service ofa copy hereof with attached questions, a deposition by written questions will be taken of the witness: CUSTODIAN OF BILLING RECORDS FOR:

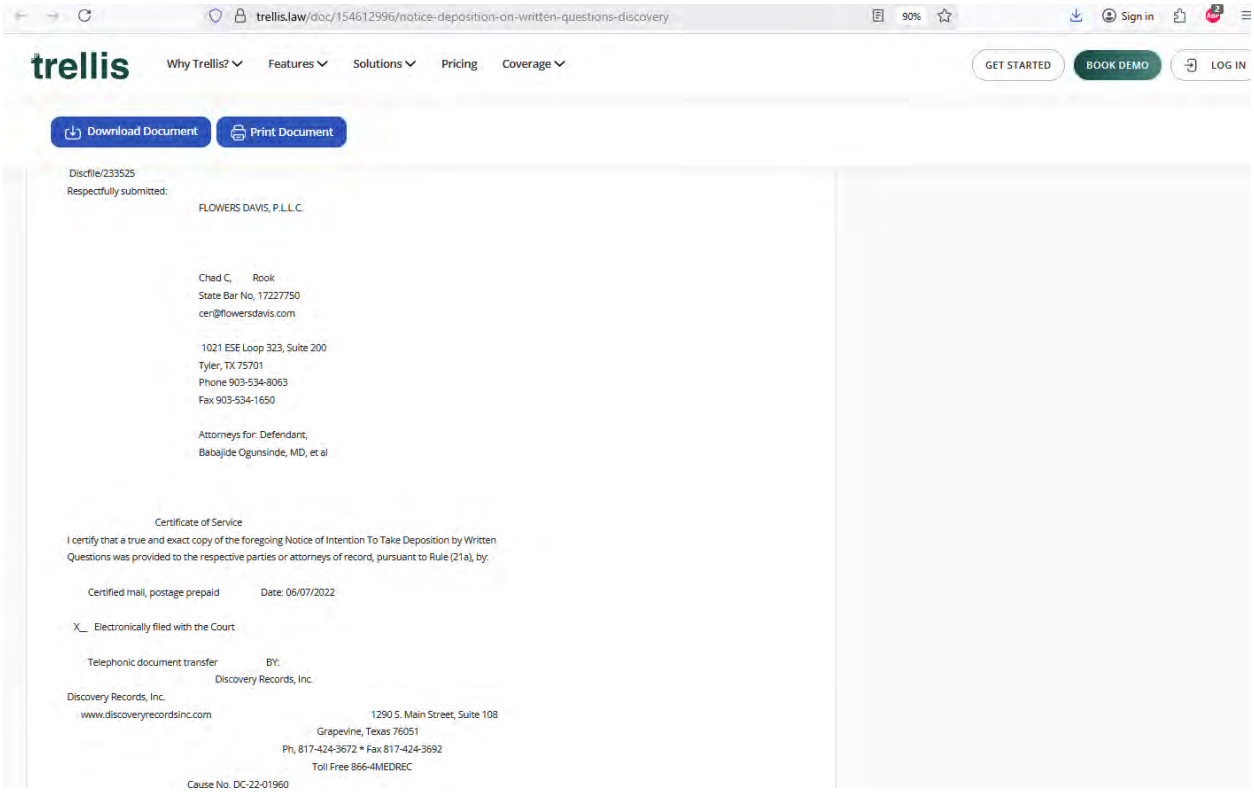
(See List of Medical Bill Providers)

Before a Notary Public, or other Officer authorized to administer oaths, with Discovery Records Inc, 1290 S. Main Street, Suite 108, Grapevine, Texas 76051, or their designated agent; at the office of the summoned witness.

Which deposition with attached questions and exhibits may be used in evidence upon the trial of the above styled and numbered cause pending in the above named court. Notice is further given that request is hereby made as authorized under Rule 200, Texas Rules of Civil Procedure, to the Officer authorized to take this deposition to issue a Subpoena Duces Tecum and cause it to be served on the witness to produce:

ITEMIZED BILLING RECORDS FROM 09/09/2019 TO PRESENT, including, but not limited to, bills, charges, itemized statements, ICD-9 and CPT codes, ub92s, statement of account, insurance payments, discounts, adjustments, write-offs, letters of protection, reduction agreements, correspondence, and any other records which are in your possession, custody, control, or at your access; pertaining to:
Alvin Lee Spearman, Sr. DOB: 04/30/1971

and turn such records over to the Officer authorized to take this deposition so that inspection and photocopying of the same may be made and attached to said deposition.



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Respectfully submitted:
FLOWERS DAVIS, P.L.L.C.

Chad C. Rook
State Bar No. 17227750
cer@flowersdavis.com

1021 ESE Loop 323, Suite 200
Tyler, TX 75701
Phone 903-534-8063
Fax 903-534-1650

Attorneys for: Defendant,
Babajide Ogunsinde, MD, et al

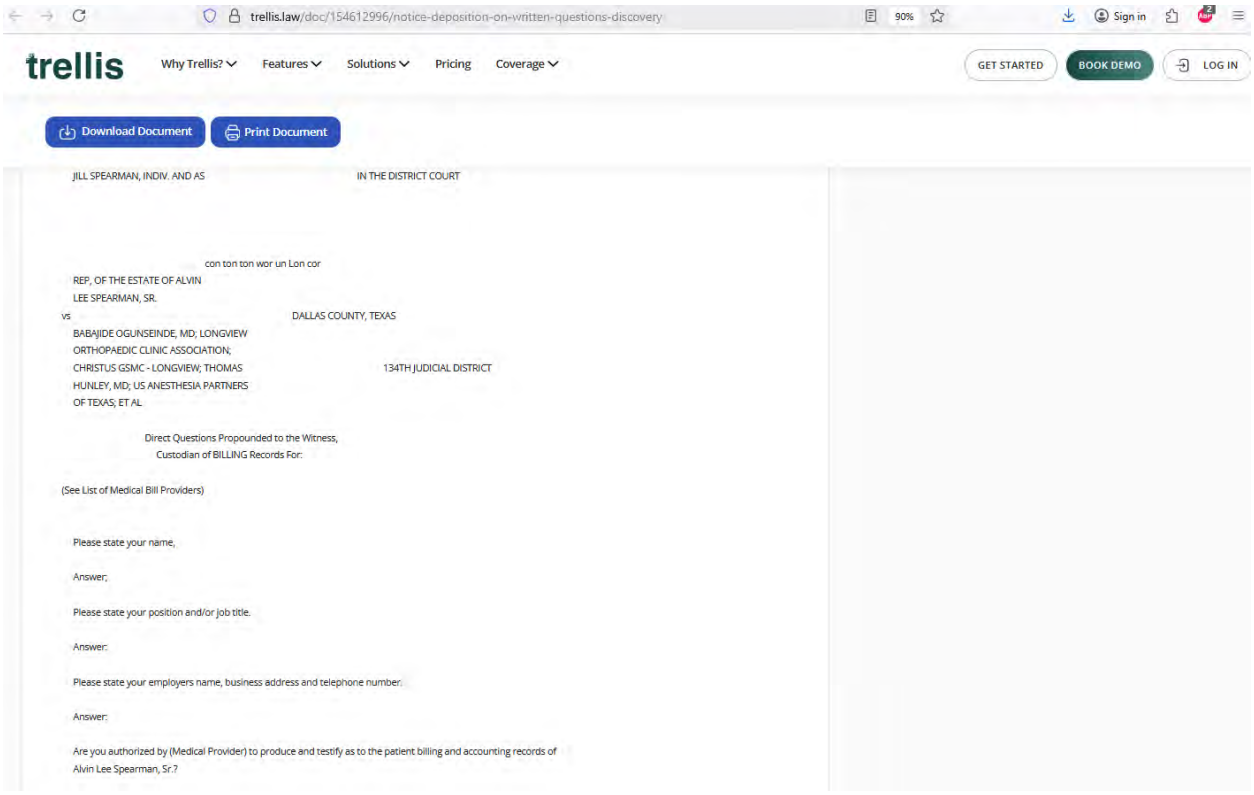
Certificate of Service
I certify that a true and exact copy of the foregoing Notice of Intention To Take Deposition by Written Questions was provided to the respective parties or attorneys of record, pursuant to Rule (21a), by:

Certified mail, postage prepaid Date: 06/07/2022

X_ Electronically filed with the Court

Telephonic document transfer BY:
Discovery Records, Inc.
Discovery Records, Inc.
www.discoveryrecordsinc.com 1290 S. Main Street, Suite 108
Grapevine, Texas 76051
Ph. 817-424-3672 * Fax 817-424-3692
Toll Free 866-4MEDREC

Cause No. DC-22-01960



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JILL SPEARMAN, INDIV. AND AS REP, OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.
vs
BABAJIDE OGUNSEINDE, MD; LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION; CHRISTUS GSMC - LONGVIEW; THOMAS HUNLEY, MD; US ANESTHESIA PARTNERS OF TEXAS; ET AL

IN THE DISTRICT COURT

DALLAS COUNTY, TEXAS

134TH JUDICIAL DISTRICT

Direct Questions Propounded to the Witness,
Custodian of BILLING Records For:

(See List of Medical Bill Providers)

Please state your name.

Answer:

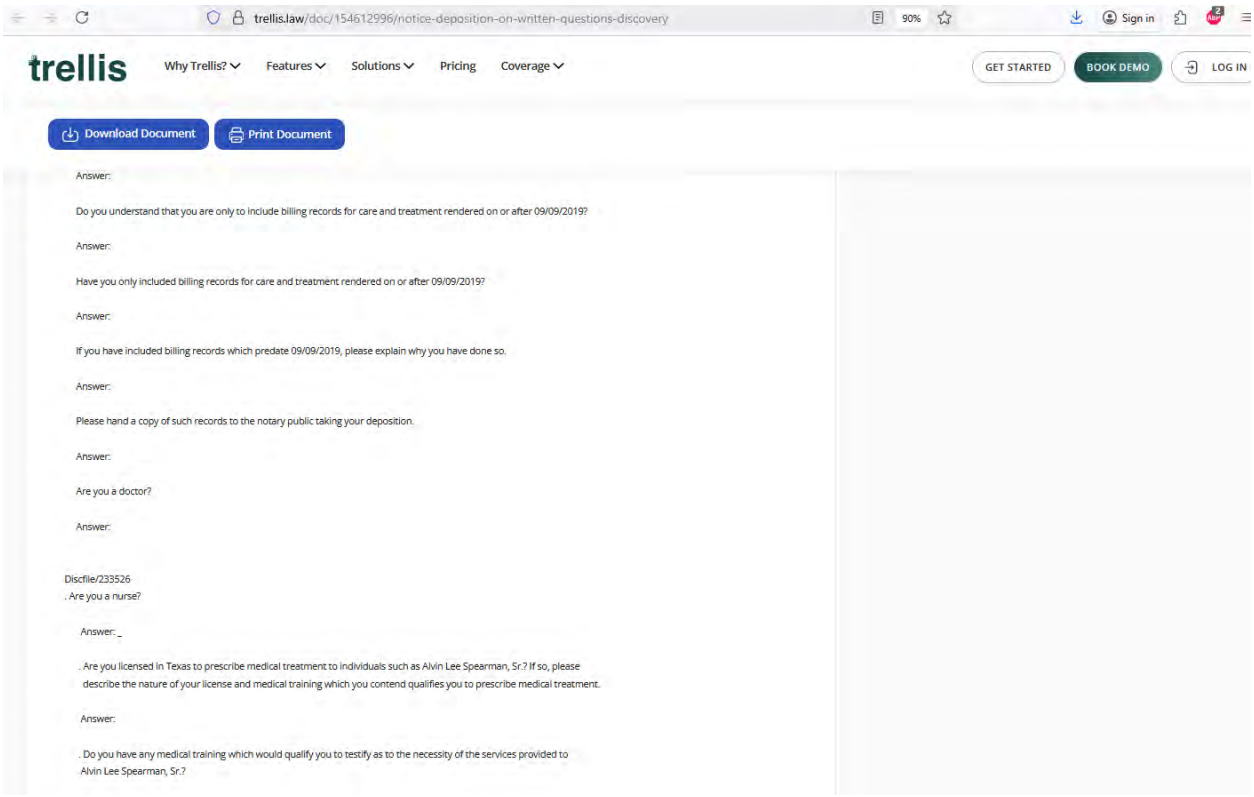
Please state your position and/or job title.

Answer:

Please state your employers name, business address and telephone number.

Answer:

Are you authorized by (Medical Provider) to produce and testify as to the patient billing and accounting records of Alvin Lee Spearman, Sr.?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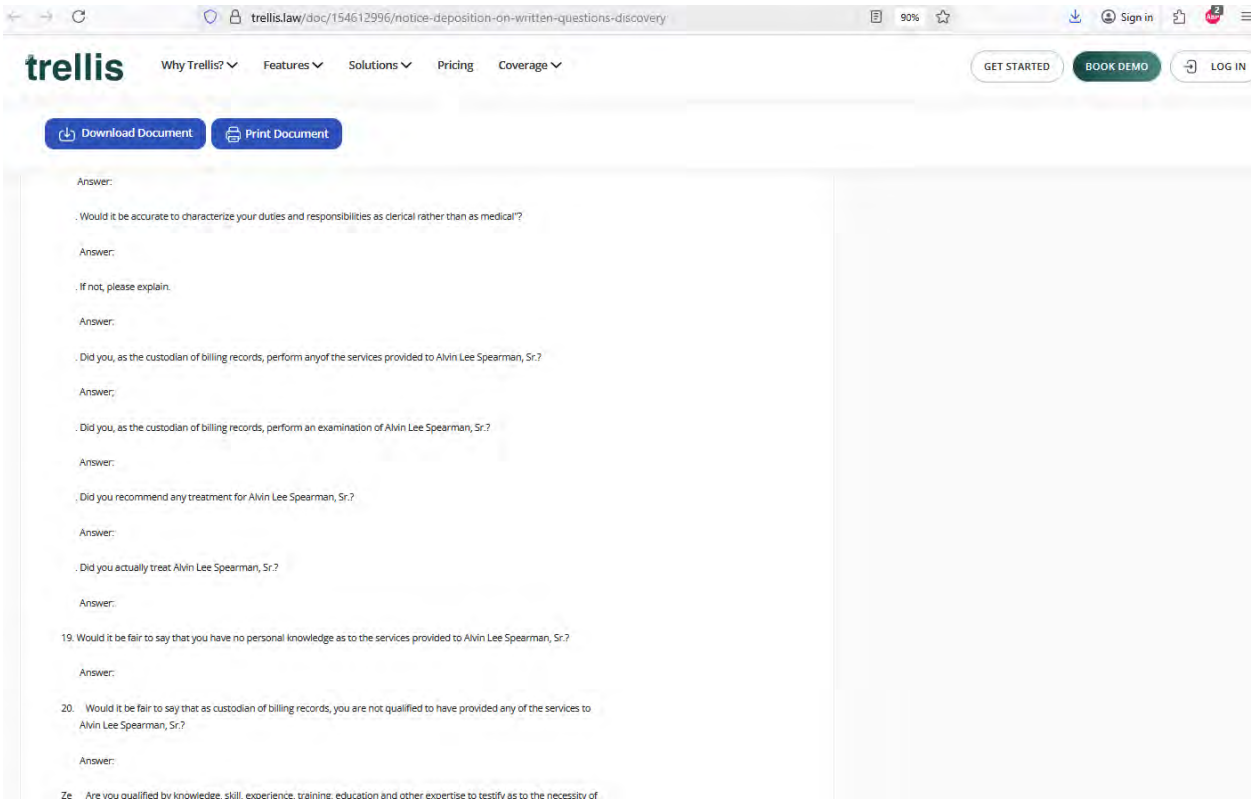
Answer:
Do you understand that you are only to include billing records for care and treatment rendered on or after 09/09/2019?
Answer:
Have you only included billing records for care and treatment rendered on or after 09/09/2019?
Answer:
If you have included billing records which predate 09/09/2019, please explain why you have done so.
Answer:
Please hand a copy of such records to the notary public taking your deposition.
Answer:
Are you a doctor?
Answer:
Discfile/233526
. Are you a nurse?
Answer: _
. Are you licensed in Texas to prescribe medical treatment to individuals such as Alvin Lee Spearman, Sr.? If so, please describe the nature of your license and medical training which you contend qualifies you to prescribe medical treatment.
Answer:
. Do you have any medical training which would qualify you to testify as to the necessity of the services provided to Alvin Lee Spearman, Sr.?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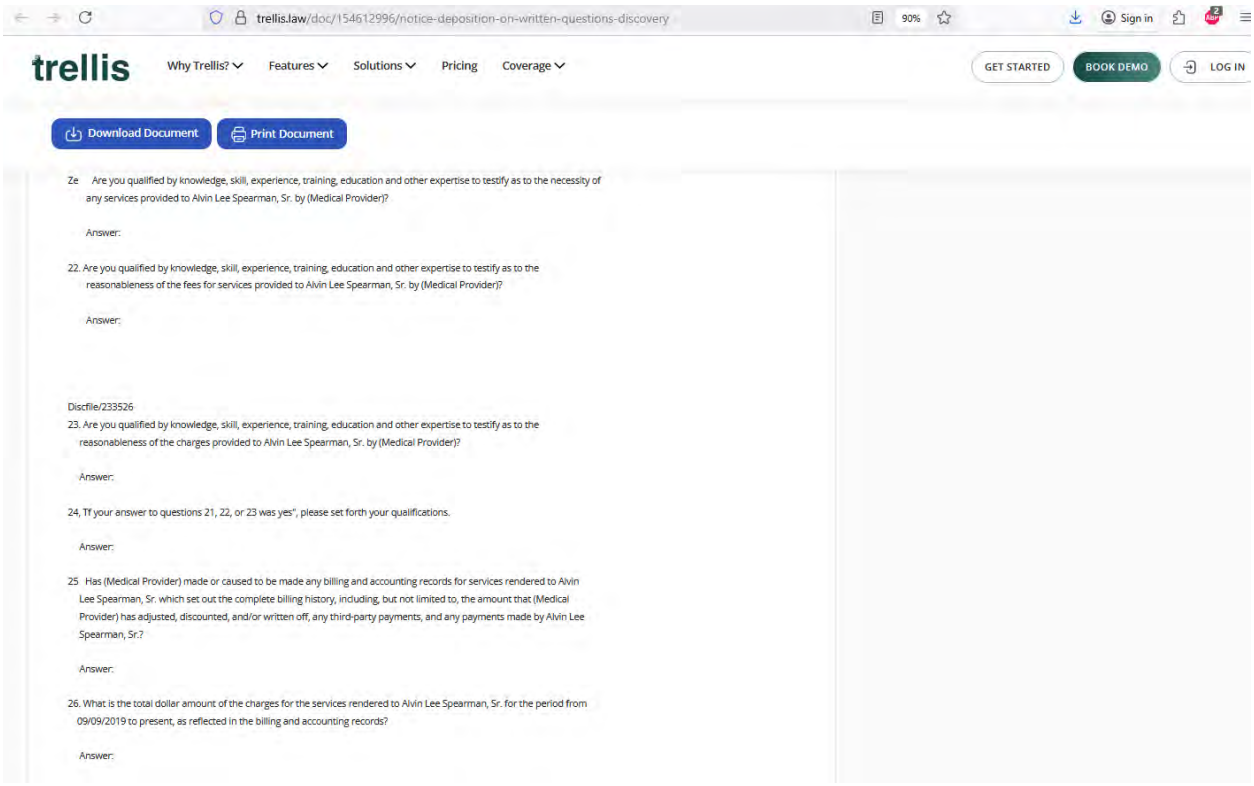
Answer:
. Would it be accurate to characterize your duties and responsibilities as clerical rather than as medical"?
Answer:
. If not, please explain.
Answer:
. Did you, as the custodian of billing records, perform anyof the services provided to Alvin Lee Spearman, Sr.?
Answer;
. Did you, as the custodian of billing records, perform an examination of Alvin Lee Spearman, Sr.?
Answer:
. Did you recommend any treatment for Alvin Lee Spearman, Sr.?
Answer:
. Did you actually treat Alvin Lee Spearman, Sr.?
Answer:
19. Would it be fair to say that you have no personal knowledge as to the services provided to Alvin Lee Spearman, Sr.?
Answer:
20. Would it be fair to say that as custodian of billing records, you are not qualified to have provided any of the services to Alvin Lee Spearman, Sr.?
Answer:
Ze Are you qualified by knowledge, skill, experience, training, education and other expertise to testify as to the necessity of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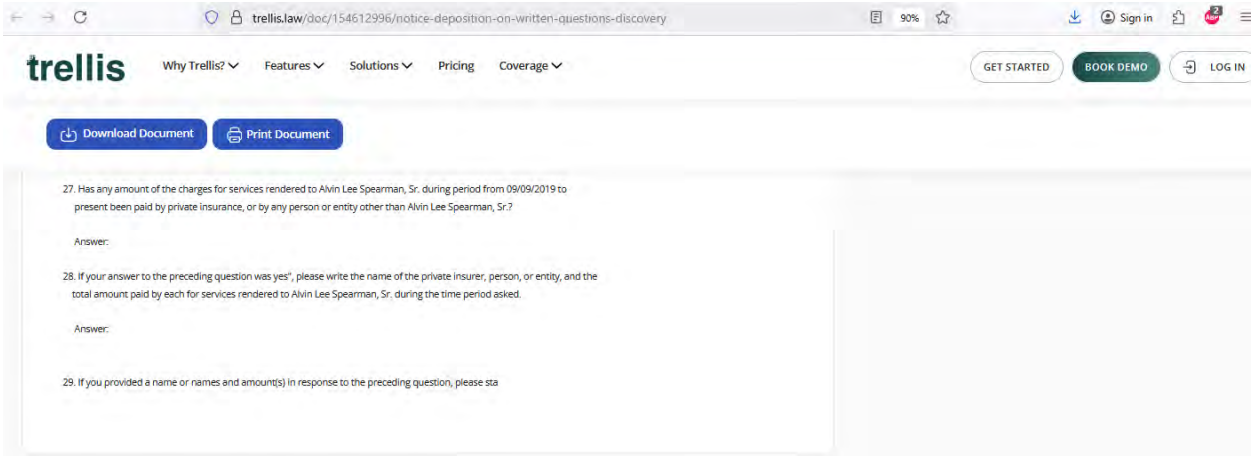
2e Are you qualified by knowledge, skill, experience, training, education and other expertise to testify as to the necessity of any services provided to Alvin Lee Spearman, Sr. by (Medical Provider)?
Answer:
22. Are you qualified by knowledge, skill, experience, training, education and other expertise to testify as to the reasonableness of the fees for services provided to Alvin Lee Spearman, Sr. by (Medical Provider)?
Answer:
Discfile/233526
23. Are you qualified by knowledge, skill, experience, training, education and other expertise to testify as to the reasonableness of the charges provided to Alvin Lee Spearman, Sr. by (Medical Provider)?
Answer:
24. If your answer to questions 21, 22, or 23 was yes", please set forth your qualifications.
Answer:
25 Has (Medical Provider) made or caused to be made any billing and accounting records for services rendered to Alvin Lee Spearman, Sr. which set out the complete billing history, including, but not limited to, the amount that (Medical Provider) has adjusted, discounted, and/or written off, any third-party payments, and any payments made by Alvin Lee Spearman, Sr.?
Answer:
26. What is the total dollar amount of the charges for the services rendered to Alvin Lee Spearman, Sr. for the period from 09/09/2019 to present, as reflected in the billing and accounting records?
Answer: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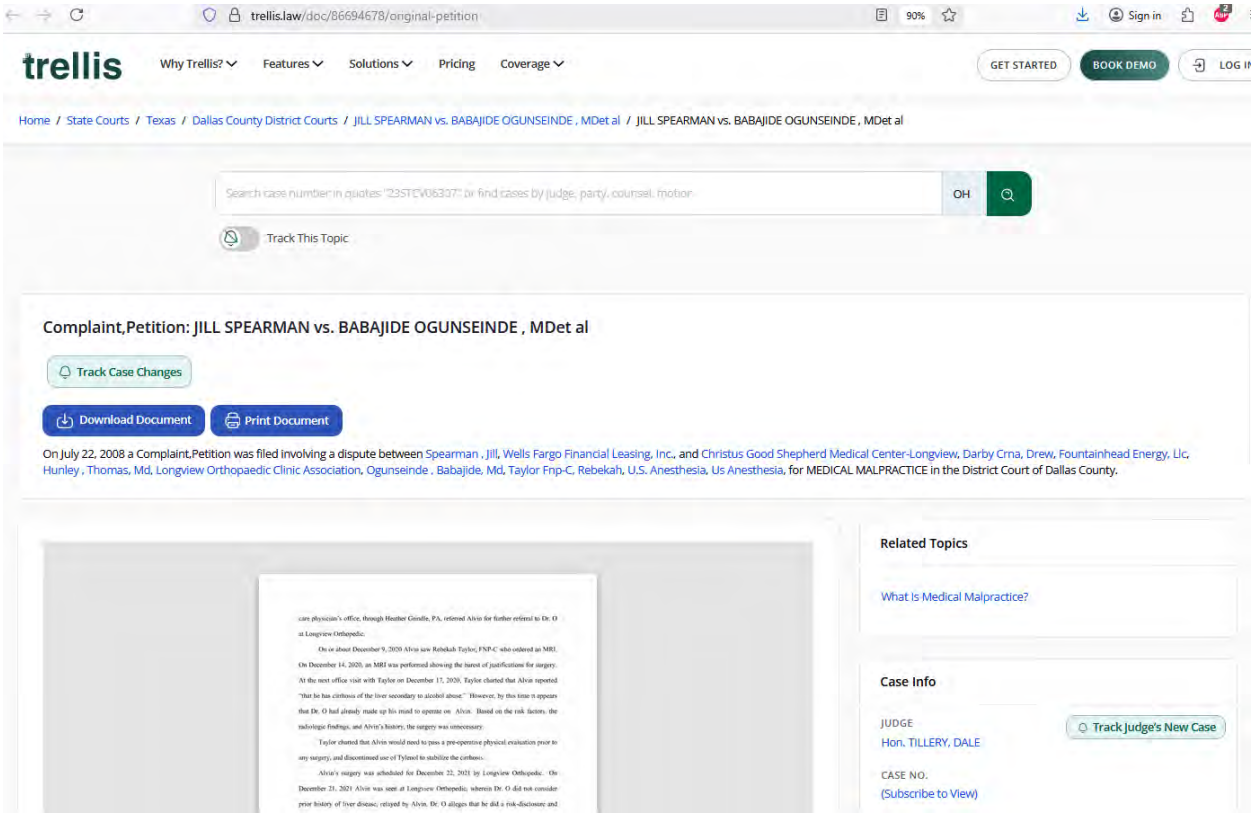
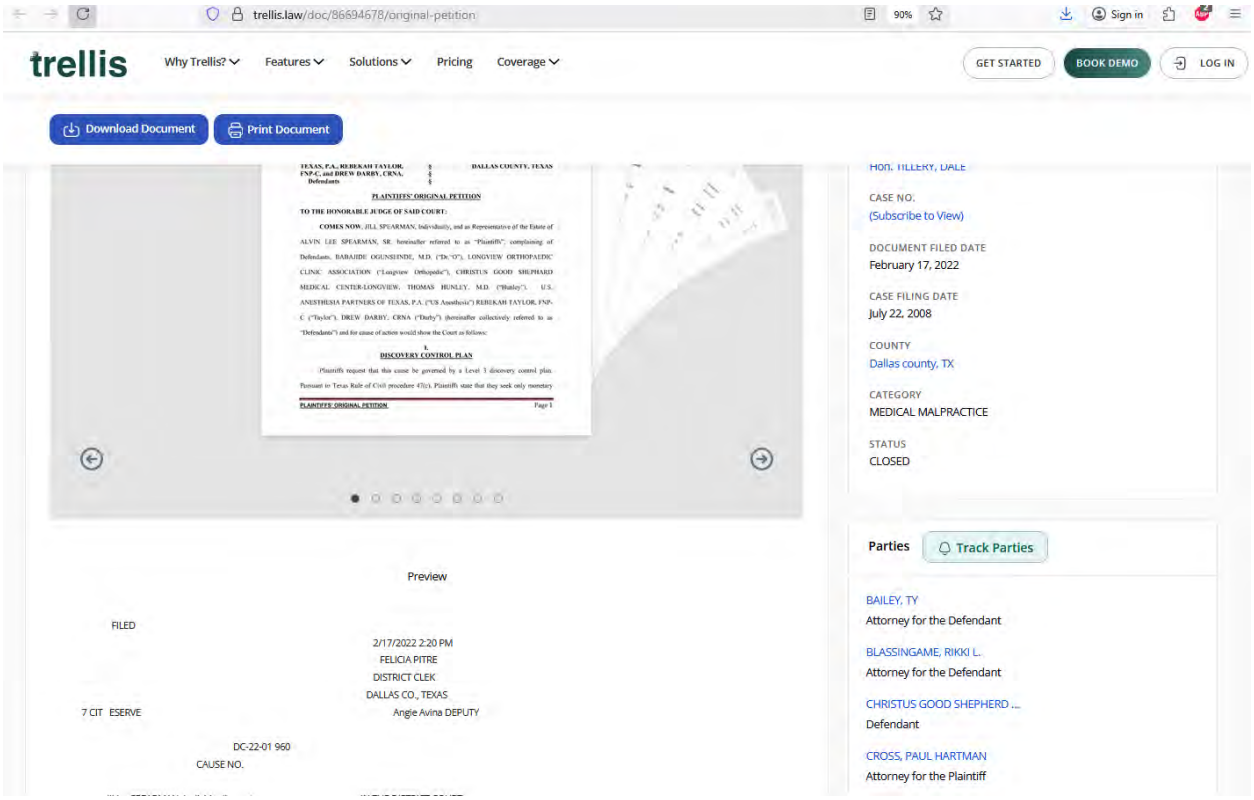
27. Has any amount of the charges for services rendered to Alvin Lee Spearman, Sr. during period from 09/09/2019 to present been paid by private insurance, or by any person or entity other than Alvin Lee Spearman, Sr.?
Answer:
28. If your answer to the preceding question was yes", please write the name of the private insurer, person, or entity, and the total amount paid by each for services rendered to Alvin Lee Spearman, Sr. during the time period asked.
Answer:
29. If you provided a name or names and amount(s) in response to the preceding question, please sta

RECORD 9:

The following record was confirmed using Subject's name, location, and occupation.

https://trellis.law/doc/86694678/original-petition

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PLAINTIFFS' ORIGINAL PETITION
TO THE HONORABLE JUDGE OF SAID COURT:
DISCOVERY CONTROL PLAN
Preview
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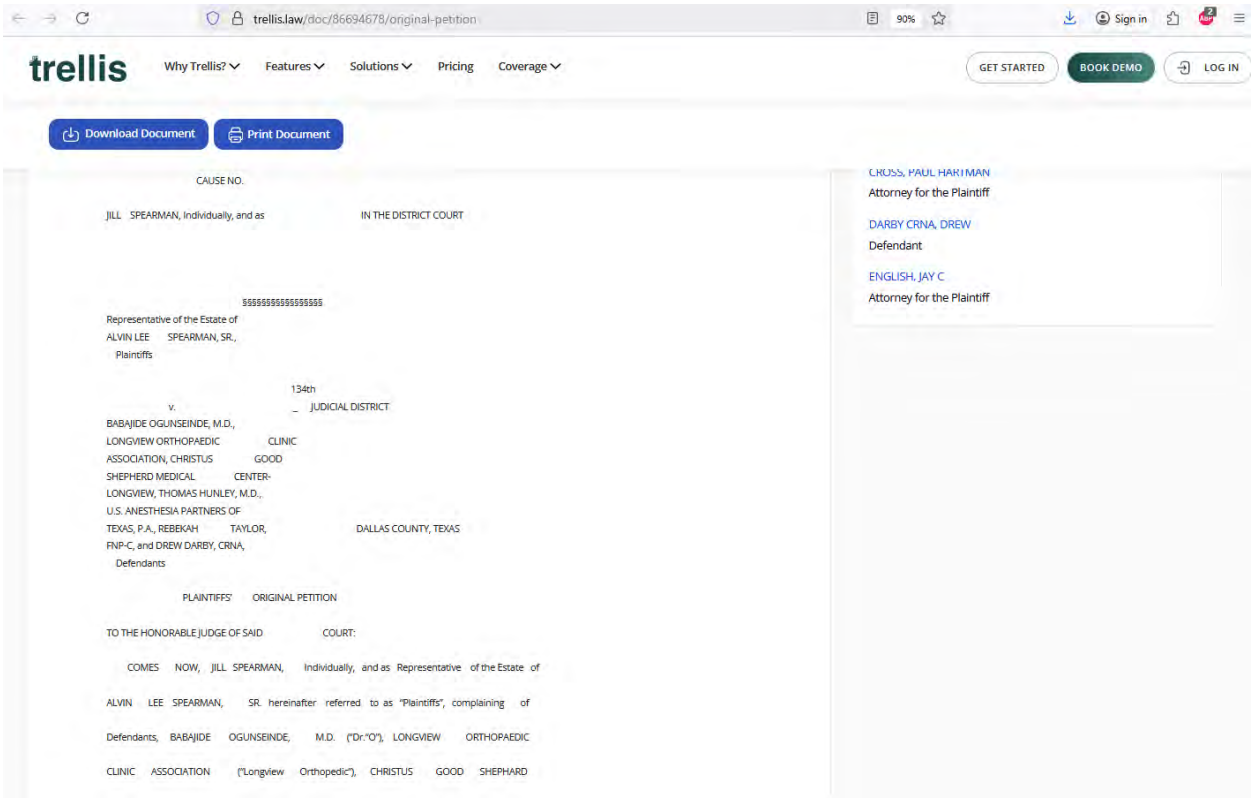
2/17/2022 2:20 PM
FELICIA PITRE
DISTRICT CLEK
DALLAS CO., TEXAS
Angie Avina DEPUTY
7 CIT ESERVE
DC-22-01 960
CAUSE NO.
CASE NO.
(Subscribe to View)
DOCUMENT FILED DATE
February 17, 2022
CASE FILING DATE
July 22, 2008
COUNTY
Dallas county, TX
CATEGORY
MEDICAL MALPRACTICE
STATUS
CLOSED
Parties
Track Parties
BAILEY, TY
Attorney for the Defendant
BLASSINGAME, RIKKI L.
Attorney for the Defendant
CHRISTUS GOOD SHEPHERD ...
Defendant
CROSS, PAUL HARTMAN
Attorney for the Plaintiff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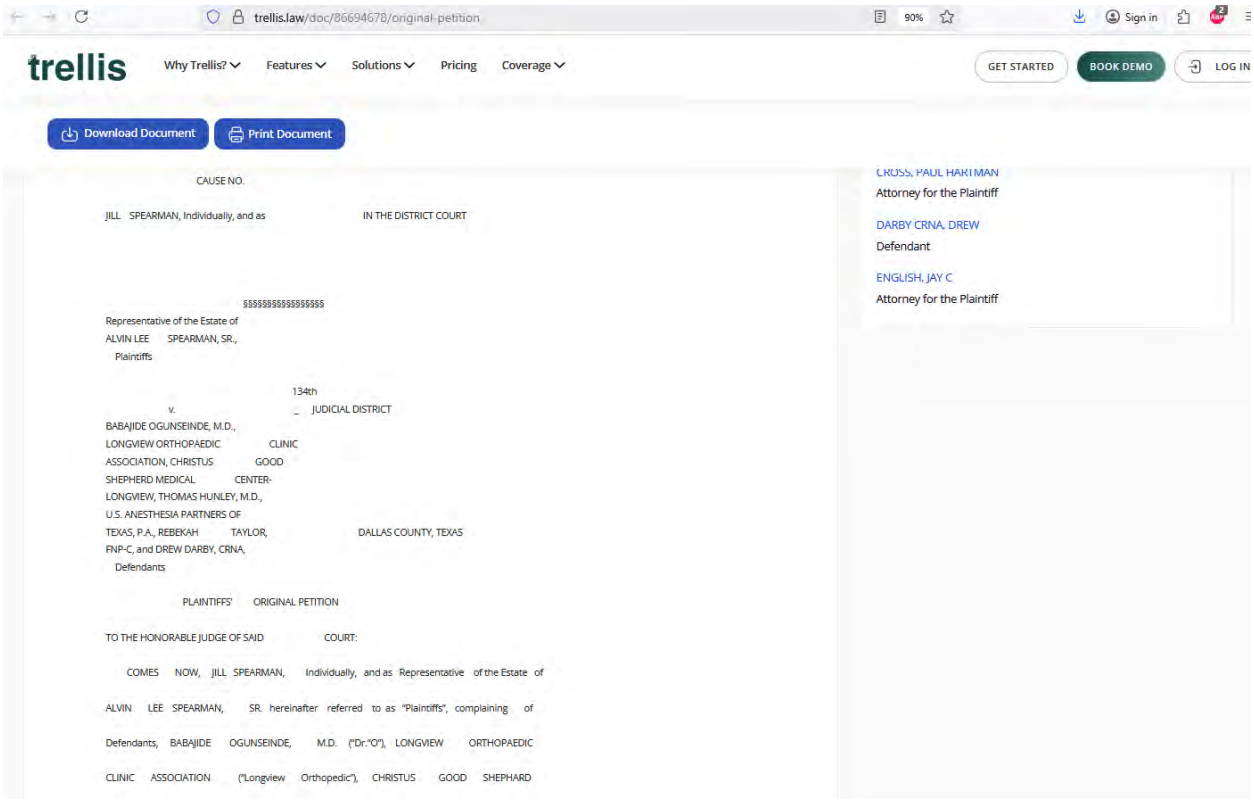
CAUSE NO.
JILL SPEARMAN, Individually, and as
IN THE DISTRICT COURT
Representative of the Estate of
ALVIN LEE SPEARMAN, SR.,
Plaintiffs
134th
v.
JUDICIAL DISTRICT
BABAJIDE OGUNSEINDE, M.D.,
LONGVIEW ORTHOPAEDIC CLINIC
ASSOCIATION, CHRISTUS GOOD
SHEPHERD MEDICAL CENTER-
LONGVIEW, THOMAS HUNLEY, M.D.,
U.S. ANESTHESIA PARTNERS OF
TEXAS, P.A., REBEKAH TAYLOR,
FNP-C, and DREW DARBY, CRNA,
Defendants
DALLAS COUNTY, TEXAS
PLAINTIFFS' ORIGINAL PETITION
TO THE HONORABLE JUDGE OF SAID COURT:
COMES NOW, JILL SPEARMAN, Individually, and as Representative of the Estate of
ALVIN LEE SPEARMAN, SR. hereinafter referred to as "Plaintiffs", complaining of
Defendants, BABAJIDE OGUNSEINDE, M.D. ("Dr."O"), LONGVIEW ORTHOPAEDIC
CLINIC ASSOCIATION ("Longview Orthopedic"), CHRISTUS GOOD SHEPHARD
CROSS, PAUL HARTMAN
Attorney for the Plaintiff
DARBY CRNA, DREW
Defendant
ENGLISH, JAY C
Attorney for the Plaintiff



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CAUSE NO.

JILL SPEARMAN, Individually, and as Representative of the Estate of ALVIN LEE SPEARMAN, SR., Plaintiffs

v.

BABAJIDE OGUNSEINDE, M.D., LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION, CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW, THOMAS HUNLEY, M.D., U.S. ANESTHESIA PARTNERS OF TEXAS, P.A., REBEKAH TAYLOR, FNP-C, and DREW DARBY, CRNA, Defendants

IN THE DISTRICT COURT

§§§§§§§§§§§§§§§§

134th JUDICIAL DISTRICT

DALLAS COUNTY, TEXAS

PLAINTIFFS' ORIGINAL PETITION

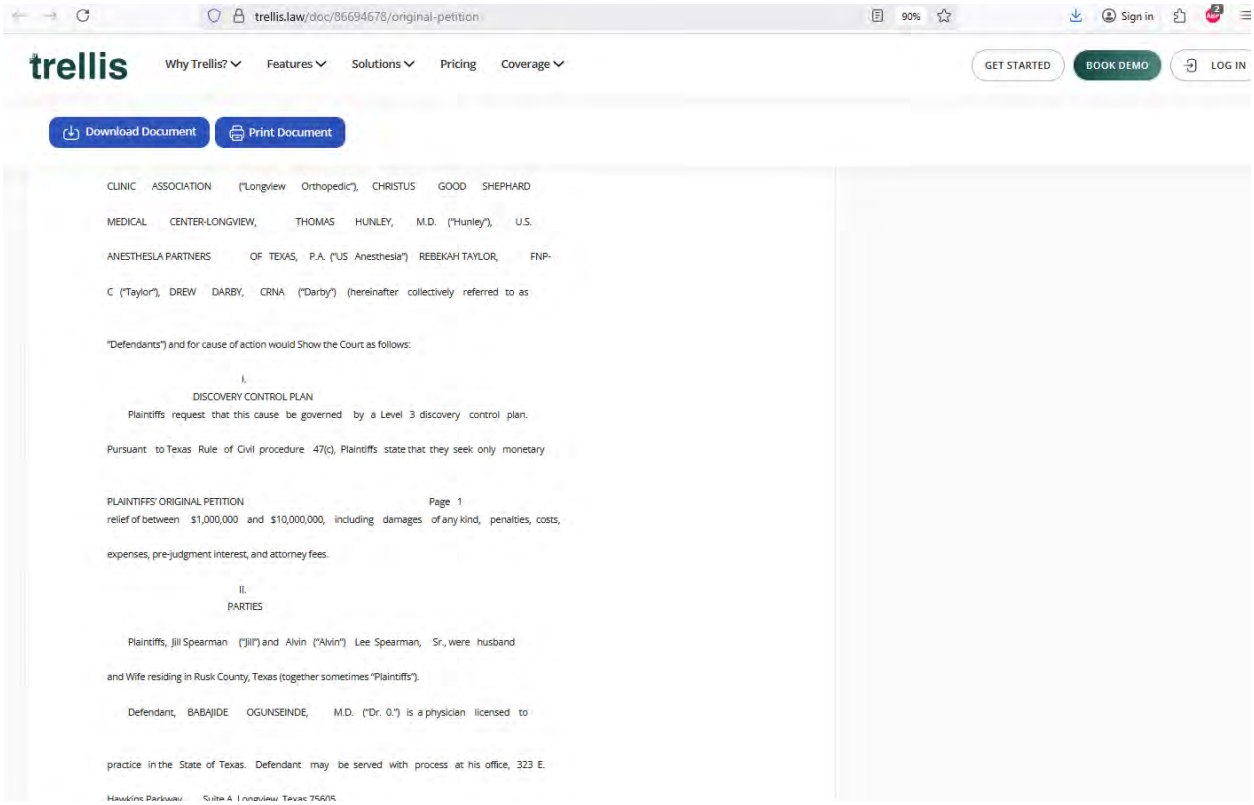
TO THE HONORABLE JUDGE OF SAID COURT:

COMES NOW, JILL SPEARMAN, Individually, and as Representative of the Estate of ALVIN LEE SPEARMAN, SR. hereinafter referred to as "Plaintiffs", complaining of Defendants, BABAJIDE OGUNSEINDE, M.D. ("Dr."O"), LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION ("Longview Orthopedic"), CHRISTUS GOOD SHEPHARD

CROSS, PAUL HARTMAN
Attorney for the Plaintiff

DARBY CRNA, DREW
Defendant

ENGLISH, JAY C
Attorney for the Plaintiff



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CLINIC ASSOCIATION ("Longview Orthopedic"), CHRISTUS GOOD SHEPHARD MEDICAL CENTER-LONGVIEW, THOMAS HUNLEY, M.D. ("Hunley"), U.S. ANESTHESLA PARTNERS OF TEXAS, P.A. ("US Anesthesia") REBEKAH TAYLOR, FNP-C ("Taylor"), DREW DARBY, CRNA ("Darby") (hereinafter collectively referred to as "Defendants") and for cause of action would Show the Court as follows:

I.
DISCOVERY CONTROL PLAN

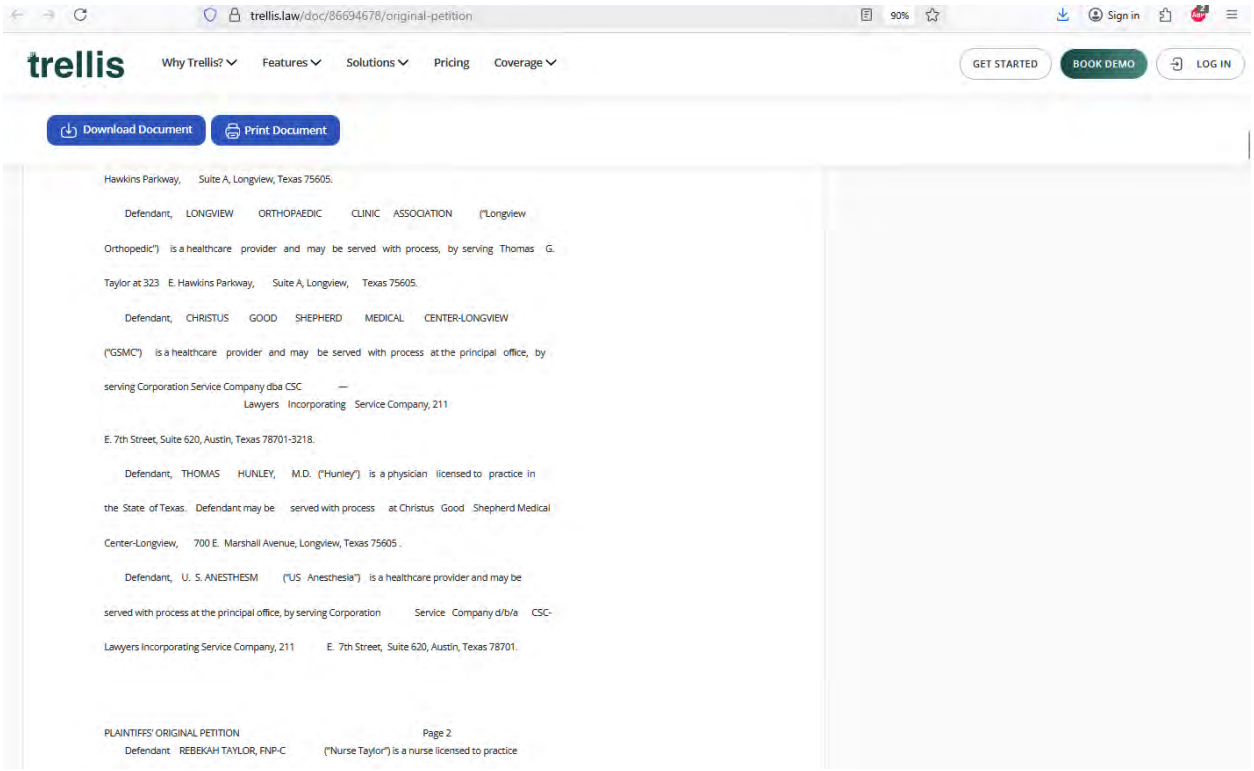
Plaintiffs request that this cause be governed by a Level 3 discovery control plan. Pursuant to Texas Rule of Civil procedure 47(c), Plaintiffs state that they seek only monetary

relief of between $1,000,000 and $10,000,000, including damages of any kind, penalties, costs, expenses, pre-judgment interest, and attorney fees.

II.
PARTIES

Plaintiffs, Jill Spearman ("Jill") and Alvin ("Alvin") Lee Spearman, Sr., were husband and Wife residing in Rusk County, Texas (together sometimes "Plaintiffs").

Defendant, BABAJIDE OGUNSEINDE, M.D. ("Dr. O.") is a physician licensed to practice in the State of Texas. Defendant may be served with process at his office, 323 E. Hawkins Parkway, Suite A, Longview, Texas 75605



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Hawkins Parkway, Suite A, Longview, Texas 75605.

Defendant, LONGVIEW ORTHOPAEDIC CLINIC ASSOCIATION ("Longview Orthopedic") is a healthcare provider and may be served with process, by serving Thomas G. Taylor at 323 E. Hawkins Parkway, Suite A, Longview, Texas 75605.

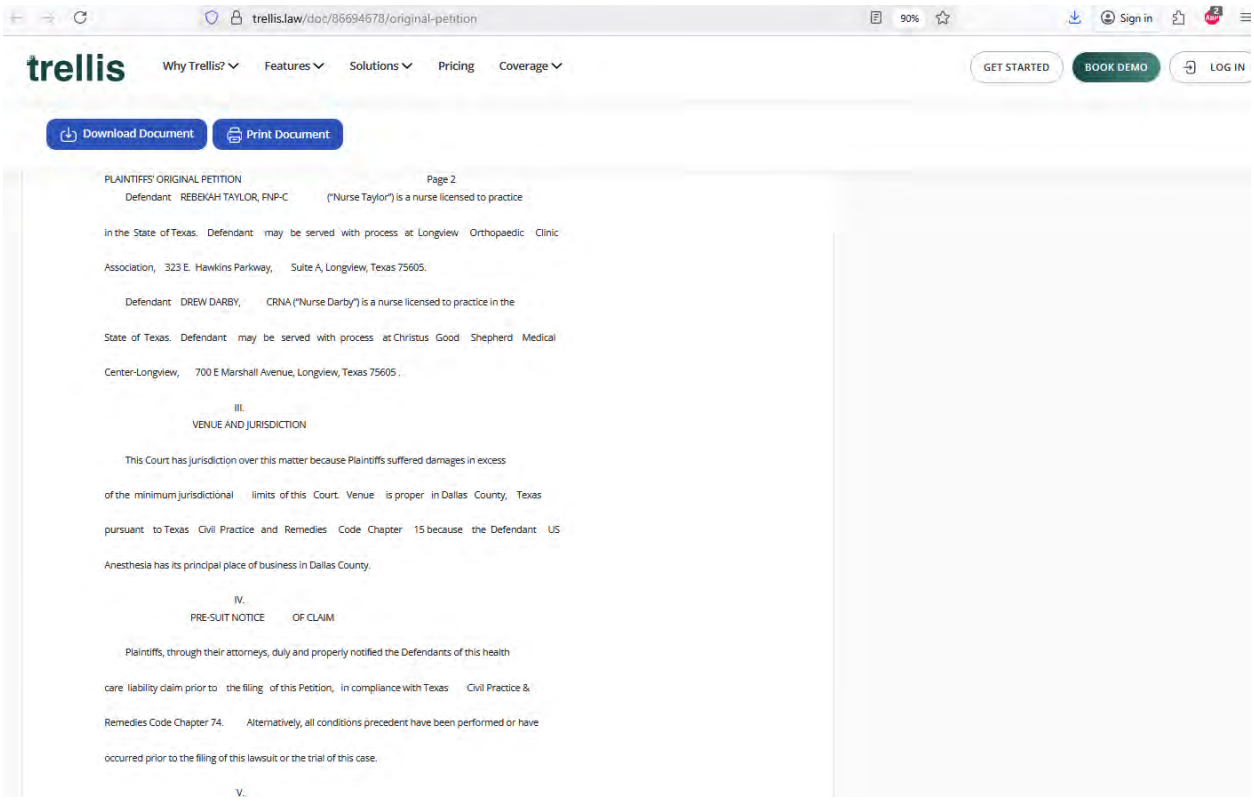
Defendant, CHRISTUS GOOD SHEPHERD MEDICAL CENTER-LONGVIEW ("GSMC") is a healthcare provider and may be served with process at the principal office, by serving Corporation Service Company dba CSC — Lawyers Incorporating Service Company, 211 E. 7th Street, Suite 620, Austin, Texas 78701-3218.

Defendant, THOMAS HUNLEY, M.D. ("Hunley") is a physician licensed to practice in the State of Texas. Defendant may be served with process at Christus Good Shepherd Medical Center-Longview, 700 E. Marshall Avenue, Longview, Texas 75605 .

Defendant, U. S. ANESTHESM ("US Anesthesia") is a healthcare provider and may be served with process at the principal office, by serving Corporation Service Company d/b/a CSC-Lawyers Incorporating Service Company, 211 E. 7th Street, Suite 620, Austin, Texas 78701.

PLAINTIFFS' ORIGINAL PETITION Page 2

Defendant REBEKAH TAYLOR, FNP-C ("Nurse Taylor") is a nurse licensed to practice



PLAINTIFFS' ORIGINAL PETITION Page 2

Defendant REBEKAH TAYLOR, FNP-C ("Nurse Taylor") is a nurse licensed to practice in the State of Texas. Defendant may be served with process at Longview Orthopaedic Clinic Association, 323 E. Hawkins Parkway, Suite A, Longview, Texas 75605.

Defendant DREW DARBY, CRNA ("Nurse Darby") is a nurse licensed to practice in the State of Texas. Defendant may be served with process at Christus Good Shepherd Medical Center-Longview, 700 E Marshall Avenue, Longview, Texas 75605 .

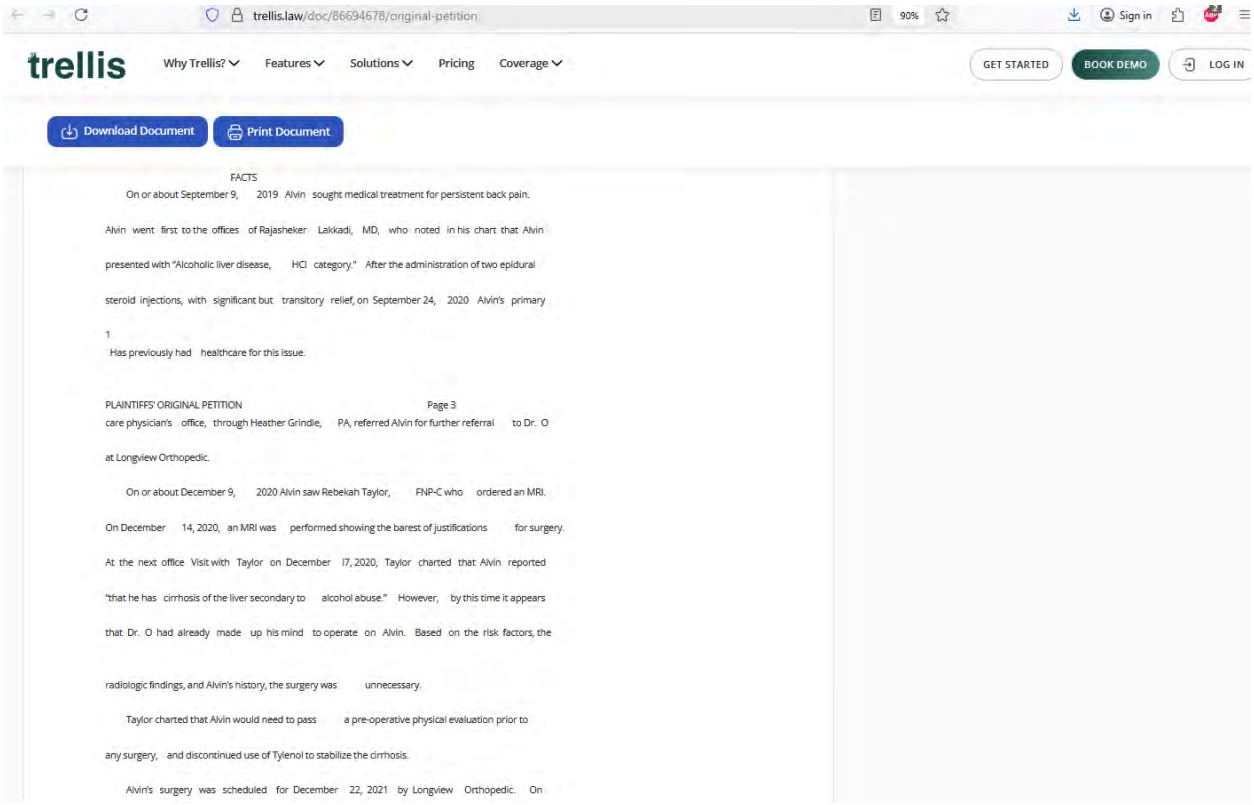
III.
VENUE AND JURISDICTION

This Court has jurisdiction over this matter because Plaintiffs suffered damages in excess of the minimum jurisdictional limits of this Court. Venue is proper in Dallas County, Texas pursuant to Texas Civil Practice and Remedies Code Chapter 15 because the Defendant US Anesthesia has its principal place of business in Dallas County.

IV.
PRE-SUIT NOTICE OF CLAIM

Plaintiffs, through their attorneys, duly and properly notified the Defendants of this health care liability claim prior to the filing of this Petition, in compliance with Texas Civil Practice & Remedies Code Chapter 74. Alternatively, all conditions precedent have been performed or have occurred prior to the filing of this lawsuit or the trial of this case.

V.



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FACTS

On or about September 9, 2019 Alvin sought medical treatment for persistent back pain. Alvin went first to the offices of Rajasheker Lakkadi, MD, who noted in his chart that Alvin presented with "Alcoholic liver disease, HCI category." After the administration of two epidural steroid injections, with significant but transitory relief, on September 24, 2020 Alvin's primary

1

Has previously had healthcare for this issue.

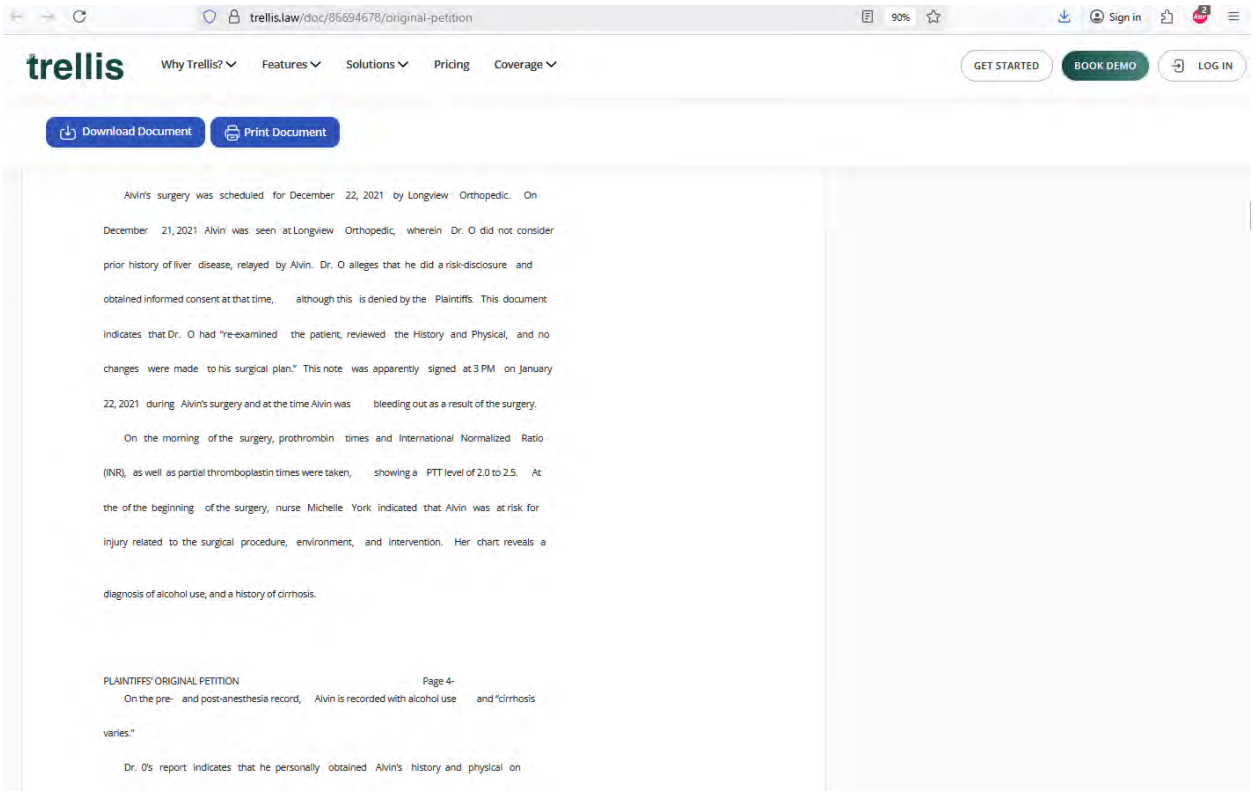
PLAINTIFFS' ORIGINAL PETITION Page 3

care physician's office, through Heather Grindle, PA, referred Alvin for further referral to Dr. O at Longview Orthopedic.

On or about December 9, 2020 Alvin saw Rebekah Taylor, FNP-C who ordered an MRI. On December 14, 2020, an MRI was performed showing the barest of justifications for surgery. At the next office Visit with Taylor on December 17, 2020, Taylor charted that Alvin reported "that he has cirrhosis of the liver secondary to alcohol abuse." However, by this time it appears that Dr. O had already made up his mind to operate on Alvin. Based on the risk factors, the radiologic findings, and Alvin's history, the surgery was unnecessary.

Taylor charted that Alvin would need to pass a pre-operative physical evaluation prior to any surgery, and discontinued use of Tylenol to stabilize the cirrhosis.

Alvin's surgery was scheduled for December 22, 2021 by Longview Orthopedic. On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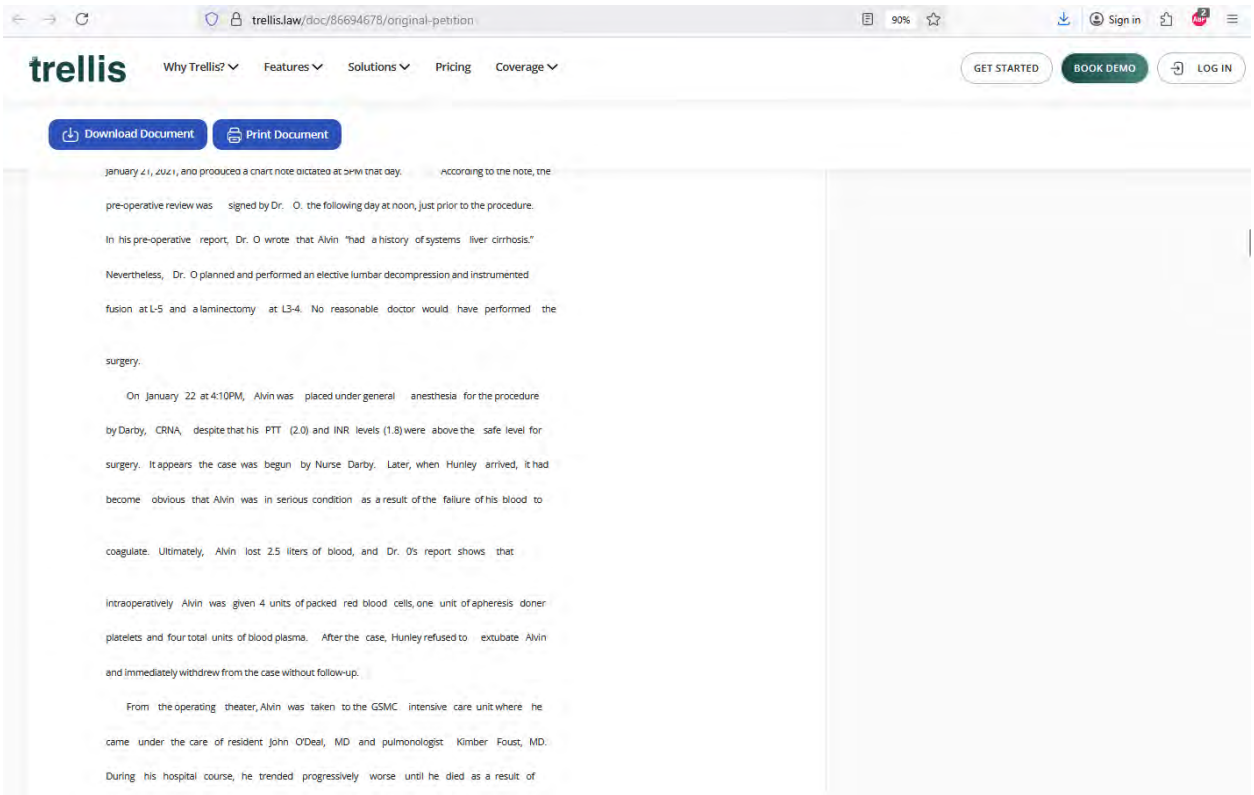
Alvin's surgery was scheduled for December 22, 2021 by Longview Orthopedic. On December 21, 2021 Alvin was seen at Longview Orthopedic, wherein Dr. O did not consider prior history of liver disease, relayed by Alvin. Dr. O alleges that he did a risk-disclosure and obtained informed consent at that time, although this is denied by the Plaintiffs. This document indicates that Dr. O had "re-examined the patient, reviewed the History and Physical, and no changes were made to his surgical plan." This note was apparently signed at 3 PM on January 22, 2021 during Alvin's surgery and at the time Alvin was bleeding out as a result of the surgery.
On the morning of the surgery, prothrombin times and International Normalized Ratio (INR), as well as partial thromboplastin times were taken, showing a PTT level of 2.0 to 2.5. At the of the beginning of the surgery, nurse Michelle York indicated that Alvin was at risk for injury related to the surgical procedure, environment, and intervention. Her chart reveals a diagnosis of alcohol use, and a history of cirrhosis.
PLAINTIFFS' ORIGINAL PETITION Page 4-
On the pre- and post-anesthesia record, Alvin is recorded with alcohol use and "cirrhosis varies."
Dr. O's report indicates that he personally obtained Alvin's history and physical on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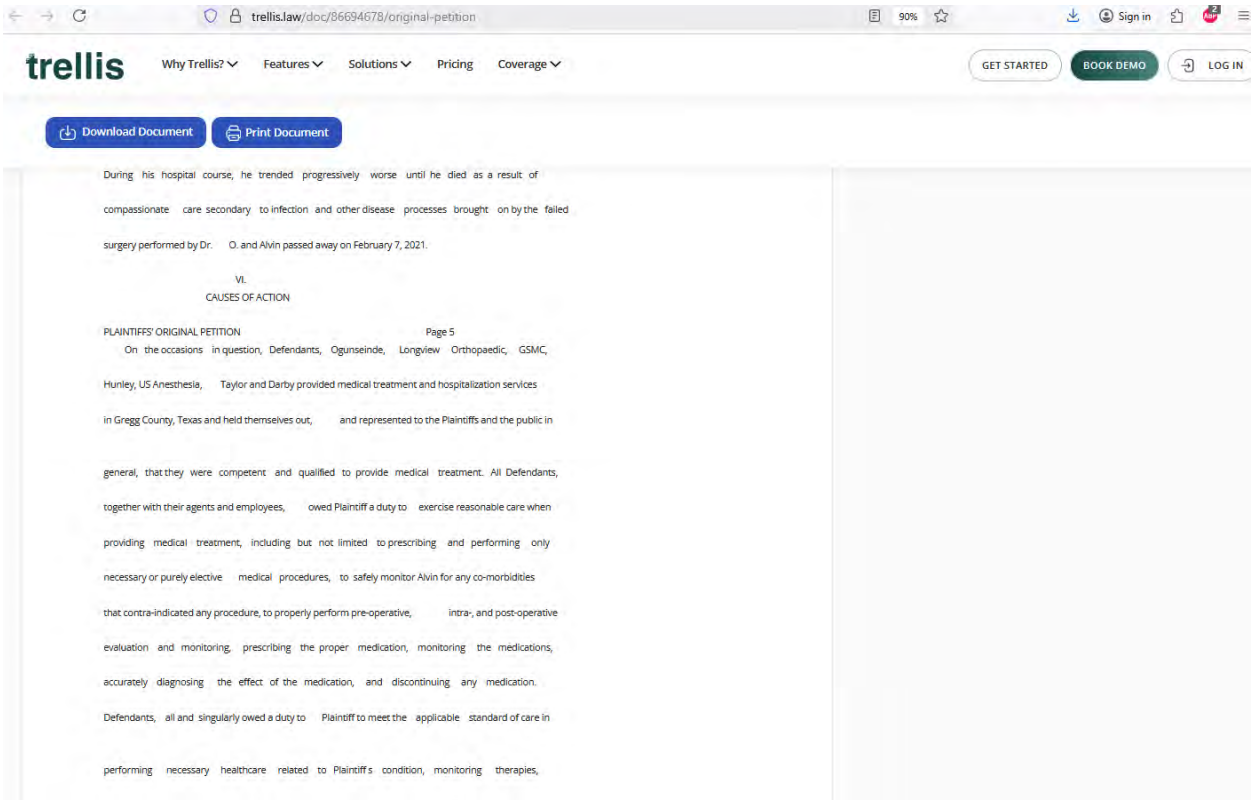
January 21, 2021, and produced a chart note dictated at 5PM that day. According to the note, the pre-operative review was signed by Dr. O. the following day at noon, just prior to the procedure. In his pre-operative report, Dr. O wrote that Alvin "had a history of systems liver cirrhosis." Nevertheless, Dr. O planned and performed an elective lumbar decompression and instrumented fusion at L-5 and a laminectomy at L3-4. No reasonable doctor would have performed the surgery.
On January 22 at 4:10PM, Alvin was placed under general anesthesia for the procedure by Darby, CRNA, despite that his PTT (2.0) and INR levels (1.8) were above the safe level for surgery. It appears the case was begun by Nurse Darby. Later, when Hunley arrived, it had become obvious that Alvin was in serious condition as a result of the failure of his blood to coagulate. Ultimately, Alvin lost 2.5 liters of blood, and Dr. O's report shows that intraoperatively Alvin was given 4 units of packed red blood cells, one unit of apheresis doner platelets and four total units of blood plasma. After the case, Hunley refused to extubate Alvin and immediately withdrew from the case without follow-up.
From the operating theater, Alvin was taken to the GSMC intensive care unit where he came under the care of resident John O'Deal, MD and pulmonologist Kimber Foust, MD. During his hospital course, he trended progressively worse until he died as a result of



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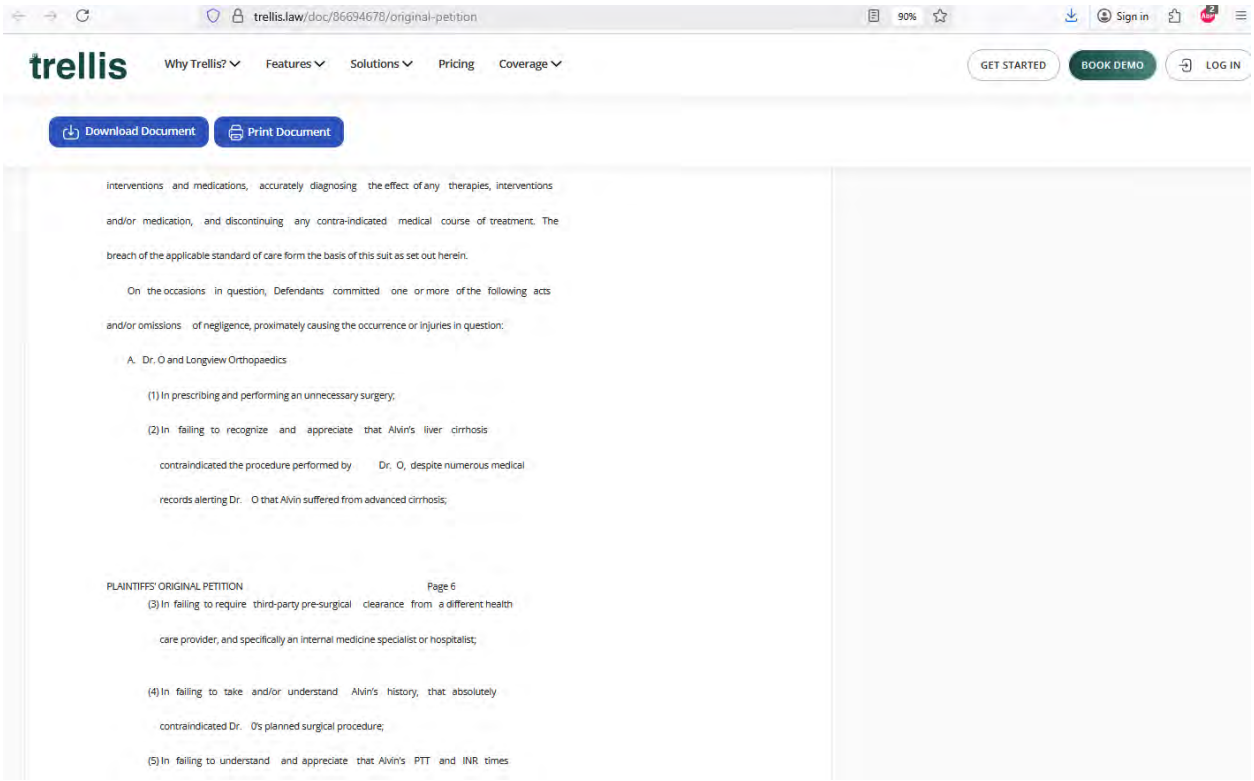
During his hospital course, he trended progressively worse until he died as a result of compassionate care secondary to infection and other disease processes brought on by the failed surgery performed by Dr. O. and Alvin passed away on February 7, 2021.

VI.
CAUSES OF ACTION

PLAINTIFFS' ORIGINAL PETITION Page 5

On the occasions in question, Defendants, Ogunseinde, Longview Orthopaedic, GSMC, Hunley, US Anesthesia, Taylor and Darby provided medical treatment and hospitalization services in Gregg County, Texas and held themselves out, and represented to the Plaintiffs and the public in general, that they were competent and qualified to provide medical treatment. All Defendants, together with their agents and employees, owed Plaintiff a duty to exercise reasonable care when providing medical treatment, including but not limited to prescribing and performing only necessary or purely elective medical procedures, to safely monitor Alvin for any co-morbidities that contra-indicated any procedure, to properly perform pre-operative, intra-, and post-operative evaluation and monitoring, prescribing the proper medication, monitoring the medications, accurately diagnosing the effect of the medication, and discontinuing any medication. Defendants, all and singularly owed a duty to Plaintiff to meet the applicable standard of care in performing necessary healthcare related to Plaintiff s condition, monitoring therapies,



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interventions and medications, accurately diagnosing the effect of any therapies, interventions and/or medication, and discontinuing any contra-indicated medical course of treatment. The breach of the applicable standard of care form the basis of this suit as set out herein.

On the occasions in question, Defendants committed one or more of the following acts and/or omissions of negligence, proximately causing the occurrence or injuries in question:

A. Dr. O and Longview Orthopaedics

(1) In prescribing and performing an unnecessary surgery;

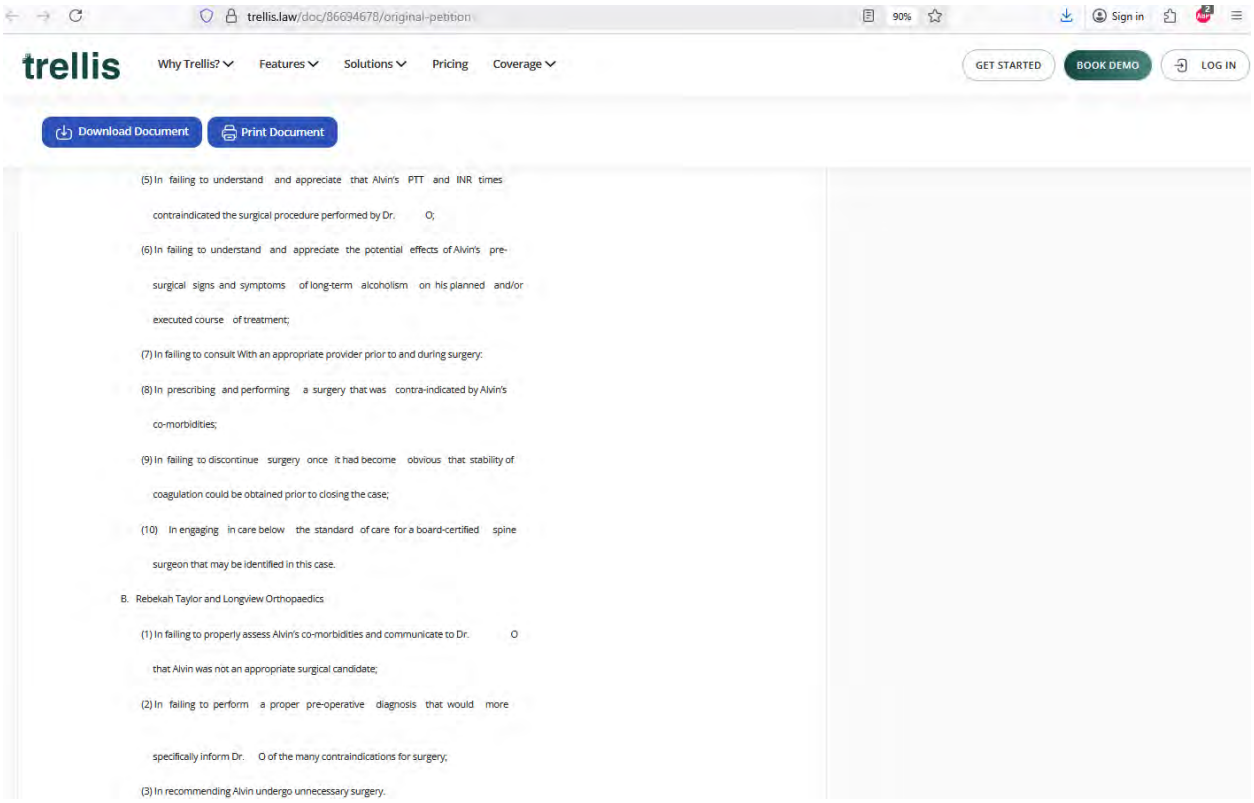
(2) In failing to recognize and appreciate that Alvin's liver cirrhosis contraindicated the procedure performed by Dr. O, despite numerous medical records alerting Dr. O that Alvin suffered from advanced cirrhosis;

PLAINTIFFS' ORIGINAL PETITION Page 6

(3) In failing to require third-party pre-surgical clearance from a different health care provider, and specifically an internal medicine specialist or hospitalist;

(4) In failing to take and/or understand Alvin's history, that absolutely contraindicated Dr. O's planned surgical procedure;

(5) In failing to understand and appreciate that Alvin's PTT and INR times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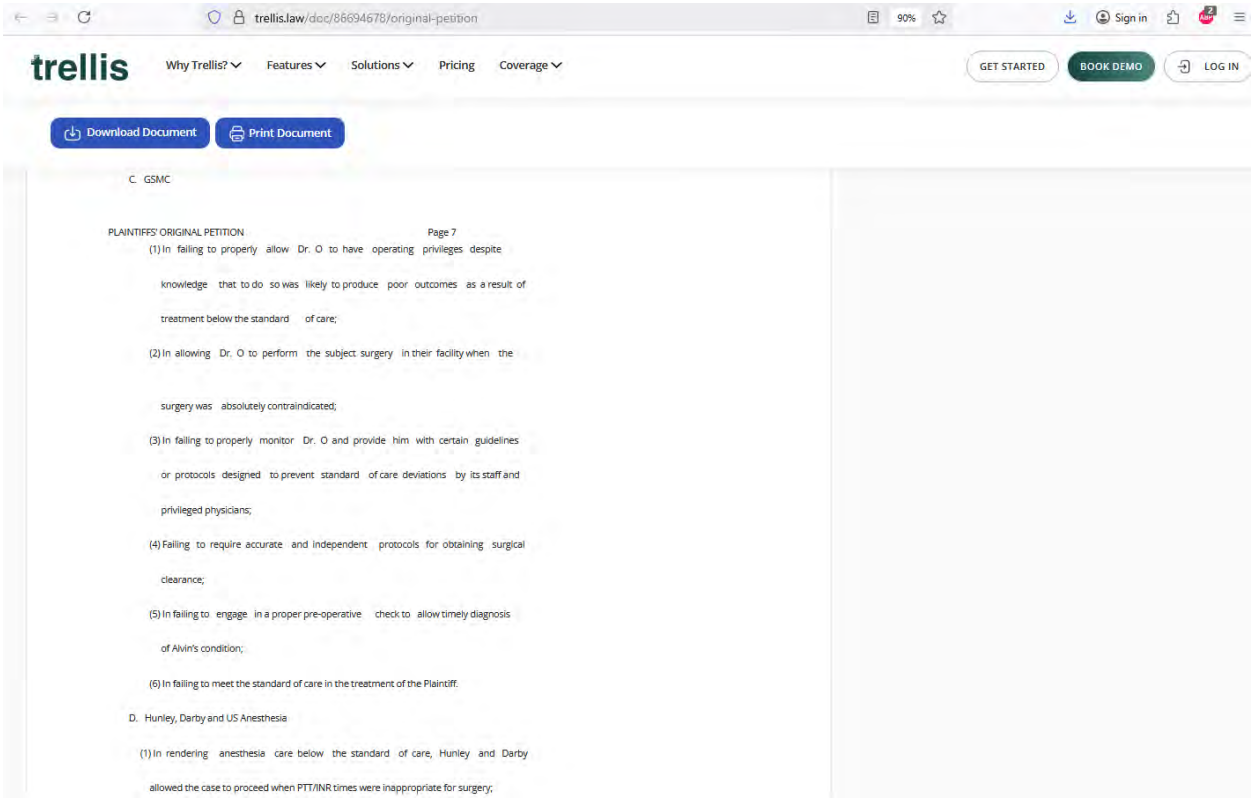
(5) In failing to understand and appreciate that Alvin's PTT and INR times contraindicated the surgical procedure performed by Dr. O;
(6) In failing to understand and appreciate the potential effects of Alvin's pre-surgical signs and symptoms of long-term alcoholism on his planned and/or executed course of treatment;
(7) In failing to consult With an appropriate provider prior to and during surgery;
(8) In prescribing and performing a surgery that was contra-indicated by Alvin's co-morbidities;
(9) In failing to discontinue surgery once it had become obvious that stability of coagulation could be obtained prior to closing the case;
(10) In engaging in care below the standard of care for a board-certified spine surgeon that may be identified in this case.
B. Rebekah Taylor and Longview Orthopaedics
(1) In failing to properly assess Alvin's co-morbidities and communicate to Dr. O that Alvin was not an appropriate surgical candidate;
(2) In failing to perform a proper pre-operative diagnosis that would more specifically inform Dr. O of the many contraindications for surgery;
(3) In recommending Alvin undergo unnecessary surgery.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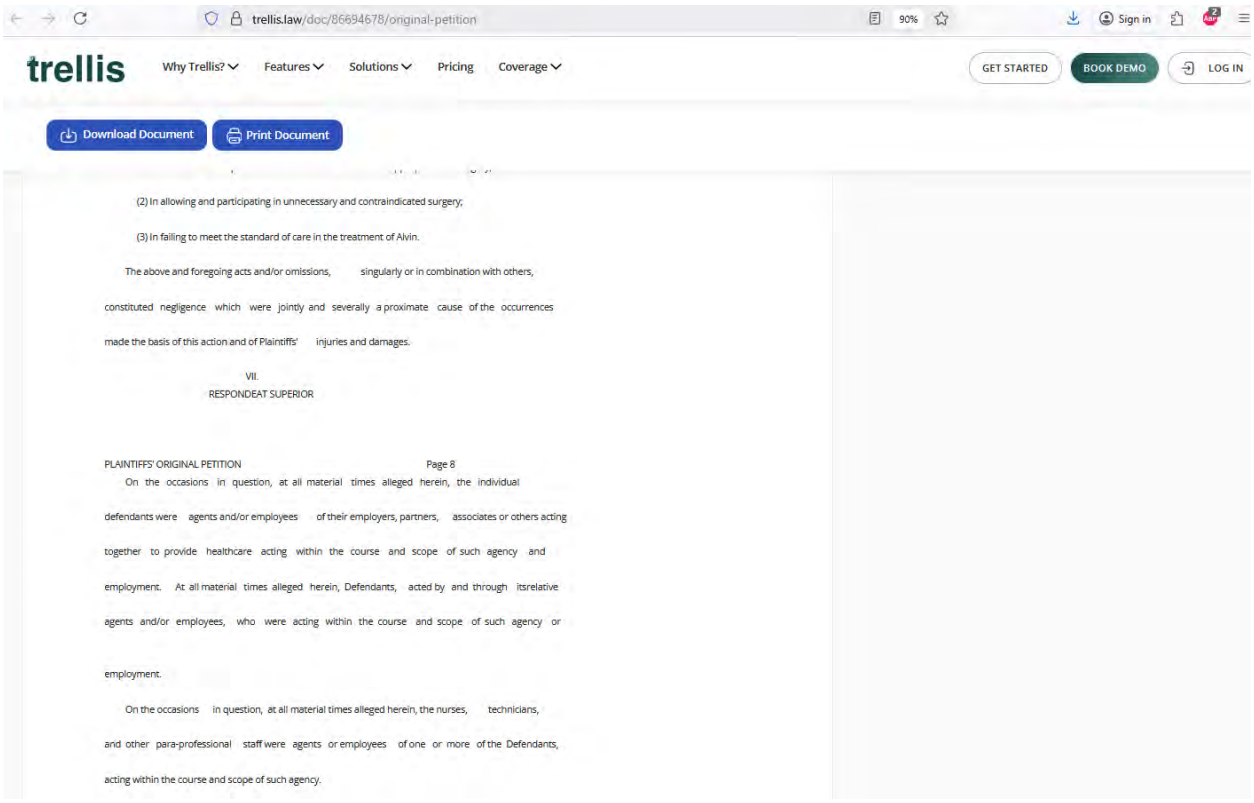
PLAINTIFFS' ORIGINAL PETITION Page 7
(1) In failing to properly allow Dr. O to have operating privileges despite knowledge that to do so was likely to produce poor outcomes as a result of treatment below the standard of care;
(2) In allowing Dr. O to perform the subject surgery in their facility when the surgery was absolutely contraindicated;
(3) In failing to properly monitor Dr. O and provide him with certain guidelines or protocols designed to prevent standard of care deviations by its staff and privileged physicians;
(4) Failing to require accurate and independent protocols for obtaining surgical clearance;
(5) In failing to engage in a proper pre-operative check to allow timely diagnosis of Alvin's condition;
(6) In failing to meet the standard of care in the treatment of the Plaintiff.
D. Hunley, Darby and US Anesthesia
(1) In rendering anesthesia care below the standard of care, Hunley and Darby allowed the case to proceed when PTT/INR times were inappropriate for surgery;



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(2) In allowing and participating in unnecessary and contraindicated surgery;

(3) In failing to meet the standard of care in the treatment of Alvin.

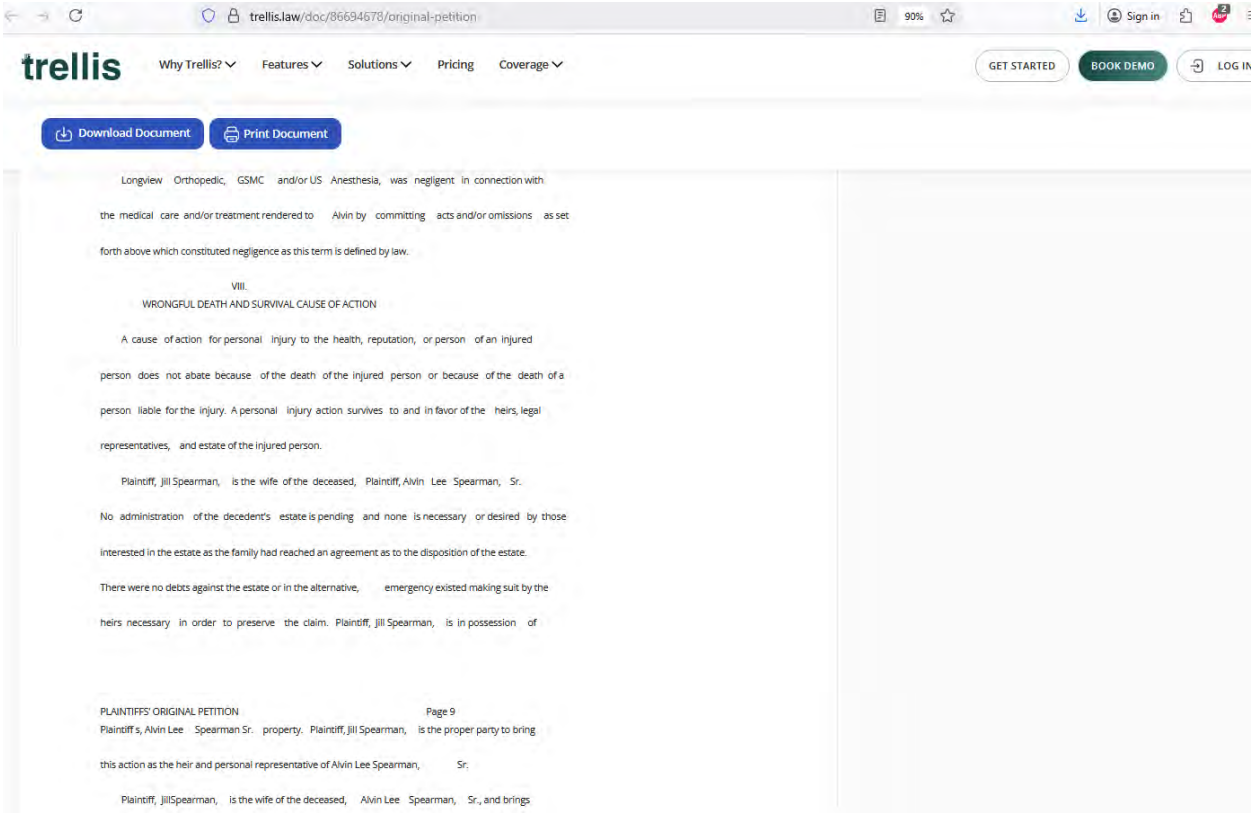
The above and foregoing acts and/or omissions, singularly or in combination with others, constituted negligence which were jointly and severally a proximate cause of the occurrences made the basis of this action and of Plaintiffs' injuries and damages.

VII.
RESPONDEAT SUPERIOR

PLAINTIFFS' ORIGINAL PETITION Page 8

On the occasions in question, at all material times alleged herein, the individual defendants were agents and/or employees of their employers, partners, associates or others acting together to provide healthcare acting within the course and scope of such agency and employment. At all material times alleged herein, Defendants, acted by and through itsrelative agents and/or employees, who were acting within the course and scope of such agency or employment.

On the occasions in question, at all material times alleged herein, the nurses, technicians, and other para-professional staff were agents or employees of one or more of the Defendants, acting within the course and scope of such agency.



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Longview Orthopedic, GSMC and/or US Anesthesia, was negligent in connection with the medical care and/or treatment rendered to Alvin by committing acts and/or omissions as set forth above which constituted negligence as this term is defined by law.

VIII.
WRONGFUL DEATH AND SURVIVAL CAUSE OF ACTION

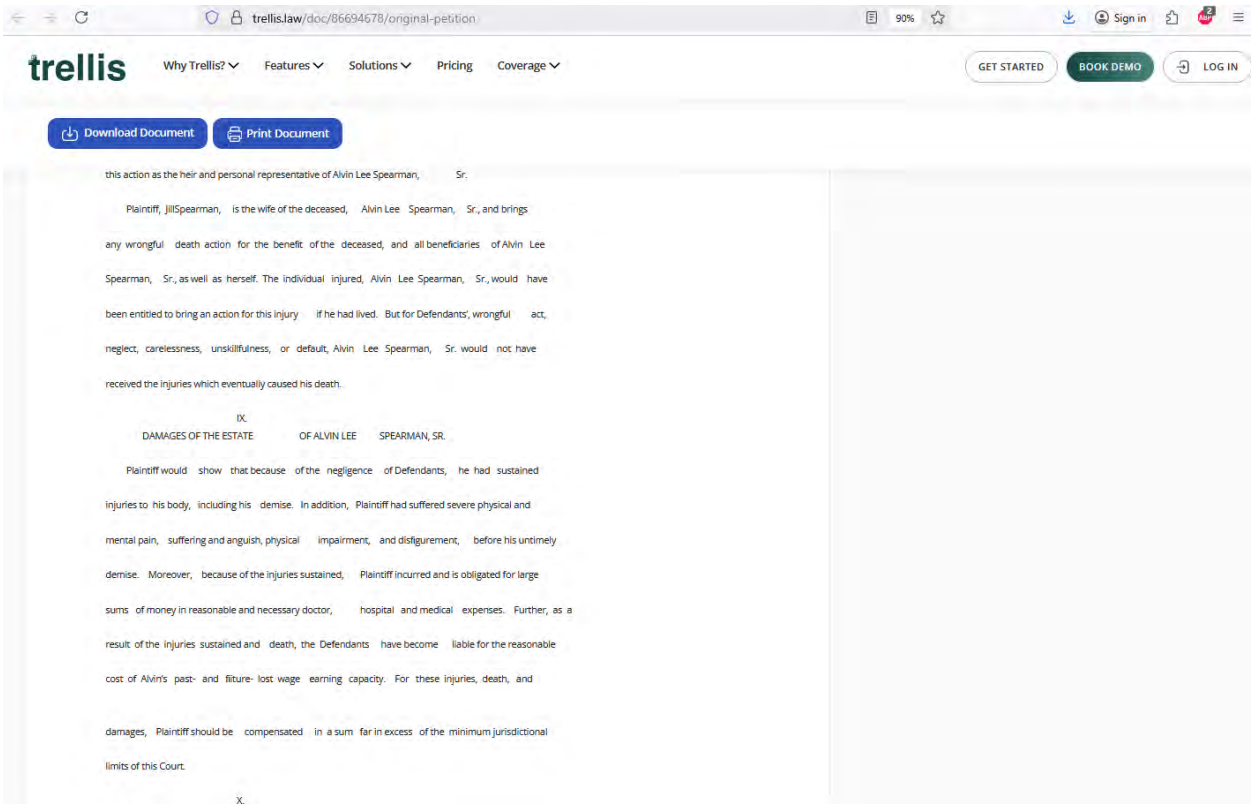
A cause of action for personal injury to the health, reputation, or person of an injured person does not abate because of the death of the injured person or because of the death of a person liable for the injury. A personal injury action survives to and in favor of the heirs, legal representatives, and estate of the injured person.

Plaintiff, Jill Spearman, is the wife of the deceased, Plaintiff, Alvin Lee Spearman, Sr. No administration of the decedent's estate is pending and none is necessary or desired by those interested in the estate as the family had reached an agreement as to the disposition of the estate. There were no debts against the estate or in the alternative, emergency existed making suit by the heirs necessary in order to preserve the claim. Plaintiff, Jill Spearman, is in possession of

PLAINTIFFS' ORIGINAL PETITION Page 9

Plaintiff s, Alvin Lee Spearman Sr. property. Plaintiff, Jill Spearman, is the proper party to bring this action as the heir and personal representative of Alvin Lee Spearman, Sr.

Plaintiff, JillSpearman, is the wife of the deceased, Alvin Lee Spearman, Sr., and brings



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this action as the heir and personal representative of Alvin Lee Spearman, Sr.

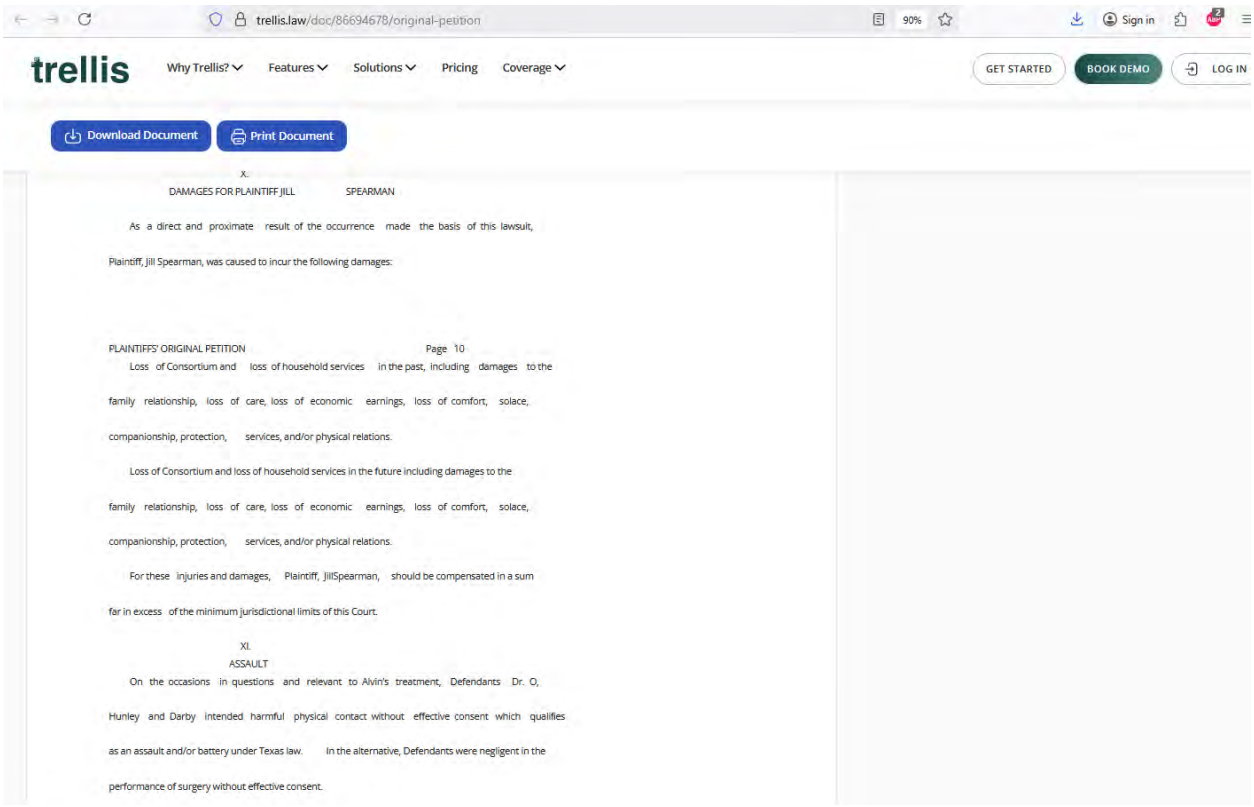
Plaintiff, JillSpearman, is the wife of the deceased, Alvin Lee Spearman, Sr., and brings any wrongful death action for the benefit of the deceased, and all beneficiaries of Alvin Lee Spearman, Sr., as well as herself. The individual injured, Alvin Lee Spearman, Sr., would have been entitled to bring an action for this injury if he had lived. But for Defendants', wrongful act, neglect, carelessness, unskillfulness, or default, Alvin Lee Spearman, Sr. would not have received the injuries which eventually caused his death.

IX.

DAMAGES OF THE ESTATE OF ALVIN LEE SPEARMAN, SR.

Plaintiff would show that because of the negligence of Defendants, he had sustained injuries to his body, including his demise. In addition, Plaintiff had suffered severe physical and mental pain, suffering and anguish, physical impairment, and disfigurement, before his untimely demise. Moreover, because of the injuries sustained, Plaintiff incurred and is obligated for large sums of money in reasonable and necessary doctor, hospital and medical expenses. Further, as a result of the injuries sustained and death, the Defendants have become liable for the reasonable cost of Alvin's past- and future- lost wage earning capacity. For these injuries, death, and damages, Plaintiff should be compensated in a sum far in excess of the minimum jurisdictional limits of this Court.

X.



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X.

DAMAGES FOR PLAINTIFF JILL SPEARMAN

As a direct and proximate result of the occurrence made the basis of this lawsuit, Plaintiff, Jill Spearman, was caused to incur the following damages:

PLAINTIFFS' ORIGINAL PETITION Page 10

Loss of Consortium and loss of household services in the past, including damages to the family relationship, loss of care, loss of economic earnings, loss of comfort, solace, companionship, protection, services, and/or physical relations.

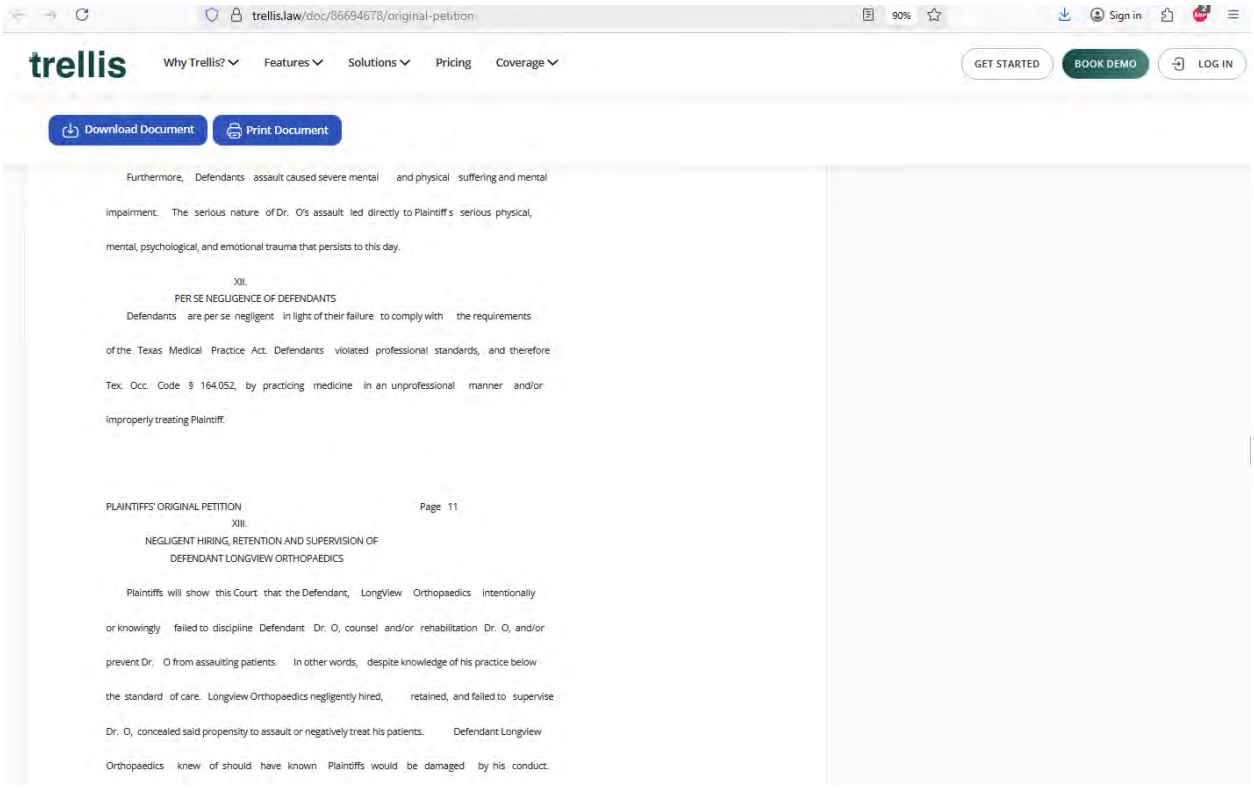
Loss of Consortium and loss of household services in the future including damages to the family relationship, loss of care, loss of economic earnings, loss of comfort, solace, companionship, protection, services, and/or physical relations.

For these injuries and damages, Plaintiff, JillSpearman, should be compensated in a sum far in excess of the minimum jurisdictional limits of this Court.

XI.

ASSAULT

On the occasions in questions and relevant to Alvin's treatment, Defendants Dr. O, Hunley and Darby intended harmful physical contact without effective consent which qualifies as an assault and/or battery under Texas law. In the alternative, Defendants were negligent in the performance of surgery without effective consent.



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Furthermore, Defendants assault caused severe mental and physical suffering and mental impairment. The serious nature of Dr. O's assault led directly to Plaintiff s serious physical, mental, psychological, and emotional trauma that persists to this day.

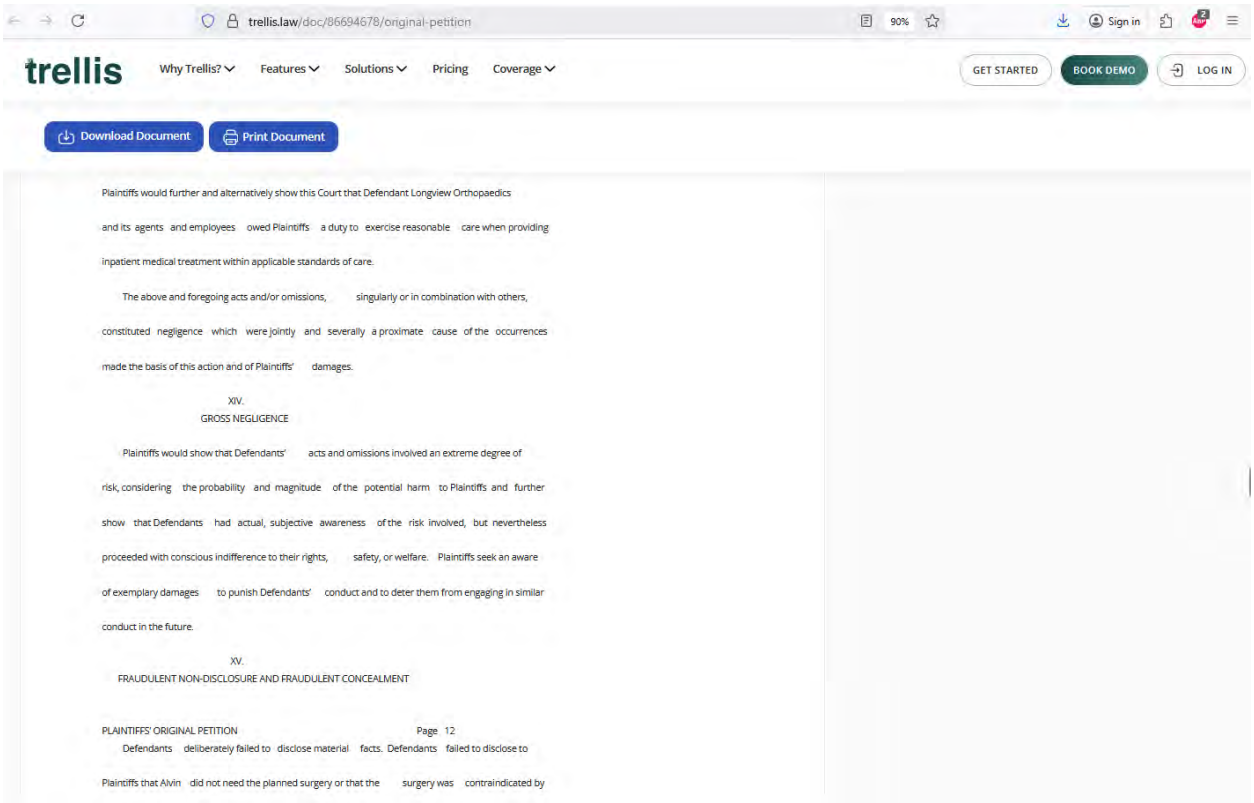
XII.
PER SE NEGLIGENCE OF DEFENDANTS

Defendants are per se negligent in light of their failure to comply with the requirements of the Texas Medical Practice Act. Defendants violated professional standards, and therefore Tex. Occ. Code § 164.052, by practicing medicine in an unprofessional manner and/or improperly treating Plaintiff.

PLAINTIFFS' ORIGINAL PETITION Page 11

XIII.
NEGLIGENT HIRING, RETENTION AND SUPERVISION OF DEFENDANT LONGVIEW ORTHOPAEDICS

Plaintiffs will show this Court that the Defendant, LongView Orthopaedics intentionally or knowingly failed to discipline Defendant Dr. O, counsel and/or rehabilitation Dr. O, and/or prevent Dr. O from assaulting patients. In other words, despite knowledge of his practice below the standard of care. Longview Orthopaedics negligently hired, retained, and failed to supervise Dr. O, concealed said propensity to assault or negatively treat his patients. Defendant Longview Orthopaedics knew of should have known Plaintiffs would be damaged by his conduct.



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Plaintiffs would further and alternatively show this Court that Defendant Longview Orthopaedics and its agents and employees owed Plaintiffs a duty to exercise reasonable care when providing inpatient medical treatment within applicable standards of care.

The above and foregoing acts and/or omissions, singularly or in combination with others, constituted negligence which were jointly and severally a proximate cause of the occurrences made the basis of this action and of Plaintiffs' damages.

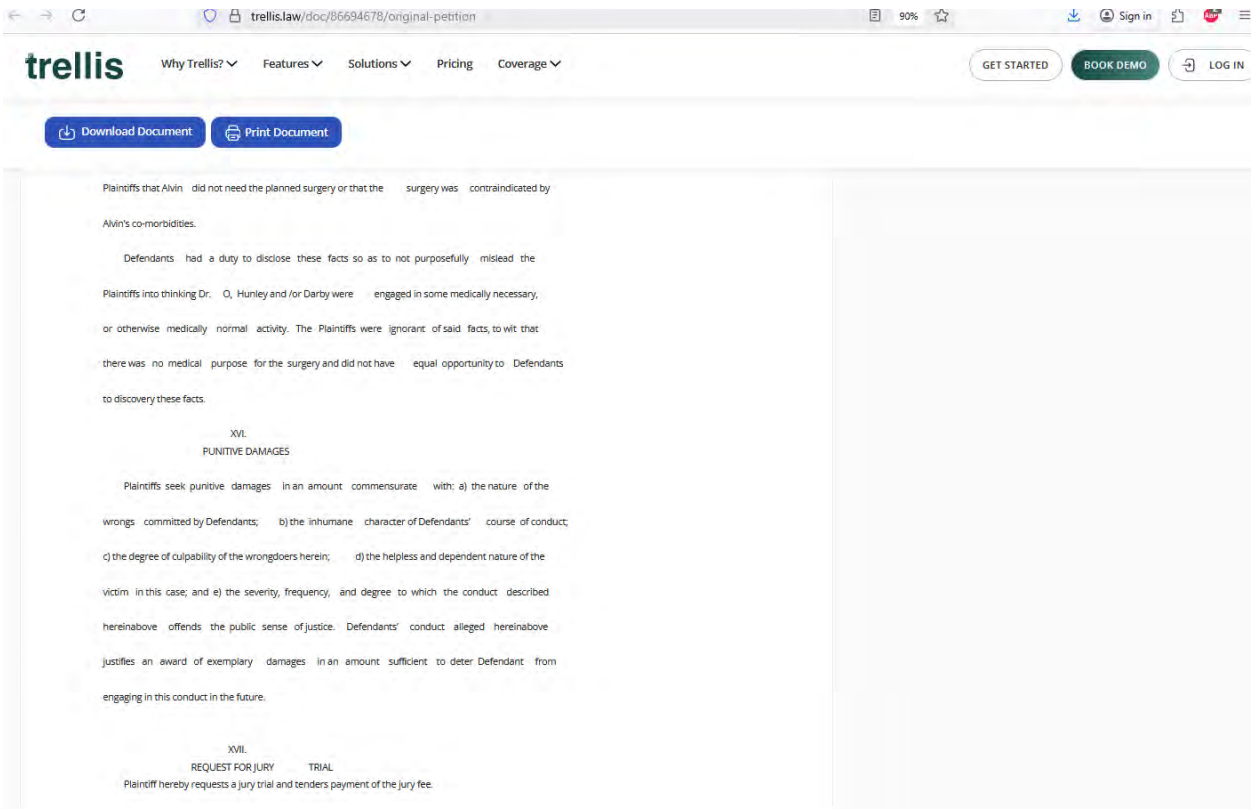
XIV.
GROSS NEGLIGENCE

Plaintiffs would show that Defendants' acts and omissions involved an extreme degree of risk, considering the probability and magnitude of the potential harm to Plaintiffs and further show that Defendants had actual, subjective awareness of the risk involved, but nevertheless proceeded with conscious indifference to their rights, safety, or welfare. Plaintiffs seek an aware of exemplary damages to punish Defendants' conduct and to deter them from engaging in similar conduct in the future.

XV.
FRAUDULENT NON-DISCLOSURE AND FRAUDULENT CONCEALMENT

PLAINTIFFS' ORIGINAL PETITION Page 12

Defendants deliberately failed to disclose material facts. Defendants failed to disclose to Plaintiffs that Alvin did not need the planned surgery or that the surgery was contraindicated by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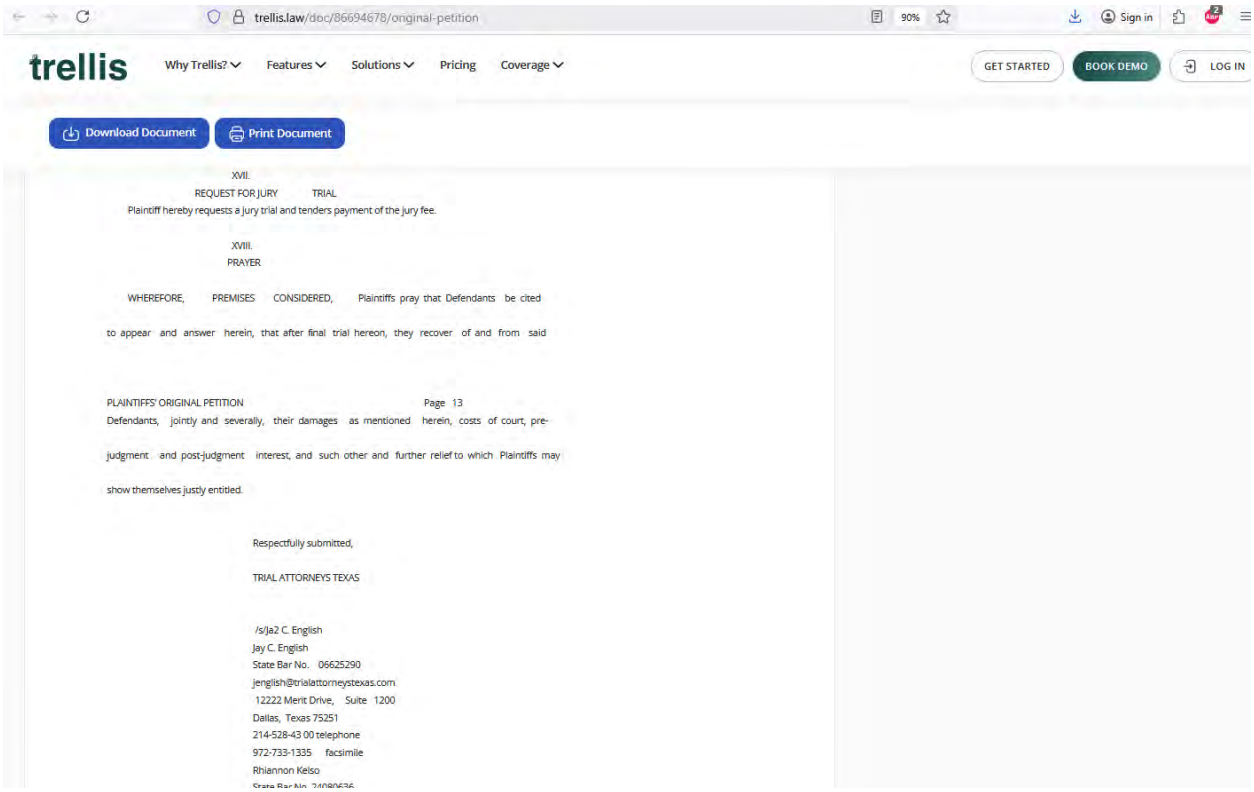
Plaintiffs that Alvin did not need the planned surgery or that the surgery was contraindicated by Alvin's co-morbidities.
Defendants had a duty to disclose these facts so as to not purposefully mislead the Plaintiffs into thinking Dr. O, Hunley and /or Darby were engaged in some medically necessary, or otherwise medically normal activity. The Plaintiffs were ignorant of said facts, to wit that there was no medical purpose for the surgery and did not have equal opportunity to Defendants to discovery these facts.
XVI.
PUNITIVE DAMAGES
Plaintiffs seek punitive damages in an amount commensurate with: a) the nature of the wrongs committed by Defendants; b) the inhumane character of Defendants' course of conduct; c) the degree of culpability of the wrongdoers herein; d) the helpless and dependent nature of the victim in this case; and e) the severity, frequency, and degree to which the conduct described hereinabove offends the public sense of justice. Defendants' conduct alleged hereinabove justifies an award of exemplary damages in an amount sufficient to deter Defendant from engaging in this conduct in the future.
XVII.
REQUEST FOR JURY TRIAL
Plaintiff hereby requests a jury trial and tenders payment of the jury fee.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XVII.
REQUEST FOR JURY TRIAL
Plaintiff hereby requests a jury trial and tenders payment of the jury fee.
XVIII.
PRAYER
WHEREFORE, PREMISES CONSIDERED, Plaintiffs pray that Defendants be cited to appear and answer herein, that after final trial hereon, they recover of and from said
PLAINTIFFS' ORIGINAL PETITION Page 13
Defendants, jointly and severally, their damages as mentioned herein, costs of court, pre-judgment and post-judgment interest, and such other and further relief to which Plaintiffs may show themselves justly entitled.
Respectfully submitted,
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/s/Ja2 C. English
Jay C. English
State Bar No. 06625290
jenglish@trialattorneystexas.com
12222 Merit Drive, Suite 1200
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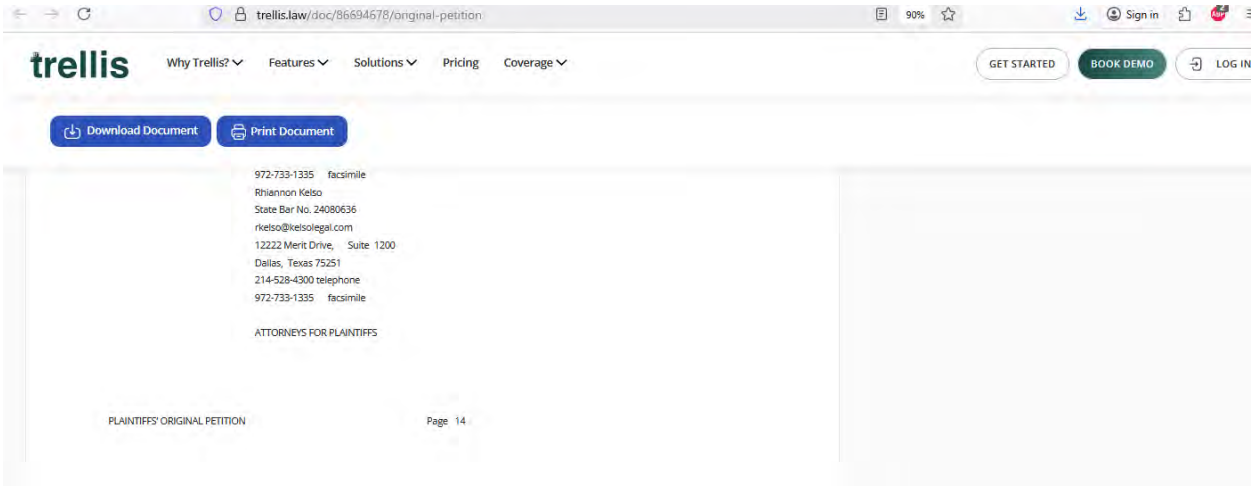
Rhiannon Kelso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214-528-4300 telephone
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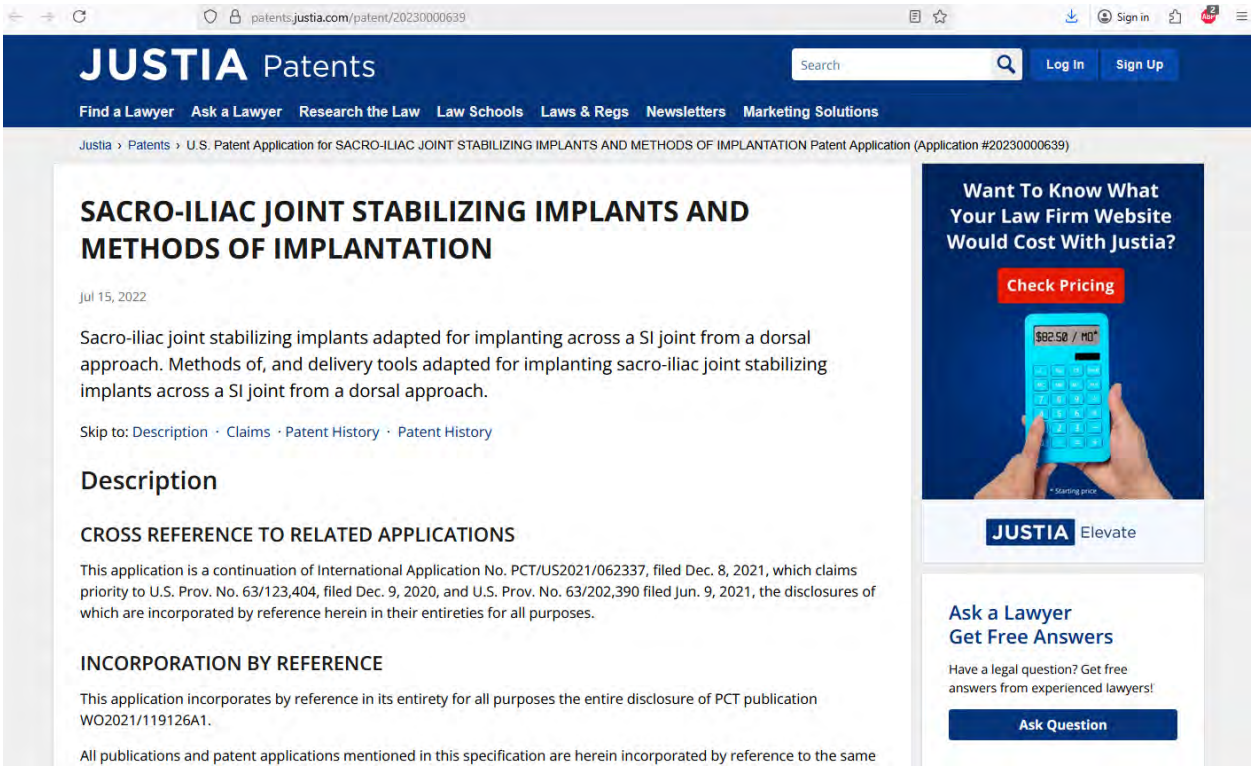
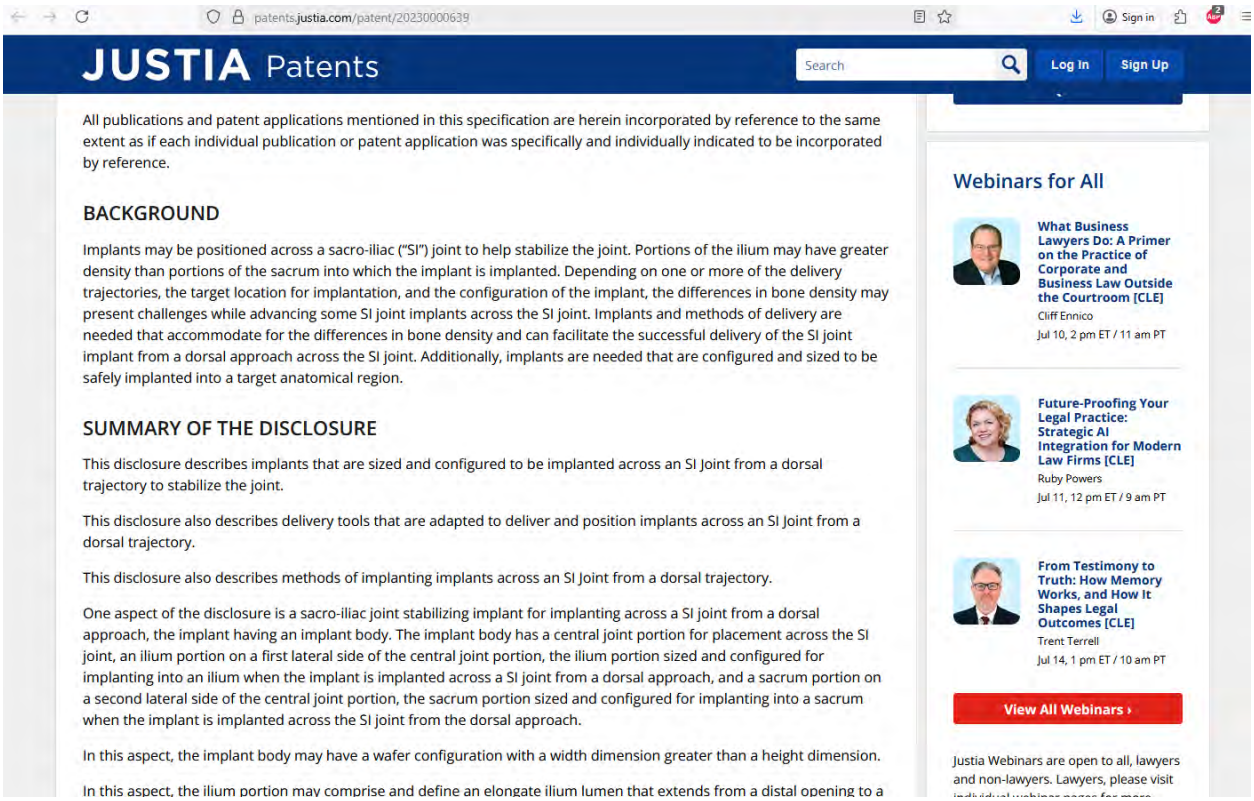
Page 14

RECORD 10:

The following record was confirmed using Subject's name, location, and occupation.

https://patents.justia.com/patent/20230000639

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All publications and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.
BACKGROUND
Implants may be positioned across a sacro-iliac ("SI") joint to help stabilize the joint. Portions of the ilium may have greater density than portions of the sacrum into which the implant is implanted. Depending on one or more of the delivery trajectories, the target location for implantation, and the configuration of the implant, the differences in bone density may present challenges while advancing some SI joint implants across the SI joint. Implants and methods of delivery are needed that accommodate for the differences in bone density and can facilitate the successful delivery of the SI joint implant from a dorsal approach across the SI joint. Additionally, implants are needed that are configured and sized to be safely implanted into a target anatomical region.
SUMMARY OF THE DISCLOSURE
This disclosure describes implants that are sized and configured to be implanted across an SI Joint from a dorsal trajectory to stabilize the joint.
This disclosure also describes delivery tools that are adapted to deliver and position implants across an SI Joint from a dorsal trajectory.
This disclosure also describes methods of implanting implants across an SI Joint from a dorsal trajectory.
One aspect of the disclosure is a sacro-iliac joint stabilizing implant for implanting across a SI joint from a dorsal approach, the implant having an implant body. The implant body has a central joint portion for placement across the SI joint, an ilium portion on a first lateral side of the central joint portion, the ilium portion sized and configured for implanting into an ilium when the implant is implanted across a SI joint from a dorsal approach, and a sacrum portion on a second lateral side of the central joint portion, the sacrum portion sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach.
In this aspect, the implant body may have a wafer configuration with a width dimension greater than a height dimension.
In this aspect, the ilium portion may comprise and define an elongate ilium lumen that extends from a distal opening to a
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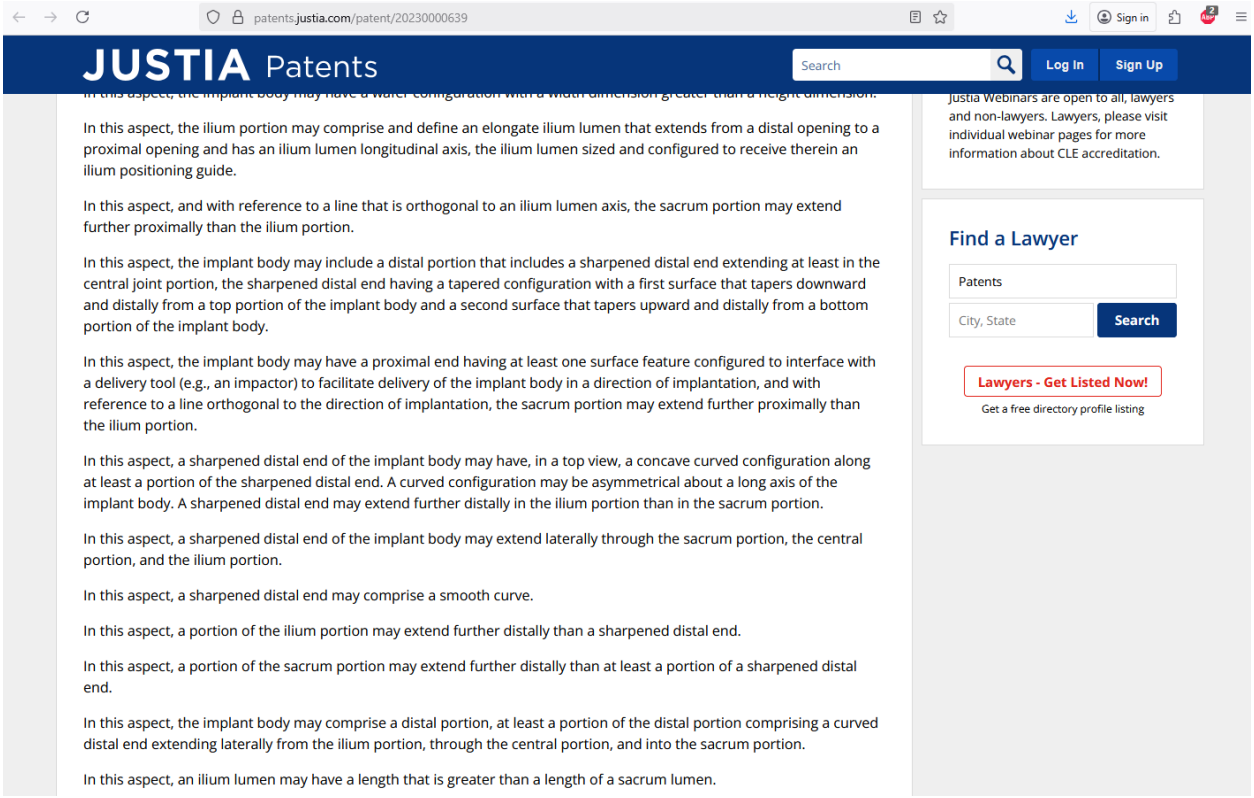
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In this aspect, the ilium portion may comprise and define an elongate ilium lumen that extends from a distal opening to a proximal opening and has an ilium lumen longitudinal axis, the ilium lumen sized and configured to receive therein an ilium positioning guide.
In this aspect, and with reference to a line that is orthogonal to an ilium lumen axis, the sacrum portion may extend further proximally than the ilium portion.
In this aspect, the implant body may include a distal portion that includes a sharpened distal end extending at least in the central joint portion, the sharpened distal end having a tapered configuration with a first surface that tapers downward and distally from a top portion of the implant body and a second surface that tapers upward and distally from a bottom portion of the implant body.
In this aspect, the implant body may have a proximal end having at least one surface feature configured to interface with a delivery tool (e.g., an impactor) to facilitate delivery of the implant body in a direction of implantation, and with reference to a line orthogonal to the direction of implantation, the sacrum portion may extend further proximally than the ilium portion.
In this aspect, a sharpened distal end of the implant body may have, in a top view, a concave curved configuration along at least a portion of the sharpened distal end. A curved configuration may be asymmetrical about a long axis of the implant body. A sharpened distal end may extend further distally in the ilium portion than in the sacrum portion.
In this aspect, a sharpened distal end of the implant body may extend laterally through the sacrum portion, the central portion, and the ilium portion.
In this aspect, a sharpened distal end may comprise a smooth curve.
In this aspect, a portion of the ilium portion may extend further distally than a sharpened distal end.
In this aspect, a portion of the sacrum portion may extend further distally than at least a portion of a sharpened distal end.
In this aspect, the implant body may comprise a distal portion, at least a portion of the distal portion comprising a curved distal end extending laterally from the ilium portion, through the central portion, and into the sacrum portion.
In this aspect, an ilium lumen may have a length that is greater than a length of a sacrum lumen.
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In this aspect, an ilium lumen may have a length that is the same as a length of a sacrum lumen.

In this aspect, a sacrum lumen may have a length that is greater than a length of an ilium lumen.

In this aspect, an ilium lumen may be parallel with a sacrum lumen.

In this aspect, the ilium portion has an ilium length, and the sacrum portion has a sacrum length, and the ilium length may be greater than the sacrum length, the ilium length may be the same as the sacrum length, or the sacrum length may be greater than the ilium length.

In this aspect, a sacrum lumen may extend further proximally than an ilium lumen.

In this aspect, an ilium lumen may extend further distally than a sacrum lumen.

In this aspect, at least one distal opening of optional lumens may extend further distally than at least a portion of the central portion of the implant body. Distal openings of more than one lumen may extend further distally than the central portion.

In this aspect, the implant body may further comprise an inner frame, and an outer porous network of interconnected struts extending about at least a top portion and a bottom portion of the implant. A porous network of interconnected struts may further extend about the ilium portion and the sacrum portion. A porous network of interconnected struts may further extend about a plurality of side fenestrations in each of an ilium side of the implant body and a sacrum side of the implant body, wherein the plurality of fenestrations in the ilium side may be in communication with an ilium lumen and the plurality of fenestrations in the sacrum side may be in communication with a sacrum lumen. A porous network of interconnected struts may comprise pores in a central region of the implant body that are larger in size than pores that extend about the ilium portion and larger than pores that extend about the sacrum portion. An inner frame may have a slanted "digital eight" configuration that is slanted distally on the ilium side. An inner frame may include first and second axially extending elongate members and a plurality of axially spaced apart connecting elongate members extending from the first elongate member to the second elongate member, each two adjacent connecting elongate members, along with the first and second axially extending elongate members, defining one of a plurality of frame fenestrations.

In this aspect, the implant body may have a height dimension that is not greater than 70% of a width dimension of the implant body. The height dimension may not be greater than 60% of the width dimension of the implant body.

In this aspect, the implant body may have a length from 15 mm to 80 mm.

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In this aspect, the implant body may have a width from 15 mm to 50 mm.

In this aspect, the implant body may have a height from 4 mm to 20 mm.

In this aspect, the implant body, in a top view, may have a parallelogram configuration that does not include right angles.

In this aspect, the implant body may have, in a top view, a rhomboid configuration or a rhombus configuration.

In this aspect, the implant body may have a height that is not constant across a width of the implant body. A height dimension may be greater in at least a portion of in the ilium portion than in the central region, and wherein the height dimension may be greater in at least a portion of in the sacrum portion than in the central region. At least one of a top portion or a bottom portion of the implant body may have a curvature therein. A height dimension of the implant body may be greater in at least a portion of the central portion than in the ilium portion, and wherein the height dimension may be greater in at least the portion of the central portion than in the sacrum portion.

In this aspect, the ilium portion may comprise a cutting region proximally adjacent and disposed about the distal opening. A cutting region may comprise a plurality of axially-spaced cutting edges, which may be annular or circularly shaped.

In this aspect, the sacrum region may comprise a cutting region proximally adjacent and about the distal opening. A cutting region may comprise a plurality of axially-spaced cutting edges, which may be annular or circularly shaped.

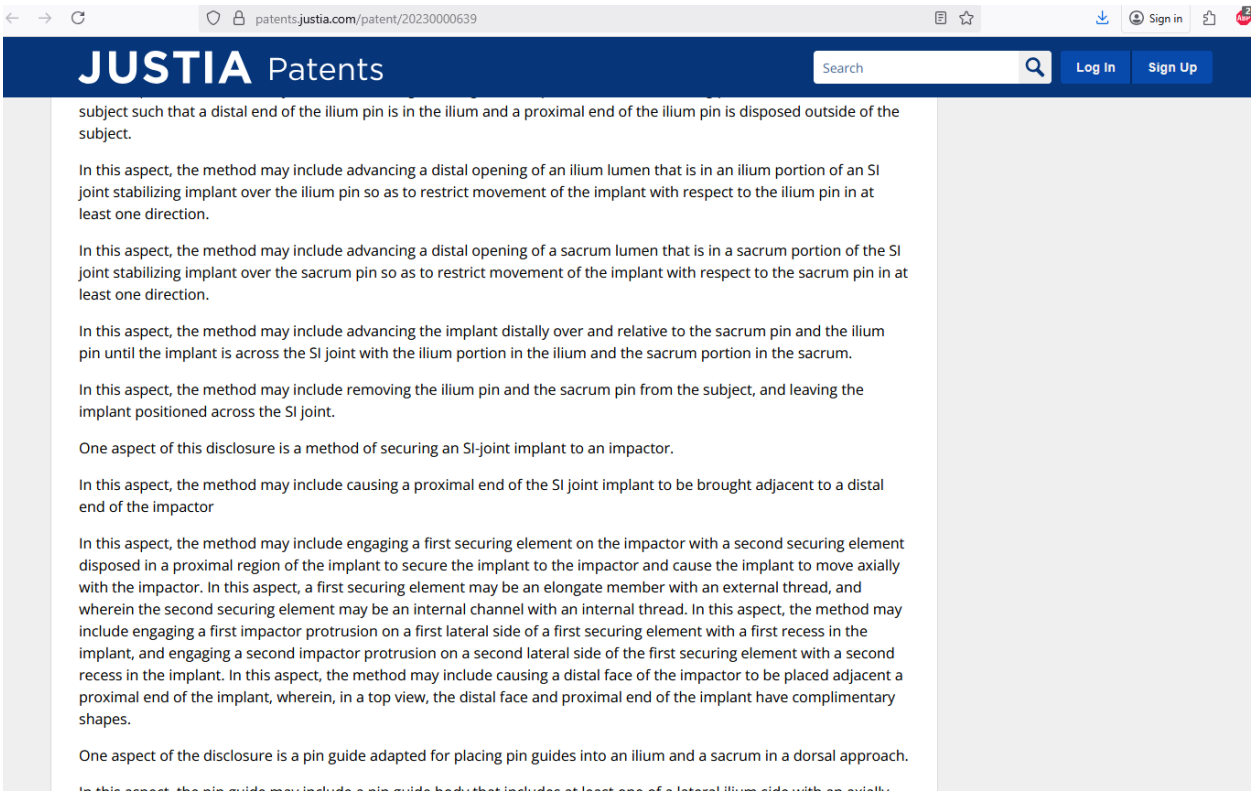
In this aspect, a proximal end of the implant body may include a plurality of recessed members. A first recessed member may be in a first lateral half of the implant body, and a second recessed member may be in a second lateral half of the implant body.

In this aspect, a proximal end of the implant body may include a cylindrical channel (optionally extending along a long axis of the implant body) defining a lumen, wherein the channel comprises an inner thread.

One aspect of the disclosure is a method of positioning a sacro-iliac ("SI") joint stabilizing implant across an SI joint from a dorsal approach.

In this aspect, the method may include advancing an elongate sacrum pin from a dorsal starting point into a sacrum of a subject such that a distal end of the sacrum pin is in the sacrum and a proximal end of the sacrum pin is disposed outside of the subject.

In this aspect, the method may include advancing an elongate ilium pin from a dorsal starting point into an ilium of the subject such that a distal end of the ilium pin is in the ilium and a proximal end of the ilium pin is disposed outside of the



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subject such that a distal end of the ilium pin is in the ilium and a proximal end of the ilium pin is disposed outside of the subject.

In this aspect, the method may include advancing a distal opening of an ilium lumen that is in an ilium portion of an SI joint stabilizing implant over the ilium pin so as to restrict movement of the implant with respect to the ilium pin in at least one direction.

In this aspect, the method may include advancing a distal opening of a sacrum lumen that is in a sacrum portion of the SI joint stabilizing implant over the sacrum pin so as to restrict movement of the implant with respect to the sacrum pin in at least one direction.

In this aspect, the method may include advancing the implant distally over and relative to the sacrum pin and the ilium pin until the implant is across the SI joint with the ilium portion in the ilium and the sacrum portion in the sacrum.

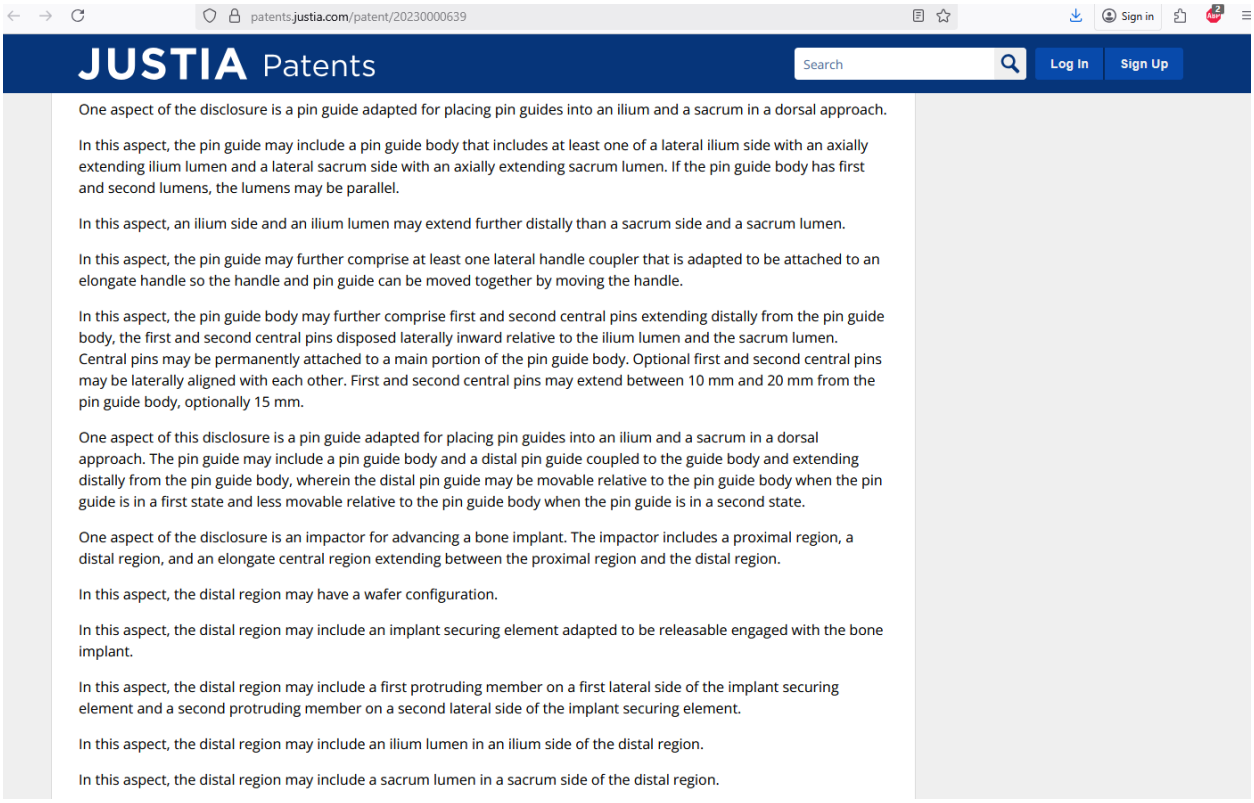
In this aspect, the method may include removing the ilium pin and the sacrum pin from the subject, and leaving the implant positioned across the SI joint.

One aspect of this disclosure is a method of securing an SI-joint implant to an impactor.

In this aspect, the method may include causing a proximal end of the SI joint implant to be brought adjacent to a distal end of the impactor

In this aspect, the method may include engaging a first securing element on the impactor with a second securing element disposed in a proximal region of the implant to secure the implant to the impactor and cause the implant to move axially with the impactor. In this aspect, a first securing element may be an elongate member with an external thread, and wherein the second securing element may be an internal channel with an internal thread. In this aspect, the method may include engaging a first impactor protrusion on a first lateral side of a first securing element with a first recess in the implant, and engaging a second impactor protrusion on a second lateral side of the first securing element with a second recess in the implant. In this aspect, the method may include causing a distal face of the impactor to be placed adjacent a proximal end of the implant, wherein, in a top view, the distal face and proximal end of the implant have complimentary shapes.

One aspect of the disclosure is a pin guide adapted for placing pin guides into an ilium and a sacrum in a dorsal approach.



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One aspect of the disclosure is a pin guide adapted for placing pin guides into an ilium and a sacrum in a dorsal approach.

In this aspect, the pin guide may include a pin guide body that includes at least one of a lateral ilium side with an axially extending ilium lumen and a lateral sacrum side with an axially extending sacrum lumen. If the pin guide body has first and second lumens, the lumens may be parallel.

In this aspect, an ilium side and an ilium lumen may extend further distally than a sacrum side and a sacrum lumen.

In this aspect, the pin guide may further comprise at least one lateral handle coupler that is adapted to be attached to an elongate handle so the handle and pin guide can be moved together by moving the handle.

In this aspect, the pin guide body may further comprise first and second central pins extending distally from the pin guide body, the first and second central pins disposed laterally inward relative to the ilium lumen and the sacrum lumen. Central pins may be permanently attached to a main portion of the pin guide body. Optional first and second central pins may be laterally aligned with each other. First and second central pins may extend between 10 mm and 20 mm from the pin guide body, optionally 15 mm.

One aspect of this disclosure is a pin guide adapted for placing pin guides into an ilium and a sacrum in a dorsal approach. The pin guide may include a pin guide body and a distal pin guide coupled to the guide body and extending distally from the pin guide body, wherein the distal pin guide may be movable relative to the pin guide body when the pin guide is in a first state and less movable relative to the pin guide body when the pin guide is in a second state.

One aspect of the disclosure is an impactor for advancing a bone implant. The impactor includes a proximal region, a distal region, and an elongate central region extending between the proximal region and the distal region.

In this aspect, the distal region may have a wafer configuration.

In this aspect, the distal region may include an implant securing element adapted to be releasable engaged with the bone implant.

In this aspect, the distal region may include a first protruding member on a first lateral side of the implant securing element and a second protruding member on a second lateral side of the implant securing element.

In this aspect, the distal region may include an ilium lumen in an ilium side of the distal region.

In this aspect, the distal region may include a sacrum lumen in a sacrum side of the distal region.

In this aspect, the distal region may include a first protruding member on a first lateral side of the implant securing element and a second protruding member on a second lateral side of the implant securing element.

In this aspect, the distal region may include an ilium lumen in an ilium side of the distal region.

In this aspect, the distal region may include a sacrum lumen in a sacrum side of the distal region.

In this aspect, the distal region may include a distal face that is not orthogonal to a long axis of the central region. A distal face may extend further distally on the ilium side than on the sacrum side.

In this aspect, a first protruding member may extend further distally than a second protruding member.

In this aspect, an ilium lumen may extend further distally than a sacrum lumen.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1**A and **1**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIGS. **2**A and **2**B illustrate an exemplary SI joint implant engaged with first and second positioning guides.

FIGS. **3**A and **3**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIGS. **4**A and **4**B illustrate an exemplary SI joint implant engaged with first and second positioning guides.

FIGS. **5**A and **5**B illustrate an exemplary SI joint implant engaged with a plurality of positioning guides.

FIGS. **6**A and **6**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIG. **7** illustrates an exemplary SI joint implant.

FIG. **8** illustrates a portion of an exemplary SI joint implant engaged with a positioning guide.

FIG. **9** illustrates a portion of an exemplary SI joint implant engaged with a positioning guide.

FIG. **10** illustrates an exemplary SI joint implant engaged with a plurality of positioning guides.

FIGS. **11**A and **11**B illustrate an exemplary SI joint implant.

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FIG. **10** illustrates an exemplary SI joint implant engaged with a plurality of positioning guides.

FIGS. **11**A and **11**B illustrate an exemplary SI joint implant.

FIG. **12** illustrates an exemplary SI joint implant.

FIG. **13** illustrates an exemplary SI joint implant.

FIG. **14** illustrates an exemplary SI joint implant.

FIGS. **15**A, **15**B and **15**C illustrate an exemplary SI joint implant.

FIG. **16** illustrates an exemplary SI joint implant.

FIGS. **17**A, **17**B and **17**C illustrate exemplary cutting edges disposed about optional lumens.

FIGS. **18**A, **18**B and **18**C illustrate an exemplary SI joint implant.

FIG. **19** illustrates an exemplary SI joint implant.

FIG. **20** illustrates an exemplary SI joint implant.

FIG. **21** illustrates an exemplary SI joint implant.

FIGS. **22**A, **22**B and **22**C illustrate an exemplary SI joint implant.

FIGS. **23**A and **23**B illustrate an exemplary SI joint implant.

FIG. **24** illustrates an exemplary SI joint implant.

FIG. **25** illustrates an exemplary SI joint implant.

FIG. **26** illustrates an exemplary SI joint implant.

FIGS. **27**A and **27**B illustrate an exemplary SI joint implant.

FIG. **28** illustrates an exemplary SI joint implant and an approximated quadrilateral shape or configuration of the implant in a top view of the implant body.

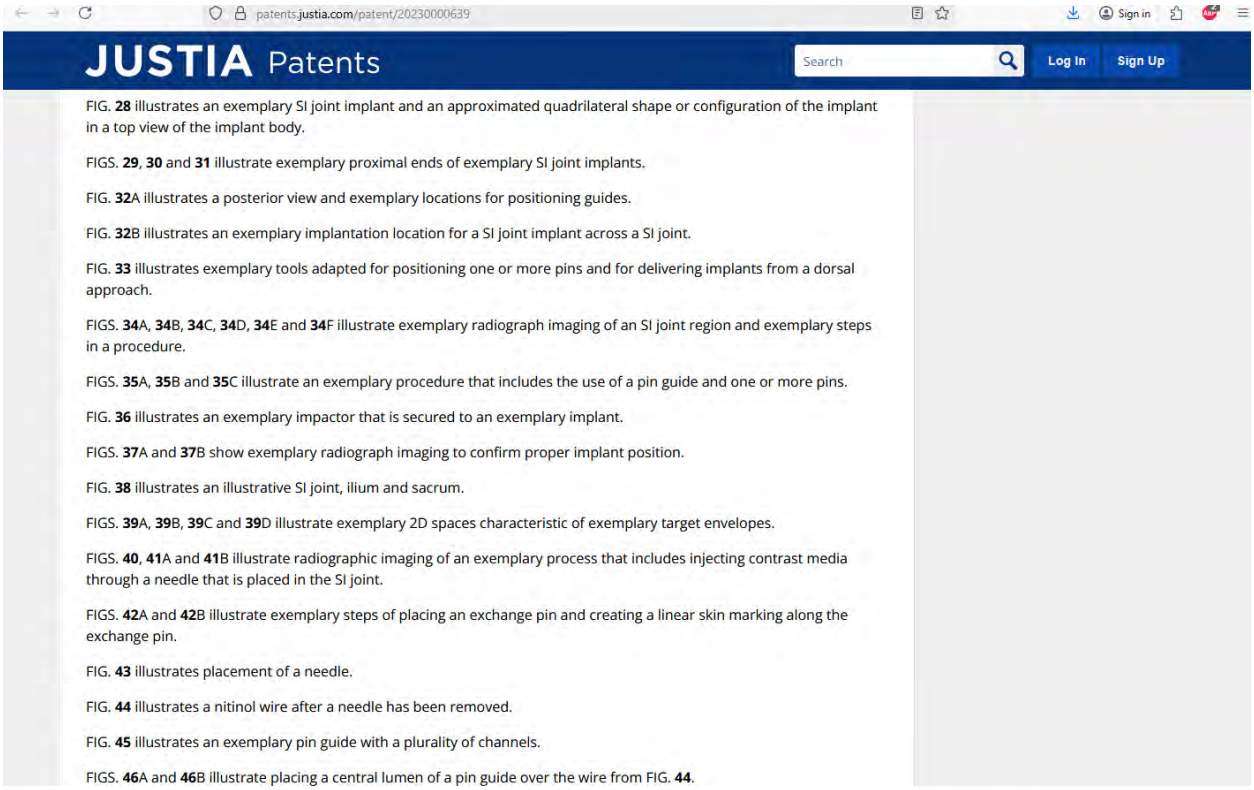

FIG. **28** illustrates an exemplary SI joint implant and an approximated quadrilateral shape or configuration of the implant in a top view of the implant body.

FIGS. **29**, **30** and **31** illustrate exemplary proximal ends of exemplary SI joint implants.

FIG. **32**A illustrates a posterior view and exemplary locations for positioning guides.

FIG. **32**B illustrates an exemplary implantation location for a SI joint implant across a SI joint.

FIG. **33** illustrates exemplary tools adapted for positioning one or more pins and for delivering implants from a dorsal approach.

FIGS. **34**A, **34**B, **34**C, **34**D, **34**E and **34**F illustrate exemplary radiograph imaging of an SI joint region and exemplary steps in a procedure.

FIGS. **35**A, **35**B and **35**C illustrate an exemplary procedure that includes the use of a pin guide and one or more pins.

FIG. **36** illustrates an exemplary impactor that is secured to an exemplary implant.

FIGS. **37**A and **37**B show exemplary radiograph imaging to confirm proper implant position.

FIG. **38** illustrates an illustrative SI joint, ilium and sacrum.

FIGS. **39**A, **39**B, **39**C and **39**D illustrate exemplary 2D spaces characteristic of exemplary target envelopes.

FIGS. **40**, **41**A and **41**B illustrate radiographic imaging of an exemplary process that includes injecting contrast media through a needle that is placed in the SI joint.

FIGS. **42**A and **42**B illustrate exemplary steps of placing an exchange pin and creating a linear skin marking along the exchange pin.

FIG. **43** illustrates placement of a needle.

FIG. **44** illustrates a nitinol wire after a needle has been removed.

FIG. **45** illustrates an exemplary pin guide with a plurality of channels.

FIGS. **46**A and **46**B illustrate placing a central lumen of a pin guide over the wire from FIG. **44**.

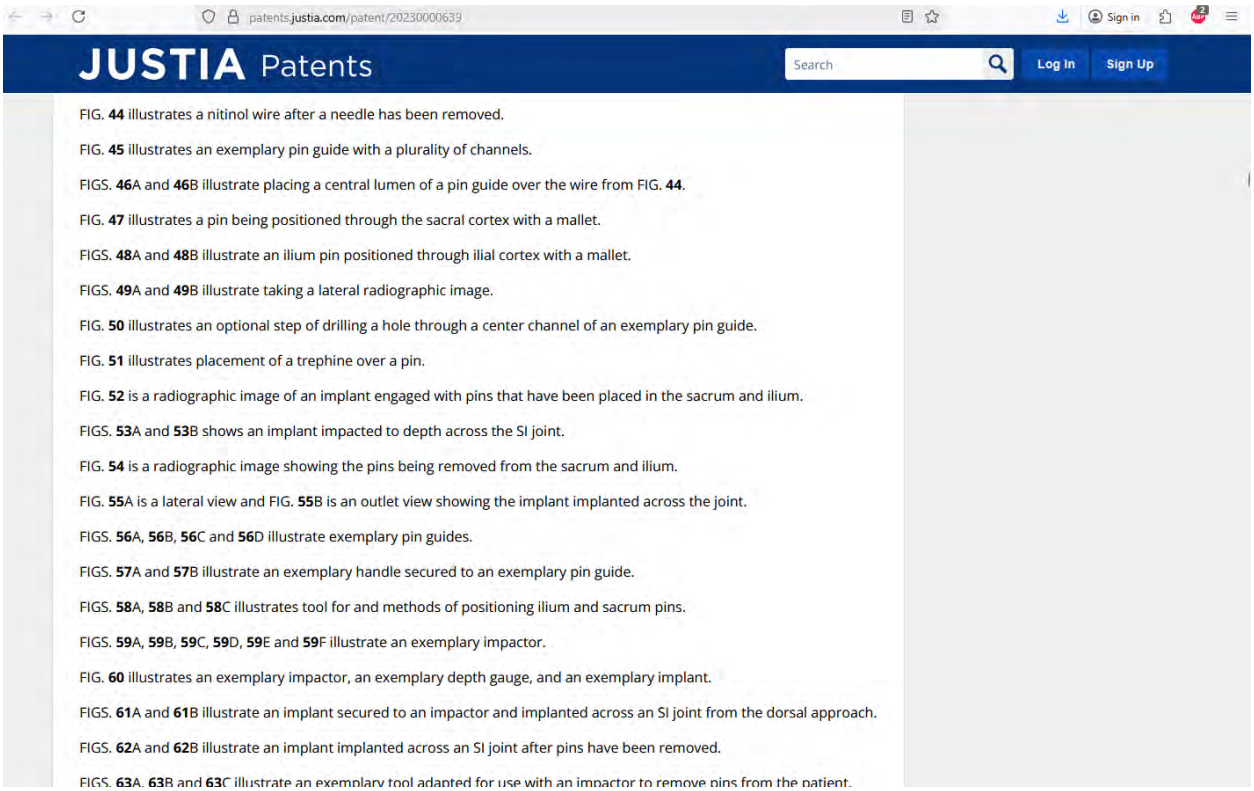

FIG. **44** illustrates a nitinol wire after a needle has been removed.

FIG. **45** illustrates an exemplary pin guide with a plurality of channels.

FIGS. **46**A and **46**B illustrate placing a central lumen of a pin guide over the wire from FIG. **44**.

FIG. **47** illustrates a pin being positioned through the sacral cortex with a mallet.

FIGS. **48**A and **48**B illustrate an ilium pin positioned through ilial cortex with a mallet.

FIGS. **49**A and **49**B illustrate taking a lateral radiographic image.

FIG. **50** illustrates an optional step of drilling a hole through a center channel of an exemplary pin guide.

FIG. **51** illustrates placement of a trephine over a pin.

FIG. **52** is a radiographic image of an implant engaged with pins that have been placed in the sacrum and ilium.

FIGS. **53**A and **53**B shows an implant impacted to depth across the SI joint.

FIG. **54** is a radiographic image showing the pins being removed from the sacrum and ilium.

FIG. **55**A is a lateral view and FIG. **55**B is an outlet view showing the implant implanted across the joint.

FIGS. **56**A, **56**B, **56**C and **56**D illustrate exemplary pin guides.

FIGS. **57**A and **57**B illustrate an exemplary handle secured to an exemplary pin guide.

FIGS. **58**A, **58**B and **58**C illustrates tool for and methods of positioning ilium and sacrum pins.

FIGS. **59**A, **59**B, **59**C, **59**D, **59**E and **59**F illustrate an exemplary impactor.

FIG. **60** illustrates an exemplary impactor, an exemplary depth gauge, and an exemplary implant.

FIGS. **61**A and **61**B illustrate an implant secured to an impactor and implanted across an SI joint from the dorsal approach.

FIGS. **62**A and **62**B illustrate an implant implanted across an SI joint after pins have been removed.

FIGS. **63**A, **63**B and **63**C illustrate an exemplary tool adapted for use with an impactor to remove pins from the patient.

FIGS. **63**A, **63**B and **63**C illustrate an exemplary tool adapted for use with an impactor to remove pins from the patient.

FIG. **64** illustrates an exemplary pin guide.

DETAILED DESCRIPTION

The disclosure herein is related to SI joint stabilizing implants ("implants") and methods of implanting SI joint stabilizing implants across an SI joint from a dorsal approach. Methods herein include implanting an implant from a dorsal approach across the SI joint with a first portion of the implant positioned in the ilium, a second portion of the implant positioned in the sacrum, and a third portion (e.g., a central portion) placed across the SI joint. The implants herein may be sized and configured to be implanted utilizing any of the suitable methods of implantation and delivery tools herein, unless indicated herein to the contrary. Similarly, method of implantation and delivery tools herein may be used to deliver any or all of the suitably configured implants across an SI joint, unless indicated herein to the contrary.

A region or portion of the ilium into which a first portion of the implant is positioned from a dorsal approach may have greater density than a region or portion of the sacrum into which a second portion or region of the implant is positioned. When positioning a SI joint implant across a SI joint from a dorsal approach, the implant may thus tend to deflect away from denser cortical iliac bone and migrate towards and into the less dense sacrum, which can prevent proper positioning of the implant across the SI joint. Implantation methods, delivery tools and implants are described herein that can maintain proper implant trajectory when advancing the SI joint implant across the SI joint from a dorsal approach described herein. The methods and approaches herein can account for the differences in bone density between the ilium and sacrum and prevent the implant from migrating away from denser iliac bone during implantation. Additionally, implants herein are sized and configured to be safely implanted into a target anatomical region when implanted from the dorsal approaches herein.

Methods of implanting the implants herein may include advancing one or more positioning guides, any of which may be referred to herein as a "guide," into an ilium from a dorsal approach, and in some embodiments between lateral and medial cortical walls of the ilium, which is described and shown herein. FIG. **32**A illustrates a posterior view and a general dorsal approach for implanting the SI joint implants herein across an SI joint. FIG. **32**B illustrates an exemplary implant **1106** that has been implanted across an SI joint **1114**′ with a first region or portion of the implant disposed in the ilium **1110**, a second region or portion of the implant disposed in the sacrum **1112**, and a central region or portion extending across the SI joint **1114**′. FIGS. **32**A and **32**B, which are described in more detail below, illustrate ilium **1110**, sacrum **1112**, the SI joints **1114** and **1114**′, and lumbar vertebrae **1116**. FIG. **32**A also illustrates an optional anatomical region **1120** that is a starting point for advancing an ilium positioning guide into the ilium, and an optional exemplary anatomical region

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1110, a second region or portion of the implant disposed in the sacrum **1112**, and a central region or portion extending across the SI joint **1114**′. FIGS. **32**A and **32**B, which are described in more detail below, illustrate ilium **1110**, sacrum **1112**, the SI joints **1114** and **1114**′, and lumbar vertebrae **1116**. FIG. **32**A also illustrates an optional anatomical region **1120** that is a starting point for advancing an ilium positioning guide into the ilium, and an optional exemplary anatomical region **1130** for a starting point for advancing a sacrum positioning guide into the ilium. FIG. **32**A further illustrates an exemplary and optional ilium starting point **1122** for an ilium positioning guide, as well as an exemplary and optional sacrum starting point **1132** for a sacrum positioning guide. Any of the ilium positioning guides herein may have a starting point in ilium region **1120**, such as ilium starting point **1122**. Any of the sacrum positioning guides herein may have a starting point in sacrum region **1130**, such as sacrum starting point **1132**. A radiographic view image may be obtained and utilized to help guide the positioning guide into the ilium between lateral and medial cortical walls of the ilium, which are illustrated generally in FIGS. **32**A and **32**B. Methods herein may optionally include interfacing an ilium positioning guide herein with an ilium portion or region of the SI joint implant, such as an interface member of the implant, to guide the implant across the SI joint while maintaining a proper trajectory and achieving a desired implantation location. By positioning an ilium positioning guide in the relatively dense region of the ilium, and by interfacing and engaging the positioning guide with the ilium portion of the implant, the guide can help ensure a portion of or the entire implant will stay on course with a desired trajectory during advancement during implantation in the dorsal approach, rather than migrating away from the relatively dense cortical ilium bone and towards the sacrum. The optional positioning guides herein thus interface directly with the implant, and are sized and configured to act as a guide for the implant to ensure that an ilium portion or region of the implant is properly positioned in the ilium and that a joint region (which may be referred herein as a central region or portion) of the implant is properly implanted across the SI joint.

The positioning guides are sized and configured to, when engaged with the implant, generally restrict movement of the implant with respect to the positioning guide in at least one direction. The implant may be free to move relative to the positioning guide in other ways or directions. For example, once interfaced, the implant may still be able to rotate relative to the guide, such as in FIGS. **1**A and **1**B, but the guide can still maintain the desired trajectory (relative axial movement) of the implant when the implant is advanced in the dorsal trajectory with respect to the engaged guide.

The methods herein include advancing the implant across the SI joint, while the optional guide(s) helps guide an ilium portion of the implant into the ilium. The methods may also include removing the positioning guide from the ilium after the implant has been positioned across the SI joint.

The methods herein may include positioning more than one positioning guide, optionally more than one ilium guide in the ilium, and optionally one or more guides into sacral bone. Any of the one or more guides herein may be sized and configured to function as a positioning guide to help guide a portion of the implant into ilium bone or sacral bone.

The methods herein may include positioning more than one positioning guide, optionally more than one ilium guide in the ilium, and optionally one or more guides into sacral bone. Any of the one or more guides herein may be sized and configured to function as a positioning guide to help guide a portion of the implant into ilium bone or sacral bone.

In some alternative methods and implants described herein, the method of implantation may not require a position guide. For example, an implant may be advanced across an SI joint from a dorsal approach without using a positioning guide. For example, these methods may include radiographically visualizing a teardrop view of the ilium and advancing the implant while visualizing the teardrop view to ensure a portion of the implant stays sufficiently on course into the teardrop region of the ilium. Any of the methods herein may thus optionally exclude an ilium positioning guide, and may rely on a radiographic image, such as a teardrop view, to help maintain a desired implant trajectory into a teardrop region of the ilium. Implants implanted according to these methods may be implanted with or without a broach (described in more detail below), and if implanted without the use of a broach, the implants may have distal end regions that are configured to penetrate into bone, optionally having sharpened distal ends.

Some of the implants herein, such as any of those shown in FIGS. **1**A-**31**, are generally sized and configured to be able to interface with an elongate ilium positioning guide, and may be sized and configured to interface with one or more additional positioning guides, which may be ilium or sacrum guides.

Exemplary implants are described below. Even if the textual description of an exemplary implant does not expressly include it, it is understood that features shown with respect to different exemplary implants may be incorporated into other exemplary implants. For example, the implants shown in FIGS. **1**A, **1**B, **2**A and **2**B each have an interface member with an annular inner surface that defines a lumen, even if the text does not expressly include a description thereof. Additionally, similar components may be similarly labeled in different embodiments. For example, it is understood that references to elements **10**, **20**, **30**, **40**, etc., in some of the figures may illustrate systems, even if the text related to any particular embodiment is silent with reference to a reference number shown in the figure.

FIG. **1**A is an end dorsal view (showing the proximal portion) and FIG. **1**B is a perspective view of exemplary system **10** that includes SI joint stabilizing implant **14** and elongate ilium guide **12**. Implant **14** includes an ilium guide interface member **18** interfacing, which may be also referred to herein as engaging, with ilium guide **12**. Implant **14** includes main body or implant body **16**, a central portion or region of which is disposed across the SI joint when the implant is implanted. The interface member **18** includes a surface **19** that has a configuration, in this example annular, that is sized and configured to interface with the corresponding configuration of ilium guide **12** to allow implant **14** to be axially advanced relative to guide **12**. In these figures, the guide may or may not already be positioned in an ilium, such as at the exemplary general location shown in FIG. **32**A. The interface between the guide and the interface member of the implant restricts the

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location shown in FIG. **32**A. The interface between the guide and the interface member of the implant restricts the movement of the implant interface guide member with respect to the ilium guide in one or more directions. In this example, implant **14** may still be rotated relative to guide **12**, but the interface restricts, for example, side-to-side (lateral) movement of **14** implant relative to guide **12**. In this embodiment, the guide has a cylindrical configuration, with an annular outer profile in cross section along almost all of its length (except for the distal tip region, which may be configured to penetrate and/or anchor (temporarily) into bone). Any of the guides herein may have a cylindrical configuration along all or substantially all of its length. Any of the guides herein may also include a sharpened or pointed distal end (e.g., as shown in FIGS. **1**B, **2**B, **3**B), which may be configured to help penetrate and/or anchor into bone (temporarily), such as iliac bone and/or sacral bone.

In figures herein, including FIGS. **1**A and **10**, "S" refers to a sacrum and "I" refers to an ilium.

FIGS. **2**A (end view) and **2**B (perspective) illustrate exemplary system **20**, which includes implant **24**, ilium or iliac guide **22**, and an optional elongate sacrum or sacral guide **21**. In the figures shown, ilium guide **22** and the sacrum guide **21** may or may not yet be positioned within the ilium and sacrum, respectively. In some methods, the one or more guides may be inserted into bone, and then the implant may be advanced over the guides. In some embodiments, the implant is interfaced with the one or more guides, and subsequently the one or more guides can be inserted into bone. Interfacing the implant to a plurality of guides (in examples with more than one guide) before guide insertion may help prevent the guides from being inserted into bone and spaced apart at positions that prevent the implant from then be interfaced with the guides and successfully advanced along the guides and across the SI joint. Interfacing the implant with the guides first may help the guides being properly spaced apart to accommodate the implant during implantation. In merely exemplary embodiments herein, a method may include inserting an ilium guide into iliac bone, interfacing the guide with the implant, interfacing the implant with a sacrum guide, and inserting the sacrum guide into a sacrum. The implant may subsequently be advanced across the SI joint.

Any of the dashed lines in FIGS. **1**A, **2**A, **3**A and **4**A in an implant body indicates an optional axially extending bore or opening within a body portion of the implant, which may extend through distal and proximal implant body surfaces.

FIGS. **3**A (end view) and **3**B (perspective view) illustrate an exemplary system **30** that includes implant **34**, which is configured to interface with ilium guide **32**. Implant **34** includes guide interface member **33** that has a surface **35** sized and configured to interface with guide **32**, which may be an ilium guide. Member **33** is in this embodiment curvilinear and has an almost completely annular configuration, but extends less than 360 degrees.

FIGS. **4**A (end view) and **4**B (perspective view) illustrate exemplary system **40** that includes implant **44** with first and

FIGS. **4**A (end view) and **4**B (perspective view) illustrate exemplary system **40** that includes implant **44** with first and second ilium guide interface members **43** and **45**, each of which has a surface configured to interface with ilium guide **41** and ilium guide **42**, respectively. Members **43** and **45** in this embodiment extend upward and downward from the main body region further than the guide interface members in FIGS. **1**A, **1**B, **2**A and **2**B, for example.

FIGS. **5**A (end view) and **5**B (perspective view) illustrate an exemplary system **50** that includes exemplary implant **54**, and exemplary ilium guides **51** and **52** and sacral guides **53** and **55**. Implant **54** includes four guide members **56**, **57**, **58** and **59**, each configured to interface with and be axially moveable relative to a separate guide. The implant body has a general "X" or crossing configuration in an end view, but could have other configurations, such as square, rectangular, oval, etc., and may still have four (or more) guide interface members.

FIGS. **6**A (end view) and **6**B (perspective view) illustrate an exemplary system **60** that includes implant **64** configured to interface with guide **62**. In this embodiment guide **62** includes a recessed region that is configured to stably interface with interface member **63** that in this example is a lateral protrusion or extension from a main body region of the implant. This is an example of the implant having a guide interface member that extends within a portion of the guide, compared with guide interface members that extend around a portion of the guide, such as is shown in FIGS. **1**A-**5**B. The interface in this embodiment limits up and down movement of the implant relative to the guide, as well as right lateral movement relative to the guide, but allows guide **62** to act as a guide for implant **64** during implantation.

FIG. **7** illustrates an exemplary implant **70** or broach **70** with a sharpened distal end, in this example extending laterally across the entire or substantially the entire width of the implant body, as shown. If used as a broach, the broach **70** may be configured with any of the guide members herein, and in methods of use can be guided over one or more guides (before the implant is implanted) to create a space across the SI joint for the implant. The broach can be removed, and an implant can then be advanced over the guides, which is described in more detail below.

If used as an implant, the implant **70** may comprise any of the guide members herein (e.g., one or more lumens), and in methods of use can be guided over one or more guides to position the implant across an SI joint. The sharpened region of the implant may create a space for the implant by penetrating or cutting into bone.

FIG. **8** (end view) illustrates an exemplary implant **84** that includes guide interface member **86**, which is configured to interface with guide **82**. In this exemplary embodiment, guide **82** has a triangular configuration (which may have other rectilinear configurations), and member **86** includes an inner surface triangular configuration (which may have other rectilinear configurations), as shown. Implant **84** may also have any number of members **86**, each of which can be configured to interface with a different guide.

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Any of the implants herein may also have a guide interface member with a first configuration and a second guide interface member with a second configuration different than the first. For example, any of the implants herein may have one or more interface members that are the same or similar to member **23**, the same or similar to member **33**, the same or similar to member **63**, and/or the same or similar to members **86**.

FIG. **9** (end view) illustrates an exemplary system **90** that includes implant **94**. Implant **94** has a plurality of arms, and not all of the arms include a guide interface member at the respective arm end region. In this embodiment, only one of the arms has a guide interface member (in this embodiment member **96**), but in other embodiments the implant may have any number of members less than the number of arms extending from a main body portion (e.g., two, three, four, etc.).

FIG. **10** (end view) illustrates an exemplary system **100** that includes an implant **104** that includes ilium guide interface member **106** and sacrum guide interface member **108**, each of which is configured to interface with guides **110** and **112**, respectively. The position shown illustrates the implant as it may be implanted across an SI joint, illustrating that any of the implants herein may be implanted with one guide member (e.g., **106**) in one type of bone superior to another guide member in a different type of bone (e.g., ilium versus sacrum). For example, guide **110** may be positioned in iliac bone, and guide **112** may be positioned in a sacrum, either inferior to guide **110** as shown, or in other embodiments superior to guide **110**, which is not shown, but which would be above guide **110** in FIG. **10**.

Any of the implants herein may have one or more surfaces that are configured and adapted to facilitate at least one of bony ingrowth and ongrowth. For example, without limitation, any of the implants herein may include one or more of fenestrations, apertures, porous surfaces, irregular surfaces, etc., such as any that may be described in U.S. Pat. No. 9,044,321, U.S. Published Application 2013/0296953, U.S. Pat. Nos. 9,662,157, 10,166,033, U.S. Published Application 2016/0287171, the disclosures of which are incorporated by reference herein for all purposes.

As is set forth herein, SI joint implants herein may include one or more interface members, which may be configured as axially extending lumens or bores, and which may also be referred to as channels herein. The interface members are generally sized and configured to accommodate relative movement of one or more guides (such as an ilium guide), which are positioned in an ilium or a sacrum. In this way, implants may be moved axially relative to and guided by the positioning guides to the intended implantation location across the SI joint without migrating (or at least minimizing migration) away from the denser iliac bone.

In some embodiments, the implant may include interface members that are in opposing lateral side regions of the implant, an example of which is shown in FIGS. **2**A and **2**B. In this arrangement, the implant is advanced over the guides to position the implant across the SI joint. The guides may be removed after the SI joint implant is delivered to its desired

In some embodiments, the implant may include interface members that are in opposing lateral side regions of the implant, an example of which is shown in FIGS. **2**A and **2**B. In this arrangement, the implant is advanced over the guides to position the implant across the SI joint. The guides may be removed after the SI joint implant is delivered to its desired position, leaving the implant implanted across the SI joint.

FIGS. **11**A and **11**B illustrate in top and back end views, respectively, exemplary implant **1300**. Implant **1300** may include any of the suitable features of other implants herein, such as interfacing members configured to interface with a positioning guide. FIGS. **11**A and **11**B illustrate implant **1300**, which is sized and configured for implantation across a SI joint from a dorsal approach. Implant **1300** includes implant body **1302** that includes an ilium region or portion **1304** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1302** also includes a sacrum region or portion **1306** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach.

Height, Width and Length directions of the implant are also labeled to provide the relative dimensions of the implant body that are described herein. When the description herein refers to a general dimension (e.g., height, length) of the implant body, it refers to the greatest dimension of the implant body. For example, with reference to FIG. **11**B, if the disclosure refers to a Height of implant body **1302**, it refers to the greatest height dimension of the implant body, which in this embodiment is in lateral regions of the implant body. The disclosure herein may also, however, refer to dimension in a particular region of the implant (e.g., central region Height). The relative Distal and Proximal directions are also labeled in FIG. **11**A.

As shown, ilium region **1304** includes and defines elongate ilium lumen **1305** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. In this example, sacrum region **1306** extends further proximally than the ilium region **1304** with reference to the Length direction, as shown in FIG. **11**A. FIG. **38** illustrates an illustrative SI joint **1800**, ilium **1802**, and sacrum **1804**. Implants herein may be advanced from a dorsal approach and into position across the SI joint, with the ilium region or portion of the implant in the ilium and the sacrum region or portion in the sacrum. The overall implant dimensions and configuration of exemplary implant **1300** (which may also be referred to herein as the implant outer profile) may provide one or more advantages when implanting the implant across the SI joint from the dorsal approaches described herein. As can be seen in FIGS. **38**, **39**A and **39**B, the sacrum may extend further proximally than the ilium, relative to the delivery trajectory. With implants that have an ilium region that extends as far proximally as a sacrum region, the ilium region of the implants may extend too far posteriorly when implanted, such that they are extending out of the ilium. Ilium region **1304** does not extend as far proximally as sacrum region **1306**, such that when implanted there is less risk that the ilium region **1304** will extend outside of the ilium. The proximal end of the implant body in this example includes optional stepped region or portion **1308** between a sacral

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side and an ilium side of the implant body **1302**, and in this example optionally includes three flat surfaces (shown in the top view of FIG. **11**A), the central of which is tapered and extends further distally in the ilium portion of implant body. The tapered surface in this example extends between proximal sacrum and ilium surfaces that are orthogonal to a long axis of the implant (as shown), and are described in more detail with respect to an impactor, an example of which is shown in FIGS. **33** and **36**. In alternative implants, the proximal end may be a combination of one or more flat or curved surfaces, additional examples of which are described below.

Alternatively, implant **1300** may have a distal end in which ilium region **1304** extends further distally than sacrum region **1306**, some examples of which are described below. For example, the configuration of implant body **1302** may approximate a general parallelogram shape that does not comprise four right angles, such as a rhomboid or rhombus configuration (in a top view of the implant). Implants for which sacrum regions do not extend as far distally as the ilium region may provide an advantage of preventing the sacrum region **1306** from being advanced too far distally in the patient, which may mitigate a risk of damaging tissue distal to the desired implantation location. Some implants herein thus may have ilium and sacrum regions that do not extend as far proximally or as far distally as one another, which may provide the exemplary advantages set forth herein.

Implant body **1302** is an example of an implant body that has a height dimension that is less than a width dimension, as shown. Implant body **1302** also includes a sacrum region **1306** that includes an optional elongate sacrum lumen **1307** therein that extends from a distal opening to a proximal opening and is sized and configured to receive therein a sacrum positioning guide (such as any of the sacrum guides herein). In this example, sacrum lumen **1307** has a length that is greater than a length of ilium lumen **1305**, but in alternatives in which the sacrum region does not extend as far distally as is shown in FIG. **11**A, the lumens may have lengths that are the same or substantially the same. In this example, sacrum lumen **1307** is parallel to the ilium lumen **1305**. The term parallel in this disclosure can include a very minor deviation from being strictly parallel, such as lumens or sides with corresponding axes that intersect at an angle that is five degrees or less, for example. Ilium lumen **1305** is also parallel to a longitudinal ("long") axis of the implant body, with the long axis in this example extending in the length direction.

As is set forth herein, the outer profile of the implant body is important to ensure the implant is positioned at a target implant location and generally within a patient's target anatomical envelope. A target envelope refers generally to an anatomical volume that is the target location for the implant, which may vary from patient to patient due to anatomical variability. For example, some implant configurations mitigate a risk of extending too far proximally out of the ilium, as described above. Additionally, some implant outer profiles may mitigate a risk of extending too far distally, such as too far distally in the sacrum and potentially damaging sensitive tissue. As such, the implant body generally has dimensions and profiles sized and configured to avoid these potential problems. The target envelope may optionally be characterized by

described above. Additionally, some implant outer profiles may mitigate a risk of extending too far distally, such as too far distally in the sacrum and potentially damaging sensitive tissue. As such, the implant body generally has dimensions and profiles sized and configured to avoid these potential problems. The target envelope may optionally be characterized by two dimensional (2D) spaces and/or a three dimensional (3D) space. FIGS. **39**A, **39**B, **39**C and **39**D illustrate exemplary views that illustrate exemplary 2D spaces with exemplary dimensions that partially characterize exemplary target envelopes. As shown, there can be some patient-to-patient variability in sacral bone shape, iliac bone shape, and SI joint shape. While some implant shapes herein may be able to treat a wide range of patients, it may optionally be beneficial to customize an SI joint implant for a particular patient, such as by customization of one or more dimensions (e.g. angles), and/or the outer profile of the implant. A customization process can include characterizing the target envelope, such as obtaining one or more 2D views (e.g., FIGS. **39**A-**3**D) and/or constructing a 3D image of the target envelope, and designing or selecting an implant (optionally from a kit of implants with at least some different dimensions and/or outer profiles, for example) based on the target envelope characterization. For example, a patient from which the image in FIG. **39**D is obtained may optionally be treated with an implant herein where ilium regions and sacrum regions extend to the same distal extent (e.g., FIG. **11**A, **24**, **25**, **26** or **28**A and **28**B), whereas a patient from which the image in FIG. **39**B is obtained may optionally be treated with an implant with a configuration that more closely approximates the general rhomboid 2D space annotated in FIG. **39**D, such as (without limitation) any of the implants in FIG. **14**, **15**A, **16**, **18**A, or **23**A).

The implant bodies herein may have a length from 15 mm to 80 mm (an example length of which is shown in FIG. **14**, as "Length (implant body)"). For example, in FIG. **11**A, the greatest proximal extent of implant body **1302** is in sacrum region **1306**, and the greatest distal extent of implant body **1302** is in both sacrum region **1306** and ilium region **1304**. In any of the embodiments herein, the ilium lateral side of the implant body may have a length from 35 mm to 70 mm, an exemplary dimension of which is shown in FIG. **14** as "Length (ilium lateral side)." In any of the embodiments herein, the sacrum lateral side may have a length from 25 mm to 60 mm. In any of the embodiments herein, the implant body may have a width from 15 mm to 50 mm, as example of which is shown in FIG. **16** ("Implant Width"). In any of the embodiments herein, the implant body may have a height from 4 mm to 15 mm in at least a portion of the implant (such as one or both of an ilium region or a sacrum region), and the height may also vary across the width of the implant body, an example of which is shown in FIG. **11**B.

FIG. **28** illustrates an approximated shape of the implant body in a top view, including angles beta (the angle between the proximal end and the sacrum side of the approximated shape) and alpha (the angle between the ilium side and the distal or front end of the approximated shape). FIGS. **39**A-**39**D also include exemplary angles alpha and beta for exemplary envelopes for particular patients. In some embodiments, the implant and/or the approximated shape (an example of which is shown in FIG. **28**) may have an angle beta from 30 degrees to 85 degrees, including any subrange therein. In some more particular embodiments, the angle beta may be from 35 degrees to 80 degrees. In some embodiments, the

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some more particular embodiments, the angle beta may be from 35 degrees to 80 degrees. In some embodiments, the angle alpha may be from 30 degrees to 90 degrees. The angle alpha may be slightly greater than 90 degrees (e.g., 90.2 degrees) and still be considered to be within the range from 30 degrees to 90 degrees, including any subrange therein. In some particular embodiments, angle alpha may be from 40 degrees to 90 degrees. It is understood that implants herein may have one or more right angles, such as having a rectangular shape in the top view (e.g., square). For example, some implants may be modified such that angles alpha and beta are 90 degrees. Any of the implants herein (including in any claims) may have any of the exemplary angles alpha and beta described herein.

The implant configuration may also be characterized by a top and/or bottom surface area of the implant, such as is shown in the top view of FIG. **11**A. The surface area may refer generally to an area of an outer profile of the configuration of the implant (in a top view), even if there are a plurality of openings **1320** extending through the implant body (examples of which are shown in FIG. **13**A). In any of the embodiments herein, a surface area of a top portion and/or a bottom portion of the implant body may be from 400 to 3,000 mm^2.

As mentioned above, in some non-limiting embodiments the implant body have a quadrilateral configuration, such as a parallelogram configuration without right angles (e.g., rhomboid or rhombus), with the ilium portion extending further distally than the sacrum portion, and the sacrum portion extending further proximally than the ilium portion, many examples of which are shown and described herein.

In some embodiments, the implant body may have a quadrilateral shape (in a top view) with one or more right angles, such as a rectangle or square. For example, an implant body herein may have a rectangular shape with a sharpened distal region, an example of which is shown with implant **70** shown in FIG. **7**. FIGS. **24**-**26** illustrate exemplary implant bodies with a quadrilateral shape or configuration, without any right angles.

As shown in FIG. **11**B, implant body **1302** optionally has a height that is not constant across a width of the implant. In this example, the height is greater in at least a portion of the ilium and sacrum portions than in the central portion. The top and bottom portions or surfaces of the implant bodies herein may have a gradual curvature therein in an end view, as shown in the example in FIG. **11**B.

As used herein, an implant body that has a wafer configuration or profile refers to an implant body with a width dimension that is greater than a height dimension. Implant body **1302** is an example of an implant body that has a wafer or wafer-like configuration. The height dimension of any implant body herein may be not more than 70% of a width dimension of the implant body, not more than 65%, not more than 60%, not more than 55%, not more than 50%, not more than 45%, not more than 40%, not more than 35%, not more than 30%, not more than 25%, not more than 20%, not more than 15%, or not more than 10% of the implant body width. Implants herein are implanted across an SI joint from a

dimension that is greater than a height dimension. Implant body **1302** is an example of an implant body that has a wafer or wafer-like configuration. The height dimension of any implant body herein may be not more than 70% of a width dimension of the implant body, not more than 65%, not more than 60%, not more than 55%, not more than 50%, not more than 45%, not more than 40%, not more than 35%, not more than 30%, not more than 25%, not more than 20%, not more than 15%, or not more than 10% of the implant body width. Implants herein are implanted across an SI joint from a dorsal approach, and if the implant body height is too great, the implant body may undesirably extend outside of the joint when implanted.

Wafer implants herein, may however, have relatively larger heights than those described in the ranges herein (absolute and/or relative) and may be able to safely stabilize and/or fuse an SI joint. For example, the implant bodies herein may be able to safely stabilize the SI Joint even if the height dimension is, for example, not more than 80% of the width dimension.

Implant body **1302** is also an example of a SI joint implant body wherein the ilium lateral side of the implant body has a length that is different than a length of the sacrum lateral side of the implant body. In this example, the ilium lateral side is shorter than the length of the sacrum lateral side, as shown. The lengths of the lateral sides in this context refers to the lengths of the lateral sides of the implant body, example of which are shown in FIG. **14** as "Length (ilium lateral side," and "Length (sacrum lateral side").

Implant body **1302** also includes a distal end region **1310** (which in this example is not the furthest distal extent of the entire implant body) that is sized and configured for one or more of penetrating through bony tissue as the implant is advanced or reducing the likelihood that the implant deviates from the intended trajectory. For example, distal end region **1310** is an example of a sharpened distal end at least a portion of which extends laterally inward or centrally relative to lateral sides of the implant, the sharpened distal end configured to help penetrate or cut through bony tissue as the implant is advanced. Additionally, end region **1310** has an optional concave curved configuration that can reduce the likelihood that the implant deviates from its intended trajectory when being distally advanced during implantation. A concave curved configuration (an example of which is shown in the top view of FIG. **11**A) may be thought of as helping self-center the implant across the SI joint as the implant is being advanced. The degree of curvature may vary along the curve, as is shown in the example of FIG. **11**A. The curve may be symmetrical about a long axis of the implant (even if the degree of curvature varies), of the curve may be asymmetrical about a long axis of the implant (such as if the ilium and sacrum regions have distal ends that do not extend distally to the same point, examples of which are described below). The sharpened distal end in this example has a tapered configuration, as shown, with a first surface tapering downward and distally from a top portion or surface of the implant body, and a second surface tapering upward and distally from a bottom portion or surface of the implant body, as shown. A sharpened region as that phrase is used herein does not require a configuration with a knife's edge, but rather may be a region with surfaces that taper towards one another or

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bottom portion or surface of the implant body, as shown. A sharpened region as that phrase is used herein does not require a configuration with a knife's edge, but rather may be a region with surfaces that taper towards one another or other configurations that facilitate cut or penetrating through bony tissue.

In this example, the sacrum and ilium lateral sides of the implant body extend further distally than distal region **1310** (distal region **1310** includes a central region of implant body), but in other embodiments the sacrum lateral side may not extend further distally than distal region **1310**. The curvature of region **1310**, in a top view, may optionally be symmetrical about a long axis of the implant body (such as is shown in the example in FIG. **11**A), which may help maintaining the implant trajectory. Distal end region **1310** also extends laterally across a central region of the implant, wherein the central region is laterally inward relative to lateral sides of the implant body. A long axis of the implant body may extend through sharpened distal end region **1310**.

Implant distal region **1310** is an example of a front region of the implant that has at least one surface sized and configured to at least help maintain the implant trajectory when implanted across the SI joint from a dorsal approach. In this example the region has an inwardly curved configuration. In this context, the term front, or forward, refers to the portion of the implant body that will typically engage tissue when the implant is advanced along a direction of implantation. The "front" of the implant body thus may extend laterally across the entire distal end of the implant body, and thus some front portions of the implant body (e.g., a central front portion) may be disposed proximally relative to other front regions of the implant. Distal region **1310** is an example of a front portion of implant body, at least a portion of which is proximal relative to distal ends of the ilium lateral side and the sacrum lateral side, as shown in FIG. **11**A.

Alternatively, any of the implant bodies may have sacrum and ilium portions that have distal ends with surfaces that are configured to compress the SI joint as the implant is advanced, such as by having larger diameter regions, or one or more fins.

The central portion of implant bodies herein refers to a portion or region of the implant body that, in a top view of the implant, is laterally central or inward relative to lateral sides of the implant body, at least a portion of which is adapted or intended to be disposed in the SI joint when implanted. A long axis of the implant body may pass through central portions of implants herein. A central portion generally includes a lateral midpoint of the implant body, as measured laterally across one or both of distal and proximal ends of the implant body. Implant bodies herein do not necessarily have exact or definitive demarcations or delineations between an ilium portion and a central portion, or between a sacrum portion and central portion, but rather a central portion may include the portion or region of the implant that will be or is intended to be positioned across an SI joint when the implant body is implanted. In this regard, the use of the phrases ilium portion and sacrum portion herein refers generally to a lateral position of the portion relative to the central portion. For some or any of the implant bodies herein, it is understood that there may be some degree of lateral overlap between

For some or any of the implant bodies herein, it is understood that there may be some degree of lateral overlap between a central portion and at least one of the ilium portion and the sacrum portion. The phrase central portion or central region herein can thus refer to a lateral position relative to ilium and sacrum lateral sides of the implant body.

FIG. **12** illustrates a proximal and top perspective view of implant **1200**, which is sized and configured for implantation across an SI joint from the dorsal approaches described herein. Implant **1200** includes implant body **1202** that includes ilium portion **1204** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1202** also includes sacrum portion **1206** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A and **11**B may be incorporated by reference into the description of FIG. **12**, such as the relative proximal and distal directions. Ilium portion **1204** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening to a proximal opening, which is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1206** includes and defines an elongate sacrum lumen **1207** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1206** extends further proximally than ilium portion **1204** with reference to the length direction, as shown in FIG. **12**. Ilium portion **1204** extends further distally than sacrum portion **1206**, as shown, exemplary advantages of which are described herein, such as preventing the sacrum region **1206** from being advanced too far distally in the patient, which may mitigate a risk of damaging tissue distal to the desired implantation location across the SI joint. Implant body **1202** is also an example of an implant body with a parallelogram configuration that does not have four right angles, and is generally rhomboid.

While an end view is not shown, implant body **1202** is an example of an implant body that has a wafer configuration, with a height dimension that is less than a width dimension, as can be appreciated from the perspective views that are shown. In this example, sacrum lumen **1207** has a length that is greater than a length of the ilium lumen, but may be at least substantially the same (optionally being exactly the same same) as a length of the ilium lumen. The guide lumens in implant body **1202** are examples of lumens that have axes that are parallel with each other, which again includes slight deviations from perfectly parallel (e.g., lumen axes intersecting with an angle of five degrees or less therebetween). Ilium lumen is also parallel to a long axis LA of the implant body, with the long axis LA in this example extending in the length direction.

Implant body **1202** is an example of an implant body comprising one or more porous networks of interconnected struts. Implant body **1202** includes top porous network of interconnected struts **1201**, a bottom porous network of interconnected struts (not labeled, but defines part of the bottom portion of the implant body), and lateral side porous network of interconnected struts **1209** (only the sacrum side of which is shown and labeled). Top porous network of

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interconnected struts (not labeled, but defines part of the bottom portion of the implant body), and lateral side porous network of interconnected struts **1209** (only the sacrum side of which is shown and labeled). Top porous network of interconnected struts **1201** forms at least a portion of a top portion of the implant body, and lateral side porous network of interconnected struts **1209** form at least part of the lateral sides of the implant body. In the embodiment, implant body **1202** includes frame **1213**, portions of which are connected or coupled by one or more discrete porous network of interconnected struts. For example, frame **1213** includes a plurality of axially extending frame members **1211***a*, **1211***b*, **1211***c*, and **1211***d* (**1211***d* is not shown or labeled, but is one of the lower or bottom members), which may also be referred to as struts, and which may be a part of the framework providing much of the structural support of the implant body. Frame **1213** may also comprise a proximal frame portion **1215**, which in this example extends laterally but obliquely (but not strictly laterally) across the width of implant body **1202**, and generally obliquely to the axially extending members **1211***a*-**1211***d*. In this example, proximal frame portion **1215** forms a proximal side of the quadrilateral shape of the implant, which in this example is a parallelogram, and in particular a rhomboid. Implant body frame **1213** also comprises distal frame portion **1217**, which in this example includes a sharpened distal end, which is described in more detail herein Similar to proximal frame portion **1215**, sharpened distal end **1217** extends generally laterally but not strictly orthogonally across implant body **1202** relative to long axis LA. Frame **1213** in this embodiment comprises distal frame portion **1217**, proximal frame portion **1215**, and a plurality of axially extending and linear frame members **1211***a*-**1211***d* coupling the proximal **1215** and distal **1217** frame members.

A plurality of discrete porous networks of interconnected struts extend between and couple the frame members, as shown, forming most of the top, bottom, and lateral sides of the implant body. The top and bottom porous networks of interconnected struts each form most of the top and bottom portions, respectively, that, in an end view of the implant, define at least partially curved configurations for the top and bottom portions of the implant. In this example, each of the lateral side porous networks of interconnected struts **1209** partially define the ilium and sacrum lumens, as shown, and in particular, define a lateral section of each of the lumens, even though the lateral sides of the lumen have openings therein in between the struts.

Body **1202** is also an example of an implant body that has a quadrilateral configuration, and in this example has a parallelogram configuration that does not include four right angles. For example, body **1202** is an example of an implant body that has a rhomboid configuration, and may alternatively have a rhombus configuration, but in alternative embodiments it may have other quadrilateral configurations (including rectangular, square, etc.).

Implant bodies herein may have, in a top view of the implant body, a general quadrilateral configuration. In this context, the term quadrilateral does not require completely linear sides. Any side of implant bodies herein may have some minor degree of curvature while still approximating a quadrilateral configuration, such as the implant body in FIG. **26**.

Additional details of porous networks of interconnected struts may be found in published PCT application WO2021/108590A1, the disclosure of which is incorporated by reference herein for all purposes. For example, any and all disclosure of porous networks of interconnected struts described in WO2021/108590A1 may be incorporated into the disclosure herein, including any examples that comprise one or more porous networks of interconnected struts. For example, a porous network of interconnected struts may also be referred to as a porous lattice, or mesh. Additionally, any of the individual struts herein may also be referred to as a beam. Additionally, the porous networks of interconnected struts may have and form a smooth outer surface, such as shown in the example in FIG. **12** (as opposed to struts or beams with free ends that extend outward). Additionally, in some embodiments the porous network may have an irregular configuration of struts, or it may have a regular pattern of struts, or a combination thereof. It is therefore understood that the term lattice or network as used herein does not require a regular or repeating pattern of struts. Additionally, struts of the porous network of interconnected struts may be interconnected at connections or nodal locations, which is described in more detail in, for example, WO2021/108590A1. Connections or nodal locations herein may be the connection of two, three, four, or more individual struts or beams of the porous network of interconnected struts.

Implant bodies herein that include a porous network of interconnected struts may have added stability once implanted as the bone grows around the many struts.

FIG. **13** is a distal and top perspective view illustrating exemplary implant **1350**, which, like others herein, is sized and configured for implantation across an SI joint from the dorsal approaches herein. Implant **1350** includes implant body **1352** that includes ilium portion **1354** that is sized and configured for implanting into an ilium when the implant is implanted across an SI joint from the dorsal approach. Implant body **1352** also includes a sacrum portion **1356** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**12**B may be incorporated by reference to the description of FIG. **13**. Ilium portion **1354** includes and defines an elongate ilium guide lumen **1358** that extends from a distal opening to a proximal opening, and is sized and configured to receive therein and move relative to an ilium positioning guide (not shown). Sacrum portion **1356** includes and defines an elongate sacrum lumen **1340** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1356** extends further proximally than ilium portion **1354** with reference to a length direction. Ilium portion **1354** extends further distally than sacrum portion **1356**, as shown, exemplary advantages of which are described herein. Implant body **1352** is also an example of an implant body with, in a top view, a parallelogram configuration that does not include four right angles, and in this example has a rhomboid configuration (but may alternatively have a rhombus configuration). Implant body **1352** is also an example of an implant body that has a wafer configuration. In this example, sacrum lumen **1340** has a length that is slightly greater than a length of the ilium lumen **1358**, but in alternatives it may be

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sacrum lumen **1340** has a length that is slightly greater than a length of the ilium lumen **1358**, but in alternatives it may be at least substantially the same or exactly the same as a length of the ilium lumen **1358**. The guide lumens in implant body **1352** are examples of lumens that have long axes that are parallel, which includes slight deviations from perfectly parallel (described herein). Ilium lumen **1358** and sacrum lumen **1340** are also parallel to a longitudinal (or long) axis LA of the implant body, with the long axis in this example extending in the length direction. In this example, long axis LA extends through a lateral midpoint of the implant body (e.g., dividing the implant body laterally into halves). As shown in the examples herein, a long axis of the implant body may or may not be a line of symmetry of the implant body in a top view of the implant body. In FIGS. **11**A-**28**, the long axis of the respective implant body is not a line of symmetry of the implant body in a top view. Implant body **1352** also includes a distal portion, at least a portion of which comprises sharpened distal end **1360**, which is described in detail elsewhere herein. Sharpened or cutting distal end **1360** has a tapered configuration **1364**, which tapers downward from a top portion **1362** of the implant body and that tapers upward from a bottom portion of the implant body. In this embodiment, tapering surface **1365** tapers downward and distally from top portion **1362**, and a tapering surface (not shown but on the bottom side of implant body **1352**) tapers upward and distally from the bottom portion of the implant body. The sharpened distal end **1360** has some height dimension that is less than the height between the top and bottom portions of the implant body from which the tapered surfaces extend. The tapering surfaces help the distal end **1360** penetrate into bone during implantation. Distal end **1360**, as shown, also has a concave curve configuration in a top view, and is recessed proximally relative to the distal ends of ilium portion **1354** and sacrum portion **1356**, as shown.

Implant body **1352** also comprises frame **1373**. Implant body **1352** may be monolithic (and may be 3D printed, for example), frame **1373** includes first and second axially extending elongate regions **1374***a* and **1374***b*, which are in ilium portion **1354** and sacrum portion **1356**, respectively. Axially extending elongate regions **1374***a* and **1374***b* are connected or coupled together by generally oblique connecting members **1375***a*, **1375***b* and **1375***c*, which extend across the long axis, and extend from elongate region **1374***b* non-orthogonally relative to the elongate region **1374***b*, and in this example extend from elongate region **1374***b* partially distally such that they have a slanted configuration and are further distally in the ilium portion than in the sacrum portion. The distal most connector **1375***c* includes, in this example, top surface **1362** from which the tapered surface **1365** extends distally and downward. The distal connector **1375***c* also includes a corresponding bottom surface of the implant and a bottom tapered surface that extends distally and upward. Frame **1373** is an example of a frame that has a shape that, in a top view, resembles a digital eight configuration that is slanted further distally on the ilium side.

The implant will be subject to stresses when implanted across the SI joint with a portion of the implant in the sacrum and a portion of the implant in the ilium. Connectors **1375** of the frame are adapted to resist both bending and shear forces.

Frame **1373**, in this embodiment, further defines a plurality of fenestrations (or openings) **1376***a* and **1376***b*, which as shown extend through the top and bottom portions or surfaces of the implant body. The fenestrations in any of the implant bodies herein can facilitate the ingrowth or ongrowth of tissue, while in some examples (such as FIGS. **15**A-**15**C) the fenestrations may be used to facilitate delivery of one or more agents into the patient. In alternative embodiments, any of the frames herein may include more than two fenestrations, such as from three to two hundred fenestrations. Implant body **1302** in FIG. **11**A is, for example, an example of an implant body including nine fenestrations **1320** extending through top and bottom portions or surfaces of the implant. Elongate members **1374***a* and **1374***b* and connecting members **1375***a*, **1375***b* and **1375***c*, in this embodiment, define fenestrations **1376***a* and **1376***b* that extend through the top and bottom portions of implant body.

FIG. **14** is a top view illustrating exemplary implant **1400**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **1400** includes implant body **1402**, which is similar to implant **1350** in some ways. Implant body **1402** includes ilium portion **1404** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1402** also includes sacrum portion **1406** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**13** may be incorporated by reference to the description of FIG. **14**. Ilium portion **1404** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1406** includes and defines an elongate sacrum lumen therein (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1406** extends further proximally than ilium portion **1404**, as shown. Ilium portion **1404** extends further distally than sacrum portion **1406**, as shown. Implant body **1402** is also an example of an implant body with, in a top view, a parallelogram configuration without right angles, and in particular has a rhomboid configuration (which may alternatively have a rhombus configuration if all sides have the same length).

Implant body **1402** is an example of an implant body that has a wafer configuration. In this example, the sacrum lumen has a length that is slightly greater than a length of the ilium lumen, although in alterative embodiments they may be substantially the same. The guide lumens in implant body **1402** are examples of lumens that have axes (ilium lumen axis "ILA" and sacrum lumen axis "SLA") that are parallel with each other, which again includes slight deviations from perfectly parallel. ILA and SLA are also each parallel to a long axis LA of the implant body, as shown, which passes through a lateral midpoint of implant body.

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Implant body **1402** also comprises frame **1413**, which is similar in some ways to frame **1373** in FIG. **13**, and which may have the same general configuration as frame **1373** in FIG. **13**. Implant body **1402** also includes porous network of interconnected struts **1401**, which may be additively manufactured with frame **1373**, for example, to form implant body **1402**. The disclosure that is incorporated by reference herein related to porous network of interconnected struts, such as the disclosure in WO2021/108590A1, may be incorporated into network **1401** of implant **1402**. Network **1401** may extend over and about a portion of frame **1413**, as shown, including over and about the lateral sides of the frame, as shown. As shown, network of interconnected struts **1401** may be at least partially continuous (or uninterrupted) laterally across portions of implant body, over a first lateral side, laterally across the bottom of implant body, and over the other lateral side. In some embodiments the network of struts may extend over and about a portion of frame **1413**. In some ways, implant body **1402** in FIG. **14** includes aspects of frame **1373** from FIG. **13** and network of struts **1201** from FIG. **12**.

All of the disclosure from FIG. **13** related to frame **1373** is incorporated by reference in its entirety into the disclosure of FIG. **14** with respect to frame **1401**.

Implant body **1402** is also an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiments, implant body **1402** may have a rhombus configuration, or it may have any other quadrilateral configuration (including rectangular, square, etc.). The proximal end of implant body **1402** is an example of a back or proximal side of an implant body that is considered a side, even though it does not have complete linearity.

FIGS. **15**A-**15**C illustrate implant **1500**, which is sized and configured for implantation across a SI joint from a dorsal approach, which is described herein. Implant **1500** includes implant body **1502** that includes ilium portion **1504** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1502** also includes a sacrum portion **1506** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**14** may be incorporated by reference to the description of FIGS. **15**A-**15**C. Ilium portion **1504** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening **1501** to a proximal opening **1503**, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1506** similarly includes and defines an elongate sacrum lumen therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. Exemplary lumens are described herein, and may each have a long axis. In this example, and as shown, sacrum portion **1506** extends further proximally than the ilium portion **1504**. Ilium portion **1504** extends further distally than sacrum portion **1506**, as shown, exemplary advantages of which are described herein. Implant body **1502** is also an example of an implant body with a parallelogram configuration without right angles, and in

this example, and as shown, sacrum portion **1506** extends further proximally than the ilium portion **1504**. Ilium portion **1504** extends further distally than sacrum portion **1506**, as shown, exemplary advantages of which are described herein. Implant body **1502** is also an example of an implant body with a parallelogram configuration without right angles, and in this example has a rhomboid configuration, exemplary benefits are described herein.

Implant body **1502** is an example of an implant body with a wafer configuration with a height dimension that is less than a width dimension. As shown, and in this example, the sacrum lateral side and sacrum lumen have lengths that are greater than corresponding lengths of the ilium lumen and ilium lateral side. The guide lumen axes in implant body **1502** are examples of lumens that have axes (ilium lumen axis ILA; sacrum lumen axis SLA) that are parallel to each other (as shown), which includes slight deviations from perfectly parallel. Ilium lumen axis ILA and sacrum lumen axis SLA are each also parallel to long axis LA of the implant body, as shown, which includes slight deviations from perfectly parallel.

Implant body **1502** further includes inner frame **1513**, which may include the same general or similar configuration as the frame in the embodiment in FIGS. **12** and **13**. In this regard, the entire disclosure of the frame from the embodiments in FIGS. **12** and **13** is incorporated by reference herein to the disclosure of frame **1513**. For example, frame **1513** includes a plurality of axially extending frame members (not labeled but may be the same or similar to those in FIG. **13**) and oblique or slanted connecting members (one of which is labeled, **1515**) coupling and extending between the axially extending frame members. Connecting member(s) **1515** also extend obliquely across long axis LA, as shown. Implant body **1502** also comprises distal sharpened end **1517**, which has a concave shape as shown, and which is described in more detail herein, and which extends generally laterally across implant body **1502**, as shown.

Implant body **1502** is an example of an implant body comprising one or more porous network of interconnected struts, as shown. Implant body **1502** includes a porous network of interconnected struts **1511** that in this embodiment extends over and about a top implant body portion, a bottom implant portion, and lateral sides of the implant body. In this embodiment, porous network of interconnected struts **1511** define larger cells or pores in the central region than in the ilium and sacrum portions of the implant, as shown.

Implant body **1502** is an example of an implant body with a quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1502** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration (including rectangular). The proximal end of implant body in FIG. **15** is an example of a proximal portion of an implant body that is considered to approximate a side of a quadrilateral even though it does not have complete linearity, as is shown.

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FIG. **15**B illustrates implant **1500**, and illustrates the exemplary length of the implant, measured axially from the distal end to the proximal end of the implant.

FIG. **15**C illustrates a perspective view of implant **1500**, and also illustrates lateral side fenestrations **1550***a* and **1550***b* in the sacrum side of the implant, and which are in communication with the sacrum lumen as shown. Fenestrations **1550***a* and **1550***b* may be used to help facilitate delivery of an agent into the patient via delivery of the agent through the proximal opening of the sacrum lumen. Alternatively or additionally, fenestrations **1550***a* and **1550***b* may help tissue growth therethrough, which can help stabilize the implant. The ilium lateral side can similarly have fenestrations **1550***a* and **1550***b* therethrough. The lateral sides of the implant can optionally have one or more fenestrations **1550** therethrough, such as, without limitation, from one to ten, or more.

FIG. **16** is a top view illustrating exemplary implant **1600**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **1600** may incorporate any suitable feature of any other implant body herein, such as those shown and described with respect to FIGS. **11**A-**15**. Implant **1600** includes implant body **1602** that includes ilium portion **1604** that is sized and configured for implanting into an ilium when the implant is implanted across an SI joint from the dorsal approach. Implant body **1602** also includes sacrum portion **1606** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Ilium portion **1604** includes and defines an elongate ilium guide lumen (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1606** includes and defines an elongate sacrum lumen therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1606** extends further proximally than ilium portion **1604**, as shown, exemplary advantages of which are described herein. Ilium portion **1604** extends further distally than sacrum portion **1606**, as shown, exemplary advantages of which are described herein. Implant body **1602** is also an example of an implant body with, in a top view, a parallelogram configuration without right angles, as shown, which may be rhomboid or rhombus shaped. Implant body **1602** is also an example of an implant body with a wafer configuration that has a height dimension that is less than a width dimension. In this example, the sacrum lumen and sacrum side have lengths that are greater than length of the ilium lumen and ilium lateral side, respectively (as shown). The guide lumens are examples of lumens that have long axes that are parallel with each other (as shown), which includes slight deviations from perfectly parallel. Elongate ilium lumen axis ILA and sacrum lumen axis SLA are also parallel to a longitudinal (or long) axis LA of the implant body, as shown. As shown in the examples herein, a long axis of the implant body LA may or may not be a line of symmetry of the implant body (in a top view), which in this case it is not. Implant body **1602** also includes a distal portion, at least a portion of which comprises sharpened distal end **1617**, exemplary details of which are described herein, and which may be incorporated into this embodiment. For example, sharpened or cutting distal end **1617** has a tapered configuration that tapers downward from a top portion of the implant

sharpened or cutting distal end **1617** has a tapered configuration that tapers downward from a top portion of the implant body and that tapers upward from a bottom portion of the implant body.

In this example, implant body **1602** includes a frame, which as shown does not comprise fenestrations through top and bottom portions of the implant body (e.g., such as fenestrations **1376***a* and **1376***b*). Any of the implants herein may not include fenestrations through top and bottom portions of the implant body, as is the case with implant body **1602**.

Implant body **1602** is an example of an implant body with a wafer configuration with a height dimension that is less than a width dimension. As shown, and in this example, the sacrum side and sacrum lumen have lengths that are greater than corresponding lengths of the ilium lumen and ilium side, respectively. The guide lumen axes in implant body **1602** are examples of lumens that have axes (ilium lumen axis ILA; sacrum lumen axis SLA) that are parallel to each other (as shown), which includes slight deviations from perfectly parallel. Ilium lumen axis ILA and sacrum lumen axis SLA are each also parallel to long axis LA of the implant body, as shown, which includes slight deviations from perfectly parallel.

Implant body **1602** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration, additional examples of which are shown herein. In alternative embodiment, implant body **1502** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration (including rectangular).

Implant **1600** may incorporate any other suitable feature of any of implant body herein.

FIGS. **17**A and **17**B illustrate an exemplary distal end **1720** of an ilium portion of an implant body, features of which may be incorporated into any of the distal ends of the ilium portions herein. FIG. **17**B is a front end view, also showing the ilium lumen. FIG. **17**C illustrates an exemplary distal end **1707** of a sacrum portion of an implant body, features of which may be incorporated into any of the distal ends of the sacrum portions herein. The distal end **1720** and **1707** both include a plurality of cutting edges **1750**, which in each case progressively have larger dimensions moving proximally, as shown. The configuration of the cutting edges **1750** on each end acts like a broach to help both ends penetrate into bone as the implant is advanced distally. Cutting edges **1750** have annular configurations, as shown, which may be colinear with the lumen axes, which is also shown. Exemplary sharpened distal end **1717** is shown in FIG. **17**B, exemplary details of which are described herein. In this example, the ilium distal end **1720** has three axially spaced annular cutting edges, while the sacrum region distal end **1707** has two axially spaced annular cutting edges. Each end may have more or fewer cutting edges. Cutting edges like those shown in FIGS. **17**A-**17**C are shown in the implant bodies in FIGS. **12**, **13**, **14**, **15**A-**15**C and **16**, and thus the description of these other figures implicitly includes the description of FIGS. **17**A-**17**C.

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Any of the ilium portions herein may have cutting edges, such as those shown in FIGS. **17**A and **17**B. Any of the sacrum portions herein may have cutting edges, such as those shown in FIG. **17**C.

FIGS. **18**A-**18**C illustrate implant **1800**, which include implant body **1802** that may be the same as implant body **1352** from FIG. **13** in all ways, except those described herewith. Implant body **1802** includes ilium portion **1804** that includes distal end **1820** with a configuration that helps penetrate or cut through tissue as the implant is being advanced distally. FIG. **18**B illustrates a close-up perspective view of distal end **1820** of ilium region **1804**. Ilium region **1804** includes ilium lumen IL, additional details of which are described herein. Distal end **1820** includes first cutting region **1822** with a first cutting member **1823**, and a second cutting region **1824** with a second cutting member **1825**. Concave surfaces extend between the two cutting regions, as shown. Second cutting region **1824** extends further distally and is wider than first cutting region **1822**. First cutting member **1823** has a height that is greater than a height of second cutting member **1825**. Cutting edges of both first and second cutting members **1823** and **1825** are relatively sharp and help penetrate through tissue as implant **1800** is advanced.

Sacrum region **1806** includes distal end **1807**, which may have the same configuration as any other sacrum or ilium portion distal end herein (including like distal end **1820**). The sacrum portion may optionally include sacrum lumen SL as shown in FIG. **18**C, but in alternative embodiments the sacrum portion may not include a lumen, as is described in examples herein. Implant body **1802** also has a sharpened distal end extending at least in the central portion of the implant body, examples of which are described herein and the disclosure of which is incorporated by reference into the description of FIGS. **18**A-**18**C.

Implant body **1802** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1802** may have a rhombus configuration, while in alternative embodiments it may have any other quadrilateral configuration.

FIG. **19** shows a top view of implant **1900**, which includes implant body **1902**, which may be the same in any or all ways as implant body **1802** in FIGS. **18**A-**18**C except for those details described herewith. Implant body **1902** includes frame **1913** and one or more porous network of interconnecting struts **1930** extending from frame **1913**. A porous network of interconnecting struts **1930** may by the same in any or all ways as porous network of interconnecting struts **1401** from FIG. **14**. Implant body **1902** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1902** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **20** is a top view of implant **2000**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **2000** may incorporate any suitable feature of any other implant body herein, such as those shown and described with respect to FIGS. **11**A-**19**. Implant body **2002** may be the same as implant body **1802** from FIGS. **18**A and **18**B in any or all other ways except those described herewith. Implant body **2002** includes ilium portion **2004** with an ilium portion distal end **2020** that does not extend as far distally as some ilium portion distal ends described herein. Additionally, sacrum portion **2006** includes sacrum portion distal end **2007** that does not extend as far distally as some sacrum portion distal ends described herein. Distal end **2020** of ilium portion **2004** includes first cutting region **2022** and second cutting region **2024**, and distal end **2007** of sacrum portion **2006** includes first cutting region **2009** and second cutting region **2011**, all of which have pointed or sharpened configurations that help penetrate or cut into tissue as the implant is advanced distally. Each of the adjacent sharpened regions have concave surfaces therebetween in the top view, as shown.

Implant body **2002** includes a distal portion that includes sharpened distal end **2017** (which extends through the central region of the implant body. Any or all exemplary details of any of the sharpened distal ends herein may be incorporated by reference into sharpened distal end **2017** of FIG. **20**. In this embodiment, due partially to the distal end of distal ends **2020** and **2007**, sharpened distal end **2017** does not have as pronounced a concave curve as in other embodiments herein. In fact, as shown, sharpened distal end **2017** has a slight "S" shape curvature, as shown. Sharpened end **2017** thus has a convex curvature along a first portion of the front face, and is concave along a second portion of the front face, wherein the convex region is closer to the ilium side, as shown. Any of the implant bodies herein may be modified to include any or all of the features shown and described with respect to FIG. **20**.

Implant body **2002** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2002** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **21** is a top view of implant **2100**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **2100** may be the same as implant **2000** in any or all ways except as described herewith. Implant body **2130** includes a plurality of porous networks of interconnecting struts **2130**. While only one network **2130** is shown that extends over a portion of the top portion of the implant **2100** (the network similar have a slanted digital eight configuration), it is understood that a second network **2130'** (not labeled) may similarly extend over the corresponding bottom portion of the implant body **2102**. Network **2130** may be considered similar to network **1930** shown and described with respect to FIG. **19**. Implant body **2102** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a

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with respect to FIG. **19**. Implant body **2102** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2102** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

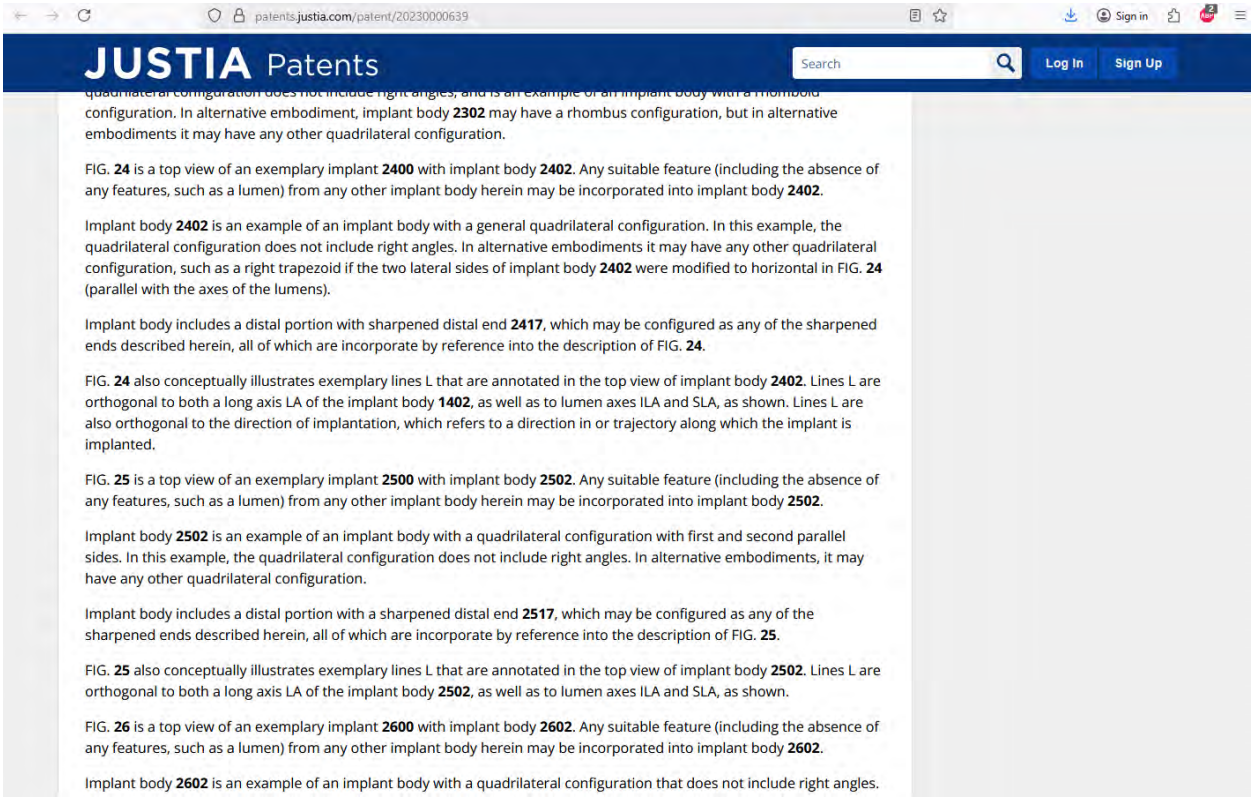
FIGS. **22**A-**22**C illustrate implant **2200**, which may include any suitable feature from any of implant **1350** in FIG. **13**, implant **1600** in FIG. **16**, implant **1800** from FIGS. **18**A-**18**C, and/or implant **2000** from FIG. **20**, except with respect to the features described herewith. Implant **2200** includes implant body **2202**, for which sacrum lumen SL does not have a distal opening, as shown. As such, delivery of implant **2200** does not include delivery over a sacrum guide, examples of which are described herein. Implant body **2202** includes a sacrum lumen SL, however, that includes a proximal opening, as shown, which may help facilitate growth on the lateral sacrum side via lateral sacrum side fenestrations **2240***a* and **2240***b*, as shown, or delivery of an agent therethrough as described herein. Additionally, as shown, distal end **2220** of the ilium region extends further distally than distal end **2207** of the sacrum region.

Implant body **2202** also includes a distal portion that comprises a sharpened distal end **2217**, exemplary details of which are described herein and may be incorporated fully into the description of FIGS. **22**A-**22**C. The curvature of the sharpened distal end has a varying radius of curvature along the curve, and may include a concave section and a convex section, for example. In the embodiment in FIGS. **22**A-**22**C, the sharpened distal end comprises a convex section that is closer to the ilium lateral side than the sacrum lateral side, and includes a concave curve section that is closer to the sacrum side than the ilium side, as shown.

Implant body **2202** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2202** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIGS. **23**A and **23**B illustrate implant **2300** comprising implant body **2302**, which may include any of the features of implant **2200** described with respect to FIGS. **22**A-**22**C. As with other examples herein, implant **2300** may include one or more network of struts **2130** extending about any portion of the implant body, examples of which are shown in FIGS. **23**A and **23**B.

Implant body **2302** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2302** may have a rhombus configuration, but in alternative



quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2302** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **24** is a top view of an exemplary implant **2400** with implant body **2402**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2402**.

Implant body **2402** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles. In alternative embodiments it may have any other quadrilateral configuration, such as a right trapezoid if the two lateral sides of implant body **2402** were modified to horizontal in FIG. **24** (parallel with the axes of the lumens).

Implant body includes a distal portion with sharpened distal end **2417**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **24**.

FIG. **24** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2402**. Lines L are orthogonal to both a long axis LA of the implant body **1402**, as well as to lumen axes ILA and SLA, as shown. Lines L are also orthogonal to the direction of implantation, which refers to a direction in or trajectory along which the implant is implanted.

FIG. **25** is a top view of an exemplary implant **2500** with implant body **2502**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2502**.

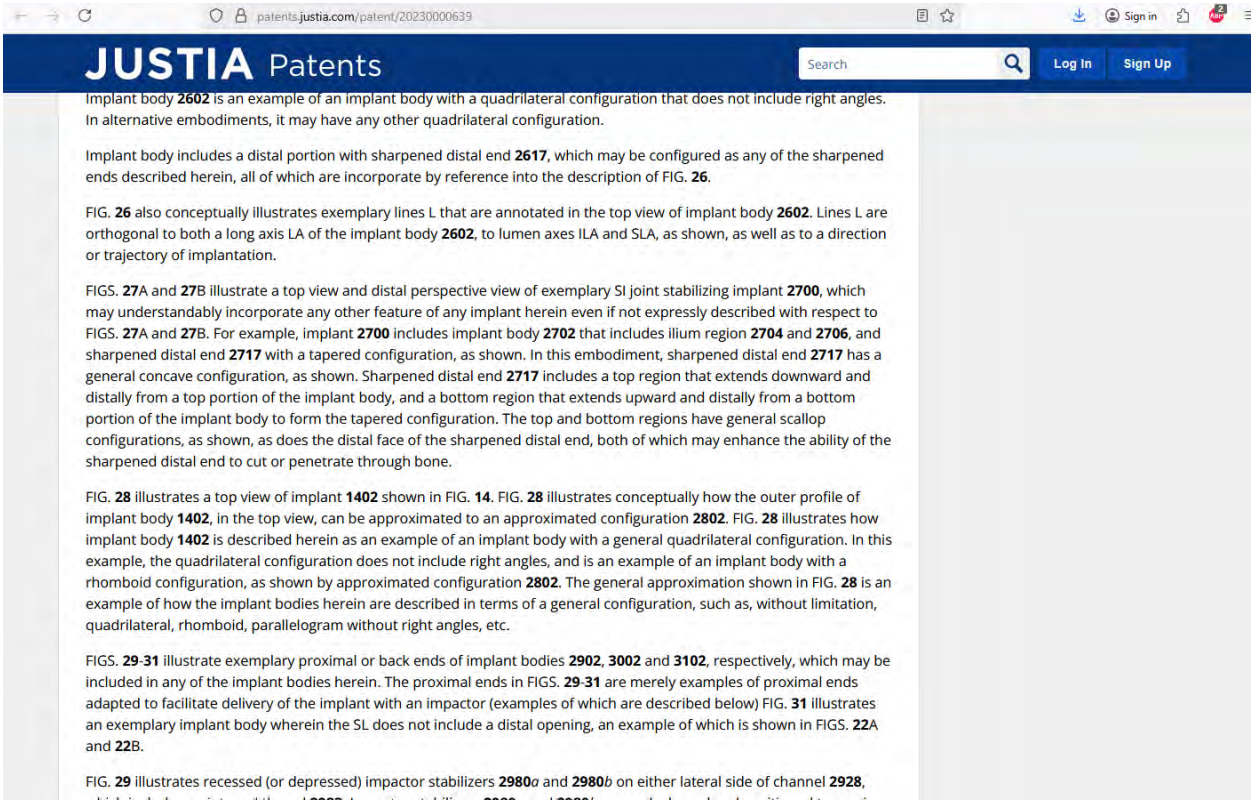
Implant body **2502** is an example of an implant body with a quadrilateral configuration with first and second parallel sides. In this example, the quadrilateral configuration does not include right angles. In alternative embodiments, it may have any other quadrilateral configuration.

Implant body includes a distal portion with a sharpened distal end **2517**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **25**.

FIG. **25** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2502**. Lines L are orthogonal to both a long axis LA of the implant body **2502**, as well as to lumen axes ILA and SLA, as shown.

FIG. **26** is a top view of an exemplary implant **2600** with implant body **2602**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2602**.

Implant body **2602** is an example of an implant body with a quadrilateral configuration that does not include right angles.



Implant body **2602** is an example of an implant body with a quadrilateral configuration that does not include right angles. In alternative embodiments, it may have any other quadrilateral configuration.

Implant body includes a distal portion with sharpened distal end **2617**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **26**.

FIG. **26** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2602**. Lines L are orthogonal to both a long axis LA of the implant body **2602**, to lumen axes ILA and SLA, as shown, as well as to a direction or trajectory of implantation.

FIGS. **27**A and **27**B illustrate a top view and distal perspective view of exemplary SI joint stabilizing implant **2700**, which may understandably incorporate any other feature of any implant herein even if not expressly described with respect to FIGS. **27**A and **27**B. For example, implant **2700** includes implant body **2702** that includes ilium region **2704** and **2706**, and sharpened distal end **2717** with a tapered configuration, as shown. In this embodiment, sharpened distal end **2717** has a general concave configuration, as shown. Sharpened distal end **2717** includes a top region that extends downward and distally from a top portion of the implant body, and a bottom region that extends upward and distally from a bottom portion of the implant body to form the tapered configuration. The top and bottom regions have general scallop configurations, as shown, as does the distal face of the sharpened distal end, both of which may enhance the ability of the sharpened distal end to cut or penetrate through bone.

FIG. **28** illustrates a top view of implant **1402** shown in FIG. **14**. FIG. **28** illustrates conceptually how the outer profile of implant body **1402**, in the top view, can be approximated to an approximated configuration **2802**. FIG. **28** illustrates how implant body **1402** is described herein as an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration, as shown by approximated configuration **2802**. The general approximation shown in FIG. **28** is an example of how the implant bodies herein are described in terms of a general configuration, such as, without limitation, quadrilateral, rhomboid, parallelogram without right angles, etc.

FIGS. **29**-**31** illustrate exemplary proximal or back ends of implant bodies **2902**, **3002** and **3102**, respectively, which may be included in any of the implant bodies herein. The proximal ends in FIGS. **29**-**31** are merely examples of proximal ends adapted to facilitate delivery of the implant with an impactor (examples of which are described below) FIG. **31** illustrates an exemplary implant body wherein the SL does not include a distal opening, an example of which is shown in FIGS. **22**A and **22**B.

FIG. **29** illustrates recessed (or depressed) impactor stabilizers **2980***a* and **2980***b* on either lateral side of channel **2928**,

FIG. **29** illustrates recessed (or depressed) impactor stabilizers **2980***a* and **2980***b* on either lateral side of channel **2928**, which includes an internal thread **2983**. Impactor stabilizers **2980***a* and **2980***b* are each shaped and positioned to receive therein a protrusion on the distal end of an impactor or other delivery tool, such as protrusions **5960** shown in FIG. **59**D. The interface and engagement between the impactor and implant on both sides prevents rotation therebetween when the implant is loaded onto the impactor and when the implant is impacted.

Channel **2982** includes an internal thread, which is configured to engage with the external thread on implant securing member **5958** of the impactor to facilitate the releasable coupling between the impactor and the implant. The releasable coupling therebetween allows the implant to be axially secured to the impactor for impaction across the SI joint, and also allows the implant to be retracted proximally if needed by pulling on the impactor.

FIGS. **30** and **31** illustrate exemplary proximal ends that include recessed impactor stabilizers **3080** and **3180**, respectively, which are sized and configured to interface with protrusions on a distal end of a delivery tool, such as an impactor herein. Stabilizers **3080** and **3180** are examples of stabilizers that are centrally located (in a lateral direction), and may extend across the long axis of the implant.

One aspect of the disclosure is related to methods of positioning an SI joint stabilizing implant across a SI joint from a dorsal approach. In these methods, the SI joint implant may be any of the SI joint implants herein unless the method is limited to one or more implants herein. The methods may include advancing an elongate ilium positioning guide from a dorsal starting point, such as starting point **1122** shown in FIG. **32**A, and into an ilium of a subject. For example only, FIGS. **2**A and **2**B illustrate exemplary ilium guide **22**, but other types of ilium guides may be positioned from a dorsal approach into an ilium of the subject. FIG. **32**A also illustrates a general region **1120** into which any of the ilium guides herein may be started and advanced into an ilium to function as a guide for the SI joint implant. The methods herein may include engaging a guide interface member of the SI joint implant with a positioning guide to restrict movement of the implant with respect to the positioning guide in at least one direction. For example only, FIGS. **1**A and **1**B illustrate ilium guide interface member **18** of SI joint implant **14**, but other interface members herein may be engaged with any of the guides herein to restrict movement of the SI joint implant with respect to the positioning guide in at least one direction. The methods may include, at a time subsequent to the engaging step, advancing the implant across the SI joint while guiding the implant with the positioning guide to implant the implant across the SI joint. The methods further include removing the positioning guide from the ilium and leaving the implant implanted across the SI joint. The methods may include advancing a positioning guide into an ilium between lateral and medial cortical walls of the ilium, descriptions and locations of which are generally known and shown generally in FIGS. **32**A and **32**B. In these methods, engaging the implant with an ilium positioning guide helps maintain the implantation trajectory and limits the extent to which the implant migrates towards the sacrum while advancing the implant across the SI joint.

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Some methods may also include advancing a sacrum positioning guide into a sacrum of the patient, and further engaging a second guide interface member of the implant with the sacrum positioning guide. In these examples, the implant advancing step may occur while also guiding the implant with the sacrum positioning guide. In these examples, the method also includes removing the sacrum positioning guide from the sacrum. Any of the methods herein may include positioning a sacrum positioning guide into a sacrum before or after an ilium positioning guide is positioned in an ilium.

Methods herein may optionally include, prior to implanting the implant across the SI joint, interfacing a sharpened broach with one or more of the guides herein; advancing the sharpened broach over the one or more positioning guides towards the SI joint while guiding the broach with the one or more positioning guide; and creating a space for the SI joint implant with the sharpened broach. These methods may include removing the broach to allow dorsal access to the space. An implant may then be advanced over the one or more positioning guides as described elsewhere herein and implanted across the SI joint.

Depending on the implant being implanted across the SI joint, any of the methods herein may also include positioning a second ilium positioning guide from a dorsal approach into the ilium of a subject. These examples may also include engaging a second guide interface member of the implant with the second ilium positioning guide to further restrict movement of the implant with respect to the second ilium positioning guide in at least one direction.

Depending on the implant being implanted across the SI joint, any of the methods herein may optionally include positioning first and second sacral positioning guides from a dorsal approach into the sacrum of a subject. These examples may also include engaging first and second sacrum guide interface members of the implant with the first and second sacrum positioning guides to further restrict movement of the implant with respect to the first and second sacrum positioning guides in at least one direction.

Any of the individual method steps set forth herein may be combined with any other suitable method step or sequence of steps, unless the disclosure herein indicates to the contrary.

As is described above, an aspect of this disclosure is related to methods of positioning a sacro-iliac ("SI") joint stabilizing implant across a SI joint from a dorsal approach. An additional aspect of this disclosure is delivery tools that facilitate the delivery of one or more guides into the ilium and/or sacrum, and the methods of delivering the one or more guides into the ilium and/or sacrum. The disclosure that follows is related to those methods and delivery tools, and may be incorporated into any of the other disclosure herein. For example, methods and delivery tools herein may include and be adapted for advancing an elongate ilium positioning guide from a dorsal approach into an ilium of a subject, engaging an

with respect to the ilium positioning guide in at least one direction, advancing the implant across the SI joint while guiding the implant with the ilium positioning guide, and removing the ilium positioning guide from the ilium. The disclosure that follows provides merely exemplary and illustrative additional steps that may be incorporated into any of these methods. It is fully understood that these steps are illustrative, may be optional, and are not limiting the general methods set forth herein. It is also fully understood that the order of one or more of the steps set forth herein may be changed. The method steps that follow may refer to one or more delivery devices, examples of which are shown in FIG. **33** (e.g., impactor, positioning template, pin guide, guide pins, trephines, etc.). It is understood that the names of these delivery devices are not necessarily limiting, and they instead may be described or characterized by the one or functions they provide during the procedure. For example, a guide pin may instead be considered more generally as a positioning guide or simply a guide for the implant. A parallel pin guide herein may also be referred to as a pin guide herein.

Methods herein may include one or more steps to ensure a proper trajectory for the implant. The one or more positioning guides (e.g., guide pins) herein may help facilitate the desired trajectory from the dorsal approach. Methods herein may also include one or more steps to properly determine a starting point or location for the one or more positioning guides. The methods herein may further include one or more steps to advance the positioning guides along a proper trajectory, which may help maintain a desired or proper trajectory for the implant when advanced distally relative to the positioning guide(s). Merely exemplary steps that may be performed to position one or more positioning guides and advance an implant in a dorsal approach are set forth below, and are made in reference to FIGS. **34**A-**38**.

A patient may be positioned in a prone position to facilitate the dorsal approach and dorsal entry. Radiograph imaging may be performed to obtain an A/P (anteroposterior) view of the SI joint region, as shown in FIG. **34**A. The inferior joint aspect of the SI joint may be localized. A visual marking may be made on the skin (e.g., with a marker), optionally about 1 cm proximal to the end of the joint, which can generally indicate an implant insertion location, such as shown in FIG. **34**B. A second visual skin marking may be made, which may be 3 cm long or about 3 cm long, in line with the SI joint bifurcating the transverse skin mark, such as shown in FIG. **34**B. A skin incision may then be made along the second visual skin marking. An inlet oblique view may then be obtained, which may provide a view of the inferior limb of the articular joint, such as shown in FIG. **34**C. A positioning template, such as the example shown in FIG. **33**, may be placed in line with the transverse skin visual marking, and as represented in the view of FIG. **34**D. It is of note that the methods herein may use only one positioning guide (e.g., pin), and the methods herein that use three are exemplary. The center hole or aperture in the positioning template may be positioned over the SI joint. The positioning template may be used to properly position one or more guide pins at one or more desired entry or starting point locations, and is illustrated in place in FIG. **34**E (to illustrate the position relative to the view that is shown). Any of the methods herein may further include positioning a guide pin through the positioning template into the Ilium, optionally through an ilium aperture in the template, which may be one or one, two, or three apertures in the template. The guide pin may have a sharpened distal end to help advance

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guide pin through the positioning template into the Ilium, optionally through an ilium aperture in the template, which may be one or one, two, or three apertures in the template. The guide pin may have a sharpened distal end to help advance the guide pin. A sharp ilium guide pin may be replaced with a blunt ilium pin. The methods herein may further include aligning the pin, optionally in the inlet oblique view, so that it is parallel to the inferior aspect of the SI joint. The pin may be seated in the ilium and advanced, optionally 1 cm or about 1 cm. A lateral view may then be obtained, such as in FIG. **34**F, and the ilium guide pin may be advanced, such as, for example only, 4 cm or about 4 cm.

The following steps are understood to be optional, and not all steps may need to be performed depending on the implant and the particulars of the procedure. For example, one or all of the following steps may not be performed if the method does not utilize more than a single guide pin (e.g., an ilium guide pin). The description that follows is made in reference to FIGS. **35**A-**35**C, but it is fully understood that one or more of these steps may occur in combination with one or more of the steps described with respect to FIGS. **34**A-**34**F. The methods may further include obtaining an Inlet Oblique View, and the positioning template may be removed from the patient. A pin guide, an example of which is shown in FIG. **33** and labeled parallel pin guide (which can also be seen in FIGS. **35**A-**35**C), may be advanced over the guide pin that is in the ilium. In the example in FIG. **33**, the longer of the tubes of the pin guide may be advanced over the ilium pin, which can be seen in FIG. **35**A. The methods herein may include advancing a guide pin (such as a stepped guide pin) into the sacrum through a sacrum guide tube of the pin guide, which can be seen in the view of FIG. **35**A. The methods herein may include preparing a hole in the joint through a central lumen of the parallel pin guide, such as by drilling with a trephine through the center hole to a stop, such as into the joint approximately 30 mm, which can be seen in FIG. **35**B. A broach may be used instead of a drill, for example, and it is understood that any of the methods herein may be performed completely without electrical power (e.g., without power tools). If a trephine is used, the trephine may be removed, a guide pin may be advanced through the central lumen of the pin guide. Performing this optional step may help prevent the pin guide from rotating while placing a sacral trephine. The optional sacral guide pin may be removed and a hole may be prepared in the sacrum, such as by drilling into the sacrum with the trephine, such as about 30 mm, and example of which can be seen in FIG. **35**C. The methods herein may include removing an optional sacral trephine and placing a blunt pin in the sacrum through the sacrum tube of the pin guide (not shown). The pin guide may be removed, and a central guide pin, if utilized, may be removed. A hole may optionally be prepared in the ilium, such as by drilling with a trephine over the iliac pin, such as up a line (e.g., 30 cm) on the trephine. A broach may alternatively be used without power to prepare an ilium hole. A trephine may be removed from the ilium, and in this merely exemplary embodiment, iliac and sacral guide pins are left behind in the patient to help guide the implant during implantation. It is again noted that any of the methods herein may utilize only one positioning guide (e.g., one guide pin), such as an ilium positioning guide.

With specific but not limiting reference to exemplary implant **1300** from FIGS. **11**A and **11**B, the implant may then be engaged with the guides (e.g., pins) by advancing the lumens **1305** and **1307** over the respective guide pins. The ilium

With specific but not limiting reference to exemplary implant **1300** from FIGS. **11**A and **11**B, the implant may then be engaged with the guides (e.g., pins) by advancing the lumens **1305** and **1307** over the respective guide pins. The ilium portion, which in this example does not extend as far proximally as the sacrum portion, is engaged with the ilium positioning guide and the implant **3610** is advanced over the pin guides, as shown in FIG. **36**. An impactor **3600** (or other similar tool that can be used to advance the implant) can be advanced over the guide pins behind implant **3610** until it engages the implant at location **3620**. As shown in FIGS. **33** and **36**, the distal end of the impactor can have a configuration that is shaped to mate with the configuration of the proximal end of implant **3610**, and also to allow the impactor to apply a distally directed force to the implant. In this example, the impactor distal end is also stepped to match the configuration of the proximal end of implant **3610**. Implant **3610** may include any of the features of any of the implants herein. Impactor **3600** includes a plurality of pin guides **3602** as well, sized and configured to receive therein the guide pins **3640**, which in this embodiment are lumens extending axially along lateral portions of the impactor, as shown. This allows the impactor **3600** to be advanced over the guide pins and to be aligned with implant **3610** to facilitate distal advancement of the implant **3610** by applying a distally directed force on impactor **3600** (directly or indirectly applying the force). The implant may be advanced to the desired depth by applying the force on the impactor (e.g., with a mallet). The impactor and guide pins may be removed, leaving the implant behind implanted in the patient across the SI joint. A proper implant position may be confirmed, such as shown in the views of FIGS. **37**A, and **37**B.

It is understood and stated again that the methods of implantation herein may include using as few as one, and optionally two, three or more guide pins.

Any of the methods of implantation herein may be performed solely under an inlet radiographic view. Any of the methods of implantation herein may be performed solely under an inlet or inlet oblique radiographic view.

Any of the methods of implantation herein may be performed without electric power (e.g., manual power only). Any of the methods of implantation herein may be performed with electric power (e.g., including use of an electric drill for one or more steps, examples of which are set forth herein).

Any of the methods steps herein that include preparing a hole may be performed by drilling a hole. Any of the methods steps herein that include preparing a hole may be performed by manually creating a hole, such as with a broach. Broaches herein may also be used to create a channel within the bones from one guide pin to the other to accept the entire implant.

Any of the methods herein may include a removable pin that threads into the sacral tube of the pin guide. This may provide an added advantage of not risking distal advancement beyond a desired location, which may reduce the risk of

entire implant.

Any of the methods herein may include a removable pin that threads into the sacral tube of the pin guide. This may provide an added advantage of not risking distal advancement beyond a desired location, which may reduce the risk of damaging sensitive tissue.

The disclosure that follows provides additional and exemplary methods and steps that may be included when preparing for the implantation and implanting any of the SI joint implants herein from a dorsal approach. The disclosure that follows describes a merely exemplary method, not all steps of which are necessarily required (and the order of some steps may be changed), and refers generally to FIGS. **40**-**55**B. Suitable method steps below may, however, be incorporated into alternative methods described herein, and vice versa. An exemplary method of placing a plurality of guide pins may include, in an inlet oblique view such as is shown in FIG. **40**, optionally placing a needle in the SI joint, as may occur in an SI joint injection. The method may optionally include injecting a contrast media such as Omnipaque with the needle to ensure the needle is in the SI joint, which can be viewed in, for example, an inlet oblique view and/or a lateral view as shown in FIGS. **41**A and **41**B. As shown in the radiographic view of FIG. **42**A, the method may include placing an exchange pin along the skin over the sacral promontory. The method may include creating a linear skin marking along the exchange pin, as shown in FIG. **42**B. Additional skin markings may be made on either side of the SI joint, such as about 2 cm on either side of the SI joint, which may be used for creating an incision, which is described below. The method may include removing the back end of the needle, including the luer lock, and placing a Jamshidi™ needle over the needle, as represented in FIG. **43**. The method may include removing the original needle and replacing it with a nitinol wire through the Jamshidi™ needle and into the SI joint. The Jamshidi™ may then be removed, leaving the nitinol wire in the SI joint, as shown in FIG. **44**.

The method may also include making an incision along the linear marking between the additional markings that were made on either side of the SI joint, such as an incision about 4 cm in total length (e.g., 2 cm on either side of the joint). The method may also include placing a pin guide over the nitinol wire. Exemplary pin guides are shown in FIGS. **33** and **45**, both of which are examples of pin guides that include a plurality of tubes or channels as shown, and are also examples of pin guides that include three tubes, channels, or lumens. In an exemplary method, the center of three channels may be placed over the nitinol wire, which is shown in FIG. **46**A and the radiographic image of FIG. **46**B. Pin guide adjustment may be made under radiographic imaging such as fluoroscopy to obtain the appropriate pin guide positioning. The exemplary pin guide shown in FIG. **45** includes actuators that in this example include knobs that can individually be tightened against one of the three channels or tubes to prevent them from moving axially relative to the pin guide main body. Releasing the engagement can be performed to allow any of the tubes to be individually moved axially relative to the main body, after which time their relative axial positions can again be fixed by rotating the knobs until the threaded element engages the

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which time their relative axial positions can again be fixed by rotating the knobs until the threaded element engages the particular tube/channel. A variety of alternative mechanisms to both maintain axial position in a first configuration yet allow for axial movement in a second configuration may also be used. As used herein, any of the pin guide tubes may also be referred to herein as pin guide channels, both of which are understood to define a pin guide lumen therethrough.

The method may also include placing a sacral tube of the pin guide down to sacral bone. The sacral-side knob may then be tightened to secure the sacral tube of the pin guide on the sacrum. The method may include placing a pin (e.g., a 3.2 mm pin) through the sacral tube of the pin guide through sacral cortex, but not to depth. The pin may be positioned through the sacral cortex with a mallet, for example, as is shown in FIG. **47**.

The method may also include distally advancing an ilium tube of the pin guide down and into contact with iliac bone, which may be performed before or after the sacral tube is advanced distally to sacral bone. The ilium-side knob on the pin guide may then be tightened to secure the ilium tube of the pin guide on the ilium. The method may include placing a pin (e.g., a 3.2 mm pin) through the ilium tube of the pin guide through ilial cortex, but not to depth, which may be performed before or after the sacrum pin is advanced through sacral cortex. The ilium pin may be positioned through the ilial cortex with a mallet, for example, as shown in FIG. **48**A and the radiographic image of FIG. **48**B. At this exemplary embodiment, guide pins are positioned in both the sacrum and ilium (which may be positioned therein in either order).

The method may include providing or taking a lateral image, as shown in FIGS. **49**A and **49**B, and distally driving the sacrum and ilium pins (in either order, or only one pin if the procedure utilizes only a single pin) to depth in the lateral view. The method may preferably include not distally advancing the guide pins passed the alar line, as shown. At this time, the elongate guiding wire (e.g., nitinol wire) may be removed from the optionally center channel of the pin guide.

A hole may optionally then be drilled through a center channel of the pin guide, as shown in FIG. **50**. The pin guide may then be removed from the patient, leaving the ilium and sacrum pins in place in the ilium and sacrum, respectively. Ilium and sacrum bone may then be cut or removed using a cutting instrument such as a trephine placed over the ilium and sacrum pins, as shown in FIG. **51**. Preferably only cortex bone is cut with the cutting instrument.

With guide pins in place in the ilium and sacrum, the SI joint implant can be engaged with the guide pins, details of which are described herein, an exemplary step of which is shown in the radiographic image of FIG. **52**. The implant is then impacted to depth (e.g., using an impactor such as shown in FIG. **33** or other similar impactor) across the SI joint while being guided by the guide pins, as shown in FIGS. **53**A and **53**B, and additional details of which are set forth above. After the implant is delivered to the desired position across the SI joint, the impactor and the guide pins may then be removed, which is shown in FIG. **54** when the guide pins are being removed. An additional lateral view (FIG. **55**A) and an outlet view (FIG. **55**B) may be obtained to visualize the implant position across the joint.

being guided by the guide pins, as shown in FIGS. **53**A and **53**B, and additional details of which are set forth above. After the implant is delivered to the desired position across the SI joint, the impactor and the guide pins may then be removed, which is shown in FIG. **54** when the guide pins are being removed. An additional lateral view (FIG. **55**A) and an outlet view (FIG. **55**B) may be obtained to visualize the implant position across the joint.

This exemplary method includes implanting an SI joint implant that comprises larger and fewer fenestrations than the implant in FIG. **11**A, which can be seen in the radiographic image of FIG. **55**B. This method also includes implanting an implant that includes a proximal region that does not include a sacrum region that extends further proximally than an ilium region, in comparison to the implant in FIG. **11**A. As shown in FIG. **55**B, the implant in this embodiment also includes a distal central region with at least some degree of curvature, which is described in more detail above with respect to the implant in FIGS. **11**A and **11**B. Additionally, the implant shown in FIG. **55**B also includes a sharpened distal central region, examples of which are described herein.

The disclosure that follows provides additional exemplary delivery tools (e.g., a pin guide) sized and configured for positioning one or more guides (e.g., guide pins) into an ilium and/or sacrum. The disclosure that follows additionally provides exemplary tools for advancing implants over the one or more guides and into position across the SI joint. It is understood that aspects of methods that follow may be incorporated into other methods of guide pin placement herein, and vice versa. It is also understood that features of delivery tools that follow may be incorporated into other suitable delivery tools herein, and vice versa. The methods and delivery tools that follow may be used to delivery one or more of the suitable implants herein. The disclosure below describes delivery tools in the context of their methods of use with the exemplary methods.

In the dorsal approach with the patient prone (with their back facing up), an incision can first be made proximate the SI joint, followed by retracting soft tissue to expose the underling bone and provide access to the joint.

FIGS. **56**A and **56**B illustrate an exemplary pin guide **5600** that can be used in methods herein to place one or more guides (e.g., guide pins) into an ilium and/or a sacrum from a dorsal approach. Pin guide **5600** includes pin guide body **5602** with an ilium guide portion **5604** that is optionally longer than sacrum guide portion **5606**. Ilium guide portion **5604** includes a lumen **5605** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described below. Sacrum guide portion **5606** includes a lumen **5607** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described below. Body **5602** further includes first and second laterally extending attachment members **5610***a* and **5610***b*, which are configured to interface with an optional elongate handle (described below), wherein the optional handle can be held by medical personnel and which can help maintain the position of pin guide **5600**. The distal direction indicates the front of the pin guide **5600** that is first advanced into the patient. The pin guide may include a visual indicator that indicates if it should be used for right or left SI joint pin

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maintain the position of pin guide **5600**. The distal direction indicates the front of the pin guide **5600** that is first advanced into the patient. The pin guide may include a visual indicator that indicates if it should be used for right or left SI joint pin placement. For example, in this embodiment the pin guide includes a visual indicator that states Right or Left, but other indicators may be used.

FIGS. **56**C and **56**D illustrate perspective front and side views, respectively, of alternative pin guide **5600**′, which can be the same as pin guide **5600** in all other ways (and used in the same ways) except as described herewith. The same components are similarly labeled, such as body **5602** (FIGS. **56**A, **56**B) and **5602**′ (FIGS. **56**C, **56**D). Implant **5600**′ includes first and second central pins **5690***a* and **5690***b*, which may be permanently coupled with (attached to) body **5602**′. Pins **5690***a* and **5690***b* are laterally aligned, with pin **5690***a* being superior to or above **5690***b*. Pins **5690***a* and **5690***b* extend to the same extent distally, as shown in FIG. **56**D. Pins **5690***a* and **5690***b* are generally configured and positioned to be advanced across the SI Joint as pin guide is being moved distally towards the SI joint. Pins **5690***a* and **5690***b* extend further distally than other parts of pin guide and are the first portion of pin guide **5600**′ to engage with the SI joint. Pins **5690***a* and **5690***b* may, in some embodiments, extend from 10 mm to 20 mm distally from the pin lumens in body **5602**′. Pins **5690***a* and **5690***b* have sharpened distal ends to pierce into joint tissue and help secure the pin guide relative to the Joint. As set forth herein, the pin guide may or may not include central joint pins **5690***a* and **5690***b*, although incorporating them may help secure the pin guide relative to the joint as the other one or more pins as advanced into bone.

FIGS. **57**A and **57**B illustrate exemplary handle **5700** after it has releasably secured to one of the laterally extending attachment members. FIG. **57**B is a close up view of the region where they are releasably coupled. Handle **5700** includes a channel at one end sized and configured to fit over and be secured to the attachment member. A variety of mechanisms may be used to secure the two components together, and in this example the attachment members include a detent or recessed region configured to receive a locking element within the channel of the handle. The handle is configured to be gripped or grasped by medical personnel, which may make it easier to maintain the position of the pin guide during the pin placement procedure. FIGS. **57**A and **57**B illustrate pin guide **5600**′, which has a visual of Left to indicate it is configured for pin placement in a procedure on a patient's left SI joint. The left and right pin guides may have the same features, but which are mirror images of each other so they can be used on the right or left side. Additionally, pin guides **5600** and **5600**′ are optionally longer on the ilium side, as shown. The optional handle may be attached to the pin guide prior to the following exemplary steps.

Distal tips of the optional pins **5690***a* and **5690***b* may then be centered within the SI joint, and the starting point is optionally about 1 cm superior from the ventral SI joint surface. Pin guide **5600**′ (or any other pin guide herein) may be tapped into the SI joint at the target anatomy, optionally about 1 cm superior from the ventral SI joint surface, and the distal tip of the pins **5690***a* and **5690***b* may be docked into the joint.

FIG. **64** illustrates an exemplary pin guide **6400**, which is similar to pin guides **5600** and **5600**′ but with differences set forth herein. Any suitable feature of pin guide **5600** or pin guide **5600**′ may be incorporated into the disclosure of FIG. **64** unless indicated to the contrary herein. Pin guide **6400** includes body **6402**, ilium guide portion **6404** with lumen **6405**, and sacrum guide portion **6406** with lumen **6407**. Sacrum guide portion **6406** can extend as far distally as ilium guide portion **6404**, as shown.

Unlike with pins **5690***a* and **5690***b* in FIGS. **56**C and **56**D, which have a fixed orientation relative to pin guide **5602**′, pin guide **6400** is adapted such that distal pin **6470** can move relative to the pin guide body **6402** when pin guide **6400** is in a first state, and then can be locked in place relative to pin guide body **6402** (or at least become much more relative thereto) when pin guide **6400** is in a second state. Particularly, and in this embodiment, when stabilizer **6465** is in a first state, pin **6470** can be moved 360 degrees relative to the distal end of the body **6402** from which pin **6470** extends. By tightening stabilizer **6465** to a second state, however, the orientation of pin **6470** relative to body **6402** can be locked in place or at least becomes much more difficult to move relative to body **6402**. By allowing more relative movement between the pin **6470** and body **6402** in a first state, yet allowing the orientation of the pin **6470** to be secured relative to the body **6402** in a second state, the pin **6470** can first be placed into the joint, and then the orientation of the pin guide body **6402** can be fine-tuned as desired by moving it relative to the already placed pin. The pin guide body **6402** can thus be moved relative to the set pin until the body lumens **6405** and **6407** are aligned with the desired trajectories for the ilium pin and the sacrum pin, which are subsequently placed as is set forth herein. When the pin guide body **6402** has been moved to the desired orientation relative to the joint and bones, stabilizer can then be actuated to cause the position of the pin guide body **6402** to be set in place (or least more secured) relative to the pin and the joint in which the pin is placed. This arrangement thus allows for fine tuning the position and orientation of the guide body relative to the pin and joint after the pin has already been placed in the joint, yet further allows the guide body position to be set once it's been moved into the desired orientation.

In this exemplary embodiment, distal pin **6470** in FIG. **64** may be fastened or coupled to pin guide **6400** via a spherical ball-and-socket that allows the user to place the pin **6470** in the joint, and then fine tune the positioning of the sacrum guide portion **6406** and ilium guide portion **6404** over the respective bones as described above.

In use, the mounting pin **6470** may first be placed in the joint in approximately the correct location. The pin guide **6402** positioning can be further refined by decoupling the mounting pin **6470** from the pin guide **6402** by pulling the most proximal knob **6460** further proximally. The resistance of the ball-and-socket joint can be increased and decreased by turning the threaded stabilizer **6465** just distal to the proximal knob **6460**. The sacrum and ilium guide portions **6406** and **6404** can be aligned over the respective bones, and the ball-and-socket joint resistance can be increased by turning threaded stabilizer **6465** clockwise, which limits movement between pin **6470** and body **6402**. Ilium guide portion **6404**

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threaded stabilizer **6465** clockwise, which limits movement between pin **6470** and body **6402**. Ilium guide portion **6404** includes a lumen **6405** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described above with respect to FIGS. **56**A-**56**D. Sacrum guide portion **6406** includes a lumen **6407** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described above. After the sacrum and ilium guide portion positions are set, positioning of the guide pins such as **5830** and **5860** described herein may proceed, examples of which are described herein. All other uses of the pin guides herein may be applicable to pin guide **6400** shown in FIG. **64**.

FIGS. **58**A-**58**C illustrate a system of tools **5800** that can be to deliver one or more pins. FIGS. **58**A-**58**C illustrate many components assembled, but the disclosure that follows describes an exemplary process starting with pin guide **5600** prior to assembly with any of the other components.

A sharp tipped guide tube **5810** can be placed through lumen **5607** in sacral side **5606** of pin guide **5600**, as shown in FIGS. **58**A and **58**B. Cap **5820** may then be placed on the back (proximal) end of sacrum tube **5810**, as shown in FIGS. **58**A and **58**C. In this example the two components are configured to allow cap **5820** to be rotated to cause rotation of sacrum tube **5810**, and in this example they have a hex mating arrangement, as shown. Sacrum tube **5810** may then be rotated clockwise to advance sacrum tube **5810** through soft tissue. Once resistance is felt due to contact with the sacrum, sacrum tube **5810** may continue to be rotated until it is fully docked into the sacrum.

Sacrum pin **5830** (which may also be referred to an implant guide herein), which has a sharpened distal end, as shown, may then be placed into the proximal end of the lumen and through the lumen of sacrum tube **5810**, as shown in FIGS. **58**A and **58**B. Pin **5830** may then be docked into the sacrum using a mallet, such as about 1 cm, without fully docking pin **5830** into the sacrum. Imaging in the outlet view, for example, may be used to ensure the trajectory of the sacrum pin **5830** will not intersect the foramina. Sacrum pin **5830** may then be further advanced into the sacrum to depth, such as about 2 cm short of the alar line in the lateral view. The sacrum pin at this time may be considered fully positioned in the sacrum.

As shown in FIGS. **58**A and **58**B, sharpened distal tipped ilium tube **5840** can then be placed through lumen **5605** in the ilium guide portion **5604** of pin guide **5600**. A cap may be placed on the proximal end of ilium tube **5840** (Similar to cap **5820** with the sacrum tube **5810**). The cap may then be rotated to cause rotation of ilium tube **5840** to advance the tube through soft tissue. Once resistance is felt due to contact with ilium bone, rotation of sharpened tube **5840** may continue until tube **5840** is fully docked in the ilium.

Ilium pin **5860** (see FIGS. **58**A and **58**B) may then be placed through the lumen of ilium tube **5840**. A cap **5850** may be placed on the proximal end of pin **5860**, as shown in FIGS. **58**A and **58**C, which allows rotation of the cap to cause rotation

until tube **5840** is fully docked in the ilium.

Ilium pin **5860** (see FIGS. **58**A and **58**B) may then be placed through the lumen of ilium tube **5840**. A cap **5850** may be placed on the proximal end of pin **5860**, as shown in FIGS. **58**A and **58**C, which allows rotation of the cap to cause rotation of pin **5860**. Pin **5860** optionally includes a beveled distal end, as shown, which includes a pointed distal end and a flat beveled surface extending proximally and laterally from the pointed tip, as shown. In use, pin **5860** can be rotated (by rotating cap **5850**) and oriented so that the flat beveled surface is facing laterally and the pointed surface is facing medially. The bevel causes the pin the better engage in the ilium and not skive along the lateral wall of the ilium without engaging the bone. Pin **5860** can then be docked into ilium bone with a mallet, about 1 cm. Imaging may be used to ensure the ilium pin **5860** is being advanced with the desired trajectory and is not skiving laterally, for example. The ilium pin can be advanced further, until it is about 2 cm short of the alar line in the lateral view. At this time, distal ends of sacrum pin **5830** and ilium pin **5860** are preferably in line, or aligned. Cap **5820** can then be placed over pin **5860** and slid onto the proximal end of ilium tube **5840**. While holding pin **5860** with one hand, cap **5820** (which is rotationally secured to tube **5840**) can be rotated counterclockwise with the other hand to remove ilium tube **5840** from the ilium. This can be repeated on the sacral side to remove sacral tube **5810**. Once sacrum tube **5810** and ilium tube **5840** are free from bone, pin guide **5600** can be removed by sliding it proximally off pin **5830** and pin **5860**, leaving sacrum pin **5830** in the sacrum and ilium pin **5860** in the ilium.

The above method is an example of positioning guide pins in an ilium and sacrum, and is an example of a set of tools that are adapted to do the same. Not all steps necessarily need to be performed, and one or more steps may occur out of sequence compared to the disclosure above. For example, an ilium pin may be fully docked in the ilium before the sacrum pin is fully docked in the sacrum.

The disclosure that follows provides exemplary methods and tools for implanting the implants herein across an SI joint from the dorsal approach, wherein a pin has been positioned in the ilium and a pin has been positioned in the sacrum. In alternative methods, only one pin may be positioned (in the ilium or the sacrum), and in other alternatives, the method of implanting the implant may not require any pin guides at all.

FIGS. **59**A-**59**F illustrate an exemplary impactor **5900** that is configured to deliver the implant distally over the one or more pins and across the SI joint, with a portion of the implant in the ilium and a portion in the sacrum. Impactor **5900** includes distal region **5920** and proximal region **5904**, and an elongate central region **5906** extending therebetween. FIG. **59**A is a side view and FIG. **59**B is a perspective view. FIG. **59**C is a close up, side view of distal region **5902**, FIG. **59**D is a perspective view of distal region **5902**, and FIG. **59**E is a front end view. FIG. **59**F is a perspective view of proximal region **5904**. FIG. **59**C also illustrates a relative distal position of implant **2100** from FIG. **21** to illustrate an exemplary implant

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side view and FIG. **59**B is a perspective view. FIG. **59**C is a close up, side view of distal region **5902**, FIG. **59**D is a perspective view of distal region **5902**, and FIG. **59**E is a front end view. FIG. **59**F is a perspective view of proximal region **5904**. FIG. **59**C also illustrates a relative distal position of implant **2100** from FIG. **21** to illustrate an exemplary implant relative to the distal region **5902** of impactor **5900**. In FIG. **59**C, the implant is not engaged or secured to the impactor.

As shown in FIG. **59**D, distal region **5902** includes body **5950** that has, in this embodiment, a wafer configuration. Distal body **5950** has a distal face or surface **5959** with a configuration that is complimentary to the proximal end of the implant, as can be seen in FIG. **59**C. The complimentary shaping helps the distal end of the impactor make contact with much or all of the proximal end of the implant, which provides an efficient transfer of the distally directed force from the impactor to the implant.

Distal portion **5950** includes an ilium portion **5954** that extends further distally than sacrum portion **5956**, the general configuration of which, again, is complimentary to the proximal end of the implant, where the implant sacrum portion extends further proximally than the implant ilium portion (at least in this embodiment). Ilium portion **5954** includes ilium lumen **5955** that is sized and configured to receive therethrough the ilium pin (e.g., pin **5860**), and sacrum portion **5956** includes sacrum lumen **5957** that is sized and configured to receive therethrough the sacrum pin (e.g., pin **5830**). Impactor **5900** also includes an implant securing member **5958**, which in this embodiment can have a threaded distal end that is configured to mate with an internal thread in the channel in the proximal end of the implant (e.g., FIG. **29**). When implant securing member **5958** is secured to the implant via the threaded engagement, the implant can be moved by moving the impactor, which allows the implant to be removed from the patient if needed, or if the implant position needs to be adjusted. Implant securing member **5958** is in operational communication with implant control actuator **5970** in the proximal region **5904** of impactor **5900**. In this embodiment implant control actuator **5970** is a rotatable member that can be rotated by the user to cause rotation of implant securing member **5958**. Other mechanisms can be used to secure the impactor to the implant. The distal end of the impactor also includes a plurality of protrusions or fingers **5960**, at least a first of which is on a first lateral half of distal region **5950** and a second of which is on a second lateral half of distal region **5950**. The fingers on either side of the implant can help prevent rotational movement of the implant relative to the impactor as the impactor is used to distally advance the implant.

In use, and before the implant is implanted, the impactor may optionally be used to first deliver a cutting device such a broach to create a space where the implant will be implanted. A broach in this example may have a configuration that approximate the shape of the implant and/or has a proximal end that is complimentary to the distal face **5959** of the impactor. The broach can first be secured to the impactor, such as by engaging threads on securing member **5958** with internal threads in a channel in the proximal end of the broach. The broach and impactor assembly can then be advanced over the two pins, with the ilium pin passing through ilium lumen **5955** and the sacrum pin passing through sacrum

over the two pins, with the ilium pin passing through ilium lumen **5955** and the sacrum pin passing through sacrum lumen **5957**. The broach can be impacted to near the ends of the pins. A broach (if used) and impactor can then be retracted proximally to remove the broach from the patient. The optional broach can then be removed from the impactor.

The implant can then be loaded onto the distal end of the impactor and secured to the impactor, such as with the threaded engagement between the two, examples of which are described herein. This allows the axial position of the implant to be controlled by axially moving the impactor. Loading the implant also comprises aligning the plurality of fingers (e.g., fingers **5960**) with the recesses in the proximal end of the implant, examples of which are described herein with respect to FIGS. **29**-**31**. The lumens of the impactor are now also aligned with implant lumens (if the implant has one or more lumens).

The implant (and impactor secured to the implant) is then advanced onto the proximal ends of the pins, and the implant-impactor assembly is slid distally over the pins. The pins will also extend into the two lumens of the impactor. The implant is then impacted with a distally directed force (e.g., with a mallet) to distally advance the implant. One option is to use imaging (e.g., fluoro imaging) and impact the implant to the desired depth while viewing the image (e.g., lateral view with fluoro). Alternatively (or additionally), a sacral impactor depth gauge can be used, which can be used to impact to a positive stop when using the sacral impactor depth gauge, an example of which is shown in FIG. **60** as depth gauge **6000**. Depth gauge **6000** can be secured to the impactor, as shown in FIG. **60**, and the implant can be impacted until the proximal end of sacral impactor depth gauge **6000** is aligned with marking **5907** on the impactor. The impactor will be advanced relative to the depth gauge when impacted. Other visual markings can be used to provide a visual indication that the impact has been sufficiently impacted.

FIG. **61**A illustrates a lateral model view showing an implant implanted across an SI joint, and still secured to impactor **5900**. FIG. **61**B illustrates a model view of implant **6100** implanted across SI joint **6110**, with a portion of implant **6100** implanted in the ilium and a portion in the sacrum. Pins **5860** and **5830** are shown, as is exemplary impactor **5900**.

When the implant is in the desired position, the implant can be disengaged from the impactor, such as by rotating actuator **5970**, which disengages the threaded engagement.

FIGS. **63**A-**63**C illustrate an exemplary pin removal device **6300** that is adapted to be used in combination with impactor **5900** (or other impactors) to remove the ilium and sacrum pins. After the implant has been implanted, the pins remain extending through the lumens of the impactor (only one pin is shown in FIGS. **63**A-**63**C). To remove the pins, pin removal device **6300** can be placed over a pin and set on first and second impactor bosses **5999***a* and **5999***b*, as shown in FIGS. **63**-**63**C. As handles **6302** and **6304** of removal device **6300** are squeezed together, the pin is retracted proximally relative

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63-**63**C. As handles **6302** and **6304** of removal device **6300** are squeezed together, the pin is retracted proximally relative to the impactor until it has been removed from the bone and out of the patient. The mechanism may be similar to or the same as that found in wood clamps, such as the Irwin® QUICK-GRIP® clamp, the entire disclosure of which is incorporated by reference herein. Both pins can be removed from the bone in this manner, leaving the implant implanted in the SI joint.

FIG. **62**A illustrates a model view of implant **6100** implanted across SI Joint **6110** (left joint) after pin and impactor removal, and FIG. **62**B illustrates a lateral model of implant **6100** across the SI joint after pin and impactor removal.

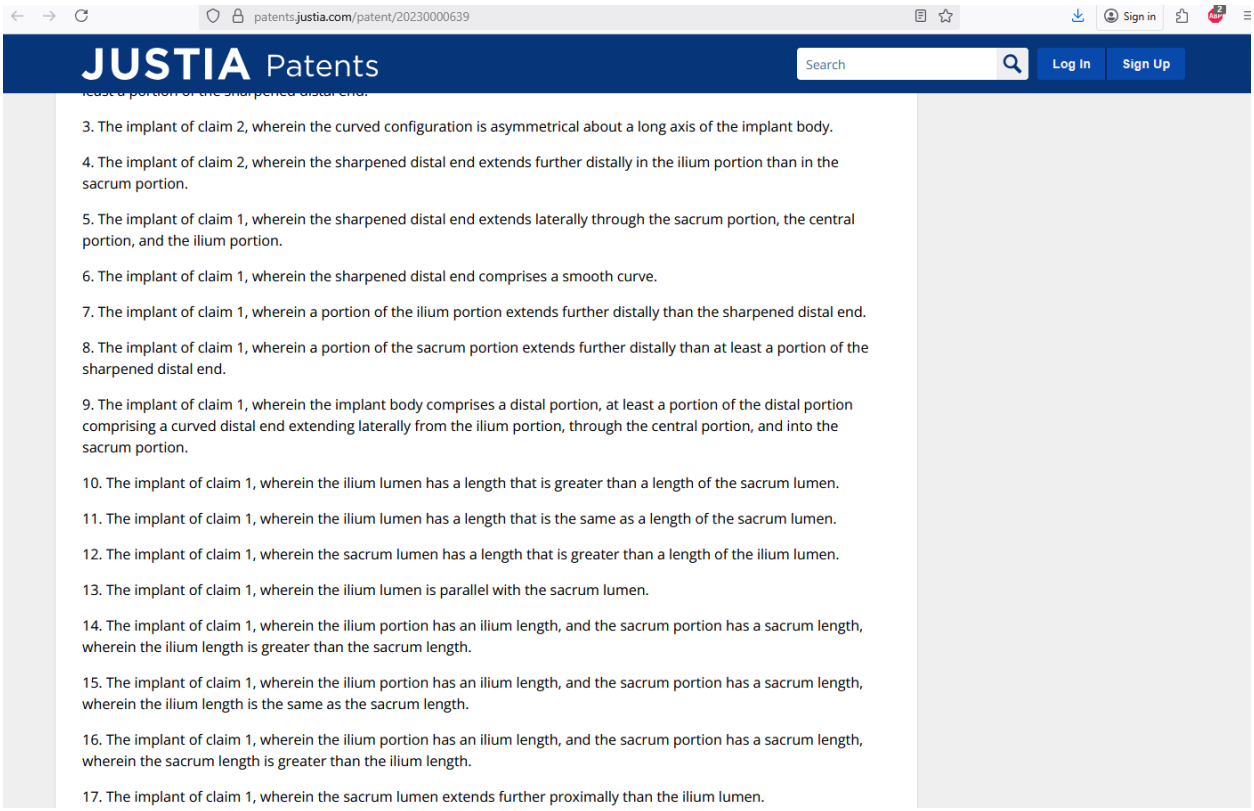
Claims

1. A sacro-iliac joint stabilizing implant for implanting across a SI joint from a dorsal approach, comprising:

> an implant body having a wafer configuration with a width dimension greater than a height dimension, the implant body including, a central joint portion for placement across the SI joint; an ilium portion on a first side of the central joint portion, the ilium portion sized and configured for implanting into an ilium when the implant is implanted across a SI joint from a dorsal approach, a sacrum portion on a second side of the central joint portion, the sacrum portion sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach, the ilium portion comprising an elongate ilium lumen extending from a distal opening to a proximal opening and having an ilium lumen longitudinal axis, the ilium lumen sized and configured to receive therein an ilium positioning guide, the sacrum portion comprising an elongate sacrum lumen extending from a distal opening to a proximal opening and having a sacrum lumen longitudinal axis, the sacrum lumen sized and configured to receive therein a sacrum positioning guide, with reference to a line that is orthogonal to the ilium lumen axis and the sacrum lumen axis, the sacrum portion extends further proximally than the ilium portion, and the ilium portion extends further distally than the sacrum portion, with reference to the line, the distal opening of the ilium lumen extends further distally than the distal opening of the sacrum lumen, and a distal portion that includes a sharpened distal end, the sharpened distal end having a tapered configuration with a first surface that tapers downward and distally from a top portion of the implant body and a second surface that tapers upward and distally from a bottom portion of the implant body.

2. The implant of claim 1, wherein the sharpened distal end has, in a top view, a concave curved configuration along at least a portion of the sharpened distal end.

3. The implant of claim 2, wherein the curved configuration is asymmetrical about a long axis of the implant body.



3. The implant of claim 2, wherein the curved configuration is asymmetrical about a long axis of the implant body.

4. The implant of claim 2, wherein the sharpened distal end extends further distally in the ilium portion than in the sacrum portion.

5. The implant of claim 1, wherein the sharpened distal end extends laterally through the sacrum portion, the central portion, and the ilium portion.

6. The implant of claim 1, wherein the sharpened distal end comprises a smooth curve.

7. The implant of claim 1, wherein a portion of the ilium portion extends further distally than the sharpened distal end.

8. The implant of claim 1, wherein a portion of the sacrum portion extends further distally than at least a portion of the sharpened distal end.

9. The implant of claim 1, wherein the implant body comprises a distal portion, at least a portion of the distal portion comprising a curved distal end extending laterally from the ilium portion, through the central portion, and into the sacrum portion.

10. The implant of claim 1, wherein the ilium lumen has a length that is greater than a length of the sacrum lumen.

11. The implant of claim 1, wherein the ilium lumen has a length that is the same as a length of the sacrum lumen.

12. The implant of claim 1, wherein the sacrum lumen has a length that is greater than a length of the ilium lumen.

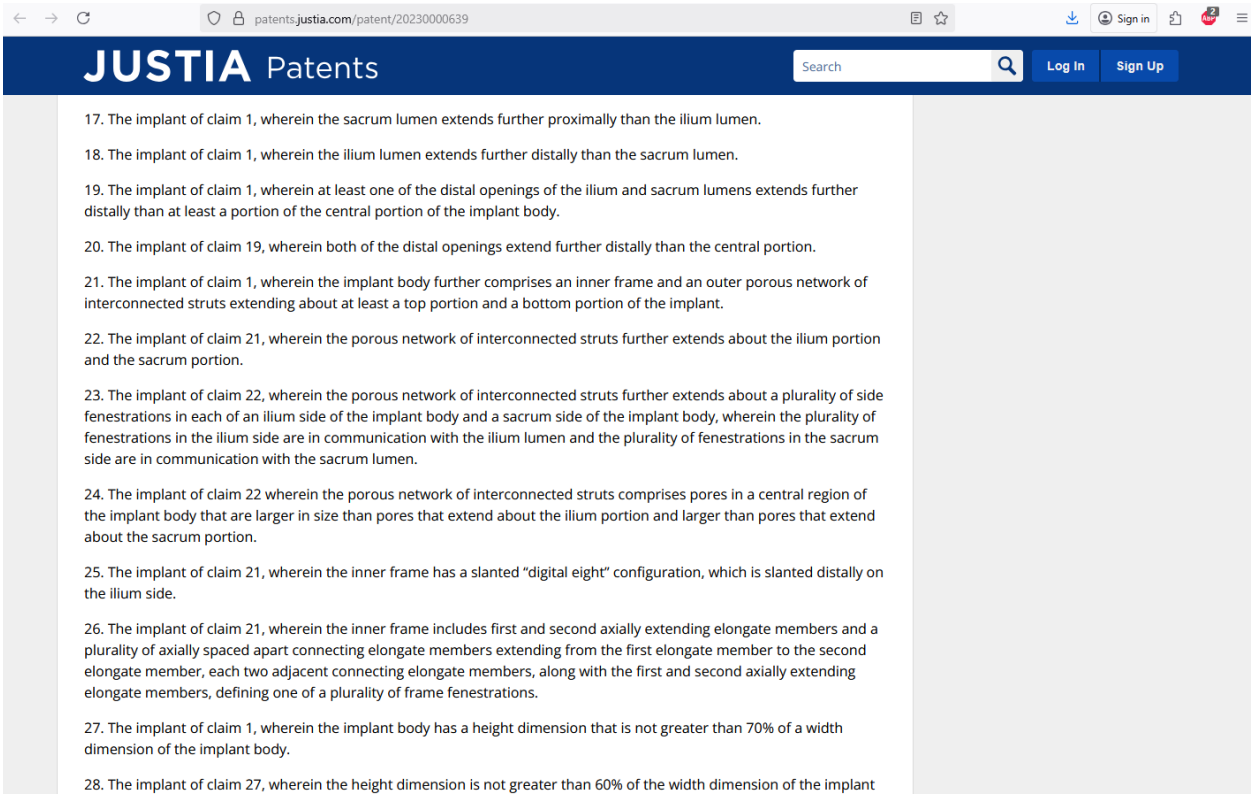
13. The implant of claim 1, wherein the ilium lumen is parallel with the sacrum lumen.

14. The implant of claim 1, wherein the ilium portion has an ilium length, and the sacrum portion has a sacrum length, wherein the ilium length is greater than the sacrum length.

15. The implant of claim 1, wherein the ilium portion has an ilium length, and the sacrum portion has a sacrum length, wherein the ilium length is the same as the sacrum length.

16. The implant of claim 1, wherein the ilium portion has an ilium length, and the sacrum portion has a sacrum length, wherein the sacrum length is greater than the ilium length.

17. The implant of claim 1, wherein the sacrum lumen extends further proximally than the ilium lumen.



17. The implant of claim 1, wherein the sacrum lumen extends further proximally than the ilium lumen.

18. The implant of claim 1, wherein the ilium lumen extends further distally than the sacrum lumen.

19. The implant of claim 1, wherein at least one of the distal openings of the ilium and sacrum lumens extends further distally than at least a portion of the central portion of the implant body.

20. The implant of claim 19, wherein both of the distal openings extend further distally than the central portion.

21. The implant of claim 1, wherein the implant body further comprises an inner frame and an outer porous network of interconnected struts extending about at least a top portion and a bottom portion of the implant.

22. The implant of claim 21, wherein the porous network of interconnected struts further extends about the ilium portion and the sacrum portion.

23. The implant of claim 22, wherein the porous network of interconnected struts further extends about a plurality of side fenestrations in each of an ilium side of the implant body and a sacrum side of the implant body, wherein the plurality of fenestrations in the ilium side are in communication with the ilium lumen and the plurality of fenestrations in the sacrum side are in communication with the sacrum lumen.

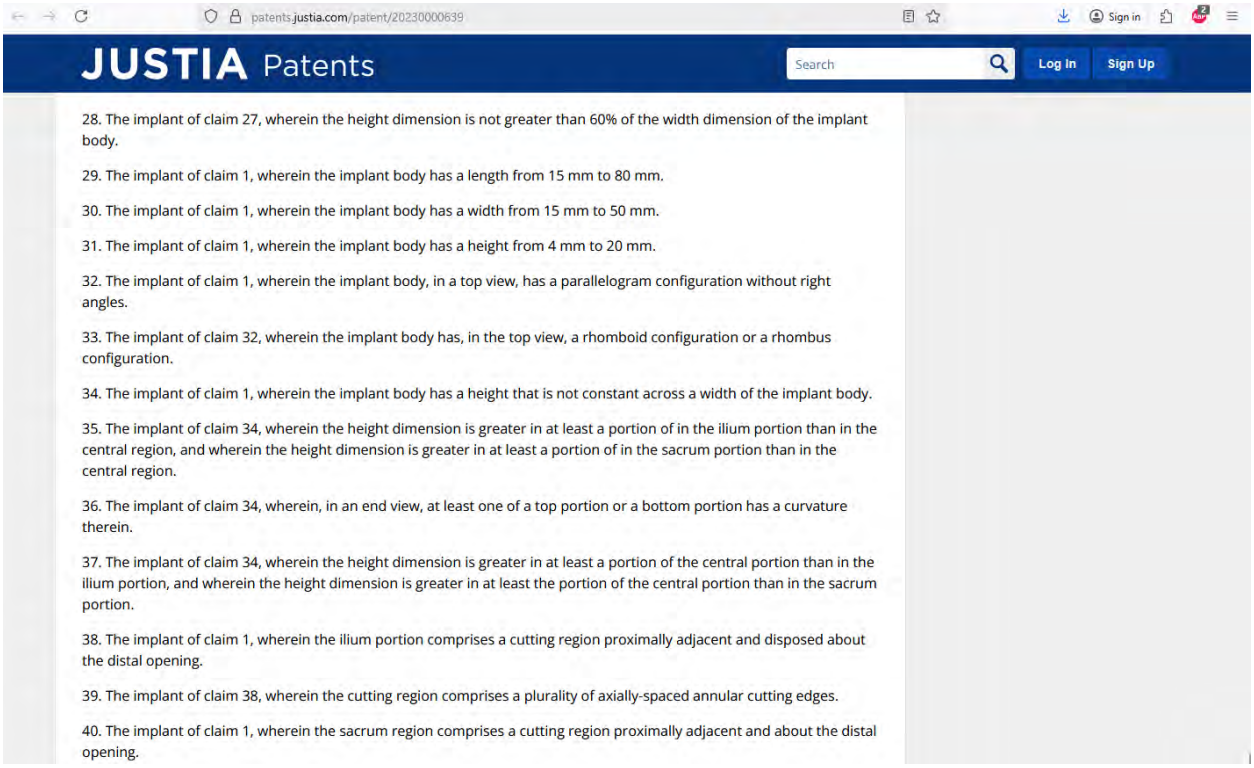
24. The implant of claim 22 wherein the porous network of interconnected struts comprises pores in a central region of the implant body that are larger in size than pores that extend about the ilium portion and larger than pores that extend about the sacrum portion.

25. The implant of claim 21, wherein the inner frame has a slanted “digital eight” configuration, which is slanted distally on the ilium side.

26. The implant of claim 21, wherein the inner frame includes first and second axially extending elongate members and a plurality of axially spaced apart connecting elongate members extending from the first elongate member to the second elongate member, each two adjacent connecting elongate members, along with the first and second axially extending elongate members, defining one of a plurality of frame fenestrations.

27. The implant of claim 1, wherein the implant body has a height dimension that is not greater than 70% of a width dimension of the implant body.

28. The implant of claim 27, wherein the height dimension is not greater than 60% of the width dimension of the implant



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28. The implant of claim 27, wherein the height dimension is not greater than 60% of the width dimension of the implant body.

29. The implant of claim 1, wherein the implant body has a length from 15 mm to 80 mm.

30. The implant of claim 1, wherein the implant body has a width from 15 mm to 50 mm.

31. The implant of claim 1, wherein the implant body has a height from 4 mm to 20 mm.

32. The implant of claim 1, wherein the implant body, in a top view, has a parallelogram configuration without right angles.

33. The implant of claim 32, wherein the implant body has, in the top view, a rhomboid configuration or a rhombus configuration.

34. The implant of claim 1, wherein the implant body has a height that is not constant across a width of the implant body.

35. The implant of claim 34, wherein the height dimension is greater in at least a portion of in the ilium portion than in the central region, and wherein the height dimension is greater in at least a portion of in the sacrum portion than in the central region.

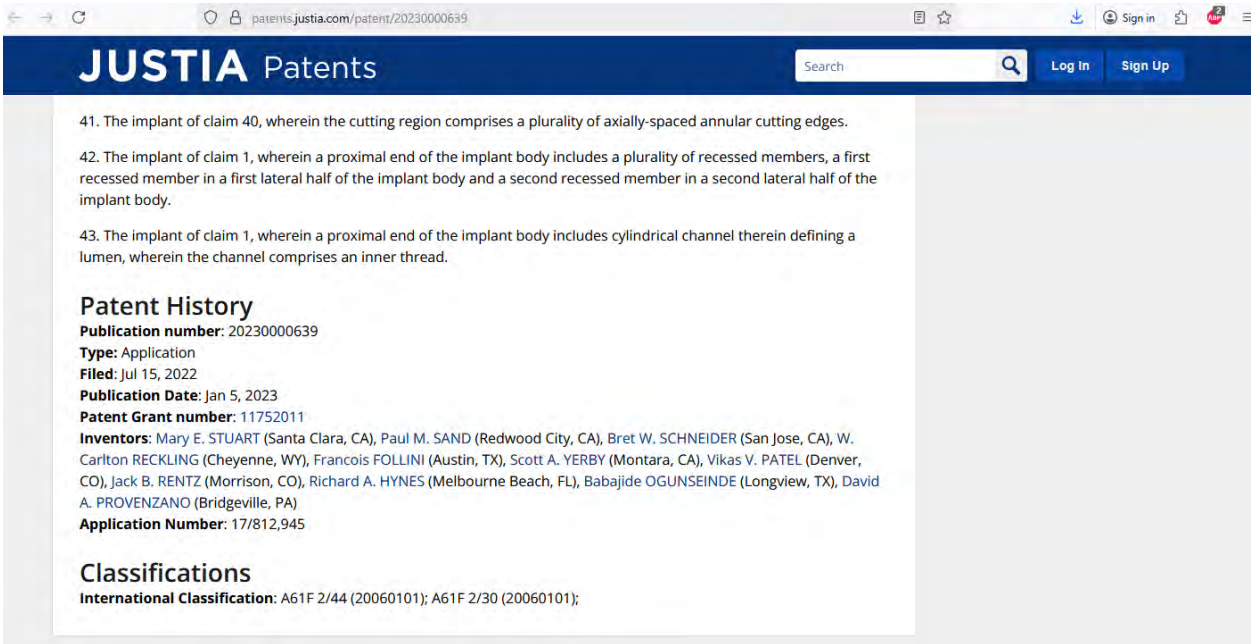
36. The implant of claim 34, wherein, in an end view, at least one of a top portion or a bottom portion has a curvature therein.

37. The implant of claim 34, wherein the height dimension is greater in at least a portion of the central portion than in the ilium portion, and wherein the height dimension is greater in at least the portion of the central portion than in the sacrum portion.

38. The implant of claim 1, wherein the ilium portion comprises a cutting region proximally adjacent and disposed about the distal opening.

39. The implant of claim 38, wherein the cutting region comprises a plurality of axially-spaced annular cutting edges.

40. The implant of claim 1, wherein the sacrum region comprises a cutting region proximally adjacent and about the distal opening.



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41. The implant of claim 40, wherein the cutting region comprises a plurality of axially-spaced annular cutting edges.

42. The implant of claim 1, wherein a proximal end of the implant body includes a plurality of recessed members, a first recessed member in a first lateral half of the implant body and a second recessed member in a second lateral half of the implant body.

43. The implant of claim 1, wherein a proximal end of the implant body includes cylindrical channel therein defining a lumen, wherein the channel comprises an inner thread.

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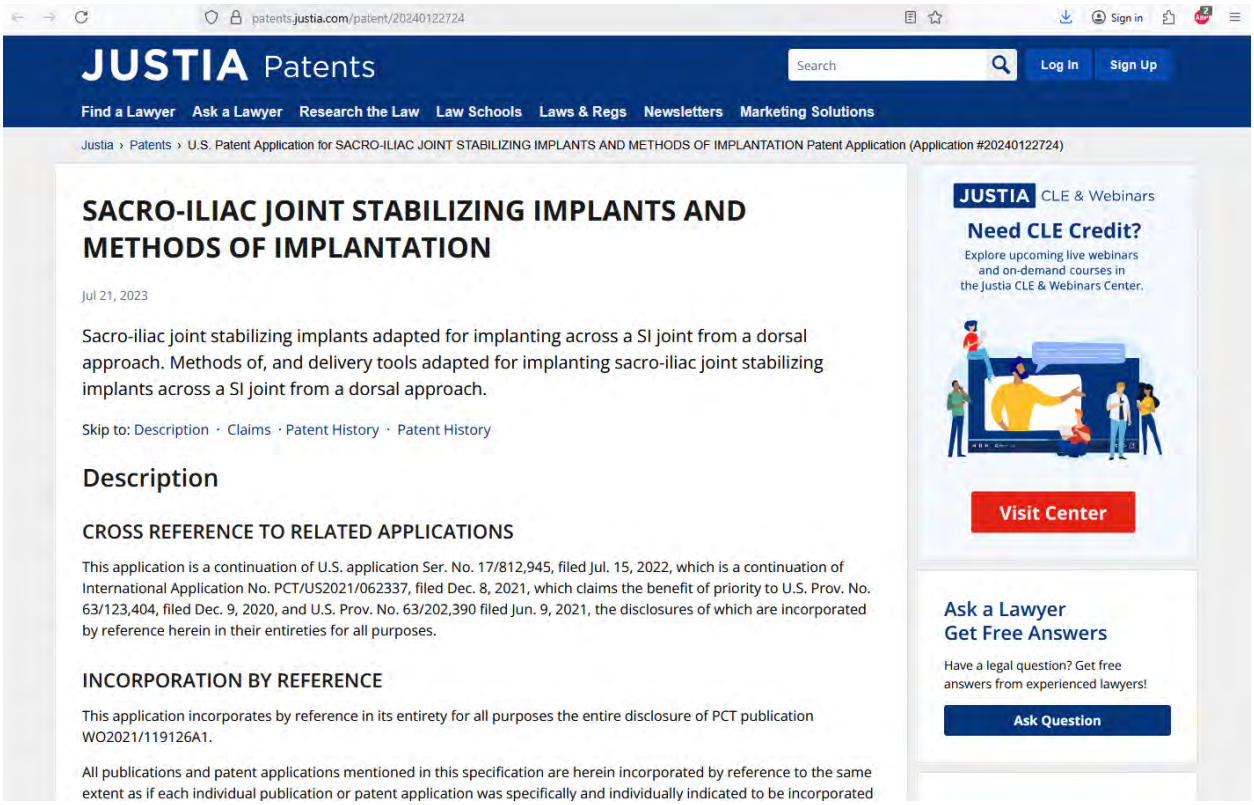

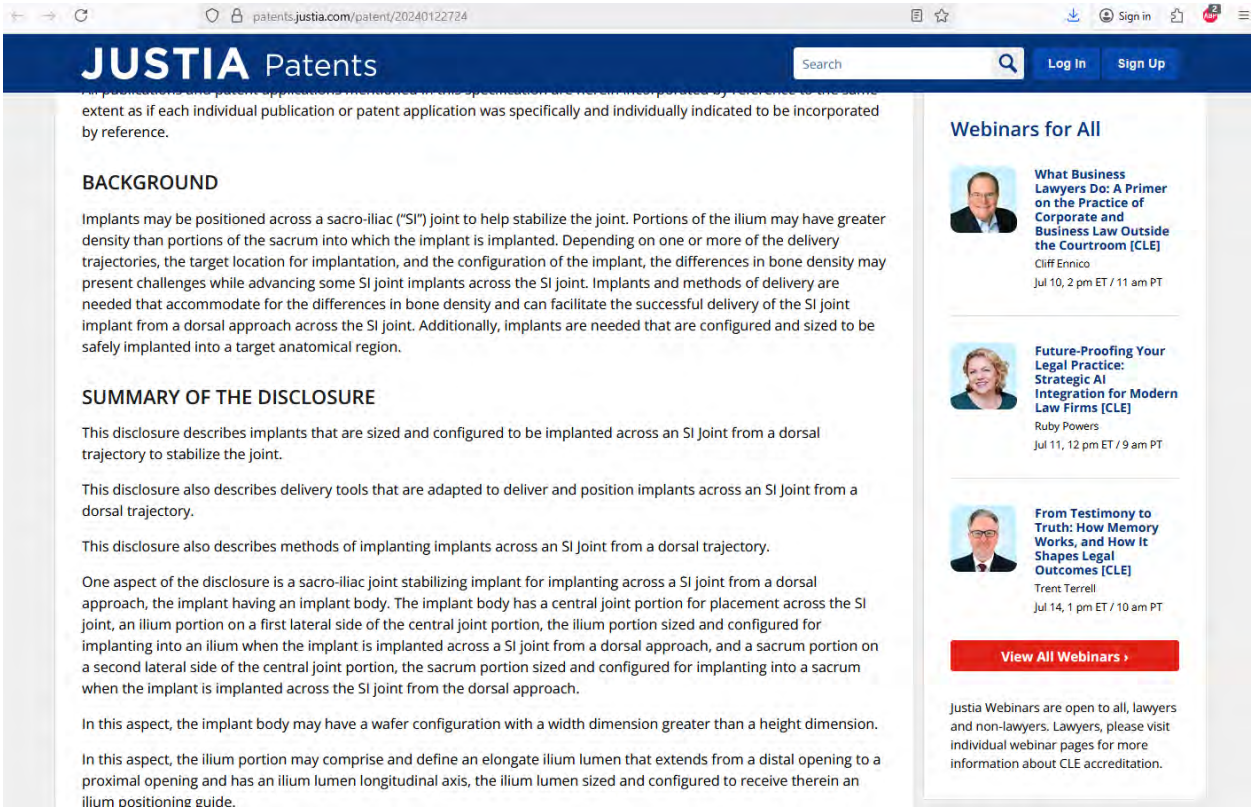

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extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.

BACKGROUND

Implants may be positioned across a sacro-iliac ("SI") joint to help stabilize the joint. Portions of the ilium may have greater density than portions of the sacrum into which the implant is implanted. Depending on one or more of the delivery trajectories, the target location for implantation, and the configuration of the implant, the differences in bone density may present challenges while advancing some SI joint implants across the SI joint. Implants and methods of delivery are needed that accommodate for the differences in bone density and can facilitate the successful delivery of the SI joint implant from a dorsal approach across the SI joint. Additionally, implants are needed that are configured and sized to be safely implanted into a target anatomical region.

SUMMARY OF THE DISCLOSURE

This disclosure describes implants that are sized and configured to be implanted across an SI Joint from a dorsal trajectory to stabilize the joint.

This disclosure also describes delivery tools that are adapted to deliver and position implants across an SI Joint from a dorsal trajectory.

This disclosure also describes methods of implanting implants across an SI Joint from a dorsal trajectory.

One aspect of the disclosure is a sacro-iliac joint stabilizing implant for implanting across a SI joint from a dorsal approach, the implant having an implant body. The implant body has a central joint portion for placement across the SI joint, an ilium portion on a first lateral side of the central joint portion, the ilium portion sized and configured for implanting into an ilium when the implant is implanted across a SI joint from a dorsal approach, and a sacrum portion on a second lateral side of the central joint portion, the sacrum portion sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach.

In this aspect, the implant body may have a wafer configuration with a width dimension greater than a height dimension.

In this aspect, the ilium portion may comprise and define an elongate ilium lumen that extends from a distal opening to a proximal opening and has an ilium lumen longitudinal axis, the ilium lumen sized and configured to receive therein an ilium positioning guide.

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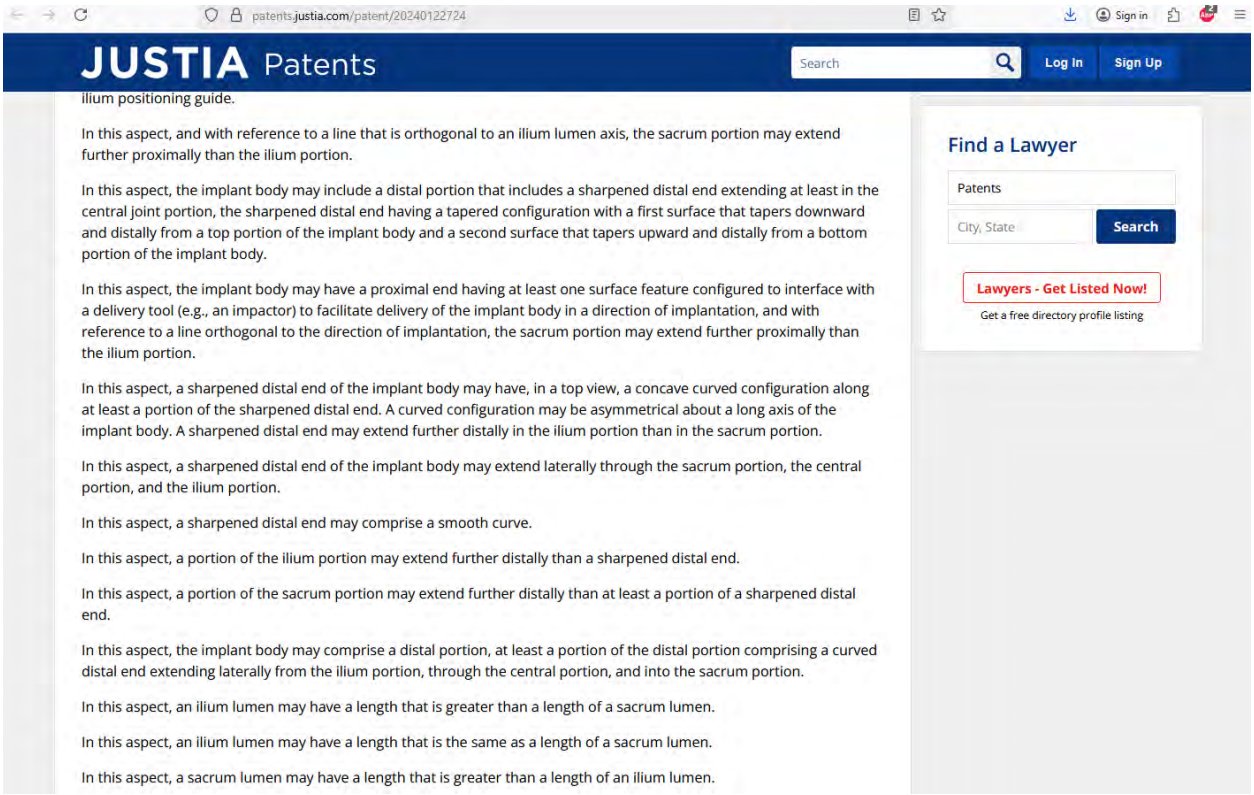

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ilium positioning guide.

In this aspect, and with reference to a line that is orthogonal to an ilium lumen axis, the sacrum portion may extend further proximally than the ilium portion.

In this aspect, the implant body may include a distal portion that includes a sharpened distal end extending at least in the central joint portion, the sharpened distal end having a tapered configuration with a first surface that tapers downward and distally from a top portion of the implant body and a second surface that tapers upward and distally from a bottom portion of the implant body.

In this aspect, the implant body may have a proximal end having at least one surface feature configured to interface with a delivery tool (e.g., an impactor) to facilitate delivery of the implant body in a direction of implantation, and with reference to a line orthogonal to the direction of implantation, the sacrum portion may extend further proximally than the ilium portion.

In this aspect, a sharpened distal end of the implant body may have, in a top view, a concave curved configuration along at least a portion of the sharpened distal end. A curved configuration may be asymmetrical about a long axis of the implant body. A sharpened distal end may extend further distally in the ilium portion than in the sacrum portion.

In this aspect, a sharpened distal end of the implant body may extend laterally through the sacrum portion, the central portion, and the ilium portion.

In this aspect, a sharpened distal end may comprise a smooth curve.

In this aspect, a portion of the ilium portion may extend further distally than a sharpened distal end.

In this aspect, a portion of the sacrum portion may extend further distally than at least a portion of a sharpened distal end.

In this aspect, the implant body may comprise a distal portion, at least a portion of the distal portion comprising a curved distal end extending laterally from the ilium portion, through the central portion, and into the sacrum portion.

In this aspect, an ilium lumen may have a length that is greater than a length of a sacrum lumen.

In this aspect, an ilium lumen may have a length that is the same as a length of a sacrum lumen.

In this aspect, a sacrum lumen may have a length that is greater than a length of an ilium lumen.

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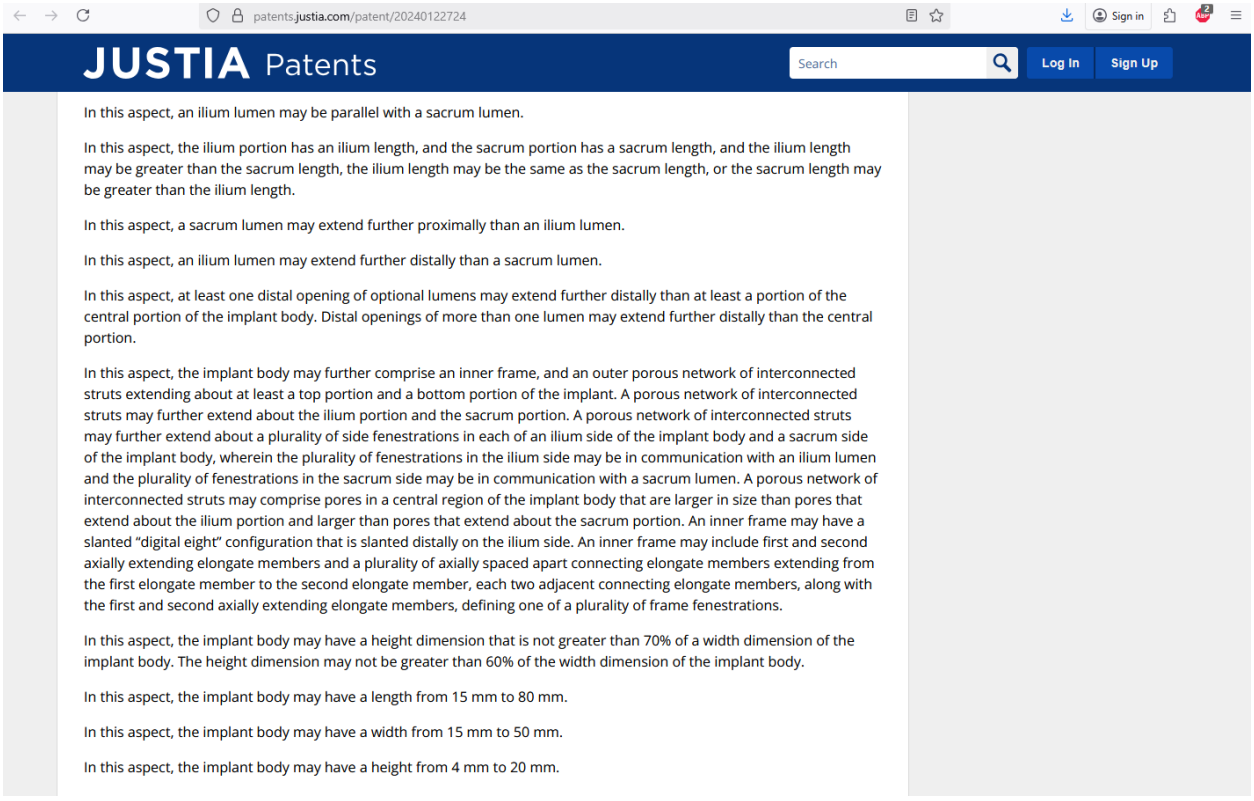

In this aspect, an ilium lumen may be parallel with a sacrum lumen.

In this aspect, the ilium portion has an ilium length, and the sacrum portion has a sacrum length, and the ilium length may be greater than the sacrum length, the ilium length may be the same as the sacrum length, or the sacrum length may be greater than the ilium length.

In this aspect, a sacrum lumen may extend further proximally than an ilium lumen.

In this aspect, an ilium lumen may extend further distally than a sacrum lumen.

In this aspect, at least one distal opening of optional lumens may extend further distally than at least a portion of the central portion of the implant body. Distal openings of more than one lumen may extend further distally than the central portion.

In this aspect, the implant body may further comprise an inner frame, and an outer porous network of interconnected struts extending about at least a top portion and a bottom portion of the implant. A porous network of interconnected struts may further extend about the ilium portion and the sacrum portion. A porous network of interconnected struts may further extend about a plurality of side fenestrations in each of an ilium side of the implant body and a sacrum side of the implant body, wherein the plurality of fenestrations in the ilium side may be in communication with an ilium lumen and the plurality of fenestrations in the sacrum side may be in communication with a sacrum lumen. A porous network of interconnected struts may comprise pores in a central region of the implant body that are larger in size than pores that extend about the ilium portion and larger than pores that extend about the sacrum portion. An inner frame may have a slanted "digital eight" configuration that is slanted distally on the ilium side. An inner frame may include first and second axially extending elongate members and a plurality of axially spaced apart connecting elongate members extending from the first elongate member to the second elongate member, each two adjacent connecting elongate members, along with the first and second axially extending elongate members, defining one of a plurality of frame fenestrations.

In this aspect, the implant body may have a height dimension that is not greater than 70% of a width dimension of the implant body. The height dimension may not be greater than 60% of the width dimension of the implant body.

In this aspect, the implant body may have a length from 15 mm to 80 mm.

In this aspect, the implant body may have a width from 15 mm to 50 mm.

In this aspect, the implant body may have a height from 4 mm to 20 mm.

In this aspect, the implant body, in a top view, may have a parallelogram configuration that does not include right angles.

In this aspect, the implant body may have, in a top view, a rhomboid configuration or a rhombus configuration.

In this aspect, the implant body may have a height that is not constant across a width of the implant body. A height dimension may be greater in at least a portion of in the ilium portion than in the central region, and wherein the height dimension may be greater in at least a portion of in the sacrum portion than in the central region. At least one of a top portion or a bottom portion of the implant body may have a curvature therein. A height dimension of the implant body may be greater in at least a portion of the central portion than in the ilium portion, and wherein the height dimension may be greater in at least the portion of the central portion than in the sacrum portion.

In this aspect, the ilium portion may comprise a cutting region proximally adjacent and disposed about the distal opening. A cutting region may comprise a plurality of axially-spaced cutting edges, which may be annular or circularly shaped.

In this aspect, the sacrum region may comprise a cutting region proximally adjacent and about the distal opening. A cutting region may comprise a plurality of axially-spaced cutting edges, which may be annular or circularly shaped.

In this aspect, a proximal end of the implant body may include a plurality of recessed members. A first recessed member may be in a first lateral half of the implant body, and a second recessed member may be in a second lateral half of the implant body.

In this aspect, a proximal end of the implant body may include a cylindrical channel (optionally extending along a long axis of the implant body) defining a lumen, wherein the channel comprises an inner thread.

One aspect of the disclosure is a method of positioning a sacro-iliac ("SI") joint stabilizing implant across an SI joint from a dorsal approach.

In this aspect, the method may include advancing an elongate sacrum pin from a dorsal starting point into a sacrum of a subject such that a distal end of the sacrum pin is in the sacrum and a proximal end of the sacrum pin is disposed outside of the subject.

In this aspect, the method may include advancing an elongate ilium pin from a dorsal starting point into an ilium of the subject such that a distal end of the ilium pin is in the ilium and a proximal end of the ilium pin is disposed outside of the subject.

subject.

In this aspect, the method may include advancing a distal opening of an ilium lumen that is in an ilium portion of an SI joint stabilizing implant over the ilium pin so as to restrict movement of the implant with respect to the ilium pin in at least one direction.

In this aspect, the method may include advancing a distal opening of a sacrum lumen that is in a sacrum portion of the SI joint stabilizing implant over the sacrum pin so as to restrict movement of the implant with respect to the sacrum pin in at least one direction.

In this aspect, the method may include advancing the implant distally over and relative to the sacrum pin and the ilium pin until the implant is across the SI joint with the ilium portion in the ilium and the sacrum portion in the sacrum.

In this aspect, the method may include removing the ilium pin and the sacrum pin from the subject, and leaving the implant positioned across the SI joint.

One aspect of this disclosure is a method of securing an SI-joint implant to an impactor.

In this aspect, the method may include causing a proximal end of the SI joint implant to be brought adjacent to a distal end of the impactor

In this aspect, the method may include engaging a first securing element on the impactor with a second securing element disposed in a proximal region of the implant to secure the implant to the impactor and cause the implant to move axially with the impactor. In this aspect, a first securing element may be an elongate member with an external thread, and wherein the second securing element may be an internal channel with an internal thread. In this aspect, the method may include engaging a first impactor protrusion on a first lateral side of a first securing element with a first recess in the implant, and engaging a second impactor protrusion on a second lateral side of the first securing element with a second recess in the implant. In this aspect, the method may include causing a distal face of the impactor to be placed adjacent a proximal end of the implant, wherein, in a top view, the distal face and proximal end of the implant have complimentary shapes.

One aspect of the disclosure is a pin guide adapted for placing pin guides into an ilium and a sacrum in a dorsal approach.

In this aspect, the pin guide may include a pin guide body that includes at least one of a lateral ilium side with an axially extending ilium lumen and a lateral sacrum side with an axially extending sacrum lumen. If the pin guide body has first and second lumens, the lumens may be parallel.

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and second lumens, the lumens may be parallel.

In this aspect, an ilium side and an ilium lumen may extend further distally than a sacrum side and a sacrum lumen.

In this aspect, the pin guide may further comprise at least one lateral handle coupler that is adapted to be attached to an elongate handle so the handle and pin guide can be moved together by moving the handle.

In this aspect, the pin guide body may further comprise first and second central pins extending distally from the pin guide body, the first and second central pins disposed laterally inward relative to the ilium lumen and the sacrum lumen. Central pins may be permanently attached to a main portion of the pin guide body. Optional first and second central pins may be laterally aligned with each other. First and second central pins may extend between 10 mm and 20 mm from the pin guide body, optionally 15 mm.

One aspect of this disclosure is a pin guide adapted for placing pin guides into an ilium and a sacrum in a dorsal approach. The pin guide may include a pin guide body and a distal pin guide coupled to the guide body and extending distally from the pin guide body, wherein the distal pin guide may be movable relative to the pin guide body when the pin guide is in a first state and less movable relative to the pin guide body when the pin guide is in a second state.

One aspect of the disclosure is an impactor for advancing a bone implant. The impactor includes a proximal region, a distal region, and an elongate central region extending between the proximal region and the distal region.

In this aspect, the distal region may have a wafer configuration.

In this aspect, the distal region may include an implant securing element adapted to be releasable engaged with the bone implant.

In this aspect, the distal region may include a first protruding member on a first lateral side of the implant securing element and a second protruding member on a second lateral side of the implant securing element.

In this aspect, the distal region may include an ilium lumen in an ilium side of the distal region.

In this aspect, the distal region may include a sacrum lumen in a sacrum side of the distal region.

In this aspect, the distal region may include a distal face that is not orthogonal to a long axis of the central region. A distal face may extend further distally on the ilium side than on the sacrum side.

In this aspect, a first protruding member may extend further distally than a second protruding member.

In this aspect, a first protruding member may extend further distally than a second protruding member.

In this aspect, an ilium lumen may extend further distally than a sacrum lumen.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1**A and **1**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIGS. **2**A and **2**B illustrate an exemplary SI joint implant engaged with first and second positioning guides.

FIGS. **3**A and **3**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIGS. **4**A and **4**B illustrate an exemplary SI joint implant engaged with first and second positioning guides.

FIGS. **5**A and **5**B illustrate an exemplary SI joint implant engaged with a plurality of positioning guides.

FIGS. **6**A and **6**B illustrate an exemplary SI joint implant engaged with a positioning guide.

FIG. **7** illustrates an exemplary SI joint implant.

FIG. **8** illustrates a portion of an exemplary SI joint implant engaged with a positioning guide.

FIG. **9** illustrates a portion of an exemplary SI joint implant engaged with a positioning guide.

FIG. **10** illustrates an exemplary SI joint implant engaged with a plurality of positioning guides.

FIGS. **11**A and **11**B illustrate an exemplary SI joint implant.

FIG. **12** illustrates an exemplary SI joint implant.

FIG. **13** illustrates an exemplary SI joint implant.

FIG. **14** illustrates an exemplary SI joint implant.

FIGS. **15**A, **15**B and **15**C illustrate an exemplary SI joint implant.

FIG. **16** illustrates an exemplary SI joint implant.

FIGS. **17**A, **17**B and **17**C illustrate exemplary cutting edges disposed about optional lumens.

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FIGS. **17**A, **17**B and **17**C illustrate exemplary cutting edges disposed about optional lumens.

FIGS. **18**A, **18**B and **18**C illustrate an exemplary SI joint implant.

FIG. **19** illustrates an exemplary SI joint implant.

FIG. **20** illustrates an exemplary SI joint implant.

FIG. **21** illustrates an exemplary SI joint implant.

FIGS. **22**A, **22**B and **22**C illustrate an exemplary SI joint implant.

FIGS. **23**A and **23**B illustrate an exemplary SI joint implant.

FIG. **24** illustrates an exemplary SI joint implant.

FIG. **25** illustrates an exemplary SI joint implant.

FIG. **26** illustrates an exemplary SI joint implant.

FIGS. **27**A and **27**B illustrate an exemplary SI joint implant.

FIG. **28** illustrates an exemplary SI joint implant and an approximated quadrilateral shape or configuration of the implant in a top view of the implant body.

FIGS. **29**, **30** and **31** illustrate exemplary proximal ends of exemplary SI joint implants.

FIG. **32**A illustrates a posterior view and exemplary locations for positioning guides.

FIG. **32**B illustrates an exemplary implantation location for a SI joint implant across a SI joint.

FIG. **33** illustrates exemplary tools adapted for positioning one or more pins and for delivering implants from a dorsal approach.

FIGS. **34**A, **34**B, **34**C, **34**D, **34**E and **34**F illustrate exemplary radiograph imaging of an SI joint region and exemplary steps in a procedure.

FIGS. **35**A, **35**B and **35**C illustrate an exemplary procedure that includes the use of a pin guide and one or more pins.

FIG. **36** illustrates an exemplary impactor that is secured to an exemplary implant.

FIGS. **37**A and **37**B show exemplary radiograph imaging to confirm proper implant position.

FIG. **38** illustrates an illustrative SI joint, ilium and sacrum.

FIGS. **39**A, **39**B, **39**C and **39**D illustrate exemplary 2D spaces characteristic of exemplary target envelopes.

FIGS. **40**, **41**A and **41**B illustrate radiographic imaging of an exemplary process that includes injecting contrast media through a needle that is placed in the SI joint.

FIGS. **42**A and **42**B illustrate exemplary steps of placing an exchange pin and creating a linear skin marking along the exchange pin.

FIG. **43** illustrates placement of a needle.

FIG. **44** illustrates a nitinol wire after a needle has been removed.

FIG. **45** illustrates an exemplary pin guide with a plurality of channels.

FIGS. **46**A and **46**B illustrate placing a central lumen of a pin guide over the wire from FIG. **44**.

FIG. **47** illustrates a pin being positioned through the sacral cortex with a mallet.

FIGS. **48**A and **48**B illustrate an ilium pin positioned through ilial cortex with a mallet.

FIGS. **49**A and **49**B illustrate taking a lateral radiographic image.

FIG. **50** illustrates an optional step of drilling a hole through a center channel of an exemplary pin guide.

FIG. **51** illustrates placement of a trephine over a pin.

FIG. **52** is a radiographic image of an implant engaged with pins that have been placed in the sacrum and ilium.

FIGS. **53**A and **53**B shows an implant impacted to depth across the SI joint.

FIG. **54** is a radiographic image showing the pins being removed from the sacrum and ilium.

FIG. **55**A is a lateral view and FIG. **55**B is an outlet view showing the implant implanted across the joint.

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FIG. **55**A is a lateral view and FIG. **55**B is an outlet view showing the implant implanted across the joint.

FIGS. **56**A, **56**B, **56**C and **56**D illustrate exemplary pin guides.

FIGS. **57**A and **57**B illustrate an exemplary handle secured to an exemplary pin guide.

FIGS. **58**A, **58**B and **58**C illustrates tool for and methods of positioning ilium and sacrum pins.

FIGS. **59**A, **59**B, **59**C, **59**D, **59**E and **59**F illustrate an exemplary impactor.

FIG. **60** illustrates an exemplary impactor, an exemplary depth gauge, and an exemplary implant.

FIGS. **61**A and **61**B illustrate an implant secured to an impactor and implanted across an SI joint from the dorsal approach.

FIGS. **62**A and **62**B illustrate an implant implanted across an SI joint after pins have been removed.

FIGS. **63**A, **63**B and **63**C illustrate an exemplary tool adapted for use with an impactor to remove pins from the patient.

FIG. **64** illustrates an exemplary pin guide.

DETAILED DESCRIPTION

The disclosure herein is related to SI joint stabilizing implants ("implants") and methods of implanting SI joint stabilizing implants across an SI joint from a dorsal approach. Methods herein include implanting an implant from a dorsal approach across the SI joint with a first portion of the implant positioned in the ilium, a second portion of the implant positioned in the sacrum, and a third portion (e.g., a central portion) placed across the SI joint. The implants herein may be sized and configured to be implanted utilizing any of the suitable methods of implantation and delivery tools herein, unless indicated herein to the contrary. Similarly, method of implantation and delivery tools herein may be used to deliver any or all of the suitably configured implants across an SI joint, unless indicated herein to the contrary.

A region or portion of the ilium into which a first portion of the implant is positioned from a dorsal approach may have greater density than a region or portion of the sacrum into which a second portion or region of the implant is positioned. When positioning a SI joint implant across a SI joint from a dorsal approach, the implant may thus tend to deflect away from denser cortical iliac bone and migrate towards and into the less dense sacrum, which can prevent proper positioning of the implant across the SI joint. Implantation methods, delivery tools and implants are described herein that can maintain proper implant trajectory when advancing the SI joint implant across the SI joint from a dorsal approach

described herein. The methods and approaches herein can account for the differences in bone density between the ilium and sacrum and prevent the implant from migrating away from denser iliac bone during implantation. Additionally, implants herein are sized and configured to be safely implanted into a target anatomical region when implanted from the dorsal approaches herein.

Methods of implanting the implants herein may include advancing one or more positioning guides, any of which may be referred to herein as a "guide," into an ilium from a dorsal approach, and in some embodiments between lateral and medial cortical walls of the ilium, which is described and shown herein. FIG. **32**A illustrates a posterior view and a general dorsal approach for implanting the SI joint implants herein across an SI joint. FIG. **32**B illustrates an exemplary implant **1106** that has been implanted across an SI joint **1114**′ with a first region or portion of the implant disposed in the ilium **1110**, a second region or portion of the implant disposed in the sacrum **1112**, and a central region or portion extending across the SI joint **1114**′. FIGS. **32**A and **32**B, which are described in more detail below, illustrate ilium **1110**, sacrum **1112**, the SI joints **1114** and **1114**′, and lumbar vertebrae **1116**. FIG. **32**A also illustrates an optional anatomical region **1120** that is a starting point for advancing an ilium positioning guide into the ilium, and an optional exemplary anatomical region **1130** for a starting point for advancing a sacrum positioning guide into the ilium. FIG. **32**A further illustrates an exemplary and optional ilium starting point **1122** for an ilium positioning guide, as well as an exemplary and optional sacrum starting point **1132** for a sacrum positioning guide. Any of the ilium positioning guides herein may have a starting point in ilium region **1120**, such as ilium starting point **1122**. Any of the sacrum positioning guides herein may have a starting point in sacrum region **1130**, such as sacrum starting point **1132**. A radiographic view image may be obtained and utilized to help guide the positioning guide into the ilium between lateral and medial cortical walls of the ilium, which are illustrated generally in FIGS. **32**A and **32**B. Methods herein may optionally include interfacing an ilium positioning guide herein with an ilium portion or region of the SI joint implant, such as an interface member of the implant, to guide the implant across the SI joint while maintaining a proper trajectory and achieving a desired implantation location. By positioning an ilium positioning guide in the relatively dense region of the ilium, and by interfacing and engaging the positioning guide with the ilium portion of the implant, the guide can help ensure a portion of or the entire implant will stay on course with a desired trajectory during advancement during implantation in the dorsal approach, rather than migrating away from the relatively dense cortical ilium bone and towards the sacrum. The optional positioning guides herein thus interface directly with the implant, and are sized and configured to act as a guide for the implant to ensure that an ilium portion or region of the implant is properly positioned in the ilium and that a joint region (which may be referred herein as a central region or portion) of the implant is properly implanted across the SI joint.

The positioning guides are sized and configured to, when engaged with the implant, generally restrict movement of the implant with respect to the positioning guide in at least one direction. The implant may be free to move relative to the positioning guide in other ways or directions. For example, once interfaced, the implant may still be able to rotate relative

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relatively dense cortical ilium bone and towards the sacrum. The optional positioning guides herein thus interface directly with the implant, and are sized and configured to act as a guide for the implant to ensure that an ilium portion or region of the implant is properly positioned in the ilium and that a joint region (which may be referred herein as a central region or portion) of the implant is properly implanted across the SI joint.

The positioning guides are sized and configured to, when engaged with the implant, generally restrict movement of the implant with respect to the positioning guide in at least one direction. The implant may be free to move relative to the positioning guide in other ways or directions. For example, once interfaced, the implant may still be able to rotate relative to the guide, such as in FIGS. **1**A and **1**B, but the guide can still maintain the desired trajectory (relative axial movement) of the implant when the implant is advanced in the dorsal trajectory with respect to the engaged guide.

The methods herein include advancing the implant across the SI joint, while the optional guide(s) helps guide an ilium portion of the implant into the ilium. The methods may also include removing the positioning guide from the ilium after the implant has been positioned across the SI joint.

The methods herein may include positioning more than one positioning guide, optionally more than one ilium guide in the ilium, and optionally one or more guides into sacral bone. Any of the one or more guides herein may be sized and configured to function as a positioning guide to help guide a portion of the implant into ilium bone or sacral bone.

In some alternative methods and implants described herein, the method of implantation may not require a position guide. For example, an implant may be advanced across an SI joint from a dorsal approach without using a positioning guide. For example, these methods may include radiographically visualizing a teardrop view of the ilium and advancing the implant while visualizing the teardrop view to ensure a portion of the implant stays sufficiently on course into the teardrop region of the ilium. Any of the methods herein may thus optionally exclude an ilium positioning guide, and may rely on a radiographic image, such as a teardrop view, to help maintain a desired implant trajectory into a teardrop region of the ilium. Implants implanted according to these methods may be implanted with or without a broach (described in more detail below), and if implanted without the use of a broach, the implants may have distal end regions that are configured to penetrate into bone, optionally having sharpened distal ends.

Some of the implants herein, such as any of those shown in FIGS. **1**A-**31**, are generally sized and configured to be able to interface with an elongate ilium positioning guide, and may be sized and configured to interface with one or more additional positioning guides, which may be ilium or sacrum guides.

Exemplary implants are described below. Even if the textual description of an exemplary implant does not expressly include it, it is understood that features shown with respect to different exemplary implants may be incorporated into

include it, it is understood that features shown with respect to different exemplary implants may be incorporated into other exemplary implants. For example, the implants shown in FIGS. **1**A, **1**B, **2**A and **2**B each have an interface member with an annular inner surface that defines a lumen, even if the text does not expressly include a description thereof. Additionally, similar components may be similarly labeled in different embodiments. For example, it is understood that references to elements **10**, **20**, **30**, **40**, etc., in some of the figures may illustrate systems, even if the text related to any particular embodiment is silent with reference to a reference number shown in the figure.

FIG. **1**A is an end dorsal view (showing the proximal portion) and FIG. **1**B is a perspective view of exemplary system **10** that includes SI joint stabilizing implant **14** and elongate ilium guide **12**. Implant **14** includes an ilium guide interface member **18** interfacing, which may be also referred to herein as engaging, with ilium guide **12**. Implant **14** includes main body or implant body **16**, a central portion or region of which is disposed across the SI joint when the implant is implanted. The interface member **18** includes a surface **19** that has a configuration, in this example annular, that is sized and configured to interface with the corresponding configuration of ilium guide **12** to allow implant **14** to be axially advanced relative to guide **12**. In these figures, the guide may or may not already be positioned in an ilium, such as at the exemplary general location shown in FIG. **32**A. The interface between the guide and the interface member of the implant restricts the movement of the implant interface guide member with respect to the ilium guide in one or more directions. In this example, implant **14** may still be rotated relative to guide **12**, but the interface restricts, for example, side-to-side (lateral) movement of **14** implant relative to guide **12**. In this embodiment, the guide has a cylindrical configuration, with an annular outer profile in cross section along almost all of its length (except for the distal tip region, which may be configured to penetrate and/or anchor (temporarily) into bone). Any of the guides herein may have a cylindrical configuration along all or substantially all of its length. Any of the guides herein may also include a sharpened or pointed distal end (e.g., as shown in FIGS. **1**B, **2**B, **3**B), which may be configured to help penetrate and/or anchor into bone (temporarily), such as iliac bone and/or sacral bone.

In figures herein, including FIGS. **1**A and **10**, "S" refers to a sacrum and "I" refers to an ilium.

FIGS. **2**A (end view) and **2**B (perspective) illustrate exemplary system **20**, which includes implant **24**, ilium or iliac guide **22**, and an optional elongate sacrum or sacral guide **21**. In the figures shown, ilium guide **22** and the sacrum guide **21** may or may not yet be positioned within the ilium and sacrum, respectively. In some methods, the one or more guides may be inserted into bone, and then the implant may be advanced over the guides. In some embodiments, the implant is interfaced with the one or more guides, and subsequently the one or more guides can be inserted into bone. Interfacing the implant to a plurality of guides (in examples with more than one guide) before guide insertion may help prevent the guides from being inserted into bone and spaced apart at positions that prevent the implant from then be interfaced with the guides and successfully advanced along the guides and across the SI joint. Interfacing the implant with the guides first

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the guides and successfully advanced along the guides and across the SI joint. Interfacing the implant with the guides first may help the guides being properly spaced apart to accommodate the implant during implantation. In merely exemplary embodiments herein, a method may include inserting an ilium guide into iliac bone, interfacing the guide with the implant, interfacing the implant with a sacrum guide, and inserting the sacrum guide into a sacrum. The implant may subsequently be advanced across the SI joint.

Any of the dashed lines in FIGS. **1**A, **2**A, **3**A and **4**A in an implant body indicates an optional axially extending bore or opening within a body portion of the implant, which may extend through distal and proximal implant body surfaces.

FIGS. **3**A (end view) and **3**B (perspective view) illustrate an exemplary system **30** that includes implant **34**, which is configured to interface with ilium guide **32**. Implant **34** includes guide interface member **33** that has a surface **35** sized and configured to interface with guide **32**, which may be an ilium guide. Member **33** is in this embodiment curvilinear and has an almost completely annular configuration, but extends less than 360 degrees.

FIGS. **4**A (end view) and **4**B (perspective view) illustrate exemplary system **40** that includes implant **44** with first and second ilium guide interface members **43** and **45**, each of which has a surface configured to interface with ilium guide **41** and ilium guide **42**, respectively. Members **43** and **45** in this embodiment extend upward and downward from the main body region further than the guide interface members in FIGS. **1**A, **1**B, **2**A and **2**B, for example.

FIGS. **5**A (end view) and **5**B (perspective view) illustrate an exemplary system **50** that includes exemplary implant **54**, and exemplary ilium guides **51** and **52** and sacral guides **53** and **55**. Implant **54** includes four guide members **56**, **57**, **58** and **59**, each configured to interface with and be axially moveable relative to a separate guide. The implant body has a general "X" or crossing configuration in an end view, but could have other configurations, such as square, rectangular, oval, etc., and may still have four (or more) guide interface members.

FIGS. **6**A (end view) and **6**B (perspective view) illustrate an exemplary system **60** that includes implant **64** configured to interface with guide **62**. In this embodiment guide **62** includes a recessed region that is configured to stably interface with interface member **63** that in this example is a lateral protrusion or extension from a main body region of the implant. This is an example of the implant having a guide interface member that extends within a portion of the guide, compared with guide interface members that extend around a portion of the guide, such as is shown in FIGS. **1**A-**5**B. The interface in this embodiment limits up and down movement of the implant relative to the guide, as well as right lateral movement relative to the guide, but allows guide **62** to act as a guide for implant **64** during implantation.

FIG. **7** illustrates an exemplary implant **70** or broach **70** with a sharpened distal end, in this example extending laterally across the entire or substantially the entire width of the implant body, as shown. If used as a broach, the broach **70** may

across the entire or substantially the entire width of the implant body, as shown. If used as a broach, the broach **70** may be configured with any of the guide members herein, and in methods of use can be guided over one or more guides (before the implant is implanted) to create a space across the SI joint for the implant. The broach can be removed, and an implant can then be advanced over the guides, which is described in more detail below.

If used as an implant, the implant **70** may comprise any of the guide members herein (e.g., one or more lumens), and in methods of use can be guided over one or more guides to position the implant across an SI joint. The sharpened region of the implant may create a space for the implant by penetrating or cutting into bone.

FIG. **8** (end view) illustrates an exemplary implant **84** that includes guide interface member **86**, which is configured to interface with guide **82**. In this exemplary embodiment, guide **82** has a triangular configuration (which may have other rectilinear configurations), and member **86** includes an inner surface triangular configuration (which may have other rectilinear configurations), as shown. Implant **84** may also have any number of members **86**, each of which can be configured to interface with a different guide.

Any of the implants herein may also have a guide interface member with a first configuration and a second guide interface member with a second configuration different than the first. For example, any of the implants herein may have one or more interface members that are the same or similar to member **23**, the same or similar to member **33**, the same or similar to member **63**, and/or the same or similar to members **86**.

FIG. **9** (end view) illustrates an exemplary system **90** that includes implant **94**. Implant **94** has a plurality of arms, and not all of the arms include a guide interface member at the respective arm end region. In this embodiment, only one of the arms has a guide interface member (in this embodiment member **96**), but in other embodiments the implant may have any number of members less than the number of arms extending from a main body portion (e.g., two, three, four, etc.).

FIG. **10** (end view) illustrates an exemplary system **100** that includes an implant **104** that includes ilium guide interface member **106** and sacrum guide interface member **108**, each of which is configured to interface with guides **110** and **112**, respectively. The position shown illustrates the implant as it may be implanted across an SI joint, illustrating that any of the implants herein may be implanted with one guide member (e.g., **106**) in one type of bone superior to another guide member in a different type of bone (e.g., ilium versus sacrum). For example, guide **110** may be positioned in iliac bone, and guide **112** may be positioned in a sacrum, either inferior to guide **110** as shown, or in other embodiments superior to guide **110**, which is not shown, but which would be above guide **110** in FIG. **10**.

Any of the implants herein may have one or more surfaces that are configured and adapted to facilitate at least one of bony ingrowth and ongrowth. For example, without limitation, any of the implants herein may include one or more of

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bony ingrowth and ongrowth. For example, without limitation, any of the implants herein may include one or more of fenestrations, apertures, porous surfaces, irregular surfaces, etc., such as any that may be described in U.S. Pat. No. 9,044,321, U.S. Published Application 2013/0296953, U.S. Pat. Nos. 9,662,157, 10,166,033, U.S. Published Application 2016/0287171, the disclosures of which are incorporated by reference herein for all purposes.

As is set forth herein, SI joint implants herein may include one or more interface members, which may be configured as axially extending lumens or bores, and which may also be referred to as channels herein. The interface members are generally sized and configured to accommodate relative movement of one or more guides (such as an ilium guide), which are positioned in an ilium or a sacrum. In this way, implants may be moved axially relative to and guided by the positioning guides to the intended implantation location across the SI joint without migrating (or at least minimizing migration) away from the denser iliac bone.

In some embodiments, the implant may include interface members that are in opposing lateral side regions of the implant, an example of which is shown in FIGS. **2**A and **2**B. In this arrangement, the implant is advanced over the guides to position the implant across the SI joint. The guides may be removed after the SI joint implant is delivered to its desired position, leaving the implant implanted across the SI joint.

FIGS. **11**A and **11**B illustrate in top and back end views, respectively, exemplary implant **1300**. Implant **1300** may include any of the suitable features of other implants herein, such as interfacing members configured to interface with a positioning guide. FIGS. **11**A and **11**B illustrate implant **1300**, which is sized and configured for implantation across a SI joint from a dorsal approach. Implant **1300** includes implant body **1302** that includes an ilium region or portion **1304** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1302** also includes a sacrum region or portion **1306** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach.

Height, Width and Length directions of the implant are also labeled to provide the relative dimensions of the implant body that are described herein. When the description herein refers to a general dimension (e.g., height, length) of the implant body, it refers to the greatest dimension of the implant body. For example, with reference to FIG. **11**B, if the disclosure refers to a Height of implant body **1302**, it refers to the greatest height dimension of the implant body, which in this embodiment is in lateral regions of the implant body. The disclosure herein may also, however, refer to dimension in a particular region of the implant (e.g., central region Height). The relative Distal and Proximal directions are also labeled in FIG. **11**A.

As shown, ilium region **1304** includes and defines elongate ilium lumen **1305** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. In this example, sacrum

As shown, ilium region **1304** includes and defines elongate ilium lumen **1305** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. In this example, sacrum region **1306** extends further proximally than the ilium region **1304** with reference to the Length direction, as shown in FIG. **11**A. FIG. **38** illustrates an illustrative SI joint **1800**, ilium **1802**, and sacrum **1804**. Implants herein may be advanced from a dorsal approach and into position across the SI joint, with the ilium region or portion of the implant in the ilium and the sacrum region or portion in the sacrum. The overall implant dimensions and configuration of exemplary implant **1300** (which may also be referred to herein as the implant outer profile) may provide one or more advantages when implanting the implant across the SI joint from the dorsal approaches described herein. As can be seen in FIGS. **38**, **39**A and **39**B, the sacrum may extend further proximally than the ilium, relative to the delivery trajectory. With implants that have an ilium region that extends as far proximally as a sacrum region, the ilium region of the implants may extend too far posteriorly when implanted, such that they are extending out of the ilium. Ilium region **1304** does not extend as far proximally as sacrum region **1306**, such that when implanted there is less risk that the ilium region **1304** will extend outside of the ilium. The proximal end of the implant body in this example includes optional stepped region or portion **1308** between a sacral side and an ilium side of the implant body **1302**, and in this example optionally includes three flat surfaces (shown in the top view of FIG. **11**A), the central of which is tapered and extends further distally in the ilium portion of implant body. The tapered surface in this example extends between proximal sacrum and ilium surfaces that are orthogonal to a long axis of the implant (as shown), and are described in more detail with respect to an impactor, an example of which is shown in FIGS. **33** and **36**. In alternative implants, the proximal end may be a combination of one or more flat or curved surfaces, additional examples of which are described below.

Alternatively, implant **1300** may have a distal end in which ilium region **1304** extends further distally than sacrum region **1306**, some examples of which are described below. For example, the configuration of implant body **1302** may approximate a general parallelogram shape that does not comprise four right angles, such as a rhomboid or rhombus configuration (in a top view of the implant). Implants for which sacrum regions do not extend as far distally as the ilium region may provide an advantage of preventing the sacrum region **1306** from being advanced too far distally in the patient, which may mitigate a risk of damaging tissue distal to the desired implantation location. Some implants herein thus may have ilium and sacrum regions that do not extend as far proximally or as far distally as one another, which may provide the exemplary advantages set forth herein.

Implant body **1302** is an example of an implant body that has a height dimension that is less than a width dimension, as shown. Implant body **1302** also includes a sacrum region **1306** that includes an optional elongate sacrum lumen **1307** therein that extends from a distal opening to a proximal opening and is sized and configured to receive therein a sacrum positioning guide (such as any of the sacrum guides herein). In this example, sacrum lumen **1307** has a length that is greater than a length of ilium lumen **1305**, but in alternatives in which the sacrum region does not extend as far distally as

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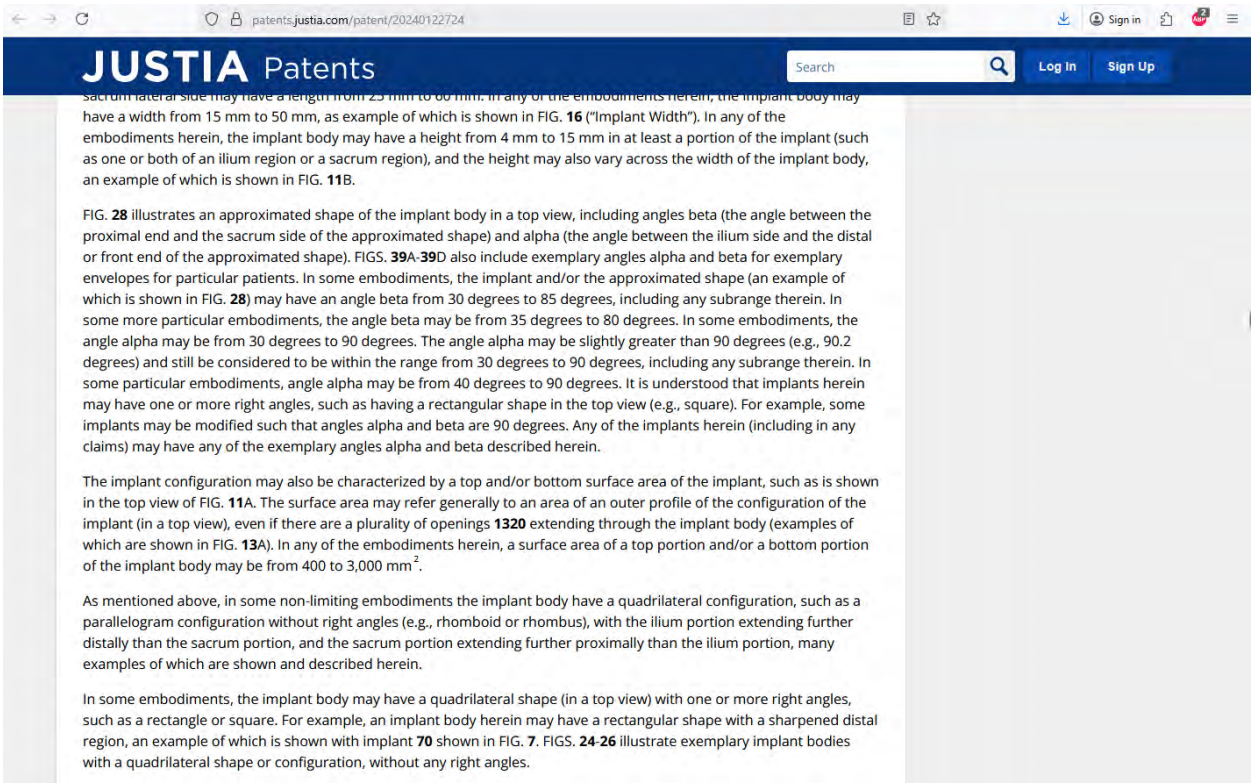
lumen **1307** is parallel to the ilium lumen **1305**. The term parallel in this disclosure can include a very minor deviation from being strictly parallel, such as lumens or sides with corresponding axes that intersect at an angle that is five degrees or less, for example. Ilium lumen **1305** is also parallel to a longitudinal ("long") axis of the implant body, with the long axis in this example extending in the length direction.

As is set forth herein, the outer profile of the implant body is important to ensure the implant is positioned at a target implant location and generally within a patient's target anatomical envelope. A target envelope refers generally to an anatomical volume that is the target location for the implant, which may vary from patient to patient due to anatomical variability. For example, some implant configurations mitigate a risk of extending too far proximally out of the ilium, as described above. Additionally, some implant outer profiles may mitigate a risk of extending too far distally, such as too far distally in the sacrum and potentially damaging sensitive tissue. As such, the implant body generally has dimensions and profiles sized and configured to avoid these potential problems. The target envelope may optionally be characterized by two dimensional (2D) spaces and/or a three dimensional (3D) space. FIGS. **39**A, **39**B, **39**C and **39**D illustrate exemplary views that illustrate exemplary 2D spaces with exemplary dimensions that partially characterize exemplary target envelopes. As shown, there can be some patient-to-patient variability in sacral bone shape, iliac bone shape, and SI joint shape. While some implant shapes herein may be able to treat a wide range of patients, it may optionally be beneficial to customize an SI joint implant for a particular patient, such as by customization of one or more dimensions (e.g. angles), and/or the outer profile of the implant. A customization process can include characterizing the target envelope, such as obtaining one or more 2D views (e.g., FIGS. **39**A-**3**D) and/or constructing a 3D image of the target envelope, and designing or selecting an implant (optionally from a kit of implants with at least some different dimensions and/or outer profiles, for example) based on the target envelope characterization. For example, a patient from which the image in FIG. **39**D is obtained may optionally be treated with an implant herein where ilium regions and sacrum regions extend to the same distal extent (e.g., FIGS. **11**A, **24**, **25**, **26** or **28**A and **28**B), whereas a patient from which the image in FIG. **39**B is obtained may optionally be treated with an implant with a configuration that more closely approximates the general rhomboid 2D space annotated in FIG. **39**D, such as (without limitation) any of the implants in FIG. **14**, **15**A, **16**, **18**A, or **23**A).

The implant bodies herein may have a length from 15 mm to 80 mm (an example length of which is shown in FIG. **14**, as "Length (implant body)"). For example, in FIG. **11**A, the greatest proximal extent of implant body **1302** is in sacrum region **1306**, and the greatest distal extent of implant body **1302** is in both sacrum region **1306** and ilium region **1304**. In any of the embodiments herein, the ilium lateral side of the implant body may have a length from 35 mm to 70 mm, an exemplary dimension of which is shown in FIG. **14** as "Length (ilium lateral side)." In any of the embodiments herein, the sacrum lateral side may have a length from 25 mm to 60 mm. In any of the embodiments herein, the implant body may have a width from 15 mm to 50 mm, as example of which is shown in FIG. **16** ("Implant Width"). In any of the embodiments herein, the implant body may have a height from 4 mm to 15 mm in at least a portion of the implant (such



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sacrum lateral side may have a length from 25 mm to 60 mm. In any of the embodiments herein, the implant body may have a width from 15 mm to 50 mm, as example of which is shown in FIG. **16** ("Implant Width"). In any of the embodiments herein, the implant body may have a height from 4 mm to 15 mm in at least a portion of the implant (such as one or both of an ilium region or a sacrum region), and the height may also vary across the width of the implant body, an example of which is shown in FIG. **11**B.

FIG. **28** illustrates an approximated shape of the implant body in a top view, including angles beta (the angle between the proximal end and the sacrum side of the approximated shape) and alpha (the angle between the ilium side and the distal or front end of the approximated shape). FIGS. **39**A-**39**D also include exemplary angles alpha and beta for exemplary envelopes for particular patients. In some embodiments, the implant and/or the approximated shape (an example of which is shown in FIG. **28**) may have an angle beta from 30 degrees to 85 degrees, including any subrange therein. In some more particular embodiments, the angle beta may be from 35 degrees to 80 degrees. In some embodiments, the angle alpha may be from 30 degrees to 90 degrees. The angle alpha may be slightly greater than 90 degrees (e.g., 90.2 degrees) and still be considered to be within the range from 30 degrees to 90 degrees, including any subrange therein. In some particular embodiments, angle alpha may be from 40 degrees to 90 degrees. It is understood that implants herein may have one or more right angles, such as having a rectangular shape in the top view (e.g., square). For example, some implants may be modified such that angles alpha and beta are 90 degrees. Any of the implants herein (including in any claims) may have any of the exemplary angles alpha and beta described herein.

The implant configuration may also be characterized by a top and/or bottom surface area of the implant, such as is shown in the top view of FIG. **11**A. The surface area may refer generally to an area of an outer profile of the configuration of the implant (in a top view), even if there are a plurality of openings **1320** extending through the implant body (examples of which are shown in FIG. **13**A). In any of the embodiments herein, a surface area of a top portion and/or a bottom portion of the implant body may be from 400 to 3,000 mm^2.

As mentioned above, in some non-limiting embodiments the implant body have a quadrilateral configuration, such as a parallelogram configuration without right angles (e.g., rhomboid or rhombus), with the ilium portion extending further distally than the sacrum portion, and the sacrum portion extending further proximally than the ilium portion, many examples of which are shown and described herein.

In some embodiments, the implant body may have a quadrilateral shape (in a top view) with one or more right angles, such as a rectangle or square. For example, an implant body herein may have a rectangular shape with a sharpened distal region, an example of which is shown with implant **70** shown in FIG. **7**. FIGS. **24**-**26** illustrate exemplary implant bodies with a quadrilateral shape or configuration, without any right angles.

As shown in FIG. **11**B, implant body **1302** optionally has a height that is not constant across a width of the implant. In this example, the height is greater in at least a portion of the ilium and sacrum portions than in the central portion. The top and bottom portions or surfaces of the implant bodies herein may have a gradual curvature therein in an end view, as shown in the example in FIG. **11**B.

As used herein, an implant body that has a wafer configuration or profile refers to an implant body with a width dimension that is greater than a height dimension. Implant body **1302** is an example of an implant body that has a wafer or wafer-like configuration. The height dimension of any implant body herein may be not more than 70% of a width dimension of the implant body, not more than 65%, not more than 60%, not more than 55%, not more than 50%, not more than 45%, not more than 40%, not more than 35%, not more than 30%, not more than 25%, not more than 20%, not more than 15%, or not more than 10% of the implant body width. Implants herein are implanted across an SI joint from a dorsal approach, and if the implant body height is too great, the implant body may undesirably extend outside of the joint when implanted.

Wafer implants herein, may however, have relatively larger heights than those described in the ranges herein (absolute and/or relative) and may be able to safely stabilize and/or fuse an SI joint. For example, the implant bodies herein may be able to safely stabilize the SI Joint even if the height dimension is, for example, not more than 80% of the width dimension.

Implant body **1302** is also an example of a SI joint implant body wherein the ilium lateral side of the implant body has a length that is different than a length of the sacrum lateral side of the implant body. In this example, the ilium lateral side is shorter than the length of the sacrum lateral side, as shown. The lengths of the lateral sides in this context refers to the lengths of the lateral sides of the implant body, example of which are shown in FIG. **14** as "Length (ilium lateral side," and "Length (sacrum lateral side").

Implant body **1302** also includes a distal end region **1310** (which in this example is not the furthest distal extent of the entire implant body) that is sized and configured for one or more of penetrating through bony tissue as the implant is advanced or reducing the likelihood that the implant deviates from the intended trajectory. For example, distal end region **1310** is an example of a sharpened distal end at least a portion of which extends laterally inward or centrally relative to lateral sides of the implant, the sharpened distal end configured to help penetrate or cut through bony tissue as the implant is advanced. Additionally, end region **1310** has an optional concave curved configuration that can reduce the likelihood that the implant deviates from its intended trajectory when being distally advanced during implantation. A concave curved configuration (an example of which is shown in the top view of FIG. **11**A) may be thought of as helping self-center the implant across the SI joint as the implant is being advanced. The degree of curvature may vary along the

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self-center the implant across the SI joint as the implant is being advanced. The degree of curvature may vary along the curve, as is shown in the example of FIG. **11**A. The curve may be symmetrical about a long axis of the implant (even if the degree of curvature varies), of the curve may be asymmetrical about a long axis of the implant (such as if the ilium and sacrum regions have distal ends that do not extend distally to the same point, examples of which are described below). The sharpened distal end in this example has a tapered configuration, as shown, with a first surface tapering downward and distally from a top portion or surface of the implant body, and a second surface tapering upward and distally from a bottom portion or surface of the implant body, as shown. A sharpened region as that phrase is used herein does not require a configuration with a knife's edge, but rather may be a region with surfaces that taper towards one another or other configurations that facilitate cut or penetrating through bony tissue.

In this example, the sacrum and ilium lateral sides of the implant body extend further distally than distal region **1310** (distal region **1310** includes a central region of implant body), but in other embodiments the sacrum lateral side may not extend further distally than distal region **1310**. The curvature of region **1310**, in a top view, may optionally be symmetrical about a long axis of the implant body (such as is shown in the example in FIG. **11**A), which may help maintaining the implant trajectory. Distal end region **1310** also extends laterally across a central region of the implant, wherein the central region is laterally inward relative to lateral sides of the implant body. A long axis of the implant body may extend through sharpened distal end region **1310**.

Implant distal region **1310** is an example of a front region of the implant that has at least one surface sized and configured to at least help maintain the implant trajectory when implanted across the SI joint from a dorsal approach. In this example the region has an inwardly curved configuration. In this context, the term front, or forward, refers to the portion of the implant body that will typically engage tissue when the implant is advanced along a direction of implantation. The "front" of the implant body thus may extend laterally across the entire distal end of the implant body, and thus some front portions of the implant body (e.g., a central front portion) may be disposed proximally relative to other front regions of the implant. Distal region **1310** is an example of a front portion of implant body, at least a portion of which is proximal relative to distal ends of the ilium lateral side and the sacrum lateral side, as shown in FIG. **11**A.

Alternatively, any of the implant bodies may have sacrum and ilium portions that have distal ends with surfaces that are configured to compress the SI joint as the implant is advanced, such as by having larger diameter regions, or one or more fins.

The central portion of implant bodies herein refers to a portion or region of the implant body that, in a top view of the implant, is laterally central or inward relative to lateral sides of the implant body, at least a portion of which is adapted or intended to be disposed in the SI joint when implanted. A long axis of the implant body may pass through central portions

intended to be disposed in the SI joint when implanted. A long axis of the implant body may pass through central portions of implants herein. A central portion generally includes a lateral midpoint of the implant body, as measured laterally across one or both of distal and proximal ends of the implant body. Implant bodies herein do not necessarily have exact or definitive demarcations or delineations between an ilium portion and a central portion, or between a sacrum portion and central portion, but rather a central portion may include the portion or region of the implant that will be or is intended to be positioned across an SI joint when the implant body is implanted. In this regard, the use of the phrases ilium portion and sacrum portion herein refers generally to a lateral position of the portion relative to the central portion. For some or any of the implant bodies herein, it is understood that there may be some degree of lateral overlap between a central portion and at least one of the ilium portion and the sacrum portion. The phrase central portion or central region herein can thus refer to a lateral position relative to ilium and sacrum lateral sides of the implant body.

FIG. **12** illustrates a proximal and top perspective view of implant **1200**, which is sized and configured for implantation across an SI joint from the dorsal approaches described herein. Implant **1200** includes implant body **1202** that includes ilium portion **1204** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1202** also includes sacrum portion **1206** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A and **11**B may be incorporated by reference into the description of FIG. **12**, such as the relative proximal and distal directions. Ilium portion **1204** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening to a proximal opening, which is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1206** includes and defines an elongate sacrum lumen **1207** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1206** extends further proximally than ilium portion **1204** with reference to the length direction, as shown in FIG. **12**. Ilium portion **1204** extends further distally than sacrum portion **1206**, as shown, exemplary advantages of which are described herein, such as preventing the sacrum region **1206** from being advanced too far distally in the patient, which may mitigate a risk of damaging tissue distal to the desired implantation location across the SI joint. Implant body **1202** is also an example of an implant body with a parallelogram configuration that does not have four right angles, and is generally rhomboid.

While an end view is not shown, implant body **1202** is an example of an implant body that has a wafer configuration, with a height dimension that is less than a width dimension, as can be appreciated from the perspective views that are shown. In this example, sacrum lumen **1207** has a length that is greater than a length of the ilium lumen, but may be at least substantially the same (optionally being exactly the same same) as a length of the ilium lumen. The guide lumens in implant body **1202** are examples of lumens that have axes that are parallel with each other, which again includes slight

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substantially the same (optionally being exactly the same same) as a length of the ilium lumen. The guide lumens in implant body **1202** are examples of lumens that have axes that are parallel with each other, which again includes slight deviations from perfectly parallel (e.g., lumen axes intersecting with an angle of five degrees or less therebetween). Ilium lumen is also parallel to a long axis LA of the implant body, with the long axis LA in this example extending in the length direction.

Implant body **1202** is an example of an implant body comprising one or more porous networks of interconnected struts. Implant body **1202** includes top porous network of interconnected struts **1201**, a bottom porous network of interconnected struts (not labeled, but defines part of the bottom portion of the implant body), and lateral side porous network of interconnected struts **1209** (only the sacrum side of which is shown and labeled). Top porous network of interconnected struts **1201** forms at least a portion of a top portion of the implant body, and lateral side porous network of interconnected struts **1209** form at least part of the lateral sides of the implant body. In the embodiment, implant body **1202** includes frame **1213**, portions of which are connected or coupled by one or more discrete porous network of interconnected struts. For example, frame **1213** includes a plurality of axially extending frame members **1211***a*, **1211***b*, **1211***c*, and **1211***d* (**1211***d* is not shown or labeled, but is one of the lower or bottom members), which may also be referred to as struts, and which may be a part of the framework providing much of the structural support of the implant body. Frame **1213** may also comprise a proximal frame portion **1215**, which in this example extends laterally but obliquely (but not strictly laterally) across the width of implant body **1202**, and generally obliquely to the axially extending members **1211***a*-**1211***d*. In this example, proximal frame portion **1215** forms a proximal side of the quadrilateral shape of the implant, which in this example is a parallelogram, and in particular a rhomboid. Implant body frame **1213** also comprises distal frame portion **1217**, which in this example includes a sharpened distal end, which is described in more detail herein Similar to proximal frame portion **1215**, sharpened distal end **1217** extends generally laterally but not strictly orthogonally across implant body **1202** relative to long axis LA. Frame **1213** in this embodiment comprises distal frame portion **1217**, proximal frame portion **1215**, and a plurality of axially extending and linear frame members **1211***a*-**1211***d* coupling the proximal **1215** and distal 1217 frame members.

A plurality of discrete porous networks of interconnected struts extend between and couple the frame members, as shown, forming most of the top, bottom, and lateral sides of the implant body. The top and bottom porous networks of interconnected struts each form most of the top and bottom portions, respectively, that, in an end view of the implant, define at least partially curved configurations for the top and bottom portions of the implant. In this example, each of the lateral side porous networks of interconnected struts **1209** partially define the ilium and sacrum lumens, as shown, and in particular, define a lateral section of each of the lumens, even though the lateral sides of the lumen have openings therein in between the struts.

Body **1202** is also an example of an implant body that has a quadrilateral configuration, and in this example has a parallelogram configuration that does not include four right angles. For example, body **1202** is an example of an implant body that has a rhomboid configuration, and may alternatively have a rhombus configuration, but in alternative embodiments it may have other quadrilateral configurations (including rectangular, square, etc.).

Implant bodies herein may have, in a top view of the implant body, a general quadrilateral configuration. In this context, the term quadrilateral does not require completely linear sides. Any side of implant bodies herein may have some minor degree of curvature while still approximating a quadrilateral configuration, such as the implant body in FIG. **26**.

Additional details of porous networks of interconnected struts may be found in published PCT application WO2021/108590A1, the disclosure of which is incorporated by reference herein for all purposes. For example, any and all disclosure of porous networks of interconnected struts described in WO2021/108590A1 may be incorporated into the disclosure herein, including any examples that comprise one or more porous networks of interconnected struts. For example, a porous network of interconnected struts may also be referred to as a porous lattice, or mesh. Additionally, any of the individual struts herein may also be referred to as a beam. Additionally, the porous networks of interconnected struts may have and form a smooth outer surface, such as shown in the example in FIG. **12** (as opposed to struts or beams with free ends that extend outward). Additionally, in some embodiments the porous network may have an irregular configuration of struts, or it may have a regular pattern of struts, or a combination thereof. It is therefore understood that the term lattice or network as used herein does not require a regular or repeating pattern of struts. Additionally, struts of the porous network of interconnected struts may be interconnected at connections or nodal locations, which is described in more detail in, for example, WO2021/108590A1. Connections or nodal locations herein may be the connection of two, three, four, or more individual struts or beams of the porous network of interconnected struts.

Implant bodies herein that include a porous network of interconnected struts may have added stability once implanted as the bone grows around the many struts.

FIG. **13** is a distal and top perspective view illustrating exemplary implant **1350**, which, like others herein, is sized and configured for implantation across an SI joint from the dorsal approaches herein. Implant **1350** includes implant body **1352** that includes ilium portion **1354** that is sized and configured for implanting into an ilium when the implant is implanted across an SI joint from the dorsal approach. Implant body **1352** also includes a sacrum portion **1356** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**12**B may be incorporated by reference to the description of FIG. **13**. Ilium portion **1354** includes and defines an elongate ilium guide lumen **1358** that extends from a distal opening to a proximal opening, and is sized and configured to receive therein and move relative to an ilium positioning guide (not shown).

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opening, and is sized and configured to receive therein and move relative to an ilium positioning guide (not shown). Sacrum portion **1356** includes and defines an elongate sacrum lumen **1340** therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1356** extends further proximally than ilium portion **1354** with reference to a length direction. Ilium portion **1354** extends further distally than sacrum portion **1356**, as shown, exemplary advantages of which are described herein. Implant body **1352** is also an example of an implant body with, in a top view, a parallelogram configuration that does not include four right angles, and in this example has a rhomboid configuration (but may alternatively have a rhombus configuration). Implant body **1352** is also an example of an implant body that has a wafer configuration. In this example, sacrum lumen **1340** has a length that is slightly greater than a length of the ilium lumen **1358**, but in alternatives it may be at least substantially the same or exactly the same as a length of the ilium lumen **1358**. The guide lumens in implant body **1352** are examples of lumens that have long axes that are parallel, which includes slight deviations from perfectly parallel (described herein). Ilium lumen **1358** and sacrum lumen **1340** are also parallel to a longitudinal (or long) axis LA of the implant body, with the long axis in this example extending in the length direction. In this example, long axis LA extends through a lateral midpoint of the implant body (e.g., dividing the implant body laterally into halves). As shown in the examples herein, a long axis of the implant body may or may not be a line of symmetry of the implant body in a top view of the implant body. In FIGS. **11**A-**28**, the long axis of the respective implant body is not a line of symmetry of the implant body in a top view. Implant body **1352** also includes a distal portion, at least a portion of which comprises sharpened distal end **1360**, which is described in detail elsewhere herein. Sharpened or cutting distal end **1360** has a tapered configuration **1364**, which tapers downward from a top portion **1362** of the implant body and that tapers upward from a bottom portion of the implant body. In this embodiment, tapering surface **1365** tapers downward and distally from top portion **1362**, and a tapering surface (not shown but on the bottom side of implant body **1352**) tapers upward and distally from the bottom portion of the implant body. The sharpened distal end **1360** has some height dimension that is less than the height between the top and bottom portions of the implant body from which the tapered surfaces extend. The tapering surfaces help the distal end **1360** penetrate into bone during implantation. Distal end **1360**, as shown, also has a concave curve configuration in a top view, and is recessed proximally relative to the distal ends of ilium portion **1354** and sacrum portion **1356**, as shown.

Implant body **1352** also comprises frame **1373**. Implant body **1352** may be monolithic (and may be 3D printed, for example), frame **1373** includes first and second axially extending elongate regions **1374***a* and **1374***b*, which are in ilium portion **1354** and sacrum portion **1356**, respectively. Axially extending elongate regions **1374***a* and **1374***b* are connected or coupled together by generally oblique connecting members **1375***a*, **1375***b* and **1375***c*, which extend across the long axis, and extend from elongate region **1374***b* non-orthogonally relative to the elongate region **1374***b*, and in this example extend from elongate region **1374***b* partially distally such that they have a slanted configuration and are further distally in the ilium portion than in the sacrum portion. The distal most connector **1375***c* includes, in this example, top surface **1362**

extend from elongate region **1374***b* partially distally such that they have a slanted configuration and are further distally in the ilium portion than in the sacrum portion. The distal most connector **1375***c* includes, in this example, top surface **1362** from which the tapered surface **1365** extends distally and downward. The distal connector **1375***c* also includes a corresponding bottom surface of the implant and a bottom tapered surface that extends distally and upward. Frame **1373** is an example of a frame that has a shape that, in a top view, resembles a digital eight configuration that is slanted further distally on the ilium side.

The implant will be subject to stresses when implanted across the SI joint with a portion of the implant in the sacrum and a portion of the implant in the ilium. Connectors **1375** of the frame are adapted to resist both bending and shear forces.

Frame **1373**, in this embodiment, further defines a plurality of fenestrations (or openings) **1376***a* and **1376***b*, which as shown extend through the top and bottom portions or surfaces of the implant body. The fenestrations in any of the implant bodies herein can facilitate the ingrowth or ongrowth of tissue, while in some examples (such as FIGS. **15**A-**15**C) the fenestrations may be used to facilitate delivery of one or more agents into the patient. In alternative embodiments, any of the frames herein may include more than two fenestrations, such as from three to two hundred fenestrations. Implant body **1302** in FIG. **11**A is, for example, an example of an implant body including nine fenestrations **1320** extending through top and bottom portions or surfaces of the implant. Elongate members **1374***a* and **1374***b* and connecting members **1375***a*, **1375***b* and **1375***c*, in this embodiment, define fenestrations **1376***a* and **1376***b* that extend through the top and bottom portions of implant body.

FIG. **14** is a top view illustrating exemplary implant **1400**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **1400** includes implant body **1402**, which is similar to implant **1350** in some ways. Implant body **1402** includes ilium portion **1404** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1402** also includes sacrum portion **1406** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**13** may be incorporated by reference to the description of FIG. **14**. Ilium portion **1404** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1406** includes and defines an elongate sacrum lumen therein (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1406** extends further proximally than ilium portion **1404**, as shown. Ilium portion **1404** extends further distally than sacrum portion **1406**, as shown. Implant body **1402** is also an example of an implant body with, in a top view, a parallelogram configuration without right angles, and in particular has a rhomboid configuration (which may alternatively have a rhombus configuration if all sides have the same length).

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Implant body **1402** is an example of an implant body that has a wafer configuration. In this example, the sacrum lumen has a length that is slightly greater than a length of the ilium lumen, although in alterative embodiments they may be substantially the same. The guide lumens in implant body **1402** are examples of lumens that have axes (ilium lumen axis "ILA" and sacrum lumen axis "SLA") that are parallel with each other, which again includes slight deviations from perfectly parallel. ILA and SLA are also each parallel to a long axis LA of the implant body, as shown, which passes through a lateral midpoint of implant body.

Implant body **1402** also comprises frame **1413**, which is similar in some ways to frame **1373** in FIG. **13**, and which may have the same general configuration as frame **1373** in FIG. **13**. Implant body **1402** also includes porous network of interconnected struts **1401**, which may be additively manufactured with frame **1373**, for example, to form implant body **1402**. The disclosure that is incorporated by reference herein related to porous network of interconnected struts, such as the disclosure in WO2021/108590A1, may be incorporated into network **1401** of implant **1402**. Network **1401** may extend over and about a portion of frame **1413**, as shown, including over and about the lateral sides of the frame, as shown. As shown, network of interconnected struts **1401** may be at least partially continuous (or uninterrupted) laterally across portions of implant body, over a first lateral side, laterally across the bottom of implant body, and over the other lateral side. In some embodiments the network of struts may extend over and about a portion of frame **1413**. In some ways, implant body **1402** in FIG. **14** includes aspects of frame **1373** from FIG. **13** and network of struts **1201** from FIG. **12**.

All of the disclosure from FIG. **13** related to frame **1373** is incorporated by reference in its entirety into the disclosure of FIG. **14** with respect to frame **1401**.

Implant body **1402** is also an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiments, implant body **1402** may have a rhombus configuration, or it may have any other quadrilateral configuration (including rectangular, square, etc.). The proximal end of implant body **1402** is an example of a back or proximal side of an implant body that is considered a side, even though it does not have complete linearity.

FIGS. **15**A-**15**C illustrate implant **1500**, which is sized and configured for implantation across a SI joint from a dorsal approach, which is described herein. Implant **1500** includes implant body **1502** that includes ilium portion **1504** that is sized and configured for implanting into an ilium when the implant is implanted across a SI joint from the dorsal approach. Implant body **1502** also includes a sacrum portion **1506** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**14** may be incorporated by reference to the description of FIGS. **15**A-**15**C. Ilium portion **1504** includes and defines an

sacrum when the implant is implanted across the SI joint from the dorsal approach. Any relevant description of FIGS. **11**A-**14** may be incorporated by reference to the description of FIGS. **15**A-**15**C. Ilium portion **1504** includes and defines an elongate ilium lumen therein (not labeled) that extends from a distal opening **1501** to a proximal opening **1503**, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1506** similarly includes and defines an elongate sacrum lumen therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. Exemplary lumens are described herein, and may each have a long axis. In this example, and as shown, sacrum portion **1506** extends further proximally than the ilium portion **1504**. Ilium portion **1504** extends further distally than sacrum portion **1506**, as shown, exemplary advantages of which are described herein. Implant body **1502** is also an example of an implant body with a parallelogram configuration without right angles, and in this example has a rhomboid configuration, exemplary benefits are described herein.

Implant body **1502** is an example of an implant body with a wafer configuration with a height dimension that is less than a width dimension. As shown, and in this example, the sacrum lateral side and sacrum lumen have lengths that are greater than corresponding lengths of the ilium lumen and ilium lateral side. The guide lumen axes in implant body **1502** are examples of lumens that have axes (ilium lumen axis ILA; sacrum lumen axis SLA) that are parallel to each other (as shown), which includes slight deviations from perfectly parallel. Ilium lumen axis ILA and sacrum lumen axis SLA are each also parallel to long axis LA of the implant body, as shown, which includes slight deviations from perfectly parallel.

Implant body **1502** further includes inner frame **1513**, which may include the same general or similar configuration as the frame in the embodiment in FIGS. **12** and **13**. In this regard, the entire disclosure of the frame from the embodiments in FIGS. **12** and **13** is incorporated by reference herein to the disclosure of frame **1513**. For example, frame **1513** includes a plurality of axially extending frame members (not labeled but may be the same or similar to those in FIG. **13**) and oblique or slanted connecting members (one of which is labeled, **1515**) coupling and extending between the axially extending frame members. Connecting member(s) **1515** also extend obliquely across long axis LA, as shown. Implant body **1502** also comprises distal sharpened end **1517**, which has a concave shape as shown, and which is described in more detail herein, and which extends generally laterally across implant body **1502**, as shown.

Implant body **1502** is an example of an implant body comprising one or more porous network of interconnected struts, as shown. Implant body **1502** includes a porous network of interconnected struts **1511** that in this embodiment extends over and about a top implant body portion, a bottom implant portion, and lateral sides of the implant body. In this embodiment, porous network of interconnected struts **1511** define larger cells or pores in the central region than in the ilium and sacrum portions of the implant, as shown.

Implant body **1502** is an example of an implant body with a quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In

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Implant body **1502** is an example of an implant body with a quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1502** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration (including rectangular). The proximal end of implant body in FIG. **15** is an example of a proximal portion of an implant body that is considered to approximate a side of a quadrilateral even though it does not have complete linearity, as is shown.

FIG. **15**B illustrates implant **1500**, and illustrates the exemplary length of the implant, measured axially from the distal end to the proximal end of the implant.

FIG. **15**C illustrates a perspective view of implant **1500**, and also illustrates lateral side fenestrations **1550***a* and **1550***b* in the sacrum side of the implant, and which are in communication with the sacrum lumen as shown. Fenestrations **1550***a* and **1550***b* may be used to help facilitate delivery of an agent into the patient via delivery of the agent through the proximal opening of the sacrum lumen. Alternatively or additionally, fenestrations **1550***a* and **1550***b* may help tissue growth therethrough, which can help stabilize the implant. The ilium lateral side can similarly have fenestrations **1550***a* and **1550***b* therethrough. The lateral sides of the implant can optionally have one or more fenestrations **1550** therethrough, such as, without limitation, from one to ten, or more.

FIG. **16** is a top view illustrating exemplary implant **1600**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **1600** may incorporate any suitable feature of any other implant body herein, such as those shown and described with respect to FIGS. **11**A-**15**. Implant **1600** includes implant body **1602** that includes ilium portion **1604** that is sized and configured for implanting into an ilium when the implant is implanted across an SI joint from the dorsal approach. Implant body **1602** also includes sacrum portion **1606** that is sized and configured for implanting into a sacrum when the implant is implanted across the SI joint from the dorsal approach. Ilium portion **1604** includes and defines an elongate ilium guide lumen (not labeled) that extends from a distal opening to a proximal opening, and is sized and configured to receive therein an ilium positioning guide. Sacrum portion **1606** includes and defines an elongate sacrum lumen therein that extends from a distal opening to a proximal opening, and is sized and configured to receive therein a sacrum positioning guide. In this example, sacrum portion **1606** extends further proximally than ilium portion **1604**, as shown, exemplary advantages of which are described herein. Ilium portion **1604** extends further distally than sacrum portion **1606**, as shown, exemplary advantages of which are described herein. Implant body **1602** is also an example of an implant body with, in a top view, a parallelogram configuration without right angles, as shown, which may be rhomboid or rhombus shaped. Implant body **1602** is also an example of an implant body with a wafer configuration that has a height dimension that is less than a width dimension. In this example, the sacrum lumen and sacrum side have lengths that are greater than length of the ilium lumen and ilium lateral side, respectively (as shown). The guide lumens are examples of lumens that have long axes that are parallel with each other (as shown), which

angles, as shown, which may be rhomboid or rhombus shaped. Implant body **1602** is also an example of an implant body with a wafer configuration that has a height dimension that is less than a width dimension. In this example, the sacrum lumen and sacrum side have lengths that are greater than length of the ilium lumen and ilium lateral side, respectively (as shown). The guide lumens are examples of lumens that have long axes that are parallel with each other (as shown), which includes slight deviations from perfectly parallel. Elongate ilium lumen axis ILA and sacrum lumen axis SLA are also parallel to a longitudinal (or long) axis LA of the implant body, as shown. As shown in the examples herein, a long axis of the implant body LA may or may not be a line of symmetry of the implant body (in a top view), which in this case it is not. Implant body **1602** also includes a distal portion, at least a portion of which comprises sharpened distal end **1617**, exemplary details of which are described herein, and which may be incorporated into this embodiment. For example, sharpened or cutting distal end **1617** has a tapered configuration that tapers downward from a top portion of the implant body and that tapers upward from a bottom portion of the implant body.

In this example, implant body **1602** includes a frame, which as shown does not comprise fenestrations through top and bottom portions of the implant body (e.g., such as fenestrations **1376***a* and **1376***b*). Any of the implants herein may not include fenestrations through top and bottom portions of the implant body, as is the case with implant body **1602**.

Implant body **1602** is an example of an implant body with a wafer configuration with a height dimension that is less than a width dimension. As shown, and in this example, the sacrum side and sacrum lumen have lengths that are greater than corresponding lengths of the ilium lumen and ilium side, respectively. The guide lumen axes in implant body **1602** are examples of lumens that have axes (ilium lumen axis ILA; sacrum lumen axis SLA) that are parallel to each other (as shown), which includes slight deviations from perfectly parallel. Ilium lumen axis ILA and sacrum lumen axis SLA are each also parallel to long axis LA of the implant body, as shown, which includes slight deviations from perfectly parallel.

Implant body **1602** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration, additional examples of which are shown herein. In alternative embodiment, implant body **1502** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration (including rectangular).

Implant **1600** may incorporate any other suitable feature of any of implant body herein.

FIGS. **17**A and **17**B illustrate an exemplary distal end **1720** of an ilium portion of an implant body, features of which may be incorporated into any of the distal ends of the ilium portions herein. FIG. **17**B is a front end view, also showing the ilium lumen. FIG. **17**C illustrates an exemplary distal end **1707** of a sacrum portion of an implant body, features of which may be incorporated into any of the distal ends of the sacrum portions herein. The distal end **1720** and **1707** both include

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be incorporated into any of the distal ends of the ilium portions herein. FIG. **17**B is a front end view, also showing the ilium lumen. FIG. **17**C illustrates an exemplary distal end **1707** of a sacrum portion of an implant body, features of which may be incorporated into any of the distal ends of the sacrum portions herein. The distal end **1720** and **1707** both include a plurality of cutting edges **1750**, which in each case progressively have larger dimensions moving proximally, as shown. The configuration of the cutting edges **1750** on each end acts like a broach to help both ends penetrate into bone as the implant is advanced distally. Cutting edges **1750** have annular configurations, as shown, which may be colinear with the lumen axes, which is also shown. Exemplary sharpened distal end **1717** is shown in FIG. **17**B, exemplary details of which are described herein. In this example, the ilium distal end **1720** has three axially spaced annular cutting edges, while the sacrum region distal end **1707** has two axially spaced annular cutting edges. Each end may have more or fewer cutting edges. Cutting edges like those shown in FIGS. **17**A-**17**C are shown in the implant bodies in FIGS. **12**, **13**, **14**, **15**A-**15**C and **16**, and thus the description of these other figures implicitly includes the description of FIGS. **17**A-**17**C.

Any of the ilium portions herein may have cutting edges, such as those shown in FIGS. **17**A and **17**B. Any of the sacrum portions herein may have cutting edges, such as those shown in FIG. **17**C.

FIGS. **18**A-**18**C illustrate implant **1800**, which include implant body **1802** that may be the same as implant body **1352** from FIG. **13** in all ways, except those described herewith. Implant body **1802** includes ilium portion **1804** that includes distal end **1820** with a configuration that helps penetrate or cut through tissue as the implant is being advanced distally. FIG. **18**B illustrates a close-up perspective view of distal end **1820** of ilium region **1804**. Ilium region **1804** includes ilium lumen IL, additional details of which are described herein. Distal end **1820** includes first cutting region **1822** with a first cutting member **1823**, and a second cutting region **1824** with a second cutting member **1825**. Concave surfaces extend between the two cutting regions, as shown. Second cutting region **1824** extends further distally and is wider than first cutting region **1822**. First cutting member **1823** has a height that is greater than a height of second cutting member **1825**. Cutting edges of both first and second cutting members **1823** and **1825** are relatively sharp and help penetrate through tissue as implant **1800** is advanced.

Sacrum region **1806** includes distal end **1807**, which may have the same configuration as any other sacrum or ilium portion distal end herein (including like distal end **1820**). The sacrum portion may optionally include sacrum lumen SL as shown in FIG. **18**C, but in alternative embodiments the sacrum portion may not include a lumen, as is described in examples herein. Implant body **1802** also has a sharpened distal end extending at least in the central portion of the implant body, examples of which are described herein and the disclosure of which is incorporated by reference into the description of FIGS. **18**A-**18**C.

Implant body **1802** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid

implant body, examples of which are described herein and the disclosure of which is incorporated by reference into the description of FIGS. **18**A-**18**C.

Implant body **1802** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1802** may have a rhombus configuration, while in alternative embodiments it may have any other quadrilateral configuration.

FIG. **19** shows a top view of implant **1900**, which includes implant body **1902**, which may be the same in any or all ways as implant body **1802** in FIGS. **18**A-**18**C except for those details described herewith. Implant body **1902** includes frame **1913** and one or more porous network of interconnecting struts **1930** extending from frame **1913**. A porous network of interconnecting struts **1930** may by the same in any or all ways as porous network of interconnecting struts **1401** from FIG. **14**. Implant body **1902** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **1902** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **20** is a top view of implant **2000**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **2000** may incorporate any suitable feature of any other implant body herein, such as those shown and described with respect to FIGS. **11**A-**19**. Implant body **2002** may be the same as implant body **1802** from FIGS. **18**A and **18**B in any or all other ways except those described herewith. Implant body **2002** includes ilium portion **2004** with an ilium portion distal end **2020** that does not extend as far distally as some ilium portion distal ends described herein. Additionally, sacrum portion **2006** includes sacrum portion distal end **2007** that does not extend as far distally as some sacrum portion distal ends described herein. Distal end **2020** of ilium portion **2004** includes first cutting region **2022** and second cutting region **2024**, and distal end **2007** of sacrum portion **2006** includes first cutting region **2009** and second cutting region **2011**, all of which have pointed or sharpened configurations that help penetrate or cut into tissue as the implant is advanced distally. Each of the adjacent sharpened regions have concave surfaces therebetween in the top view, as shown.

Implant body **2002** includes a distal portion that includes sharpened distal end **2017** (which extends through the central region of the implant body. Any or all exemplary details of any of the sharpened distal ends herein may be incorporated by reference into sharpened distal end **2017** of FIG. **20**. In this embodiment, due partially to the distal end of distal ends **2020** and **2007**, sharpened distal end **2017** does not have as pronounced a concave curve as in other embodiments herein. In fact, as shown, sharpened distal end **2017** has a slight "S" shape curvature, as shown. Sharpened end **2017** thus has a convex curvature along a first portion of the front face, and is concave along a second portion of the front face,

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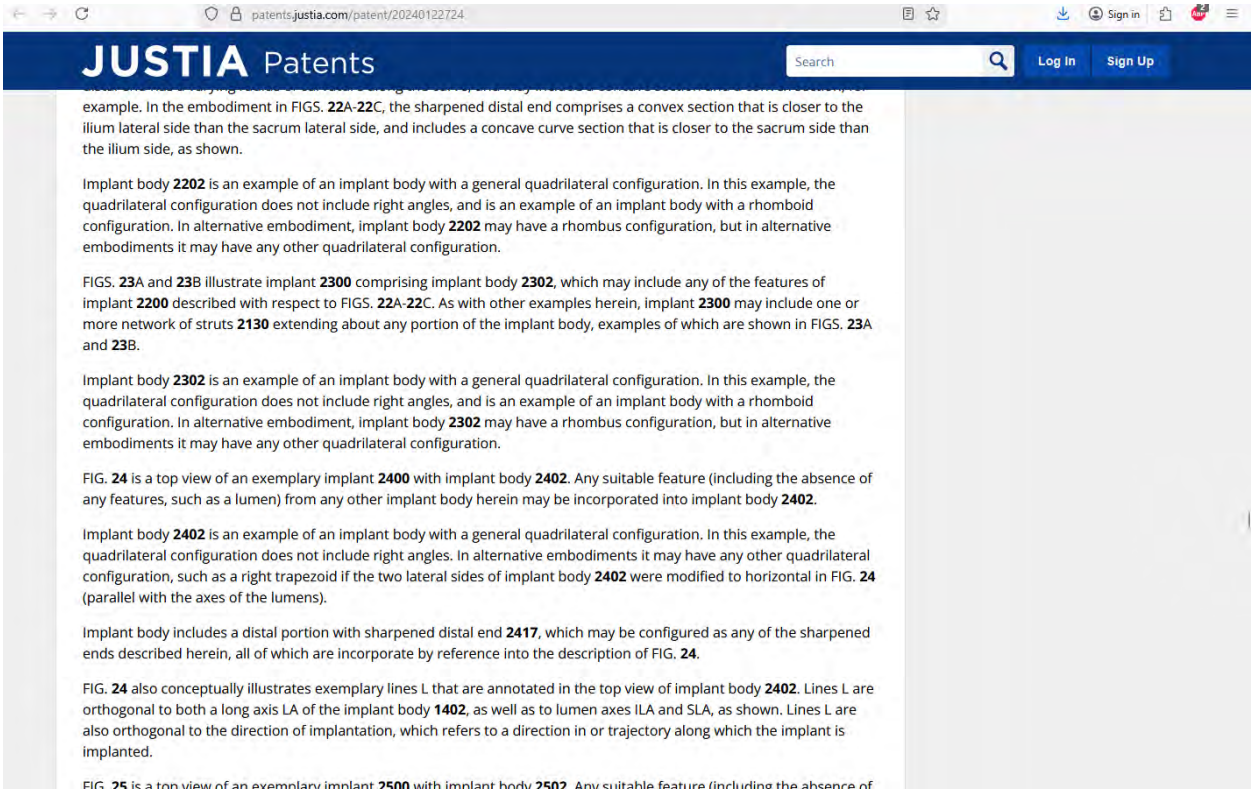
has a convex curvature along a first portion of the front face, and is concave along a second portion of the front face, wherein the convex region is closer to the ilium side, as shown. Any of the implant bodies herein may be modified to include any or all of the features shown and described with respect to FIG. **20**.

Implant body **2002** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2002** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **21** is a top view of implant **2100**, which, like others herein, is sized and configured for implantation across an SI joint from a dorsal approach. Implant **2100** may be the same as implant **2000** in any or all ways except as described herewith. Implant body **2130** includes a plurality of porous networks of interconnecting struts **2130**. While only one network **2130** is shown that extends over a portion of the top portion of the implant **2100** (the network similar have a slanted digital eight configuration), it is understood that a second network **2130'** (not labeled) may similarly extend over the corresponding bottom portion of the implant body **2102**. Network **2130** may be considered similar to network **1930** shown and described with respect to FIG. **19**. Implant body **2102** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2102** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIGS. **22**A-**22**C illustrate implant **2200**, which may include any suitable feature from any of implant **1350** in FIG. **13**, implant **1600** in FIG. **16**, implant **1800** from FIGS. **18**A-**18**C, and/or implant **2000** from FIG. **20**, except with respect to the features described herewith. Implant **2200** includes implant body **2202**, for which sacrum lumen SL does not have a distal opening, as shown. As such, delivery of implant **2200** does not include delivery over a sacrum guide, examples of which are described herein. Implant body **2202** includes a sacrum lumen SL, however, that includes a proximal opening, as shown, which may help facilitate growth on the lateral sacrum side via lateral sacrum side fenestrations **2240***a* and **2240***b*, as shown, or delivery of an agent therethrough as described herein. Additionally, as shown, distal end **2220** of the ilium region extends further distally than distal end **2207** of the sacrum region.

Implant body **2202** also includes a distal portion that comprises a sharpened distal end **2217**, exemplary details of which are described herein and may be incorporated fully into the description of FIGS. **22**A-**22**C. The curvature of the sharpened distal end has a varying radius of curvature along the curve, and may include a concave section and a convex section, for example. In the embodiment in FIGS. **22**A-**22**C, the sharpened distal end comprises a convex section that is closer to the ilium lateral side than the sacrum lateral side, and includes a concave curve section that is closer to the sacrum side than



example. In the embodiment in FIGS. **22**A-**22**C, the sharpened distal end comprises a convex section that is closer to the ilium lateral side than the sacrum lateral side, and includes a concave curve section that is closer to the sacrum side than the ilium side, as shown.

Implant body **2202** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2202** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIGS. **23**A and **23**B illustrate implant **2300** comprising implant body **2302**, which may include any of the features of implant **2200** described with respect to FIGS. **22**A-**22**C. As with other examples herein, implant **2300** may include one or more network of struts **2130** extending about any portion of the implant body, examples of which are shown in FIGS. **23**A and **23**B.

Implant body **2302** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles, and is an example of an implant body with a rhomboid configuration. In alternative embodiment, implant body **2302** may have a rhombus configuration, but in alternative embodiments it may have any other quadrilateral configuration.

FIG. **24** is a top view of an exemplary implant **2400** with implant body **2402**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2402**.

Implant body **2402** is an example of an implant body with a general quadrilateral configuration. In this example, the quadrilateral configuration does not include right angles. In alternative embodiments it may have any other quadrilateral configuration, such as a right trapezoid if the two lateral sides of implant body **2402** were modified to horizontal in FIG. **24** (parallel with the axes of the lumens).

Implant body includes a distal portion with sharpened distal end **2417**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **24**.

FIG. **24** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2402**. Lines L are orthogonal to both a long axis LA of the implant body **1402**, as well as to lumen axes ILA and SLA, as shown. Lines L are also orthogonal to the direction of implantation, which refers to a direction in or trajectory along which the implant is implanted.

FIG. **25** is a top view of an exemplary implant **2500** with implant body **2502**. Any suitable feature (including the absence of

also orthogonal to the direction of implantation, which refers to a direction in or trajectory along which the implant is implanted.

FIG. **25** is a top view of an exemplary implant **2500** with implant body **2502**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2502**.

Implant body **2502** is an example of an implant body with a quadrilateral configuration with first and second parallel sides. In this example, the quadrilateral configuration does not include right angles. In alternative embodiments, it may have any other quadrilateral configuration.

Implant body includes a distal portion with a sharpened distal end **2517**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **25**.

FIG. **25** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2502**. Lines L are orthogonal to both a long axis LA of the implant body **2502**, as well as to lumen axes ILA and SLA, as shown.

FIG. **26** is a top view of an exemplary implant **2600** with implant body **2602**. Any suitable feature (including the absence of any features, such as a lumen) from any other implant body herein may be incorporated into implant body **2602**.

Implant body **2602** is an example of an implant body with a quadrilateral configuration that does not include right angles. In alternative embodiments, it may have any other quadrilateral configuration.

Implant body includes a distal portion with sharpened distal end **2617**, which may be configured as any of the sharpened ends described herein, all of which are incorporate by reference into the description of FIG. **26**.

FIG. **26** also conceptually illustrates exemplary lines L that are annotated in the top view of implant body **2602**. Lines L are orthogonal to both a long axis LA of the implant body **2602**, to lumen axes ILA and SLA, as shown, as well as to a direction or trajectory of implantation.

FIGS. **27**A and **27**B illustrate a top view and distal perspective view of exemplary SI joint stabilizing implant **2700**, which may understandably incorporate any other feature of any implant herein even if not expressly described with respect to FIGS. **27**A and **27**B. For example, implant **2700** includes implant body **2702** that includes ilium region **2704** and **2706**, and sharpened distal end **2717** with a tapered configuration, as shown. In this embodiment, sharpened distal end **2717** has a general concave configuration, as shown. Sharpened distal end **2717** includes a top region that extends downward and distally from a top portion of the implant body, and a bottom region that extends upward and distally from a bottom portion of the implant body to form the tapered configuration. The top and bottom regions have general scallop

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the implant is loaded onto the impactor and when the implant is impacted.

Channel **2982** includes an internal thread, which is configured to engage with the external thread on implant securing member **5958** of the impactor to facilitate the releasable coupling between the impactor and the implant. The releasable coupling therebetween allows the implant to be axially secured to the impactor for impaction across the SI joint, and also allows the implant to be retracted proximally if needed by pulling on the impactor.

FIGS. **30** and **31** illustrate exemplary proximal ends that include recessed impactor stabilizers **3080** and **3180**, respectively, which are sized and configured to interface with protrusions on a distal end of a delivery tool, such as an impactor herein. Stabilizers **3080** and **3180** are examples of stabilizers that are centrally located (in a lateral direction), and may extend across the long axis of the implant.

One aspect of the disclosure is related to methods of positioning an SI joint stabilizing implant across a SI joint from a dorsal approach. In these methods, the SI joint implant may be any of the SI joint implants herein unless the method is limited to one or more implants herein. The methods may include advancing an elongate ilium positioning guide from a dorsal starting point, such as starting point **1122** shown in FIG. **32**A, and into an ilium of a subject. For example only, FIGS. **2**A and **2**B illustrate exemplary ilium guide **22**, but other types of ilium guides may be positioned from a dorsal approach into an ilium of the subject. FIG. **32**A also illustrates a general region **1120** into which any of the ilium guides herein may be started and advanced into an ilium to function as a guide for the SI joint implant. The methods herein may include engaging a guide interface member of the SI joint implant with a positioning guide to restrict movement of the implant with respect to the positioning guide in at least one direction. For example only, FIGS. **1**A and **1**B illustrate ilium guide interface member **18** of SI joint implant **14**, but other interface members herein may be engaged with any of the guides herein to restrict movement of the SI joint implant with respect to the positioning guide in at least one direction. The methods may include, at a time subsequent to the engaging step, advancing the implant across the SI joint while guiding the implant with the positioning guide to implant the implant across the SI joint. The methods further include removing the positioning guide from the ilium and leaving the implant implanted across the SI joint. The methods may include advancing a positioning guide into an ilium between lateral and medial cortical walls of the ilium, descriptions and locations of which are generally known and shown generally in FIGS. **32**A and **32**B. In these methods, engaging the implant with an ilium positioning guide helps maintain the implantation trajectory and limits the extent to which the implant migrates towards the sacrum while advancing the implant across the SI joint.

Some methods may also include advancing a sacrum positioning guide into a sacrum of the patient, and further engaging a second guide interface member of the implant with the sacrum positioning guide. In these examples, the implant advancing step may occur while also guiding the implant with the sacrum positioning guide. In these examples, the

advancing step may occur while also guiding the implant with the sacrum positioning guide. In these examples, the method also includes removing the sacrum positioning guide from the sacrum. Any of the methods herein may include positioning a sacrum positioning guide into a sacrum before or after an ilium positioning guide is positioned in an ilium.

Methods herein may optionally include, prior to implanting the implant across the SI joint, interfacing a sharpened broach with one or more of the guides herein; advancing the sharpened broach over the one or more positioning guides towards the SI joint while guiding the broach with the one or more positioning guide; and creating a space for the SI joint implant with the sharpened broach. These methods may include removing the broach to allow dorsal access to the space. An implant may then be advanced over the one or more positioning guides as described elsewhere herein and implanted across the SI joint.

Depending on the implant being implanted across the SI joint, any of the methods herein may also include positioning a second ilium positioning guide from a dorsal approach into the ilium of a subject. These examples may also include engaging a second guide interface member of the implant with the second ilium positioning guide to further restrict movement of the implant with respect to the second ilium positioning guide in at least one direction.

Depending on the implant being implanted across the SI joint, any of the methods herein may optionally include positioning first and second sacral positioning guides from a dorsal approach into the sacrum of a subject. These examples may also include engaging first and second sacrum guide interface members of the implant with the first and second sacrum positioning guides to further restrict movement of the implant with respect to the first and second sacrum positioning guides in at least one direction.

Any of the individual method steps set forth herein may be combined with any other suitable method step or sequence of steps, unless the disclosure herein indicates to the contrary.

As is described above, an aspect of this disclosure is related to methods of positioning a sacro-iliac ("SI") joint stabilizing implant across a SI joint from a dorsal approach. An additional aspect of this disclosure is delivery tools that facilitate the delivery of one or more guides into the ilium and/or sacrum, and the methods of delivering the one or more guides into the ilium and/or sacrum. The disclosure that follows is related to those methods and delivery tools, and may be incorporated into any of the other disclosure herein. For example, methods and delivery tools herein may include and be adapted for advancing an elongate ilium positioning guide from a dorsal approach into an ilium of a subject, engaging an ilium guide member of a SI joint stabilizing implant with the ilium positioning guide to restrict movement of the implant with respect to the ilium positioning guide in at least one direction, advancing the implant across the SI joint while guiding the implant with the ilium positioning guide, and removing the ilium positioning guide from the ilium. The disclosure that

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the implant with the ilium positioning guide, and removing the ilium positioning guide from the ilium. The disclosure that follows provides merely exemplary and illustrative additional steps that may be incorporated into any of these methods. It is fully understood that these steps are illustrative, may be optional, and are not limiting the general methods set forth herein. It is also fully understood that the order of one or more of the steps set forth herein may be changed. The method steps that follow may refer to one or more delivery devices, examples of which are shown in FIG. **33** (e.g., impactor, positioning template, pin guide, guide pins, trephines, etc.). It is understood that the names of these delivery devices are not necessarily limiting, and they instead may be described or characterized by the one or functions they provide during the procedure. For example, a guide pin may instead be considered more generally as a positioning guide or simply a guide for the implant. A parallel pin guide herein may also be referred to as a pin guide herein.

Methods herein may include one or more steps to ensure a proper trajectory for the implant. The one or more positioning guides (e.g., guide pins) herein may help facilitate the desired trajectory from the dorsal approach. Methods herein may also include one or more steps to properly determine a starting point or location for the one or more positioning guides. The methods herein may further include one or more steps to advance the positioning guides along a proper trajectory, which may help maintain a desired or proper trajectory for the implant when advanced distally relative to the positioning guide(s). Merely exemplary steps that may be performed to position one or more positioning guides and advance an implant in a dorsal approach are set forth below, and are made in reference to FIGS. **34**A-**38**.

A patient may be positioned in a prone position to facilitate the dorsal approach and dorsal entry. Radiograph imaging may be performed to obtain an A/P (anteroposterior) view of the SI joint region, as shown in FIG. **34**A. The inferior joint aspect of the SI joint may be localized. A visual marking may be made on the skin (e.g., with a marker), optionally about 1 cm proximal to the end of the joint, which can generally indicate an implant insertion location, such as shown in FIG. **34**B. A second visual skin marking may be made, which may be 3 cm long or about 3 cm long, in line with the SI joint bifurcating the transverse skin mark, such as shown in FIG. **34**B. A skin incision may then be made along the second visual skin marking Δn inlet oblique view may then be obtained, which may provide a view of the inferior limb of the articular joint, such as shown in FIG. **34**C. A positioning template, such as the example shown in FIG. **33**, may be placed in line with the transverse skin visual marking, and as represented in the view of FIG. **34**D. It is of note that the methods herein may use only one positioning guide (e.g., pin), and the methods herein that use three are exemplary. The center hole or aperture in the positioning template may be positioned over the SI joint. The positioning template may be used to properly position one or more guide pins at one or more desired entry or starting point locations, and is illustrated in place in FIG. **34**E (to illustrate the position relative to the view that is shown). Any of the methods herein may further include positioning a guide pin through the positioning template into the Ilium, optionally through an ilium aperture in the template, which may be one or one, two, or three apertures in the template. The guide pin may have a sharpened distal end to help advance the guide pin. A sharp ilium guide pin may be replaced with a blunt ilium pin. The methods herein may further include

be one or one, two, or three apertures in the template. The guide pin may have a sharpened distal end to help advance the guide pin. A sharp ilium guide pin may be replaced with a blunt ilium pin. The methods herein may further include aligning the pin, optionally in the inlet oblique view, so that it is parallel to the inferior aspect of the SI joint. The pin may be seated in the ilium and advanced, optionally 1 cm or about 1 cm. A lateral view may then be obtained, such as in FIG. **34**F, and the ilium guide pin may be advanced, such as, for example only, 4 cm or about 4 cm.

The following steps are understood to be optional, and not all steps may need to be performed depending on the implant and the particulars of the procedure. For example, one or all of the following steps may not be performed if the method does not utilize more than a single guide pin (e.g., an ilium guide pin). The description that follows is made in reference to FIGS. **35**A-**35**C, but it is fully understood that one or more of these steps may occur in combination with one or more of the steps described with respect to FIGS. **34**A-**34**F. The methods may further include obtaining an Inlet Oblique View, and the positioning template may be removed from the patient. A pin guide, an example of which is shown in FIG. **33** and labeled parallel pin guide (which can also be seen in FIGS. **35**A-**35**C), may be advanced over the guide pin that is in the ilium. In the example in FIG. **33**, the longer of the tubes of the pin guide may be advanced over the ilium pin, which can be seen in FIG. **35**A. The methods herein may include advancing a guide pin (such as a stepped guide pin) into the sacrum through a sacrum guide tube of the pin guide, which can be seen in the view of FIG. **35**A. The methods herein may include preparing a hole in the joint through a central lumen of the parallel pin guide, such as by drilling with a trephine through the center hole to a stop, such as into the joint approximately 30 mm, which can be seen in FIG. **35**B. A broach may be used instead of a drill, for example, and it is understood that any of the methods herein may be performed completely without electrical power (e.g., without power tools). If a trephine is used, the trephine may be removed, a guide pin may be advanced through the central lumen of the pin guide. Performing this optional step may help prevent the pin guide from rotating while placing a sacral trephine. The optional sacral guide pin may be removed and a hole may be prepared in the sacrum, such as by drilling into the sacrum with the trephine, such as about 30 mm, and example of which can be seen in FIG. **35**C. The methods herein may include removing an optional sacral trephine and placing a blunt pin in the sacrum through the sacrum tube of the pin guide (not shown). The pin guide may be removed, and a central guide pin, if utilized, may be removed. A hole may optionally be prepared in the ilium, such as by drilling with a trephine over the iliac pin, such as up a line (e.g., 30 cm) on the trephine. A broach may alternatively be used without power to prepare an ilium hole. A trephine may be removed from the ilium, and in this merely exemplary embodiment, iliac and sacral guide pins are left behind in the patient to help guide the implant during implantation. It is again noted that any of the methods herein may utilize only one positioning guide (e.g., one guide pin), such as an ilium positioning guide.

With specific but not limiting reference to exemplary implant **1300** from FIGS. **11**A and **11**B, the implant may then be engaged with the guides (e.g., pins) by advancing the lumens **1305** and **1307** over the respective guide pins. The ilium

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portion, which in this example does not extend as far proximally as the sacrum portion, is engaged with the ilium positioning guide and the implant **3610** is advanced over the pin guides, as shown in FIG. **36**. An impactor **3600** (or other similar tool that can be used to advance the implant) can be advanced over the guide pins behind implant **3610** until it engages the implant at location **3620**. As shown in FIGS. **33** and **36**, the distal end of the impactor can have a configuration that is shaped to mate with the configuration of the proximal end of implant **3610**, and also to allow the impactor to apply a distally directed force to the implant. In this example, the impactor distal end is also stepped to match the configuration of the proximal end of implant **3610**. Implant **3610** may include any of the features of any of the implants herein. Impactor **3600** includes a plurality of pin guides **3602** as well, sized and configured to receive therein the guide pins **3640**, which in this embodiment are lumens extending axially along lateral portions of the impactor, as shown. This allows the impactor **3600** to be advanced over the guide pins and to be aligned with implant **3610** to facilitate distal advancement of the implant **3610** by applying a distally directed force on impactor **3600** (directly or indirectly applying the force). The implant may be advanced to the desired depth by applying the force on the impactor (e.g., with a mallet). The impactor and guide pins may be removed, leaving the implant behind implanted in the patient across the SI joint. A proper implant position may be confirmed, such as shown in the views of FIGS. **37**A, and **37**B.

It is understood and stated again that the methods of implantation herein may include using as few as one, and optionally two, three or more guide pins.

Any of the methods of implantation herein may be performed solely under an inlet radiographic view. Any of the methods of implantation herein may be performed solely under an inlet or inlet oblique radiographic view.

Any of the methods of implantation herein may be performed without electric power (e.g., manual power only). Any of the methods of implantation herein may be performed with electric power (e.g., including use of an electric drill for one or more steps, examples of which are set forth herein).

Any of the methods steps herein that include preparing a hole may be performed by drilling a hole. Any of the methods steps herein that include preparing a hole may be performed by manually creating a hole, such as with a broach. Broaches herein may also be used to create a channel within the bones from one guide pin to the other to accept the entire implant.

Any of the methods herein may include a removable pin that threads into the sacral tube of the pin guide. This may provide an added advantage of not risking distal advancement beyond a desired location, which may reduce the risk of damaging sensitive tissue.

The disclosure that follows provides additional and exemplary methods and steps that may be included when preparing

provide an added advantage of not risking distal advancement beyond a desired location, which may reduce the risk of damaging sensitive tissue.

The disclosure that follows provides additional and exemplary methods and steps that may be included when preparing for the implantation and implanting any of the SI joint implants herein from a dorsal approach. The disclosure that follows describes a merely exemplary method, not all steps of which are necessarily required (and the order of some steps may be changed), and refers generally to FIGS. **40**-**55**B. Suitable method steps below may, however, be incorporated into alternative methods described herein, and vice versa. An exemplary method of placing a plurality of guide pins may include, in an inlet oblique view such as is shown in FIG. **40**, optionally placing a needle in the SI joint, as may occur in an SI joint injection. The method may optionally include injecting a contrast media such as Omnipaque with the needle to ensure the needle is in the SI joint, which can be viewed in, for example, an inlet oblique view and/or a lateral view as shown in FIGS. **41**A and **41**B. As shown in the radiographic view of FIG. **42**A, the method may include placing an exchange pin along the skin over the sacral promontory. The method may include creating a linear skin marking along the exchange pin, as shown in FIG. **42**B. Additional skin markings may be made on either side of the SI joint, such as about 2 cm on either side of the SI joint, which may be used for creating an incision, which is described below. The method may include removing the back end of the needle, including the luer lock, and placing a Jamshidi™ needle over the needle, as represented in FIG. **43**. The method may include removing the original needle and replacing it with a nitinol wire through the Jamshidi™ needle and into the SI joint. The Jamshidi™ may then be removed, leaving the nitinol wire in the SI joint, as shown in FIG. **44**.

The method may also include making an incision along the linear marking between the additional markings that were made on either side of the SI joint, such as an incision about 4 cm in total length (e.g., 2 cm on either side of the joint). The method may also include placing a pin guide over the nitinol wire. Exemplary pin guides are shown in FIGS. **33** and **45**, both of which are examples of pin guides that include a plurality of tubes or channels as shown, and are also examples of pin guides that include three tubes, channels, or lumens. In an exemplary method, the center of three channels may be placed over the nitinol wire, which is shown in FIG. **46**A and the radiographic image of FIG. **46**B. Pin guide adjustment may be made under radiographic imaging such as fluoroscopy to obtain the appropriate pin guide positioning. The exemplary pin guide shown in FIG. **45** includes actuators that in this example include knobs that can individually be tightened against one of the three channels or tubes to prevent them from moving axially relative to the pin guide main body. Releasing the engagement can be performed to allow any of the tubes to be individually moved axially relative to the main body, after which time their relative axial positions can again be fixed by rotating the knobs until the threaded element engages the particular tube/channel. A variety of alternative mechanisms to both maintain axial position in a first configuration yet allow for axial movement in a second configuration may also be used. As used herein, any of the pin guide tubes may also be referred to herein as pin guide channels, both of which are understood to define a pin guide lumen therethrough.

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allow for axial movement in a second configuration may also be used. As used herein, any of the pin guide tubes may also be referred to herein as pin guide channels, both of which are understood to define a pin guide lumen therethrough.

The method may also include placing a sacral tube of the pin guide down to sacral bone. The sacral-side knob may then be tightened to secure the sacral tube of the pin guide on the sacrum. The method may include placing a pin (e.g., a 3.2 mm pin) through the sacral tube of the pin guide through sacral cortex, but not to depth. The pin may be positioned through the sacral cortex with a mallet, for example, as is shown in FIG. **47**.

The method may also include distally advancing an ilium tube of the pin guide down and into contact with iliac bone, which may be performed before or after the sacral tube is advanced distally to sacral bone. The ilium-side knob on the pin guide may then be tightened to secure the ilium tube of the pin guide on the ilium. The method may include placing a pin (e.g., a 3.2 mm pin) through the ilium tube of the pin guide through ilial cortex, but not to depth, which may be performed before or after the sacrum pin is advanced through sacral cortex. The ilium pin may be positioned through the ilial cortex with a mallet, for example, as shown in FIG. **48**A and the radiographic image of FIG. **48**B. At this exemplary embodiment, guide pins are positioned in both the sacrum and ilium (which may be positioned therein in either order).

The method may include providing or taking a lateral image, as shown in FIGS. **49**A and **49**B, and distally driving the sacrum and ilium pins (in either order, or only one pin if the procedure utilizes only a single pin) to depth in the lateral view. The method may preferably include not distally advancing the guide pins passed the alar line, as shown. At this time, the elongate guiding wire (e.g., nitinol wire) may be removed from the optionally center channel of the pin guide.

A hole may optionally then be drilled through a center channel of the pin guide, as shown in FIG. **50**. The pin guide may then be removed from the patient, leaving the ilium and sacrum pins in place in the ilium and sacrum, respectively. Ilium and sacrum bone may then be cut or removed using a cutting instrument such as a trephine placed over the ilium and sacrum pins, as shown in FIG. **51**. Preferably only cortex bone is cut with the cutting instrument.

With guide pins in place in the ilium and sacrum, the SI joint implant can be engaged with the guide pins, details of which are described herein, an exemplary step of which is shown in the radiographic image of FIG. **52**. The implant is then impacted to depth (e.g., using an impactor such as shown in FIG. **33** or other similar impactor) across the SI joint while being guided by the guide pins, as shown in FIGS. **53**A and **53**B, and additional details of which are set forth above. After the implant is delivered to the desired position across the SI joint, the impactor and the guide pins may then be removed, which is shown in FIG. **54** when the guide pins are being removed. An additional lateral view (FIG. **55**A) and an outlet view (FIG. **55**B) may be obtained to visualize the implant position across the joint.

This exemplary method includes implanting an SI joint implant that comprises larger and fewer fenestrations than the

This exemplary method includes implanting an SI joint implant that comprises larger and fewer fenestrations than the implant in FIG. **11**A, which can be seen in the radiographic image of FIG. **55**B. This method also includes implanting an implant that includes a proximal region that does not include a sacrum region that extends further proximally than an ilium region, in comparison to the implant in FIG. **11**A. As shown in FIG. **55**B, the implant in this embodiment also includes a distal central region with at least some degree of curvature, which is described in more detail above with respect to the implant in FIGS. **11**A and **11**B. Additionally, the implant shown in FIG. **55**B also includes a sharpened distal central region, examples of which are described herein.

The disclosure that follows provides additional exemplary delivery tools (e.g., a pin guide) sized and configured for positioning one or more guides (e.g., guide pins) into an ilium and/or sacrum. The disclosure that follows additionally provides exemplary tools for advancing implants over the one or more guides and into position across the SI joint. It is understood that aspects of methods that follow may be incorporated into other methods of guide pin placement herein, and vice versa. It is also understood that features of delivery tools that follow may be incorporated into other suitable delivery tools herein, and vice versa. The methods and delivery tools that follow may be used to delivery one or more of the suitable implants herein. The disclosure below describes delivery tools in the context of their methods of use with the exemplary methods.

In the dorsal approach with the patient prone (with their back facing up), an incision can first be made proximate the SI joint, followed by retracting soft tissue to expose the underling bone and provide access to the joint.

FIGS. **56**A and **56**B illustrate an exemplary pin guide **5600** that can be used in methods herein to place one or more guides (e.g., guide pins) into an ilium and/or a sacrum from a dorsal approach. Pin guide **5600** includes pin guide body **5602** with an ilium guide portion **5604** that is optionally longer than sacrum guide portion **5606**. Ilium guide portion **5604** includes a lumen **5605** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described below. Sacrum guide portion **5606** includes a lumen **5607** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described below. Body **5602** further includes first and second laterally extending attachment members **5610***a* and **5610***b*, which are configured to interface with an optional elongate handle (described below), wherein the optional handle can be held by medical personnel and which can help maintain the position of pin guide **5600**. The distal direction indicates the front of the pin guide **5600** that is first advanced into the patient. The pin guide may include a visual indicator that indicates if it should be used for right or left SI joint pin placement. For example, in this embodiment the pin guide includes a visual indicator that states Right or Left, but other indicators may be used.

FIGS. **56**C and **56**D illustrate perspective front and side views, respectively, of alternative pin guide **5600**′, which can be the

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FIGS. **56**C and **56**D illustrate perspective front and side views, respectively, of alternative pin guide **5600**′, which can be the same as pin guide **5600** in all other ways (and used in the same ways) except as described herewith. The same components are similarly labeled, such as body **5602** (FIGS. **56**A, **56**B) and **5602**′ (FIGS. **56**C, **56**D). Implant **5600**′ includes first and second central pins **5690***a* and **5690***b*, which may be permanently coupled with (attached to) body **5602**′. Pins **5690***a* and **5690***b* are laterally aligned, with pin **5690***a* being superior to or above **5690***b*. Pins **5690***a* and **5690***b* extend to the same extent distally, as shown in FIG. **56**D. Pins **5690***a* and **5690***b* are generally configured and positioned to be advanced across the SI Joint as pin guide is being moved distally towards the SI joint. Pins **5690***a* and **5690***b* extend further distally than other parts of pin guide and are the first portion of pin guide **5600**′ to engage with the SI joint. Pins **5690***a* and **5690***b* may, in some embodiments, extend from 10 mm to 20 mm distally from the pin lumens in body **5602**′. Pins **5690***a* and **5690***b* have sharpened distal ends to pierce into joint tissue and help secure the pin guide relative to the Joint. As set forth herein, the pin guide may or may not include central joint pins **5690***a* and **5690***b*, although incorporating them may help secure the pin guide relative to the joint as the other one or more pins as advanced into bone.

FIGS. **57**A and **57**B illustrate exemplary handle **5700** after it has releasably secured to one of the laterally extending attachment members. FIG. **57**B is a close up view of the region where they are releasably coupled. Handle **5700** includes a channel at one end sized and configured to fit over and be secured to the attachment member. A variety of mechanisms may be used to secure the two components together, and in this example the attachment members include a detent or recessed region configured to receive a locking element within the channel of the handle. The handle is configured to be gripped or grasped by medical personnel, which may make it easier to maintain the position of the pin guide during the pin placement procedure. FIGS. **57**A and **57**B illustrate pin guide **5600**′, which has a visual of Left to indicate it is configured for pin placement in a procedure on a patient's left SI joint. The left and right pin guides may have the same features, but which are mirror images of each other so they can be used on the right or left side. Additionally, pin guides **5600** and **5600**′ are optionally longer on the ilium side, as shown. The optional handle may be attached to the pin guide prior to the following exemplary steps.

Distal tips of the optional pins **5690***a* and **5690***b* may then be centered within the SI joint, and the starting point is optionally about 1 cm superior from the ventral SI joint surface. Pin guide **5600**′ (or any other pin guide herein) may be tapped into the SI joint at the target anatomy, optionally about 1 cm superior from the ventral SI joint surface, and the distal tip of the pins **5690***a* and **5690***b* may be docked into the joint.

FIG. **64** illustrates an exemplary pin guide **6400**, which is similar to pin guides **5600** and **5600**′ but with differences set forth herein. Any suitable feature of pin guide **5600** or pin guide **5600**′ may be incorporated into the disclosure of FIG. **64** unless indicated to the contrary herein. Pin guide **6400** includes body **6402**, ilium guide portion **6404** with lumen **6405**, and sacrum guide portion **6406** with lumen **6407**. Sacrum guide portion **6406** can extend as far distally as ilium guide

and sacrum guide portion **6406** with lumen **6407**. Sacrum guide portion **6406** can extend as far distally as ilium guide portion **6404**, as shown.

Unlike with pins **5690***a* and **5690***b* in FIGS. **56**C and **56**D, which have a fixed orientation relative to pin guide **5602**′, pin guide **6400** is adapted such that distal pin **6470** can move relative to the pin guide body **6402** when pin guide **6400** is in a first state, and then can be locked in place relative to pin guide body **6402** (or at least become much more relative thereto) when pin guide **6400** is in a second state. Particularly, and in this embodiment, when stabilizer **6465** is in a first state, pin **6470** can be moved 360 degrees relative to the distal end of the body **6402** from which pin **6470** extends. By tightening stabilizer **6465** to a second state, however, the orientation of pin **6470** relative to body **6402** can be locked in place or at least becomes much more difficult to move relative to body **6402**. By allowing more relative movement between the pin **6470** and body **6402** in a first state, yet allowing the orientation of the pin **6470** to be secured relative to the body **6402** in a second state, the pin **6470** can first be placed into the joint, and then the orientation of the pin guide body **6402** can be fine-tuned as desired by moving it relative to the already placed pin. The pin guide body **6402** can thus be moved relative to the set pin until the body lumens **6405** and **6407** are aligned with the desired trajectories for the ilium pin and the sacrum pin, which are subsequently placed as is set forth herein. When the pin guide body **6402** has been moved to the desired orientation relative to the joint and bones, stabilizer can then be actuated to cause the position of the pin guide body **6402** to be set in place (or least more secured) relative to the pin and the joint in which the pin is placed. This arrangement thus allows for fine tuning the position and orientation of the guide body relative to the pin and joint after the pin has already been placed in the joint, yet further allows the guide body position to be set once it's been moved into the desired orientation.

In this exemplary embodiment, distal pin **6470** in FIG. **64** may be fastened or coupled to pin guide **6400** via a spherical ball-and-socket that allows the user to place the pin **6470** in the joint, and then fine tune the positioning of the sacrum guide portion **6406** and ilium guide portion **6404** over the respective bones as described above.

In use, the mounting pin **6470** may first be placed in the joint in approximately the correct location. The pin guide **6402** positioning can be further refined by decoupling the mounting pin **6470** from the pin guide **6402** by pulling the most proximal knob **6460** further proximally. The resistance of the ball-and-socket joint can be increased and decreased by turning the threaded stabilizer **6465** just distal to the proximal knob **6460**. The sacrum and ilium guide portions **6406** and **6404** can be aligned over the respective bones, and the ball-and-socket joint resistance can be increased by turning threaded stabilizer **6465** clockwise, which limits movement between pin **6470** and body **6402**. Ilium guide portion **6404** includes a lumen **6405** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described above with respect to FIGS. **56**A-**56**D. Sacrum guide portion **6406** includes a lumen **6407** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are

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includes a lumen **6405** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described above with respect to FIGS. **56**A-**56**D. Sacrum guide portion **6406** includes a lumen **6407** sized and configured (optionally cylindrical) to receive one or more elongate delivery tools, examples of which are described above. After the sacrum and ilium guide portion positions are set, positioning of the guide pins such as **5830** and **5860** described herein may proceed, examples of which are described herein. All other uses of the pin guides herein may be applicable to pin guide **6400** shown in FIG. **64**.

FIGS. **58**A-**58**C illustrate a system of tools **5800** that can be to deliver one or more pins. FIGS. **58**A-**58**C illustrate many components assembled, but the disclosure that follows describes an exemplary process starting with pin guide **5600** prior to assembly with any of the other components.

A sharp tipped guide tube **5810** can be placed through lumen **5607** in sacral side **5606** of pin guide **5600**, as shown in FIGS. **58**A and **58**B. Cap **5820** may then be placed on the back (proximal) end of sacrum tube **5810**, as shown in FIGS. **58**A and **58**C. In this example the two components are configured to allow cap **5820** to be rotated to cause rotation of sacrum tube **5810**, and in this example they have a hex mating arrangement, as shown. Sacrum tube **5810** may then be rotated clockwise to advance sacrum tube **5810** through soft tissue. Once resistance is felt due to contact with the sacrum, sacrum tube **5810** may continue to be rotated until it is fully docked into the sacrum.

Sacrum pin **5830** (which may also be referred to an implant guide herein), which has a sharpened distal end, as shown, may then be placed into the proximal end of the lumen and through the lumen of sacrum tube **5810**, as shown in FIGS. **58**A and **58**B. Pin **5830** may then be docked into the sacrum using a mallet, such as about 1 cm, without fully docking pin **5830** into the sacrum. Imaging in the outlet view, for example, may be used to ensure the trajectory of the sacrum pin **5830** will not intersect the foramina. Sacrum pin **5830** may then be further advanced into the sacrum to depth, such as about 2 cm short of the alar line in the lateral view. The sacrum pin at this time may be considered fully positioned in the sacrum.

As shown in FIGS. **58**A and **58**B, sharpened distal tipped ilium tube **5840** can then be placed through lumen **5605** in the ilium guide portion **5604** of pin guide **5600**. A cap may be placed on the proximal end of ilium tube **5840** (Similar to cap **5820** with the sacrum tube **5810**). The cap may then be rotated to cause rotation of ilium tube **5840** to advance the tube through soft tissue. Once resistance is felt due to contact with ilium bone, rotation of sharpened tube **5840** may continue until tube **5840** is fully docked in the ilium.

Ilium pin **5860** (see FIGS. **58**A and **58**B) may then be placed through the lumen of ilium tube **5840**. A cap **5850** may be placed on the proximal end of pin **5860**, as shown in FIGS. **58**A and **58**C, which allows rotation of the cap to cause rotation of pin **5860**. Pin **5860** optionally includes a beveled distal end, as shown, which includes a pointed distal end and a flat

placed on the proximal end of pin **5860**, as shown in FIGS. **58**A and **58**C, which allows rotation of the cap to cause rotation of pin **5860**. Pin **5860** optionally includes a beveled distal end, as shown, which includes a pointed distal end and a flat beveled surface extending proximally and laterally from the pointed tip, as shown. In use, pin **5860** can be rotated (by rotating cap **5850**) and oriented so that the flat beveled surface is facing laterally and the pointed surface is facing medially. The bevel causes the pin the better engage in the ilium and not skive along the lateral wall of the ilium without engaging the bone. Pin **5860** can then be docked into ilium bone with a mallet, about 1 cm. Imaging may be used to ensure the ilium pin **5860** is being advanced with the desired trajectory and is not skiving laterally, for example. The ilium pin can be advanced further, until it is about 2 cm short of the alar line in the lateral view. At this time, distal ends of sacrum pin **5830** and ilium pin **5860** are preferably in line, or aligned. Cap **5820** can then be placed over pin **5860** and slid onto the proximal end of ilium tube **5840**. While holding pin **5860** with one hand, cap **5820** (which is rotationally secured to tube **5840**) can be rotated counterclockwise with the other hand to remove ilium tube **5840** from the ilium. This can be repeated on the sacral side to remove sacral tube **5810**. Once sacrum tube **5810** and ilium tube **5840** are free from bone, pin guide **5600** can be removed by sliding it proximally off pin **5830** and pin **5860**, leaving sacrum pin **5830** in the sacrum and ilium pin **5860** in the ilium.

The above method is an example of positioning guide pins in an ilium and sacrum, and is an example of a set of tools that are adapted to do the same. Not all steps necessarily need to be performed, and one or more steps may occur out of sequence compared to the disclosure above. For example, an ilium pin may be fully docked in the ilium before the sacrum pin is fully docked in the sacrum.

The disclosure that follows provides exemplary methods and tools for implanting the implants herein across an SI joint from the dorsal approach, wherein a pin has been positioned in the ilium and a pin has been positioned in the sacrum. In alternative methods, only one pin may be positioned (in the ilium or the sacrum), and in other alternatives, the method of implanting the implant may not require any pin guides at all.

FIGS. **59**A-**59**F illustrate an exemplary impactor **5900** that is configured to deliver the implant distally over the one or more pins and across the SI joint, with a portion of the implant in the ilium and a portion in the sacrum. Impactor **5900** includes distal region **5920** and proximal region **5904**, and an elongate central region **5906** extending therebetween. FIG. **59**A is a side view and FIG. **59**B is a perspective view. FIG. **59**C is a close up, side view of distal region **5902**, FIG. **59**D is a perspective view of distal region **5902**, and FIG. **59**E is a front end view. FIG. **59**F is a perspective view of proximal region **5904**. FIG. **59**C also illustrates a relative distal position of implant **2100** from FIG. **21** to illustrate an exemplary implant relative to the distal region **5902** of impactor **5900**. In FIG. **59**C, the implant is not engaged or secured to the impactor.

As shown in FIG. **59**D, distal region **5902** includes body **5950** that has, in this embodiment, a wafer configuration. Distal body **5950** has a distal face or surface **5959** with a configuration that is complimentary to the proximal end of the implant,

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As shown in FIG. **59**D, distal region **5902** includes body **5950** that has, in this embodiment, a wafer configuration. Distal body **5950** has a distal face or surface **5959** with a configuration that is complimentary to the proximal end of the implant, as can be seen in FIG. **59**C. The complimentary shaping helps the distal end of the impactor make contact with much or all of the proximal end of the implant, which provides an efficient transfer of the distally directed force from the impactor to the implant.

Distal portion **5950** includes an ilium portion **5954** that extends further distally than sacrum portion **5956**, the general configuration of which, again, is complimentary to the proximal end of the implant, where the implant sacrum portion extends further proximally than the implant ilium portion (at least in this embodiment). Ilium portion **5954** includes ilium lumen **5955** that is sized and configured to receive therethrough the ilium pin (e.g., pin **5860**), and sacrum portion **5956** includes sacrum lumen **5957** that is sized and configured to receive therethrough the sacrum pin (e.g., pin **5830**). Impactor **5900** also includes an implant securing member **5958**, which in this embodiment can have a threaded distal end that is configured to mate with an internal thread in the channel in the proximal end of the implant (e.g., FIG. **29**). When implant securing member **5958** is secured to the implant via the threaded engagement, the implant can be moved by moving the impactor, which allows the implant to be removed from the patient if needed, or if the implant position needs to be adjusted. Implant securing member **5958** is in operational communication with implant control actuator **5970** in the proximal region **5904** of impactor **5900**. In this embodiment implant control actuator **5970** is a rotatable member that can be rotated by the user to cause rotation of implant securing member **5958**. Other mechanisms can be used to secure the impactor to the implant. The distal end of the impactor also includes a plurality of protrusions or fingers **5960**, at least a first of which is on a first lateral half of distal region **5950** and a second of which is on a second lateral half of distal region **5950**. The fingers on either side of the implant can help prevent rotational movement of the implant relative to the impactor as the impactor is used to distally advance the implant.

In use, and before the implant is implanted, the impactor may optionally be used to first deliver a cutting device such a broach to create a space where the implant will be implanted. A broach in this example may have a configuration that approximate the shape of the implant and/or has a proximal end that is complimentary to the distal face **5959** of the impactor. The broach can first be secured to the impactor, such as by engaging threads on securing member **5958** with internal threads in a channel in the proximal end of the broach. The broach and impactor assembly can then be advanced over the two pins, with the ilium pin passing through ilium lumen **5955** and the sacrum pin passing through sacrum lumen **5957**. The broach can be impacted to near the ends of the pins. A broach (if used) and impactor can then be retracted proximally to remove the broach from the patient. The optional broach can then be removed from the impactor.

The implant can then be loaded onto the distal end of the impactor and secured to the impactor, such as with the threaded engagement between the two, examples of which are described herein. This allows the axial position of the implant to be controlled by axially moving the impactor. Loading the implant also comprises aligning the plurality of fingers (e.g., fingers **5960**) with the recesses in the proximal end of the implant, examples of which are described herein with respect to FIGS. **29**-**31**. The lumens of the impactor are now also aligned with implant lumens (if the implant has one or more lumens).

The implant (and impactor secured to the implant) is then advanced onto the proximal ends of the pins, and the implant-impactor assembly is slid distally over the pins. The pins will also extend into the two lumens of the impactor. The implant is then impacted with a distally directed force (e.g., with a mallet) to distally advance the implant. One option is to use imaging (e.g., fluoro imaging) and impact the implant to the desired depth while viewing the image (e.g., lateral view with fluoro). Alternatively (or additionally), a sacral impactor depth gauge can be used, which can be used to impact to a positive stop when using the sacral impactor depth gauge, an example of which is shown in FIG. **60** as depth gauge **6000**. Depth gauge **6000** can be secured to the impactor, as shown in FIG. **60**, and the implant can be impacted until the proximal end of sacral impactor depth gauge **6000** is aligned with marking **5907** on the impactor. The impactor will be advanced relative to the depth gauge when impacted. Other visual markings can be used to provide a visual indication that the impact has been sufficiently impacted.

FIG. **61**A illustrates a lateral model view showing an implant implanted across an SI joint, and still secured to impactor **5900**. FIG. **61**B illustrates a model view of implant **6100** implanted across SI joint **6110**, with a portion of implant **6100** implanted in the ilium and a portion in the sacrum. Pins **5860** and **5830** are shown, as is exemplary impactor **5900**.

When the implant is in the desired position, the implant can be disengaged from the impactor, such as by rotating actuator **5970**, which disengages the threaded engagement.

FIGS. **63**A-**63**C illustrate an exemplary pin removal device **6300** that is adapted to be used in combination with impactor **5900** (or other impactors) to remove the ilium and sacrum pins. After the implant has been implanted, the pins remain extending through the lumens of the impactor (only one pin is shown in FIGS. **63**A-**63**C). To remove the pins, pin removal device **6300** can be placed over a pin and set on first and second impactor bosses **5999***a* and **5999***b*, as shown in FIGS. **63**-**63**C. As handles **6302** and **6304** of removal device **6300** are squeezed together, the pin is retracted proximally relative to the impactor until it has been removed from the bone and out of the patient. The mechanism may be similar to or the same as that found in wood clamps, such as the Irwin® QUICK-GRIP® clamp, the entire disclosure of which is incorporated by reference herein. Both pins can be removed from the bone in this manner, leaving the implant implanted in the SI joint.

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FIG. **62**A illustrates a model view of implant **6100** implanted across SI Joint **6110** (left joint) after pin and impactor removal, and FIG. **62**B illustrates a lateral model of implant **6100** across the SI joint after pin and impactor removal.

Claims

1-43. (canceled)

44. A method of positioning a sacro-iliac ("SI") joint stabilizing implant across an SI joint from a dorsal approach, comprising:

advancing an elongate sacrum pin from a dorsal starting point into a sacrum of a subject such that a distal end of the sacrum pin is in the sacrum and a proximal end of the sacrum pin is disposed outside of the subject;

advancing an elongate ilium pin from a dorsal starting point into an ilium of the subject such that a distal end of the ilium pin is in the ilium and a proximal end of the ilium pin is disposed outside of the subject;

advancing a distal opening of an ilium lumen that is in an ilium portion of an SI joint stabilizing implant over the ilium pin and advancing a distal opening of a sacrum lumen that is in a sacrum portion of the SI joint stabilizing implant over the sacrum pin, wherein the distal opening of the ilium lumen extends further distally than the distal opening of the sacrum lumen;

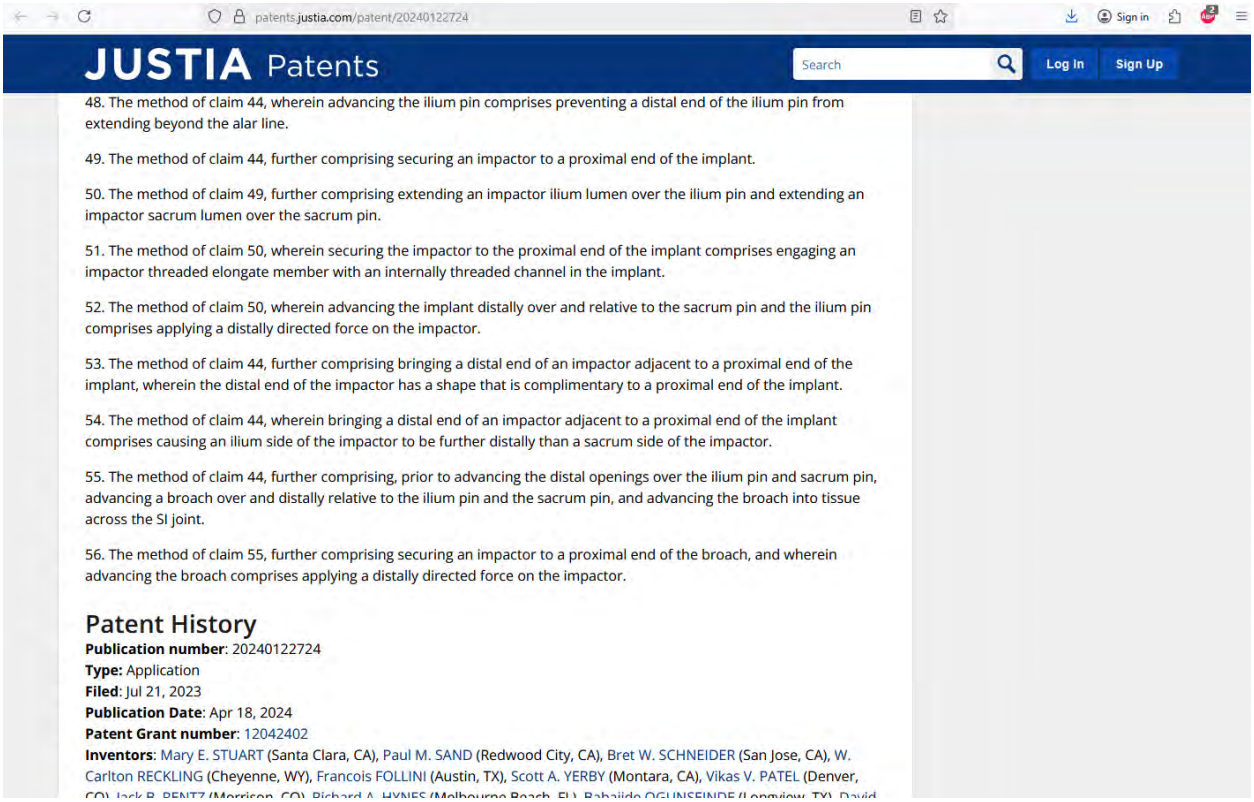
advancing the implant distally over and relative to the sacrum pin and the ilium pin until the implant is across the SI joint with the ilium portion in the ilium and the sacrum portion in the sacrum, wherein the distal opening of the ilium portion is advanced further distally than the distal opening of the sacrum portion; and

removing the ilium pin and the sacrum pin from the subject, leaving the implant positioned across the SI joint.

45. The method of claim 44, wherein advancing the ilium pin comprises advancing the ilium pin into the ilium between lateral and medial cortical walls of the ilium.

46. The method of claim 44, wherein advancing the sacrum pin occurs in time prior to advancing the ilium pin.

47. The method of claim 44, wherein advancing the sacrum pin comprises preventing a distal end of the sacrum pin from extending beyond the alar line.



48. The method of claim 44, wherein advancing the ilium pin comprises preventing a distal end of the ilium pin from extending beyond the alar line.

49. The method of claim 44, further comprising securing an impactor to a proximal end of the implant.

50. The method of claim 49, further comprising extending an impactor ilium lumen over the ilium pin and extending an impactor sacrum lumen over the sacrum pin.

51. The method of claim 50, wherein securing the impactor to the proximal end of the implant comprises engaging an impactor threaded elongate member with an internally threaded channel in the implant.

52. The method of claim 50, wherein advancing the implant distally over and relative to the sacrum pin and the ilium pin comprises applying a distally directed force on the impactor.

53. The method of claim 44, further comprising bringing a distal end of an impactor adjacent to a proximal end of the implant, wherein the distal end of the impactor has a shape that is complimentary to a proximal end of the implant.

54. The method of claim 44, wherein bringing a distal end of an impactor adjacent to a proximal end of the implant comprises causing an ilium side of the impactor to be further distally than a sacrum side of the impactor.

55. The method of claim 44, further comprising, prior to advancing the distal openings over the ilium pin and sacrum pin, advancing a broach over and distally relative to the ilium pin and the sacrum pin, and advancing the broach into tissue across the SI joint.

56. The method of claim 55, further comprising securing an impactor to a proximal end of the broach, and wherein advancing the broach comprises applying a distally directed force on the impactor.

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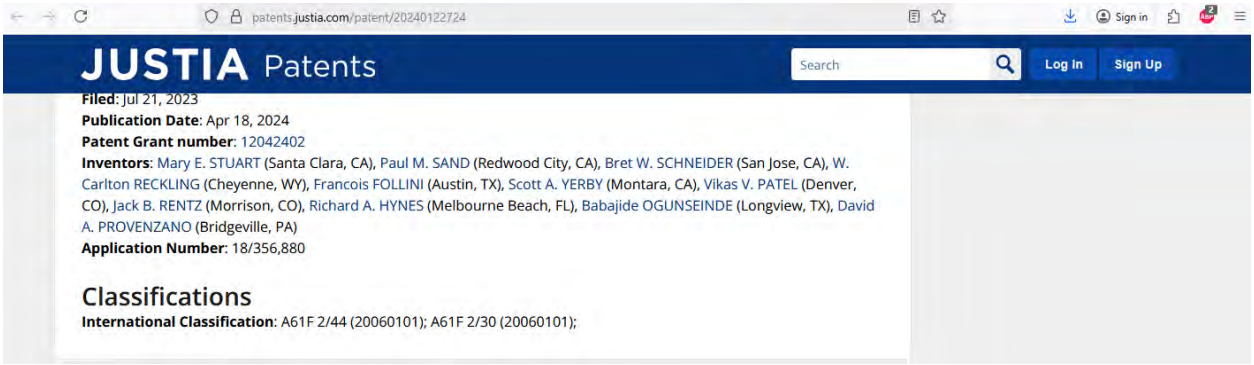

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