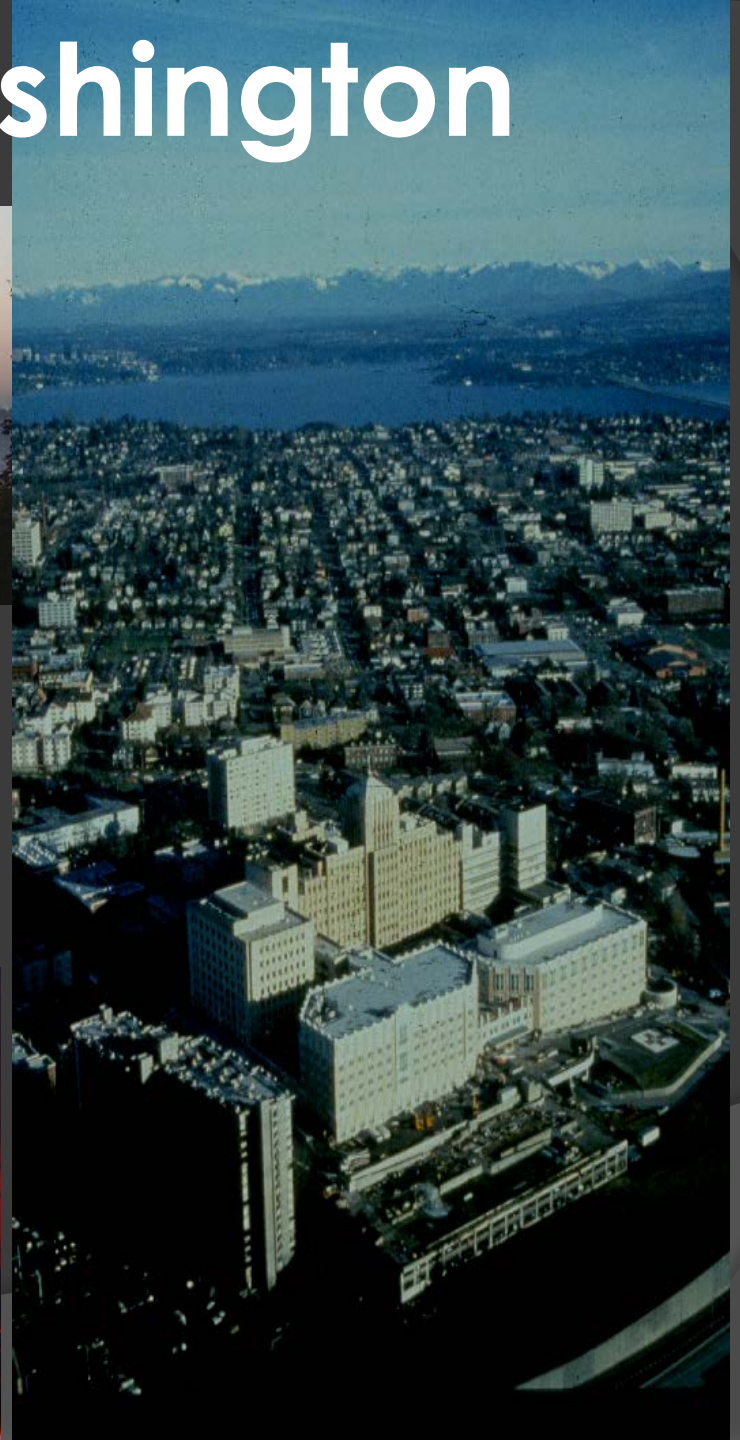
COMPLEX SPINE OVERVIEW

Nicholas Qandah, DO, FACOS

Director of Neurosurgery
Mohawk Valley Health System

December 15, 2016

University of Washington



Combined Neurosurgical & Orthopedic Complex Spine Fellowship

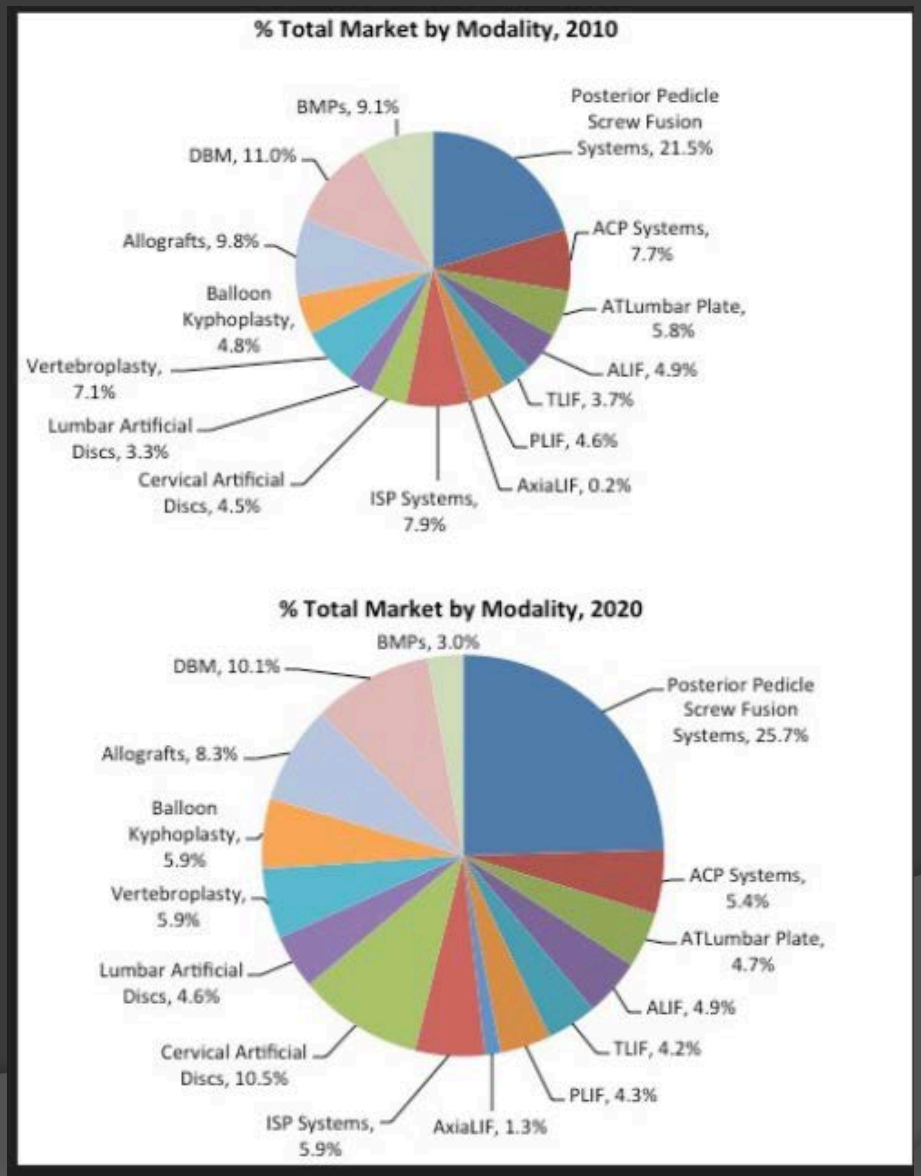
GOALS

- UNDERSTAND WHAT COMPLEX SPINE SURGERY IS
- UNDERSTAND CHANGING HEALTHCARE CLIMATE AS IT RELATES TO COMPLEX SPINE
- UNDERSTAND HOW MEDICREA IS UNIQUELY POSITIONED IN THE MARKET WITH THEIR APPLIED TECHNOLOGY

“Life is a Progressive Kyphotic Event”

Dave Polly

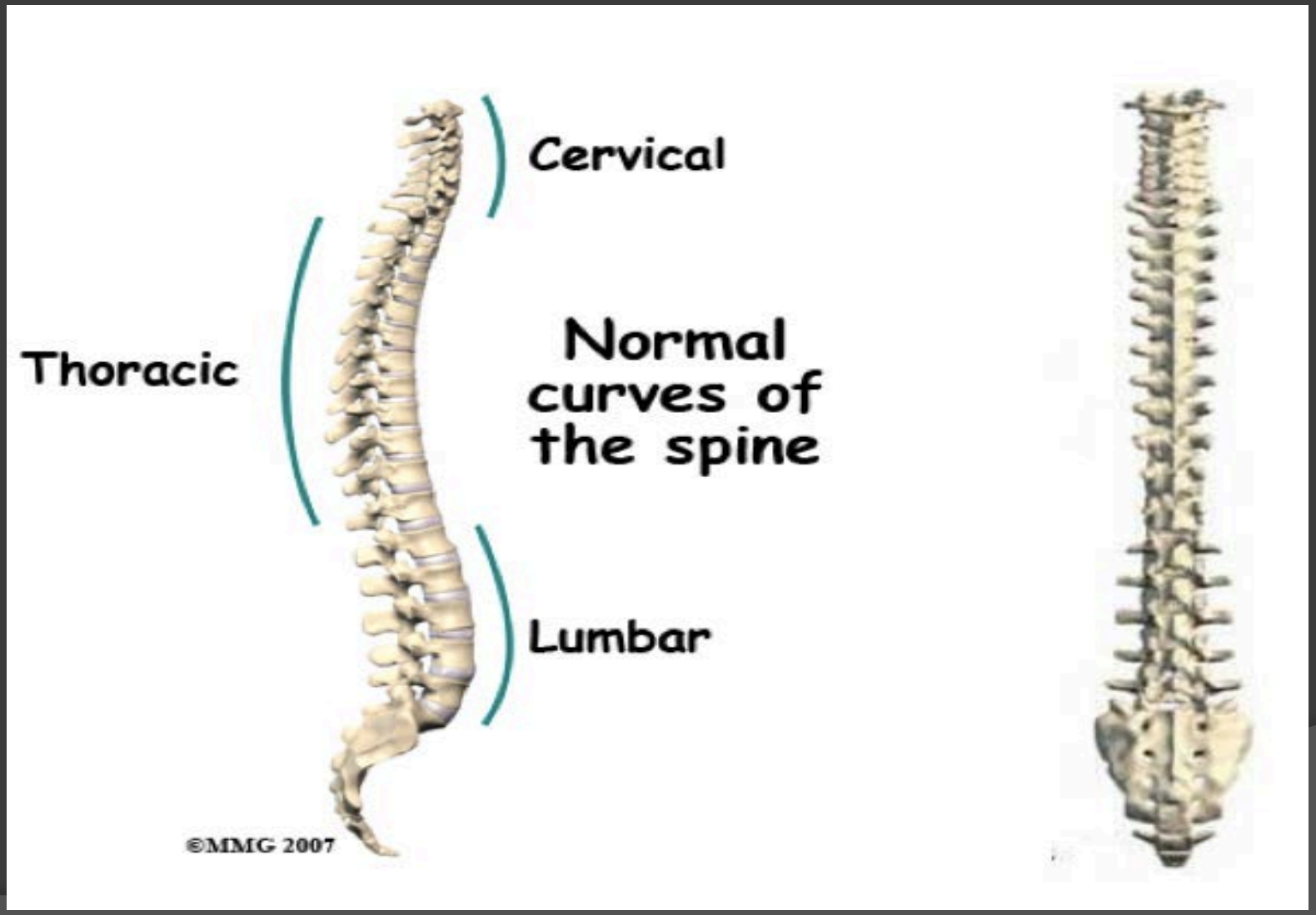
COMPLEX SPINE SURGERY



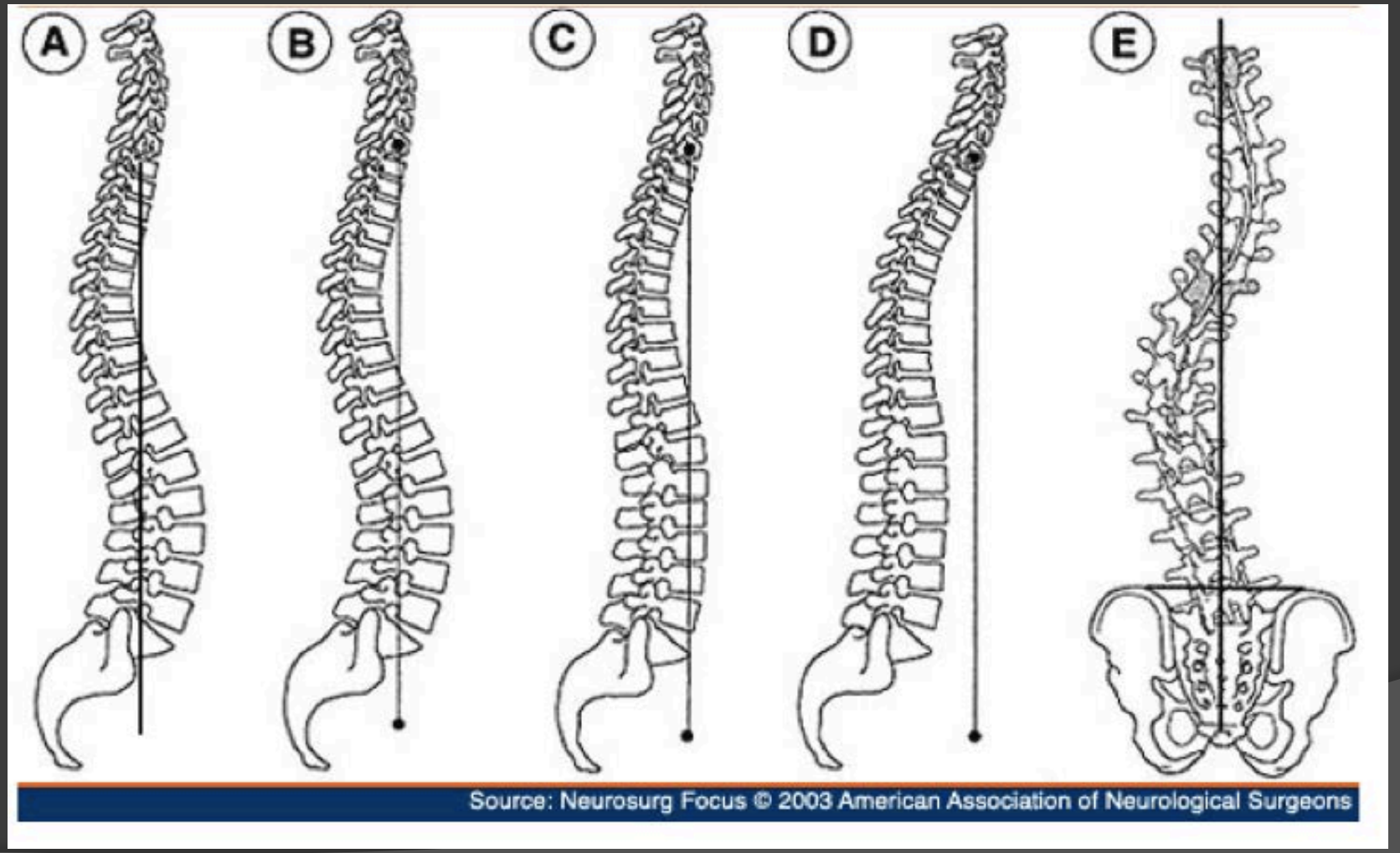
Case

upr

Normal Spinal Anatomy

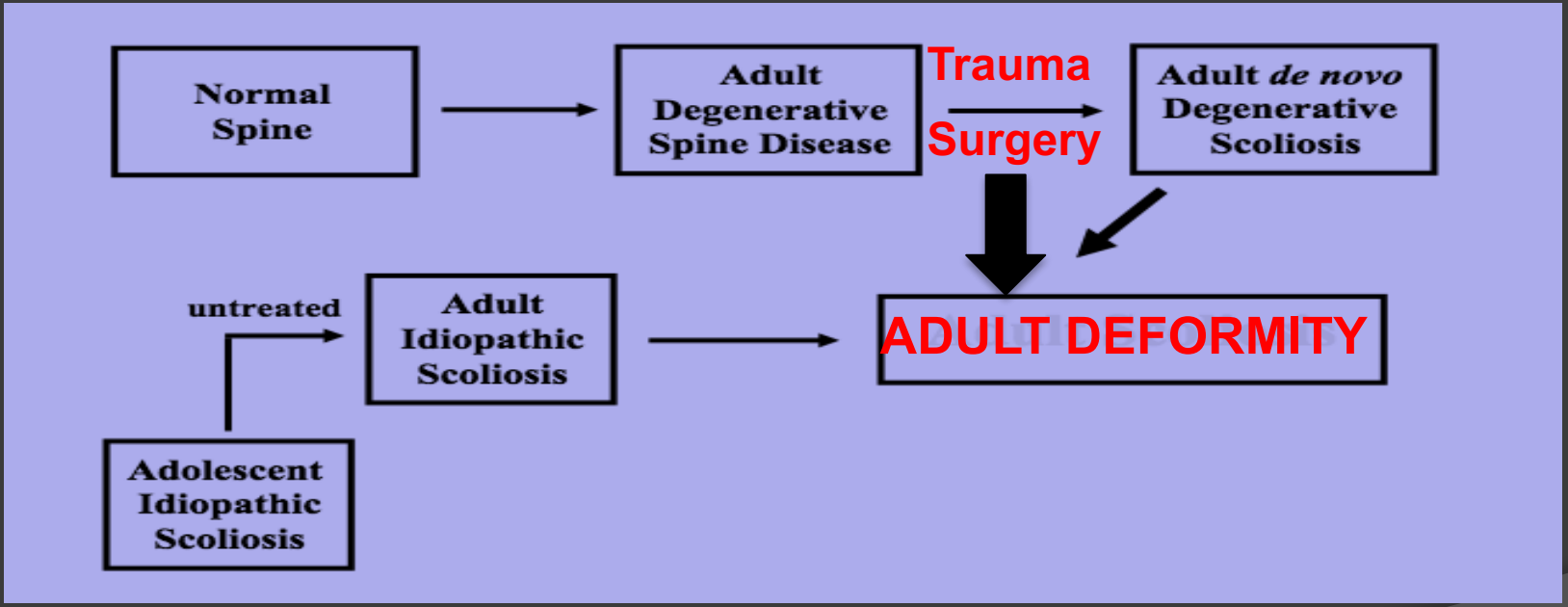


Adult Kypho-Scoliosis



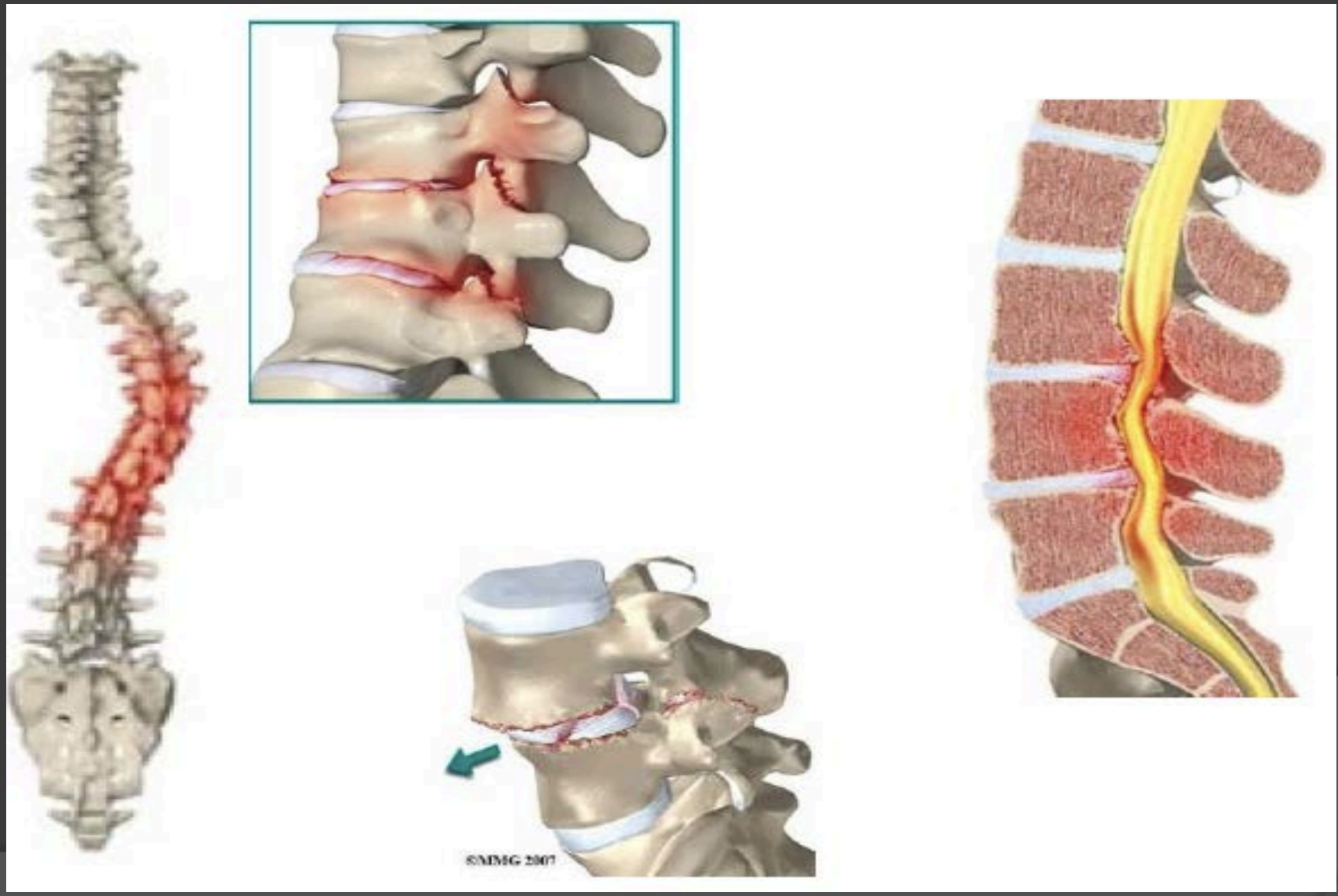
One Common Diagnoses Multiple Presentations

- Degenerative
  - Occurs over a long period time
  - Previous Surgery resulting in flat back
  - Can occur from old treated or untreated trauma



- Idiopathic
  - Once an adolescent becomes skeletally mature, diagnosis changes to adult idiopathic

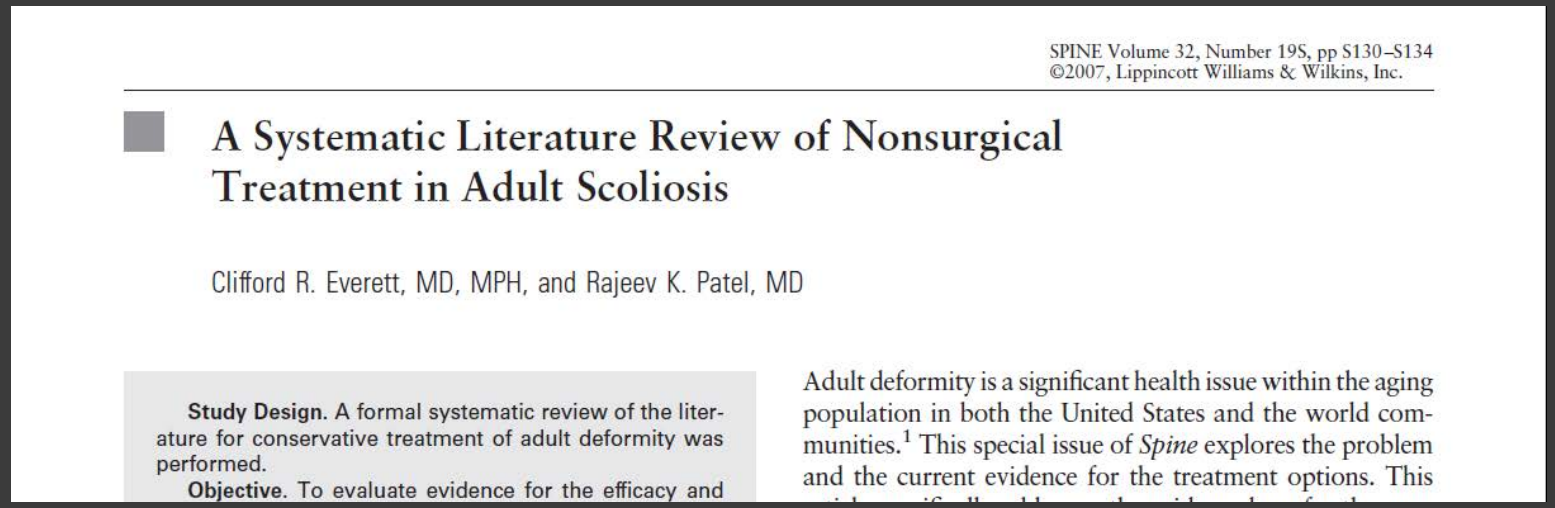
Presentation



Physical Exam

- Forward gaze while ambulating
- Standing posture with maximal hip and knee extension
- Is lumbar lordosis maintained?
- Quantify hip/knee
  - ROM
  - Flexion contractures
    - Thomas test

NON OPERATIVE TREATMENT



SPINE Volume 32, Number 19S, pp S130–S134
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A Systematic Literature Review of Nonsurgical Treatment in Adult Scoliosis

Clifford R. Everett, MD, MPH, and Rajeev K. Patel, MD

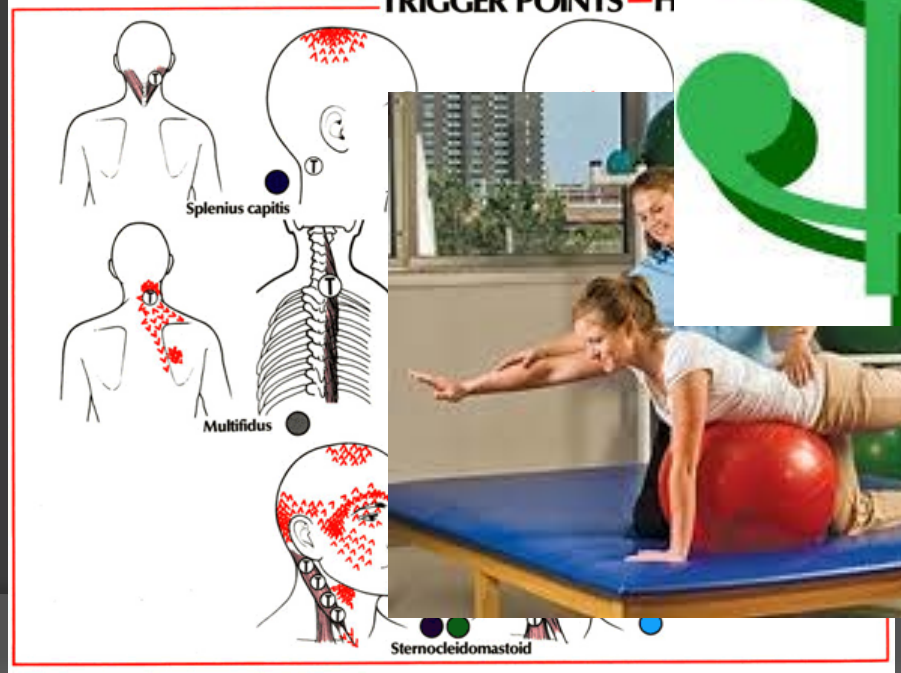
Study Design. A formal systematic review of the literature for conservative treatment of adult deformity was performed.

Objective. To evaluate evidence for the efficacy and

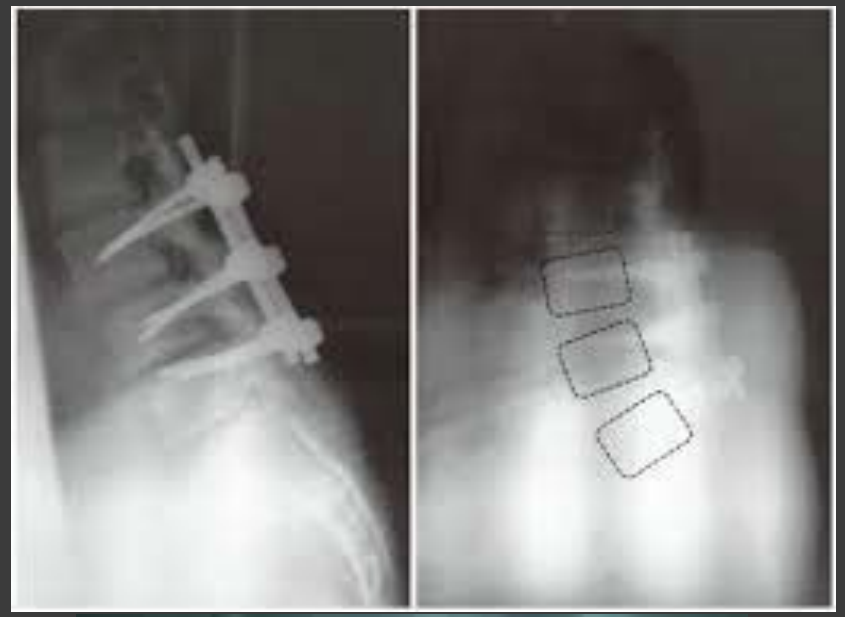
Adult deformity is a significant health issue within the aging population in both the United States and the world communities.[1] This special issue of *Spine* explores the problem and the current evidence for the treatment options. This

➢**No substantial evidence for any nonsurgical treatment in adult scoliosis.**

Conservative Tx



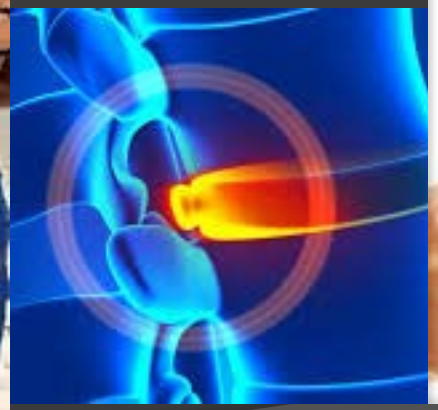
IATROGENIC
CAUSE OF DEFORMITY



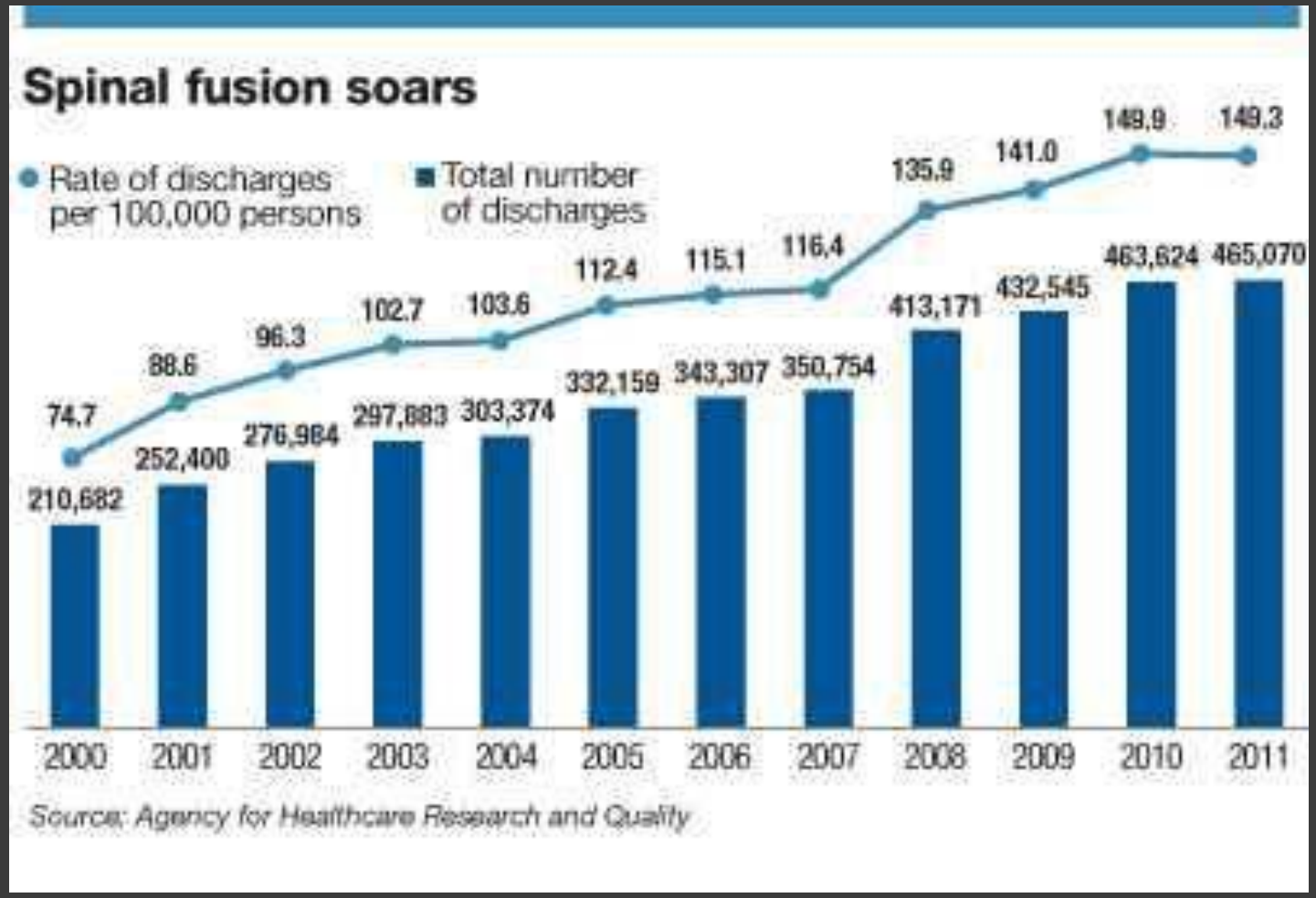
Hey Doc, can you do Laser surgery on me?

LASER SPINE INSTITUTE®

THE LEADER IN ENDOSCOPIC SPINE SURGERY



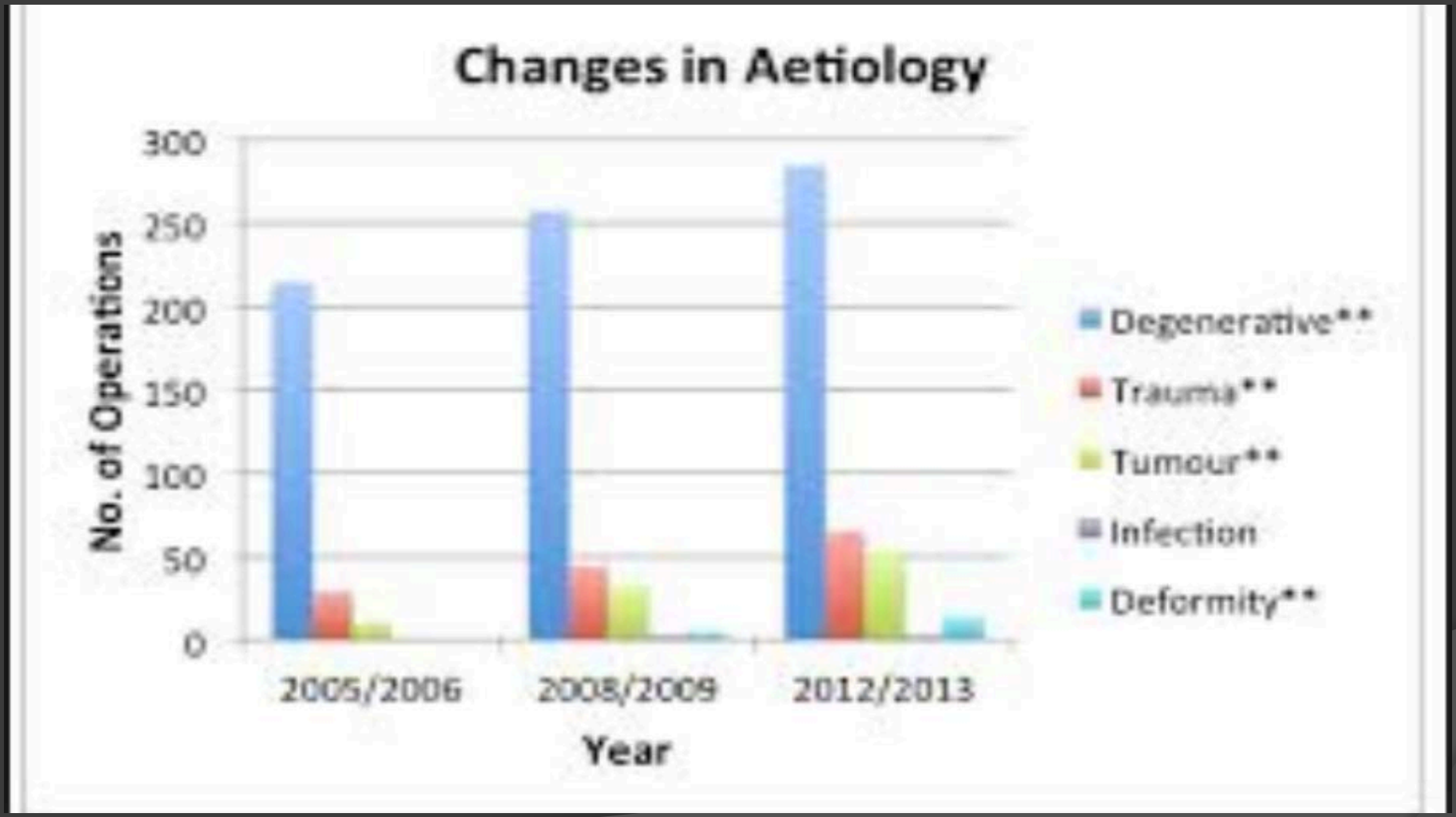
Spine Market



MORE INSURANCE DENIALS

MULTI-DICIPLINARY - EVIDENCE BASED

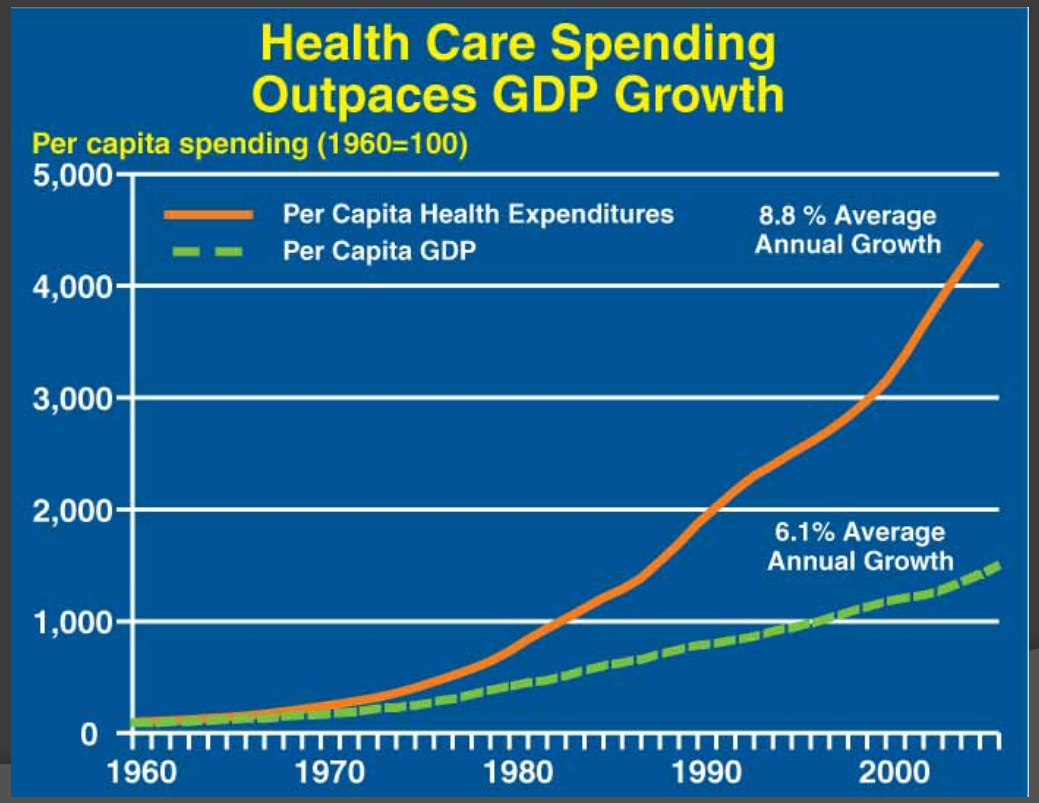
CROSSOVERS


Changes in Aetiology
No. of Operations
300
250
200
150
100
50
0
2005/2006
2008/2009
2012/2013
Year
Degenerative**
Trauma**
Tumour**
Infection
Deformity**

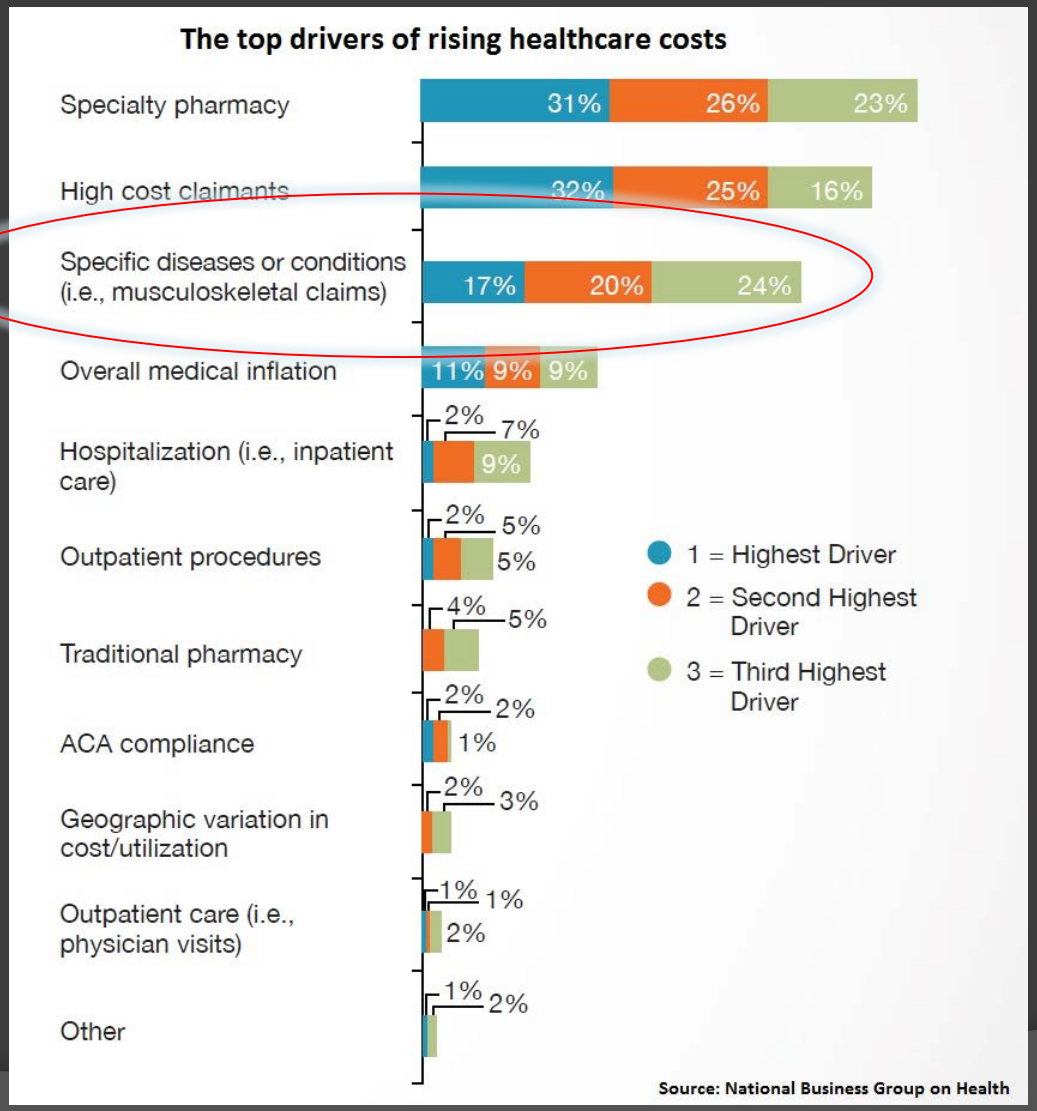
upr

Economic Value

Economic value is an increasingly important component of healthcare policy decision making.



Healthcare Costs



VALUE

METRICS

QALY (Quality Adjusted Life Year)

1 = perfect health while 0 = death

&

DALY (Disabilty Adjusted Life Year)

1 = death while 0 = perfect health

DALY, in essence, measures health loss in the quality of life. On the other hand, QALY measures the same quality of life in health gain. QALY is usually used in measuring the quality and quantity of care and life when considering options for health treatments for a particular illness.

Measuring and Defining Value

What is an acceptable outcome?

SCB

TABLE VII Minimum Clinically Important Difference Values for Current Study Population and Values Previously Reported in the Literature as Compared with Substantial Clinical Benefit Values

	Substantial Clinical Benefit, Current Study *(points)*	Minimum Clinically Important Difference *(points)*	
		Current Study	As Reported in Literature
Oswestry Disability Index	18.8	12.8	10.0 (Hägg et al.[13]); 11.0 (Lauridsen et al.[24])
SF-36 physical component summary	6.2	4.9	5.4 (Ware et al.[12])
Back pain numeric rating scale	2.5	1.2	1.0 (Lauridsen et al.[24])
Leg pain numeric rating scale	2.5	1.6	2.0 (Lauridsen et al.[24])

Translating HRQOL to Value

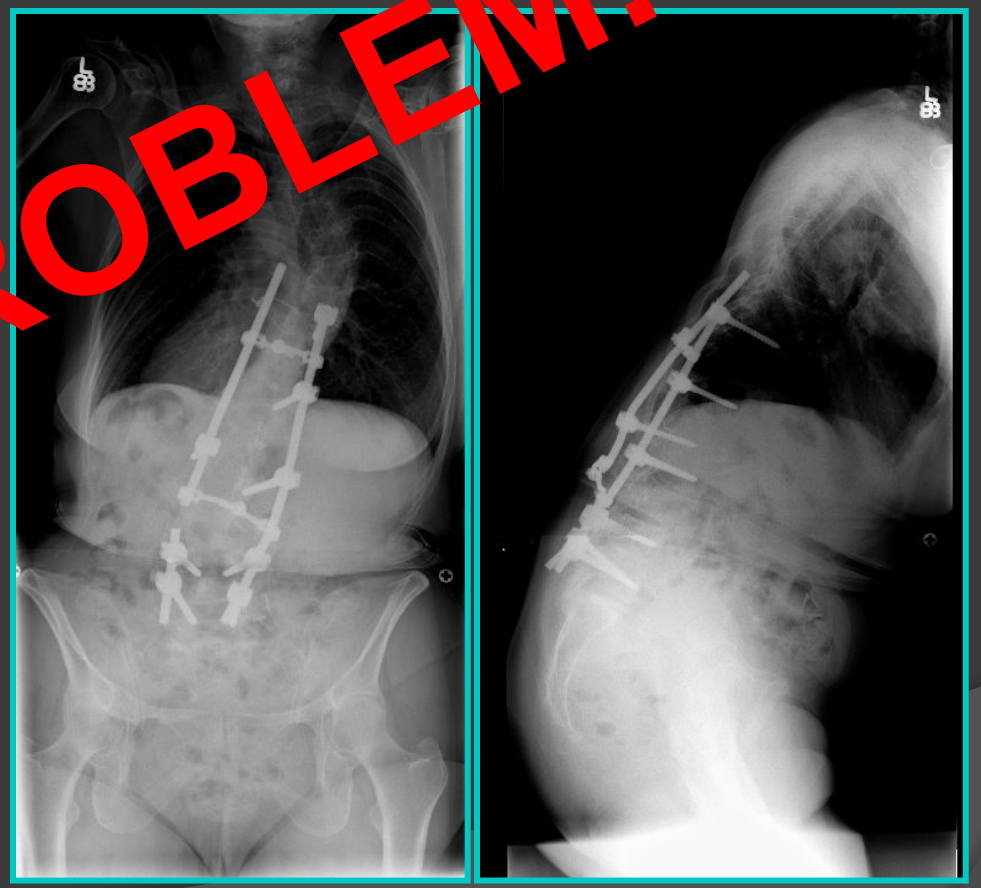
- Cost/QALY has become the primary currency for Healthcare Economics?

DURABILITY?

- ✓ cost/QALY $50,000 - $100,000 is generally considered cost effective.

Revision Spine Surgery

- 7%->50% of spine surgeries eventually require revision
- The more complex the procedure, the more likely something is going to go wrong
- Results of revision spine surgery are usually less satisfactory than primary surgery



Failure to Adequately Correct Deformity

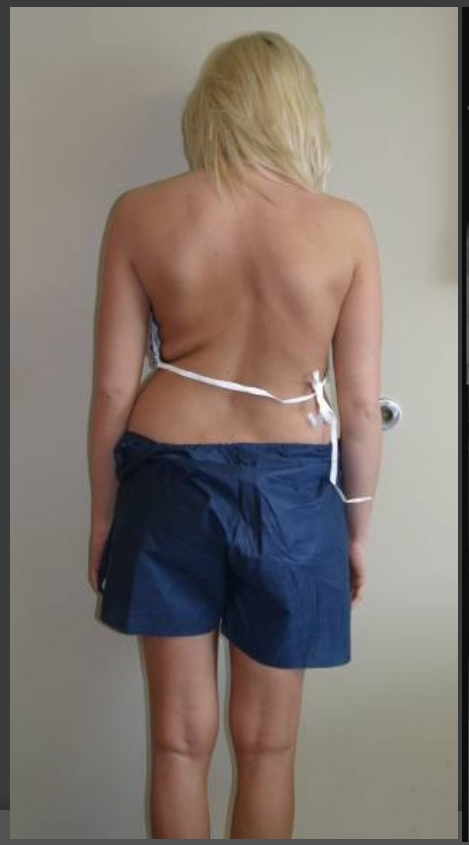
SOLUTION

UNiD™

YOUR SAGITTAL CODE

Assessment of Spinal Alignment

How do we measure spinal balance?



Global Sagittal Alignment

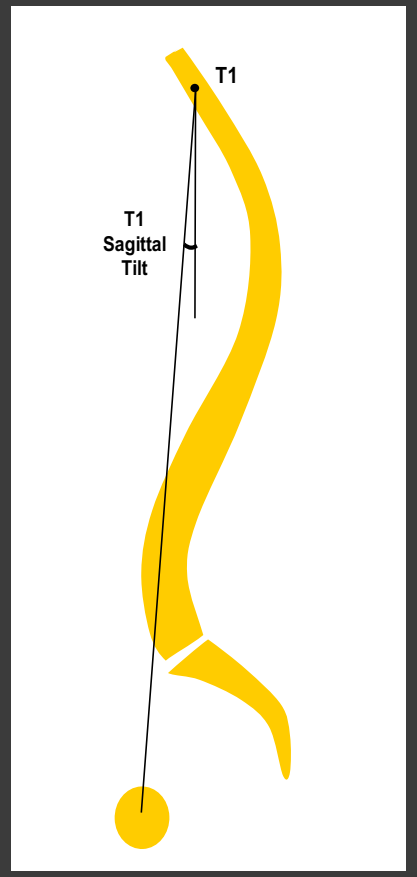
Distance

C7 Plumbline – Posterior Superior Corner of Sacrum

SVA

(Jackson)

0 to 5cm



-9° to +7°

Angle

Vertical vs line between femoral heads and T1

T1 angle

(Duval-Beaupere)

SPINE Volume 30, Number 18, pp 2024–2029
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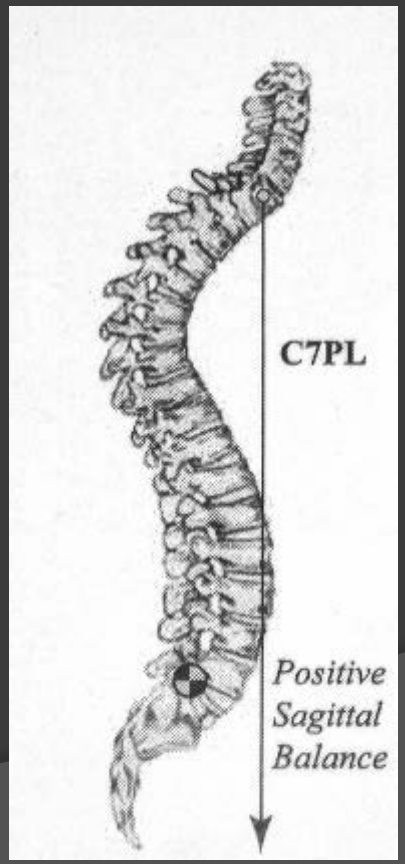
The Impact of Positive Sagittal Balance in Adult Spinal Deformity

Steven D. Glassman, MD,* Keith Bridwell, MD,‡ John R. Dimar, MD,* William Horton, MD,§
Sigurd Berven, MD,† and Frank Schwab, MD‖

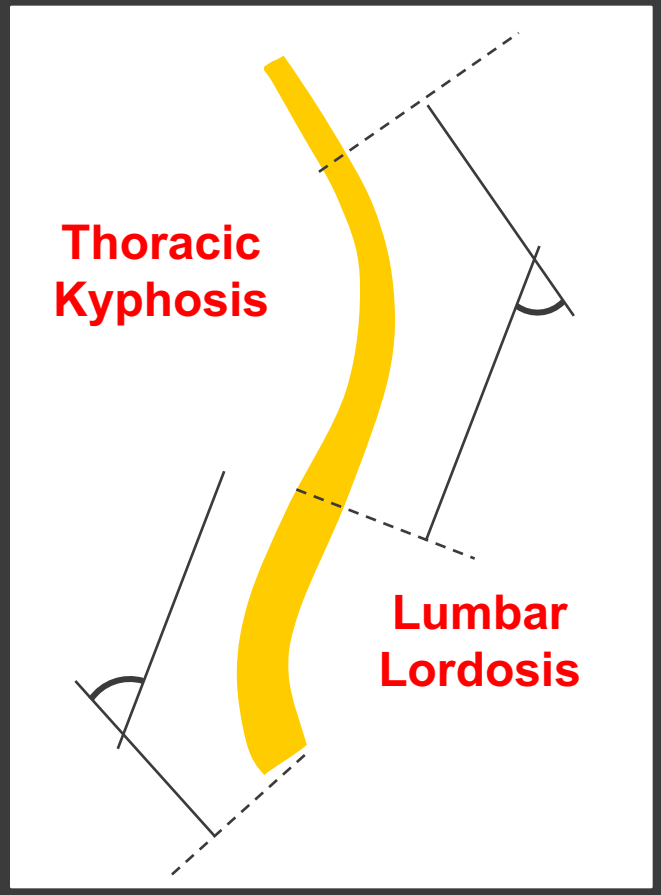
Plumbline Shift Anteriorly

=> Increasing disability
SF-12, SRS-29, ODI ($p<0.001$)

=> Lumbar kyphosis marked disability
SRS-29, ODI ($p<0.05$)



Regional Sagittal Alignment

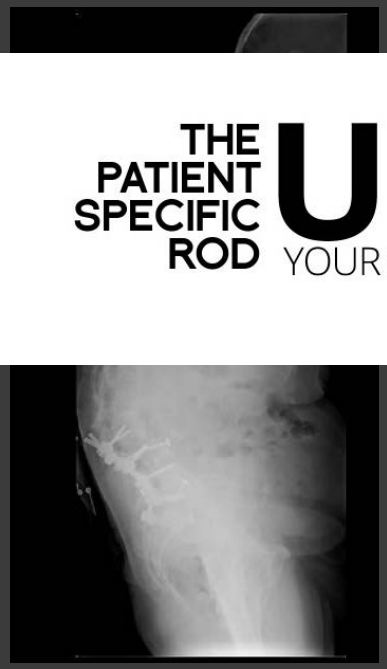


Thoracic kyphosis	20-40
Lumbar Lordosis	30-80

Curves 'Proportional' to One Another

Sagittal Alignment and Symptoms

Conclusion



THE PATIENT SPECIFIC ROD UNiD™ YOUR SAGITTAL CODE

Sagittal Balance is the dominant predictor of HRQOL in Adult Spinal Deformity

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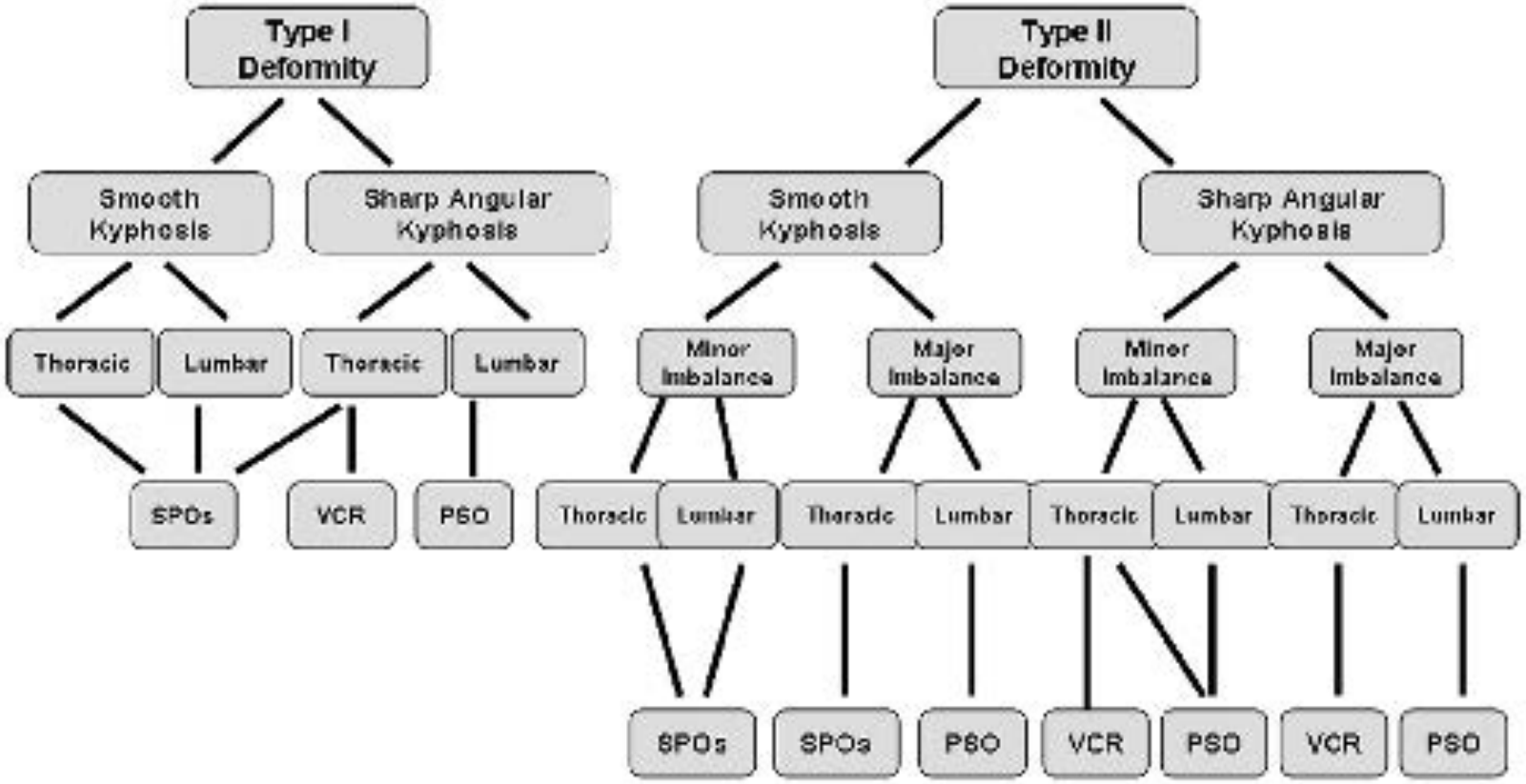
Decision Making Regarding Smith-Petersen *vs.* Pedicle Subtraction Osteotomy *vs.* Vertebral Column Resection for Spinal Deformity

Keith H. Bridwell, MD



Schwab Formula

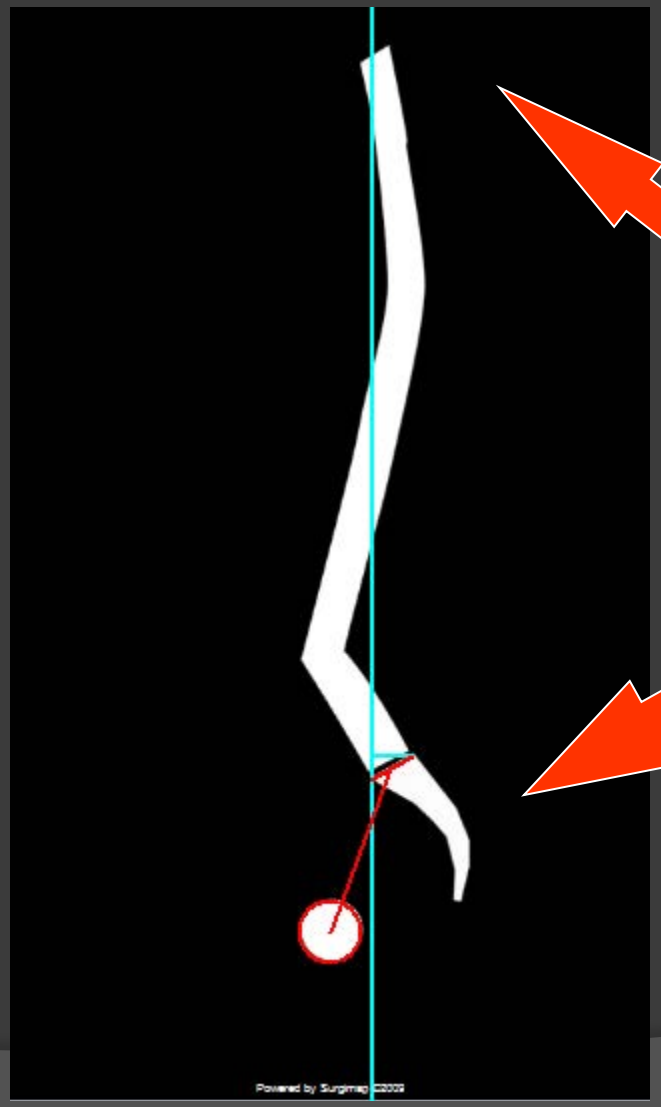
Utilizing Pelvic Parameters to help Plan Osteotomies

$$PT = 1.14 + 0.71 \times (PI) - 0.52 \times (Maximal\ Lumbar\ Lordosis) - 0.19 \times (Maximal\ Thoracic\ Kyphosis)$$

$$SVA = -52.87 + 5.90 \times (PI) - 5.13 \times (Maximum\ Lumbar\ Lordosis) - 4.45 \times (PT) - 2.09 \times (Maximal\ Thoracic\ Kyphosis) + 0.566 \times (Age)$$

Prediction of PT=16.3 Prediction of SVA= -1.8cm

Ex: Reconstruction



Pre-Op Evaluation
Large SVA (>20cm)
Large PT (38 deg)

PSO Planning
SVA + PT correction
PSO 46deg

Post-Op Evaluation
SVA <5cm
PT < 25deg

Frank Schwab

MEDICREA

UNiD

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YOUR SAGITTAL CODE

Surgeon Name	dah	Rod	(L) / (R)
Surgery Date (MM/DD/YY)	16		5.5 / 5.5
Patient initials			Titani / m
Age / Gender	emale		Stand
Case ID		Cali	Spher
Levels		Extr	
Hospital			

Surgical steps:

	Surgical proc	ertebra c d
1.	TLIF	L4-L5
2.		
3.		
4.		
5.		

Comments:

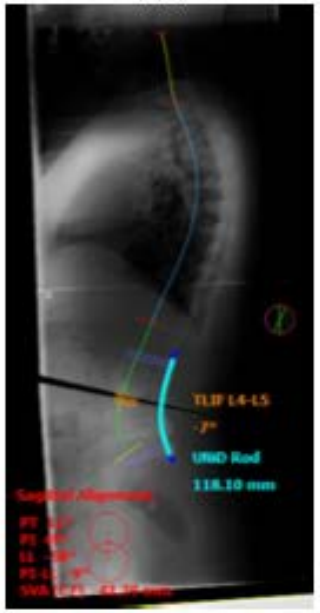
1. Rod to be lengthened according to coronal deformity
2.
3.

SPINOPELVIC PARA		PLAN
elvic Tilt		12
elvic Inc l,°)	4	49
acral Slo	3	37
umbar L LL,°)		58
-LL (°)		-9
horacic (TK,°)	36	36
T1 Pelvic Angle (TPA,°)	4	3
Sagittal Vertical Axis (SVA,mm)	-5	-41

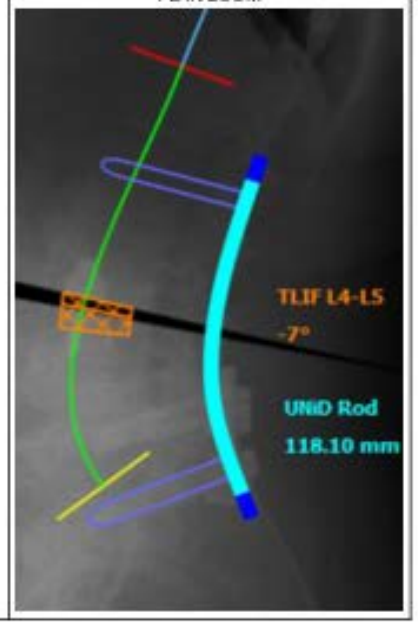
PREOPERATIVE FRONTAL

PREOPERATIVE SAGITTAL

PLAN



PLAN ZOOM



MEDICREA (IM)PROVE

UNiD

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YOUR SAGITTAL CODE

Surgeon Name	h	Rod	(L)	(R)
Surgery Date (MM/DD/YY)			5.5	5.5
Patient Initials			Titaniu	um
Age / Gender	hale		Standa	d
Case ID		Calibr	Sphere	
Levels		Extra		
Hospital	t. Luke's			

Surgical steps:

	Surgical proced	rtebra c d
1.	PSO	T9
2.		
3.		
4.		
5.		

Comments:

1. Rod to be lengthened according to coronal deformity
2.
3.

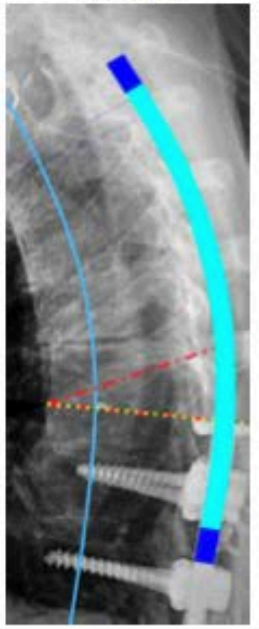
SP LVIC PA	OP	PLAN
Pelvic Ti (PT,°)		22
Pelvic In (PI,°)		66
Sacral S °)		44
Lumbar s (LL,°)		53
PI-LL (°)		13
Thoracic Kyphosis (TK,°)	61	36
T1 Pelvic Angle (TPA,°)	30	23
Sagittal Vertical Axis (SVA, mm)	16	63

PREOPERATIVE FRONTAL

PREOPERATIVE SAGITTAL

PLAN

PLAN ZOOM



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TECHNOLOGIES TODAY
ADVANCES IN THE
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MARKET
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COMPREHENSIVE
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A NEW ERA IN SPINE SURGERY

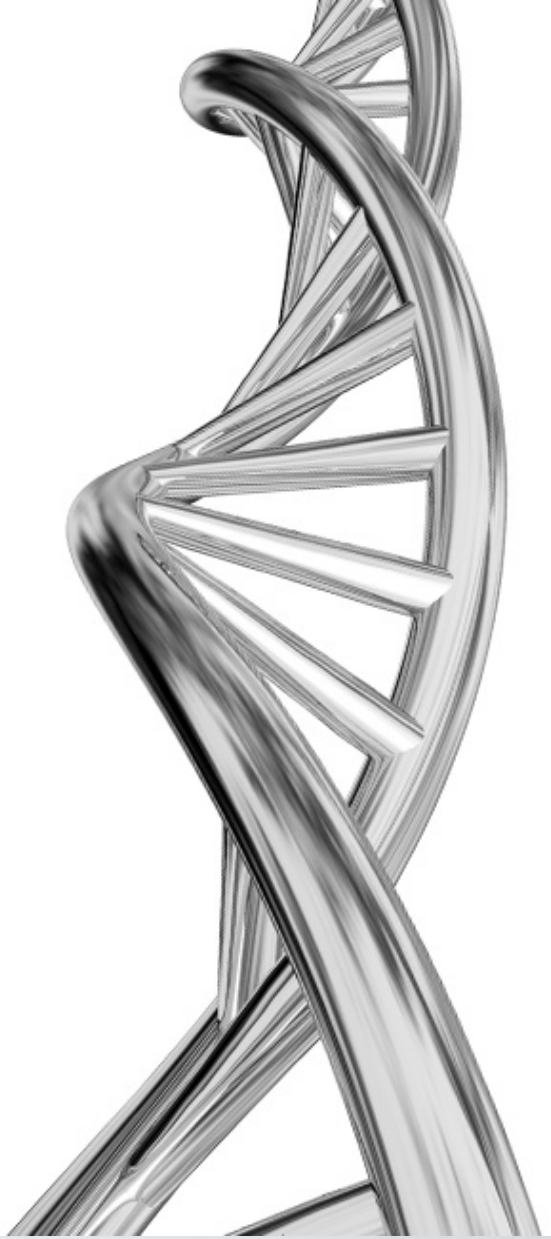
"Personalized Spine" is the ability to create patient-specific implants for complex spine procedures requiring sagittal rebalancing, tailored to achieve the optimal outcome: early and long term structural integrity with global sagittal alignment.

Medicrea offers a unique, service-based approach to complex spine utilizing its UNiD™ IT platform and proprietary manufacturing algorithm.

Medicrea galvanizes surgeons with an iterative system that has both Predictive and Deep Learning capacity, delivering data and information that support surgical case decisions from pre-operative planning to post-operative analysis.

For the first time in this industry, Medicrea is building upon a unique and deep partnership between the surgeon and the UNiD Lab engineers. Medicrea is leading the way in personalized spinal surgery with market-disrupting, proprietary planning, manufacturing and analytical technologies.

THE FUTURE IS NOW



COMPANY OVERVIEW

- HEADQUARTERED IN LYON, FRANCE AND NEW YORK CITY
- COMPREHENSIVE PATIENT-SPECIFIC TECHNOLOGIES FOR COMPLEX SPINE MARKET

- FIRST TO MARKET PATIENT-SPECIFIC IMPLANTS FOR THE SPINE WITH UNID™ RODS
- COMPREHENSIVE 3D-PRINTED PATIENT-SPECIFIC PLATFORM IN-HOUSE
- CENTRALIZED HEADQUARTERS AND MANUFACTURING FACILITIES

- 2015 €27.8M. 2016 SEPTEMBER YTD REVENUE OF €21.6M WITH 81% H1 GROSS MARGIN
- PUBLICLY TRADED ON ALTERNEXT: ALMED TICKER

- RAISED €20 MILLION WITH LEADING U.S. INVESTORS IN AUGUST LED BY ATHYRIUM CAPITAL
- RICK KIENZLE, FOUNDING MEMBER OF GLOBUS MEDICAL, APPOINTED CHIEF COMMERCIAL OFFICER

INVESTMENT HIGHLIGHTS

- INNOVATIVE SERVICE-ORIENTED APPROACH TO COMPLEX SPINE
- PATIENT SPECIFIC IMPLANTS DRIVE OPTIMAL PATIENT OUTCOMES
- DIFFERENTIATED UNiD TECHNOLOGY BENEFITS ALL KEY STAKEHOLDERS
- SIGNIFICANT GLOBAL MARKET OPPORTUNITY WITH LIMITED COMPETITION
- EXPERIENCED MANAGEMENT TEAM FOCUSED ON COMMERCIAL EXECUTION
- ATTRACTIVE FINANCIAL PROFILE

LEADERSHIP

Denys SOURNAC
Founder, Chairman & CEO

Successful entrepreneur in the medical supply and orthopaedics industry with over 30 years' experience creating, building and managing companies.

Richard KIENZLE
Chief Commercial & Business Development Officer

Co-founder of Globus Medical with over 25 years of Executive Sales Management experience in the medical device industry.

Fabrice KILFIGER
Chief Financial Officer

Over 25 years' experience in finance, including over 10 years heading the finance divisions of listed companies.

David RYAN
VP Product Dev & Marketing

Biomechanical Engineer with more than 11 years' experience in orthopedics. Former R&D Director, Scient'x (Alphatec Spine).

Pierre OLIVIER
CEO
Medicrea USA

Over 25 years' experience in Marketing and Project Management, mainly in the United States, particularly in sales launches of new innovative products.

Greg RHINEHART
VP Sales
Medicrea USA

Industry executive with over 20 years of Sales Management experience in the medical device industry.

SPINE MARKET SEGMENTS

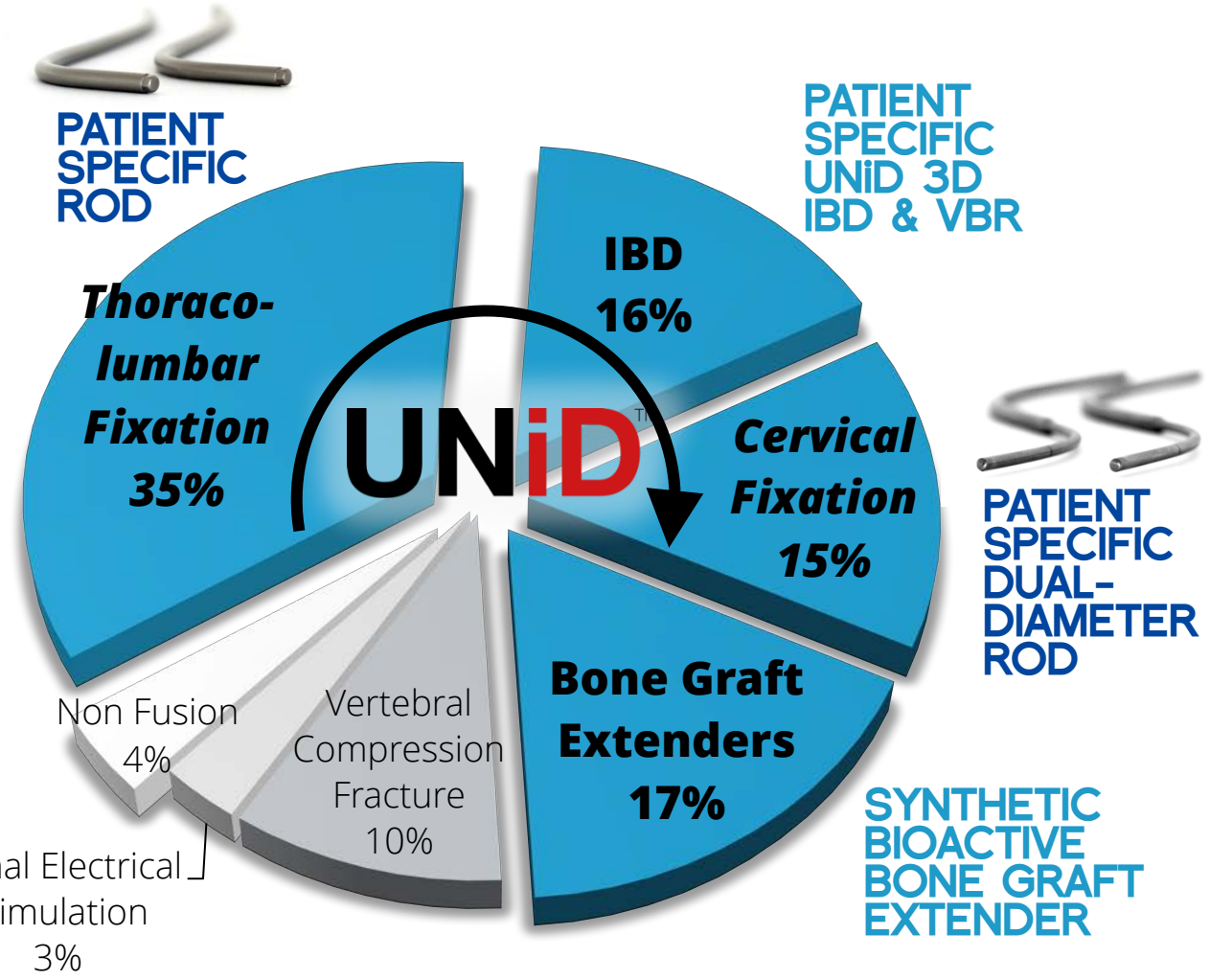
116,000
ANNUAL COMPLEX SPINE CASES[1]

$30,000
AVG REVENUE PER COMPLEX CASE

221,000
ANNUAL DEGEN CASES[1]

$11,200
AVG REVENUE PER DEGEN CASE

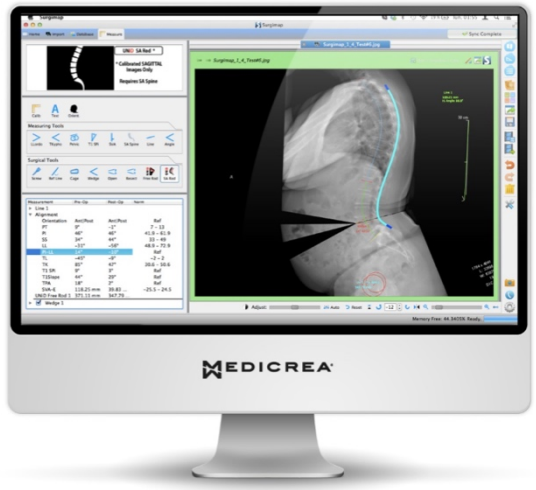
UNID TECHNOLOGIES U.S. MARKET OPPORTUNITY NEARS **$6B**



1. *2015 Instrumented Thoracolumbar Procedures annually (409,100). 2013 Millennium Research Group, Inc., Table 87 "Thoracolumbar Fusions, by Indication."*

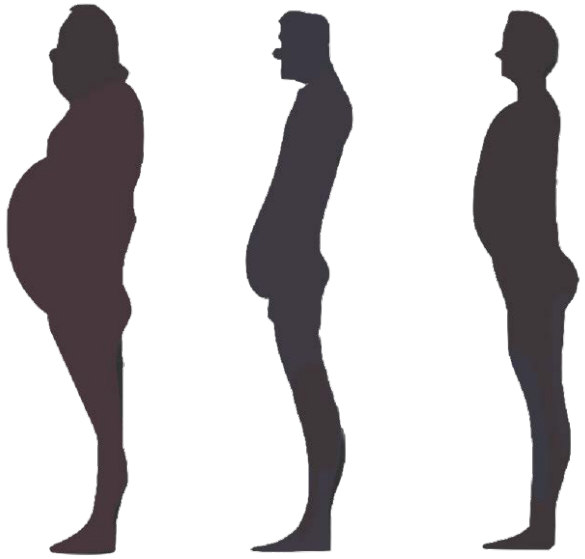
MARKET ENVIRONMENT

- Growing payer pressure on doctors to follow a measurable & systematic treatment plan with penalty charges applied for incurring revision surgery in the USA
- Increased legal liability concerns in achieving a successful outcome and documenting the treatment plan in patient file
- Implant choices rely more now on hospital value-based strategy vs surgeon preference
- Achieving sagittal alignment for a patient post operation delivers the best clinical results
- The UNiD Lab / Surgeon relationship delivers far greater company / surgeon control with a new commercial sales paradigm that is much more cost effective than traditional sales rep structures.
- Medicrea's Software system enables a huge reduction in intra op inventory creating a massive systemic efficiency and $ reduction (ex. 400-500 screws per case / reduced to 75).



CLINICAL RATIONALE

ONE SIZE DOES NOT FIT ALL…



Post-op X-Ray

HIGH VARIABILITY IN BENDING

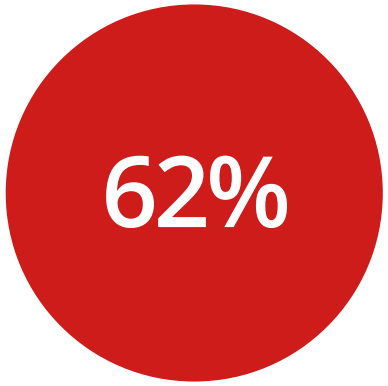
Attending Surgeons **Fellows**

High Variability: Qualitative comparison between the real shape and the bending obtained by the attending and fellow groups.[7]

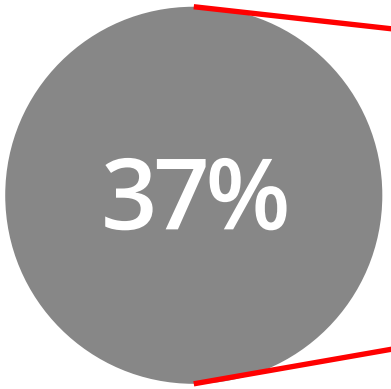
7. Rod bending lab organized in 2012 included 8 spine surgeons and fellows from major US teaching institution

CURRENT SHORTCOMINGS IN TREATMENT

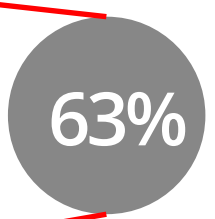
CLINICAL ISSUES



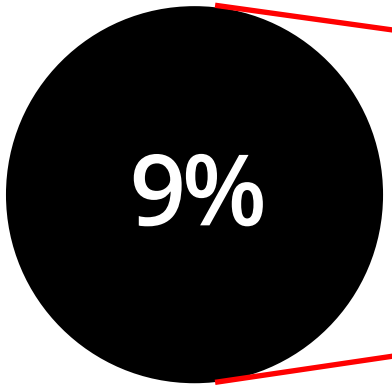
OF PATIENTS ARE MALALIGNED POST-OP[1]



LONG-TERM REPORTED REVISION RATE[4]



OF REVISIONS FAIL TO ACHIEVE ADEQUATE LUMBAR LORDISIS[5]



OF MANUALLY BENT RODS FRACTURE[3]

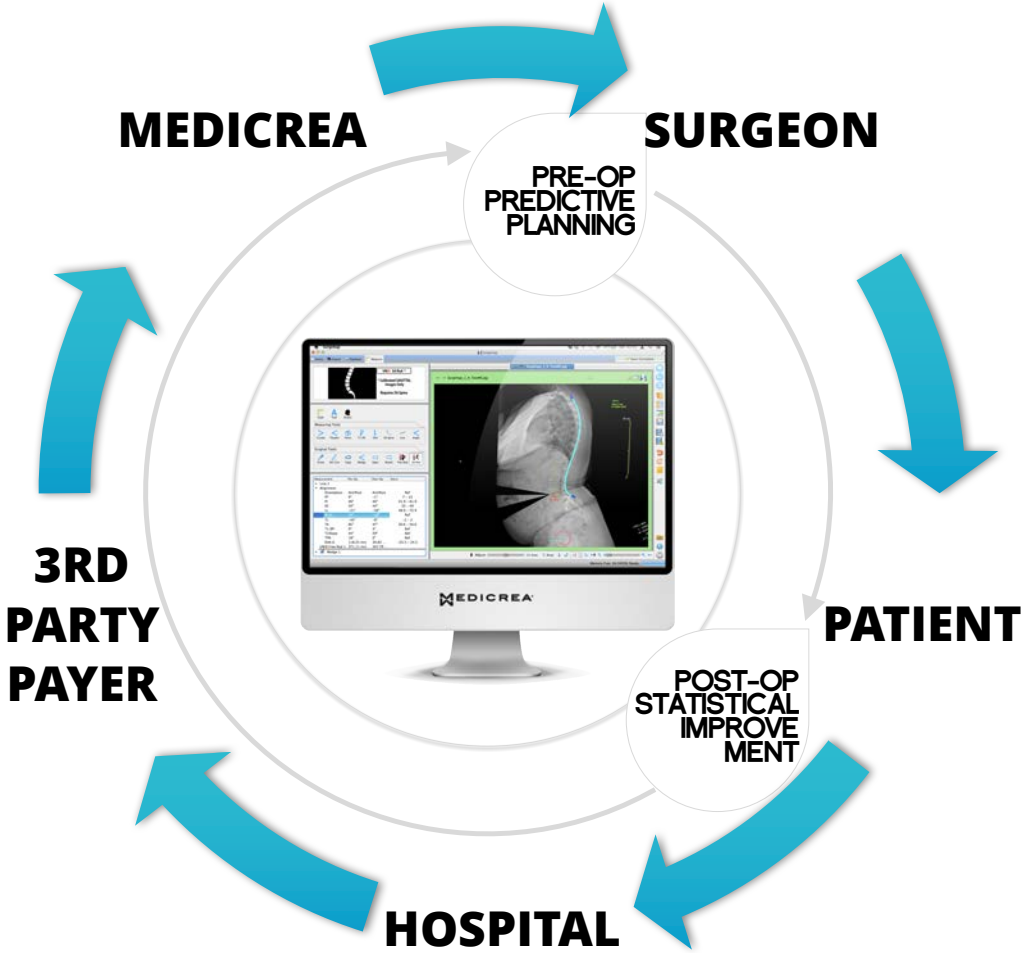
FRACTURE-RATE WITH PSO[3]

INCREASED RISK OF ADJACENT LEVEL DISEASE[2]

1. *Moal B, Schwab F, Ames CP, et al. Radiographic Outcomes of Adult Spinal Deformity Correction: A Critical Analysis of Variability and Failures Across Deformity Patterns. Spine Deform. 2014.*
2. *Rothenfluh DA, Mueller DA, et al. Pelvic incidence-lumbar lordosis mismatch predisposes to adjacent segment disease after lumbar spinal fusion. Eur Spine J (2015) 24:1251-1258*
3. *Smith JS, Shaffrey CI, Klineberg E, et al. Prospective multicenter assessment of risk factors for rod fracture following surgery for adult spinal deformity. J Neurosurg Spine 21:994–1003, 2014.*
4. *Frymoyer JW, Matteri RE, Hanley EN, et al: Failed lumbar disc surgery requiring second operation. A long-term follow-up study. Spine 3:7-11, 1978*
5. *Jang J-S, Lee S-H, Min J-H, Kim SK, Han K-M, Maeng DH. Surgical treatment outcomeof failed back surgery syndrome due to sagittal imbalance. Spine (Phila. Pa. 1976). 2007*

COMPREHENSIVE PERSONALIZED SPINE

ITERATIVE DEEP-LEARNING VIRTUOUS CYCLE BENEFITS ALL STAKEHOLDERS



UNiD™

- DATA-DRIVEN METHODOLOGY
- IMPROVED CLINICAL RESULTS
- REDUCED INCIDENCE OF REVISION
- COST SAVING TO HEALTH SYSTEM
- REDUCED INVENTORY REQUIREMENTS

GLOBAL UNiD ADOPTION

PATIENTS TREATED AS OF 7 DEC '16

76%

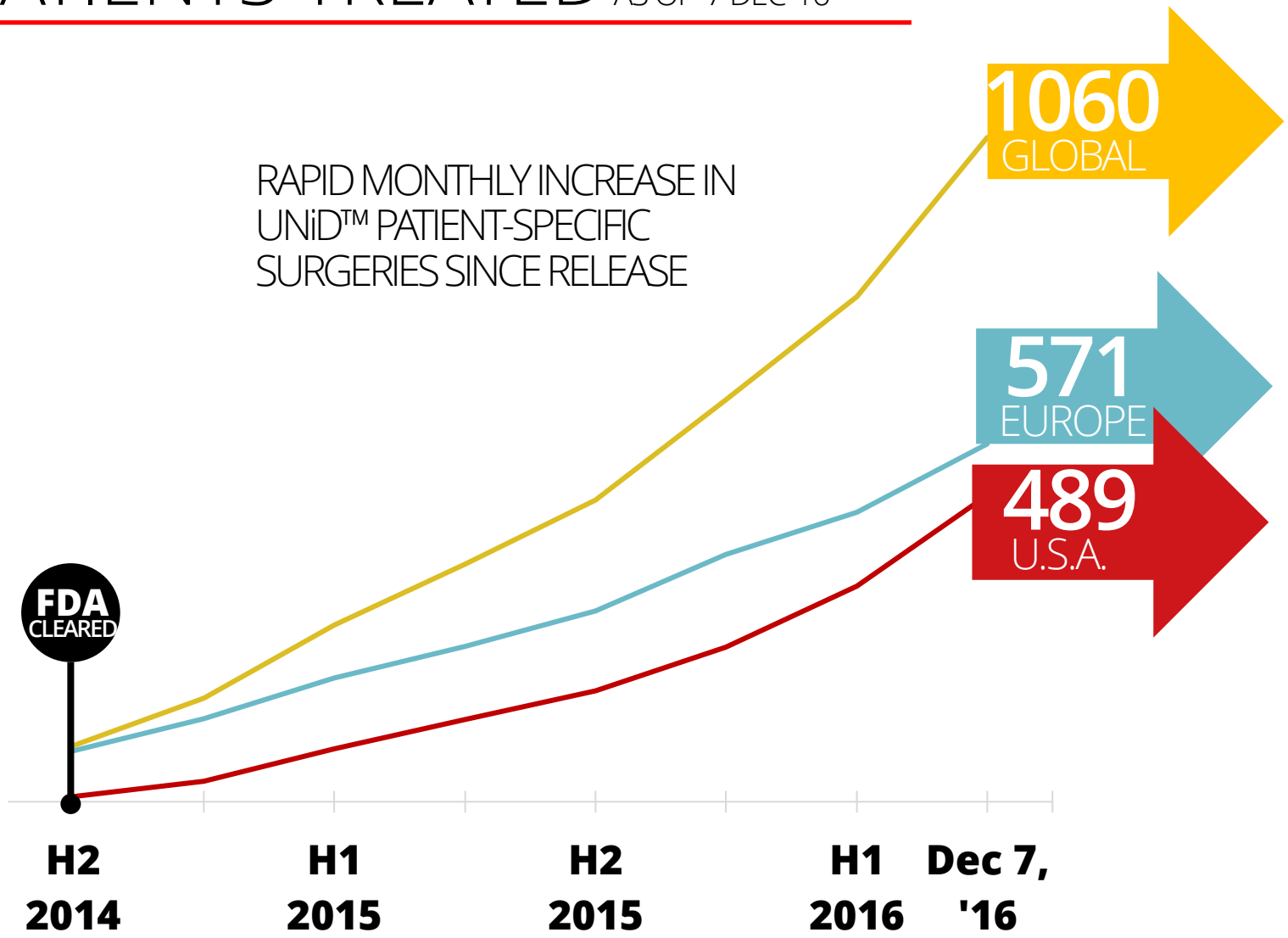
USED WITH MEDICREA FIXATION

$9.8M

TOTAL US UNiD CASE REVENUE

(15% PREMIUM ON PATIENT-SPECIFIC)

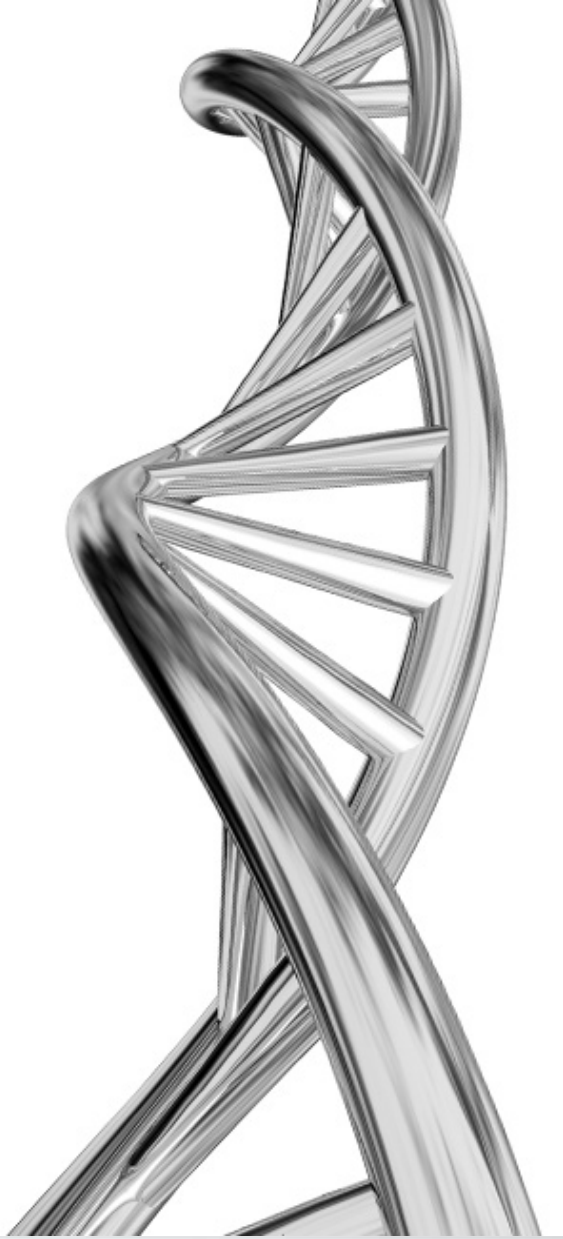
RAPID MONTHLY INCREASE IN UNiD™ PATIENT-SPECIFIC SURGERIES SINCE RELEASE



FINANCIAL PROFILE

AT A GLANCE

- 2016 projected revenue of $30M
- High gross margin in the 80 % range
- Significant capex spendings in 2016 & 2015 to increase in-source of production and manufacturing efficiency
- EBITDA positive since 2010
- 150+ Headcount
- Transformative € 20M fundraising in August 2016, including € 15M from Athyrium Capital Management in US and € 5M from multiple US investors & Executive team



GROWTH STRATEGY

SALES AND MARKETING

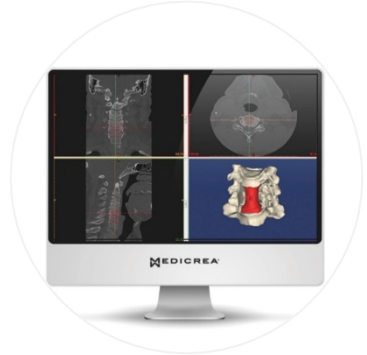
- RICK KIENZLE APPOINTED TO LEAD COMMERCIALIZATION EFFORTS
- DRIVE REVENUE WITH INTEGRATED PRODUCT SOLUTIONS THROUGH UNiD TECHNOLOGY ADOPTION
- BUILD BODY OF EVIDENCE FOR PATIENT-SPECIFIC UNiD ROD
- INCREASE PRESENCE WITH KOLS IN STRATEGIC HOSPITALS AND CENTERS
- INCREASE AWARENESS WITH UNiD WARRANTY PROGRAM
- EXPAND ONLINE MARKETING CAMPAIGN AIMED AT US PATIENTS

MANUFACTURING

- IN-HOUSE TITANIUM 3D PRINTING PATIENT-SPECIFIC IBD & VBR
- U.S. UNiD ROD MANUFACTURING FOR DEGENERATIVE DEFORMITY MARKET
- BRING STERILIZATION CAPABILITIES IN-HOUSE
- SIGNIFICANT COST REDUCTION AND INCREASED EFFICIENCY IN INVENTORY MANAGEMENT VIA UNiD PLATFORM PREDICTIVE TECHNOLOGIES

GROWTH STRATEGY

NEW TECHNOLOGY DEVELOPMENT



Q1 '17

- PREDICTIVE, DEEP LEARNING THRU BIG DATA COMPILATION AND MINING
- COMPLETE UNiD MIS DEVELOPMENT
- FDA FILE SUBMISSION FOR PATIENT-SPECIFIC 3D-PRINTED

Q2 '17

- UNiD LAB ONLINE INTERFACE
- UNiD 3D BIPLANAR ROD DEVELOPMENT, MARKET RELEASE

Q3 '17

- FDA CLEARANCE OF PATIENT-SPECIFIC 3D-PRINTED INTERBODY & VERTEBRAL BODY REPLACEMENT DEVICES

NYU Langone
MEDICAL CENTER

CLINICAL EXPERIENCE WITH UNiD TECHNOLOGY

Themistocles S. Protopsaltis, MD

Director, Adult Spinal Deformity Surgery
Assistant Professor of Orthopaedic Surgery
NYU Langone Medical Center, New York

Introduction to planning

- Pre-operative planning using sagittal parameters is becoming more prevalent
- Pelvic Incidence ranges 35-85 degrees
- SRS-Schwab Classification includes sagittal modifiers based on disability measures
- Published alignment targets based on broad age ranges
- Elderly patients have higher rates of PJK and complications
  - Age should be a factor in pre-operative planning

SRS-Schwab Classification
3 Sagittal Modifiers[1]

PI minus LL

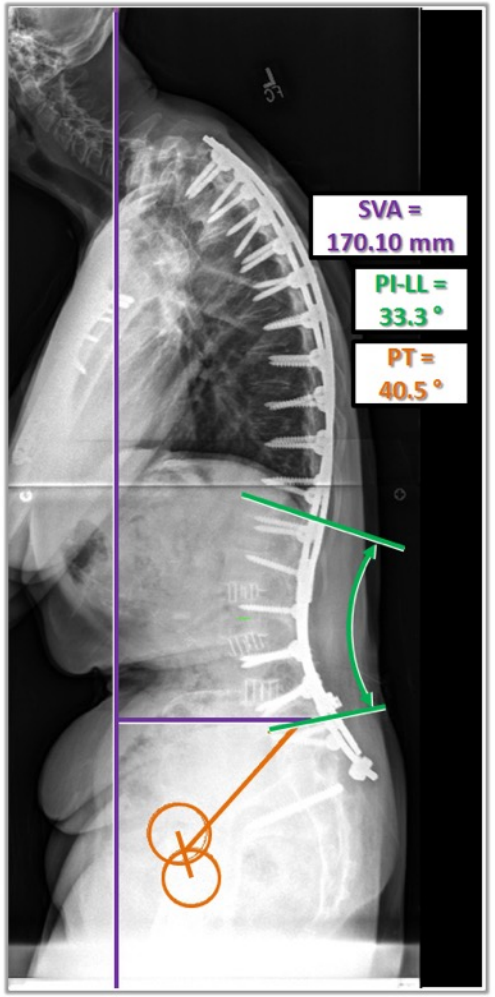
0 : within 10°
+: moderate 10-20°
++ : marked >20°

Global alignment

0 : SVA < 4cm
+ : SVA 4 to 9.5cm
++ : SVA > 9.5cm

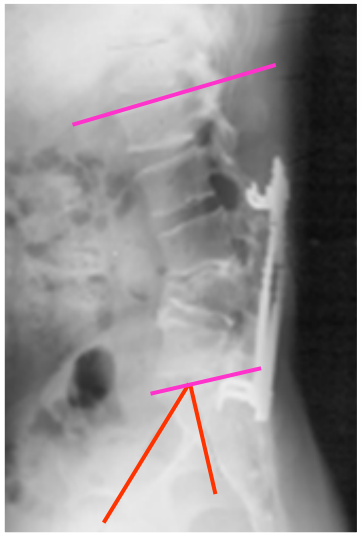
Pelvic Tilt

0 : PT<20°
+ : PT 20-30°
++ : PT>30°



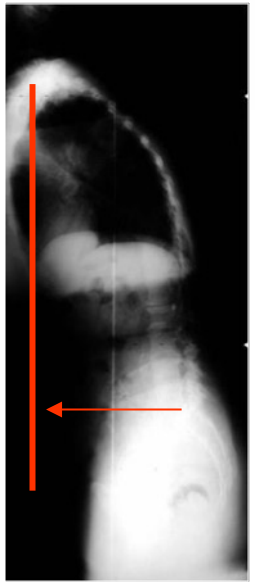
1. Schwab et al., Spine 2013

Proposed Alignment Targets



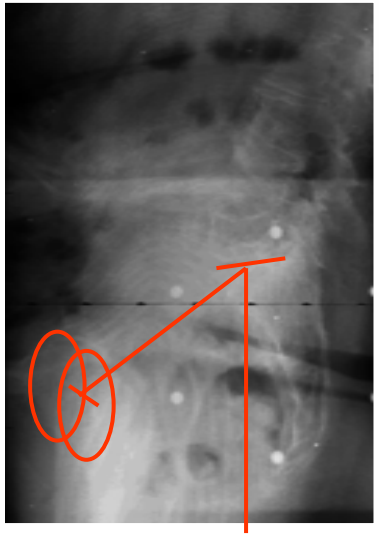
Regional
Loss of lordosis
Versus PI

PI-LL < 10°



Global
SVA

SVA < 4.5cm



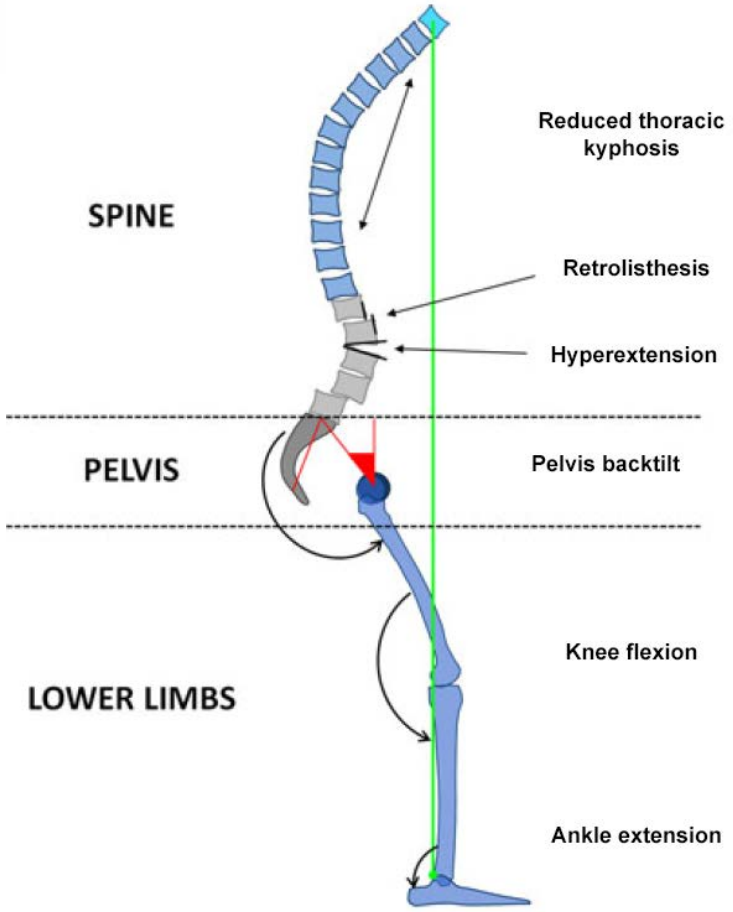
Compensatory
Pelvic tilt

PT < 20°

Adult deformity databases have been used to propose targets for deformity correction (Schwab et al Spine 2013)

Alignment targets are based on baseline analysis of HRQOL and alignment

Personalization of treatment



Alignment targets should not be the same for these patients

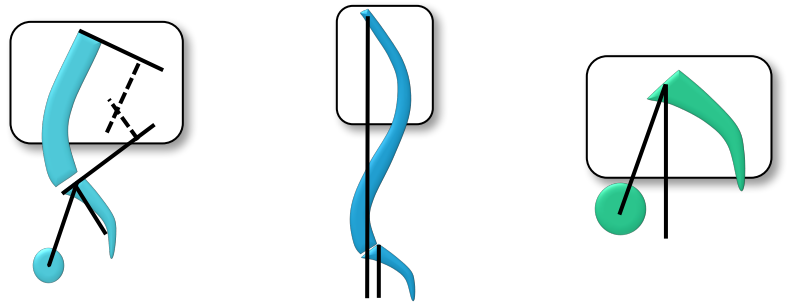
Methodology & Resources

- **Age-adjusted alignments were calculated using simplified formula**
- **Patients were classified as either:**
  - Under corrected (UNDER)
  - Matched (MATCHED)
  - Over corrected (OVER)
- **Threshold for over and under corrected were calculated base on patient age +/- 10 years**
- **Patient reported outcomes were compared between these 3 groups**
  - ANOVA with Tukey's Post-hoc analysis
  - Kruskall-Wallis

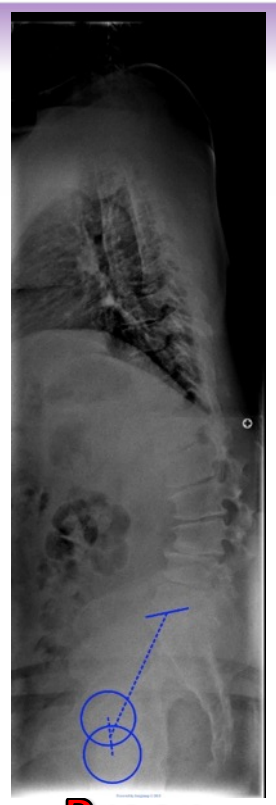
$$PT = \frac{(Age - 55)}{3} + 20$$

$$PI - LL = \frac{(Age - 55)}{2} + 3$$

$$SVA = 2 * (Age - 55) + 25$$

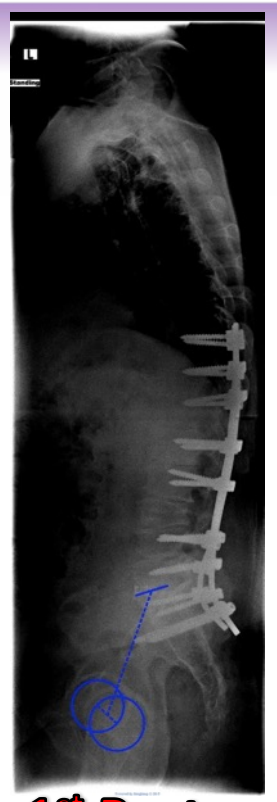


Surgical limitations & Revision



Preop

TPA	36°
SVA	9 cm
PT	34°
PI-LL	31°

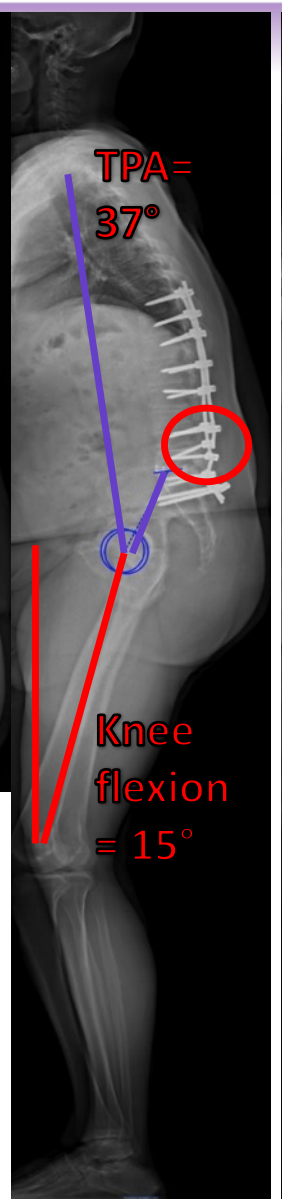


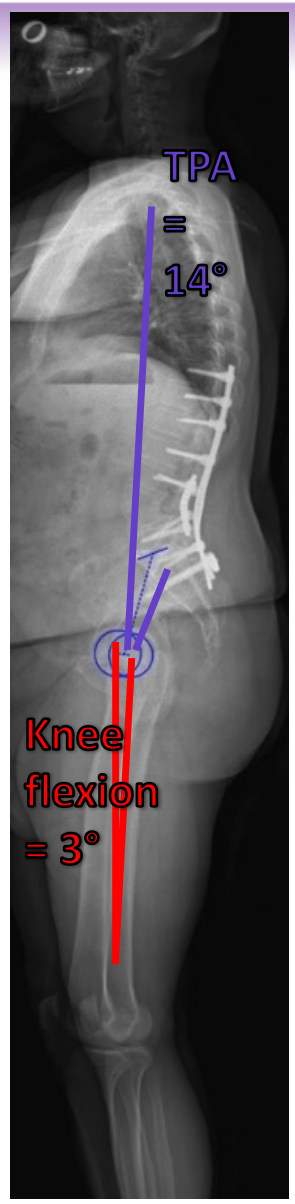
1st Postop

TPA	21°
SVA	5.2 cm
PT	25°
PI-LL	30°

3 year f/u

TPA	37°
SVA	6.8 cm
PT	29°
PI-LL	38°





45 year old M with post-traumatic lumbar kyphosis

- **Undergoes PSO L3 and T10-Plevis prior to UNiD**
- **2 years F/U: broken rods and loss of sagittal alignment**

Approximation & mechanical weakening in manual bending

2nd Postop

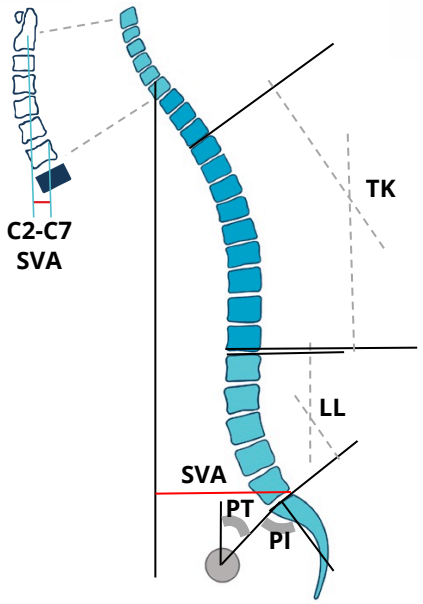
TPA	14°
SVA	2.3 cm
PT	16°
PI-LL	-2°

Patient-specific solution

UNiD™

- OVER 40 UNID ROD CASES PERFORMED SINCE DEC 2014
- ADAPTATION AND IMPROVEMENT OF SURGICAL STRATEGY BASED ON ANALYSIS OF EXPERIENCE
- PRIOR EXPERIENCE PLANNING CASES PERSONALLY
- LIMITED LEARNING CURVE ADOPTING INTO PRACTICE

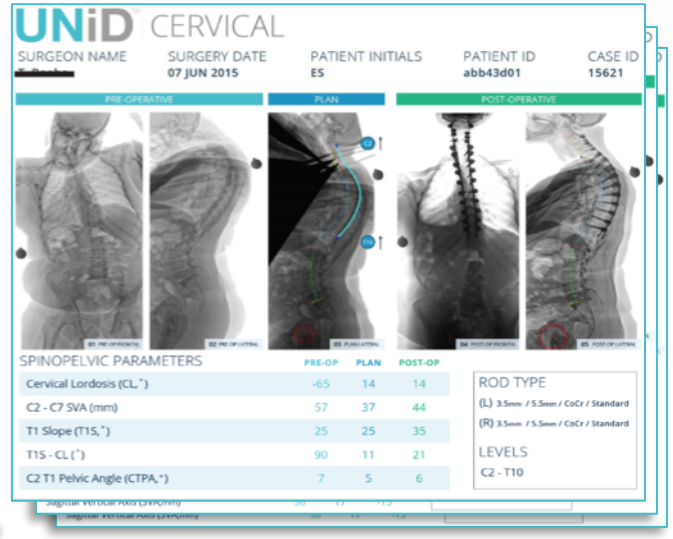
Forming an iterative technique



X-RAY MEASUREMENTS

DIGITIZED CASE PLAN SIMULATION

PATIENT-SPECIFIC IMPLANTS



ADVANCED POST-OPERATIVE ANALYSES

UNiD™ LAB

Case study: Early experience

SURGICAL STRATEGY

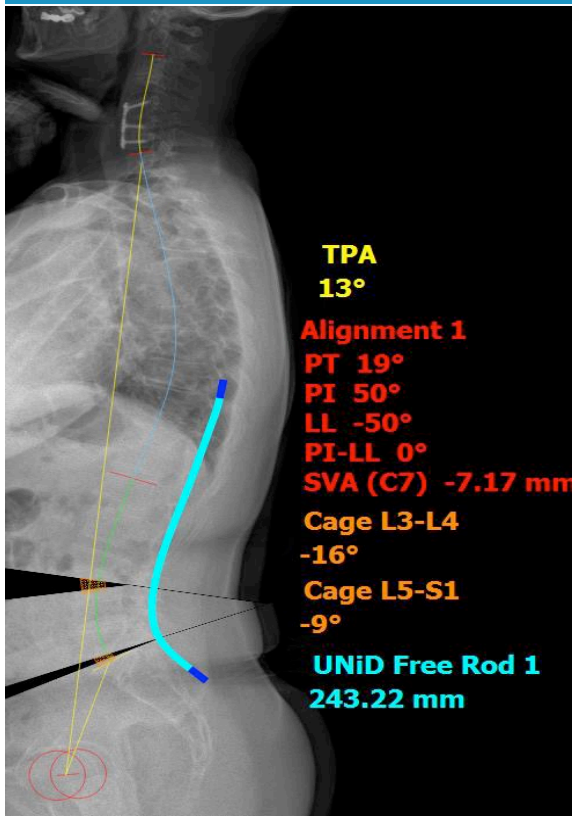
Date: 04/01/15

Levels: T10 - Pelvis

Interbody cages: L3-L4, L5-S1

PRE-OPERATIVE

PLAN

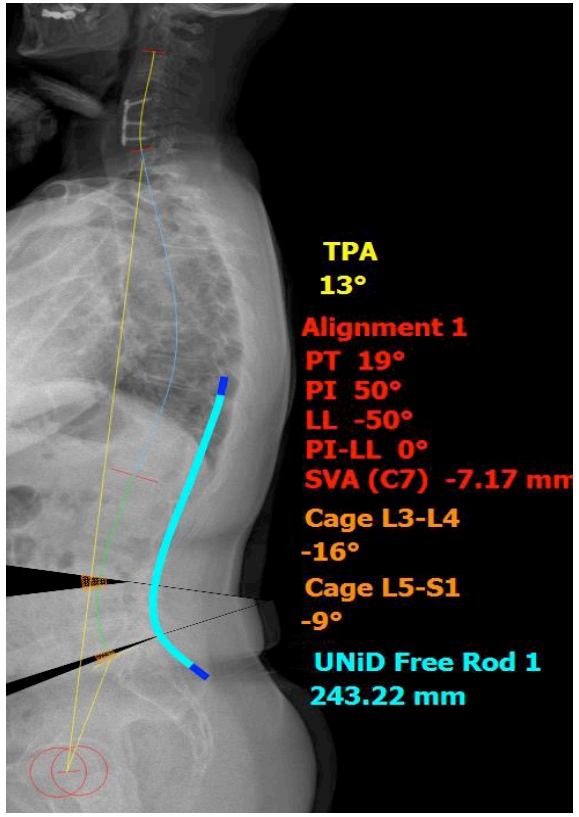


Case study: Early experience

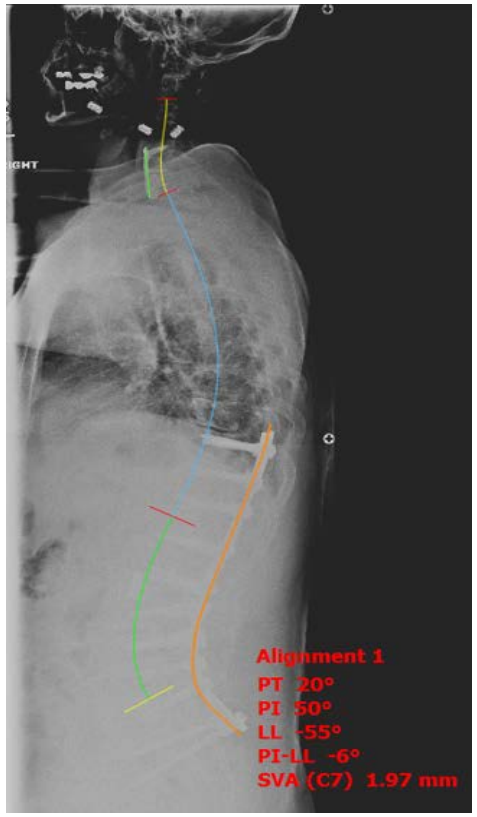
SPINOPELVIC PARAMETERS	PRE-OP	PLAN	3-MO POST OP
Pelvic Tilt (PT,°)	29	19	20
Pelvic Incidence (PI,°)	50	50	50
Sacral Slope (SS,°)	21	31	30
Lumbar Lordosis (LL,°)	29	50	55
PI-LL (°)	20	0	-6
Thoracic Kyphosis (TK,°)	32	32	44
T1 Pelvic Angle (TPA,°)	27	13	-
Sagittal Vertical Alignment (SVA,mm)	51.9	-7.2	1.95

PRE-OPERATIVE

PLAN



3-MO POST-OP



Case study: pelvic compensation

SURGICAL STRATEGY

Date: 08/22/16

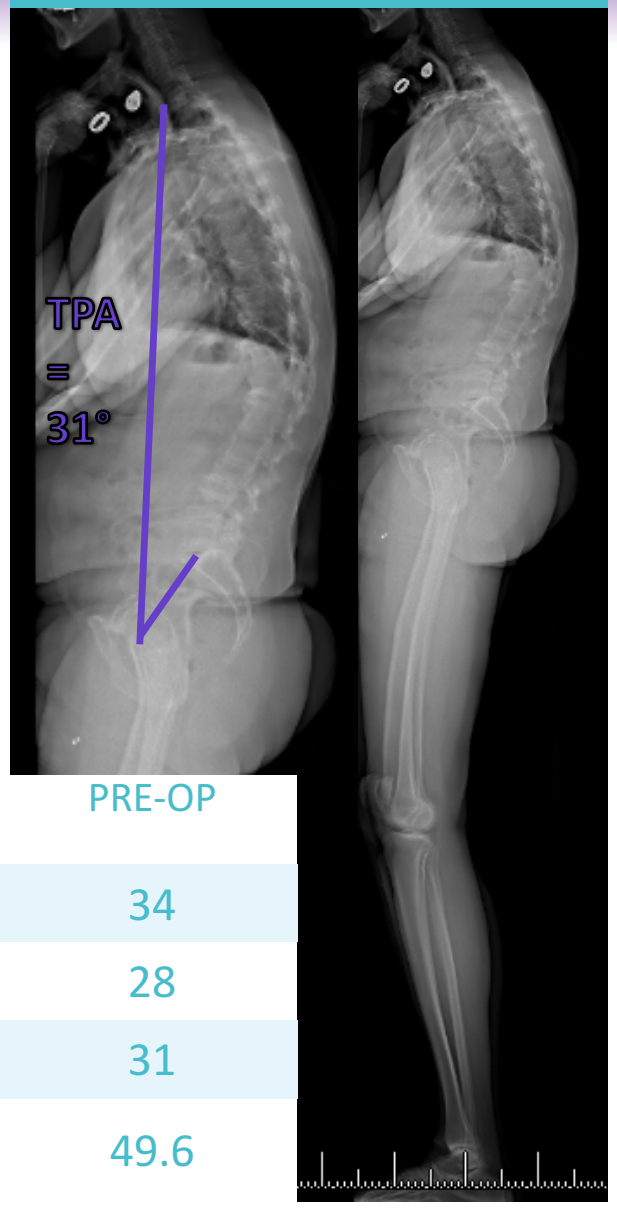
Levels: T10 - Pelvis

Interbody cages: L5/L6, L6/S1

Osteotomy: L5 PSO

Comments: 6 lumbar vertebrae

PRE-OPERATIVE



SPINOPELVIC PARAMETERS	PRE-OP
Pelvic Tilt (PT,°)	34
PI-LL (°)	28
T1 Pelvic Angle (TPA,°)	31
Sagittal Vertical Alignment (SVA,mm)	49.6

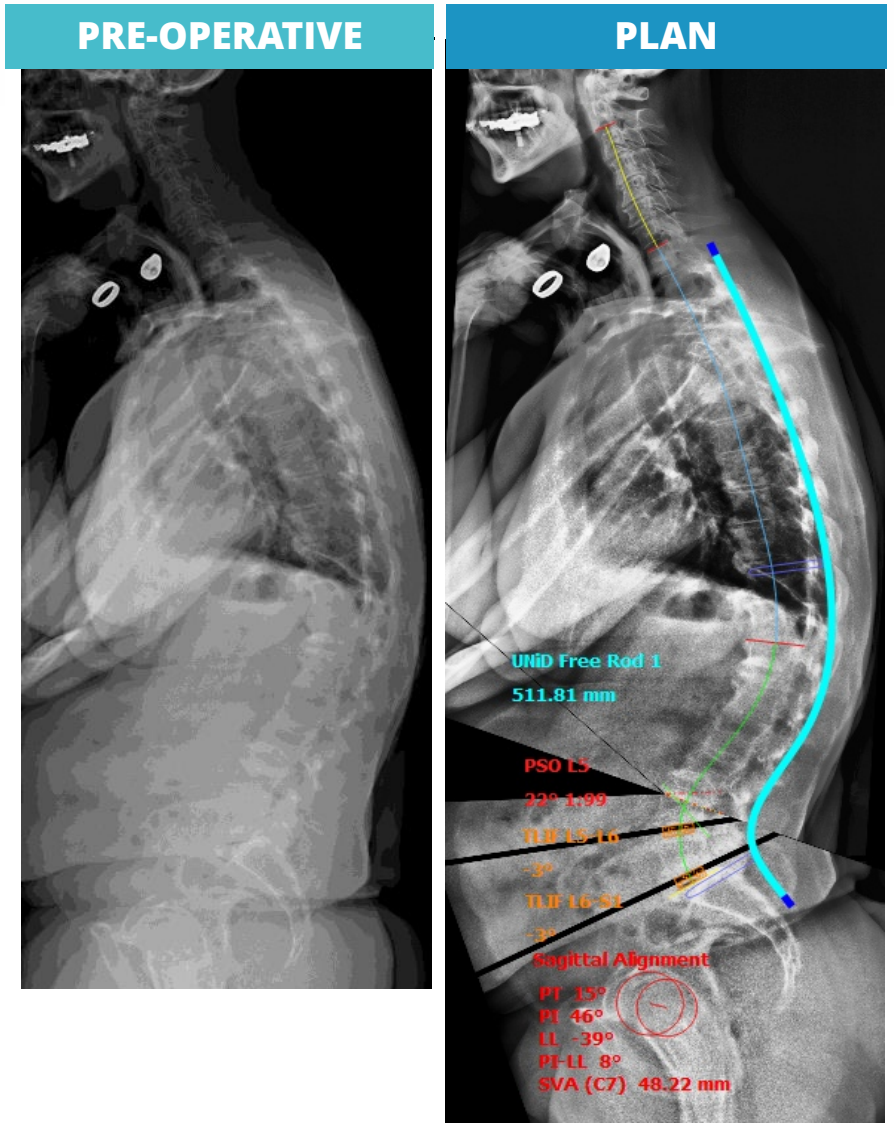
70 year old M with lumbar flatback and severe spinal stenosis

Evolution of planning

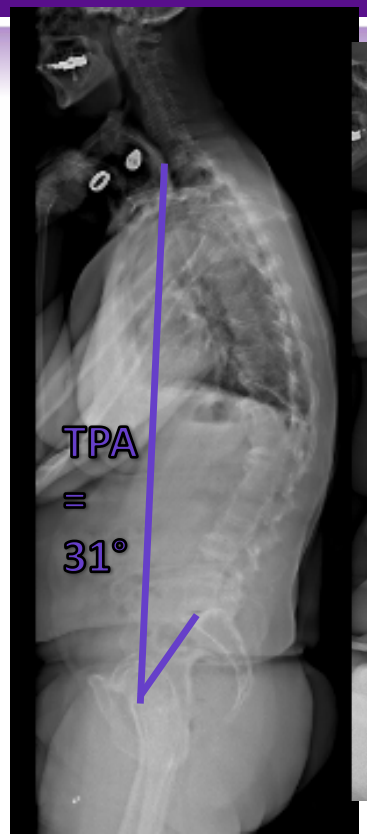
Rod planned from T2 to Pelvis for intra-op flexibility.

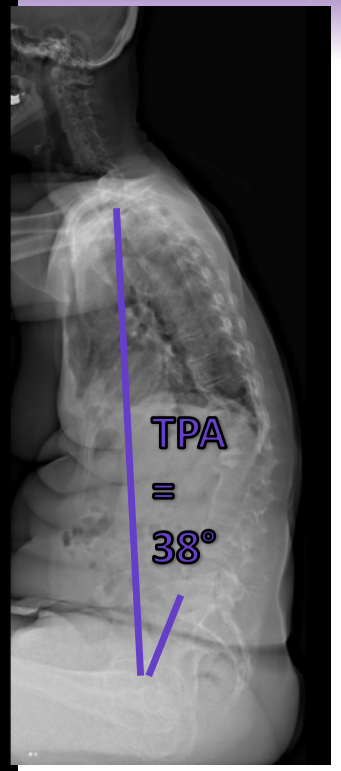
70 year old M with lumbar flatback and severe spinal stenosis

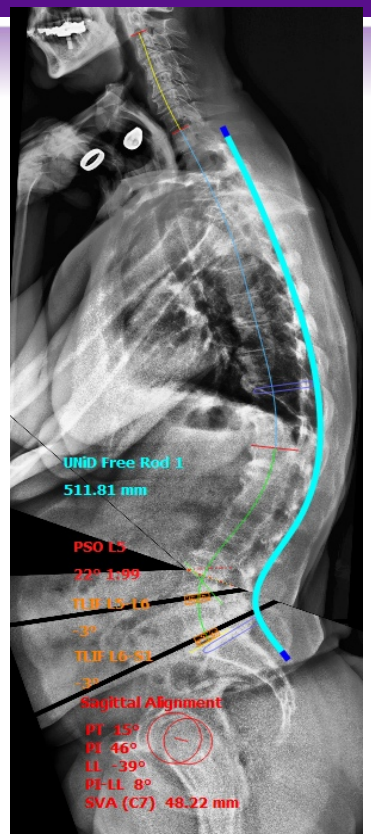
SPINOPELVIC PARAMETERS	PRE-OP	PLAN
Pelvic Tilt (PT,°)	34	15
Pelvic Incidence (PI,°)	46	46
Sacral Slope (SS,°)	12	31
Lumbar Lordosis (LL,°)	17	39
PI-LL (°)	29	7
Thoracic Kyphosis (TK,°)	28	28
T1 Pelvic Angle (TPA,°)	31	15
Sagittal Vertical Alignment (SVA,mm)	52	48

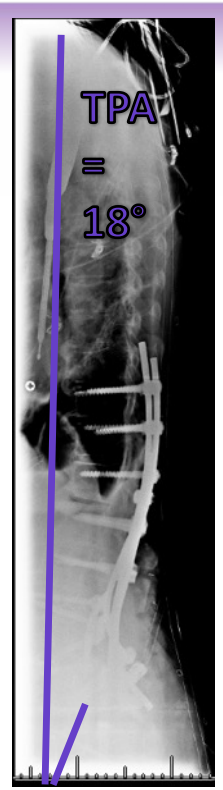


Predictability of correction



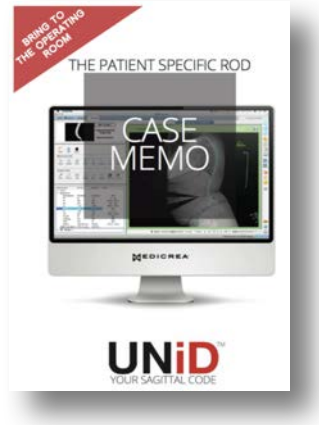






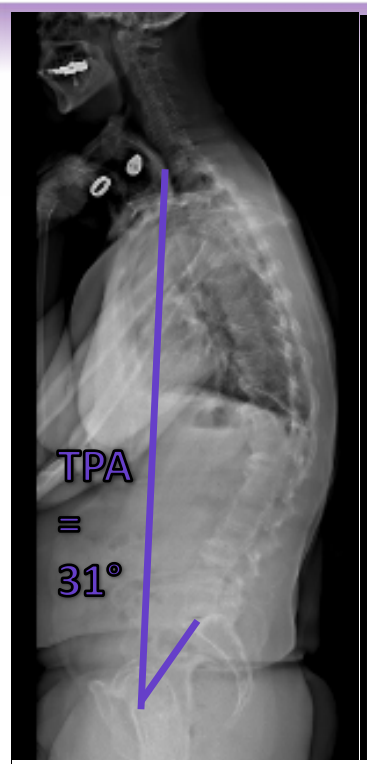
70 year old M with lumbar flatback and severe spinal stenosis

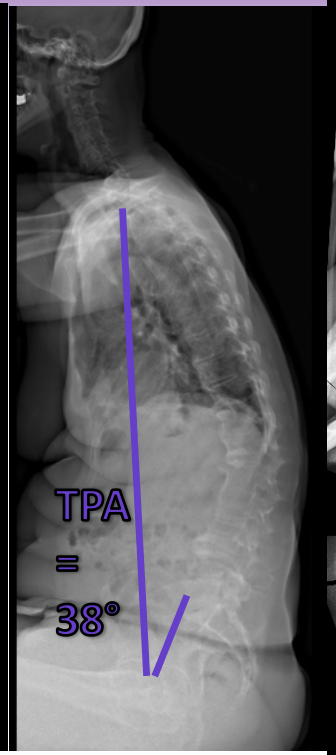
- **Undergoes PSO L5 and T10-Pelvis**

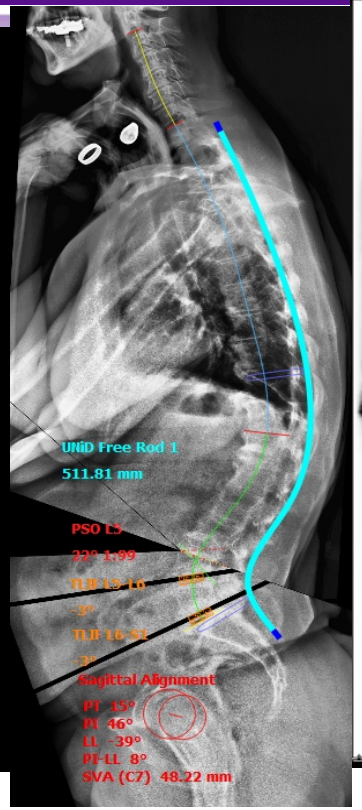


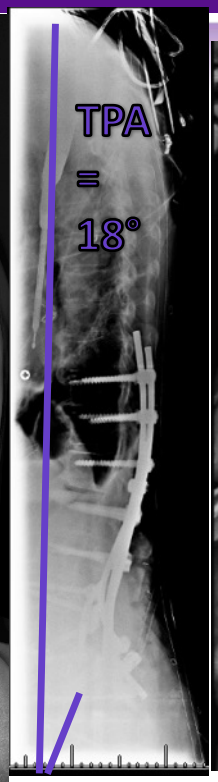
SPINOPELVIC PARAMETERS	PRE-OP	SITTING	PLAN	INTRA-OP
Pelvic Tilt (PT,°)	34	37	15	--
PI-LL (°)	28	30	7	5
T1 Pelvic Angle (TPA,°)	31	38	15	18
Sagittal Vertical Alignment (SVA,mm)	49.6	80	48	--

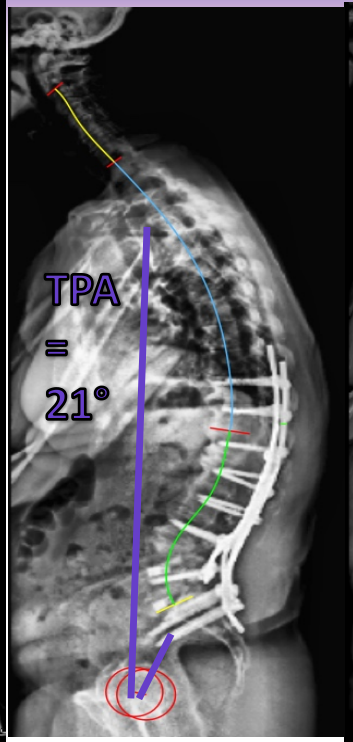
Continuous improvement











70 year old M with lumbar flatback and severe spinal stenosis

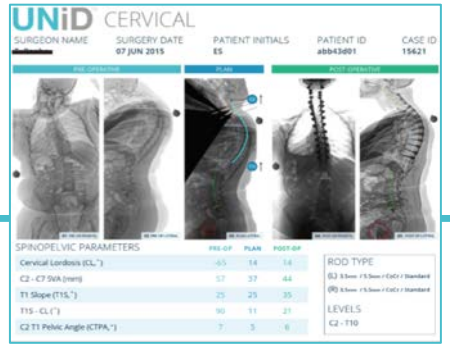
SPINOPELVIC PARAMETERS	PRE-OP	SITTING	PLAN	INTRA-OP	INITIAL POST-OP
Pelvic Tilt (PT,°)	34	37	15	--	20
PI-LL (°)	28	30	7	5	5
T1 Pelvic Angle (TPA,°)	31	38	15	18	21
Sagittal Vertical Alignment (SVA,mm)	49.6	80	48	--	65 30

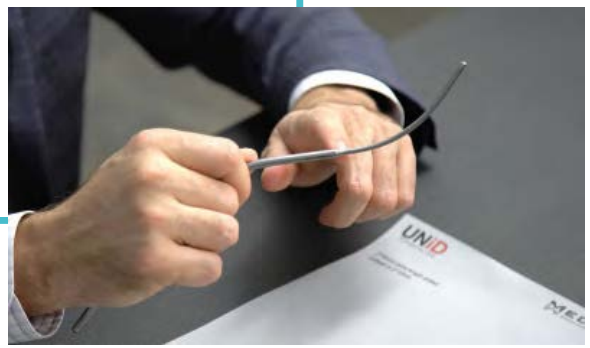
Pelvic compensation resolved

Evolution of practice

UNiD™

- Reduction in revision cases
- No rod breakage experienced
- Respects need for comprehensive patient file documentation
- Clear markers for quality of care assessment
- Established working relationship with UNiD Lab
- More consistent start to finish





SUMMARY

1) PREDICTS PATIENT-SPECIFIC **OPTIMAL** SAGITTAL ALIGNMENT
2) PROVIDES ITERATIVE CLINICAL TREATMENT SOLUTION
3) SAFEGUARDS AGAINST REVISION
4) REMOVES INTRA-OPERATIVE FIDDLE & MATERIAL DAMAGE
5) FEEDS BACK STATISTICAL ANALYSIS TO PLANNING SEQUENCE

UNiD TECHNOLOGY MAY BECOME STANDARD OF CARE FOR ALL CERVICAL AND THORACO-LUMBAR COMPLEX SPINE PROCEDURES.

UNiD™

Wider surgical community

"Understanding and restoring sagittal alignment is key towards providing better patient outcomes and preventing the need for reoperations, a major factor in rising health care costs. By providing rod customization, UNiD™ allows surgeons to precisely execute their preoperative plan and frees them from the antiquated technique of freehand bending, ensuring individual patients receive the most accurate and effective treatment. Having a more precise, personalized rod ready before even stepping foot in the operating room is a game-changer for spine surgery."

- Dr. Frank Schwab, HSS, New York

"We now realize how important it is to provide a specific alignment of the spine that is unique to each patient. If we do not achieve the optimal alignment during surgery, then we are too-often revising that patient later. UNiD™ is using precision technology and analysis to solve this clinical issue for patients as well as providing an invaluable support service and feedback loop for surgeons."

- Dr. Evalina Burger, University of Colorado Hospital

"The [UNiD™] patient-specific rod is very much ahead of its time. When we finish the operation, we've left them with the best possible appearance for the rest of their lives. The curve is not going to worsen and there is less likelihood of them having pain."

- Dr. Andrew King, Children's Hospital New Orleans

"The days of walking into the OR and 'figuring it out' are over."

- Dr. John Steck, LSU, New Orleans