SUMMARY

We studied 58 patients who underwent fusion to the sacrum at a single institution for the primary treatment of adult scoliosis. We compared the clinical and radiographic outcomes between those fused to the upper thoracic spine (UT) and those fused to the lower thoracic spine (LT). The UT cohort had a higher rate of pseudarthrosis, perioperative complications, and revision surgery. This resulted in worse functional outcome compared to the LT group.

INTRODUCTION
We compared the upper thoracic (UT: T2-T5) and lower thoracic (LT: T9-T12) spine as the upper instrumented vertebra (UIV) in primary fusions to the sacrum for adult scoliosis. We hypothesized that: (1) UT would have a increased pseudarthrosis, more perioperative complications, and worse outcomes; (2) LT would have more PJK.

METHODS
Patients who underwent primary surgery for adult scoliosis b/n 2002-2006 were studied. UT and LT were matched by age, diagnosis, BMI, co-morbidities, and f/u. All pts were fused to the sacrum through a posterior approach. Min f/u for all pts was 2-yrs. SRS scores and ODI were used.

RESULTS
58 pts (UT=20, LT=38), mean age 55.7-yrs, f/u 3.0±1.1-yrs. UT had greater preop thoracic kyphosis and coronal Cobb values (P<0.05). Diagnoses: idiopathic (75.9%) and de novo (24.1%). UT had greater fusion levels (15.8 vs 8.6) and mL of EBL (1350 vs 811). OR time, mg of rhBMP-2/level, and caudal interbody grafting (80.0%-UT vs 89.5%-LT; 90% ALIFs/10% TLIFs) were similar. All pts had iliac screws. UT had an increased number of perioperative complications (30.0% vs 13.2%), more pseudarthrosis (20.0% vs 5.2%), and a higher prevalence of revision surgery (20.0% vs 10.5%). LT had more PJK (20° of kyphosis 2 segments above the UIV) (18.4% vs 10.0%). SRS/ODI were improved in both cohorts in all domains (P<0.001) except function (P=0.07) and mental health (P=0.27), which were not significantly improved in the UT group.

CONCLUSION
With long fusions to the sacrum, one should anticipate more perioperative complications, a

higher pseudarthrosis rate, and perhaps more revision surgery than short fusions. Short fusions may result in a more PJK which only rarely requires revision surgery. If patient and deformity characteristics permit, fusion to the LT spine will likely result in a better functional outcome.

SIGNIFICANCE

In primary adult scoliosis surgery, long fusion from the upper thoracic spine to the sacrum results in a similar overall, but worse functional outcome than short fusion. We advocate the appropriate surgery for each patient based on intrinsic patient-related factors as well as the characteristics of the deformity.

Table 1. Within Group Comparisons of Clinical Outcome Measures (Pre-op vs Final)*

Upper Thoracic (UT; N=20)			
	Pre-op	Final	P-value
SRS Pain			

2.85±0.73
3.95±0.88
<0.001
SRS Self Image
2.24±0.64
3.71±0.87
<0.001
SRS Function
3.04±0.86
3.38±0.71
0.073

SRS Mental Health				
3.75±0.78				
3.96±0.90				
0.265				
SRS Subscore				
2.99±0.56				
3.76±0.71				
<0.001				
Oswestry Disability Index				
37.1±17.9				
21.9±16.9				

0.001

Lower Thoracic (LT; N=38)

SRS Pain

2.73±0.89

4.03±0.71

<0.001

SRS Self Image

2.64±0.61

3.90±0.81

<0.001

SRS Function
3.03±0.81
3.66±0.81
<0.001
SRS Mental Health
3.61±0.68
4.29±0.69
<0.001
SRS Subscore
3.02±0.59
3.99±0.66

			<0.001
Oswestry Disability Index			
		35.8±17.4	
		16.8±15.8	
			<0.001

*Plus-minus values are means±SD.