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# Assessment of Spinal Balance and Range of Motion Using the Kinect Motion Analysis System

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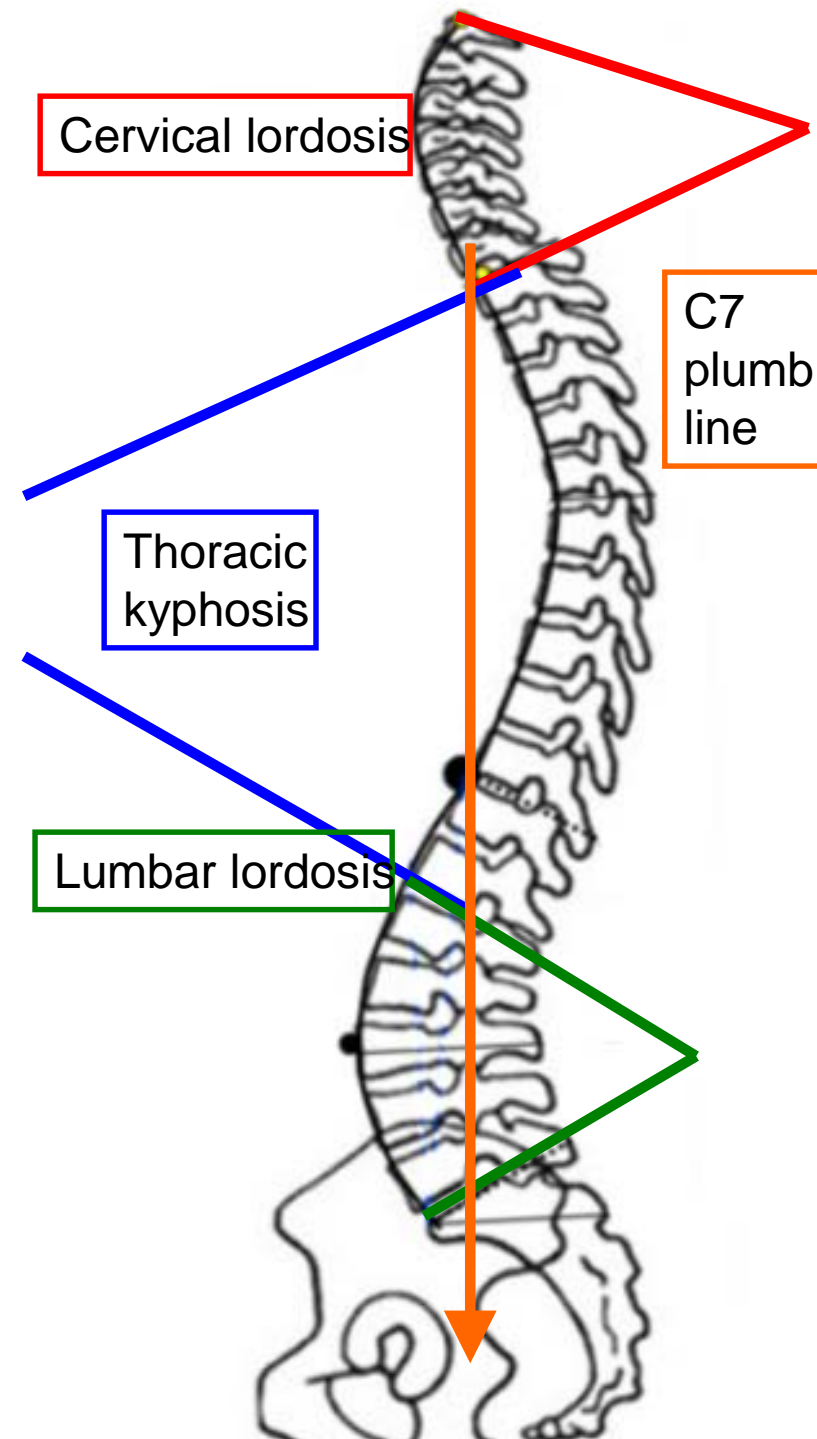
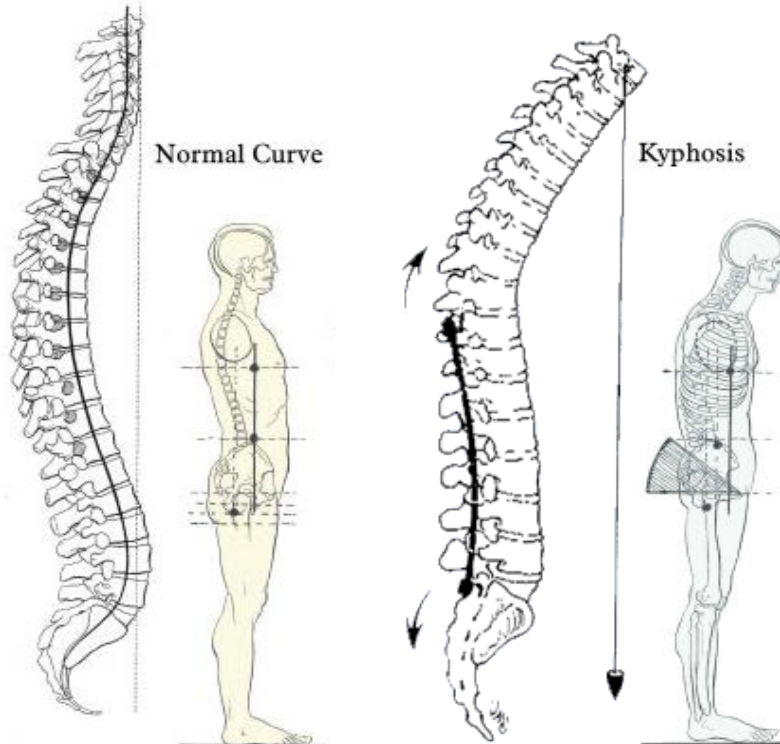
UCSF

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[WWW.NSFCDMI.ORG](http://WWW.NSFCDMI.ORG)

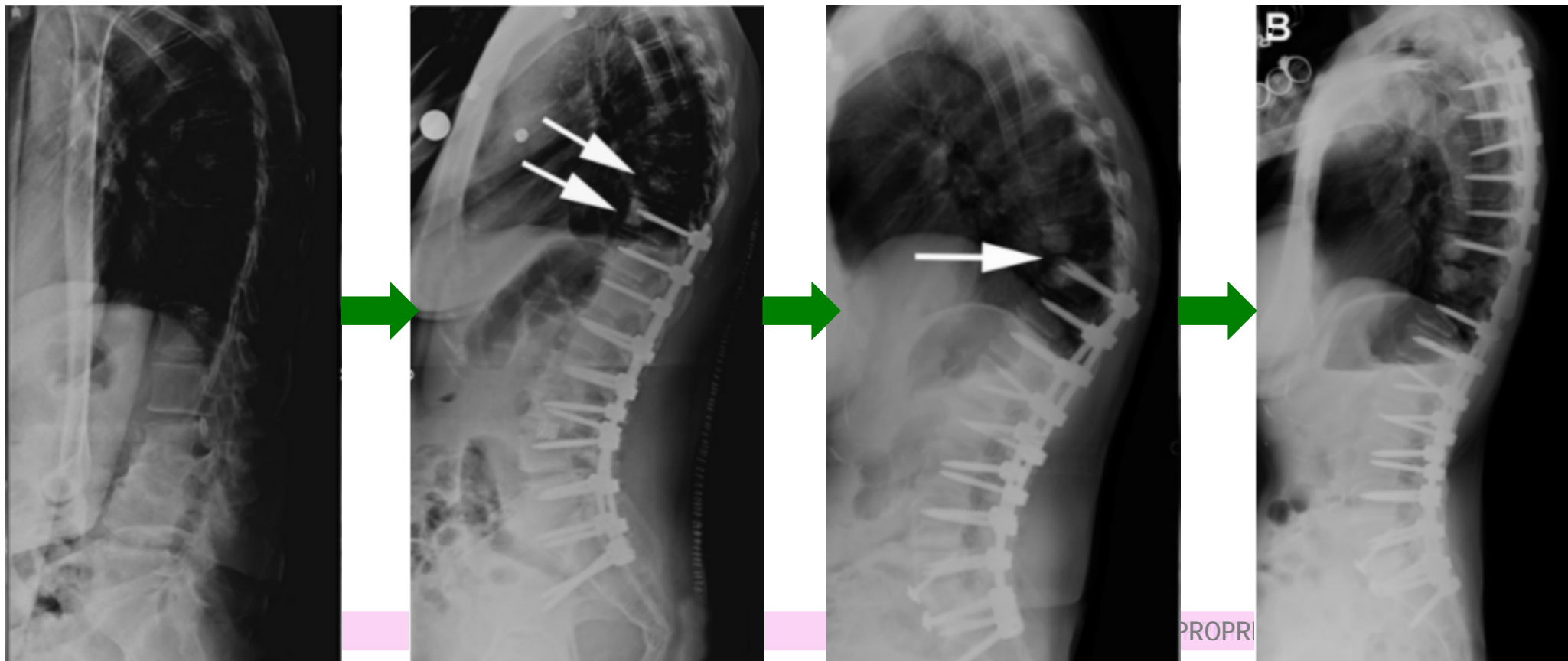
# Background

- Normal spine alignment
- Sagittal balance associated with better HRQL scores
- Loss of spinal balance with age



# Background

- Realignment of spine with surgery
- Effective, but failure through junctional kyphosis at adjacent segments
- Assessment of global & segmental motion critical to success of surgery



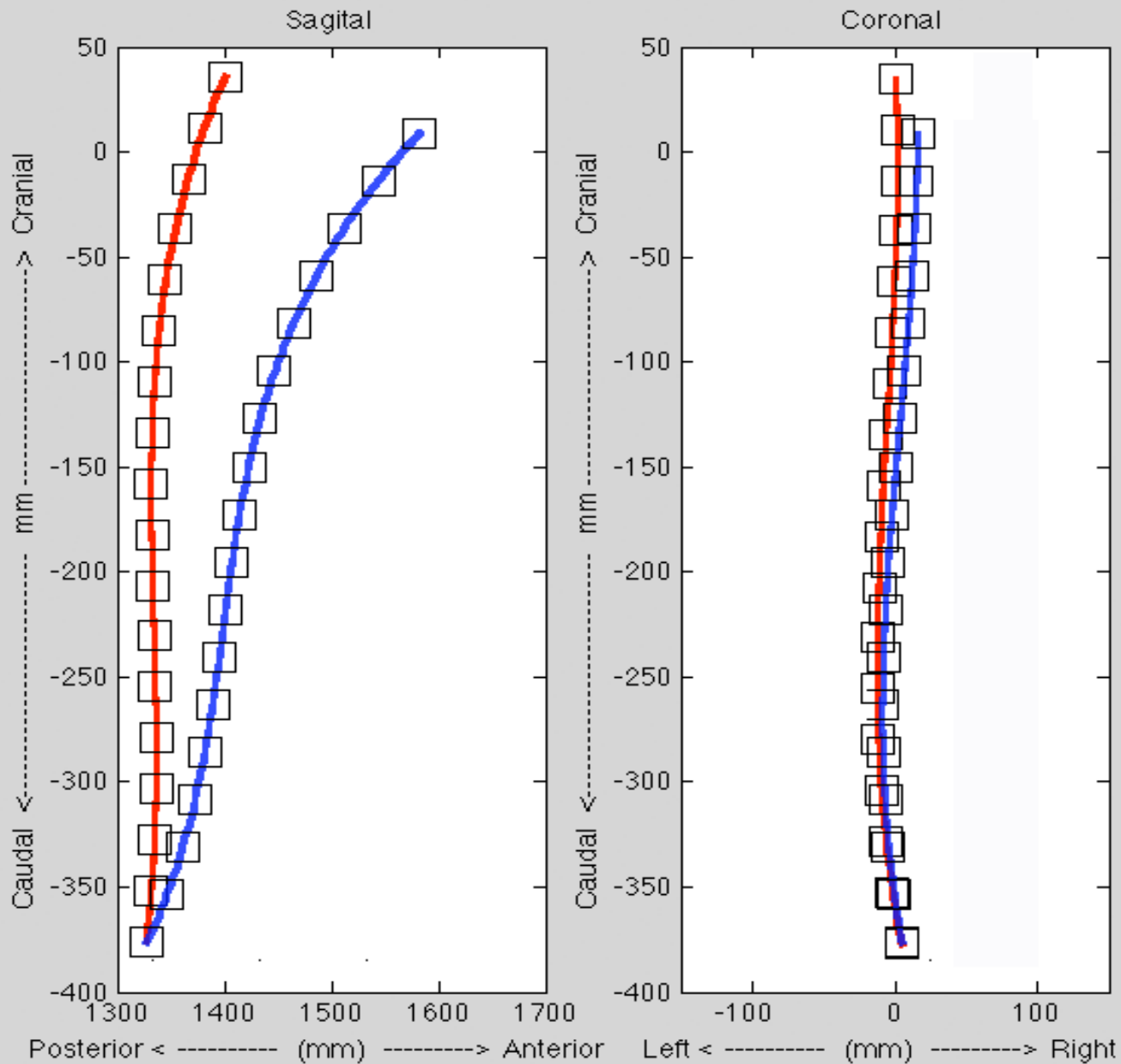
# Background

- Static spine alignment with radiographs
- Limited techniques for dynamic motion
- Three-dimensional motion analysis techniques may be appropriate
- Limited applicability due to cost, size and availability
- Microsoft Kinect has potential low-cost motion analysis system

# Project Goals

1. To measure the static and dynamic relationships of the thoracic-lumbar - pelvis and hip axes in a standing and sitting position.
2. To measure the excursion of the thoracic and lumbar spine from a neutral vertical axis during flexion and extension in patients with adult degenerative scoliosis
3. To observe and categorize compensation patterns caused by the patients pathology
4. To measure the moment arm or stress on the construct applied through dynamic motion.
5. To measure the excursion between the pubic symphysis and the sternum during flexion and extension compared to neutral in patients with adult degenerative scoliosis. \*

# Preliminary Data



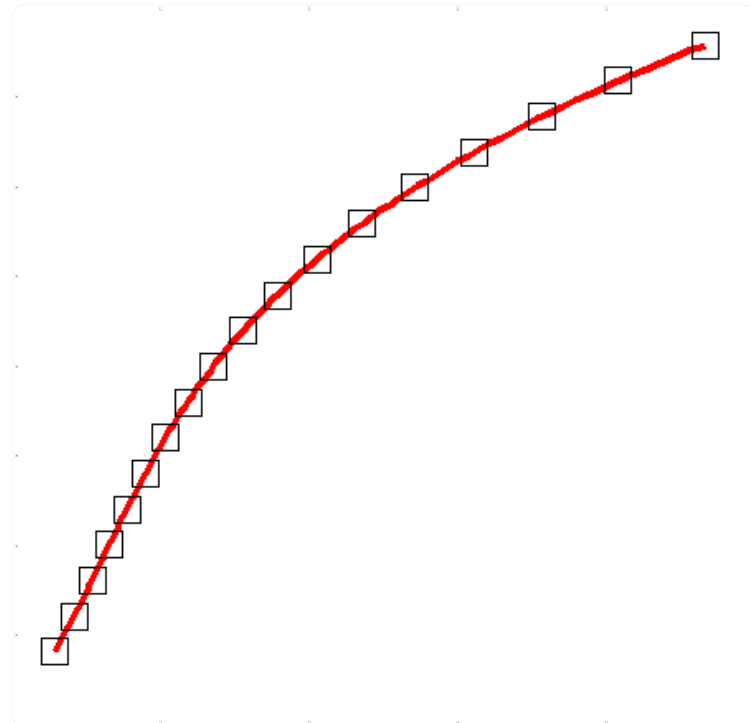
# Current Limitations

## Clinical

- Have collected on 1-5 pts per day, 2x per week.
- New computers were not executing the program properly on Matlab  
-(this has been resolved)
- Old computer had highly variable capture rate, some data was discarded

## Post-Processing

- Soft tissue over spine “flattens spine out”
- Soft tissue hysteresis



Questions?

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