Ultrasound for Lumbar Puncture

Keith Agnew - Oct 2025

Objectives

Briefly review the anatomy of the lumbar vertebrae

In order of importance, and using ultrasound, how we identify:

- -The midline of the back
- -A few interspinous spaces
- -The sacrum and interspinous spaces (up to L1/2)
- -Depth to the spinal canal target

Like most procedures that have gone the way of US, there are many **Benefits**/Reasons why:

1. Improved 1st attempt success
2. Fewer needle redirections
3. Overall reduced failure/procedural abandonment

ETC. ETC.

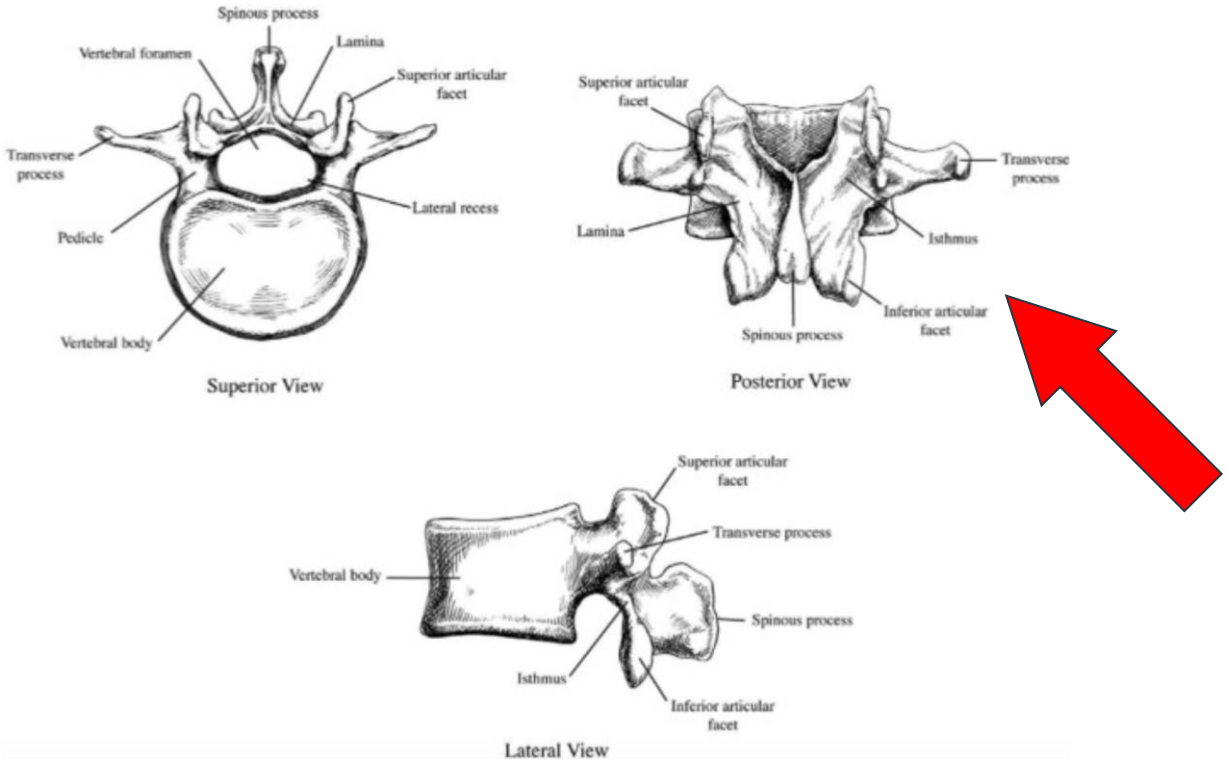
Ultrasound - “Static”….not dynamic

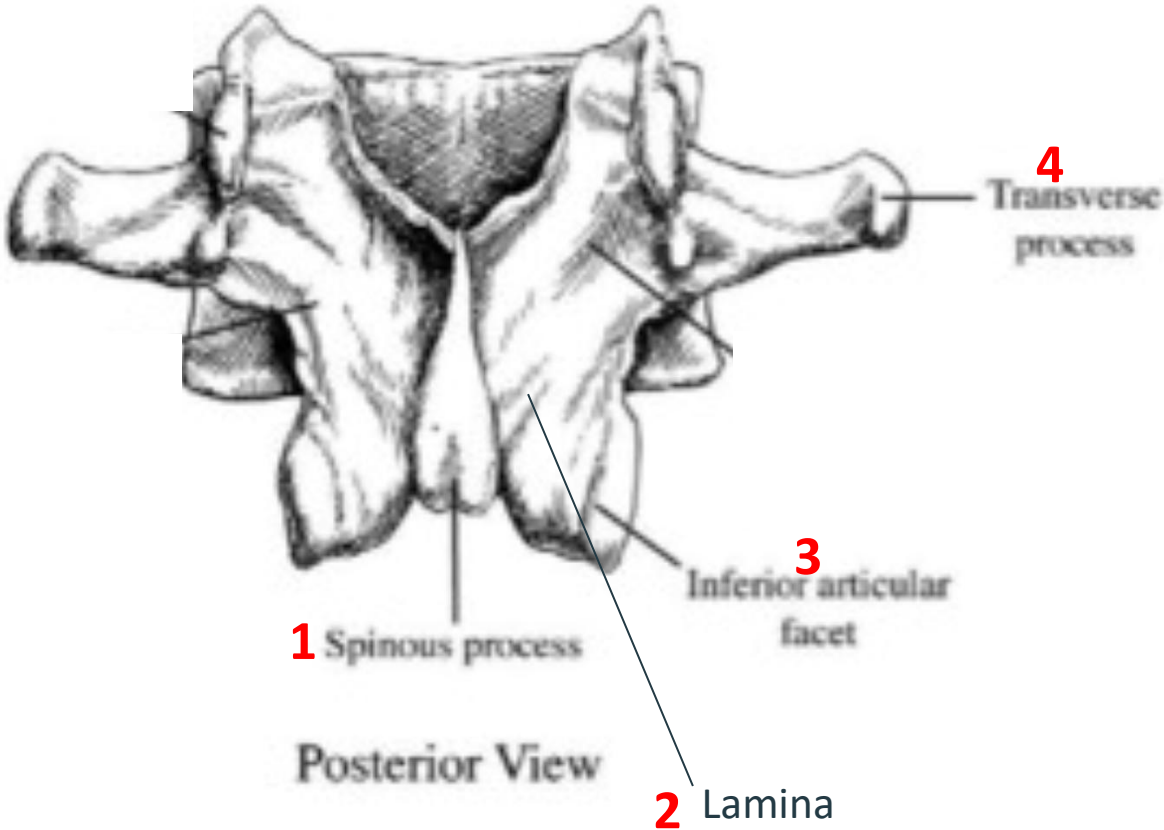
Ultrasound used to MARK your spots (hopefully 5 mins max!)

…then you put the Ultrasound aside

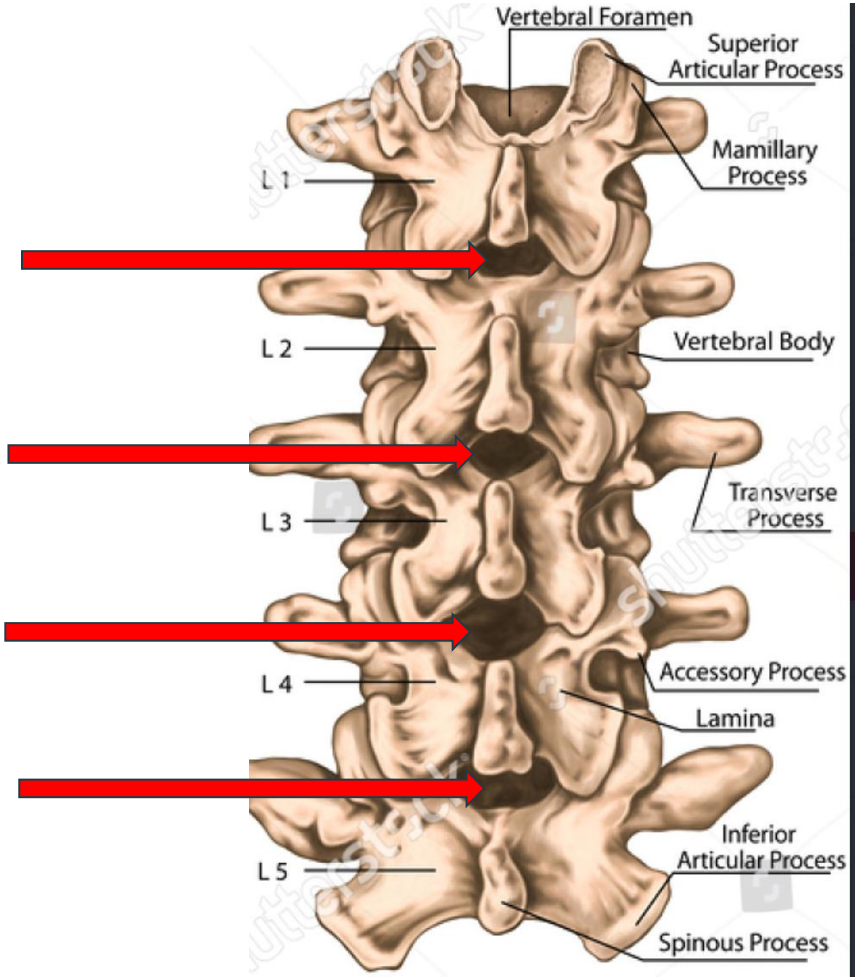
…then the back is prepped and the procedure completed as usual

Anatomy of the Lumbar Vertebrae

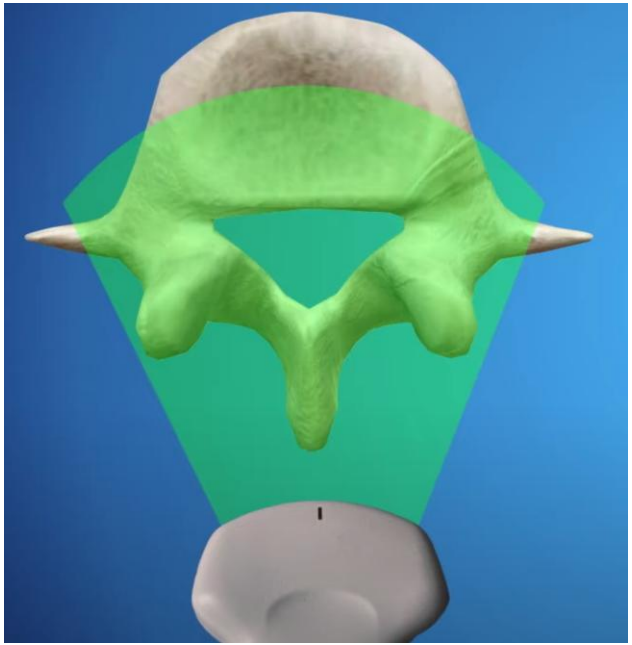


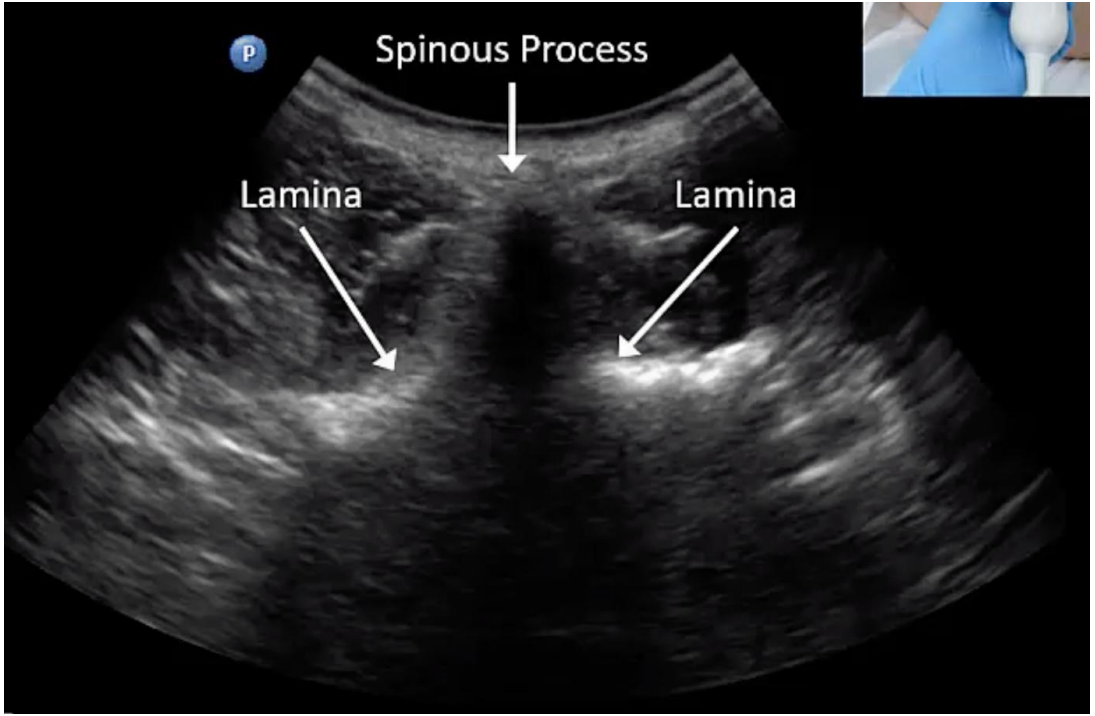

4
Transverse process
3
Inferior articular facet
1 Spinous process
Posterior View
2 Lamina

Our Target


Vertebral Foramen
Superior Articular Process
Mamillary Process
L 1
L 2
Vertebral Body
L 3
Transverse Process
L 4
Accessory Process
Lamina
L 5
Inferior Articular Process
Spinous Process

Step One: Mark the Midline (Left to Right)

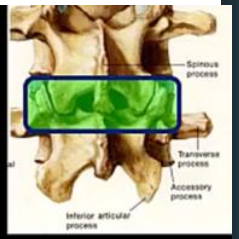


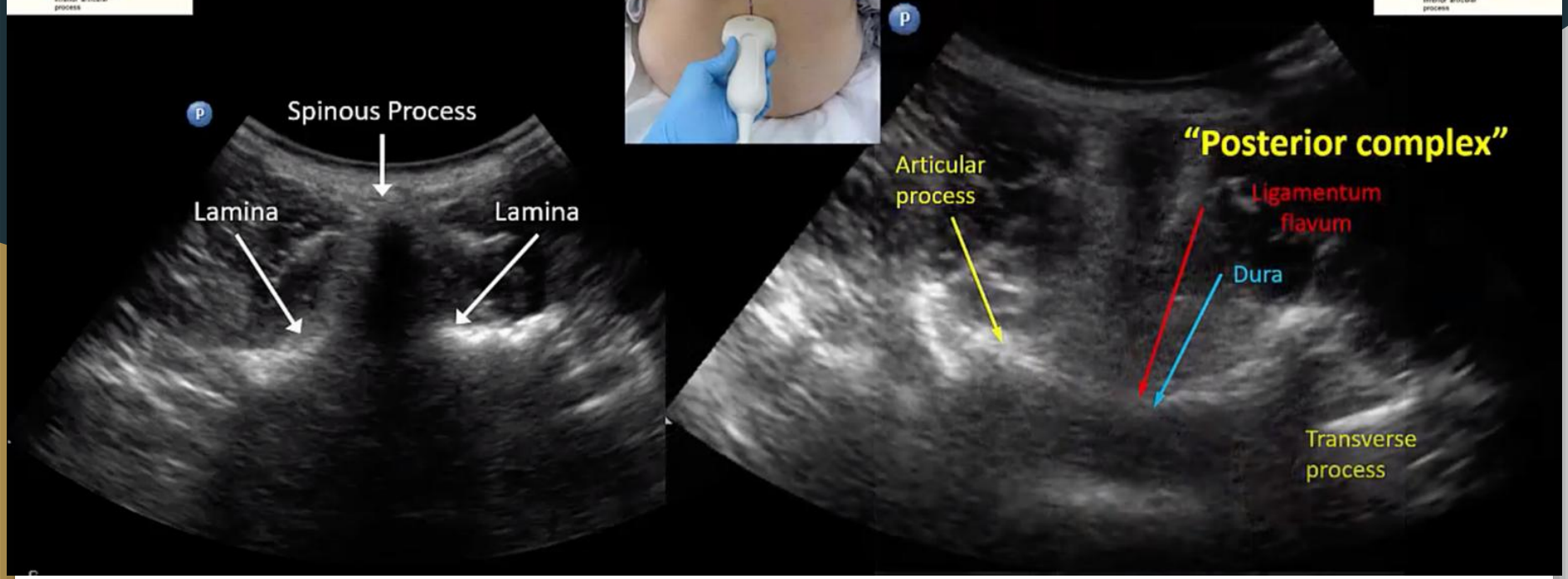


Transverse Midline (TM) View

Spinous Process View

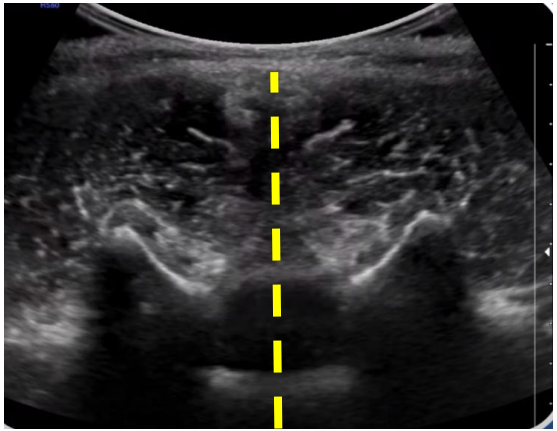
Interspinous View



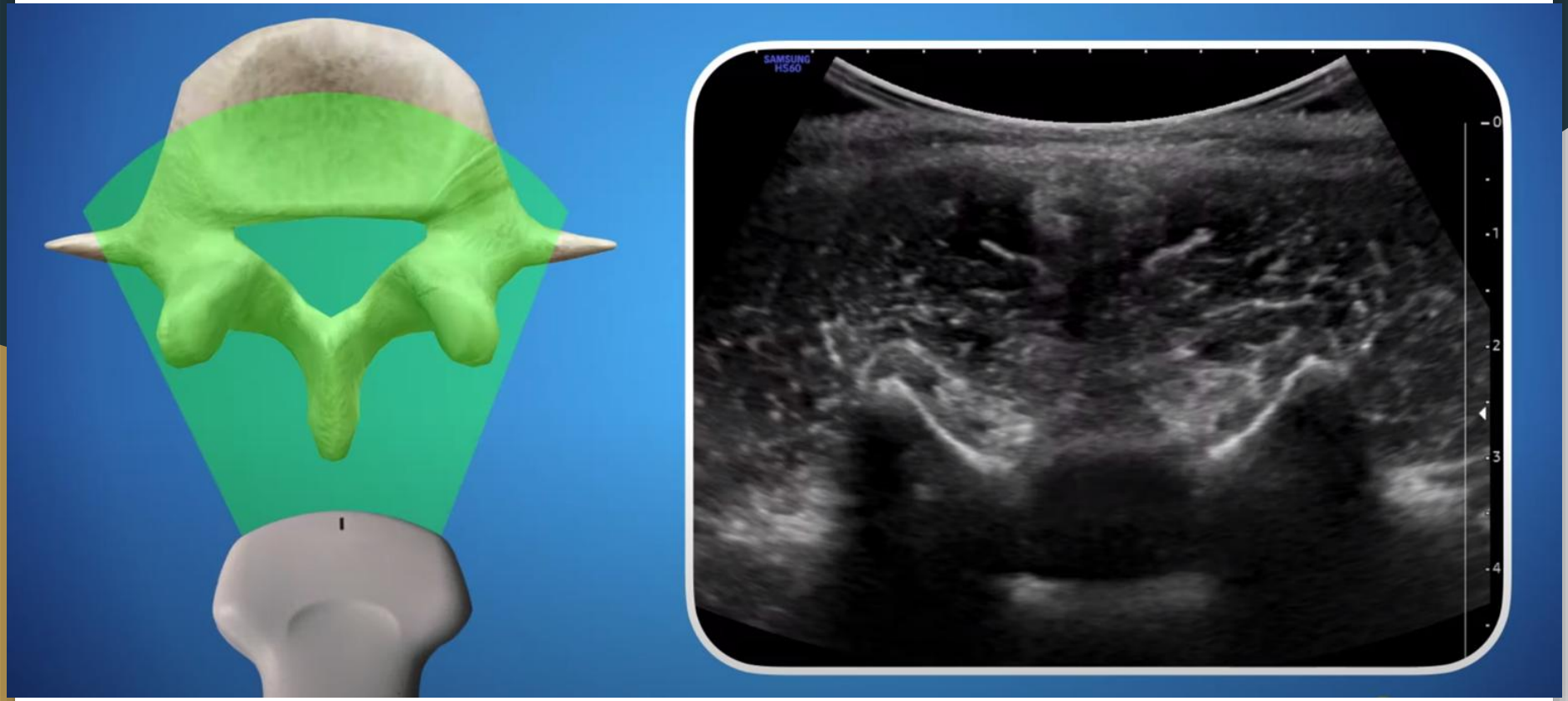


Step 1:

Often the ONLY step you need



Step 1b - Make a mental note of the distance to where you find the CSF



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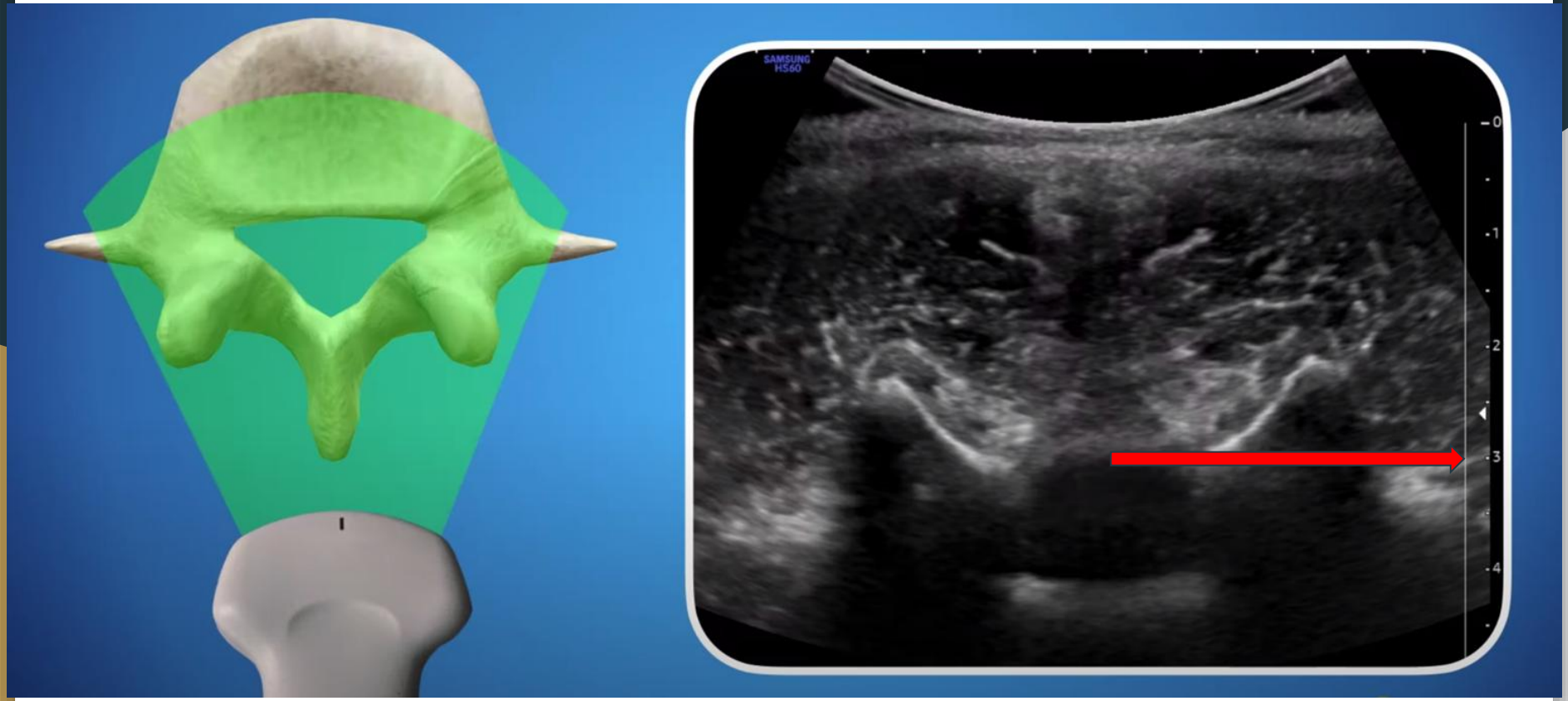
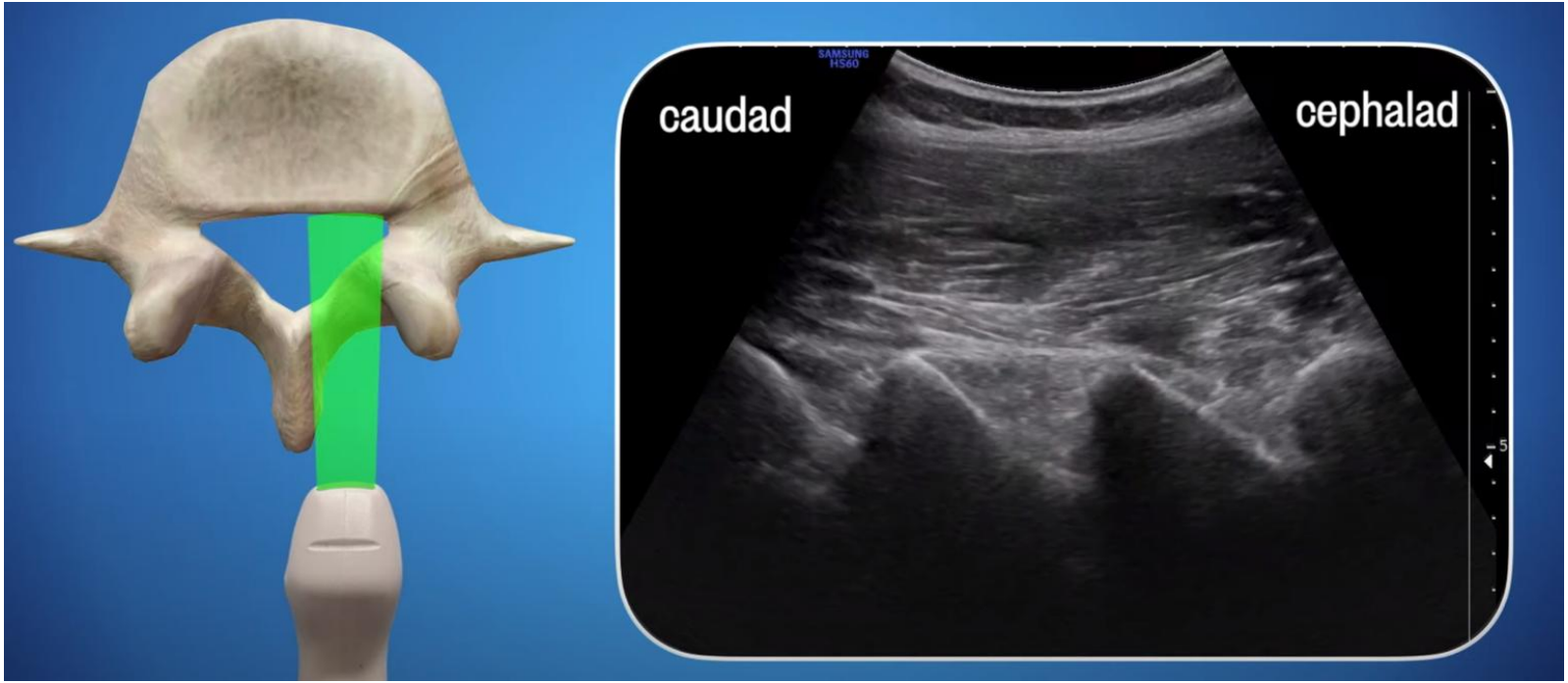
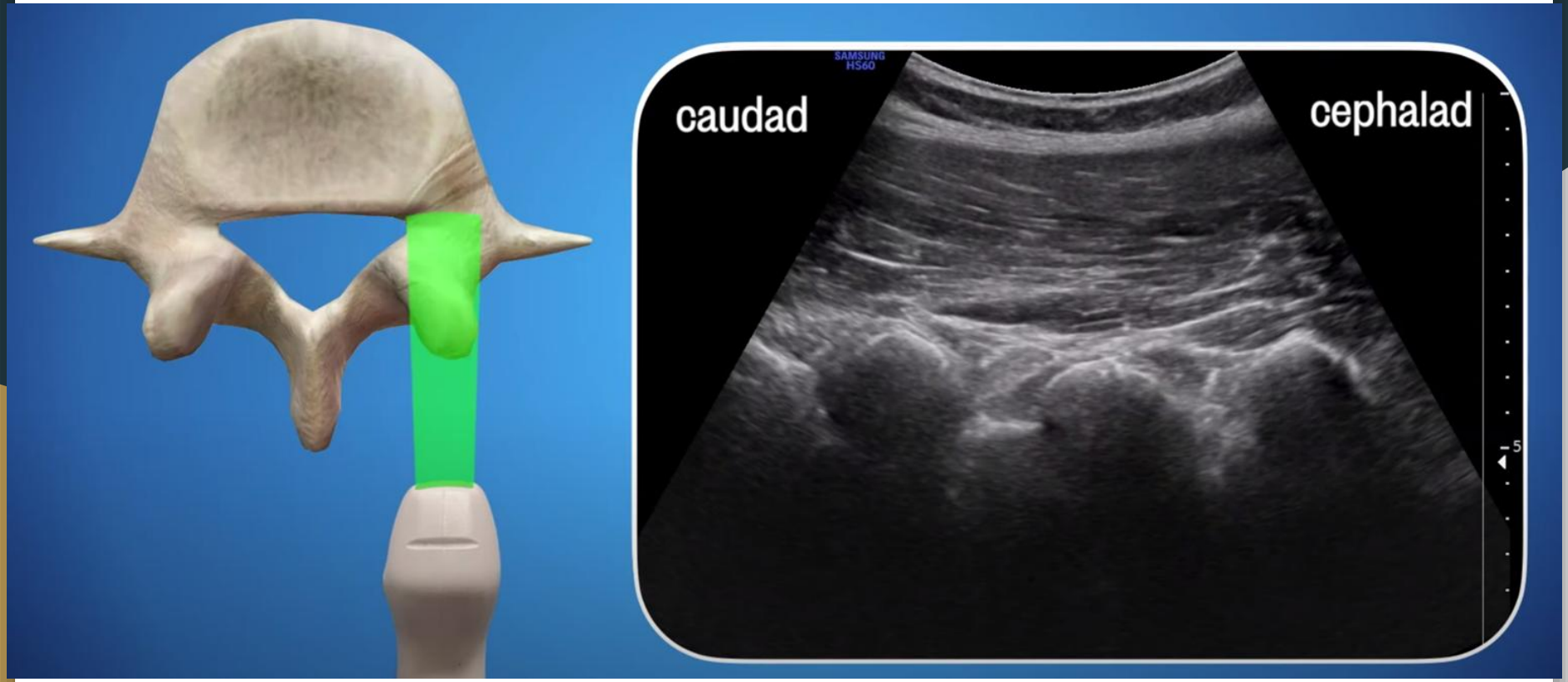
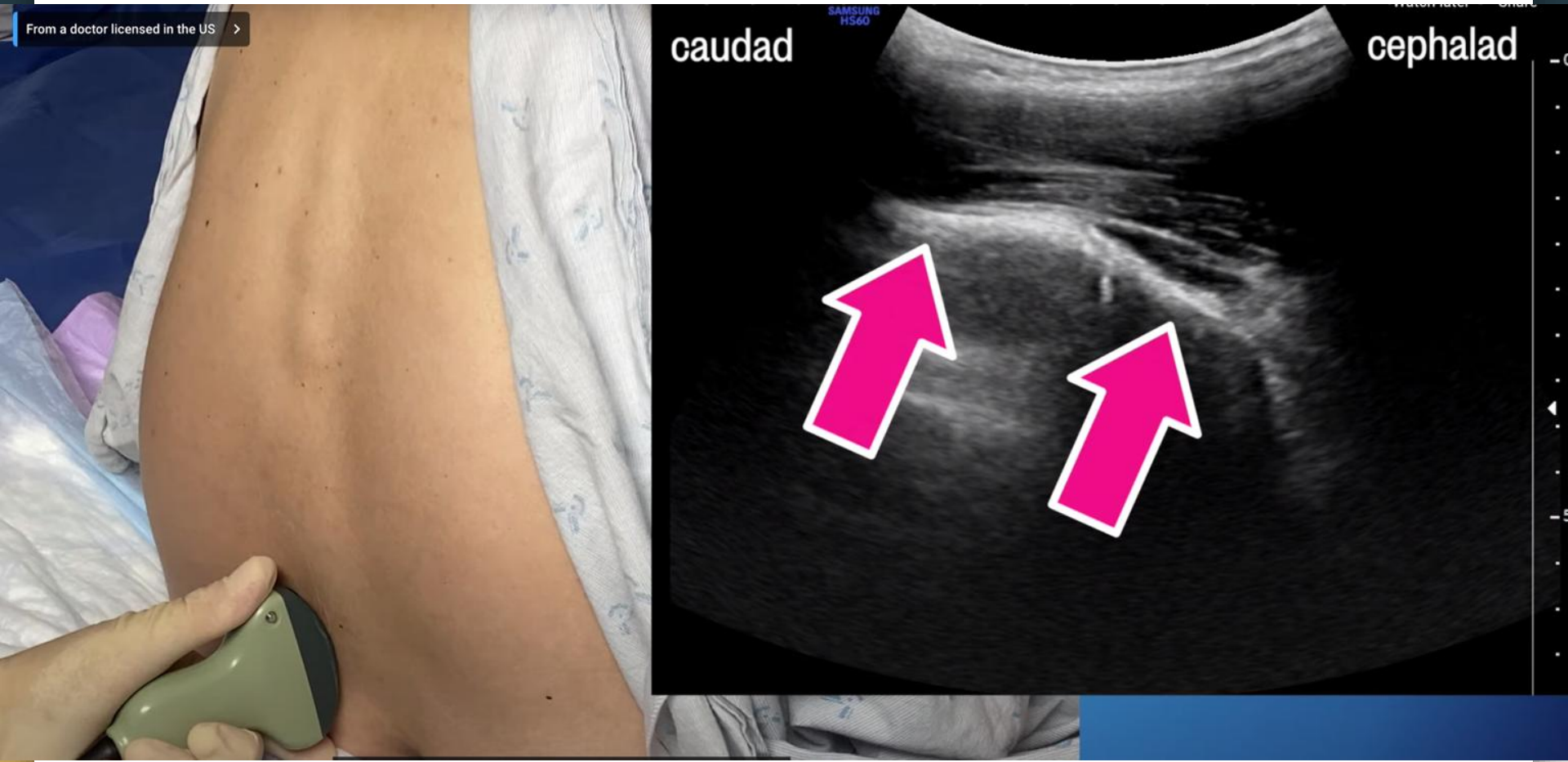
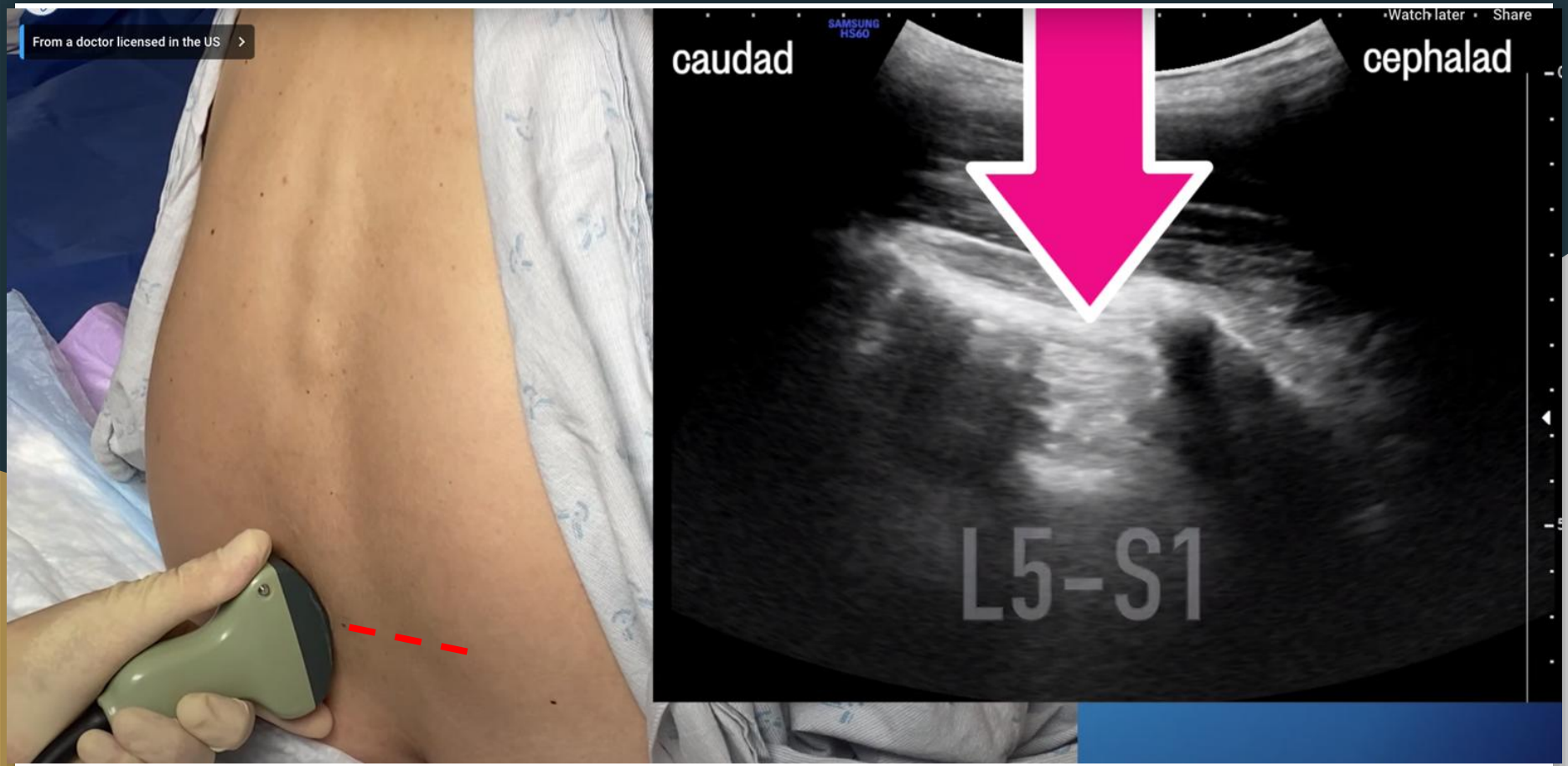


Step Two: Mark out an Interspinous Space (or 2, or 3..)




caudad
cephalad
SAMSUNG
HS60


From a doctor licensed in the US
SAMSUNG
HS60
caudad
cephalad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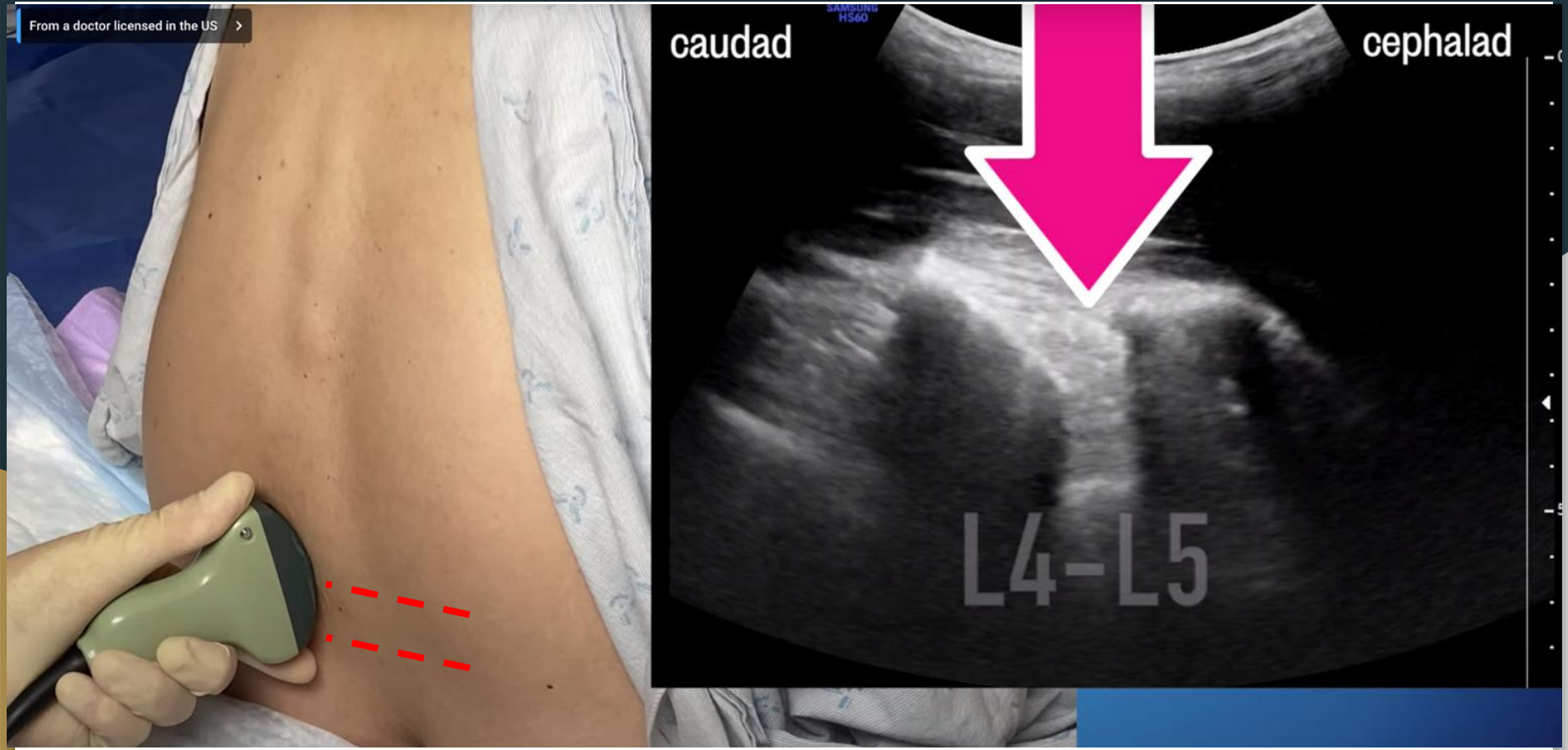
cephalad
L5-S1


From a doctor licensed in the US
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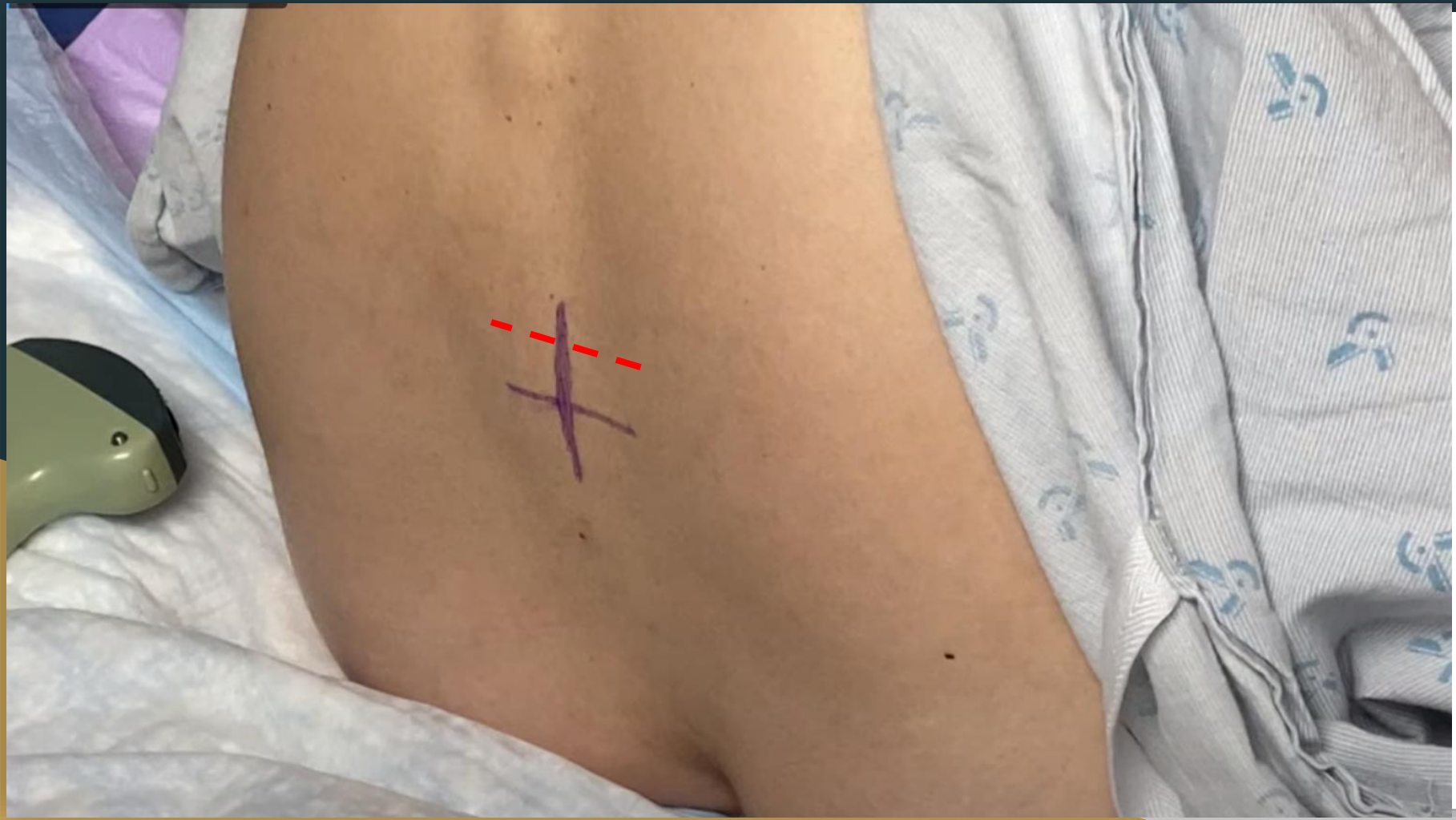
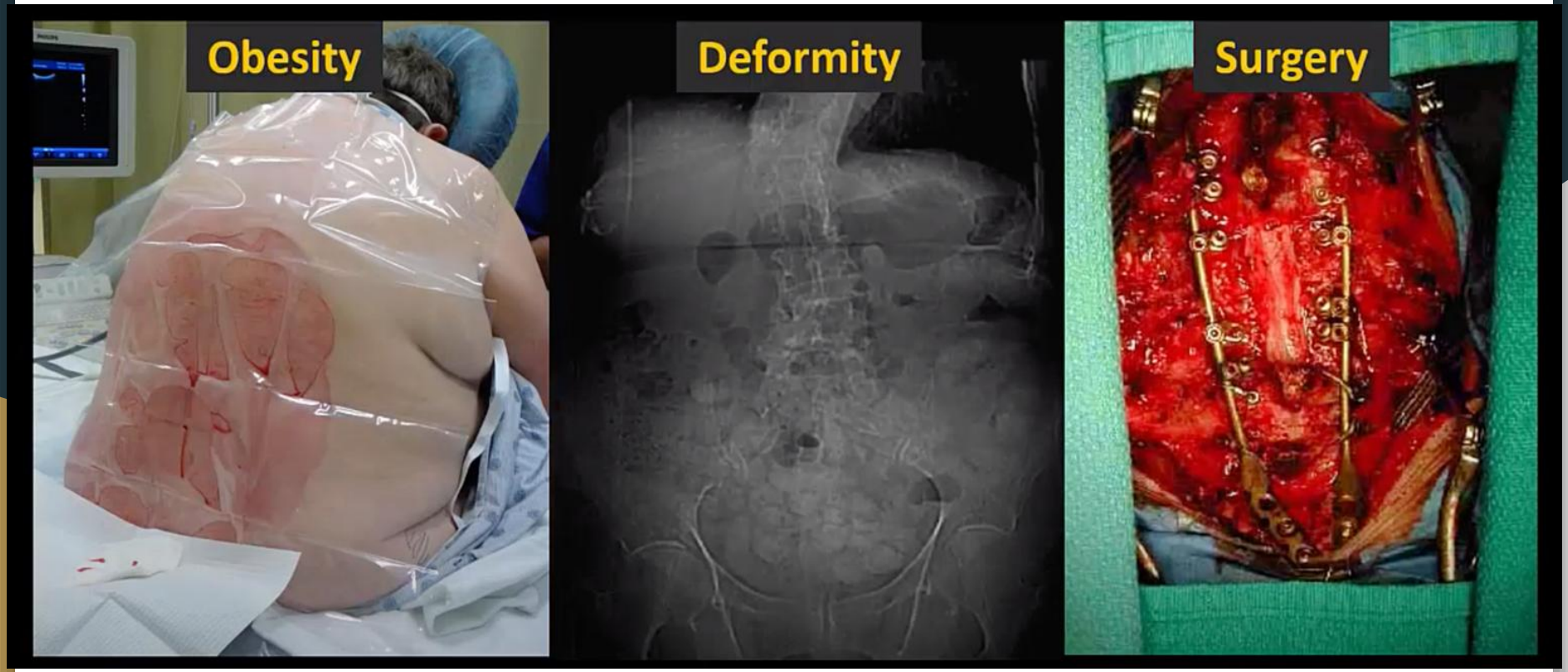
L4-L5



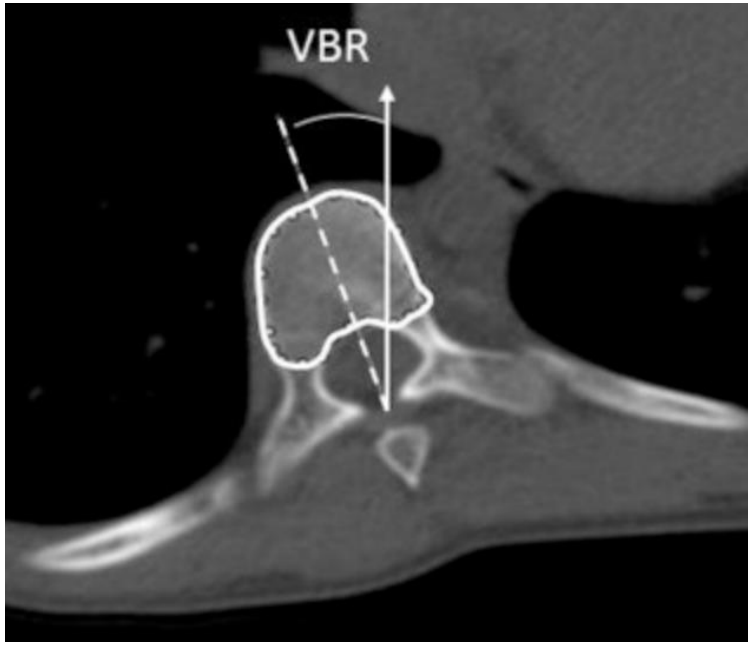
Questions?

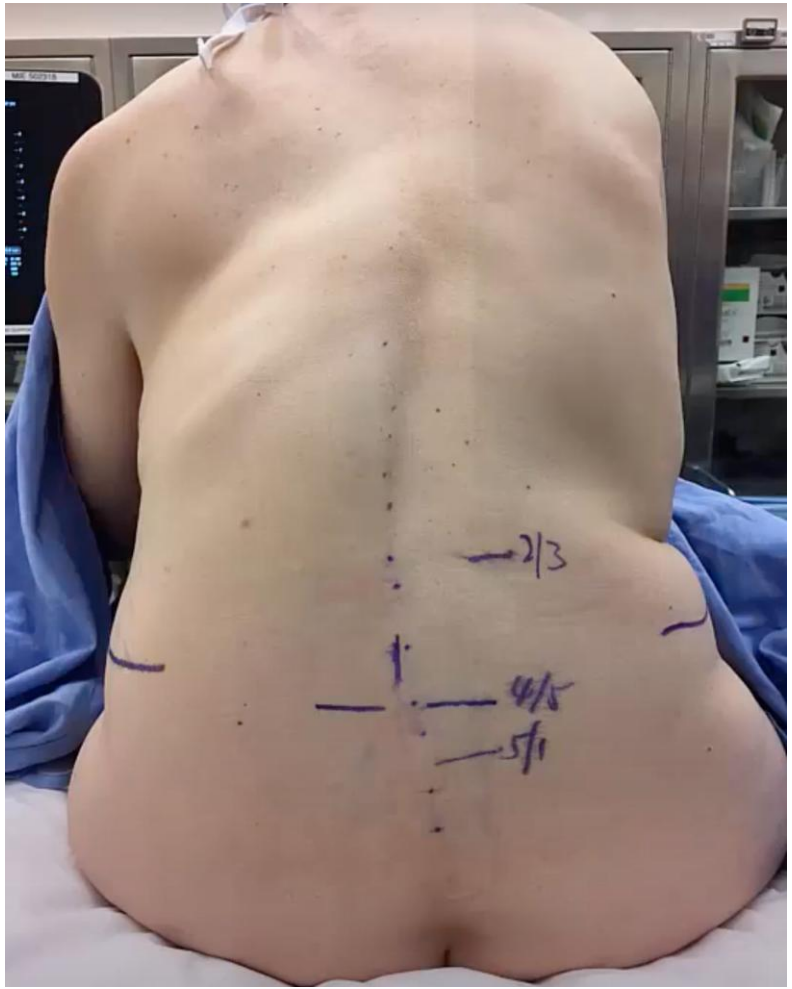
-> online videos are excellent if you want a second tutorial or to learn more

Appendix

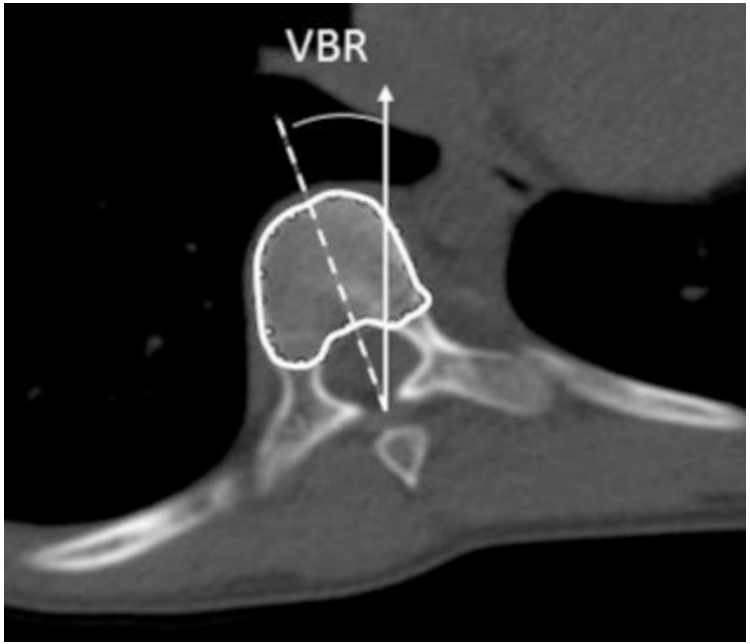

Obesity
Deformity
Surgery

Scoliosis





Scoliosis



Spinous process is always rotated toward the inner (concave) side of the curve.

Vertebral body is always rotated toward the convex (outer) portion of the lumbar curve

So…

Midline - insert needle toward convex side of curve.

“Paraspinous” approach - insert needle on the convex side of the spinous process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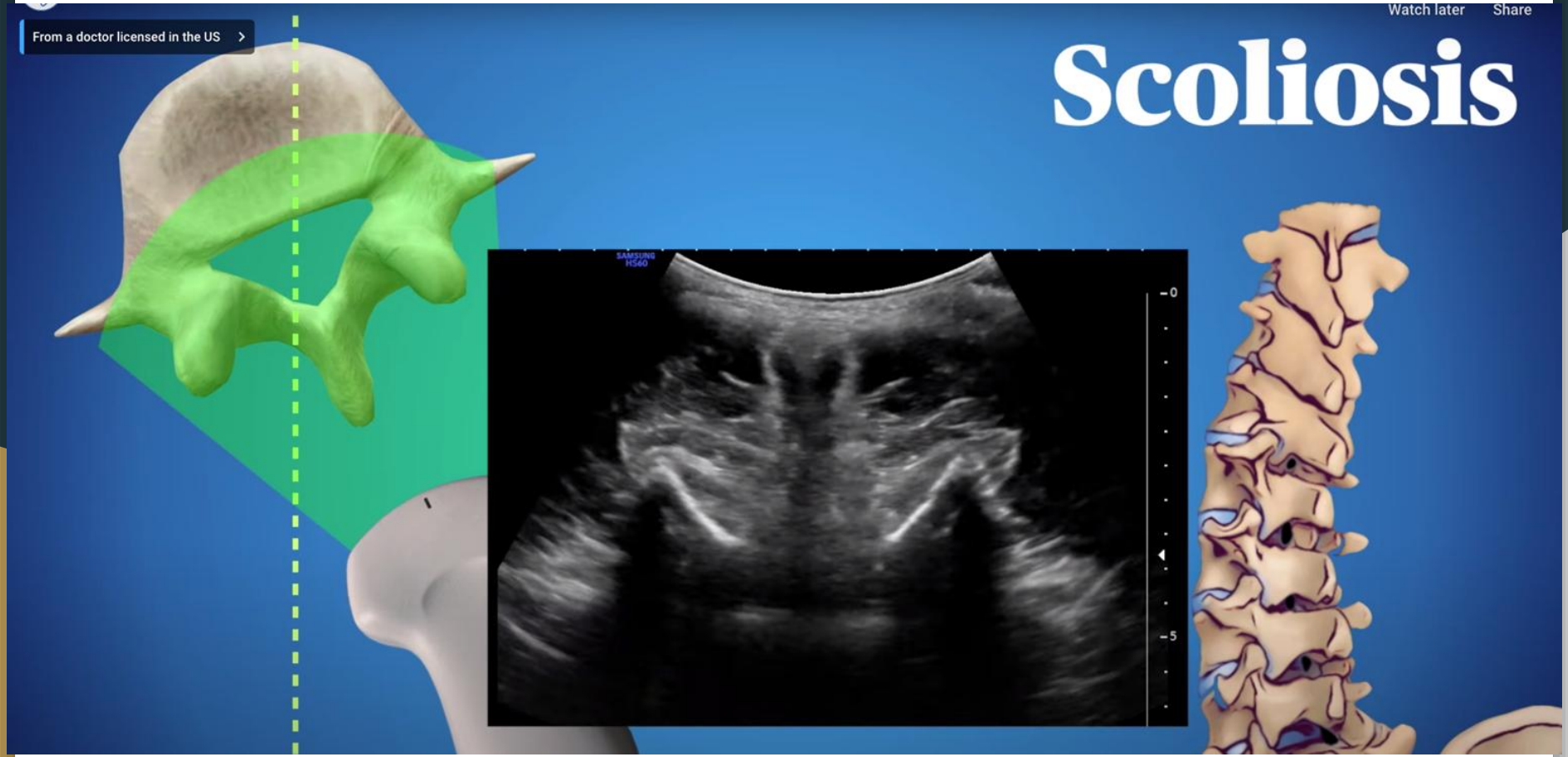
Watch later
Share
Scoliosis
SAMSUNG
HS60
0
5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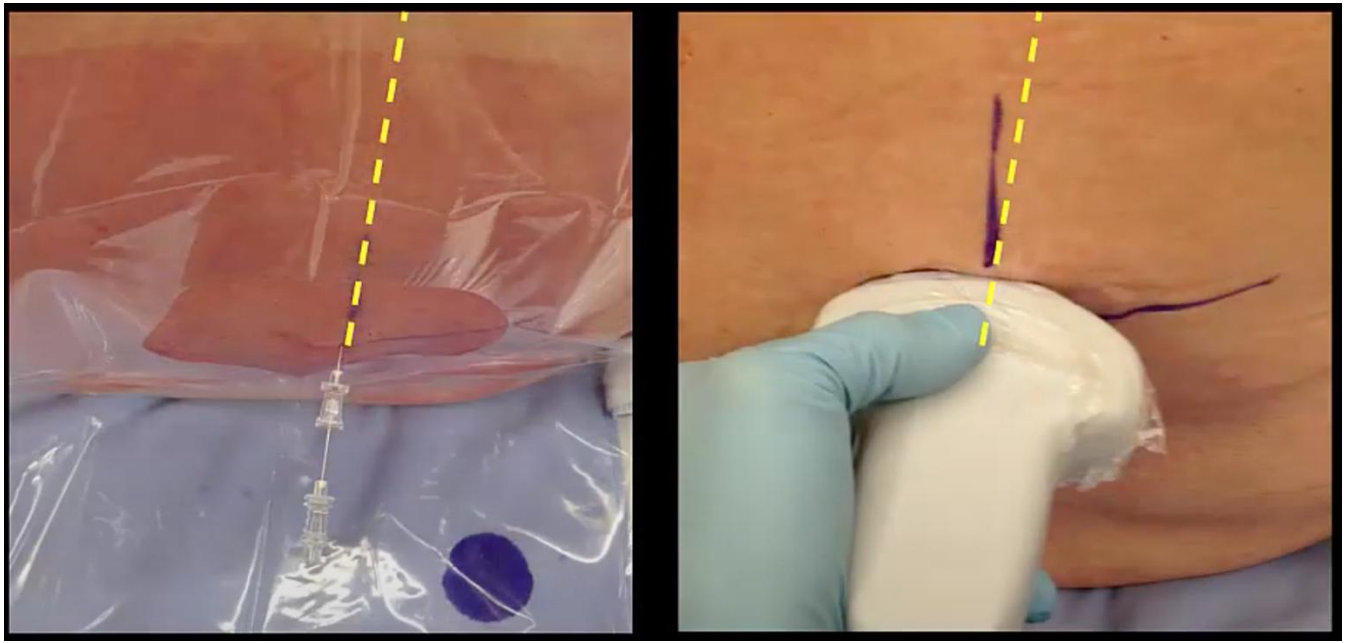
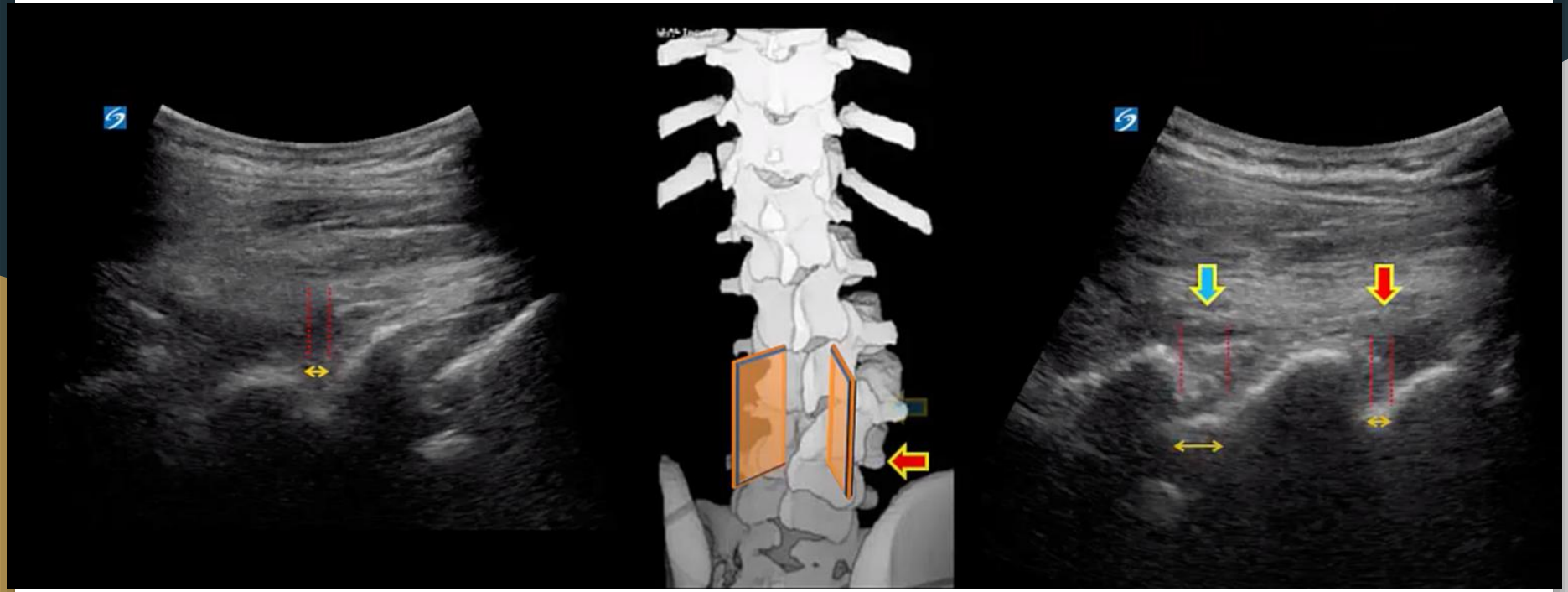
And.....success



US can tell us which spaces are biggest



Overall Principle

If the US beam can penetrate into the spinal canal through soft tissues…

Then a Lumbar Puncture needle will also be able to find its way into the canal at that same spot