

Title:

- Optimal Patient Position for Lumbar Puncture, Measured by Ultrasonography

Background and Objective:

- This study uses ultrasound to visualize which patient position gives the widest interspinous spaces for lumbar puncture procedures. Three positions were measured: lateral recumbent with knees to chest (**LR**), sitting on the bed with feet unsupported on the ground and bending forward over a bedside stand (**SFU**) and sitting with feet supported on a fixed height support block on the ground and then bending forward in the chest to knees position (**SFS**).

Methods:

- Sixteen ED resident and staff volunteers (9 men and 7 women, ages 26-38 years) participated as research subjects in this study.
- Three volunteers were excluded because of body habitus or being unable to hold each position for 5 minutes.
- The subjects positioned themselves in each of the three positions in random order, holding each for 5 minutes.
- Three images of the L4-L5 interspinous space were recorded in each position for each volunteer after the appropriate landmarks were identified. The mean of the three images was used for comparison.
- Data was analyzed using Tukey's honest significant difference test and 95% confidence intervals were calculated using a paired t-test.

Results:

- The interspinous space was significantly greater in the sitting, feet supported (**SFS**) position than in either the lateral recumbent or the sitting feet unsupported position ($P < 0.001$).
- The SFS space was greater than the LR space by 0.11 cm (95% CI: 0.07-0.14) and the SFS space was greater than the SFU space by 0.11 cm (95% CI: 0.06-0.17).
- The difference in space between the LR and SFU was not statistically significant.

Discussion:

- The **LR** position is still the traditional choice when the measurement of the **opening CSF pressure** is warranted.

- When asked about comfort, the **participants greatly preferred the SFS position, which may increase LP success rates due to patient cooperation.**

Conclusion:

- **Ultrasound** may be useful when performing LPs to help identify landmarks and choose the best position for each patient.
- The **SFS** position may offer the widest interspinous space and the most patient comfort to help increase success rate of ED LPs.

Limitations:

- Only young, healthy adult volunteers were used. The results may not be applicable to pediatric or older patients. Patients with serious illness such as meningismus may also be more challenging.

Reviewer's Comments:

In the pediatric ED, I used the LR position most often where a holder kept the infants' heads in flexion and knees to their chests. Their small body habitus' didn't obstruct my landmarks and their movement was very limited. In the adult ED, most people seem to prefer the sitting position in order to make sure they are midline on the patient. I chose this study to see if there was any true benefit to either position in adults. I had never been introduced to the sitting with feet supported position, but that is the one I will now try to use when possible. Obviously, there are situations where we don't have much of a choice, such as when we need to obtain an opening CSF pressure measurement or when we have a sedated/intubated patient who cannot hold a sitting position. In these situations, it is convenient that we know several possible positions for the patient that can all potentially get the same CSF fluid for analysis. But for ease and efficiency of this procedure, it is important that we find which position works best for us and do what we can to perfect our technique. However, we should also be comfortable using all positions in case we only have one option.

Reference:

http://www.academia.edu/3193608/Optimal_patient_position_for_lumbar_puncture_measured_by_ultrasonography