situations that are not necessarily unexpected. If these situations are treated promptly and appropriately without consequence, are they truly ‘critical’ incidents? However, I feel that unusual events or situations where a lesson can be learnt should be reported as they are an essential learning tool that without a doubt contributes to patient safety.

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Mid-calf position—an improved technique to place neuraxial anaesthesia

Editor—Optimal patient positioning with minimal movement during placement of neuraxial anaesthesia may increase the ease and speed of the block procedure. Several studies have shown that alterations in patient positioning can affect the difficulty of placing neuraxial anaesthesia. While the sitting position is widely used, there have been no published reports describing variants of the sitting position. To optimize spine flexion for midline neuraxial block placement, patients are often asked to assume a ‘mad cat’ or ‘cooked shrimp’ position. However, directing patients, especially parturients in labour, to assume this position for epidural or spinal placement can be challenging. We report a modification of the sitting position for neuraxial anaesthesia placement: the mid-calf position. While using this position, we have noticed that patients easily assume a stable, flexed posture with minimal coaching. This position has been an effective positioning tool for several body types including obese parturients.

In the mid-calf position, the patient rests the lower legs (mid-calf), rather than the knees, on the edge of the bed, sitting somewhat further back on the bed than in the conventional sitting position. As a result, the knees are slightly flexed with the patient’s back nearer to the practitioner. The patient’s neck is flexed forward and the arms are crossed in front of the body (Fig. 1).

One advantage of the mid-calf position is that the patient naturally assumes an ideal position for placement of a neuraxial block with little instruction. The shoulders fall forward and the flexed position achieved appears to optimally open the spaces between the spinous processes.

Another advantage of the mid-calf position is that the legs provide two additional points of stability. This prevents excessive forward flexion at the hips, so the torso does not move away from the practitioner during the procedure. Patients in this position are less inclined to lean forward, backward or tilt laterally. The patient’s centre of gravity shifts away from the forward edge of the bed, increasing stability and requiring less physical assistance by nursing staff, tables or commercial support devices.

A number of techniques have been used to improve the success of neuraxial anaesthesia placement including ultrasound visualization of the spinous processes or microdrip identification of the epidural space. However, we feel a simple variation of the sitting position can optimize patient position for neuraxial anaesthesia placement. If one elects the sitting position for midline neuraxial anaesthesia placement, we believe the mid-calf position provides superior conditions to the conventional sitting position.

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Table 1 Reasons for not filling in critical incident (CI) forms

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI too trivial</td>
<td>64%</td>
</tr>
<tr>
<td>Forgot to fill in form</td>
<td>49%</td>
</tr>
<tr>
<td>Too busy in theatre</td>
<td>41%</td>
</tr>
<tr>
<td>Forms too cumbersome</td>
<td>38%</td>
</tr>
<tr>
<td>Fear of judgement by peers</td>
<td>28%</td>
</tr>
<tr>
<td>Unsure what a CI is</td>
<td>26%</td>
</tr>
<tr>
<td>Makes little difference to patient care</td>
<td>23%</td>
</tr>
<tr>
<td>Forms not available/poorly accessible</td>
<td>23%</td>
</tr>
<tr>
<td>Not anonymous</td>
<td>13%</td>
</tr>
<tr>
<td>Form is confusing</td>
<td>8%</td>
</tr>
<tr>
<td>Fear of legal ramifications</td>
<td>5%</td>
</tr>
<tr>
<td>Not aware there were CI forms</td>
<td>0%</td>
</tr>
<tr>
<td>Never had a CI</td>
<td>0%</td>
</tr>
</tbody>
</table>

Fig 1 Lateral photo showing mid-calf position. Reproduced with permission from the patient.

Table 1 Reasons for not filling in critical incident (CI) forms
Safe placement of central venous catheters

Editor—We read with interest the recent paper on central venous catheter (CVC) tip position using the carina as a radiological landmark\(^1\) having recently completed a similar retrospective audit of 139 CVCs in an adult intensive care setting. Similar to Stonelake and Bodenham, we found a high incidence of CVC tips below the carina with 50 (35.9\%) right-sided and 8 (5.7\%) left-sided so placed. Similarly, more than half of the left-sided catheters that were above the carina had a steep angle to the vertical, a risk factor for erosion and perforation, whereas the vast majority of right-sided catheters in a similar position had a shallow angle to the vertical.

The optimal position of the CVC tip remains the subject of debate,\(^2\) but the package inserts of many CVCs give strong warnings about the absolute requirement for the catheter to lie outside the pericardium to avoid the risk of pericardial tamponade, advice mirrored by the FDA in the United States. Although perforation and tamponade are very rare with little data available regarding overall incidence, these warnings are hard to ignore.

Stonelake and Bodenham contend that it is particularly difficult to satisfy all criteria for safe placement of left-sided catheters and this is supported by our results. However, they then go on to suggest that the most important determinant of final tip position for a left-sided catheter should be the angle of incidence between the catheter tip and the vessel wall and that this should take precedence over intracardiac tip placement and other risk factors. We question whether this is always necessary or desirable, especially given the lack of evidence to support the real risk of perforation and the underestimation of the incidence of morbidity arising from catheter-related thrombosis.\(^3\)\(^4\)

In addition to an acute angle of incidence between catheter and a simulated membrane, an *in vitro* study identified perforation risk factors as stiff catheter material (e.g., polyethylene), multiple lumens and bevelled tip design.\(^5\) Where left-sided placement is unavoidable, modification of these risk factors can reduce the risk of perforation without resorting to intracardiac placement. Proximal CVC tip placement is unlikely to be associated with a high risk of perforation if used only in the short term for pressure monitoring or the infusion of isotonic fluids. Regular aspiration of blood from the catheter lumen or lumens can also help to confirm that the catheter tip is not abutting against the vessel wall.

To site a left-sided catheter such that there is a shallow angle between the catheter and the vessel wall will in many instances require that the catheter tip be placed low in the SVC. Stonelake and Bodenham divide the great veins and upper right atrium into three zones representing different areas of significance for CVC placement and suggest different ideal tip locations for right- and left-sided catheters. However, the SVC is a relatively short structure, measuring on average 6 cm, and precise placement is technically difficult and probably not achievable. The final position of the catheter tip is checked by chest radiograph but the exact location of some CVC tips illustrates this point.

Furthermore, most CVC insertions are performed in the trendelenburg or supine positions, and the catheter tip can change position as the patient is moved with subsequent radiographs showing descent of the abdominal contents and diaphragm and a change in the catheter position relative to the mediastinal contents.\(^7\) Many catheters may consequently be in the right atrium.

Finally, despite current guidelines which stress the importance of siting the catheter tip outside the right atrium, both studies demonstrate a high proportion of CVCs with their tips below the carina. We question whether encouraging further insertion of left-sided catheters would only add to the confusion and suggest greater improvements in patient safety would be achieved by further underlining the importance of ensuring all catheter tips are sited in the SVC.

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Editor—We thank Dr Sundaram and colleagues for their interest in our paper. Our main purpose was to highlight the issue of catheter tip position as important in clinical practice, particularly for the longer term catheter. In the absence of definite evidence on which to base practice, and the limitations of plain chest X-rays in determining...