

Accuracy of length measurements on neonatal umbilical catheters

Umbilical venous catheters (UVCs) and umbilical arterial catheters (UACs) are marked at intervals indicating the distance in centimetres (cm) from the tip. When inserting umbilical catheters, clinicians estimate the depth to which they should insert them using birth weight¹ or shoulder, umbilicus length,² and secure them at this depth as indicated on the catheter. Complications occur more frequently with umbilical catheters when the tip is incorrectly positioned.^{3 4}

We suspected that the marks on UVCs and UACs might not accurately indicate the distance from the catheter tip. We examined the catheters we routinely use at our hospital—4F (French) double lumen UVC, 3.5F and 5F single lumen UAC (all Vygon, Ecoen, France). Both authors independently measured the distance from the catheter tip to the marks indicating 5, 10, 15 and 20 cm on each of three samples of each of the three types of catheter using the same steel ruler.

None of the nine catheters we measured had all four marks at the distance indicated from the catheter tip. The most striking differences were on the size 3.5F UACs, where only 2 of the 12 marks were at the distance indicated (figure 1). The

largest differences were on one 3.5F UAC where the marks for 5, 10, 15 and 20 cm appeared at 4.8, 9.6, 14.5 and 19.2 cm, respectively. On the 5F UACs, 4 of the 12 marks appeared at the indicated distance. The 10 cm mark appeared 10 cm from the tip on all three 5F UACs; the remaining marks appeared at a distance between 0 and 5 mm from that indicated. Three of the 12 marks on the UVCs were accurate, the remainder appeared at a distance between 1 and 3 mm from that indicated.

We found that the marks that clinicians use to estimate insertion depth of UVCs and UACs were often inaccurate. Though the differences between the indicated and actual distance from the tip were often small, they may be of clinical relevance, particularly in extremely small babies who have 3.5F UACs inserted.

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Contributors EAK was involved in the study design, helped in data collection and interpretation and wrote the first draft of the manuscript. CPFO'D conceived and designed the study, helped in data collection and interpretation and critically revised the manuscript for intellectual content. Both authors approved the final draft of the manuscript.

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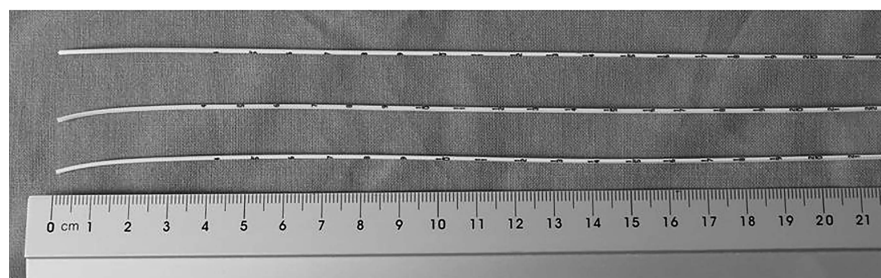


Figure 1 Three 3.5-French umbilical arterial catheters (Vygon, Ecoen, France) showing both inaccuracies and differences in the distances from the tip at which 5, 10, 15 and 20 marks appear on the catheters.

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