

Residents' Epidural and Spinal Placement Time As a Marker for Proficiency: How Long on OB Is Long Enough?

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Learner Audience: Anesthesiology Residents on OB Anesthesiology

Background: Investigators employing both learning curves^{1 2} and cusum³ analysis have estimated that residents must perform 60-90 epidurals and 45-70 spinals to become proficient. Most have had only "success" and "failure" as outcomes, and none have incorporated the relative difficulty of the case into their analyses.

Hypothesis: In our study of regional anesthetic difficulty, we considered resident experience as a potential predictor of difficulty. Examining that same data from a different angle, we now consider the residents separately, and ask, what can resident placement time tell us about how they learn?

Method Design: This study examined pregnant patients for risk factors predisposing them to neuraxial anesthetic difficulty. One marker for difficulty was the placement time from local-anesthetic skin infiltration to either spinal injection or epidural catheter threading. Three predictors were originally identified: two were patient characteristics, and the third was resident experience, defined as the number of days the resident had spent on OB Anesthesiology, where residents accrue 40-50 neuraxial procedures/month. This study delved into the resident-learning component of the results by developing a regression model specifically focused on the resident and staff placement times.

Outcome: When stratified for patient predictors for difficulty, the linear regression model of log time demonstrated that the placement time for a resident-initiated neuraxial anesthetic decreased linearly over 5 months of OB Anesthesia service, but did not reach attending levels of efficiency. The model also demonstrated that "difficult" cases required more time for all practitioners, regardless of experience.

For residents in our study, efficiency – and perhaps proficiency – increased over a time span much longer than the two months of OB Anesthesiology required by the ACGME. We did not see the rapid improvement followed by a plateau that can be more typical of learning curves. At some point, the resident placement time must plateau and approach the attendings' time, but that point can't be determined from our current data.

Graphs: Submitted as separate attachment.

¹ Kopacz DJ. Reg Anesth 1996;21:182-90.

² Konrad C. Anesth Analg 1998;86:635-9.

³ Naik VN. Can J Anesth 2003;50:694-8.