

Title : COMMON ERRORS DURING RESIDENT PERFORMANCE OF CONTINUOUS LUMBAR EPIDURAL ANALGESIA

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Introduction. A protocol for the teaching and testing of the performance of a continuous lumbar epidural was developed to determine whether errors in performance were random or systematic. It may be used for testing a resident/examinee or as a teaching instrument. The protocol consists of a detailed step-by-step regimen, for preparation, insertion and securing the epidural catheter. In addition, it is a system for rechecking and back-up to protect the patient against avoidable discomfort and sequelae of the procedure when those attending the patient are unfamiliar with some important problems.

The continuous epidural protocol is one that requires performance of several key steps in order to accomplish insertion. These steps were performed by all residents as all videotaped performances were successful insertions. In this situation, therefore, we are testing total performance. We believe this is essential to developing good teaching methods since all steps are essential to optimal performance.

Method. To test the reliability of the protocol, 9 faculty members of 7 institutions evaluated eight videotaped performances of continuous lumbar epidural. Evaluation consisted of all members watching the performances simultaneously, using one copy of the exam for each performance to grade that particular performance. The inter-rater agreement on scoring individual performance was determined using Cohen's Kappa ($K=0.81$). We took that same data using a scattergram technique and examined it for error rates of 50% or greater. Five areas stood out where 50% or more examinees under supervision made an error. These were: 1) incomplete set-up, monitoring and failure to record values; 2) improper handling of prep solution in the presence of sterile equipment and drugs; 3) poor or inadequate preparation of the kit with failure to check for serviceable equipment and/or identification and preparation of drugs; 4) failure to maintain and check catheter; 5) poor or inadequate management and monitoring of patients following test dose to catheter.

Results. Of 61 items, 18 were missed by 4 or

more of the residents. For inclusion, at least 6 of the 9 raters felt the resident did not perform the step. These 10 steps were some of the most commonly missed steps:

Steps	Taking/Missing Test/Step	
1. Vital signs: BP taken	8	8
BP recorded	8	8
Pulse taken	8	8
Pulse recorded	8	8
2. Prep solution identified	8	8
correctly		
3. Kit sterility verified	8	4
4. Drugs identified specifically	8	7
5. Clarity of solutions checked	8	8
6. Epidural needles checked for	8	8
free stylette and no barbs on		
needle		
7. Length of catheter from the	8	7
skin noted		
8. BP and Pulse taken immediately	8	8
after giving test dose		
9. Continuous monitoring of patient	8	8
following test dose		
10. BP taken 1-2 minutes for the	8	8
first 10 minutes after thera-		
peutic dose		

Discussion. Not surprisingly, many of the areas of error noted are especially relevant to the teaching situation where good habits must be inculcated. Under supervision, non-technical aspects and provisions for back-up and rechecking were those areas most neglected by the residents' performances. Yet these areas have much to do with respect and trust of the patient and the physician's coworkers.

In conclusion, this study describes the use of a method of testing continuous lumbar epidural. The protocol was used to identify the most common errors through objective evaluation. With the help of the protocol, we identified 5 areas in which 50% or more of the performances were in error.