

## **Commentary**

### **Effectiveness and Efficiency of Root Cause Analysis in Medicine**

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PREVENTABLE MISTAKES ARE COMMON IN MEDICINE. FOR example, at 1 hospital, a patient received patient controlled analgesia (PCA), a combination of local anesthetic and narcotic. The medication was intended to be infused into the epidural space. Instead, a nurse inadvertently connected the tubing to an intravenous catheter, delivering potentially lethal anesthetic into the patient's bloodstream. What followed were the nurse's anguish and guilt and, almost as inevitably, the hospital's root cause analysis (RCA). In the last decade, this process has become the main way medicine investigates mistakes and tries to prevent future mistakes. But like many innovations in medicine, RCA has never been evaluated for effectiveness. In the case mentioned above, the team identified flaws in the design of the epidural catheter, but thought that fixing those flaws was beyond their scope. Therefore, they made a recommendation they could implement: reeducating staff about the equipment's use. In the end, despite a significant investment of resources, this solution did not remove the underlying hazard and had little effect outside the institution. No one had confidence that things were safer. Indeed, since 1999, the US Pharmacopeia has received 1600 reports of epidural-to-intravenous misconnection (MEDMARX data in file, USP 2007). Many of these incidents undoubtedly received their own RCAs, but the mistake continues to occur.