

SAFER PATIENT-CONTROLLED ANALGESIA: A CLINICAL PERSPECTIVE



An interview with
Michael A. E. Ramsay, MD, FRCA
Chief, Department of Anesthesiology and Pain Management
Baylor University Medical Center
Dallas, Texas

This Clinical Perspective is underwritten by Hospira. Michael Ramsay's comments were taken from an interview conducted by representatives of Hospira. The information contained in this article may not be typical of all hospitals.

Born in Ireland and raised in England, Michael Ramsay has lived and worked in the U.S. for the past 26 years, and is a leading pain management specialist. As Chief of Anesthesiology and Pain Management on the medical staff at Baylor University Medical Center, in Dallas, Texas, Dr. Ramsay is also Co-Medical Director of Operating Room Services, and so has daily clinical interactions with caregivers providing bedside postoperative pain management. Baylor University Medical Center is a 993-bed, full-service hospital and level-one trauma center serving Dallas and North Texas, and currently one of the top four centers nationwide for liver transplantation. In addition, *U.S. News & World Report* "America's Best Hospitals" guide has listed Baylor University Medical Center among the best hospitals in the United States in a range of medical specialties for 10 consecutive years. The recognized treatment specialties include AIDS, cancer, cardiology and cardiac surgery, endocrinology, gastroenterology, geriatrics, gynecology, neurology and neurosurgery, ophthalmology, orthopedics, otolaryngology, pulmonary disease, rehabilitation, rheumatology, and urology.

The Need for Adequate Pain Management

Dr. Ramsay's approach to pain management emphasizes proactivity in providing adequate control. Preventing pain rather than reacting to it offers the best way to uphold the physician's charge of "first, do no harm." Says Dr. Ramsay, "Inadequate pain management can cause significant harm. Data now show that the development of chronic pain after inadequately treated acute pain incurs enormous costs both to patients' lifestyles and to the healthcare system." This needn't be so, he explains. "We have the

responsibility to actually try and prevent patients from feeling pain as far as possible, as far as we can safely do that." And make no mistake: in the delivery of analgesia, safety is of critical concern.

The Safety Issue

When not used properly, some pain medications carry a high risk for patient injury, due to their well-known side effects. For opioids, this includes respiratory depression, which, says Dr. Ramsay, is particularly tricky because it is not something that is easily detected on the ward. "It's hard to tell the difference between normal, natural sleep and narcotized sleep," he explains. "And so we see significant problems out there for patients who get overmedicated with narcotics."

To underscore the importance of safety in pain management, Dr. Ramsay cites the landmark 1995 study by Bates et al,¹ which lists analgesics as the drug class most related to adverse drug events. These data indicate that analgesics account for 30% of all adverse drug events.

"The problem of errors in administration further complicates the issue of safe pain management," says Dr. Ramsay. According to a systems analysis of the data compiled by Bates et al (conducted by Leape et al,² and published concurrently in *JAMA*), Wrong Dose is the most common error made in the administration of medications, occurring 27% of the time. Also troubling is the rate of Wrong Drug errors, which measures 12%.

The Promise of Bar Codes

In an effort to reduce these errors, Dr. Ramsay explains, some institutions have added an additional step to bedside analgesia administration, whereby a second healthcare provider rechecks the loaded PCA pump to confirm the drug, the dosage, and the administration program. Nevertheless, errors still occur. This means that patients stand to benefit from systems designed to guard against errors in the

administration of analgesics. Dr. Ramsay points to bar coding as a critical tool to aid in this effort: “With the right pump, bar coding can help confirm the right drug and make sure the right dose is given,” he explains. “Even the U.S. Secretary of Health, Tommy Thompson, was in the press months ago advocating the bar coding of drugs. And, it makes sense. We’ve been using bar codes in supermarkets, yet until now we haven’t converted that technology into the hospital system, except in very few areas, such as inventory.”

Testing the Hospira PCA3 in a Clinical Setting

The Hospira LifeCare® PCA3 Medication Management System was developed to employ bar code technology to confirm Right Drug and Right Dose. A built-in bar code reader instantly scans the bar codes applied to the pump’s prefilled drug vials. The PCA3 employs device design and utility features that were developed after extensive human factors research was conducted with practicing nurses.

At Baylor, Dr. Ramsay recently directed a medical device study of the PCA3, conducted in the post-op ward. Nurses used the device to infuse approximately 550 vials of pain medication. Research coordinators observed the nurses conducting pump operations, and downloaded operation data recorded on each device to record how the devices worked and to note any malfunctions or other issues. In addition, the coordinators interviewed nurses about the PCA3’s utility. Patients also were queried about their pain levels and the sense of safety the new device afforded them.

Nurse Response to the PCA3

The Baylor nurses responded positively to the design of the new device. “The nurses quickly learned how to operate the PCA3,” says Dr. Ramsay. Among key factors, he notes the human factors-based use of colors in the drug syringe labeling and the color-coding of the device buttons. “These are simple things. The start button is green, and the stop button is red,” says Dr. Ramsay. “This is important, because it makes it obvious which button to use.” The readability of the display screen also offered an important advantage: “The PCA3 screen is highly visible. With many pumps

the screen is not readable, because you don’t see it face on,” he explains. And patients also appreciated this feature. “Patients could actually read the face of the pump and could see what they were being given,” notes Dr. Ramsay. “They found that comforting.” The programming sequence was also well received. “The PCA3 has a programming sequence that is easy to follow, using soft key buttons, rather like ATM machines.” Overall, says Ramsay, the Baylor nurses were pleased. “It was a very user-friendly pump for the nurses.”

Dr. Ramsay explains that not only the nurses but also the hospital’s pharmacists valued the PCA3’s prefilled syringes for their enhanced safety and convenience. Prefilled syringes virtually eliminate the risk of pharmacy mixing errors and save valuable time.

Safety by Design

Dr. Ramsay values the way the PCA3 combines the use of bar coding and other safety features. “The design of the PCA3 is a real leap forward,” he says. “The vial easily snaps into the pump and tells you what the drug is. Because all vials look similar, this is a safety factor. In addition, the program confirms that the doses are right for the patient,” Ramsay explains.

Out of the testing at Baylor, Dr. Ramsay developed an appreciation for the human factors-oriented design that enhances ease of use – and further promotes safety in administration. “We’re all human and seek to continually improve patient care. When we integrate these types of systems into our processes of care, we see improvements,” he explains. The PCA3, he adds, “has quality safety features and is easy to use.”

Physicians are members of the medical staff at one of Baylor Health Care System’s subsidiary, community or affiliated medical centers and are neither employees nor agents of those medical centers, Baylor University Medical Center or Baylor Health Care System.

References:

1. Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events: implications for prevention. *JAMA*. 1995;274(1):29-34.
2. Leape LL, Bates DW, Cullen DJ, et al. Systems analysis of adverse drug events. *JAMA*. 1995;274(1):35-43.

