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Patient-controlled Analgesia (PCA)

To the Editor:—To date, there are no reports of severe respiratory depression with catastrophic outcome following PCA. Two cases of respiratory depression following PCA with morphine were mentioned in a recent correspondence.1 The safety record of PCA machines has been excellent. There is also one report of two mishaps both due to human error.2

My concern regarding safety is the current introduction of a choice of modes increasingly offered by manufacturers. Three modes are available: 1) PCA; 2) continuous; or 3) continuous plus PCA. Whenever the continuous or continuous plus PCA mode is used, a danger of overdose is present.

With the PCA mode, patients are given a pre-assessed individualized loading dose to create analgesia. They are taught to titrate potent opioids by pressing a button on a hand-held pendant. The physician sets the PCA machine to deliver a small dose of opioid. When the button is pushed and released, the small dose is delivered intravenously. A preset, lockout interval also limits the maximum dose the patient may receive. With experience with more than 18,000 postoperative patients, we have utilized a low dose of morphine (1 mg) or meperidine (10 mg) for the patient dose followed by a lockout period of 6 min. The maximum hourly patient-controlled dose is 10 mg of morphine or 100 mg of meperidine. Some patients push the button frequently, while others require only occasional bolus doses. If excessive sedation or somnolence occurs, the patient does not push the button. At Magee-Womens Hospital, severe respiratory depression has not occurred using either morphine or meperidine.

We foresee problems with the continuous mode plus PCA. The manufacturer's recommended continuous dose is 1-5 mg·h⁻¹ morphine, which may be dangerously high for some patients. At Magee-Womens Hospital following abdominal hysterectomy patients receiving 0.5 mg·h⁻¹ morphine have slept well during the night without having to activate the machine, in other words, no additional boluses are required. When a continuous plus PCA mode is prescribed, the safe and effective setting of the continuous dose is an estimate by the prescribing physician. If the patient does not use PCA with continuous, the continuous dose is too high. If the patient needs frequent PCA boluses, the continuous dose is too low.

In many hospitals, the prescribing physician is not in-house during the night. The nursing staff is responsible for monitoring prescribed patient care by following doctor's orders and nursing protocols. As sessment of the hourly level of consciousness is advocated in some institutions and used as a monitoring tool.3 Somnolence should precede respiratory depression for patients using PCA and the patient does not push the button. However, if the continuous plus PCA mode is being used, the continuous dose must be less than the patient requires. In our opinion, some patient use of PCA is essential to prevent overdose from the prescribed continuous dose.

We suggest that when the patient is utilizing the continuous plus PCA mode, nursing staff must confirm that the patient is using some PCA. Nursing orders for the above mode could be made to preempt the state of somnolence. For example, “If no patient activation during the last hour, reduce continuous dose by 0.2 mg·h⁻¹. If patient activation exceeds 4 per hour, increase continuous dose by 0.2 mg/h.” Individual variation may require more than 0.2 mg reduction/increase of the continuous dose of morphine for some patients and would be prescribed by the physician.

In conclusion, the danger of opioid overdose is ever present when the continuous mode is used. When continuous plus PCA mode is used, patient use of PCA must be monitored to maintain the excellent safety record pure PCA machines have established.

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REFERENCES
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An Illuminating Suggestion

To the Editor:—In a recent letter, Kubota et al.1 describe the illumination of the vocal cords by holding a pencil torch at the mouth, in the event of laryngoscope light failure. We would like to make the following suggestions. First, there should always be two laryngoscopes available. Second, the technique they describe may be refined in the following manner. The larynx should be transilluminated anteriorly...