

Bariatric Surgery Patients Can be Safely Managed Postoperatively on a Medical Surgical Unit Utilizing Continuous Cardiorespiratory Monitoring

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Objectives

Evaluate the effectiveness of continuous monitoring via capnometry (end-tidal CO₂, respiratory rate) and pulse oximetry (SpO₂, pulse rate) in bariatric surgery patients on a medical-surgical unit in preventing near codes, codes, and death.

Hypothesis

Continuous monitoring with pulse oximetry or end tidal capnometry will result in effective prevention of cardiorespiratory complications and death in post surgical bariatric patients on a medical-surgical unit.

There will be no increase in complications in bariatric surgery patients receiving continuous monitoring on a med-surg unit when compared to bariatric surgery patients admitted to the ICU for postoperative monitoring.

Background

- Increased risk for obstructive sleep apnea-hypopnea syndrome in obese patients
- Increased risk for respiratory depression with postoperative opioid pain medication
- ICU monitoring previously required in many patients

Method

Subjects:

- 125 bariatric surgery patients receiving opioid medications for analgesia
- Baseline prior to implementation of continuous monitoring (10 weeks): 39 patients (includes those sent to ICU for monitoring)
- Continuous monitoring (15 weeks): 86 patients
- Evidence-based care pathway for bariatric surgery patients was followed
- Part of a larger study evaluating safety and outcomes of continuous monitoring in postoperative patients

Patients who underwent RY or gastric sleeve typically received PCA opioids postoperatively, and patients who underwent lap band typically received oral opioids. Patients who did not receive any opioid medication are excluded from this analysis.



Results

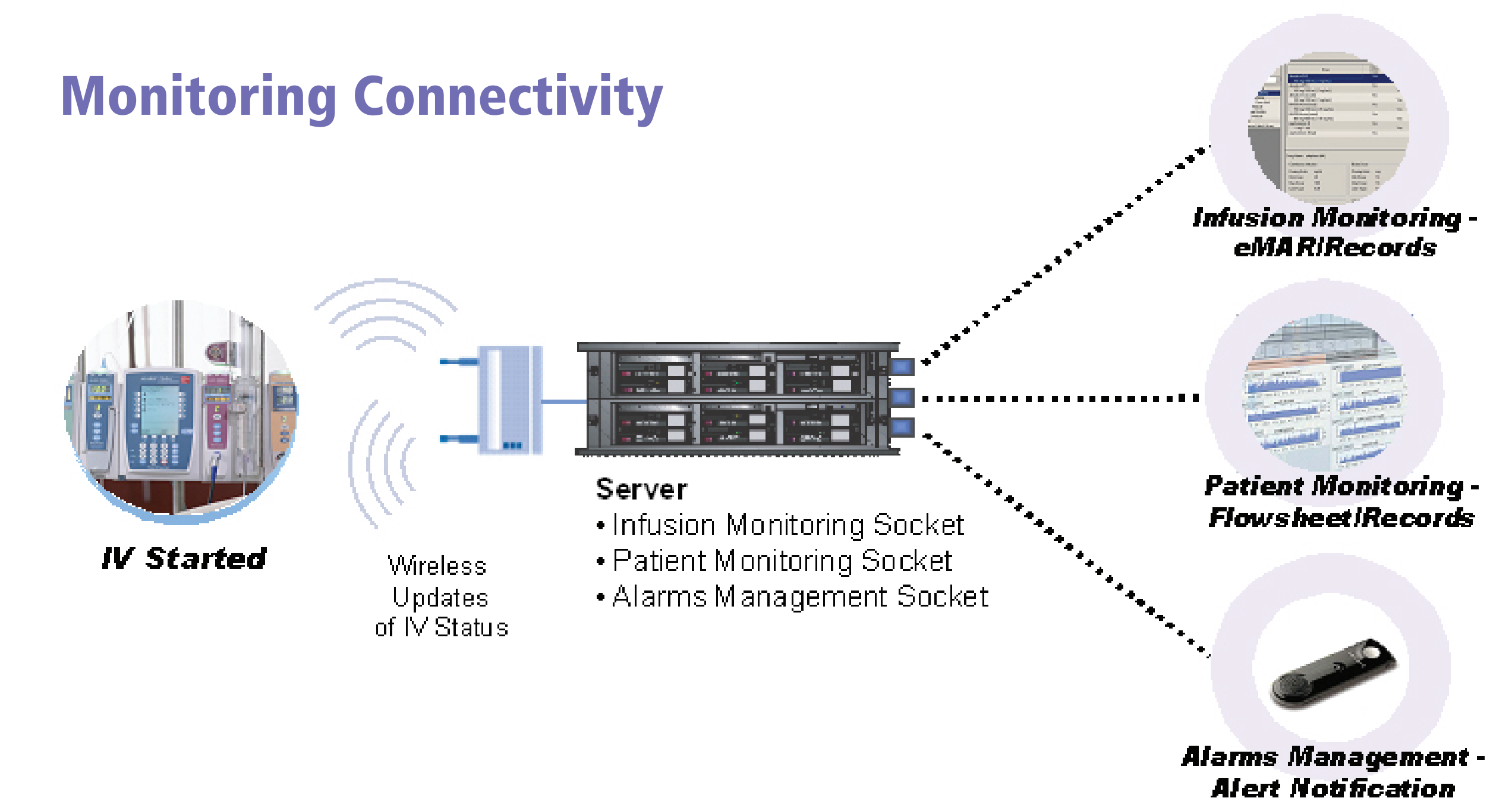
PCA Patients

Variable	Kolgomorov-Smirnov Test p-value	Baseline (n=15)	Study (n= 48)
↑ monitoring of vitals	>.10, ns	26.7%	22.9%
↑ frequency of nurse assessment	>.10, ns	13.3%	35.4%
Physician called	>.10, ns	13.3%	16.7%
RT called for assessment	>.10, ns	0	8.3%
↓ in PCA settings	>.10, ns	6.7%	6.2%
Use of reversal agent	>.10, ns	0	0
↑ in oxygen flow	>.10, ns	46.7%	33.3%
Stimulation	>.10, ns	0	25%
Incentive spirometry	>.10, ns	0	0
Medical response team called	>.10, ns	0	0
Code	>.10, ns	0	0
Transfer to ICU	>.10, ns	6.7%	4.2%
Death	>.10, ns	0	0

Non-PCA Patients

Variable	Kolgomorov-Smirnov Test p-value	Baseline (n=24)	Study (n= 38)
↑ monitoring of vitals	>.10, ns	12.5%	5.2%
↑ frequency of nurse assessment	>.10, ns	8.3%	10.5%
Physician called	>.10, ns	0	5.2%
RT called for assessment	>.10, ns	4.2%	2.6%
↓ in PCA/PCEA settings	>.10, ns	n/a	n/a
Use of reversal agent	>.10, ns	0	0
↑ in oxygen flow	>.10, ns	37.5%	7.9%
Stimulation	>.10, ns	4.2%	2.6%
Incentive spirometry	>.10, ns	0	0
Medical response team called	>.10, ns	0	0
Code	>.10, ns	0	0
Transfer to ICU	>.10, ns	0	0
Death	>.10, ns	0	0

Monitoring Connectivity



Innovative technology

- Interoperability between monitoring devices and PCA pumps:

PCA pump and monitoring devices "talk" to each other

PCA is programmed to immediately pause the administration of analgesia when oxygen saturation falls below 88% or respiratory rate falls below 6

PCA does not restart without nursing intervention

- Continuous monitoring included end-tidal CO₂, respiratory rate, and pulse oximetry (SpO₂)
- Central monitoring station with audible and visual prompts
- Immediate nurse notification of alarms thru pagers
- Daily reports with summary of cardiorespiratory parameters for each patient

Design

- Quasi-experimental prospective design: baseline obtained prior to implementation of continuous monitoring, followed by implementation of continuous monitoring
- Frequency and types of interventions were measured

Examples

- Increased vital sign monitoring/nursing assessments
- Physician and respiratory therapy notification
- Discontinuance of PCA/Epidural r/t respiratory status
- Use of reversal agent
- Physical and verbal stimulation

Discussion

- Continuous monitoring provides immediate and accurate evaluation of postoperative bariatric respiratory status
- No statistically significant differences in cardiorespiratory complications between baseline and continuous monitoring periods
- Trends toward more appropriate interventions following the implementation of continuous monitoring included: stimulation, opioid adjustments, and less frequent increase in supplemental oxygen flow
- Continuous monitoring on medical-surgical unit decreases costs (decreased need for ICU care) without compromise in patient safety

