Acute Pain Management: Impact of Opioid Tolerance Leveling on Patient, Provider, and System Outcomes

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Purpose

The purpose of this scholarly project is to evaluate the effect on patient satisfaction, knowledge and attitudes of healthcare providers, and rate of harm of implementing an integrated pain management program in a postoperative surgical unit in a quaternary care academic health center located in the Midwest. Using the conceptual frameworks of the Iowa Model of Evidence-Based Practice (Brown, 2014) and the University of Iowa Translation Research Model (Titler et al., 2009) adopted by the study organization as common frameworks for spreading and sustaining evidence-based practice, the proposed pain management program will be examined to determine its effect and potential for organizational system-wide implementation.

Clinical Question

Does the implementation of an integrated pain management program for inpatient postoperative patients improve patients' perception of pain management and providers' knowledge of opioid use at 90 days post-implementation as compared to patients who receive traditional care pain management?

Opioid Tolerance Leveling Tool (OTL) ©

Instructions: Provider to use this section to determine Opioid Level	Opioids patient exposed to in past 45 days		OTL Level based on daily intake x 45 days or more		
	Drug	Brand Names®	OTL 1	OTL 2	OTL 3
	OXYcodone	OxyContin, Roxicodone, Endocet, Percocet, Roxicet, Tylox	No opioid or sparse, intermittent/ PRN exposure within past 6 weeks	10 - 60 mg	61 mg or more
	hydroCODONE	Lorcet, Lortab, Norco, Vicodin, Vicoprofen		15 - 90 mg	91 mg or more
	morphine	MS Contin, Kadian, Avinza, Roxanol, Oramorph SR, MSIR		15 - 90 mg	91 mg or more
	fentaNYL patch	Duragesic		25 mCg/hr or less	More than 25 mCg/hr
	methadone	Methadose		Up to 20 mg	21 mg or more
	HYDROmorphone	Dilaudid,Exalgo	Less than 4 mg	4 - 22 mg	More than 22 mg
	codeine (including all combination products with codeine)		Less than 90 mg	90 – 360 mg	More than 360 mg
	tapentadol	Nucynta	Less than 50 mg	50 – 400 mg	More than 400 mg
	Buprenorphine patch	Butran	Less than 5 mCg/hr	5 mCg/hr - 15 mCg/hr	More than 15 mCg/hr
	oxymorphone	Opana	Less than 10 mg	10-40 mg	More than 40 mg
	Butorphanol Nasal Spray	Stadol	Less than 2 mg	2 – 6 mg	More than 6 mg
	levorphanol	Levo-Dromoran	Less than 4 mg	4-12 mg	More than 12 mg

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Study Design

Design

A quasi-experimental design examined the effects of an integrated pain management program designed with a four prong approach:

- education of the provider of opioid selection and utilization
- tiered approach for assessment of patient experience and tolerance with opioids
- consistent and reliable evidenced based selection and administration of opioids
- structure and processes enabling surveillance and escalation of pain management

Data Sources

- Nurses knowledge and attitudes survey regarding pain (NKASRP)
- HCAHPS
- Naloxone administration logs
- Utilization Rates

Setting

- Four post-operative nursing units within one large healthcare system

Study Population

- Registered Nurses
- Post-Operative Surgical Patients
- Providers on pilot units

Methods

- Non-randomized convenience sampling of nurses were administered the NKASRP survey across all shifts and compared pre to post
- HCAHPS aggregate data was collected pre and post via the organization's selected vendor for the instrument
- Naloxone administration rates were pulled from existing hospital databases and rate was calculated by patient days compared pre to post
- Utilization rates of pilot order sets were tracked over time of pilot period
- 3 month period - November 2014 to February 2015

IRB Approval

- Registered Nurses completion of the survey implied consent

Data Analysis

- Mann Whitney *U*
- Chi-Square

Results

- 92 nursing NKASRP participants across four units

Summary of pre and post individual unit total group responses for the pain knowledge and atittudes survey using a Mann-Whitney U-test

Unit	*U*	*Z*	*p*
UH3N	46.5	-1.679	0.093
UH3S	23.5	-0.129	0.897
BMH7N	24.0	0.000	1.0
MH4S	45.0	-0.641	0.521

- HCAHPS patient perceptions of pain results

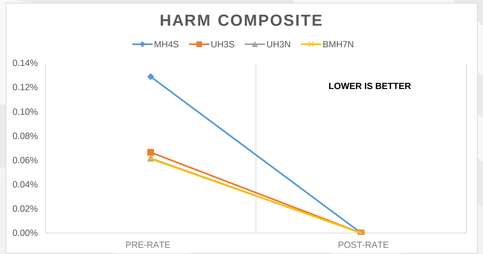
HCAHPS Pre Post within unit comparisons: Staff did everything to help with pain

Unit	*p*
UH3N	0.75
UH3S	0.67
BMH7N	0.53
MH4S	0.67

HCAHPS Pre Post within unit comparisons: Pain was well controlled

Unit	*p*
UH3N	0.76
UH3S	0.80
BMH7N	0.89
MH4S	0.91

- 430 pilot pain management order sets initiated
- No naloxone administration for opioid induced respiratory depression during the pilot period



Limitations

- Quasi-experimental design ability to detect change
- Convenience sampling
- Aggregate data

Conclusion

- No significant relationship noted between the pre- and post-HCAHPS scores on either pain question in this population
- No significant relationship noted between the total pre- to post-groups or the individual unit pre- to post-groups NKASRP scores.
- Out of 430 OTL pain plans administered during the pilot period, zero patients were administered naloxone for opioid induced respiratory depression. While the percentage of administration of naloxone in the pre-group was small, research shows that even one episode of naloxone rescue can have damaging effects (Dahan et al., 2010). A reduction to a rate of zero naloxone administration was deemed clinically significant.

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