Expanding clinical pharmacy practice and medication stewardship efforts in perioperative settings: Service line report and panel discussion

Sara Jordan, PharmD, BCPS | Brian Kramer, PharmD
Adam Trimble, PharmD, BCPS | Jennifer Bonnell, PharmD
Grant Medical Center | OhioHealth | Columbus, OH | 4.30.18
Objectives

Pharmacist Learning Objectives:
• Enumerate medication-related components of CMS's Value-Based Purchasing program for perioperative patient populations
• Discuss potential roles for the clinical pharmacist as an integral member of the surgery interdisciplinary team
• Describe a process for developing value-based clinical pharmacy services with measurable outcomes impact
• Discuss potential strategies (clinical and operational) for defining and enforcing appropriate use of high-risk, high-cost medications in the perioperative period

Technician Learning Objectives:
• Describe the role of the surgery medication history pharmacy technician

The presenters have no actual or potential conflicts of interest to disclose
Grant Medical Center
Poll Everywhere

Text JENNIFERBONN399 to 22333 once to join
What is the role of your institution’s current perioperative pharmacist(s)?

A) Nonexistent
B) Distribution/operational services only
C) Some clinical activities
D) Significant operational and clinical services provided
E) Other
To show this poll

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GMC OR Pharmacy Services

Why your OR needs YOU
Stories from our journey with integrating clinical pharmacy into perioperative services

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Grant Medical Center, OhioHealth
Columbus, OH – April 2016

The speakers have no actual or potential conflicts of interest in relation to this presentation.
Pharmacy FTEs Dedicated to Peri-op Services

- **≤2012:** Ops only
- **2013:** Integrated clinical + ops RPh
- **2014:** Expanded clinical RPh - floor
- **2015:** Added admin
- **2016:** Expanded clinical RPh - continuum
- **2017:** Expanded clinical CPhT - med rec
Orthopedic Surgery as Strategic Growth Area for Pharmacy Services

Outcomes Accountability
- Reimbursement
- Accreditation

Elective
- Patient choice
- Public rankings
- Satisfaction

Financial Driver
- (+) contribution margin
- Significant $$$ penalties

Strategic Growth Area

https://www.qualitymeasures.ahrq.gov/summaries/summary/49200
Am J Orthop. 2016 March;45(3):E112-E113
CMS Value Based Purchasing

FY18 Performance Measures

- Clinical Care 25%
- Care Coordination/Experience 25%
- Efficiency and Cost Reduction 25%
- Safety 25%

Targets for peri-op clinical pharmacists:

- Medicare spend per beneficiary (MSPB)

HCAHPS Survey:
- Pain mgmt
- Discharge info
- Care transition

- SSI, CDI
- Post-op VTE, complications

## CMS Pay for Performance

<table>
<thead>
<tr>
<th>Year</th>
<th>Value Based Purchasing (VBP)</th>
<th>Readmission Reduction Program (RRP)</th>
<th>Hospital Acquired Conditions (HAC)</th>
<th>Total Possible Penalty Influenced by TJA Outcomes</th>
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</thead>
<tbody>
<tr>
<td>FY15</td>
<td>1.5%</td>
<td>3%</td>
<td>1%</td>
<td>5.5%</td>
</tr>
<tr>
<td>FY16</td>
<td>1.75%</td>
<td>3%</td>
<td>1%</td>
<td>5.75%</td>
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<tr>
<td>FY17</td>
<td>2.0%</td>
<td>3%</td>
<td>1%</td>
<td>6%</td>
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</table>

Pilot: Ortho Clinical Pharmacist

- Inpatient PharmD
  - Rounds
  - Dose antibiotics
  - Guide critical therapies

- Ambulatory Care PharmD
  - Manage chronic meds
  - Medication reconciliation
  - Education & coaching

- Emergency Med PharmD
  - Emergency response
  - Culture review
  - Boarder optimization

- Ortho Surgery PharmD
  - ? Unknown
  - Never described
  - Data needed
Service Line Development

<table>
<thead>
<tr>
<th>4th</th>
<th>• Pilot service and measure impact</th>
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<tbody>
<tr>
<td>3rd</td>
<td>• Build workflow</td>
</tr>
<tr>
<td>2nd</td>
<td>• List clinical interventions</td>
</tr>
<tr>
<td>1st</td>
<td>• Identify opportunities</td>
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</tbody>
</table>
Ortho Clinical Pharmacist Areas of Focus

DVT Prophylaxis
- Risk stratification
- Optimal drug, dose, duration
- Inpatient & outpatient
- TXA optimization

Pain Management
- Pre-emptive protocol
- Multimodal analgesia
- Opioid stewardship

Complications Reduction
- Ileus, AKI, Infection
- Post-op order review
- Med admin verification

Discharge Optimization
- Discharge med rec
- Assess transition gaps
- Discharge counseling

Comprehensive Pharmacotherapy Optimization
Ortho Clinical Pharmacist Interventions

Pre-Admit

Pre-Op

Intra-Op

PACU

Floor

Discharge

Med rec

Pre-emptive analgesia

TXA, IVF

Multi-modal pain mgmt

DVT ppx, rounds

Discharge med rec/counseling
POD 0
- Review PMH, home meds
- Risk stratify, enter DVT ppx recs
- Review postop orders

POD 1
- Rounds
- Pain mgmt
- Verify med admins
- Complications mitigation

POD 2
- Rounds
- Discharge med rec
- Discharge counsel

POD 3
- Review PMH, home meds
- Risk stratify, enter DVT ppx recs
- Review postop orders
Role of the OR Med Rec Tech

- **Pre-Admit**
  - CPhT completes comprehensive PTA med list
  - Notifies PharmD of potential issues

- **Pre-op**
  - Pre-op RN enters last dose admin

- **Post-op**
  - Hospitalist completes admission med rec
  - PharmD verifies appropriateness

- **Discharge**
  - Hospitalist AND surgical team complete med rec
  - PharmD verifies and counsels

TJA Post-op DVT Rate (%)

Baseline Period | Intervention Periods

Baseline Period | Intervention Periods

TJA Readmission Rate (%)
Physician + Staff + Patient Satisfaction

SPOTLIGHT
Pharmacy initiatives improve patient experience

Being in a hospital can be overwhelming for patients. OhioHealth sought to improve medication therapy and increase patient satisfaction by implementing pharmacy initiatives in Joint Center of Excellence for Patient Safety and Quality.

This spring, OhioHealth began piloting pharmacy interventions at the Joint Center of Excellence for Patient Safety and Quality in partnership with CVS Pharmacy. The joint effort focused on medication therapy management and patient education.

A group of pharmacists and other associates involved in the Bone & Joint Center pilot study - from left to right: Tabitha Campbell, RN; Brian Kramer, PharmD; Sarah Jordan, PharmD, BCPS; Sarah Laub, PA; Tonya Exline, RN, and Debbie Warner, RN.

“Before this program, everyone had a piece but no one was comprehensively coordinating the patients’ medications through transitions,” Sara said. “We really wanted to provide the whole picture...”

100% patients who interacted with a pharmacist reported this to be a valuable service.

Q1 On a scale of 1 to 5, 1 being the lowest and 5 being the greatest, how well do you feel you understand the information you are receiving?
Additional Ortho PharmD Initiatives

Medical management
Opioid stewardship
Further VTE risk stratification
Antimicrobial stewardship
Interdisciplinary research and publication
Professional education and leadership
Ortho Clinical PharmD Service

Metric opportunity

Optimal stewardship

Pharmacist intervention

Advanced relationships

Improved outcomes
Inter-disciplinary Relationships

Medication Stewardship

Patient Outcomes
Stewardship of High-Risk, High-Cost Medications in Perioperative Settings
Panel Discussion
Stewardship Impact

http://theatticusgroup.net/abcs-medical-technology-reimbursement-hospital-inpatient-setting/
Poll Everywhere

Text JENNIFERBONN399 to 22333 once to join
Sugammadex – Background

Initial goal: <10% cases that require neuromuscular blockade (NMB) reversal

Dec 2015
- FDA approval

Feb 2016
- Formulary addition

June 2016
- Expanded formulary use
Mechanism of Action
Where does it fit?

Advantages
• Faster onset
• ↓ post-op curarization
• More predictable
• Deeper NMB reversal

Disadvantages
• Anaphylaxis?
• Blocks subsequent NMB
• Not recommended in CrCl<30 mL/min

Should everyone who needs NMB reversal get sugammadex?
Sugammadex Cost Implications

Medication utilization evaluation (MUE)
- July-Sept 2016: <10% cases
- April-June 2017: 42.3% of cases

Drug cost perceptions
- Difference in cost
- Dose dependent
Items to Consider

What do you do with a drug for which literature suggests clinical advantage but will result in significant cost?

Answer:

Collaboration with providers!
Collaboration

Proactively engaged anesthesia leadership

Directly addressed cost perception

Developed a plan for use

Frequent collaborative discussions

Continuously refined plans
Impact of Effective Collaboration

Sugammadex Use Estimates

- Percentage of Cases Used (%)
- July-Sept 2016
- April-June 2017

Grant Medical Center | Hospital A

July-Sept 2016: Grant Medical Center (0%) Hospital A (5%)
April-June 2017: Grant Medical Center (5%) Hospital A (35%)
Current Recommendations

Emergent reversal of NMB

Non-emergent NMB in patients who:

- Require moderate to deep intra-operative NMB
- Experiencing or likely to experience ADE due to post-operative residual curarization
- Have not responded to glycopyrrolate/neostigmine
- Contraindications to glycopyrrolate/neostigmine
IV Acetaminophen

Why all the hype now?
Pharmacokinetics

![Graph showing acetaminophen plasma concentration over time for IV 1g (n=38) and PO 1g (n=38).]
Literature Recap

Does not reduce opioid related adverse events (ORAEs) – McNicol et. al.

- PONV
- Sedation
- Urinary retention
- Pruritus
- Respiratory rate

May be an hour lag time to analgesic effect

High cost compared to PO/PR

## Literature Recap

<table>
<thead>
<tr>
<th></th>
<th>Hickman et. al.</th>
<th>IV (n = 241)</th>
<th>PO (n = 245)</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Median opioid use first 24hr*</td>
<td>21.7 mg</td>
<td>21.7 mg</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Median time to first pain med</td>
<td>41 mins</td>
<td>38 mins</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>Median time to ambulation</td>
<td>18.8 hrs</td>
<td>18.5 hrs</td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Median PACU LOS</td>
<td>2.1 hrs</td>
<td>2.2 hrs</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>Median hospital LOS</td>
<td>58.5 hrs</td>
<td>58 hrs</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Post-op nausea</td>
<td>21.2 %</td>
<td>21.6 %</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>Post-op vomiting</td>
<td>7.9 %</td>
<td>6.9 %</td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

*Opioid use in morphine mg equivalents.
PACU=post-op anesthesia care unit, LOS=length of stay
What can we do?

NPO with sips

Pre-emptive multi-modal analgesia protocols

Standardized Pre-Emptive Analgesia Protocol

Literature and Guidelines
- APS, ASRA, ASA 2016 Guidelines
- JAAOS – Current strategies in TJA
- AORN – Preemptive analgesia review

Stakeholders
- Surgeons
- Anesthesia providers
- RNs

Implementation
- Effective
- Safe
- Cost effective + operationally feasible

GMC Pre-emptive Multimodal Protocol

Acetaminophen 975mg
Celecoxib 400mg
Gabapentin 300mg

If on long-acting opioid PTA: take home dose
If opioid-tolerant but NOT on long-acting opioid
PTA: consider extended release oxycodone
Preemptive Analgesia Protocol Outcomes

**Avg Pain Score through POD1**

- TKA: Pre - Post
- THA: Pre - Post

**Avg Length of Stay**

- TKA: Pre - Post
- THA: Pre - Post
Preemptive Analgesia Protocol

Outcomes

% of Patients Out of Bed DOS

TKA

THA

Pre

Post

0 10 20 30 40 50 60 70 80 90 100
Current Restrictions

Patient must be unable to tolerate the oral route
Limit to 1 dose per order
Used with intent to minimize opioid use
May not be included in new order sets
Surgical setting: Limit 1 dose pre-op 1 dose post-op
Non-surgical setting: contraindication(s) to:
  ◦ IV NSAIDs
  ◦ Documented opioid use disorder
  ◦ Greater than 65 years of age
Liposomal Bupivacaine (Exparel®)

Theory:

- Liposomal dosage form
- ↑ Duration of action
- ↓ Post-op pain
- ↓ Narcotics
- ↓ ORAEs
- ↓ LOS, Better outcomes
Liposomal Bupivacaine (Exparel®)

Reality: $p>0.05$

- **Mean Pain Score POD3**
  - Lip. Bupiv vs Bupivacaine

- **Opioid Use**
  - Lip. Bupiv vs Standard PAI

- **LOS**
  - Lip. Bupiv vs Ropivacaine

References:
Liposomal Bupivacaine (Exparel®)

Reality:

Cost (AWP)
Liposomal Bupivacaine (Exparel®)

Our approach:

- Collaborate!
- Develop ideal protocol
- Design a better study
- Define optimal use
GMC Liposomal Bupivacaine RCT – Design

All TKA by collaborating surgeon

Admit or d/c to facility, long-acting opioid PTA

Regional anesthesia + lip. bupivacaine

Regional anesthesia + standard PAI

Standard PAI: Ropivacaine, Morphine, Ketorolac, Methylpred

PAI= peri-articular injection
## GMC Liposomal Bupivacaine RCT – Results

<table>
<thead>
<tr>
<th>Intention-to-Treat Analysis (n=57)</th>
<th>Liposomal Bupiv. (n=30)</th>
<th>Standard of Care (n=27)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT Sessions, mean (SD)</td>
<td>3.0 (1.2)</td>
<td>3.6 (1.3)</td>
<td>0.137</td>
</tr>
<tr>
<td>Opioid Consumption, OMEs (SD)</td>
<td>274.6 (121.0)</td>
<td>304.8 (143.4)</td>
<td>0.385</td>
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<tr>
<td>Average pain score, mean (SD)</td>
<td>4.4 (1.3)</td>
<td>4.7 (1.5)</td>
<td>0.343</td>
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<tr>
<td>LOS, days, mean (SD)</td>
<td>2.5 (0.8)</td>
<td>2.3 (0.5)</td>
<td>0.208</td>
</tr>
<tr>
<td>ORAEs, n (%)</td>
<td>13 (43.3)</td>
<td>11 (40.7)</td>
<td>0.843</td>
</tr>
<tr>
<td>OR Time, mins, mean (SD)</td>
<td>109.6 (18.3)</td>
<td>112.5 (11.5)</td>
<td>0.476</td>
</tr>
<tr>
<td>PACU Time, mins, mean (SD)</td>
<td>162.1 (82.5)</td>
<td>140.2 (38.2)</td>
<td>0.200</td>
</tr>
<tr>
<td><strong>Total Drug Charges, mean (SD)</strong></td>
<td><strong>3,848.57 (530.91)</strong></td>
<td><strong>2,726.74 (930.25)</strong></td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
GMC Liposomal Bupivacaine Use

Reality:

Annual Drug Use and Cost Estimates (AWP)
Current Formulary Restrictions

• Local infiltration by surgeon in bunionectomies and TJA
• Transversus abdominal plane (TAP) block by anesthesiologist in CRS

Ongoing monitoring and stewardship efforts
Interdisciplinary Relationships

Patient Outcomes

Medication Stewardship