20th ANNUAL PHARMACY PUBLIC HEALTH POLICY SYMPOSIUM

Wednesday, January 17, 2018
7:30 a.m. – 4:15 p.m.

Boston Marriott Newton Hotel
2345 Commonwealth Avenue,
Newton, MA 02466

PHARMACISTS IN ALL PRACTICE SETTINGS
AND OTHER HEALTH CARE PROFESSIONALS

6 contact hours including 2 contact hours law
Symposium Learning Objectives

Social Divides and Health Divides

- Explain the role of social factors in creating health outcomes
- Recognize the role of community providers in addressing these social factors
- Give examples of core drivers of health

ACPE UAN# 0027-9999-18-001-L04-P – 1 contact hour – knowledge based

Social Determinants: Impact on Adherence and Pharmacist’s Role

- Recognize the relationship between social determinants and health outcomes
- Identify barriers to adherence in various patient populations
- Explain the role of pharmacists in improving health outcomes

ACPE UAN# 0027-9999-18-002-L04-P – 1 contact hour – knowledge based

The Pharmacist Prescriber: Building a CDTM Clinic

- Identify the MA state requirements for collaborative practice in the ambulatory care setting
- Describe the steps involved in preparing for, conducting, and documenting a patient visit under CDTM
- List three ways to track and measure the success of a CDTM program

ACPE UAN# 0027-9999-18-003-L04-P - 1 contact hour – knowledge based

Pain Management and the Opioid Crisis

- Summarize different pain types and pathways
- Outline the new Massachusetts law on the judicious use of opioids
- Apply the new Massachusetts Law to patient care scenarios
- Given a patient case, develop an optimal pharmaco-therapeutic strategy to treat non-cancer pain

ACPE UAN# 0027-9999-18-004-L01-P – 1 contact hour – knowledge based

MassPAT, MassHealth and MassPSUD

- Explain the effect of MassPAT on prescribing and dispensing communities
- Recognize the impact of interstate data sharing in relation to MassPAT
- Explain recent changes to federal and state regulations concerning the MassHealth Pharmacy program
- Describe recent drug utilization trends in the Massachusetts Medicaid program
- Recognize the impact of Substance Use Disorder (SUD) in the Pharmacy Community
- Explain the role of the Massachusetts Pharmacists Substance Use Disorder Program in treatment and recovery for pharmacists, interns and technicians

ACPE UAN# 0027-9999-18-005-L03-P – 2 contact hours – knowledge based
7:30 am – 8:25 am  
**Registration and Coffee**

8:25 am – 8:30 am  
**Welcome and Remarks**

  Katherine Keough  
  *Co-Chair MHC Pharmacy Committee, Director of Government Relations, Atrius Health*

  Dennis Lyons, RPh  
  *Co-Chair MHC Pharmacy Committee, Principal, DGL Healthcare Consulting*

8:30 am – 9:30 am  
**Social Divides and Health Divides**

  Sandro Galea, MD  
  *Dean, Boston University School of Public Health*

9:30 am – 10:30 am  
**Social Determinants: Impact on Adherence and Pharmacist’s Role**

  Alicia Mam daCunha, PharmD, RPh, AE-C, BCACP  
  *Director, Clinical Pharmacy & PGY1 Pharmacy Residency, Greater Lawrence Family Health Center*

10:30 am – 10:45 am  
**Break**

10:45 am – 11:45 am  
**The Pharmacist Prescriber: Building a CDTM Clinic**

  Amy Vachon, PharmD, RPh  
  *Director of the Atrius Health Clinical Pharmacy Program and co-chair of the Atrius Health Pharmacy & Therapeutics Committee.*

  Jacqueline Kraft, PharmD, RPh  
  *Clinical Pharmacist at Atrius Health - Harvard Vanguard Medical Associates*

  Tanya Iliadis, PharmD, RPh  
  *Senior Clinical Pharmacist at Harvard Vanguard Medical Associates*

11:45 am – 12:45 pm  
**Lunch/Exhibits**

12:45 pm – 1:45 pm  
**Pain Management and the Opioid Crisis**

  John Marshall, PharmD, BCPS, BCCCP, FCCM, RPh  
  *Clinical Pharmacy Coordinator - Critical Care, Program Director, Critical Care Pharmacy Residency, Beth Israel Deaconess Medical Center*

1:45 pm – 2:00 pm  
**Break**

2:00 pm – 4:00 pm  
**MassPAT, MassHealth and MassPSUD**

  Paul Jeffrey, PharmD, RPh  
  *Deputy Director, Office of Clinical Affairs, Commonwealth Medicine, Director of Pharmacy, MassHealth*

  Ed Taglieri, MSM, NHA, RPh  
  *Manager, Pharmacy Substance Use Disorder Program Supervisor, Department of Public Health, Bureau of Health Professions Licensure*

  David Johnson  
  *Director of the Prescription Monitoring Program, Department of Public Health, Bureau of Health Care Safety and Quality*

4:00 pm – 4:15 pm  
**Closing Remarks**

  Jack Reynolds, PharmD, RPh  
  *Dean, Northeastern University School of Pharmacy*
EDUCATIONAL NEEDS ASSESSMENT
If there is/are specific questions you would like addressed on any of these topics, please email Anita Young at a.young@northeastern.edu by January 15, 2018.

TO REGISTER
Go to www.rxce.neu.edu. Click on Live programs; Register/Log in or create an account; at Participant Menu choose: Register for Live Programs; MA Health Council 20th Annual Pharmacy Public Health Policy Symposium – January 17, 2018

FEES/REFUND INFORMATION
- Early Registration – $135.00 per person – ends December 31, 2017
- Registration – $150.00 per person – January 1, 2018
- Registration Deadline – January 15, 2018
- Registration includes breakfast, breaks and lunch
- All refunds are subject to a $25.00 administration fee – No refunds after January 15, 2018

REQUIREMENTS FOR CREDIT
- Program attendees can earn Continuing Pharmacy Education credits for this program by electronically logging onto the website: www.rxce.neu.edu, inserting the activity specific code number and successfully completing the activity learning assessment/evaluation form. Participant names will be checked against program attendance sheets for verification of attendance.
- Participants have 60 days to complete evaluations.
- After 60 days from January 17, 2018, no credit will be available for this program.
- Credits will be electronically transferred to the CPE Monitor System.
- No Statements of Credit will be issued.
- Program participants can earn up to 6 contact hours of continuing pharmacy education credits including 2 contact hours of pharmacy law.
- This program is not accredited for pharmacy technicians

EVALUATION
All participants will have the opportunity to review the educational sessions and speakers and to identify future educational needs.

STATEMENT OF DISCLOSURE
In accordance with the Accreditation Council for Pharmacy Education (ACPE) Standards for Continuing Pharmacy Education 2009, Northeastern University School of Pharmacy requires that faculty members disclose any relationship (e.g., shareholder, recipient of research grant, consultant or member of an advisory committee) that the faculty may have with commercial companies whose products or services may be mentioned in their presentations. Such disclosure will be made available on the day of the program.

ACCREDITATION STATEMENT:
Northeastern University, Bouvé College of Health Sciences, School of Pharmacy, Office of Continuing Education is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.
Social Determinants of Health:
Impact on Adherence & Pharmacist’s Role

Alicia Mam daCunha, PharmD, BCACP, MSc-C
amdacunha@glfhc.org
Mass Health Council
17 January 2018

Disclosures
I do not have any financial disclosures

Objectives
- Recognize the relationship between social determinants and health outcomes
- Identify barriers to adherence in various patient populations
- Explain the role of pharmacists in improving health outcomes

What are Social Determinants of Health (SDoH)?
The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequalities in both within and between countries.

- WHO

Health Outcomes

Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations

Health Care System
- Health Coverage
- Provider Availability
- Pharmaceutical Costs & Policies
- Quality of Care

Neighborhood & Physical Environment
- Housing
- Transportation
- Safety
- Parks
- Playgrounds
- Walkability

Community & Social Context
- Social Integration
- Safety
- Discrimination

Education
- Early childhood education
- Enrolled in higher education
- High school graduation

Economic Stability
- Employment
- Income & insecurity
- Housing instability
- Poverty
Proportional Contribution to Premature Death

Health & Well Being
- Individual Behavior: 40%
- Social and Environmental Factors: 20%
- Health Care: 10%
- Genetics: 30%

Adherence & Role of Pharmacist

Life Expectancy at Birth

Addressing Social Determinants of Health

- Healthy People 2020

Poll Everywhere: Why is your patient nonadherent?

Step 1: Create a new text message
Step 2: Send "aliciadacunha163" to 22333 (phone #) to join session
Step 3: Enter your answer (one word)
What is adherence?

- Voluntary cooperation of the patient in taking drugs or medicine as prescribed, including timing, dosage, and frequency

Adherence is the Process by Which Patients Take Their Medications as Prescribed

- Initiate
- Implement
- Persisit

Adherence

Nonadherence Across the Population

- For every 100 prescriptions written:
  - 100% Filled by the pharmacy
  - 50-70% Picked up from the pharmacy
  - 49-66% Taken properly
  - 25-30% Refilled as prescribed

At any given time, ~50% of patients are non-adherent.

Variation in Nonadherence

- Non-Persistence
  - Prescription never filled
- Non-Conforming
  - Patient stops taking med. after taking it

Adherence Associated with Health Outcomes

- Costs the U.S. healthcare system an estimated $100-$289 billion annually
- Prematurely stopping therapy associated with mortality

Patient Cases

- 65 yo male with multiple comorbidities who presents with over 100 prescription bottles
- 30 yo healthy female prescribed oral contraceptives but concerned she may be pregnant for the 4th time
- 40 yo female with an INR of > 12

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**Intervention Types**

- Multilevel interventions required
- Focus beyond clinicians

**Role of Pharmacists**

- Educate patients and caregivers
- Effects of adherence & nonadherence
- Minimize cost
- Simplify regimens
- Minimize and educate on side effects

**Addressing Non-Adherence**

- Distinguish between reasons for nonadherence
- Incorporate health disparities

**Team based approached**

- Multilevel and team based interventions
- Positive relationship between the patient and provider
- Relationship between pharmacist and prescriber
- Incorporate caregivers
- Leverage technology

**Role of Pharmacists**

- Empower the patient
- Utilize motivational interviewing
- Be creative and individualize therapy
- Monitor for side effects
- Monitor for adherence
- Provide resources

**Pharmacists as Healthcare Providers**
The Pharmacist Prescriber: Building a CDTM Clinic

Amy Vachon, Pharm.D.
Director
Jacqueline Kraft, Pharm.D.
Clinic Program Manager
Tanya Iliadis, Pharm.D.
Associate Director

Atrius Health Clinical Pharmacy Program
January 17, 2018

Objectives

Identify the MA state requirements for collaborative practice in an ambulatory care setting.

Describe the steps involved in preparing for, conducting, and documenting a patient visit under collaborative drug therapy management (CDTM).

List three ways to track and measure the success of a CDTM program.

Atrius Health

Nonprofit ambulatory accountable care health system with 34 clinical locations, about 50 specialties, 900 physicians, and 740,000 adult and pediatric patients across eastern Massachusetts.


Clinical Pharmacy department: 13 pharmacists working primarily in Internal Medicine clinics at core practice sites. Also 3 technicians working centrally.

Collaborative Practice: What, Why, and How?

CDTM is initiating, monitoring, modifying and discontinuing of a patient’s drug therapy by a pharmacist in accordance with a collaborative practice agreement.

May include collecting/reviewing patient histories, obtaining/checking vital signs and evaluating the results of lab tests related to drug therapy.

Cannot include diagnosis.

Timeline of CDTM at Atrius Health

Initiation of CDTM
June’16
6 pilot sites

CP Clinic Expansion
Oct’16-Mar’17
13 sites

Pilot Phase 1
Oct’13-June’14
3 sites

Pilot Phase 2
June’14-June’16
3 additional sites

Collaborative Drug Therapy Management (CDTM)
Massachusetts CDTM Regulations (2009)

- 247 CMR 16.002 - updated 12/15/2017
- In accordance with M.G.L. c112, sections 24B 1/2 and 24B 3/4
- Parallel section in board of medicine regs (243 CMR 2.12)
- Pharmacist qualifications:
  - MA RPh license in good standing, currently practicing in MA
  - $1 mil (per occurrence) professional liability insurance
  - 5 years licensed pharmacist experience (or PharmD + CDTM agreement by 1/1/16, or equivalent as determined by Board)
  - Devote portion of practice to the defined CDTM drug therapy area
  - 5 extra contact hours of education per year in areas of practice generally related to CDTM
  - Controlled substance registration

Massachusetts CDTM Regulations, contd.

- Provisions for different settings
  - Hospital
  - Ambulatory care
    - Patient must be age 18+
    - Supervising physician written referral required (with diagnosis included and copy provided to pharmacist and patient)
    - Supervising physician obtains patient written consent (with copy provided to patient and pharmacist)
    - Limits to prescriptions for continued therapy and tx diseases for initiation/modification/discontinuation of therapy
    - Prescribing C-VI drugs only
  - Long-term care
  - Hospice
  - Community

Pharmacist Patient Care in Ambulatory Settings

- Direct care
  - Chronic disease management
  - Transitions medication reconciliation
  - Wellness visits (Medicare)
  - Medication adherence - telephonic, in person
  - PAP metric patient outreach

- Indirect care
  - “Roster” reviews
  - Drug information consults
  - Patient care consults

Pharmacist Patient Care in Ambulatory Settings

- MA CDTM Requirements for Ambulatory Care
  - Supervising physician
    - Collaborative practice must be is physician’s scope of practice
  - Qualified pharmacist
    - Also must have “training and experience relevant to scope of collaborative practice”
  - Practice setting
    - Approval of medical staff executive committee or medical director or designee
    - Onsite supervision
    - CDTM Agreement

CDTM Agreement

- Specific disease state(s) and scope (primary or co-morbid)
- Specific prescribing authority
- Practice protocols
- Description of risk management activities
- Rx documentation in patient’s permanent record
- Description of outcome measurements
- Procedures for informing supervising physician (routine and urgent)
- Description of absence procedures (pharmacist/supervising physician)
- Duties that may/may not be delegated to trained/authorized staff (e.g., CPhTs)
- Protocol for termination of agreement
- Signed attestations by pharmacist and supervising physician
- Copy kept at practice setting and reviewed/renewed every 2 years

Pharmacist can already influence medication therapy for individual patients, discussing and routing requests for prescription changes to patients’ PCPs for approval...so...

Why do we need CDTM?

- Enhances efficiency of visit, keeping momentum of patient engagement/motivation
- Allows new/changed medication teaching to be done on the spot
- Reduces workload on physicians; eliminates chasing after them
- Reduces calls back to patient
- Increases the value of a clinical pharmacist on the care team
Steps on the Road to CDTM: Administrative
1. Peer organization consultation
2. Interpretation of regulations
3. Selection of initial patient population
4. Development of organizational documents
5. Obtaining clinical management and clinical pharmacist buy-in

Clinical Pharmacy Clinic Workgroup

1. Peer Organization Consultation
   - CDTM program history and scope
   - Current workflows
   - Current disease states
   - Protocols and policies
   - Training
   - Credentialing
   - Auditing
   - Workload per pharmacist - visit number and length
   - How do the pharmacists like providing CDTM?
   - Data and metrics tracked
   - How did/do you handle...?
   - What works well, and what was/is a challenge?

2. Interpreting the CDTM Regulations
   - Referral?
   - Supervising physician
     - "Named" supervising physician vs every physician signs?
     - Referrals by NP/PAs? Specialists?
   - Patient consent?
   - Devote a "portion" of practice to the defined therapy area?
   - Protocols - clinical vs non-clinical details?

   Work with Legal/Compliance Department

3. Selecting the Initial Patient Population
   - One vs two vs many diseases for each clinical pharmacist?
   - Uniform diseases across organization and staff, or individualized by clinical pharmacist competency?
   - Type 2 diabetes
   - Hypertension
   - Hyperlipidemia
   - Complex medication management
   - Depression
   - Anxiety
   - Insomnia

4. Creating Organizational Documents
   - CDTM Policy
   - CDTM Agreement
   - Disease Protocols
     - Specific vs general
     - National guidelines appendix in Agreement
   - Clinic Operations Manual
   - Training/competency documents
   - Changes to HR policies for licensure funding, continuing education requirements/funds

5. Clinical Leadership/Pharmacist Buy-In
   - Three-year pilot of pharmacist patient care at six practice sites (without prescribing)
   - Confirmation of malpractice liability insurance
   - Review/sharing of CDTM literature and area organization participation
   - Multiple presentations to Internal Medicine leadership - clinician chiefs, nursing leaders, NP/PA leaders
   - Consultation with applicable Specialty leaders
   - Approval of protocols by Pharmacy & Therapeutics Committee
   - Approval of policy by Executive Leadership Team
Pharmacy Clinic: Preparation/Implementation

Steps on the Road to CDTM: Clinic Set-Up

1. Electronic medical record (EMR) tools/updates
2. Training and competency
3. Quality assurance
4. Site preparation
5. Site staff buy-in

Even after all of this, things will continue to change/evolve!

1. EMR Tools/Updates
   - Referral management tool
   - Building a schedule template
   - New encounter types - “MTM” (easier to identify)
   - Templates for documenting
     - Note template, letter templates
   - Identification of patients under active CDTM
     - Pharmacist listed on EMR care team for patient
     - Problem list code - entered at enrollment and removed at discharge

2. Training and Competency
   - Professional Affairs Department
   - Pharmacy Credentialing Committee
   - Credentialing Requirements - operational, clinical
   - Pharmacy Department competency training - presentations, assigned clinical readings, vitals, BLS, observations
   - Credentialing packets - signed Agreement(s), pharmacist license, CS license, DEA # (if schedule II-V prescribing), BLS certification, observation checklists
     - Submitted to Professional Affairs for privileging

3. Quality Assurance
   - Continuing education - 25 credits/year
   - Repeat observations (every 2 years)
   - Grand rounds cases
   - Random case presentations
   - Supervising physician annual case review
   - Annual document review (guidelines/internal documents/BCACP modules)
   - Safety event review
   - Ensure up to date licensure

4. Site Readiness
   - Secure space
     - Office space and visit space, computer and phone
     - Patient educational handouts
     - Materials: demonstration devices (inhalers, glucometers), pill boxes
   - Site protocol awareness
     - Vitals: critical values, equipment (stethoscope/BP cuff)
     - Disruptive/combative patient
     - Medical emergencies, etc.
   - Marketing to patients
     - Waiting room videos
     - Brochures
     - Public website profiles for pharmacists
5. Site Staff Buy-In

- Many people need to know what is going on:
  - Clinicians at the site (MD, PA, NP)
  - Support staff (RN, LPN, MA, secretaries)
  - Other pharmacists (if outpatient pharmacy on site)
- Provide information in many ways: department presentations, 1 page handouts, 1:1 meetings

  Consider:
  - How to explain CDTM
  - Which patients are best for referral
  - How to avoid “turf wars”
  - How to assure team communication
  - Ease-in prescribing vs start all at once

Prior to Visit: Patient Work-up

- Pharmacist responsible for pre-work of patient, which may include discussion with provider
- Pharmacist confirms patient has needed labs ordered or completed recently (e.g., HgbA1c)
- CPhT may call patient to complete labs prior to appointment if needed
- CPhT may call patients with extra reminder about appointment

Pharmacy Clinic: Visit Workflow

Prior to Visit: Referral and Appointment Booking

- Patient referred by referring provider
  - Enters referral management queue
- CPhT schedules appointment after assuring patient is appropriate for CDTM
  - Reviews chart
  - Sends letter if patient has not been notified previously of referral being placed by provider
- Schedules are managed by pharmacists
  - Number of sessions (4 hour blocks) open is determined by pharmacist, site, and demand

During Visit: Initial Clinic Visit (60 min)

1. Patient checks in (no copay) and is roomed
2. Vitals taken (e.g., BP, weight)
3. Pertinent patient history reviewed
4. Labs reviewed with patient
5. Medication review/adherence/education discussed
6. Patient goals and therapeutic plan developed
7. Medications added, changed, or discontinued as appropriate
   - Signed with clinician’s name, pharmacist as ordering provider
8. Next appointment booked by pharmacist (as appropriate)

During Visit: Follow-up Visits

- Can occur in-person, via phone, or via email
  - Majority of in-person visits are scheduled for 30 minutes however some for 60 minutes at the discretion of the pharmacist
- Workflow similar to initial visits, as appropriate
- Follow-up labs and medications (refills, new) ordered by pharmacist
- CPhTs assist when patients cancel or do not show up for follow-up appointments or to request patient complete labs/provide non-critical lab results
After Visit: Documentation and Panel Management

- **Documentation:**
  - Care team designation and problem list code added for new patients
  - Encounters documented using home-grown encounter templates
  - Pharmacist to manage medication list for those meds pertaining to visit reason

- **Panel management:**
  - Pharmacist review patient panel (all active CDTM patients) in EMR at least monthly to confirm follow-up in place
  - Discharge considered if patient reaches clinical goal, can be managed by team to goal, declines follow-up, etc.

CDTM: Measuring Outcomes

**CDTM Performance Metrics**

1. Workload/clinic utilization
2. Clinical outcomes
3. Satisfaction surveys - patient/physician

1. Workload and Clinic Utilization: Monthly Report

- Number of referrals placed in the month
- List of referring clinicians
- CP Clinic encounters and utilization for the month
- Set your goal

Reporting Systems

- EMR reports
- PBM reports
- Documentation databases
  - Analytics and reporting department
2. Clinical Outcomes

- Determine what you want to measure and in what time period
- Develop protocol of when to capture change in values
  - Inclusion/exclusion criteria
- Establish goal for each measure


- Evaluates outcomes for patients that are enrolled in each quarter in the Clinical Pharmacy Clinic
- Outcomes evaluate patients discharged who had pre- and post-care lab values
- Evaluate change in HgbA1c, BP, LDL
  - Working on incorporating depression, anxiety, insomnia metrics
- Evaluate % of patients meeting clinical goal after discharge


- Patients enrolled in Q2-2016

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Metrics</th>
<th>Patient Goal</th>
<th>Total Enc</th>
<th>Initial</th>
<th>Post</th>
<th>Δ in Avg</th>
<th>% Aim</th>
<th>Δ Δ Aim</th>
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</thead>
<tbody>
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<td>Hypertension (BP)</td>
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</tr>
</tbody>
</table>

- Patients who were discharged between Q2 2016 and Q3 2017, and 7 continue to be on service at point of data pull.
- Patients who were discharged had an average number of encounters with clinical pharmacists.

3. Satisfaction Surveys

- What to ask
  - Keep it short
  - Allow comments
- Format
  - Clinician: electronic
  - Patient: hard copy at end of visit
- Report out in a timely manner
  - Presentation to leadership and individual sites
  - Global staff newsletter

3. Satisfaction Surveys: Clinicians

<table>
<thead>
<tr>
<th>How satisfied are you with the clinical pharmacists seeing your patients?</th>
<th>Additional comments/suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td></td>
</tr>
<tr>
<td>Satisfied</td>
<td></td>
</tr>
<tr>
<td>Somewhat satisfied</td>
<td></td>
</tr>
<tr>
<td>Not at all satisfied</td>
<td></td>
</tr>
<tr>
<td>No personal experience</td>
<td></td>
</tr>
</tbody>
</table>

- Comments have great impact on true voice of clinician and advocacy
3. Satisfaction Surveys: Patients

How helpful was the discussion in assisting you to better manage your medication(s) or medical condition(s)?

- Not at all helpful
- Somewhat helpful
- Helpful
- Very helpful

Comments:

How satisfied are you with today’s visit?

- Not at all satisfied
- Somewhat satisfied
- Satisfied
- Very satisfied

Comments:

How likely are you to recommend this service to a friend or family member?

- Not likely to recommend
- Somewhat likely to recommend
- Likely to recommend
- Very likely to recommend

Comments:

Is there anything else you would like us to know about your visit(s) with the clinical pharmacist?

3. Satisfaction Surveys: Patient Results

How helpful was the discussion in assisting you to better manage your medication(s) or medical condition(s)?

- Educational and Drug therapy: 34%
- Motivational: 7%
- Personal Goal Attainment: 7%
- Time and Attention: 9%
- Professionalism and Empathy: 39%
- Other: 4%

Common Elements of Survey Comments

What's Next?

- Expansion - more practices, more sessions, more diseases?
- Specialty CDTM?
- Auto-referrals?
- Billing?

Other Ways to Measure Outcomes

- Change in hospitalization or ED visit rate
- Change in medication adherence
- Clinical interventions - number, type
- Return on investment (ROI) - drug switches, pay-for-performance metrics
- Change in clinician productivity or access
- Other?

References


Additional Resources

Objectives
- Summarize different pain types and pathways
- Outline the new Massachusetts law on the judicious use of opioids and apply it to patient care scenarios
- Given a patient case, develop an optimal pharmacotherapeutic strategy to treat non-cancer pain

Which of the following are true regarding pain?

A. Pain is an objective response that can be measured
B. Pain is the body’s way of telling us to stop doing something
C. Pain elimination should be our goal
D. Opioid-addicted patients who report pain should not be believed

Pain
- The Body’s way of telling us about a problem
  - Hand on a hot surface
  - Pain from an injured knee causing a limp
  - Without it, there would be more injury
- Acute – Trauma/injury/dental procedures
- Chronic Malignant
- Chronic Nonmalignant (arthritis)
- Withdrawal related pain

Definitions
- Nociceptive pain
  - Noxious stimuli activate primary sensory neurons most commonly due to tissue damage
- Somatic pain
  - Type of nociceptive pain arising from injury to body tissues
- Visceral pain
  - Type of nociceptive pain arising from injury to internal organs
- Neuropathic pain
  - Pain initiated or caused by a primary lesion or dysfunction in the nervous system

Pain Primer
### Perception of Pain

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basal pain sensitivity</td>
<td>Pain experienced spontaneously or evolved directly by a stimulus</td>
</tr>
<tr>
<td>Normosensitivity</td>
<td>No spontaneous or background pain</td>
</tr>
<tr>
<td></td>
<td>Pain is provoked only by intense or noxious mechanical, chemical, or thermal stimuli</td>
</tr>
<tr>
<td>Hyposensitivity</td>
<td>Superthreshold noxious stimuli fail to produce a pain response</td>
</tr>
<tr>
<td>Hypersensitivity</td>
<td>Pain that arises spontaneously in the absence of a stimulus and increased response to peripheral stimuli</td>
</tr>
<tr>
<td>Hyperalgesia</td>
<td>Exaggerated response to noxious stimuli</td>
</tr>
<tr>
<td>Allodynia</td>
<td>innocuous stimuli causing pain</td>
</tr>
</tbody>
</table>


### Clinical Presentation

**ACUTE**
- In apparent distress
- Symptoms occur in a timely relationship with an obvious noxious stimuli
- Hypertension, tachycardia, diaphoresis

**CHRONIC**
- May not be in apparent distress
- Symptoms occur without a timely relationship with an obvious noxious stimuli
- Hypertension, tachycardia, diaphoresis not typically present


### PAIN MANAGEMENT

**Which of the following is true regarding optimal pain management strategies?**

A: Opioids are considered first line therapy for patients with moderate pain

B: Medications are almost always required to treat chronic pain

C: Multi-Modal analgesia should be considered a foundation of pain management

D: The use of medical marijuana has evolved as a second-line pain management strategy

**Remember non-pharmacologic pain management!**

- Psychological approaches – e.g., cognitive behavioral therapy
- Physical rehabilitative approaches
  - Physical therapy
  - Occupational therapy
- Surgical approaches
- Complementary therapies
  - Acupuncture
  - Chiropractic
Clinical Pearls of pain management

- Non-opioid options should be considered prior to providing opioids for pain.
- If opioids are used, the lowest effective dose for the shortest duration possible should be utilized.
- Set expectations for the patient.
  - Total pain relief is rare.
  - Goal is to take the "edge off" and reduce pain 20-30%.
  - Expect a 2-3 point reduction on a 10 point scale.
- Avoid long-acting opioids unless clinically indicated.
- Utilize multimodal analgesia.
- All patients receiving opioids should receive a bowel regimen.

Which of the following is most appropriate when counseling a patient with post-surgical pain?

A: Our goal is to be pain-free
B: Our goal is at least a 50% reduction in pain intensity
C: Our goal is to "take the edge off" to promote activity
D: Our goal is at least a 75% reduction in pain intensity

Old Stepwise approach to Pain Management

<table>
<thead>
<tr>
<th>Mild Pain</th>
<th>Moderate Pain</th>
<th>Severe Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give opioids</td>
<td>Give more opioids</td>
<td>Give even more opioids</td>
</tr>
</tbody>
</table>

Multi-Modal Approach to pain management

- Appropriate analgesics for different pain severities:
  - Mild → NSAIDs, acetaminophen, localized therapy
  - Moderate → Lower dose opioids and titrate to effect
  - Severe → Up-titration of opioid therapy

- Multimodal approach to pain control:
  - Utilization of opioid analgesics in combination with non-opioid analgesics to decrease opioid requirements.
  - Decreases incidence of adverse effects of opioids.
  - In some cases, addresses the underlying cause of the pain (inflammation).

Multi-Modal Analgesia

- Non-opioid analgesics should be employed in eligible patients (mild/moderate pain) to decrease amount of opioid administered or to reduce opioid side-effects:
  - Acetaminophen (PO, PR, IV)
  - Ketorolac (IV)
  - Ibuprofen, Naproxen (PO)
  - Topical NSAIDs (osteoarthritis)
  - Duloxetine

Non-Opioid analgesics

- NSAIDS (ketorolac, ibuprofen, naproxen)
- Acetaminophen
- Tramadol
- Neuropathic therapies:
  - Gabapentin, Pregabalin
  - Anticonvulsants
  - Duloxetine
- Topical agents:
  - Diclofenac
  - Lidocaine
  - Capsaicin
### NSAIDS - Systemic

- Extremely effective for pain related to inflammation
- Important side effects to consider
  - GI bleeding
  - Renal effects
    - Dehydration
    - CHF
    - Baseline renal dysfunction
  - Elderly
  - Risk of cardiovascular events

### Ketorolac

- Extremely potent
- Can be given for no more than 5 days
- Should not be given with other NSAIDS
- 15-30 mg IV x1, then 15-30mg q 6h prn (max daily dose 120 mg)
- Renal risk
  - Patients dependent on Prostaglandins for renal blood flow (elderly, CHF, critically ill)
- GI risk

### PO NSAIDS

<table>
<thead>
<tr>
<th>Ibuprofen</th>
<th>Naproxen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max daily dose: 3.2 g</td>
<td>Max daily dose: 1250 mg</td>
</tr>
<tr>
<td>Should be dosed q 4-6 h/prn</td>
<td>Should be dosed 500mg x1, then 250 mg q 8h prn</td>
</tr>
<tr>
<td>Should be taken with food/milk if possible (GI upset)</td>
<td>Take with food/milk</td>
</tr>
<tr>
<td>Available as tab/suspension</td>
<td>Available only as tab</td>
</tr>
</tbody>
</table>

### COX-2 Inhibitors

- Celecoxib (PRECISION trial)
  - No difference in CV outcomes compared with ibuprofen and naproxen
  - Lower rates of GI bleeding than ibuprofen or naproxen
  - Lower rate of renal effects than ibuprofen
  - Adding a PPI to any NSAID (including celecoxib) reduces rate of GI bleeding

### Acetaminophen

- Analgesic with no anti-inflammatory activity
- Relatively safe across a wide group of patients
- Caution in patients with liver disease
- Available as PO, PR, and IV
- Max daily dose is 4 grams/day

### Acetaminophen and 3 grams/day

- Acetaminophen is the largest unintentional overdosed medication in the US
  - Available in MANY cough/cold preps, as well as with opioids (Percocet, Vicodin)
  - Voluntary action by 1 manufacturer (McNeil) to reduce max daily dose
    - Mainly geared towards unmonitored outpatients to reduce likelihood of unintentional overdose
  - FDA still considers 4 gram/day safe.
### Acetaminophen
- 2 grams a day maximum dose for patients with chronic liver disease/other risk factors
  - Alcoholic hepatitis/cirrhosis
  - Hepatitis B/C
  - Patients who consume >2 drinks per day

### IV Acetaminophen
- Utilized for patients unable to tolerate other routes of acetaminophen
- NO data to suggest efficacy is any different from other dosage forms
- Has an identical safety/dosing profile to oral acetaminophen
- Cost is significant when compared to PO/PR

### Tramadol
- "Weak" opioid
- Also has serotonin and norepinephrine reuptake inhibition (ascending pathway)
- Patients can become dependent
- Side effects
  - GI upset
  - Seizures (esp in patients on other antidepressants)
  - May increase suicidal ideation in at-risk patients
- Dose: 50-100mg q4-6 h (max 400mg/day)

### Gabapentin
- Binds to Ca++ channels, inhibiting neurotransmitter release
- Postherpetic neuralgia, diabetic neuropathy
- Pain relief not immediate. May take up to 2 months for an adequate trial
- Max dose 3600 mg per day (1200 q 8h)
- Dose needs to be adjusted in renal impairment

### Pregabalin
- A more lipophilic cousin of gabapentin
- May be faster-acting than gabapentin
- Schedule V controlled substance
- Start at 50mg TID
- Max dose depends on indication:
  - 450 mg fibromyalgia
  - 300 mg neuropathic pain
  - 600 mg postherpetic neuralgia
- Need to adjust dose in renal impairment

### Neuropathic Pain Options
- Agent selection dependent on type of neuropathic pain
- Gabapentin, pregabalin first line in many cases
- Tricyclic antidepressants
- Anticonvulsants
**Duloxetine**

- Serotonin/Norepinephrine reuptake inhibitor
- May be used for
  - Diabetic neuropathy – Initial 60mg/day
  - Fibromyalgia – 30mg/day for 1 week, then 60mg/day
  - Chronic musculoskeletal pain – 30mg/day for 1 week, then 60 mg/day
  - Osteoarthritis of the knee – 30mg/day for 1 week, then 60 mg/day

---

**Tricyclic Antidepressants**

- Amitriptyline, Nortriptyline etc
- Doses used are often lower than anti-depressant dosage
- Possess anticholinergic as well as antihistamine effects.
  - Sedation
  - Dry mouth
  - Elderly are especially susceptible

---

**Anticonvulsants**

- Block Na channels, thus reducing neuronal hyperexcitability
- May work well in situations where opioids have little effect
  - Trigeminal neuralgia
  - Diabetic neuropathy
- Carbamazepine, lamotrigine, phenytoin, topiramate

---

**TOPICAL THERAPY**

**Topical NSAIDS**

- Diclofenac – Available in:
  - Patch
  - Gel
  - Solution
- Gel and solution are FDA-approved for Osteoarthritis treatment
- No benefit when combined with oral NSAIDS

---

**Lidocaine Patch**

- Indicated for the relief of post-herpetic neuralgia
- Patch is applied to the most painful area
- Up to 3 patches may be used, and can remain in place for 12 hours in a 24 hour period
- DO NOT USE on broken/damaged skin
- May be useful in the treatment of rib fracture pain
Capsaicin
- Available OTC as a cream, lotion (0.025%, 0.075%) and a patch
- 8% patch (Rx only)
  - Used on an outpatient basis
  - Applied for 1 hour every 3 months
  - Application is painful, and needs to be done in a monitored setting
  - Expensive!

OPIOIDS

The crisis is everywhere
The Critical Care Crisis of Opioid Overdoses in the United States
- Opioid overdoses requiring intensive care increased 34% from 2009 to 2015
- Mortality from overdoses in the ICU increased from 7% to 10%

Ann Am Thorac Soc. 2017 Aug
These medications are a problem in Massachusetts too…

- According to the most recent data, it is estimated that there were nearly 1,200 unintentional and undetermined opioid deaths in 2014.
- The estimated rate of 17.4 deaths per 100,000 residents for 2014 is the highest ever for unintentional opioid overdoses and represents a 228% increase from the rate of 5.3 deaths per 100,000 residents in 2000. And the trend isn’t slowing.
- Preliminary data estimations show there were over 1,100 opioid deaths between January and September of 2015.

In response Massachusetts has…

- Allocated more than $250 million toward the opioid epidemic for substance use disorders, education, prevention and treatment
- Increased bulk purchasing of Narcan in municipalities by offering Narcan at a discount to our first responders
- Changed reporting requirements for the Prescription Monitoring Program from 7 days to 24 hours.
- More than two hundred substance use treatment beds have been opened throughout the Commonwealth.

An Act relative to substance use, treatment, education and prevention

- Gov. Baker signed into law March 14, 2016
- Meant to fight the opioid and heroin epidemic in MA
- Strengthen prescribing laws
  - Containing amount of opioid dispensed
  - Screening for those at risk
- Increase education for students and doctors
  - Requirement for CME focusing on effective pain management and risks of abuse and addiction associated with opioids.
  - Allowing people to voluntarily agree to treatment after an opioid overdose

Updated prescribing laws

- Opioid prescription limited to 7 day supply for first time adult prescriptions
  - Some exceptions. Provider must document why more than a 7 day supply is needed in the medical record
  - 7 day limit on every opioid prescription for minors, with certain exceptions
- Requirement for physicians to check the prescription drug monitoring program (PMP) database before writing a prescription for a schedule II or III narcotic.
- Requirement to carefully evaluate patients who are prescribed long-acting opioids.
  - Must create a written pain management treatment agreement with the patient in the medical record

Provider education

- A prerequisite to obtaining or renewing professional licenses, must complete appropriate training relative to:
  - Effective pain management
  - Risks of abuse and addiction associated with opioid medication
  - Identification of patients at risk for substance abuse disorders
  - Counseling patients about the side effects, addictive nature, and proper storage and disposal of prescription medications
  - Appropriate prescription quantities for medications that have an increased risk of abuse
  - Opioid antagonists, overdose prevention treatments

Empowering individuals

- Patients will receive access to non-opiate directive forms and the option of partially filling opiate prescriptions in consultation with doctors and pharmacists
  - Pharmacists may fill a lesser quantity, with the remainder quantity shall be void.
  - The pharmacist or designee shall within a reasonable time following a reduction in quantity, but not more than 7 days, notify the prescribing practitioner of the quantity actually dispensed.
- Schools must annually conduct verbal substance misuse screenings in two grade levels
- Schools must partner with the DPH around effective addiction education policies
Access to treatment
• Bill seeks to strengthen access to insurers
• Creates an addiction bed finder tool website
• Creation of a rehabilitation program for pharmacists, technicians, and pharmacy interns

Drug Stewardship programs
• A program financed by a pharmaceutical product manufacturer or group to collect, secure, transport, and safely dispose of unwanted drugs
• No requirement for retail pharmacies/pharmacists to participate.
  • Pharmacies may voluntarily participate

Improved access to screening
• Patients admitted to an acute care hospital with suspected substance abuse must have a substance abuse evaluation within 24 hours.
• PCP must be notified
• Must be documented in the medical record

So NOW we can talk about opioids…

Opioids
• Invoke analgesia and sedation
• Have little, if any, amnestic effects
• Side effects: Respiratory, GI
• Preventing pain is more effective than treating established pain
• The "Flying Fig" – Creating conscious ambivalence to pain

EQUIANALGESIA
• Equivalent doses of opioids that provide the same analgesic effect
• No opioid shown to be superior to any other
• Choice of agent dependent on organ function, patient history

### Equianalgesic conversion chart

<table>
<thead>
<tr>
<th>Drug</th>
<th>PO</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>7.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>--</td>
<td>0.1</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>20</td>
<td>--</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>30</td>
<td>--</td>
</tr>
<tr>
<td>Methadone</td>
<td>Extremely variable</td>
<td></td>
</tr>
</tbody>
</table>


### Dosing considerations

- Patient health status
- Concomitant disease states/acute or chronic organ dysfunction
- Previous exposure to opioids
- Therapeutic goals
- Potential harm of opioid use
- Currently on opioid agonist therapy (OAT) (Buprenorphine, methadone)


### DOSING CONSIDERATIONS

- **Tolerance**
  - Reduction of drug effect over time as a consequence of exposure to the drug

- **Addiction**
  - Loss of control over drug use, compulsive drug use, and continued use of drug despite harm


### Debunking Pseudo addiction

- Concept coined in 1989
- No studies done to test or confirm its existence
- Strong industry-associated literature support
  - No evidence to suggest that it is different than addiction
- Is pseudo the only accurate description of pseudo addiction?


### Opioid Tolerance

- Patients are considered opioid tolerant if they have been receiving opioid therapy for at least 1 week consisting of:
  - 60 mg of morphine sulfate daily,
  - 25 mcg of transdermal fentanyl per hour
  - 30 mg of oral oxycodone daily
  - 8 mg of oral hydromorphone daily
  - 25 mg of oxymorphone hydrochloride daily.
- Or an equianalgesic dosage of another opiate daily for at least 1 week.


### Key points in IV Opioid selection

<table>
<thead>
<tr>
<th>Pharmacologic agent</th>
<th>Onset of action (IV)</th>
<th>Key points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>5-10 minutes</td>
<td>Histamine release, Hypotension</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>5-15 minutes</td>
<td>Very Potent. Caution with dose</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>1-2 minutes</td>
<td>Less hemodynamic instability than with morphine. Excellent procedural analgesic</td>
</tr>
<tr>
<td>Methadone</td>
<td>1-2 days</td>
<td>Unpredictable pharmacokinetics; QTc prolongation; drug interactions</td>
</tr>
</tbody>
</table>


Long-acting opioids

- Providers should:
  - Evaluate the patient's condition, risk factors for substance abuse or misuse, history of substance abuse, and current medication usage
  - Discuss with the patient that the prescribed medication is an appropriate course of treatment based upon medical need

FENTANYL PATCH

- Dosing: 12 mcg/hr, 25 mcg/hr, 50 mcg/hr, 75 mcg/hr, 100 mcg/hr
- Convert maintenance opioid regimen to total daily oral morphine dose before switching to fentanyl patch

<table>
<thead>
<tr>
<th>DO'S</th>
<th>DON'T'S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply to intact, non-irritated, and non-irradiated skin on a flat surface</td>
<td>Use in opioid naïve patients</td>
</tr>
<tr>
<td>Allow skin to dry before applying the patch</td>
<td>Cut the patch</td>
</tr>
<tr>
<td>Avoid exposure to heat sources</td>
<td>Use for treatment of acute pain</td>
</tr>
</tbody>
</table>

Fentanyl patch

Initial Administration

Assess pain intensity and presence of adverse drug reactions (significant for respiratory depression)

Dose Titration

Dose may be increased after 3 days based on doses of supplemental opioids required

Discontinuation

May take 17-20 hours for concentrations to decrease by approximately 50%; supplement with opioids at time of patch removal according to pain requirements

Opioid Allergy cross-reactivity

- True opioid allergies are very uncommon
- Different structural classes of opioids
  - Agents in the same classes will cross-react if there is a true allergy present

<table>
<thead>
<tr>
<th>Class</th>
<th>Opioids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenanthrenes</td>
<td>Morphine, oxycodone, hydromorphone, hydrocodone, codeine</td>
</tr>
<tr>
<td>Phenylpiperidines</td>
<td>Fentanyl, meperidine</td>
</tr>
<tr>
<td>Diphenylheptanes</td>
<td>Methadone</td>
</tr>
</tbody>
</table>


Methadone

- Synthetic opioid with NMDA antagonist properties
- Long half life (24 hours) only applies to opioid craving
- Duration of analgesia: 4-8 hours
- Very difficult to ascertain “equi-analgesic” dosing… START LOW
  - 5 mg q 8 hours to start is reasonable
- Titration should be no more frequent than every week due to the long half life
- WATCH the QTc! Baseline QTc should be measured prior to initiation

Managing pain in the addicted patient

- Often very difficult
  - Patient tolerance to opioids
  - Patient enhanced perception of pain
  - Patient currently on medications that may antagonize opioid effect (buprenorphine, naloxone)
  - Risk of relapse in patients who are recovering addicts
- Providers reluctant to acknowledge pain and may subsequently undertreat
- May consider non-opioids, kappa agonists (ketamine, nalbuphine)

NMDA Antagonists (Ketamine and Methadone)

• NMDA receptors can facilitate the development of peripheral hyperalgesia (greater pain than normally expected) and central sensitization ("windup") to painful stimuli.
• NMDA antagonists can enhance the effectiveness of opioid therapy, thus decreasing dose and limiting side effects (GI).

Ketamine

• Aka “Special K”
• Causes a "dissociative" effect, not unlike PCP
• Used in patients with hyperalgesia or on high dose of opioids to minimize side effects
• Bolus of 0.2-0.75mg/kg followed by infusion of 0.1-0.3 mg/kg/hr
• Monitor for emergence reactions
• Tachycardia/hypertension common ADR

Opioid adverse drug reactions

<table>
<thead>
<tr>
<th>Nausea/vomiting</th>
<th>Constipation</th>
<th>Respiratory depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pruritis</td>
<td>Dysphoria, euphoria</td>
<td>Hypotension</td>
</tr>
</tbody>
</table>


Treatment of Nausea and Vomiting

• Serotonin antagonists
  • Ondansetron (Zofran®)
    • Indicated for prevention of nausea and vomiting
    • Concern for QTc prolongation especially at higher doses (>32mg/day)
    • QTc prolonged by 14msec after single-dose of 24mg
    • Most common patient complaint is headache
    • Adverse effects with chronic usage
    • Elevation in liver transaminases and constipation


Phenothiazines

• Prochlorperazine (Compazine®)
  • 5-10mg PO 3-4 times daily
• Promethazine (Phenergan®)
  • 25mg PO followed by repeat of 12.5-25mg every 4-6 hours as needed
  • 12.5-25mg IV no more than every 4 hours (maximum infusion rate of 25mg/min)

Adverse reactions

<table>
<thead>
<tr>
<th>Anticholinergic effects</th>
<th>Hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akathisia</td>
<td>Dystonic reactions/EPS</td>
</tr>
</tbody>
</table>

Treatment of constipation

<table>
<thead>
<tr>
<th>Pharmacologic agent</th>
<th>Mechanism of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docusate</td>
<td>Stool softener</td>
</tr>
<tr>
<td>Senna</td>
<td>Stimulant</td>
</tr>
<tr>
<td>Bisacodyl</td>
<td>Stimulant</td>
</tr>
<tr>
<td>Polytetraethylene glycol</td>
<td>Osmotic agent</td>
</tr>
<tr>
<td>Lactulose</td>
<td>Osmotic agent</td>
</tr>
<tr>
<td>Magnesium citrate/hydroxide</td>
<td>Osmotic agent</td>
</tr>
<tr>
<td>Methylnaltrexone</td>
<td>Peripherally-acting opioid antagonist</td>
</tr>
</tbody>
</table>


Methylnaltrexone
- Blocks peripheral mu receptors not causing reversal of analgesic effects
- **Indicated for opioid-induced constipation**
- Dosing
  - Dependent upon weight and renal function
  - Reduce dose by half in patients with creatinine clearance < 30 mL/min
  - Contraindicated in patients with known bowel obstruction
  - Increased risk of gastrointestinal perforation
- Only to be used when other bowel regimens have failed

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dosing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 38 kg</td>
<td>0.15mg/kg SC every other day as needed</td>
</tr>
<tr>
<td>38 kg to &lt; 62 kg</td>
<td>8mg SC every other day as needed</td>
</tr>
<tr>
<td>62 kg to &lt; 114 kg</td>
<td>12mg SC every other day as needed</td>
</tr>
<tr>
<td>&gt; 114 kg</td>
<td>0.15mg/kg SC every other day as needed</td>
</tr>
</tbody>
</table>


Case
- FP is a 38 year old male admitted to the trauma ICU status post motor vehicle collision. He has undergone several surgeries to repair multiple fractures, including femur, humorous, and rib. FP reports a pain level of 8/10, and appears to be in acute pain. How should his pain be approached?

A curveball…
- He has a past medical history significant for opioid abuse, for which he is currently taking methadone 60 mg daily

A different curveball…
- He has a past medical history significant for opioid abuse, for which he is currently taking buprenorphine/naloxone 8mg/2mg once daily

Yet another curveball
- He has a past medical history significant for opioid abuse, but has been abstinent for the past 5 years.
Clinical Pearls of pain management - Revisited

- Non-opioid options should be considered prior to providing opioids for pain
- If opioids are used, the lowest effective dose for the shortest duration possible should be utilized
- Set expectations for the patient
  - Total pain relief is rare
  - Goal is to take the "edge off" and reduce pain 20-30%
  - Expect a 2-3 point reduction on a 10 point scale
- Avoid long-acting opioids unless clinically indicated
- Utilize multimodal analgesia
- All patients receiving opioids should receive a bowel regimen.

Resources

- CDC guidelines on prescribing opioids
  - https://www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm
- CDC opioid resource website for health professionals:
  - http://www.hhs.gov/opioids/health-professionals-resources/index.html#
MassHealth Pharmacy Update
Paul L. Jeffrey, PharmD
Director of Pharmacy
Massachusetts Health Council
20th Annual Pharmacy Public Health Policy Symposium
January 17, 2018

Disclosure Information
- I have no actual or potential conflict of interest in relation to this activity.

Objectives
- Explain recent changes to federal and state regulations concerning the MassHealth Pharmacy Program
- Describe recent drug utilization trends in the Massachusetts Medicaid Program
- Describe pending changes to the MassHealth Program

MassHealth Enrollment
May 2017

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MassHealth Enrollment
May 2017

MASSE HEALTH ENROLLMENT BY PAYER TYPE
MAY 2017

MassHealth Total Programmatic Cash Spending
(Billions of Dollars)

MASSEHEALTH AS A PROPORTION OF ALL STATE SPENDING (BILLIONS OF DOLLARS)

MASSEHEALTH REIMBURSEMENT AS A PORTION OF ALL FEDERAL REVENUES (BILLIONS OF DOLLARS)

MASSHEALTH SPENDING BY SERVICE TYPE IN STATE FISCAL YEAR 2016

TOTAL MASSHEALTH SPENDING = $13.5 BILLION

GROWTH IN MASSHEALTH TOTAL SPENDING, ENROLLMENT, AND PER MEMBER PER MONTH (PMPM) COSTS

Change is in the Air

Three Varieties of MassHealth ACOs

MassHealth

Accountable Care Partnership Plan
Contract between MassHealth and Accountable Care Partnership Plan
13 selected

Primary Care ACO
Contract between MassHealth and ACO
3 selected

MCO
Contract between MassHealth and MCO

MCO-Administered ACOs
Contract between MCO and ACO
1 selected
The Pharmacy Environment

- FDA evolving – 21st Century Cures Act
- Specialty pharmacy trend
- Gene therapy enters the marketplace
- Value/outcomes-based pharmaceutical contracting
- Pharmacy utilization management strategies

Gene Therapies

<table>
<thead>
<tr>
<th>DRUG</th>
<th>BRAND NAME</th>
<th>MANUFACTURER</th>
<th>INDICATION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tisagenlecleucel (CAR-T)</td>
<td>Kymriah</td>
<td>Novartis</td>
<td>Refractory Acute Lymphoblastic Leukemia</td>
<td>$475,000*</td>
</tr>
<tr>
<td>Axicabtagene ciloleucel (CAR-T)</td>
<td>Yescarta</td>
<td>Kite / Gilead</td>
<td>Refractory Large B-cell Lymphoma</td>
<td>$373,000</td>
</tr>
<tr>
<td>Voretigene neparvovec-rzyl</td>
<td>Luxturna</td>
<td>Spark</td>
<td>RPE65 Mutation-associated Retinal Dystrophy</td>
<td>$850,000* (both eyes)</td>
</tr>
</tbody>
</table>

Manufacturer has proposed an outcomes-based pricing structure

MassHealth Drug List

New Sections

- Brand preferred over generic
- Require less than 30-day supply to minimize fraud, waste, and abuse
- Move language from Regulation to MassHealth Drug List
  - Additional professional services reimbursed for pharmacies
  - Criteria for Controlled Substances Management Program
- Language clean-up

Pharmacy Regulations

Updated August 12, 2016

Updated April 1, 2017

- CMS Covered Outpatient Drug Rule - Pharmacy reimbursement based on Actual Acquisition Cost plus Professional Dispensing Fee
  - Single Source Drugs (incl “brand preferred”) - Lower of:
    • National Average Drug Acquisition Cost (NADAC), Wholesale Acquisition Cost (WAC) + dispensing fee or Usual and Customary (U&C)
  - Multiple Source Drugs – Lower of:
    • Federal Upper Limit (FUL), NADAC, WAC, + dispensing fee or U&C
  - 340B Drug Acquisition Cost + dispensing fee
  - Different rates for hemophilia factor, physician administered drugs
  - Dispensing Fee = $10.02 (Add-on for compounded drugs)
Massachusetts Board of Registration in Pharmacy

Ed Taglieri, MSM, NHA, RPh
Pharmacy Substance Use Disorder Program Supervisor

Objectives:
1. Recognize the impact of Substance Use Disorder (SUD) in the Pharmacy Community
2. Explain the role of the Massachusetts Pharmacists Substance Use Disorder Program in treatment and recovery for pharmacists, interns and technicians

Disclosure

There are no actual or potential conflicts of interest to be disclosed.

THE OPIOID CRISIS:
AN OVERVIEW OF SUBSTANCE USE DISORDER, TREATMENT AND IT’S IMPACT ON THE PHARMACY PROFESSION

Overview of the Opioid Crisis

- 1804 Morphine distilled from opium 1st time; 1853 hypodermic syringe invented
- 1898 Bayer chemist invents diacetylmorphine, name is heroin
- 1980 NEJM publishes letter to editor that becomes known as Porter and Jick
- 1986 Drs. Kathleen Foley and Russel Portenoy publish paper in the journal Pain, opening a debate about use of opiate painkillers for wider variety of pain.

Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Health Professions Licensure
Board of Registration in Pharmacy

AN OVERVIEW OF SUBSTANCE USE DISORDER, TREATMENT AND IT’S IMPACT ON THE PHARMACY PROFESSION

Massachusetts Board of Registration in Pharmacy

Massachusetts Board of Registration in Pharmacy

Massachusetts Board of Registration in Pharmacy

This single paragraph was printed in the January 10, 1980, issue of the New England Journal of Medicine:

ADDICTION RARE IN PATIENTS TREATED WITH NARCOTICS

To the Editor: Recently, we examined our patient files to determine the incidence of narcotic addiction in 36,946 hospitalized medical patients who were monitored consecutively. Although there were 11,882 patients who received at least one narcotic preparation, there were only four cases of reasonably well documented addiction in patients who had a history of addiction. The addiction was considered major in only one instance. The drugs implicated were meperidine in two patients, Percodan in one, and hydromorphone in one. We conclude that despite widespread use of narcotic drugs in hospitals, the development of addiction is rare in medical patients with no history of addiction.

JANE PORTER
Rt. G Pharmacy Administration, JCAHO
Boston Collaborative Drug Surveillance Program
Boston University Medical Center
Waltham, MA 02154

For several years, this single, unsubstantiated paragraph was cited as evidence that opiate painkillers had a low risk of addiction.

Details of the analysis were not included in the publication.
Shown are number of citations of a 1980 letter to the Journal in which the correspondents claimed that opioid therapy rarely resulted in addiction. The citations are categorized according to whether the authors of the articles affirmed or negated the correspondents’ conclusion about opioids. Details about “other” citation categories are provided in Section 2 in the Supplementary Appendix.

Americans are prescribed about 6x as many opioids as Portugal and France, even though they have much easier access to health care. Americans consume more than 99% of the world’s supply of hydrocodone.

Drug overdose deaths by major drug type, US, 1999-2010

NCI/NCI-National Cancer Institute (NCI), Surveillance Research Program/SEDAC; CDC/NCHS, National Vital Statistics System, CDC/NCHS; Updated 2015

Motor vehicle traffic, poisoning, and drug poisoning (overdose) death rates, United States, 1880-2010


Americans are prescribed about 6x as many opioids as Portugal and France, even though they have much easier access to health care. Americans consume more than 99% of the world’s supply of hydrocodone.


Drug overdose death rate 2008 and opioid pain reliever sales rate 2010

US Food and Drug Administration, Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey

Changes in Pain Management in response to the Opioid Crisis

- Discussion with patients regarding pain expectations prior to procedure
- Alternate Treatments for mild to moderate pain:
  - physical therapy, heat, ice, massage, acupuncture
- Prescribing lower doses of pain meds and shift to non-opioid medications sooner
- MassPat (aka PMP)
- Avoid duplicate long and short acting opioids
- High dose limits: 100-120 ME
- Changes in pain scale concepts starting to emerge

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History, Epidemiology and Pathophysiology of Substance Use Disorder (SUD)

- Substance Use Disorder
  - Term “Addiction” has been abandoned
  - “Addiction” now termed as “Use Disorder”
  - Substance can be alcohol or drugs
  - Thus the term: Substance Use Disorder

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Aspects of SUD

- Chronic relapsing condition affecting the brain
- Compulsive use, loss of control with overuse, and continued use despite problems
- Shame and stigma
- Manageable just like other chronic diseases
- Responsive to treatment
  - Requires long term treatment to avoid relapse

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Statistics

- General Public SUD: 10%
- Pharmacists and other health care professions: up to 25%
  - Access to drugs
  - Stress
  - Knowledge
- Family History: 1 parent 20-25%
  2 parents 30-50%

Massachusetts Board of Registration in Pharmacy
The Culture of a Pharmacist with SUD

- Dean Dabney in JAPhA, May/June 2001
  Vol. 41, No. 3
- Use of Mind Altering or Potentially Addictive Prescription Drugs (PAPD)
- Used a random sample of licensed, practicing pharmacists who were members of APhA in the fall of 1996

What are we looking for?

- Paranoia and irritability
- Depression
- Blackouts
- Slurred speech
- Personal problems
- Parenting problems
- Sexual dysfunction

Culture of a Pharmacist with SUD

- 40% indicated using PAPD without 1st obtaining RX
- 20% reported 5 or more lifetime episodes
- 6% reported 10 or more, and 6% of these identified as being drug abusers
- Drugs obtained by stealing drugs from employers or forging scripts

Diagnostic Criteria for SUD

1. Use of substance in large amounts or for longer duration than intended
2. Personal desire to cut down or stop use, but unable to do so
3. Excessive time spent in the acquisition, use, or recovery of substance
4. Craving substance in question
5. Failure to honor personal commitments because of use
6. Ongoing use despite problems in relationships
7. Discounting important activities because of use
8. Continued use despite known harm or danger
9. Continued use despite worsening physical or psychological problems
10. Increased tolerance to substance
11. Experiencing withdrawal symptoms:
   - 2 symptoms: no disorder
   - 3 symptoms: mild disorder
   - >6 symptoms: severe disorder

Pathophysiologic Process of SUD

Substance Use Disorder:
- Is a chronic, relapsing brain disorder with potential for recurrence and recovery

Substance Use Disorder:
- Involves three-stage cycle that becomes more severe with continued substance use:
  - Binge and intoxication stage
  - Withdrawal and negative affect stage
  - Preoccupation and anticipation stage

Brain Cycle:
- Associated with dramatic and persistent changes in 3 principal regions:
  - Basal Ganglia
  - Extended Amygdala
  - Prefrontal Cortex
Pathophysiologic Process of SUD

Neurobiological Circuitry Implicated in Addiction

Disruptions in these brain regions:
- Enable substance-associated cues to trigger substance seeking
- Reduce sensitivity of brain reward systems and heighten activation of brain stress systems
- Reduce functioning of brain executive control systems, which are involved in decision-making and regulatory actions, emotions and impulses

Brain changes persist long after substance use stops; it is not known how much these changes may be reversed or how long it takes

Adolescence is a critical “at-risk period” for substance use disorder

All addictive drugs have especially harmful effects on the adolescent brain, which is still undergoing significant development.

Comparison of SUD Brain Scans

Repeated Drug Use Changes the Brain
Weakens the Brain Dopamine System

Sources: From the laboratories of Drs. A. Volkow and R. Schuster
Which of the following is not true about a SUD?

A. 10% of general public at risk of an SUD  
B. Reports up to 25% of Pharmacist and other health care professionals at risk of an SUD  
C. SUD is an acute condition needing only short term treatment  
D. The term “addiction” has been abandoned in is now termed “use disorder”

Treatment

- Assessment
- Detoxification
- Participation in an approved residential or outpatient program.
- Contractual agreement
- Support Group: 12 step program AA/NA
- Random Blood, urine or hair samples

Medications for Addiction (methadone, buprenorphine and naltrexone)

- Demonstrate superiority over behavioral interventions
- Buprenorphine and methadone (and to a lesser degree, naltrexone) have been shown to:
  - Reduce overdose rates
  - Increase retention in care
  - Reduce recidivism in incarcerated populations
  - Improve quality of life
  - Decrease depressive symptoms

A treatment program for SUD include?

- Assessment and detoxification
- Continued treatment in an approved residential or outpatient treatment program
- Support group attendance regularly long term
- All of the above

Medications for Opioid Use Disorders

- **Buprenorphine**: partial agonist, relieves cravings without “high” or dangerous side effects. Prescribed in office-based settings.
  - **Suboxone**: combines buprenorphine with naloxone (antagonist) to ward off attempts to get high by injecting. If injected, naloxone would induce withdrawal symptoms.
  - **Sublingually**: implant with continuous delivery over six months
- **Naltrexone**: antagonist, not addictive or sedating.
  - **Vivitrol**: injectable long acting formulation, eliminating need for daily dosing. Should be used only after detox to avoid withdrawal symptoms.
- **Methadone**: agonist, takes orally, reaches brain slowly.
  - Only available from approved outpatient programs, dispensed daily.

https://www.drugabuse.gov/publications/research-reports/heroin/what-are-treatments
State Programs Assisting Pharmacy Professionals with Substance Use Disorders

<table>
<thead>
<tr>
<th>Massachusetts PSUD Program</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Governor Baker and the State legislature in the acts of 2016, Chapter 52 approved as law: An Act Relative to Substance Use, Treatment, Education and Prevention</td>
<td></td>
</tr>
<tr>
<td>• PSUD is a new monitoring program in the Commonwealth of Massachusetts established by M.G.L. c. 112, § 24H</td>
<td></td>
</tr>
<tr>
<td>• Who can participate:</td>
<td></td>
</tr>
<tr>
<td>– Pharmacists</td>
<td></td>
</tr>
<tr>
<td>– Pharmacy Interns</td>
<td></td>
</tr>
<tr>
<td>– Pharmacy Technicians</td>
<td></td>
</tr>
<tr>
<td>• Voluntary</td>
<td></td>
</tr>
<tr>
<td>• Confidential</td>
<td></td>
</tr>
<tr>
<td>• Provides a non-disciplinary alternative to traditional disciplinary action against individual’s license</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PSUD Monitoring Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 5 year program</td>
</tr>
<tr>
<td>– Full restrictions from practice for first year</td>
</tr>
<tr>
<td>– Gradual return to work and duties at years 2-5</td>
</tr>
<tr>
<td>• Meet with Rehabilitation Evaluation Committee (REC) and supervisor regularly (7 member; 3 RPh, 1 PT, 1 MD, 2 public)</td>
</tr>
<tr>
<td>• Individualized Rehabilitation Plan (IRP) developed with REC</td>
</tr>
<tr>
<td>• Work setting required to report to REC and PSUD Supervisor</td>
</tr>
<tr>
<td>• Attendance at support groups and Peer Support Group</td>
</tr>
<tr>
<td>– (AA/NA)</td>
</tr>
<tr>
<td>• Random Drug Testing</td>
</tr>
<tr>
<td>– (blood, urine, hair)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>License Status and Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How the public website will display license status:</td>
</tr>
<tr>
<td>– Non-disciplinary restrictions: during complete work absence</td>
</tr>
<tr>
<td>– Non-disciplinary conditions: during gradual work return</td>
</tr>
<tr>
<td>– Once program completed successfully, removed from permanent record and website</td>
</tr>
<tr>
<td>• How is the program paid for:</td>
</tr>
<tr>
<td>– Funded by licensee</td>
</tr>
<tr>
<td>– No cost for the coordination of the program through the Board of Pharmacy</td>
</tr>
</tbody>
</table>

**Table 4**

<table>
<thead>
<tr>
<th>Model Structure</th>
<th>No. of States Currently</th>
<th>No. of States in 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Suspension</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>BDP</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Independent cooperation, 521</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Health care group departmental professional regulatory, hospital pharmacists owned or associated, nonprofit corporations</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>PSAP</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>NGOs (non-profit organizations)</td>
<td>57</td>
<td>—</td>
</tr>
<tr>
<td>BPA (Board of Pharmacy)</td>
<td>17</td>
<td>—</td>
</tr>
<tr>
<td>BPA (Board of Pharmacy)</td>
<td>17</td>
<td>—</td>
</tr>
<tr>
<td>PSAP, BPA, NGPSA, BPA, RPH, pharmacy health plans, ODP, employee assistance programs, HCA, health care association, HCS, health care organization,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

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The typical PSUD Rehabilitation Program includes?

A. 5 year program
B. Individualized Rehabilitation Plan (IRP) developed with REC (Rehabilitation Evaluation Committee)
C. Work setting reports to REC
D. Attendance at support groups
E. Random Drug Testing
F. All of the above

Referrals

Ed Taglieri, MSM, NHA, RPh
Pharmacy Substance Use Disorder Program Supervisor

Email: edmund.taglieri@state.ma.us
Phone: 781-973-0908
Learning Objectives

- Explain the effect of MassPAT on prescribing and dispensing communities
- Recognize the impact of interstate data sharing in relation to MassPAT

Daily Active Users & Searches in MassPAT from 12-04-2017 to 12-10-2017

122,107 Patient Searches Conducted in MassPAT from 12-04-2017 to 12-10-2017

MassPAT Activity and Opioid Prescribing in MA

Rate and Linear Trend of individuals with Activity of Concern in Massachusetts (FY 2009-2017)
Mandated Use

Authorized Practitioners are required to check MassPAT:

A. The first time writing a prescription for a Schedule II or III opioid or a benzodiazepine to a patient
B. Each time a Schedule II or III narcotic is prescribed or when prescribing a benzodiazepine for the first time
C. Each time a Schedule II-V drug or Gabapentin is prescribed

Exemptions

Authorized users are exempt from utilizing MassPAT if the practitioner is:

A. Issuing a prescription to a hospital inpatient at discharge
B. Providing care to hospice patients
C. Providing care to a patient you’ve treated within the past 30 days
D. All of the above

Exemptions

Authorized users are exempt from utilizing MassPAT if the practitioner:

A. Is providing care to someone under the age of 8 years
B. Is authorized to prescribe only Schedule VI drugs
C. Believes utilization of the prescription monitoring program is likely to result in patient harm
D. All of the above

EHR Integration

Data Quality

Authorized users are exempt from utilizing MassPAT if:

- Delinquent Pharmacies – Board Collaboration
- Lag Time
- Incorrect Data
- Storing Customer IDs?
- System Limitations
  - Interstate data
  - Incorrect coupling
**Interstate Data Sharing**

**Compliance**

Mass. docs fail opioid Rx checks

Matt Stout Wednesday, November 08, 2017

34 percent non-compliant

**Sample Compliance Chart (Masked Data)**

**Project Timeline**

"Part of the Solution Campaign" Update

- The CDC provided funds for an outreach campaign to encourage Massachusetts prescribers and dispensers to play an active, ongoing role in addressing the opioid crisis to:
  - Create and implement a focused prescriber/dispenser engagement campaign with a strong "Part of the Solution" message. The campaign will target prescribers/dispensers who are currently registered and using MassPAT, as well as those who have still not registered.
  - We will reach the two prescriber segments and the dispenser segment directly, and through the associations that serve them.

- ThinkArgus was selected as the vendor for this project. They were notified as the project vendor on January 5, 2018.
Provider Trend Notification

- The STEP law requires DPH to annually provide information on how an individual provider is prescribing Schedule II and III opioids in comparison to other prescribers within their self-reported specialty.
- DPH calculated the mean and median prescribing quantity, and volume (solid dosage unit) of all prescribers who prescribed at least one Schedule II or III opioid in CY 2016 by self-reported specialty.
- The first report was distributed on March 1, 2017.
- It is a confidential notification, it is not available for distribution by the Department and is only being shared with the individual provider.

New Quarterly Provider Trend Notification Report Template

Chapter 55: Linking Data

Data Sources
- DPH
- CHIA (MassHealth)
- BIOPIS
- MA SHIPS

System Attributes
- Data accessed in transit & at rest
- Embedded data self-validated at rest
- Simplified structure using summarized data
- Trending and analytics "on the fly"
- No residual file after query completed
- Analysis can't see data
- Automatic cell suppression
- Possible resolution to issues related to 42 CFR part 2

Chapter 55 – Key Findings from PDMP Linkage

- Compared to the general population, those who received three months of prescribed opioids are four times as likely to die from an opioid-related overdose within one year, and 30 times as likely to die of an opioid-related overdose within five years.
- 58% of those who died of an opioid-related overdose had an active Rx opioid in the previous 12 months.
- The use of 3 or more prescribers within a 3 month period is associated with a 7-fold increase in risk of fatal opioid overdose
- Having a concurrent prescription for opioids and benzodiazepines results in a four-fold increased risk of opioid-related death.

Chapter 55 Collaboration

- All-Domain Opening
- Significant coordination within offices
- Financial and technical support from MassIT's Data Office
- Click takes on role as Linking agent (ongoing?)
- Coordination across agencies (report & evaluation)
- High-end machines for staff
- "Volunteer" analytic support from academia and industry
- Internet or comprehensive governance from academia
- Offers to train DPH staff
(5) (a) The Department shall review the prescription monitoring information collected pursuant to 105 CMR 700.012. If there is reasonable cause to believe a violation of law or breach of professional standards may have occurred, the Department shall notify the appropriate law enforcement or professional licensing, certification or regulatory agency or entity and provide prescription monitoring information required for an investigation.

MA PMP Specialty Data
Analysis by Specialty: Pain Medicine

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Pain Medicine

CY 2016: N=25,834 for “All Prescribers”; N=205 for “Physician-Pain Medicine”; N=40 for “Nurse Practitioner-Pain Medicine”; N=12 for “Physician Assistant-Pain Medicine”

Analysis by Specialty: Oncology & Hematology

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Oncology & Hematology

CY 2016: N=25,834 for “All Prescribers”; N=612 for “Physician-Oncology/Hema”; N=146 for “Nurse Practitioner-Oncology/Hema”; N=49 for “Physician Assistant-Oncology/Hema”

Analysis by Specialty: Palliative/Hospice Care

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Palliative/Hospice Care

CY 2016: N=25,834 for “All Prescribers”; N=92 for “Physician-Hospice/Palliative”; N=17 for “Nurse Practitioner-Hospice/Palliative”; N=7 for “Physician Assistant-Hospice/Palliative”

Analysis by Specialty: Surgery

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Surgery


Analysis by Specialty: Pediatrics

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Pediatrics


Analysis by Specialty: Obstetrics and Gynecology

Average Total SO2 Per Prescriber by Prescriber Specialty 2011-2016

- Obstetrics and Gynecology

Analysis by Specialty:
Dentists

Average Total SQ\textsuperscript{2} Per Prescriber by Prescriber Specialty 2011-2016:

Dentists

CY 2016: N=25,834 for "All Prescribers"; N=3,495 for "Dentist-General"; N=222 for "Dentist-Surgery"

Analysis by Specialty:
Podiatrists

Average Total SQ\textsuperscript{2} Per Prescriber by Prescriber Specialty 2011-2016:

Podiatrists

CY 2016: N=25,834 for "All Prescribers"; N=89 for "Podiatrist-General"; N=175 for "Podiatrist-Surgery"

Analysis by Specialty:
Physical Medicine & Rehabilitation

Average Total SQ\textsuperscript{2} Per Prescriber by Prescriber Specialty 2011-2016:

Physical Medicine & Rehab.

CY 2016: N=25,834 for "All Prescribers"; N=173 for "Physician-Physical Medicine & Rehab"

Questions?