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Getting on Board: Opioid Stewardship in the ICU

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Disclosure

- There are no actual or potential conflicts of interest related to the content of this presentation

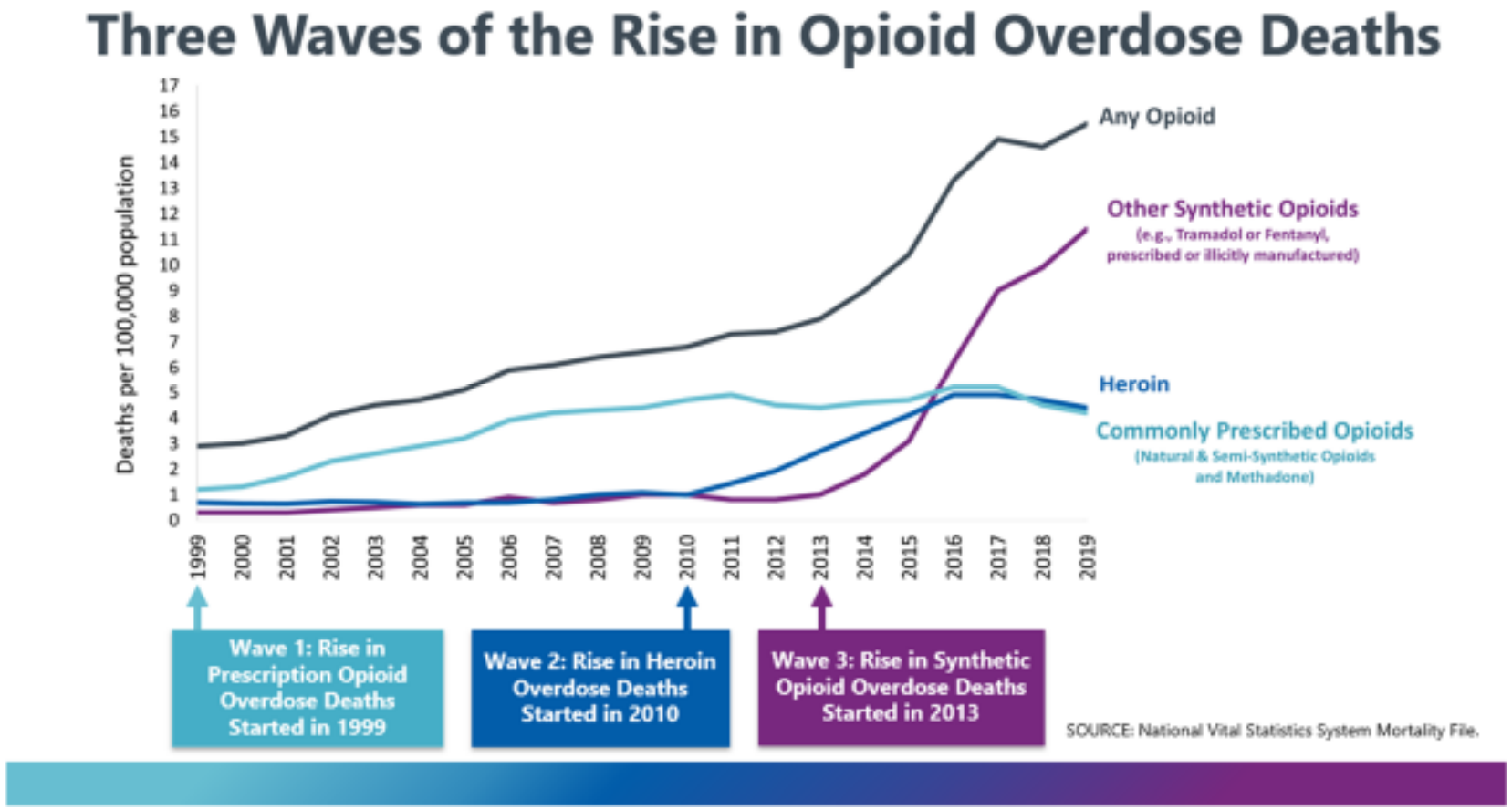
Objectives

- Define opioid stewardship
- Review the current literature regarding opioid use upon transitions of care from the ICU
- Identify key elements of opioid-reductive strategies and their application in the ICU

Patient AE

- AE is a 50 year old male with PMH significant for obesity, and recently diagnosed hypertension who was previously admitted to the ICU with COVID-19 ARDS and is now on the acute care floor
  - After a prolonged ICU stay AE is discharged to the floor on oxycodone 5 mg every 4 hours as needed for pain
  - 3 days after transfer you are called to a rapid response for patient who is now unarousable with decreased respiratory rate and pinpoint pupils

Trends in Opioid Prescribing



CDC. Understanding the Epidemic. https://www.cdc.gov/opioids/basics/epidemic.html. Mar 15, 2021.

PADIS Guidelines

- Consistent approach to pain assessment and management
- Analgesia-first approach
- Multi-modal pharmacotherapy to minimize and/or spare opioids and sedatives

Devlin JW, et al. *Crit Care Med.* 2018 Sep;46(9):e825-e873

Opioid Use in the ICU

- Up to 90% of mechanically ventilated patients receive narcotics in the ICU
- Average daily dose for IMV over 2-7 days = 63 mg MME vs 106 mg MME if IMV >7 days
- 63-86% receiving sedation received opioid analgesia

Mehta et al. *Crit Care Med*. 2006 Feb;34(2):374-80.
Burry et al. *Can J Anaesth*. 2014 Jul;61(7):619-30.
Richards-Belle et al. *Critical Care*. 2016 Oct;20:355.
Donohue JM et al. *Ann Intern Med.* 2019 Jul;17(2):81-90.

Consequences of Opioid Continuation

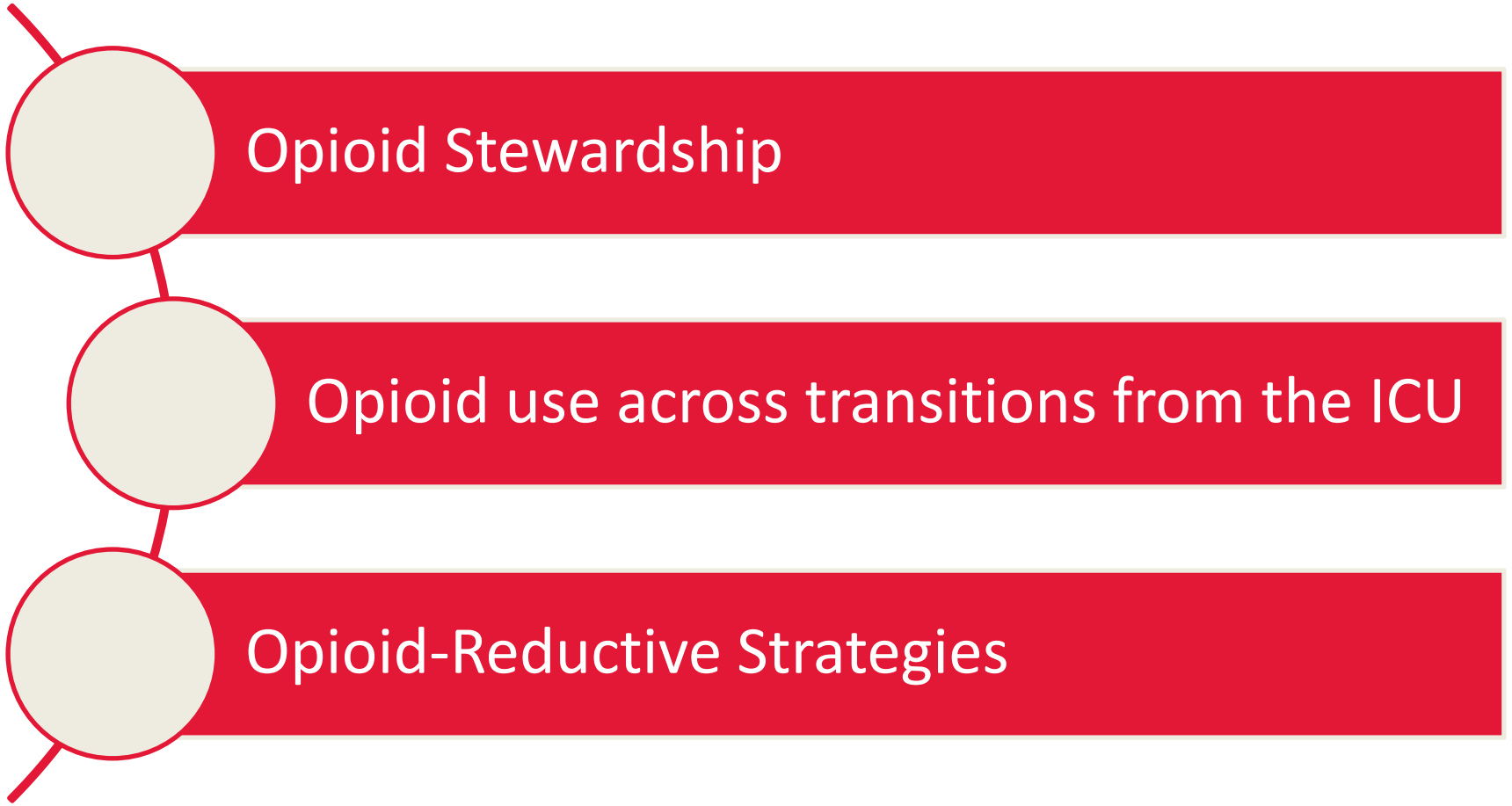
- Unintended long term use
  - Tolerance
  - Dependence
  - Withdrawal
- Diversion
- Opioid induced ventilatory impairment
- Falls
- Mortality

Macintyre P et al. *Anaesth Intensive Care.* 2011;39:545-58.
Lee L et al. *ASA Newsletter*. 2013 May;77:34-36.
Skrobik Y. *Am J Respir Crit Care Med*. 2020 Aug;202(4):484-6.

Joint Commission Pain Management Standards for Hospitals

- Identify pain assessment and pain management, including safe opioid prescribing, as an organizational priority
- Involve medical staff in leadership roles in organization performance improvement activities to improve quality of care, treatment, and services and patient safety
- Assess and manage the patient's pain and minimize the risks associated with treatment
- Collect data to monitor its performance
- Compile and analyze data

The Joint Commision. R3 Report Issue 11: Pain Assessment and Management Standards for Hospitals. 2018.


Opioid Stewardship
Opioid use across transitions from the ICU
Opioid-Reductive Strategies

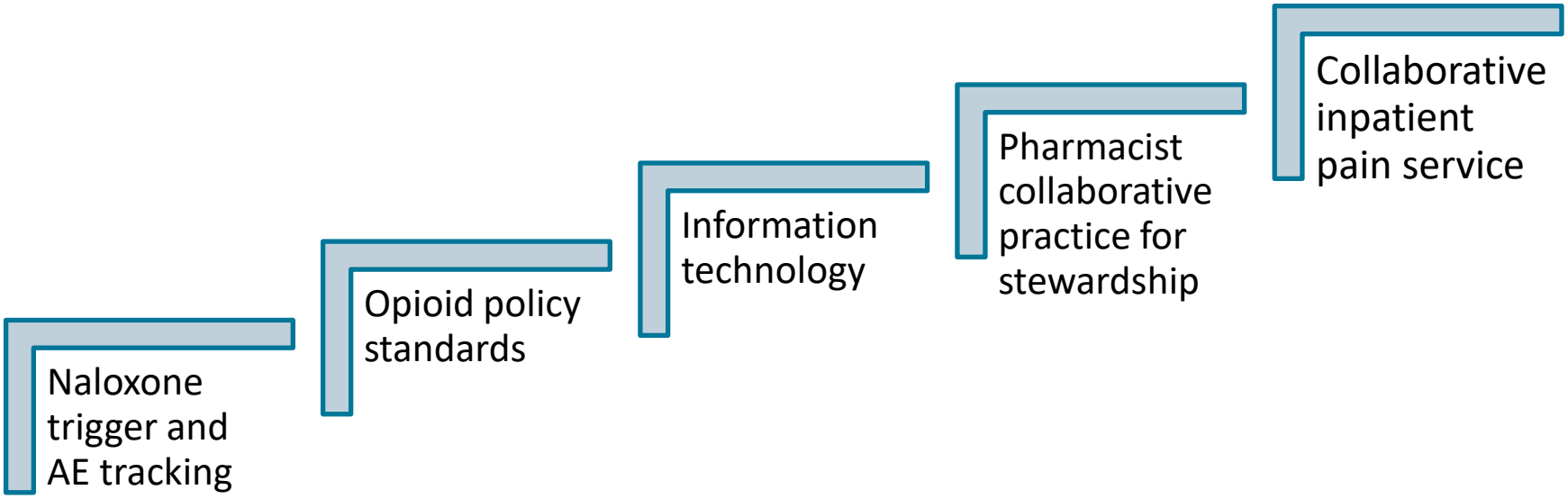
Opioid Stewardship

- Stewardship: conducting, managing, or supervising a process to oversee an organization or utilization of resources

- Coordinated interventions aimed at improving prescribing, mitigating risk and monitoring the use of opioids

Ardeljan L. et al. *Am J Health-Syst Pharm*.2020; 77:636-643.

Development of an OSP at Fairview Health Services



OSP=opioid stewardship program
AE=adverse event

Adapted from Ghafoor et al. *Hospital Pharmacy*.2019,54(4):266–273.

Initial Role of the Pharmacist at Fairview Health Services

- Pharmacy practice policies
  - Prohibited dosing range >2x
  - Standardized PCA orders
  - Opioid tolerance verification before continuous infusion
  - Adjustment of doses in end organ dysfunction
  - Review of long-acting agents
  - PMP verification

Ghafoor et al. *Hospital Pharmacy.*2019,54(4):266–273.

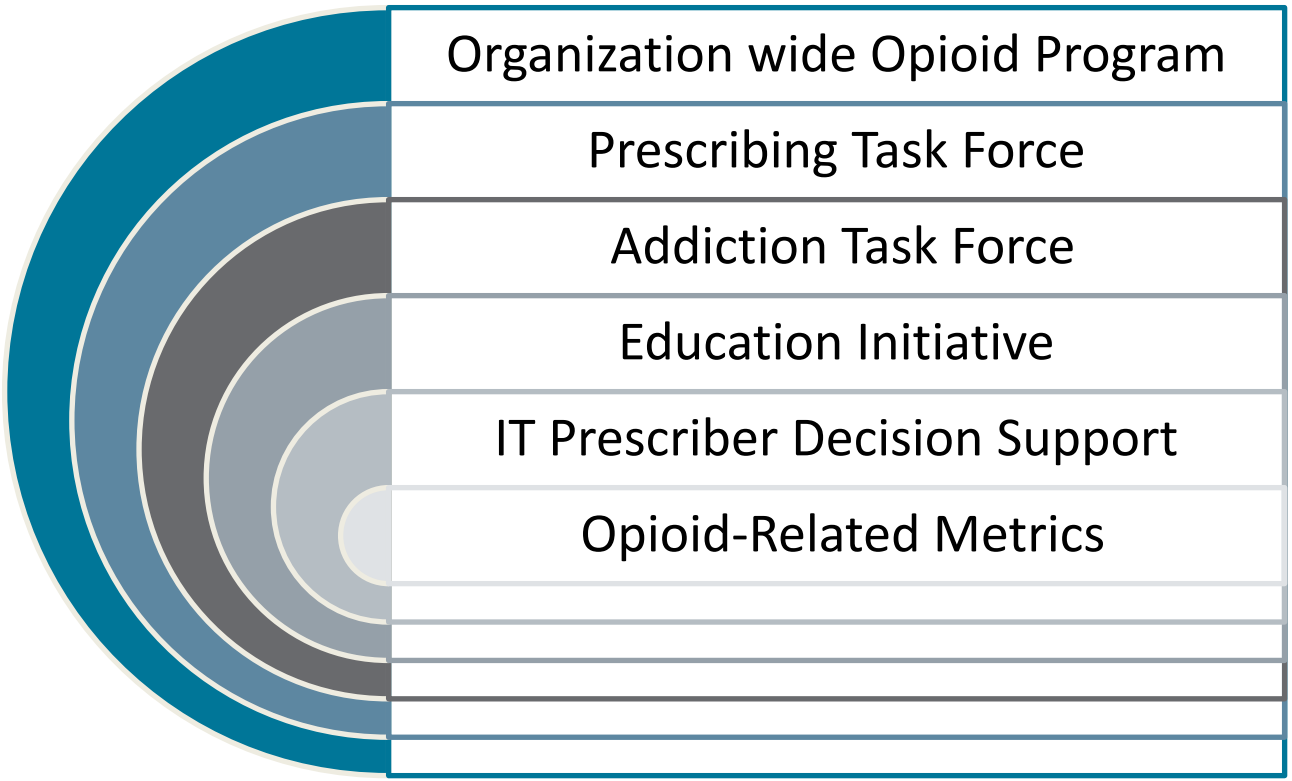
Transformation of the Pharmacist Role

- Pharmacist collaborative practice agreement

Medication History	Order Entry	Documentation	Collaboration
• PTA and current medication lists • Reconcile medications • Assess for indications & contraindications	• Order medications included in protocol	• Enter progress notes for dose changes or initiations	• Discuss with consulting teams • Prescribing provider can override orders

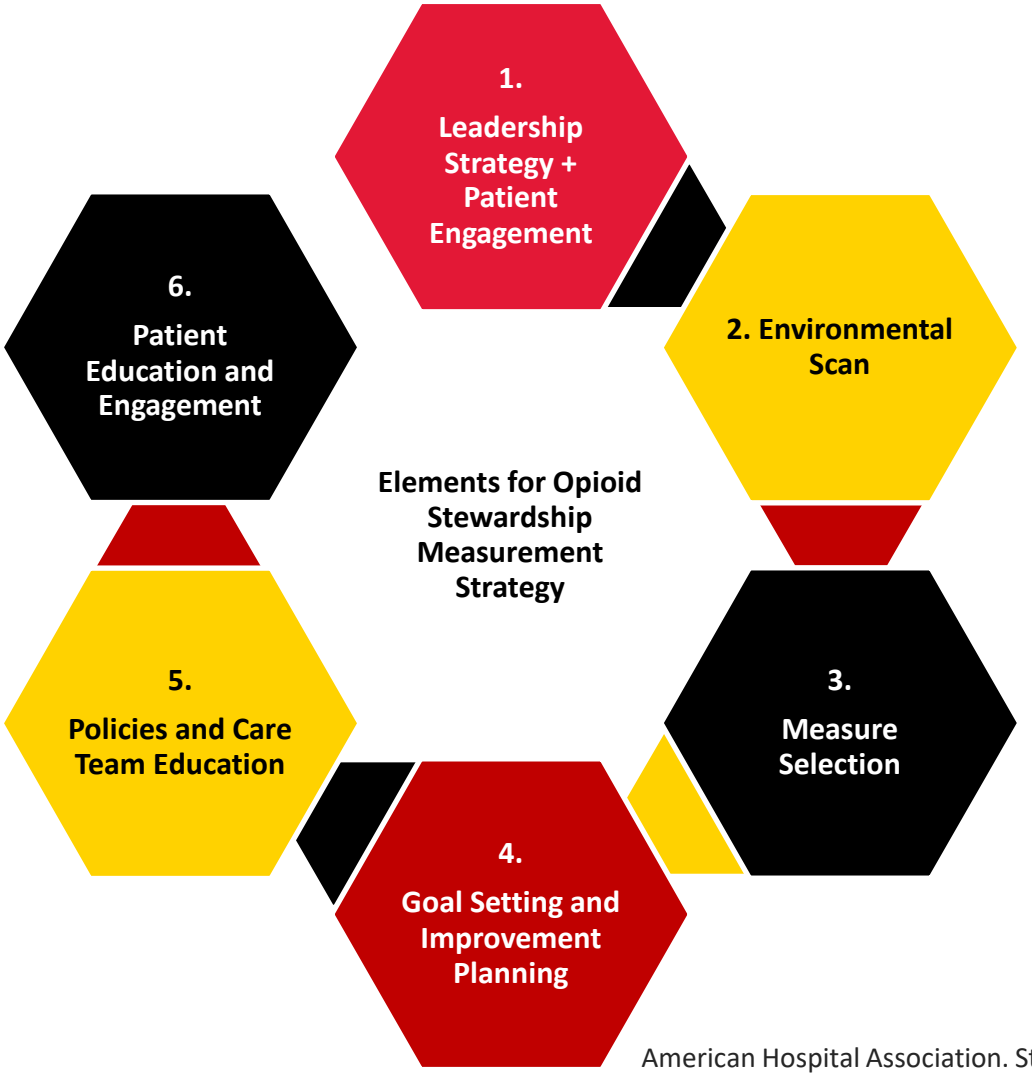
Ghafoor et al. *Hospital Pharmacy*.2019,54(4):266–273.

Health System-Wide Initiative to Decrease Opioid-Related Morbidity and Mortality



Weiner et al. *Jt Comm J Qual Patient Saf.* 2019 Jan,45(1):3-13.

AHA Implementation Guide



AHA=American Hospital Association

American Hospital Association. Stem the Tide: Opioid Stewardship Measurement Implementation Guide. www.aha.org/opioids. 2020.

Pharmacists Role in OSP

- ASHP surveyed 4897 pharmacy directors with 16.6% response rate (n=811)
- 41% of hospitals with active OSP with different components
- Pharmacists involved with:
  - Diversion and detection
  - Clinical utilization review
  - Leadership & accountability
  - Prescribing support

OSP=opioid stewardship program

Pedersen CA et al. *Am J Health-Syst Pharm.*2019; 76(14):1038-58.

Current State

- Cross-sectional survey of hospital best practices for opioid use of 133 hospitals
- Objective: to establish hospital practice patterns aimed at improving opioid use
- Results:
  - 23% with stewardship program
  - 14% with prospective screening for opioid-related AEs
  - PCA restricted at 45% of hospitals
  - 90% pain management service
  - 67% palliative care providing pain management

Ardeljan L. et al. *Am J Health-Syst Pharm*.2020; 77:636-643.

Audience Response

- Which of the following are components of the definition of opioid stewardship? (select all that apply)
    A. Coordinated Interventions
    B. Improving prescribing
    C. Monitoring
    D. Risk Mitigation


✓
Opioid Stewardship
Opioid use across transitions from the ICU
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Persistent post-discharge opioid prescribing after traumatic brain injury requiring intensive care unit admission: A cross-sectional study with longitudinal outcome| Dunn LK et al.	
Design	Single center, retrospective, cross-sectional
Objective	Determine incidence and risk factors for persistent opioid prescription after hospitalization for TBI
Population	- 297 adult patients with TBI admitted to neuroscience ICU 1/2013-2/2017 for intracranial injury - 76 PTA opioid users, 221 opioid naïve
Results	- PTA opioid users: 48 (87%), 36 (69%), 22 (56%) at 1, 6 & 12-mo - Opioid naïve opioid use: 69 (41%), 24 (23%), 17 (19%) at 1, 6 & 12 mo - Increased risk of opioid prescription @ 12 mo post-discharge: - **Preadmission opioid use:** OR 324.8, 95% CI 23.1–16907.5, p = 0.0004 - **Higher opioid requirements during hospitalization:** OR 4.5, 95% CI 1.8–16.3, p = 0.006

TBI=traumatic brain injury
PTA=prior to admission
Mo=month(s)

Dunn LK et al. *PLOS One*. 2019;14 (11):e0225787.

New Persistent Opioid Use after Postoperative Intensive Care in US Veterans| Karamchandani K et al.	
Design	Multicenter, Retrospective, cohort
Objective	Determine new persistent opioid use in patients discharged after postoperative intensive care with the VHA
Population	352,777 adult, opioid naïve patients pre-operatively receiving postoperative ICU care for >24 H within the VHA 2000-2016
Results	- 7,729 (4.1%) developed new persistent opioid use - Demographics of those with new persistent opioid use: - Younger age: 62.5 (0)*y vs 66.8 (10)y, p<0.01 - Alcohol use disorder: 1,036/7,729 (13.4%); 14,742/185,599 (7.9%); *P* < .001 - Substance use disorder: 4,335/7,729 (56.1%); 72,092/185,599 (38.8%); *P* < .001

*data presented as mean(SD)

VHA=Veterans Health Administration
y= years

Karamchandani K et al. *JAMA Surg*. 2019 Aug;154(8):778-80.

919: Incidence of Prescribing Opioids at Hospital Discharge After Admission to a Medical ICU | Clark JEJ et al.

Design	Single center, retrospective, case-control study
Objective	Identify risk factors associated with the receipt of opioid prescriptions at hospital discharge after admission to a MICU, in opioid naïve
Population	- 3351 adult patients admitted to the MICU 1/1/2010-9/30/2015

Results	- 318 (9.49%) prescribed opioids at hospital discharge
	- Continuous infusion opioids: 25 (6.8%) vs 252 (7%), p=0.1
	- **Differences in those discharged on opioids vs not:**
	  - MV: 17.6% vs 11.3%, p=0.007
	  - Chest tubes: 2.4% vs 0.4%, p=0.0002
	  - PEG tubes: 1.1% vs 0.08%, p=0.0021

OR=operating room
PTA=prior to admission
MV=mechanical ventilation
PEG=percutaneous endoscopic gastrostomy

Clark JEJ et al. *Crit Care Med*. 2018; 46:443.

New Opioid Use after Invasive Mechanical Ventilation and Hospital Discharge | Wunsch H et al.	
Design	Population based cohort study
Objective	Determine the frequency of persistent posthospital opioid use among patients who received IMV
Population	25,085 adult opioid naïve patients in the ICU receiving IMV or hospitalized patients not receiving ICU care 2/1/13 – 3/31/15, surviving 7 days after discharge
Results	- 5,007 (20%) filled prescription for opioids in 7 days after hospital discharge - 648 (2.6%; 95% CI 2.4-2.8) of IMV with persistent opioid use - **IMV ICU patients with higher persistent opioid** use vs matched non-ICU patients 2.6% vs. 1.5%; adjusted OR, 1.37; CI, 1.19–1.58 - Factors associated with persistent use: **surgical vs medical patient** adjusted OR, 3.29; CI, 2.72–3.97

IMV=invasive mechanical ventilation
CI=confidence interval

Wunsch et al. *Am J Respir Crit Care Med.* 2020 Aug 15;202(4):568-575.

Opioid Use after Intensive Care: A Nationwide Cohort Study| von Oelreich E et al.

Design	Multicenter (All Swedish ICUs), retrospective, cohort
Objective	Describe opioid use after ICU admission, identify factors associated with chronic opioid use after critical care and determine if chronic opioid use is associated with increased risk of death
Population	-204,402 adult patients surviving the first 2 quarters after ICU 1/2010-12/2018
Results	- Chronic use after discharge: 22,138 (10.8%) - Chronic use after discharge in all: age, female, somatic/psych comorbidities, PTA use, **ICU LOS > 2 days**, lower income, lower level of education, surgery - **Chronic use after discharge in naïve**: age, female, lower level of education, somatic comorbidity, surgery, **ICU LOS > 3 days** - All cause mortality 6-18 mo after ICU admission for chronic opioid users: 1.7 (95% CI, 1.6–1.7;p < 0.001)

PTA=prior to admission
LOS=length of stay
Mo=months

Von Oelreich E et al. *PLOS One*. 2019;14 (11):e0225787.

Opioid Prescribing after Discharge in a Previously Mechanically Ventilated, Opioid-Naïve Cohort | Academia EC et al.	
Design	Single center, retrospective, cohort
Objective	Determine the percentage of potentially unnecessary opioid prescriptions on discharge in previously opioid naïve patients
Population	71 adult opioid naïve, MV patients admitted to MICU or CTICU 5/21/13-5/21/18
Results	- 32 (45%) discharged with outpatient opioid prescription - 45 (63.3%) discharge prescriptions aligned with 24H pre-discharge requirements - 26 (36.7%) of discharge prescriptions in excess of calculated pre-discharge requirements - 41 (57.7%) of patients received nonopioid analgesia **- Increased risk of inappropriate discharge opioid:** CTICU admission - Decreased risk of inappropriate discharge opioid: shorter duration of inpatient oral opioid therapy

MV=mechanically ventilated
H=hour
CTICU=cardiothoracic ICU

Academia EC et al. *Ann Pharmacother*. 2020 Nov;54(11):1065-1072.

Is Admission to the Intensive Care Unit Associated with Chronic Opioid Use? A 4-Year Follow-Up of Intensive Care Unit Survivors| Yaffe et al.	
Design	Single center, retrospective review
Objective	Describe opioid use before and after ICU admission and to identify factors associated with chronic opioid use up to 4 years after discharge
Population	2595 adult patients admitted to the ICU 1/1/2005 – 12/31/2008
Results	- 3 mo PTA: 76.9% nonusers, 16.9% intermittent opioid use, 6.2% chronic use - Nonuser patients from 87.8% early post-ICU to 95.6% at 48 mo - Intermittent and chronic opioid use decreased to 8.6% and 3.6% discharge and 2.6 and 1.8% at 48 mo - Factors associated with chronic opioid use: prolonged hospital LOS - **Admission to ICU and duration ICU stay not associated with chronic use**

Mo=months
PTA=prior to admission
LOS=length of stay

Yaffe et al. *Crit Care Med*. 2019 Apr;47(4):543-549.

Continuation of Opioid Therapy at Transitions of Care in Critically Ill Patients| Witcraft EJ et al.	
Design	Single center, retrospective cohort study
Objective	To characterize opioid prescribing practices across 2 transitions of care during an inpatient hospital stay
Population	- 112 opioid naïve adult patients started on opioids in the MICU/IMC 12/1/2016-11/30/2017
Results	- Transfer MICU/IMC >floor (T1) opioid continuation: 37 (56.1%) - Transfer floor>discharge (T2) opioid continuation: 21 (56.8%) - T1 characteristics of continued vs not continued on opioids: - **Longer hospital LOS** 22 (11-36)* vs 8 (6-14), p=0.004 - T2 characteristics of continued vs not continued on opioids: - **Intubation** during hospital stay 17 (80.9%) vs 7 (43.8%), p=.019; - **Cumulative opioid dosage** 3482 mcg (1690-9530) vs 732.5 mcg (187.5-1360.9), p=.0018

*data presented as n(%) or median (IQR) as appropriate

IMC=intermediate care unit
T1= transition 1
T2=transition 2
LOS = length of stay

Witcraft EJ et al. *J Intensive Care Med*. 2021 Aug;36(8):879-884.

Opioid Prescribing at Discharge in Opioid-Naïve Trauma Patients | Johnston et al.

Design	Single center, retrospective, cohort
Objective	Evaluate opioid prescribing at hospital discharge for traumatic injury
Population	471 adult opioid naïve patients admitted with traumatic injury for ≥24 hours
Results	- Mean age 60±23y, 62.0% male - Majority blunt trauma and 49.9% falls, Mean ISS=9±7.2 - 93.6% received nonopioids and 84.3% received multimodal analgesia - ICU LOS 2 (0-4) days, hospital LOS 5 (3-9) days - Patients prescribed opioids in the hospital: 70.4% - Prescribed opioids at hospital discharge: 39.4% **- Less likely to be discharged on opioids: ≥30y, ICU admission, ISS <9, CCI >1, surgical intervention**

Y=years
ISS=injury severity score
CCI=Charlson Comorbidity Index

Johnston J et al. *Am Surg*. 2021 Apr 20; 31348211011105.

Impact of Opioid Administration in the Intensive Care Unit and Subsequent Use in Opioid-Naïve Patients| Krancevich N et al.	
Design	Multicenter, retrospective, cohort analysis
Objective	Evaluate the relationship between ICU opioid administration to opioid-naïve patients and subsequent opioid use following discharge
Population	- 342 adult patients receiving continuous infusion IV fentanyl, hydromorphone or morphine 7/1/11 – 6/30/18
Results	- 164 (47.1%) received opioid at discharge - 17 (5.0%) became long-term opioid users: more common in those with opioid prescribed at discharge 8.7% vs 1.6%, p=0.006 - Neither total ICU MME nor daily ICU MME correlate with daily MME quantity at discharge (R^2=0.008 and R^2=0.03) - Predictors of opioid at discharge: history of illicit drug use, **longer non-ICU LOS**, admission diagnosis of respiratory, surgical, neurology, trauma or malignancy

MME=morphine milligram equivalents
LOS=length of stay

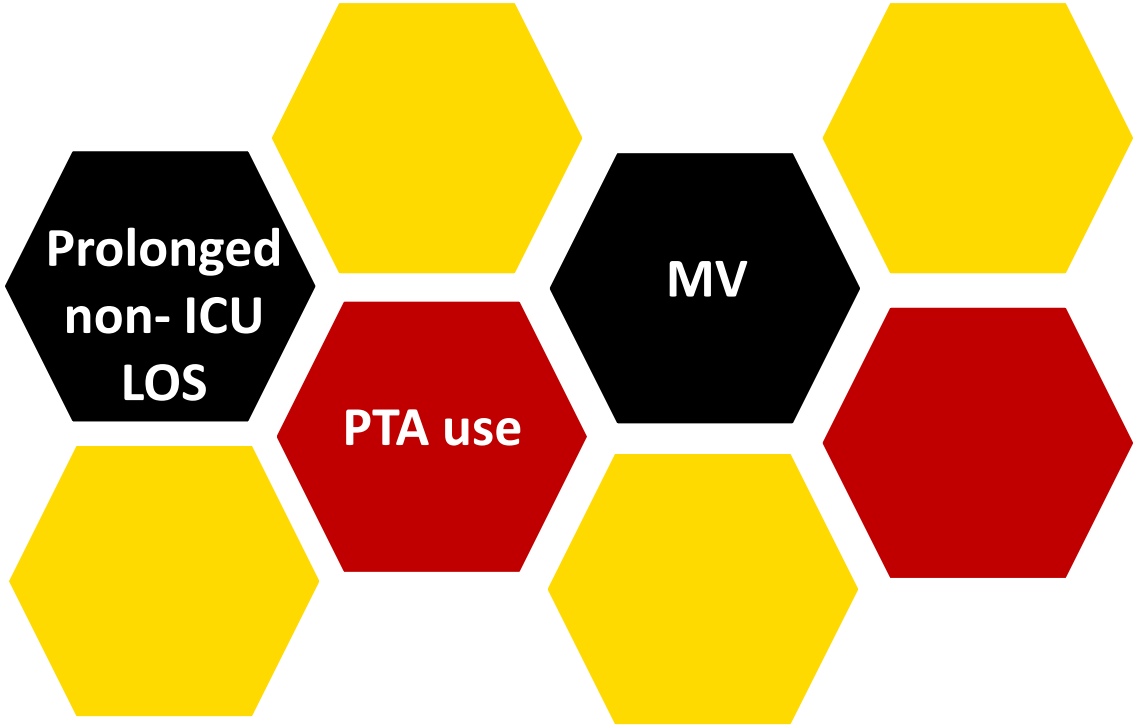
Krancevich N et al. *Ann Pharmacother*. 2021 May 17; 10600280211016856.

Comparison of the Existing Literature

Study	ICU admission or LOS	IMV	Higher Opioid Requirements in patient
Dunn	---	---	↑
Karamchandani	---	---	---
Clark	---	↑	↓
Wunsch	↑	↑	---
Von Oelreich	↑	---	---
Academia	CTICU admission	---	---
Yaffe	---	---	---
Witcraft	---	↑	↑
Johnston	↓	---	---
Krancevich	---	---	---

LOS=length of stay
IMV=invasive mechanical ventilation
CTICU=cardiothoracic ICU

Potential Risk Factors for Opioid Continuation after ICU



LOS=length of stay
PTA=prior to admission
MV=mechanical ventilation

Audience Response

- Admission to the ICU is a definite risk factor for continuation of opioids on discharge from the ICU?
  - True
  - False

Gaps in the Literature

- If no consistent risk factors-for an ICU population how do we start mitigating these?
  - Maybe the answer is in transitions of care and not just in the ICU
- Pain assessments during hospitalization and after discharge
- Opiate exposure/acute →chronic pain role in post-intensive care syndrome?


Opioid Stewardship
Opioid use across transitions from the ICU
Opioid-Reductive Strategies

Opioid Reductive Strategies

- Accurate pain assessment
- Re-assess need for continuous infusion opioids
- Opiate adjustment to symptoms
- Multi-modal pain management
- Non-pharmacologic pain management
- Opiate withdrawal assessment
- Counseling
- Re-evaluate opioids during transitions of care
- Post-ICU clinic pharmacist involvement

Skrobik Y. *Am J Respir Crit Care Med*. 2020 Aug;202(4):484-6.
Erstad B. *JACCP*. 2018 Oct 24;2(2):161-166.

Pain Assessment

- Self reported pain: 0-10 numerical rating scale
- Behavioral Pain Scale in intubated and non-intubated
- Critical-Care Pain Observation Tool

Devlin JW, et al. *Crit Care Med*. 2018 Sep;46(9):e825-e873

Multi-modal Pain Management

- Acetaminophen
- Ketamine
- Neuropathic pain: gabapentin, pregabalin, carbamazepine
- Non-steroidal anti-inflammatory drugs

- Lidocaine ?

Devlin JW, et al. *Crit Care Med*. 2018 Sep;46(9):e825-e873

Non-pharmacologic Pain Management

- Massage therapy
- Music therapy
- Cold therapy
- Relaxation therapy

Devlin JW, et al. *Crit Care Med*. 2018 Sep;46(9):e825-e873

Opioid Withdrawal Assessment

- No specific tools for the adult critically ill patient population
- Withdrawal Assessment Tool-version 1 – validated in critically ill pediatric population
- Management
  - Gradual weaning of opioid
  - Reintroduction of previously weaned opioids or use alternative
- Data for management in pediatric patients:
  - Methadone
  - Alpha$_2$ adrenergic receptor agonists

Chiu AW, et al. *Ann Pharmacother*. 2017 Dec;51(12):1099-1111.

Audience Response

- Which of the following are potential opioid reductive strategies that can be used for ICU patients?
    A. Consistent pain assessment
    B. Multi-modal pain management
    C. Opiate adjustment to symptoms
    D. Involvement of pharmacist across transitions of care

Conclusions

- Pharmacist integration into opioid stewardship programs specifically geared at ICU patients may ensure judicious use of opioids in the ICU
- It is unclear what effect starting opioids in the ICU may have on long term continuation
- Efforts to re-evaluate use of opioids on transitions of care and utilization of opioid reduction strategies where appropriate can be taken

Last Remarks

- Impact of COVID-19
- Risk factors for prospective screening
- Medication assisted treatment
- Specific strategies for pain control in the ICU with limited evidence

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