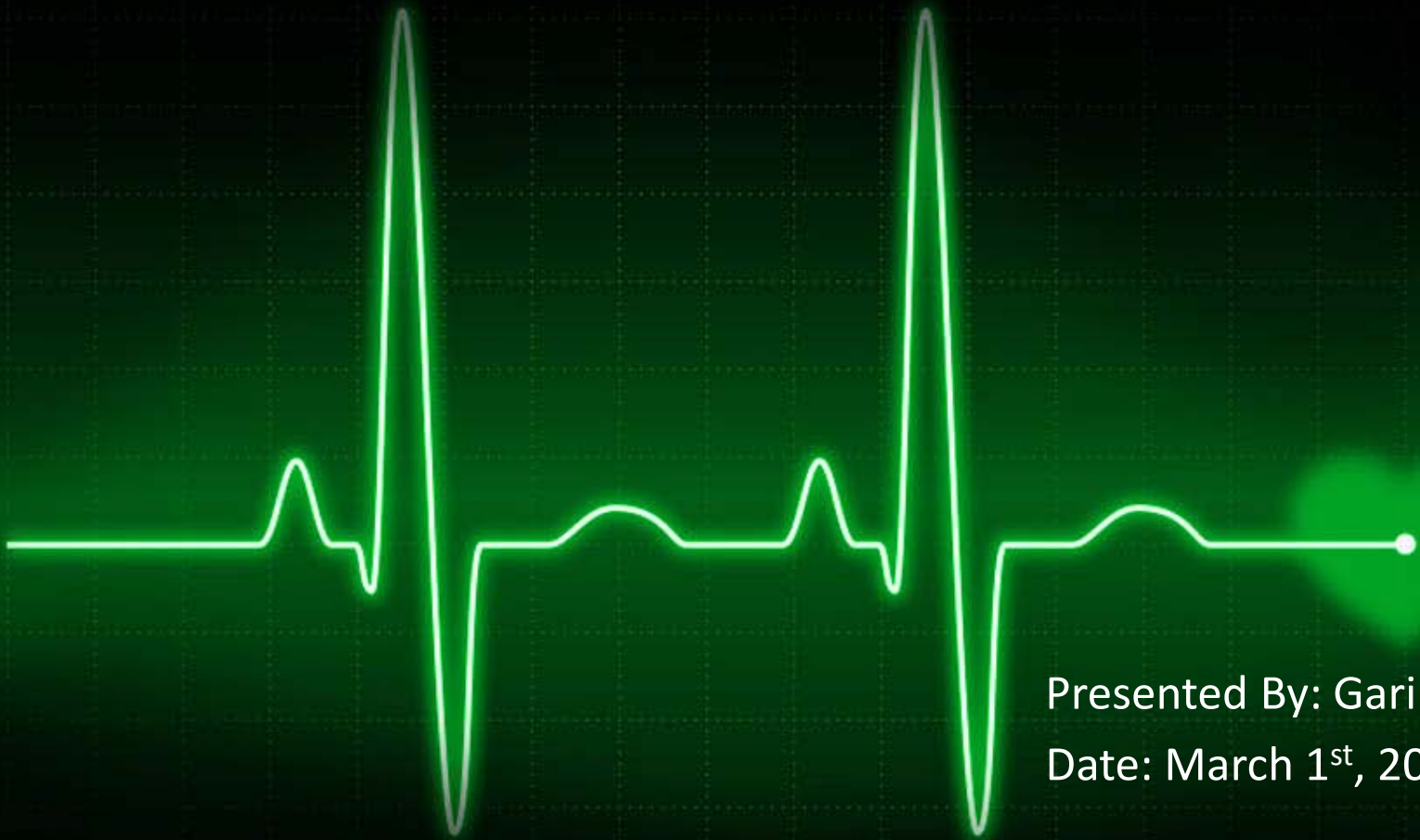


Medication Safety At The Bedside

HYDROmorphine vs. Morphine



Presented By: Gariné Jamjekian

Date: March 1st, 2013



Outline

- Overview
- HYDRORmorphine vs. Morphine
- Documentary
- Safety Initiatives
- Resources
- Key Messages

Learning Objectives

- To better understand the meaning of “medication safety” and “medication incident”
- To develop a strong understanding of the differences between HYDRomorphine and morphine
- To be aware of the safety initiatives set in place to reduce preventable medication errors

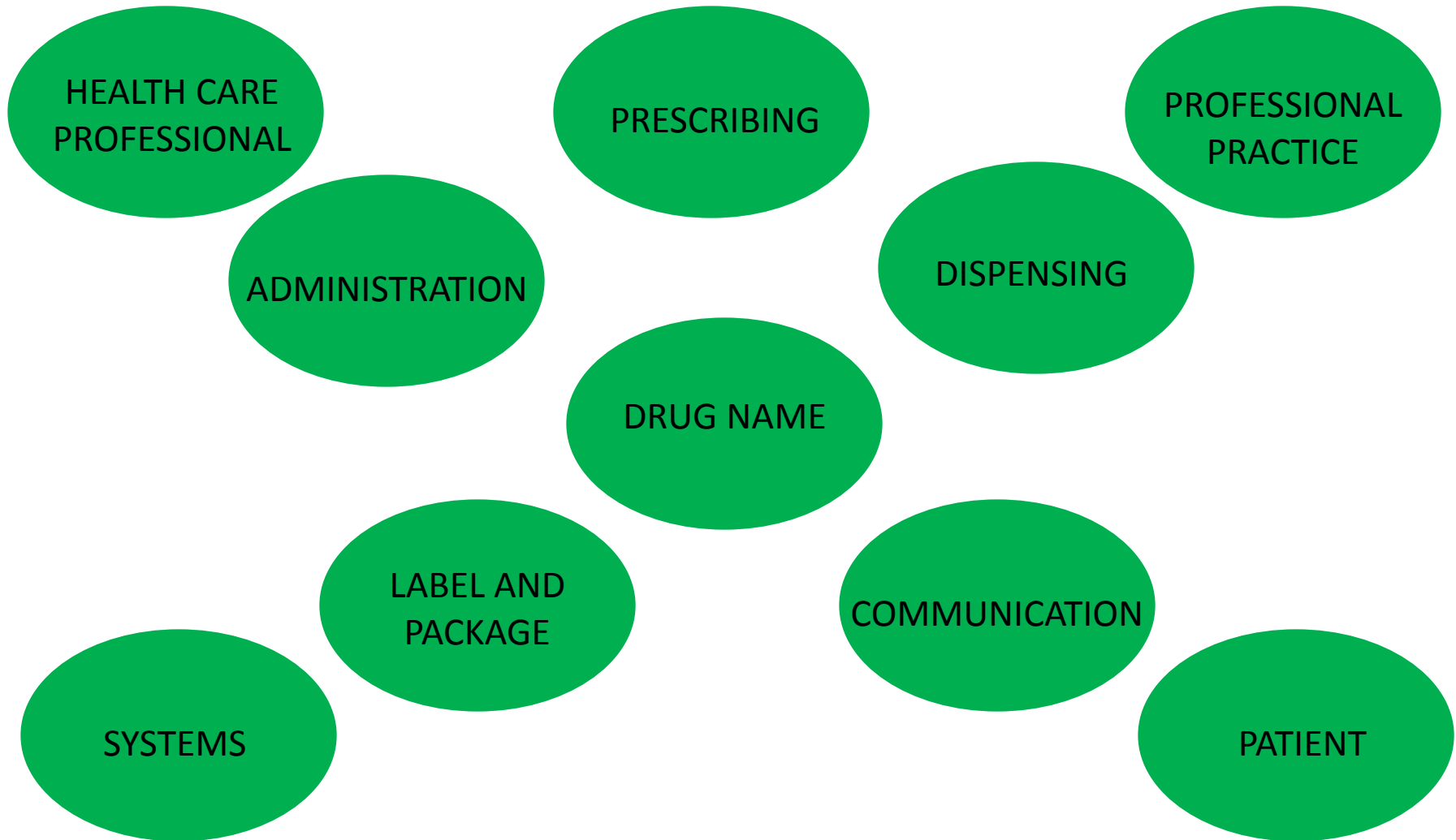
Overview

- Medication Safety
 - Freedom from preventable harm with medication use

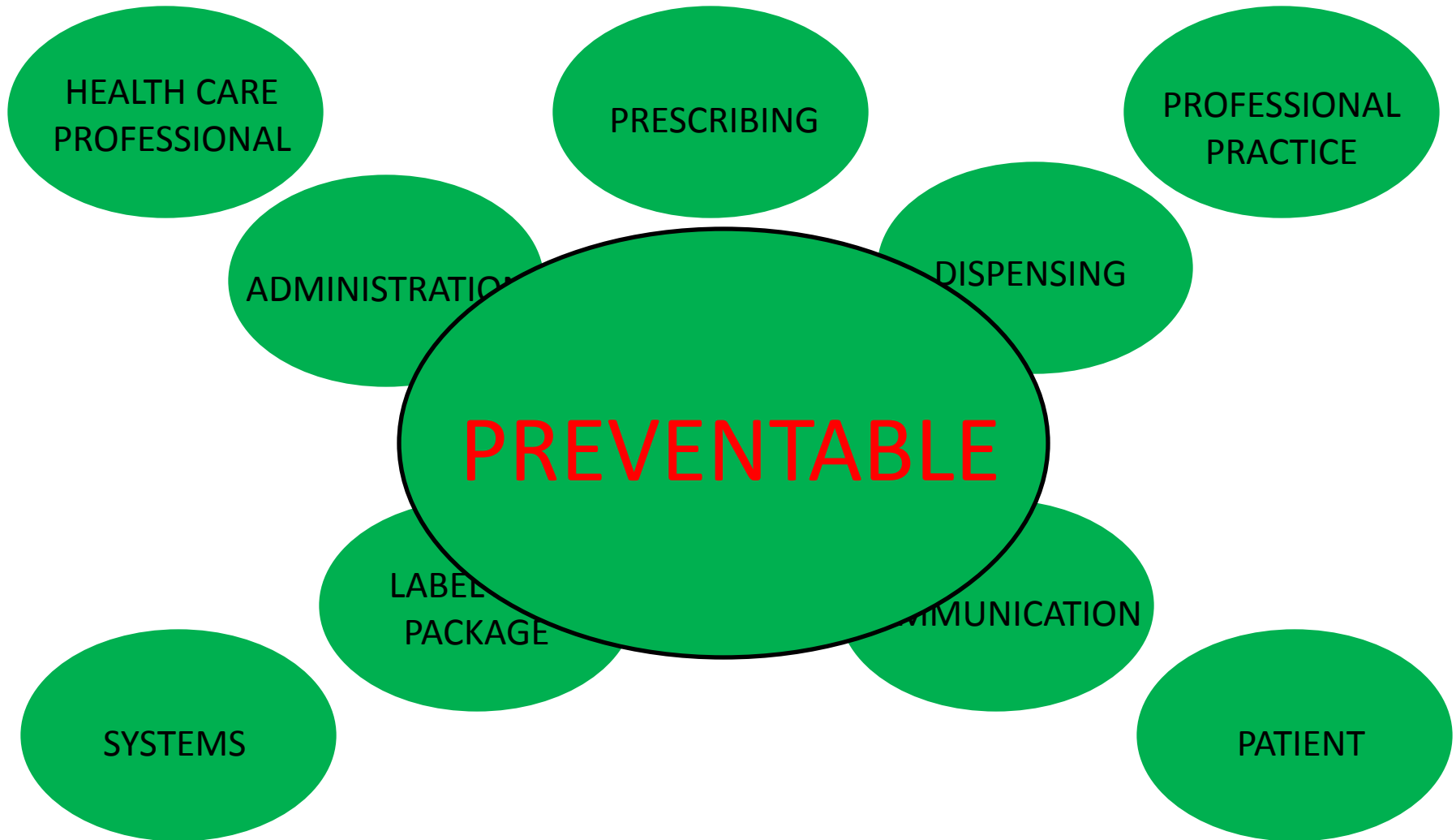
Overview

- Medication Incident = Medication Error
 - A mistake with a medicine or a problem that could cause a mistake with a medicine

Medication Incident



Medication Incident



Stages of Medication Use

- Physician ordering
- Order entry and transcription
- Dispensing and delivery
- Administration
- Monitoring

Stages of Medication Use

Medication Error Events in Ontario Acute Care Hospitals

Joan A Marshman, David K U, Robert WK Lam, and Sylvia Hyland

Table 3. Frequency of Errors by Stage of Medication-Use Process

Stage of Medication-Use Process	Type of Event; No. (%) of Events*					
	Reported Error Events (n = 4243)		Potential ADEs (n = 685)		ADEs (n = 120)	
Administration of medication	2396	(56.6)	559	(81.6)	87	(72.5)
Order entry and transcription	1383	(32.6)	95	(13.9)	30	(25.0)
Dispensing and delivery	771	(18.2)	75	(10.9)	8	(6.7)
Physician ordering	297	(7.0)	35	(5.1)	14	(11.7)
Monitoring	167	(3.9)	51	(7.4)	10	(8.3)

ADE = adverse drug event.

*A single event may involve errors at more than one stage.

Medication Error Types

Table 4. Types of Process Error

Type of Error	Type of Event; No. (%) of Events*					
	Reported Error Events (n = 4243)		Potential ADEs (n = 685)		ADEs (n = 120)	
Dose omission	1216	(28.7)	197	(28.8)	41	(34.2)
Improper dose	1092	(25.7)	216	(31.5)	37	(30.8)
Wrong drug	438	(10.3)	86	(12.6)	8	(6.7)
Wrong time	240	(5.7)	31	(4.5)	2	(1.7)
Wrong strength or concentration	132	(3.1)	25	(3.6)	1	(0.8)
Wrong patient	129	(3.0)	29	(4.2)	2	(1.7)
Wrong rate	106	(2.5)	22	(3.2)	6	(5.0)
Monitoring error	67	(1.6)	20	(2.9)	4	(3.3)
Wrong dosage form	58	(1.4)	4	(0.6)	1	(0.8)
Wrong route of administration	55	(1.3)	11	(1.6)	1	(0.8)
Wrong duration	33	(0.8)	3	(0.4)	0	(0)
Deteriorated drug error	16	(0.4)	3	(0.4)	0	(0)
Wrong technique	12	(0.3)	4	(0.6)	2	(1.7)
Other	649	(15.3)	34	(5.0)	15	(12.5)

ADE = adverse drug event.

* Percentages may not sum to 100 because of rounding.

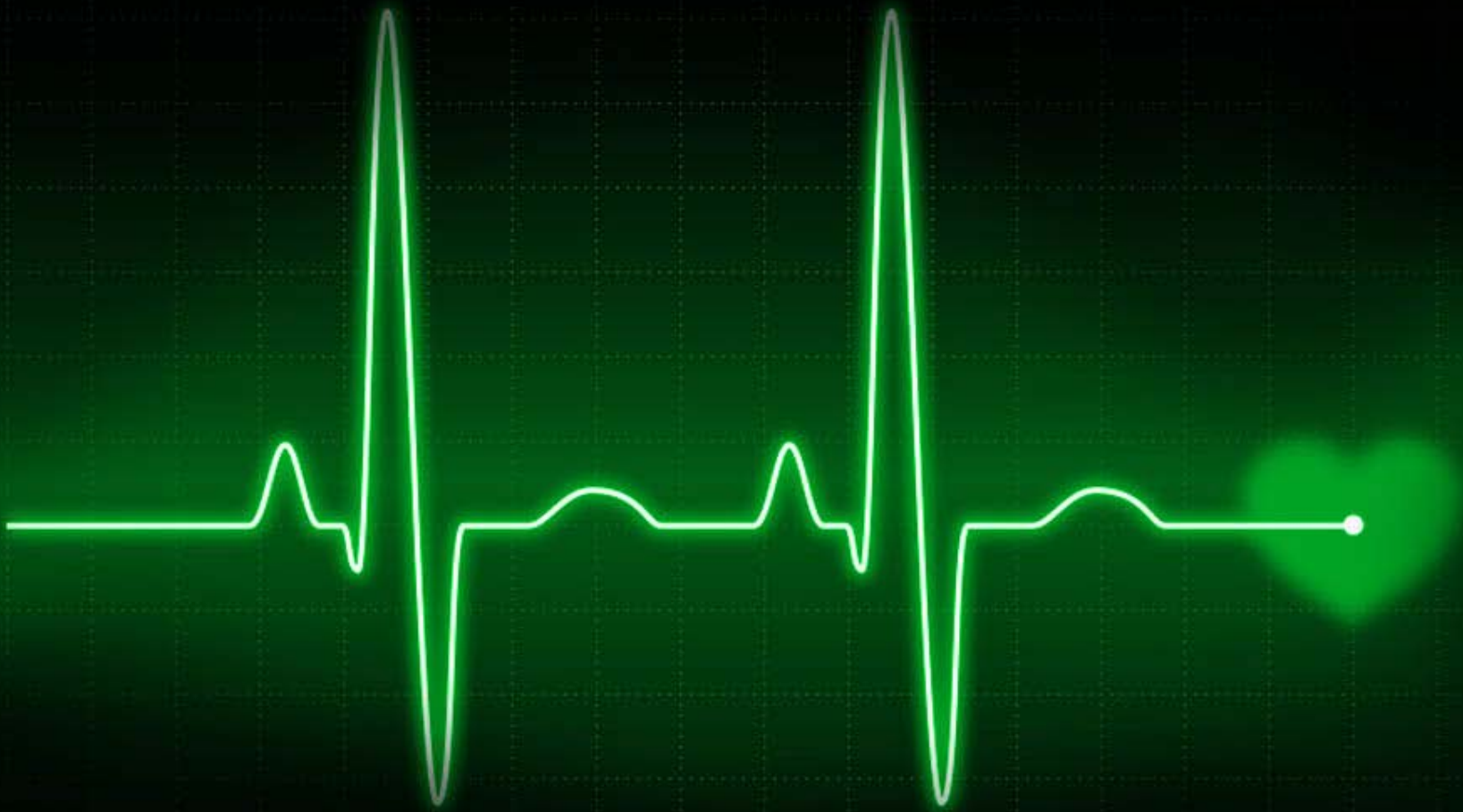
Wrong Drug Errors

Table. Top 25 Medication Pairs Involved in Wrong Drug Errors Reported to PA-PSRS

Drug #1	Drug #2	Total Reports	Percent of Applicable Wrong Drug Errors (n=8400)
morphine	hydromorphone	295	3.5%
HYDRocodone w/acetaminophen	OXYcodone w/acetaminophen	199	2.4%
oxycodone	Oxycontin	188	2.2%
alprazolam	lorazepam	173	2.1%
acetaminophen w/codeine	OXYcodone w/acetaminophen	146	1.7%
OXYcodone	OXYcodone w/acetaminophen	108	1.3%
MS Contin	OxyContin	79	0.9%
Novolog Mix 70/30	Novolin 70/30	75	0.9%
morphine	meperidine	70	0.8%
propoxyphene w/acetaminophen	OXYcodone w/acetaminophen	63	0.8%
cefazolin	ceftriaxone	57	0.7%
clonazepam	clonidine	49	0.6%

Drug #1	Drug #2	Total Reports	Percent of Applicable Wrong Drug Errors (n=8400)
clonazepam	lorazepam	46	0.5%
doPAMine	doBUTamine	41	0.5%
Solu-Cortef	Solu-Medrol	39	0.5%
Novolog	regular insulin	35	0.4%
hydromorphone	meperidine	35	0.4%
hydrOXYzine	hydrRALazine	35	0.4%
Humalog	Humulin-R	34	0.4%
Novolog	Novolin R	34	0.4%
glipiZIDE	glyBURIDE	34	0.4%
Humalog	regular insulin	32	0.4%
Vicodin	Vicodin ES	28	0.3%
diazepam	lorazepam	27	0.3%
ampicillin	cefazolin	26	0.3%
Total of Above		1948	23.1%

HYDRMorphine vs. Morphine



Why Should We Care?

- Of all the wrong drug safety reports that include morphine and/or HYDRORmorphone:
 - 62% of the time morphine was prescribed but HYDRORmorphone was given in error
 - 71% of errors occurred when the medications were selected from unit stock (selection error)

Why Should We Care?

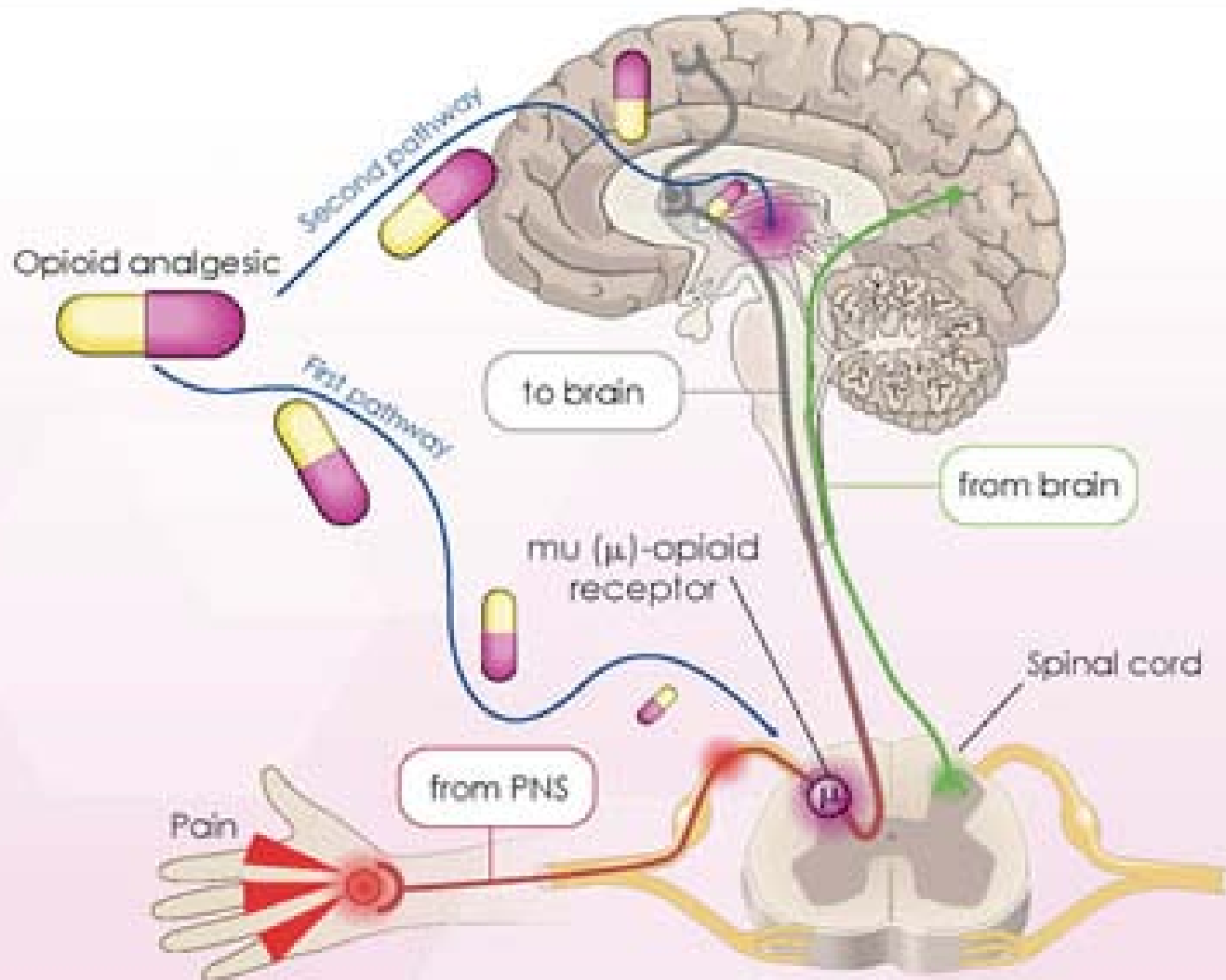
- **True** HYDROmorphine/Morphine Event

Documentary: <http://youtu.be/J4CZEmvqnrw8>

HYDRomorphine/Morphine

- BOTH are opioid analgesics
- SIMILAR mechanism of action
- SIMILAR side effect profile
- NOT the same drug
- NOT equivalent in dosing

Mechanism of Action



Adverse Effects

- Nausea and vomiting
- Drowsiness/sedation
- Constipation
- Respiratory depression (rare)
- Cardiac depression/arrest (rare)
- Tolerance/dependence

What Is The Difference?

HYDRORmorphone : morphine

What Is The Difference?

HYDROmorphine : morphine

5:1

HYDROmorphine is **5 times*** more potent than morphine

*4 to 7 depending on source

Examples

Morphine	HYDROmorphine
2 to 4 mg IV/SC q2h PRN pain	0.4 to 0.8 mg IV q2h PRN pain
30 mg PO q4h PRN pain	6 mg PO q4h PRN pain
2.5 mg PO q4h PRN pain	0.5 mg PO q4h PRN pain

Other Differences

HYDRORmorphine	Morphine
Better oral absorption	Lower oral absorption
Eliminated in urine	90% eliminated in urine, 10% in feces
No major active metabolites	Active metabolites formed (toxicity in renal impairment)
Less itchiness (less histamine release)	More itchiness (more histamine release)
Higher potential for addiction	

The top portion of the image features a dark green background with a faint, glowing white ECG (heart rate) line. The line starts on the left, has a small peak, a dip, and then continues with several larger peaks and troughs before ending on the right with a small dot.

Memory Aid

Memory Aid



Memory Aid



Horse

HYDR**O**morphone

Memory Aid



Horse

HYDR**O**morphine



Mouse

morphine

Memory Aid



Horse

HYDR**O**morphine

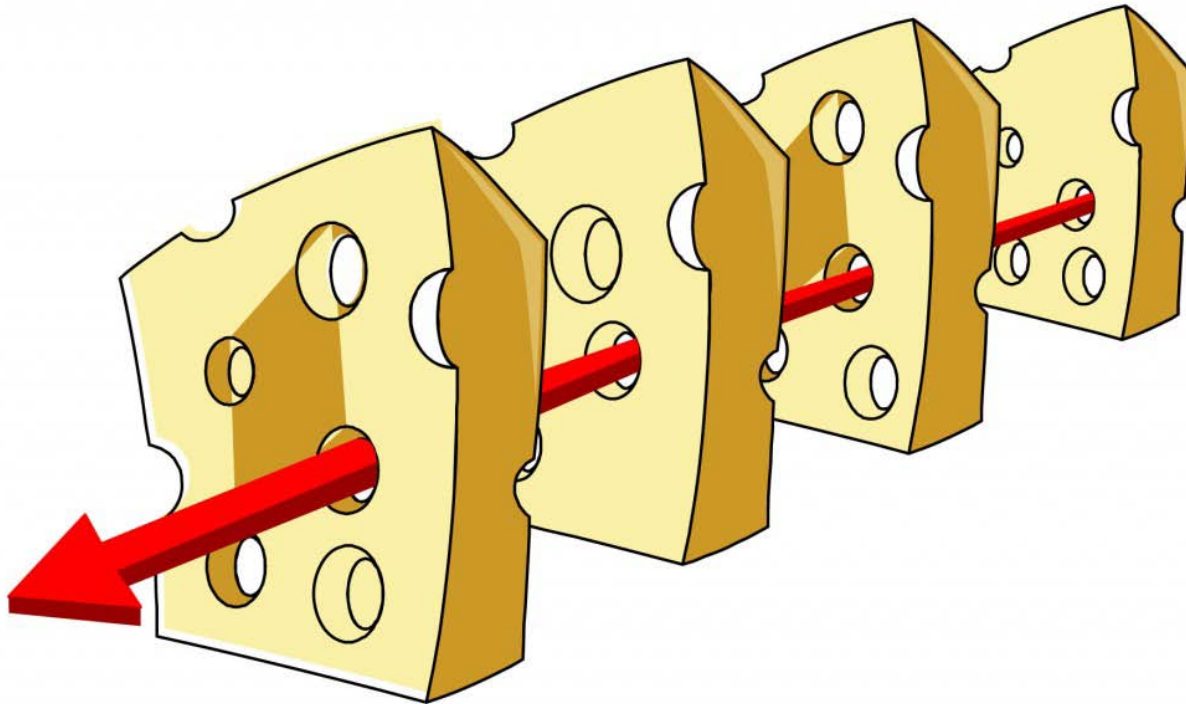


Mouse

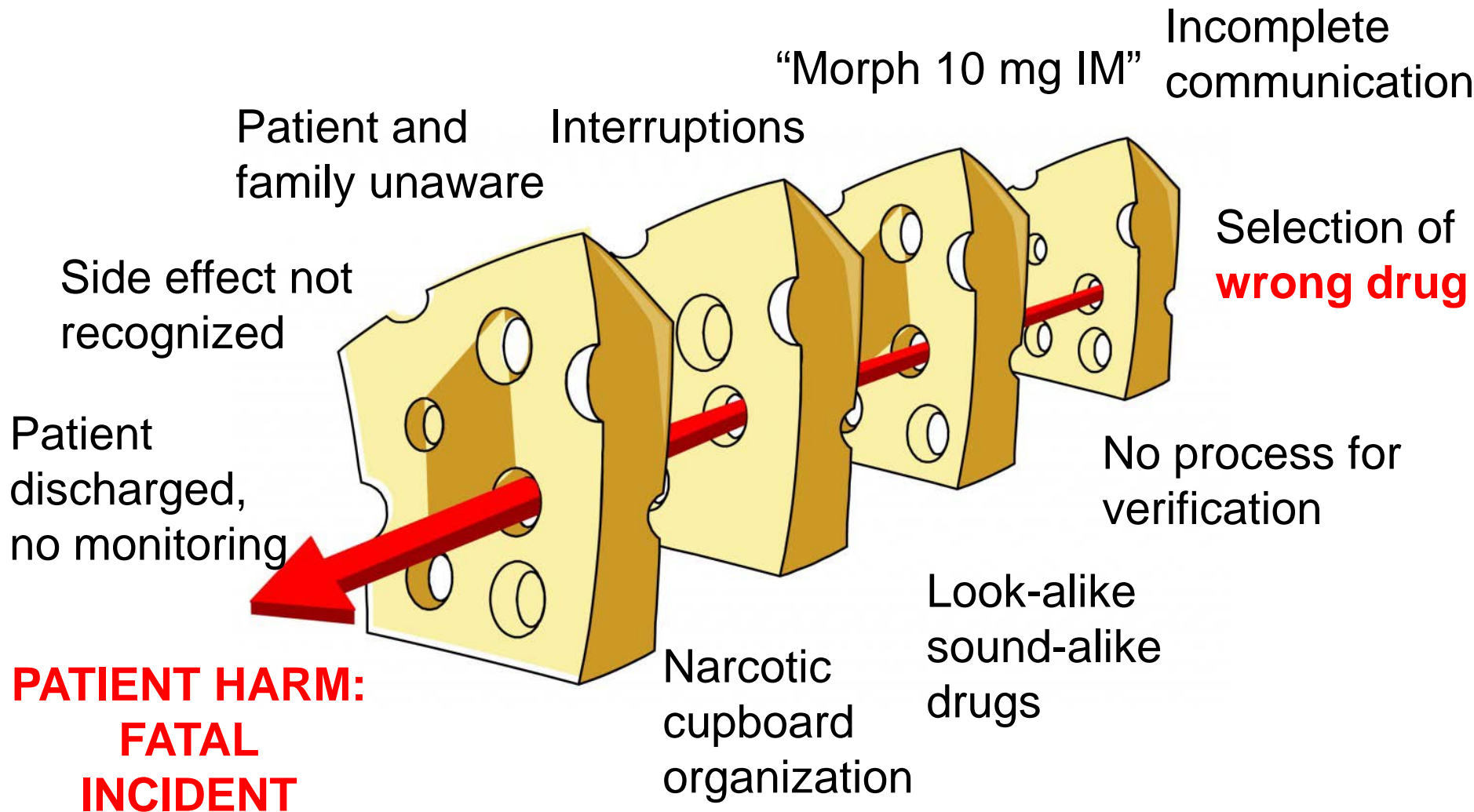
morphine

HYDRORmorphine/Morphine Event Analysis

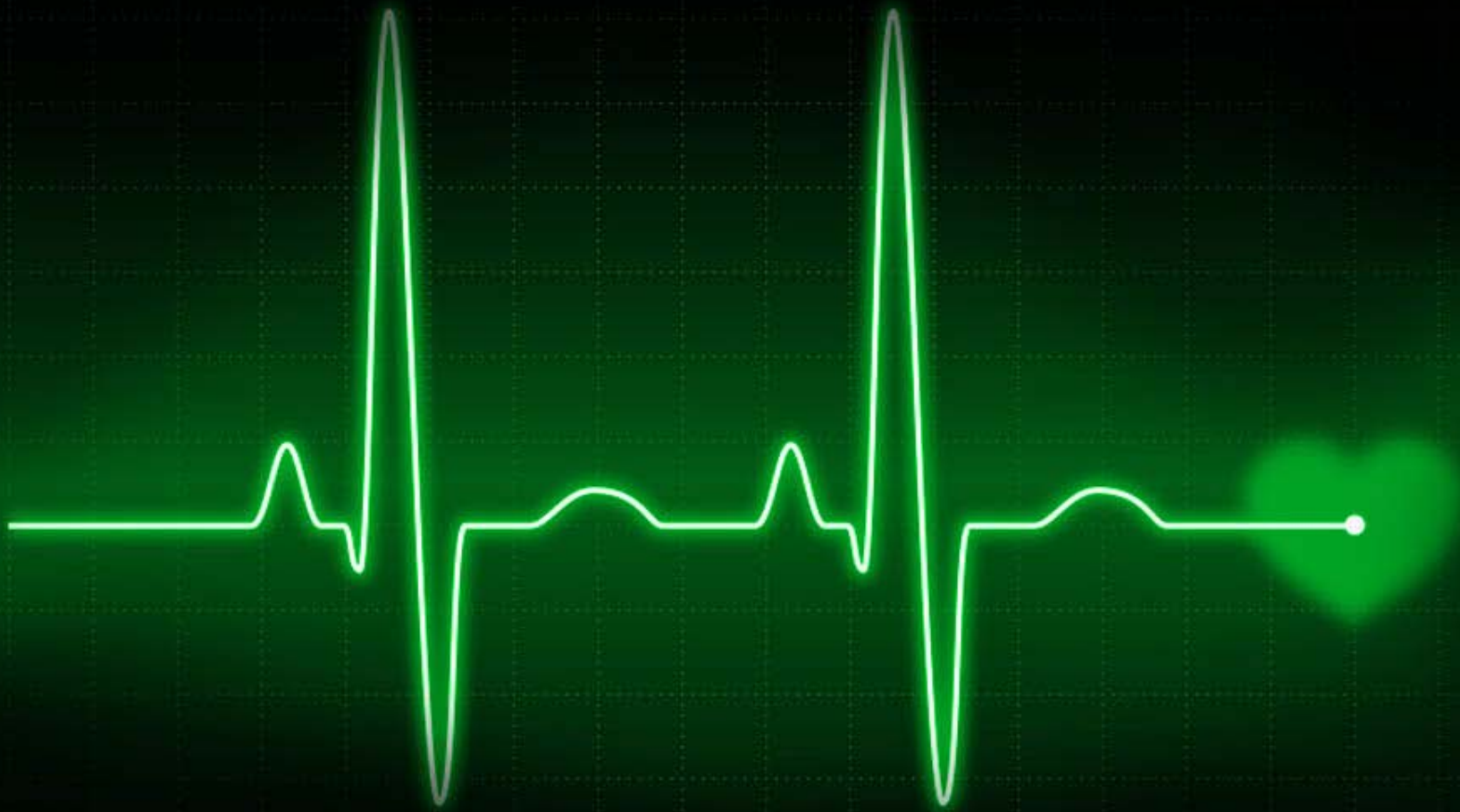
HYDRomorphine/Morphine Event Analysis



HYDRomorphine/Morphine Event Analysis



Safety Initiatives





Safety Initiatives

1. Limiting access and reducing options
2. Reorganization of narcotic cupboard
3. Reduce “look-alike” potential (TALLman)
4. Employ technology

Safety Initiatives

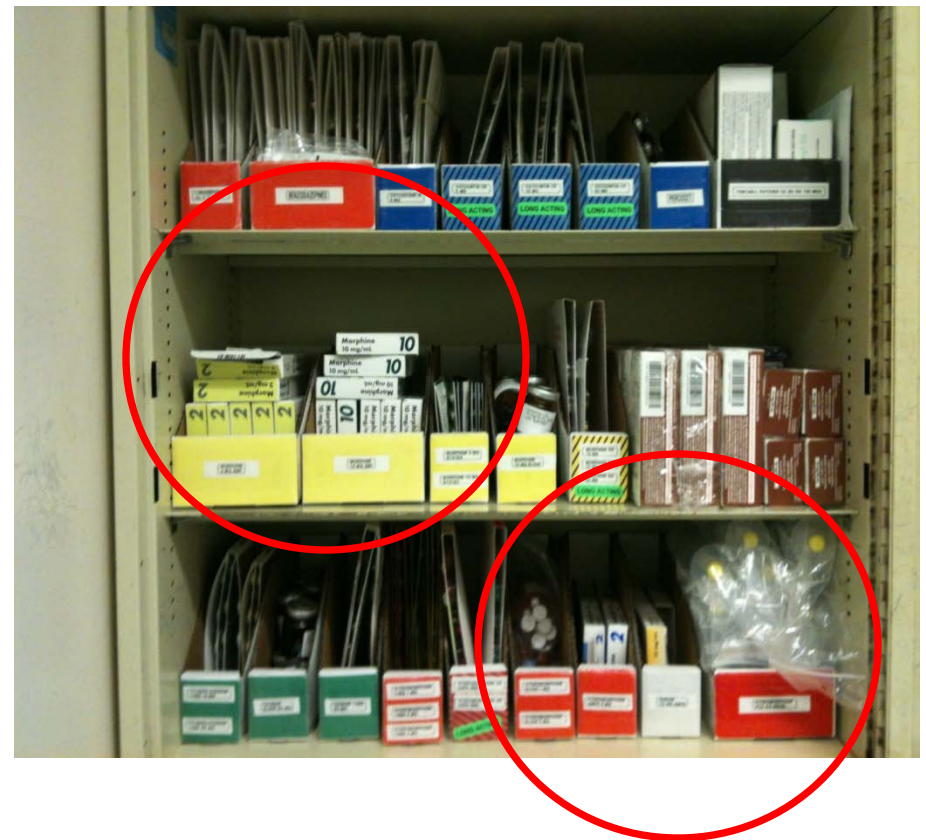
5. Independent double-check policies prior to administration
6. Monitor patients
7. Potency education for staff 😊
8. Educate patients

Safety Initiatives

BEFORE



AFTER



Resources

- Pharmacist – medication experts
- Interprofessional team members
- Hospital standards of care, policies and procedures
- ISMP Canada www.ismp-canada.org



Resources

Website: www.medsafety.weebly.com

*Self Assessment Quiz for all nurses

Key Messages

- HYDRORmorphine and morphine
 - Similar mechanism of action, side effects
 - NOT the same drug, NOT equivalent in dosing



**HYDRORmorphine is approximately
5 times more potent than **morphine!****

- Use caution when administering these and other narcotic drugs to patients

Memory Aid



Horse

HYDR**O**morphine

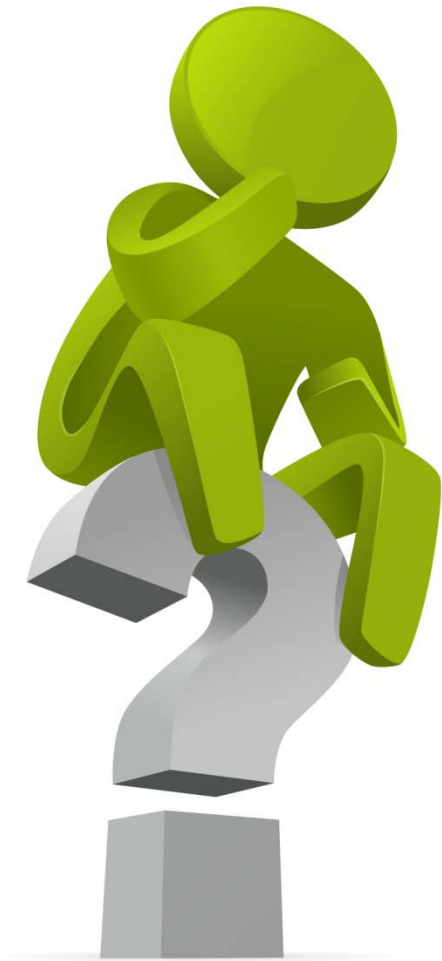


Mouse

morphine

References

- DiPiro JT, Talbert RL, Yee GC, et al. Pharmacotherapy: A Pathophysiologic Approach. 7th Ed. Chapter 62: Pain Management. New York. McGraw-Hill Companies; 2008.
- HYDROmorphine. LexiComp Online. Available at: <http://www.lexicomp.com>. Accessed February 15, 2013.
- ISMP Canada. Definition of terms. <http://www.ismp-canada.org/definitions.htm> Accessed February 15, 2013.
- ISMP Canada. Event analysis report: hydromorphone/morphine event XXX Hospital, XXX, XXX. Available at: http://www.ismp-canada.org/download/Hydromorphone_Morphine_RCA_Report_final12.pdf. Accessed January 25, 2013.
- ISMP Canada Safety Bulletin. Identifying knowledge deficits related to HYDROmorphine. June 27, 2012. Available at: http://www.ismp-canada.org/download/safetyBulletins/2012/ISMPCSB2012-07_IdentifyingKnowledgeDeficits-HYDROmorphine.pdf. Accessed February 18, 2013.
- ISMP Canada Safe Medications Use, Mistakes with medicines can happen. Are they preventable? November 1, 2012 presentation. Available at: http://www.safemedicationuse.ca/tools_resources/tips.html. Accessed February 15, 2012.
- Kalant H, Grant DM, Mitchell J. Principles of Medical Pharmacology. 7th Edition. Toronto, Canada. Elsevier; 2007.
- Marsham JA, U DK, Lam RWK et al. Medication error events in Ontario acute care hospitals. Can J Hosp Pharm. 2006;59(5):243-50.
- Morphine. LexiComp Online. Available at: <http://www.lexicomp.com>. Accessed February 15, 2013.
- PA PSRS Patient Saf Advis 2007 Sep;4(3):89.



www.medsafety.weebly.com