Opioid Bootcamp

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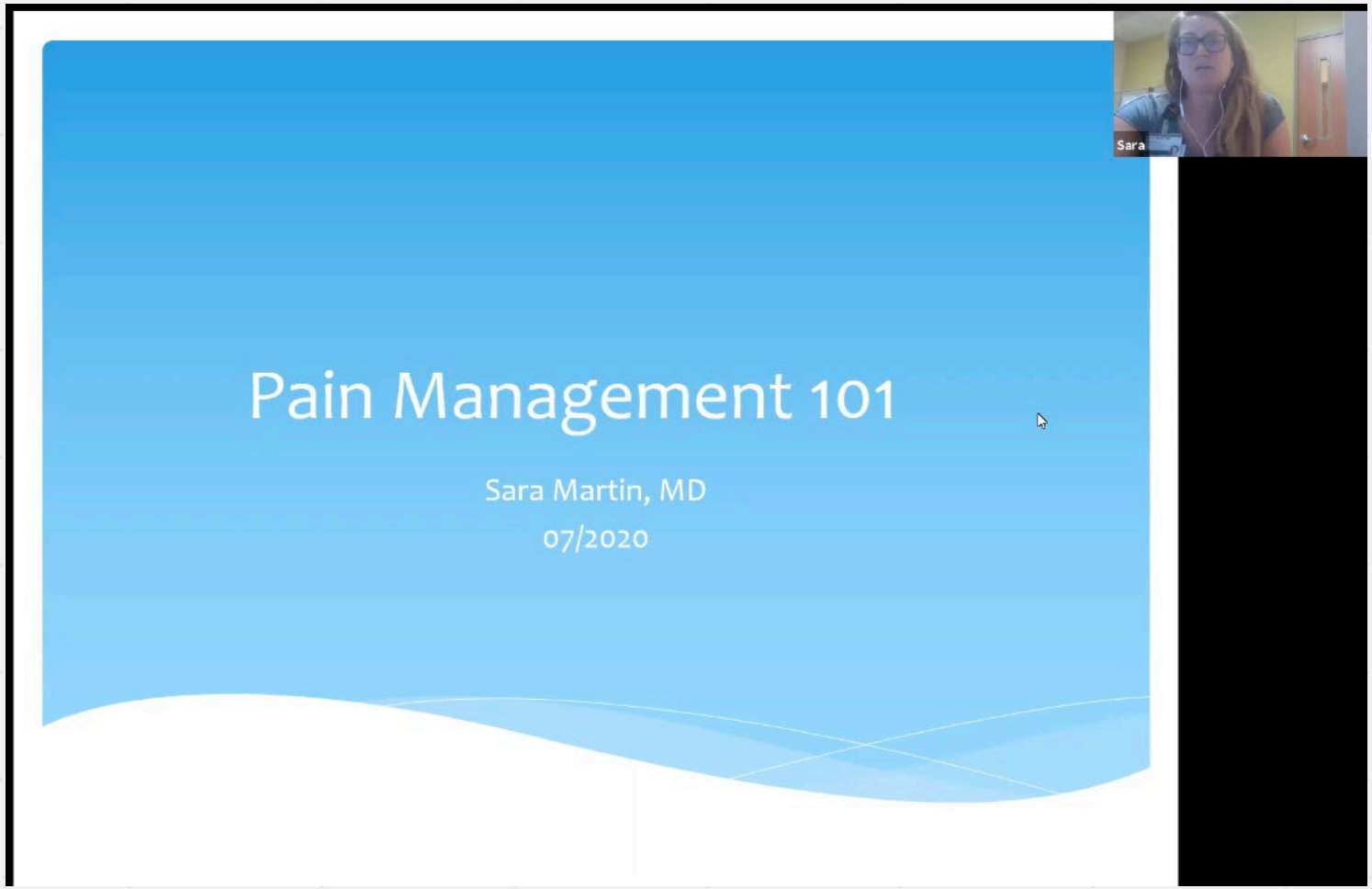
Administration set for use with Alaris PCA Module

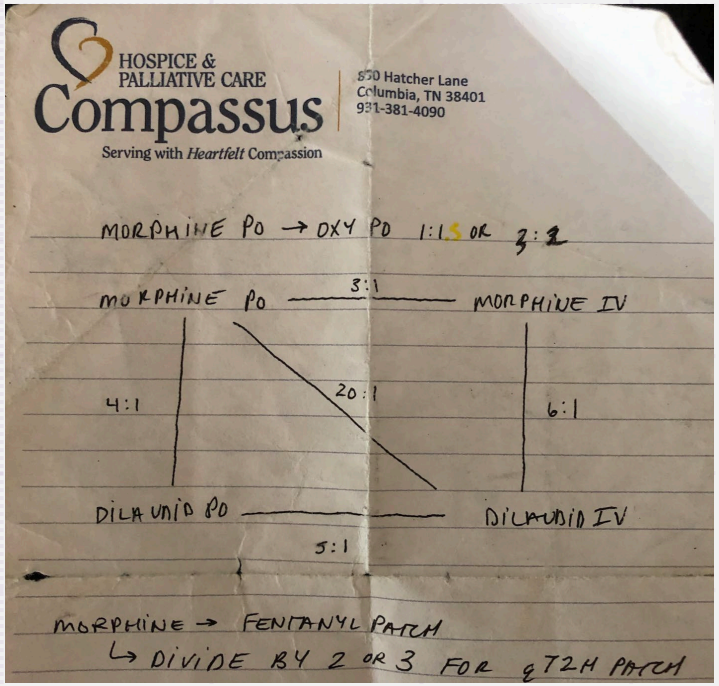
Goals and Objectives

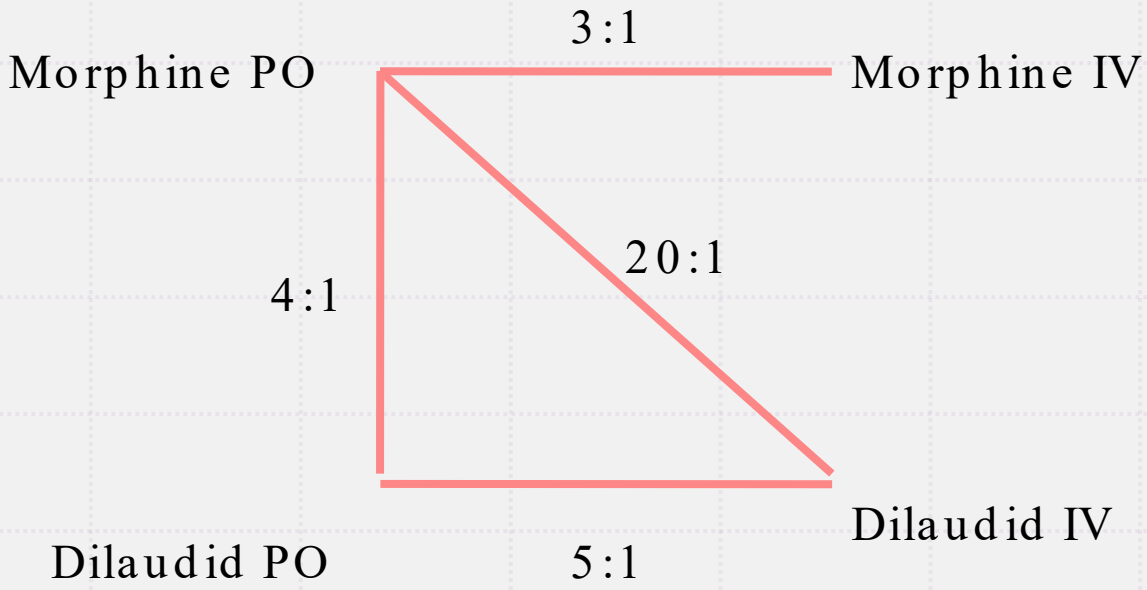
- By the end of this session, residents should be able to:
- Calculate oral morphine equivalents for the common PO and IV opioids.
- Determine an appropriate long and short acting oral opioid regimen based on a patient's OME needs.
- Convert an oral opioid regimen into a PCA and adjust the regimen based on their pain level.
- Convert an IV regimen into a fentanyl patch/oral regimen.

Review from Dr. Martin



Save this Conversion Chart





For those of you who prefer tables…

Morphine PO	30 mg
Morphine IV	10 mg
Dilaudid PO	7.5 mg
Dilaudid IV	1.5 mg
Oxycodone PO	20 mg
Hydrocodone PO	30 mg

Converting from oral morphine to fentanyl patch →
Divide oral morphine equivalent (total daily dose) by 2 or 3
This gives you dose of fentanyl patch in mcg/hr q72h

5 Steps for Successful Conversions

1. Assess the patient and their pain.
2. Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).
3. Calculate long-acting medicine dose and frequency.
4. Calculate PRN medicine dose and frequency.
5. Follow-up and Reassess.

From Demystifying Opioid Conversion Calculations.

Some rules for pain management

- Start with short-acting as needed regimen
- Start long-acting when patient is requiring 4 or 5 prn doses per day
- Bolus dose should be about 10-20% of total daily dose
- Availability should be based on half-life of medicine (4h for PO, 2h for IV)

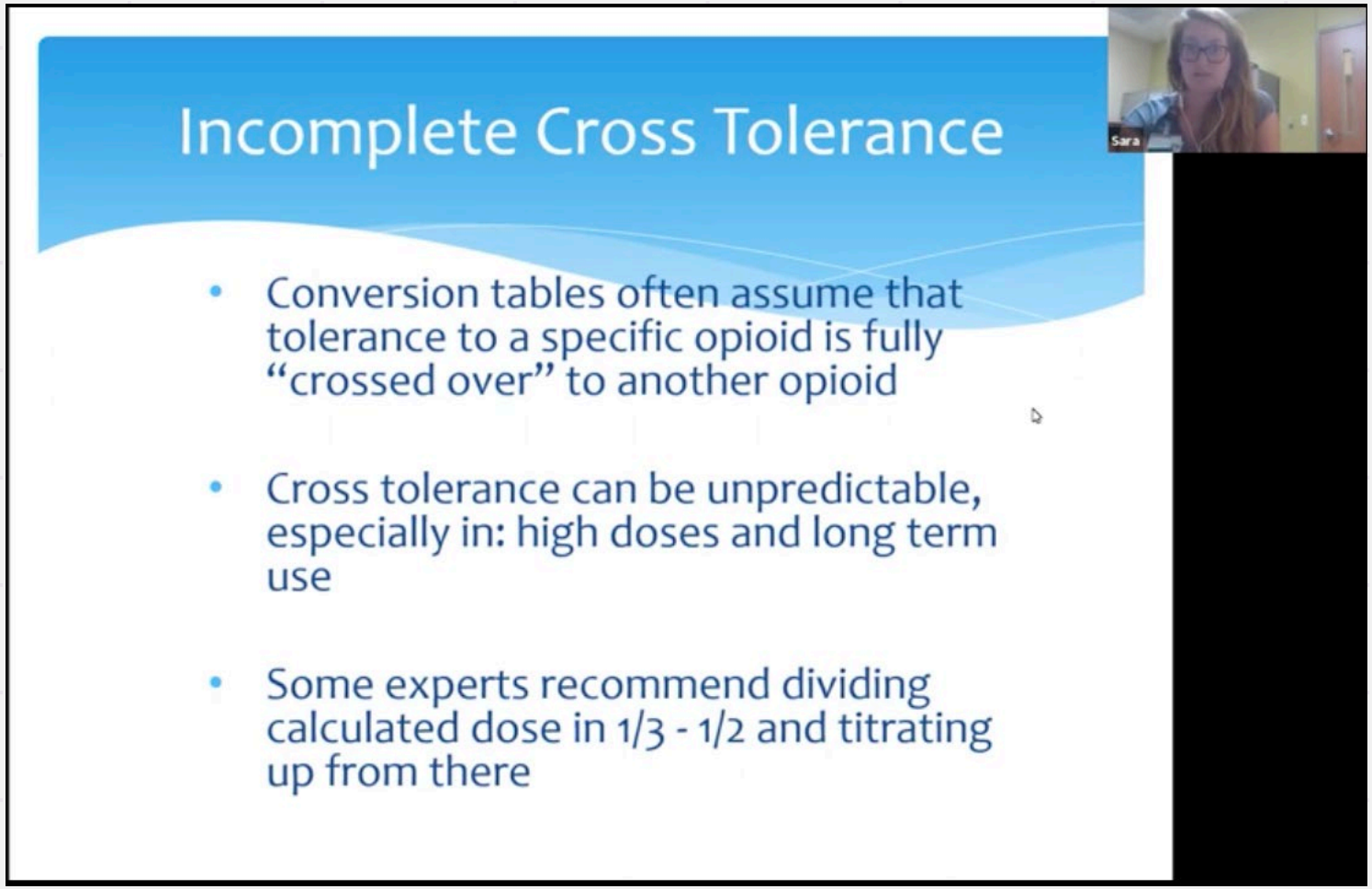
Titrating

- Moderate pain (4-7 out of 10) → increase dose by 25-50%
- Severe pain (8-10 out of 10) → increase dose by 50-100%

A brief word on PCAs

- When calculating basal dose, ensure you know what the patient is taking (≠ prescribed) and use the total OME + adjust this basal based on titration rules:
- Moderate pain (4-7 out of 10) → increase dose by 25-50%
- Severe pain (8-10 out of 10) → increase dose by 50-100%
- Bolus dose should still be about 10-20% of the BASAL DOSE.
- Availability should be based on half-life of medicine (2h for IV)
- Remember to adjust the above availability based on how frequently you want them to be able to demand (ex. q10 minute will divide by 12 or q15 minutes will divide by 8 for 2 hours)
- Do not forget LOCK-OUTS (include both BASAL and DEMAND here)!

Incomplete Cross Tolerance



"…a lot of this is the art of medicine"

One example before the contest!

Mr. Smith has cancer pain, on hydrocodone/APAP 10/325 mg q4h prn for pain. Normal renal function.

His pain is "low" most of the time as long as he takes the pain pill every 4 hours. He takes 6 pills per day.

Hydrocodone 10mg x 6 = 60mg Hydrocodone = 60mg OME

Long acting dose: 30mg Morphine SR q12h

Morphine PO	30 mg
Morphine IV	10 mg
Dilaudid PO	7.5 mg
Dilaudid IV	1.5 mg
Oxycodone PO	20 mg

60 X 10% = 6mg or 6 X 20% = 12mg → in the middle = 10mg
Will ensure dose is q4h given PO half life
Hydrocodone 10mg q4h

Bolus dose should be about 10-20% of total daily dose

Final Regimen 30mg Morphine SR q12h + Hydrocodone 10mg q4h PRN

Assess	Assess the patient and their pain.
Determine	Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).
Calculate	Calculate long-acting medicine dose and frequency.
Calculate	Calculate PRN medicine dose and frequency.
Follow	Follow-up and Reassess.

Case 1

Mr. Jones is a 70 year old with metastatic prostate cancer. He presents to clinic with worsening back pain. He is taking oxycodone 20 mg SR every 12 hours and oxycodone 5 mg IR q4h prn. His pain is "moderate (5/10)" most of the time even if he takes the oxycodone IR every 4 hours. In addition to oxycodone SR, he takes 6 pills of oxycodone IR per day. Renal function is normal.

RULES: YOU WANT TO CHANGE TO ORAL MORPHINE AND INCREASE TOTAL OME

1	Determine	Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).
2	Calculate	Calculate long-acting medicine dose and frequency.
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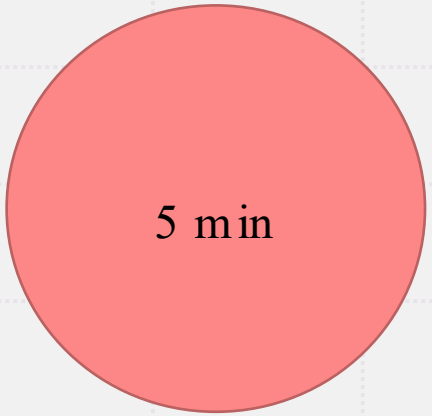

Titrating

Moderate pain (4-7 out of 10) → increase dose by 25-50%

Severe pain (8-10 out of 10) → increase dose by 50-100%

REMINDER

Morphine PO	30 mg
Morphine IV	10 mg
Dilaudid PO	7.5 mg
Dilaudid IV	1.5 mg
Oxycodone PO	20 mg
Hydrocodone PO	30 mg

FYI: MS Contin available in 15mg, 30mg, 60mg, 100mg and 200mg and can be dosed q12h or q8h

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RULES: YOU WANT TO CHANGE TO ORAL MORPHINE AND INCREASE TOTAL OME.

1	Determine	Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).
2	Calculate	Calculate long-acting medicine dose and frequency.
3	Calculate	Calculate PRN medicine dose and frequency.

Oxycodone 20mg x2 + Oxycodone 5mg x6 = 70mg Oxy

Oxycodone 1.5mg = Morphine 1mg

Oxycodone 70mg = 105mg OME

Titrating

Moderate pain (4-7 out of 10) → increase dose by 25-50%

Severe pain (8-10 out of 10) → increase dose by 50-100%

REMINDER

OME 105mg x 1.25 = OME 131.25mg

MS Contin 60mg q12

Closest dose with pills available = 60mg q12

Long acting OME 120 total so…

15-20mg Morphine IR q4h PRN

Case 2

Mr. Smith has metastatic malignancy of unknown primary and is stable on a current opioid regimen (Morphine SR 30 mg every 8 hours scheduled and Morphine IR 15 mg every 4 hours as needed for breakthrough pain). He claims that he has not needed his PRN doses at all in the past 5 days prior to this starting. He presents to the ED for the past 24 hours of vomiting and diarrhea and has been unable to take any of his pills consistently. He has "high (9/10)" pain but says if he can just keep the pills down, he thinks he will have controlled pain. He is found to have a partial small bowel obstruction and is made NPO. Renal function is normal.

RULES: YOU WANT TO START A MORPHINE PCA (NO UPTITRATION NEEDED)

1	Determine	Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).
2	Calculate	Calculate long-acting medicine dose and frequency.
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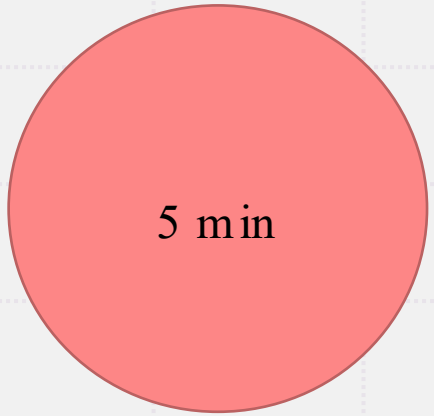

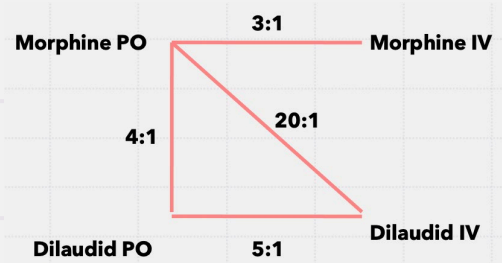

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RULES: YOU WANT TO START A MORPHINE PCA (NO UPTITRATION NEEDED)

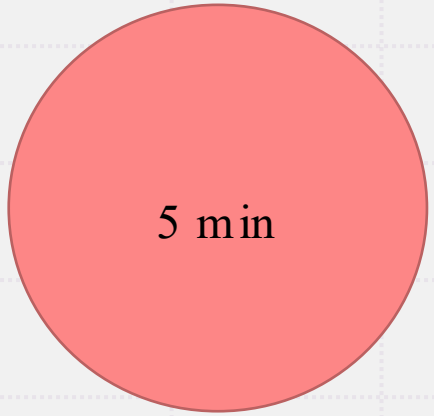
1	Determine	Determine the Total Daily Dose (TDD) of the current opioid usage in oral morphine equivalents then convert to IV.	Morphine SR 30mg x3 = 90 LONG ACTING OME CONVERT TO IV → 30mg IV Morphine/DAY
2	Calculate	Calculate BASAL dose.	BASAL = 30mg/24h = 1.25mg/hr 1.25 mg/hr BASAL
3	Calculate	Calculate BOLUS medicine dose <u>for every 15 minutes.</u>	BOLUS = 10-20% TOTAL BASAL DOSE, FREQUENCY per HALF LIFE 30mg IV Morphine X 0.1 or 0.2 (HALF LIFE for IV = 2h) 3 mg or 6 mg q2h (divided by 8) = 0.375 or 0.75 q15min Somewhere in the middle = 0.5mg every 15 minutes DEMAND

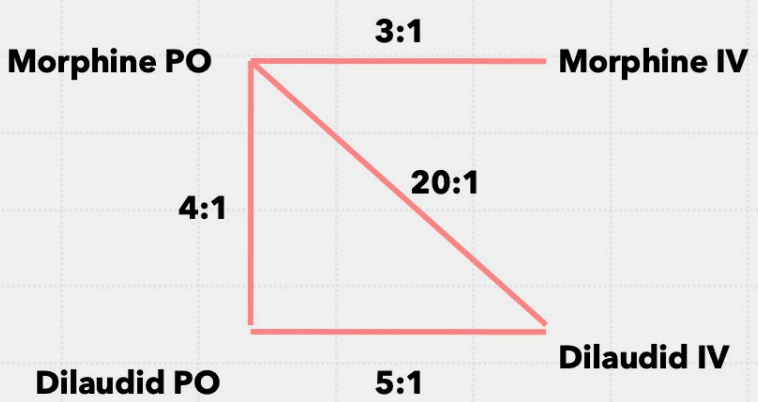
Case 3

Mr. Smith improved form his SBO and was restarted on his home pain regimen (Morphine SR 30 mg every 8 hours scheduled and Morphine IR 15 mg every 4 hours as needed for breakthrough pain). Over the next month, his pain progresses and he is taking the morphine IR every 4 hours. Unfortunately, his pain increases to the point where even with this regimen, he presents to the ER with "severe pain (10/10)". His renal function is IMPAIRED.

RULES: START A DILAUDID PCA AND INCREASE BASAL BY ~50% DUE TO SEVERE PAIN

1	Determine	Determine the Total Daily Dose (TDD) of the current opioid regimen in oral morphine equivalents then convert to IV.
2	Calculate	Calculate BASAL dose at ~50% increase.
3	Calculate	Calculate BOLUS medicine dose for every 15 minutes.





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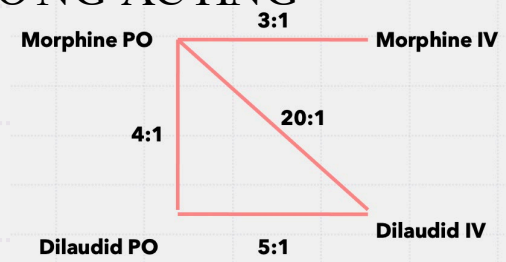
RULES: START A DILAUDID PCA AND INCREASE BASAL BY ~50% DUE TO SEVERE PAIN

1 **Determine** — Determine the Total Daily Dose (TDD) of the current opioid regimen in oral morphine equivalents then convert to IV.

Morphine SR 30mg x3 + IR 15mg x6 = 180 LONG ACTING
OME CONVERT TO IV DILAUDID (180/20)
= 9mg IV Dilaudid/DAY



2 **Calculate** — Calculate BASAL dose at ~50% increase.

BASAL = 9mg/24h = 0.375mg/hr
50% DOSE INCREASE: 0.375mg/hr (x1.5) = 0.5625 mg/hr
Somewhere in the middle = 0.5 mg/hr BASAL

3 **Calculate** — Calculate BOLUS medicine dose for every 15 minutes.

BOLUS = 10-20% TOTAL BASAL DOSE, FREQUENCY per HALF LIFE
12 mg IV Dilaudid X 0.1 or 0.2 (HALF LIFE for IV = 2h)
1.2 mg or 2.4 mg q2h (divided by 8) = 0.15-0.3 q15min
Somewhere in the middle = 0.25 mg every 15 minutes DEMAND

Case 4

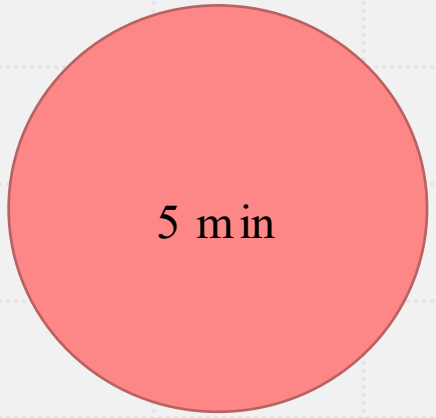
Mrs. Nesbitt has esophageal cancer and is admitted for a pain crisis. She was started on a Morphine PCA at 1.5mg/hr BASAL with 0.5mg every 15 minutes demand. When her PCA was interrogated, she had 50 total demands over the last 24 hours and 40 were delivered. She states this AM that she is eager to discharge by tomorrow to make it to her granddaughter's prom night photos, and that her pain is "well controlled (2/10)." She is on a dysphagia diet and having issues swallowing pills. Renal function is normal.

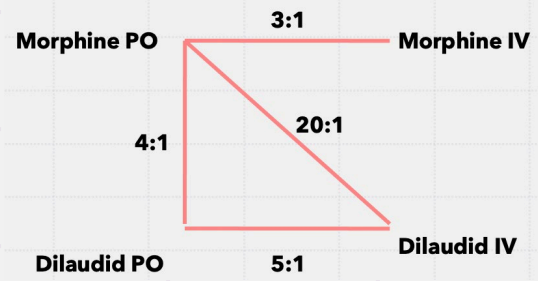
RULES: CONVERT TO FENTANYL PATCH + LIQUID MORPHINE BASED ON PCA NEEDS

1 **Determine** Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).

2 **Calculate** Calculate long-acting medicine dose and frequency.

3 **Calculate** Calculate PRN medicine dose and frequency.





Converting from oral morphine to **fentanyl patch** →
Divide oral morphine equivalent (total daily dose) by 2 or 3
This gives you dose of fentanyl patch in mcg/hr q72h

Conversion from Oral Morphine to Duragesic[4]

Recommended Initial Duragesic® Dose Based on Daily Oral Morphine Dose	
Oral 24-hour morphine (mg/day)	**Duragesic® dose (mcg/h)**
60–134	25
135–224	50
225–314	75
315–404	100

Table 5-2
Donner Recommended Conversion from Oral Morphine to Duragesic

Recommended Initial Fentanyl Doses Based on Daily Oral Morphine Dosage[12]	
24-Hour oral morphine dose (mg/day)	**Transdermal fentanyl dose (mcg/h)**
30–90	25
91–150	50
151–210	75
211–270	100
Every additional 60 mg per day	An additional 25 mcg per hour

Case 4

Mrs. Nesbitt has esophageal cancer and is admitted for a pain crisis. She was started on a Morphine PCA at 1.5mg/hr BASAL with 0.5mg every 15 minutes demand. When her PCA was interrogated, she had 50 total demands over the last 24 hours and 40 were delivered. She states this AM that she is eager to discharge by tomorrow to make it to her granddaughter's prom night photos, and that her pain is "well controlled (2/10)." She is on a dysphagia diet and having issues swallowing pills. Renal function is normal.

RULES: CONVERT TO FENTANYL PATCH + LIQUID MORPHINE BASED ON PCA NEEDS

1	Determine	Determine the Total Daily Dose (TDD) of the current opioid and Calculate this in terms of oral morphine equivalent (OME).	1.5mg x 24 hours = 36mg IV Morphine 0.5mg x 40 = 20 mg IV Morphine TOTAL = 56mg IV Morphine X3 = 168 OME
2	Calculate	Calculate long-acting medicine dose and frequency.	FENTANYL PATCH DOSE = OME divided by 2-3 168/3 = 56, 168/2 = 84 **DECREASE FOR CROSS TOLERANCE? 50mcg/h or 75 mcg/h every 72h fentanyl patch
3	Calculate	Calculate PRN medicine dose and frequency.	PRN MORPHINE 168 OME x 0.1 or 0.2 = 16.8 – 33.6 every 4 hours Somewhere in between = 20mg Liquid Morphine q4h

And the winners are…

Questions?

P.S. Don’t forget your bowel regimens!