Not what the doctor ordered?
Trends in Opioid drugs 2012

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Half Life

- Abbreviated as: $t_{\frac{1}{2}}$
- The time it takes for a substance to lose half of its pharmacologic activity
- Generally, $9 \times t_{\frac{1}{2}}$ it's gone
- Does NOT equal elimination half-life

<table>
<thead>
<tr>
<th>n</th>
<th>$1/2^n$</th>
<th>$100(1/2^n)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1/1</td>
<td>100%</td>
</tr>
<tr>
<td>1</td>
<td>1/2</td>
<td>50%</td>
</tr>
<tr>
<td>2</td>
<td>1/4</td>
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</tr>
<tr>
<td>3</td>
<td>1/8</td>
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<tr>
<td>4</td>
<td>1/16</td>
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<tr>
<td>5</td>
<td>1/32</td>
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<tr>
<td>6</td>
<td>1/64</td>
<td>1.563</td>
</tr>
<tr>
<td>7</td>
<td>1/128</td>
<td>0.781</td>
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<tr>
<td>n</td>
<td>$1/2^n$</td>
<td>$100(1/2^n)$</td>
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</tbody>
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Potency

- A measure of drug activity expressed in terms of the amount required to produce an effect of given intensity. A highly potent drug evokes a larger response at low concentrations. It is proportional to Affinity and Efficacy.
- For our purposes, how strong the stuff is….don’t forget synergistic effect and contaminants.

Effective Dose

- Abbreviated as: ED-50
- An effective dose in pharmacology is the amount of drug that produces a therapeutic response in 50% of the people taking it, sometimes also called ED-50.
Tolerance=Adaptation

• Person’s response is decreased to same dose, requiring greater volume or frequency of application (tachyphylaxis end result, as with amphetamines “amped out”)

Drugs make you feel something you normally don’t

• T ½
• Effective Dose: ED 50
• Lethal Dose: LD 50

Opioids

• Contains morphine (natural) heroin (semi-synthetic), diverted methadone (synthetic), other prescription opioid drugs
• Water soluble, detectible by UDS
• Agonist and antagonist properties at mu and kappa opioid receptor sites
• Used as analgesics, anesthetics, anti-diarrheal, cough suppressants
2000-2010 MN mortality with opiate as a cause for:

- Beltrami............14
- Cass.................14
- Clearwater.........1
- Hubbard.............6
- Mahnomen..........1

- Statewide was 1986 opiate related deaths
- 36 were in these counties

2000-2010 (total) mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties

2000-2010 (total) MN mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen counties, by year

2000-2010 (total) MN mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen counties, by gender
Between CY 2000-2010

- There were 1986 opiate related fatalities in MN
- Of those in the five county area of Beltrami, Cass, Clearwater, Hubbard and Mahnomen, 51% were Native
All Tx Admission for Opiates, by gender, Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties, 1998-2009

Opiates by age group, 2007-2010, for Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties

Pregnancy status at admission 2007-2010, opiates, for Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties

Race 2007-2010, opiates, for Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties

Source: DAANES, PMQI 2010
Heroin vs. other opiate admission statewide 1998-2009

Opiate intoxication

- Directly related to volume and strength consumed

miosis

- Constricting of the pupil, 2-3mm

Slurred speech

- Inability to enunciate words, broken sentence structure and vocabulary choice

Source: DAANES, PMQI, MN DHS 2010
fatigue

• That state, following a period of mental or bodily activity, characterized by a lessened capacity for work and reduced efficiency of accomplishment, usually accompanied by a feeling of weariness, sleepiness, or irritability.

Stupor or coma

• The partial or nearly complete unconsciousness, manifested by the subject's responding only to vigorous stimulation.

Impairment in attention

• Inability to focus on objections or discussions, e.g. can’t “track”

Impairment in memory

• Inability to recall short or long term memory, may also have difficulty with recognition.
Opioid withdrawal

Rarely life threatening
• Looks like bad case of the flu

mydriasis

• Widening of the pupil, 7-8mm, slow and sluggish to respond

lacrimation

• Watering of the eyes, shedding tears

rhinorrhea

• Flowing, nasal discharge
diaphoresis

- Perspiration, especially profuse perspiration, e.g. “sweating”

Nausea/emesis

- Upset stomach and vomiting

diarrhea

- A morbidly frequent and profuse discharge of loose or fluid evacuations from the intestines e.g. “the shits, the hershey squirts, the green apple two-step”

Muscle aches

- Burning pain in the muscle body
fever

- A rise in body temperature above normal usually as a natural response to infection. Typically an oral temperature greater than 100.4 degrees Fahrenheit constitutes a fever.

piloerection

- Erection of the hair, e.g. “hair standing on end”

Tx options

- methadone
- buprenorphine