

# Not what the doctor ordered? Trends in Opioid drugs 2012

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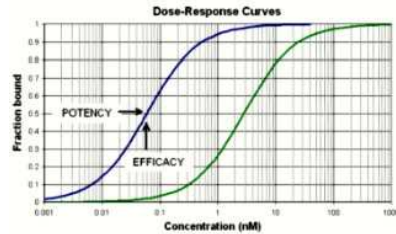
## Half Life

- Abbreviated as:  $t_{1/2}$
  - The time it takes for a substance to lose half of its pharmacologic activity
  - Generally, 9 x  $t_{1/2}$  it's gone
  - Does NOT equal elimination half-life
- |     |                  |                        |
|-----|------------------|------------------------|
| • 0 | 1/1              | 100%                   |
| • 1 | 1/2              | 50%                    |
| • 2 | 1/4              | 25%                    |
| • 3 | 1/8              | 12.5%                  |
| • 4 | 1/16             | 6.25%                  |
| • 5 | 1/32             | 3.125%                 |
| • 6 | 1/64             | 1.563                  |
| • 7 | 1/128            | 0.781                  |
| • n | 1/2 <sup>n</sup> | 100(1/2 <sup>n</sup> ) |

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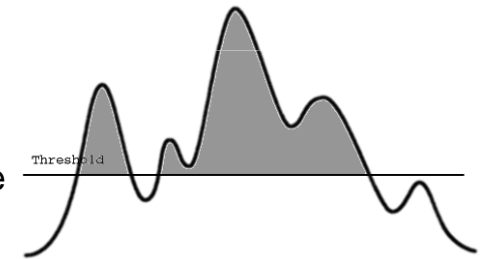
# Potency

- 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

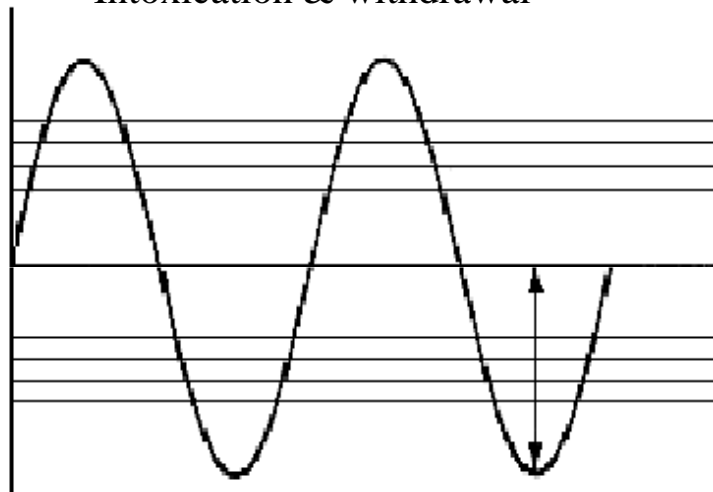


# Effective Dose

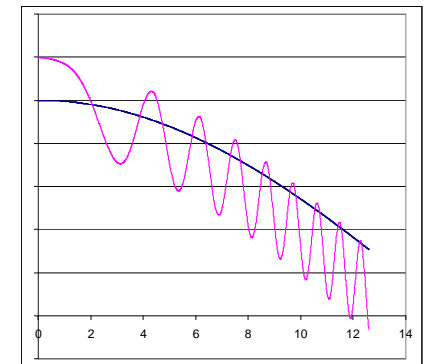
- Abbreviated as: ED-50
- An **effective dose** in pharmacology is the amount of drug that produces a therapeutic response in 50% of the people taking it, sometimes also called **ED-50**.



# Intoxication & withdrawal

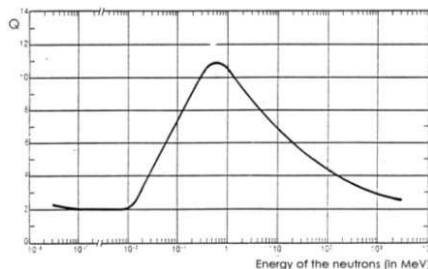


# Intoxication/Withdrawal



# Tolerance=Adaptation

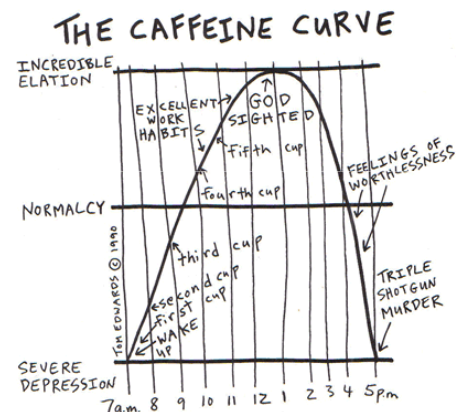
- Person's response is decreased to same dose, requiring greater volume or frequency of application (tachyphylaxis end result, as with amphetamines "amped out")



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# Drugs make you feel something you normally don't

- $T_{1/2}$
- Effective Dose: ED<sub>50</sub>
- Lethal Dose: LD<sub>50</sub>



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# 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

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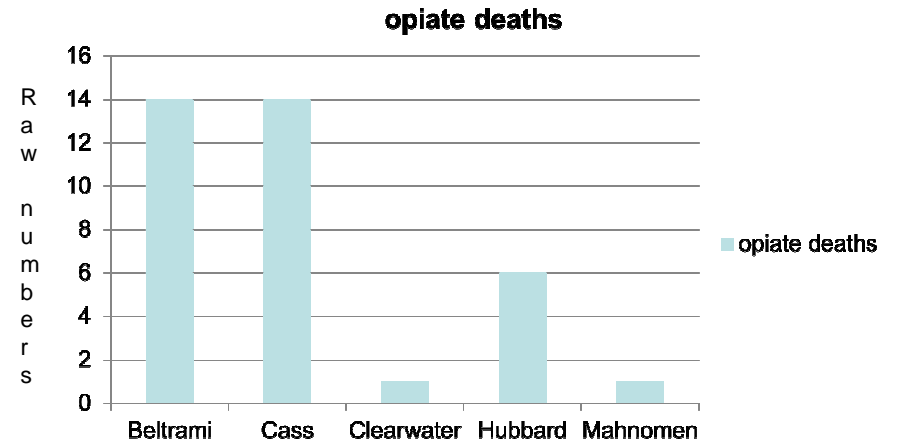


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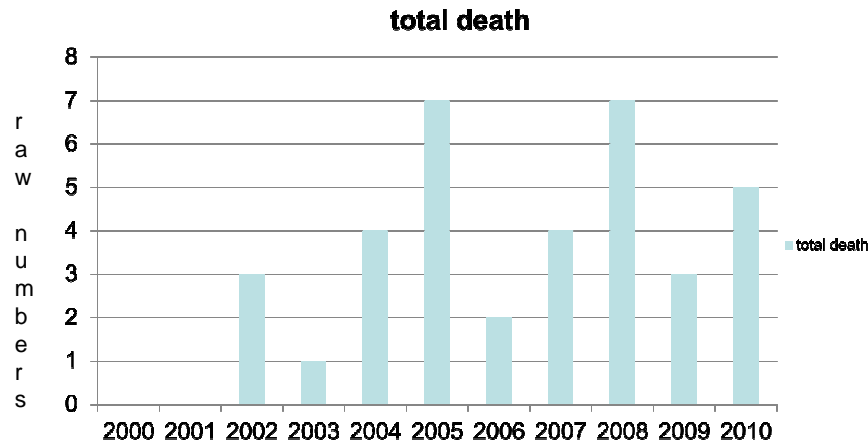
# 2000-2010 MN mortality with opiate as a cause for:

- Beltrami.....14
- Cass.....14
- Clearwater.....1
- Hubbard.....6
- Mahnomen.....1
- Statewide was 1986 opiate related deaths
- 36 were in these counties

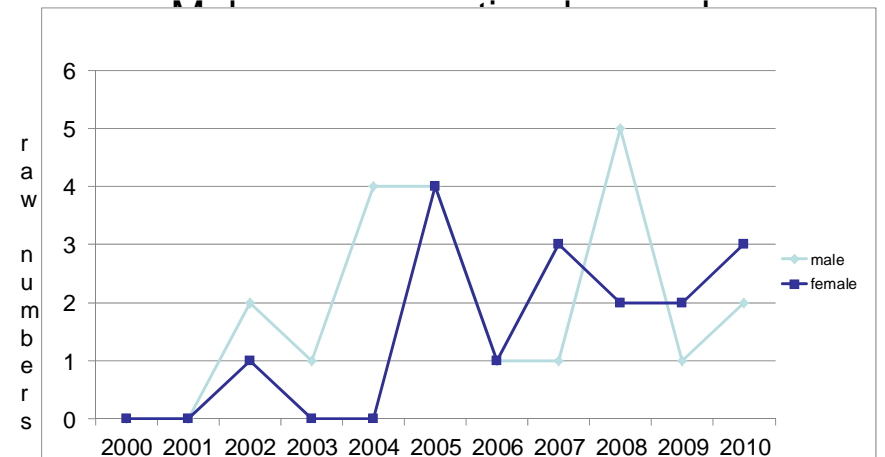
# 2000-2010 (total) mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties



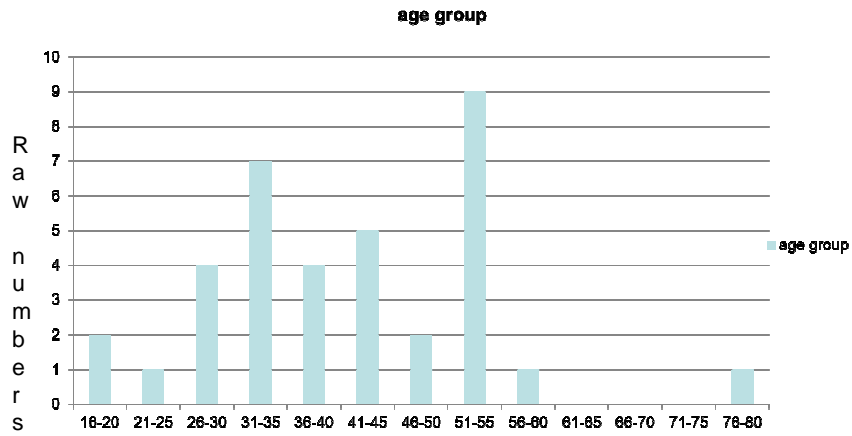
# 2000-2010 (total) MN mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen counties, by year



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

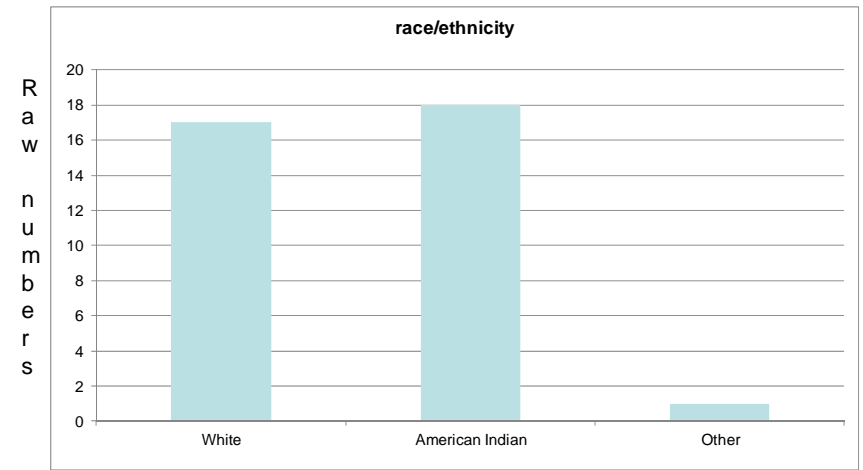


2000-2010 (total) MN mortality with opiate in Beltrami, Cass, Clearwater, Hubbard and Mahnomen counties, by selected age group



MDH Vital Stats, 2011

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



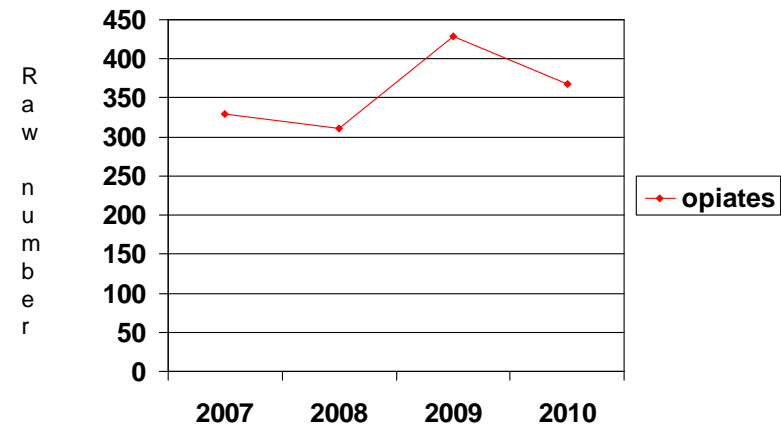
MDH Vital Stats, 2011

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

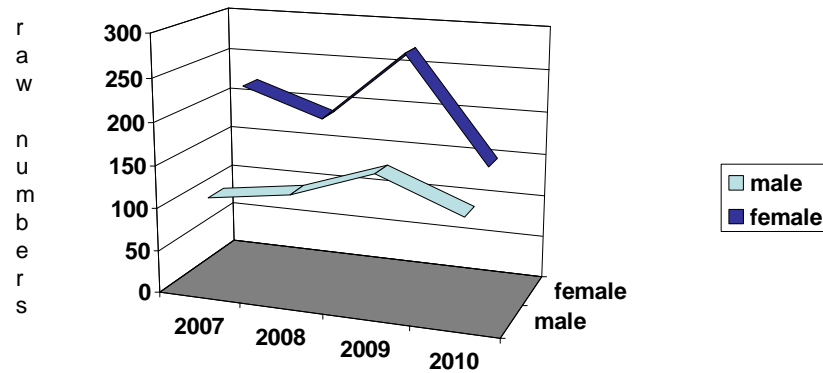
MDH Vital Stats, 2011

All Tx Admission for Opiates, 2007-2010 for Beltrami, Cass, Clearwater, Hubbard Mahnomen Counties



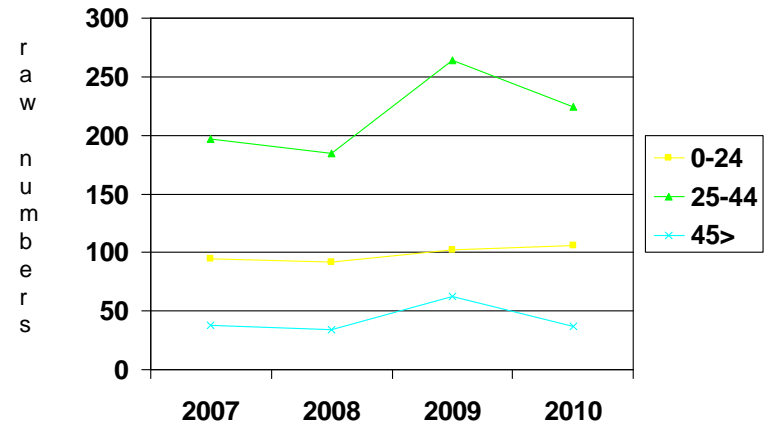
Source: DAANES, PMQI 2010

All Tx Admission for Opiates, by gender, Beltrami, Cass, Clearwater, Hubbard and Mahnomen Counties, 1998-2009



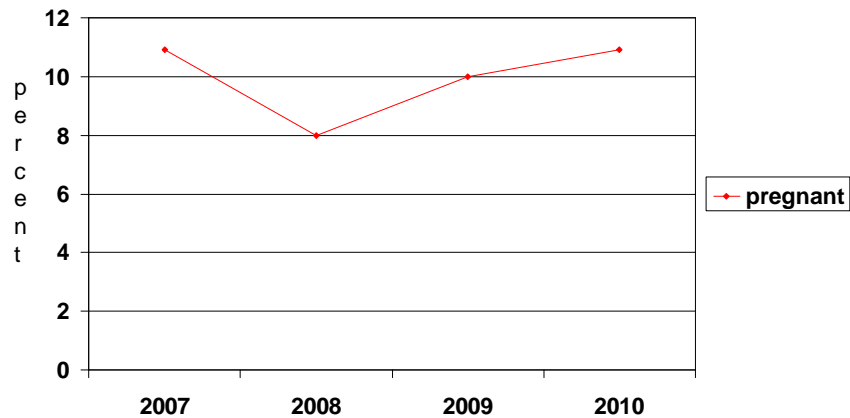
Source: DAANES, PMQI 2010

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



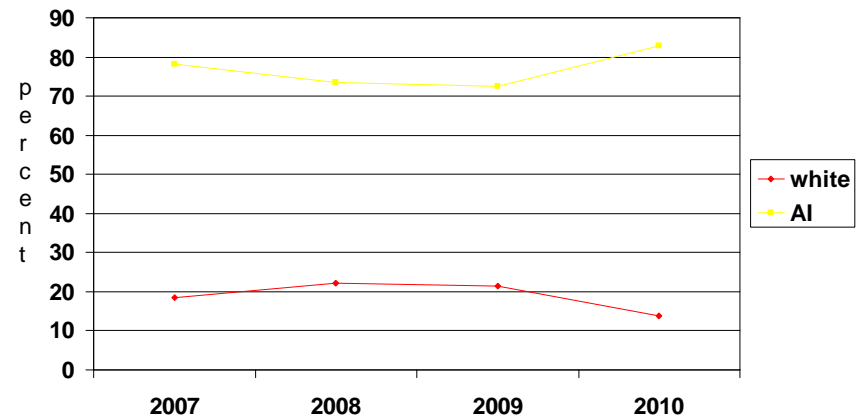
Source: DAANES, PMQI 2010

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



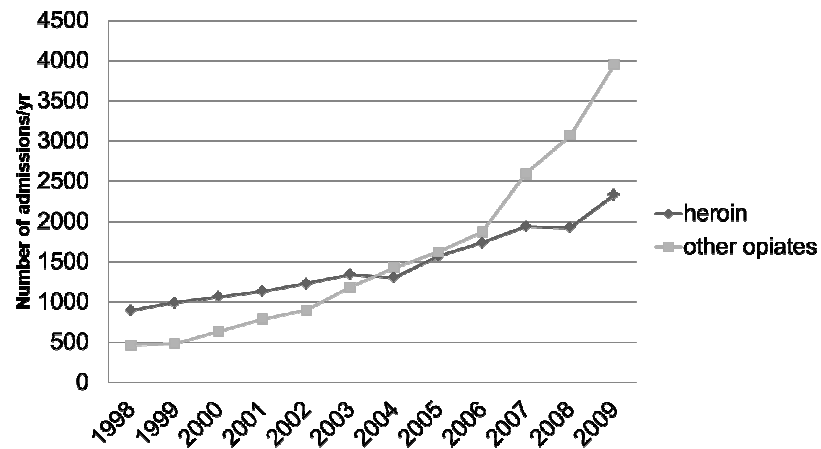
Source: DAANES, PMQI 2010

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



Source: DAANES, PMQI 2010

## Heroin vs. other opiate admission statewide 1998-2009



Source: DAANES, PMQI, MN DHS 2010

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## Opiate intoxication

- Directly related to volume and strength consumed



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## miosis

- Constricting of the pupil, 2-3mm



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## Slurred speech

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



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## 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.



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## Stupor or coma

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



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## Impairment in attention

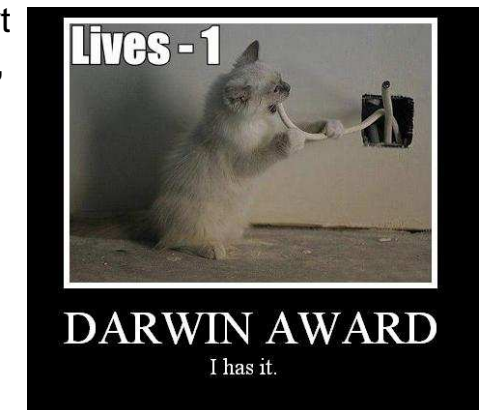
- Inability to focus on objections or discussions, e.g. can't "track"



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## Impairment in memory

- Inability to recall short or long term memory, may also have difficulty with recognition



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## Opioid withdrawal

Rarely life threatening

- Looks like bad case of the flu



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## mydriasis

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



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## lacrimation

- Watering of the eyes, shedding tears



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## rhinorrhea

- Flowing, nasal discharge



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## diaphoresis

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



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## Nausea/emesis

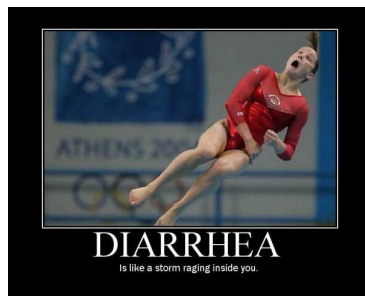
- Upset stomach and vomiting



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## diarrhea

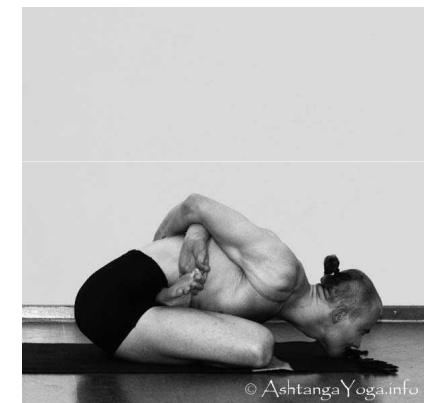
- A morbidly frequent and profuse discharge of loose or fluid evacuations from the intestines e.g. “the shits, the hershey squirts, the green apple two-step”



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## Muscle aches

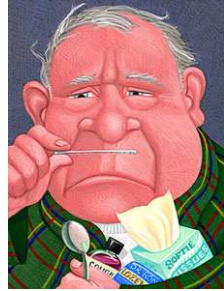
- Burning pain in the muscle body



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## 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.



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## piloerection

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



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## Tx options

- methadone
- buprenorphine

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