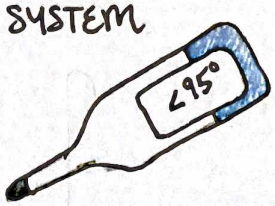
HYPOTHERMIA

& the response of the NERVOUS SYSTEM



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Cold thermoreceptors 

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dorsal horn

↓

thalamus

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somatosensory cortex

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preoptic of hypothalamus

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sympathetic nervous system

MILD HYPOTHERMIA (90-95°F)

excitation by sympathetic nervous system to compensate for cold...

- shivering
  by skeletal muscles to generate heat.
- vasoconstriction
  to conserve heat

- tachycardia
- tachypnea
- hypertension

as time progresses...

- ataxia & impeired judgement
  as brain runs short on glucose since it is being used for rapid muscle contractions for shivering
- cyanosis
  as blood flow to the skin is reduced due to vasoconstriction & blood concentrates around vital organs

MODERATE HYPOTHERMIA (82-90°F)

not enough energy to maintain sympethetic response – reflex is lost as there is not sufficient energy or O_2 flow to extremities

- atrial dysrhythmias
- decreased ♥ rate
- decreased level of consciousness
- decreased respiratory rate
- pupils dilate
- lost geg reflex

indicative of occuring brain death since afferent & efferent nerves which control it are not working

- shivering stops
- hyporoflexia

muscles unresponsive to stimuli

- hypotension

SEVERE HYPOTHERMIA (<82°F)

brain is too cold, risk of permanent brain damage & death

- apnea

brain stops sending signals to muscles controlled in breathing

- coma

occurs w/ brain damage
minimal brain activity
no sympathetic nervous system activity