The E’s: Endo, ENT, Environmental, Eyes

Peter Moffett MD FACEP
Assistant Professor
Department of Emergency Medicine
Rapid Fire Fill in the Blanks

- Endocrine
- Environmental
- HEENT
- Ophthalmology
Calculated osmolality = 2 X Na + Glucose/XX + BUN/XX
Calculated osmolality= 2 X Na + Glucose/18 + BUN/2.8
• Osmolar Gap
• M
• A
• D
• P
• I
• E
• Osmolar Gap
• Methanol
• Alcohol (ethanol)
• Diuretics (mannitol)
• Propylene glycol
• Isopropanol
• Ethylene glycol

Osmolar gap without anion gap = isopropanol
• Hyponatremia 3 types
• Hyponatremia 3 types (and now 1 cause of each)
  – Hypovolemic
  – Euvolemic
  – Hypervolemic
• Hyponatremia 3 types (and now 1 cause of each)
  – Hypovolemic
    • Vomiting/diarrhea/dehydration stuff
  – Euvolemic
    • SIADH
    • Hypothyroid
  – Hypervolemic
    • Cirrhois
    • Neprohtic
K Changes on EKG

Hyper K

Hypo K

P

T

QRS

P

T

QRS
K Changes on EKG

Hyper K

Hypo K
DKA

• First treatment?
DKA

- First treatment?
  - Crystalloid
- Goal of insulin therapy?
DKA

• First treatment?
  – Crystalloid

• Goal of insulin therapy?
  – Close the gap
DKA

• First treatment?
  – Crystalloid
• Goal of insulin therapy?
  – Close the gap
• Predominant ketone made?
DKA

• First treatment?
  – Crystalloid

• Goal of insulin therapy?
  – Close the gap

• Predominant ketone made?
  – Beta hydroxybuturate
DKA

• First treatment?
  – Crystalloid

• Goal of insulin therapy?
  – Close the gap

• Predominant ketone made?
  – Beta hydroxybuturate

• Ketone we test for?
  – Acetoacetate
HHS

- Who gets it?
HHS

• Who gets it?
  – Old people without water

• Which has higher mortality DKA or HHS?
HHS

• Who gets it?
  – Old people without water

• Which has higher mortality DKA or HHS?
  – HHS

• Who has larger fluid deficit DKA or HHS?
HHS

- Who gets it?
  - Old people without water
- Which has higher mortality DKA or HHS?
  - HHS
- Who has larger fluid deficit DKA or HHS?
  - HHS
# Hypothyroid

<table>
<thead>
<tr>
<th></th>
<th>Primary Hypo (gland)</th>
<th>Secondary Hypo (Not gland)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free T4</td>
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<td>Treatment</td>
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# Hypothyroid

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<tr>
<td><strong>Causes</strong></td>
<td>- Iatrogentic (Treat graves)</td>
<td>- Pituitary tumor</td>
</tr>
<tr>
<td></td>
<td>- Hashimoto</td>
<td>- Sheehans (postpartum hemorrhage)</td>
</tr>
<tr>
<td><strong>TSH</strong></td>
<td>Elevated (let’s go you lazy gland)</td>
<td>Low (I don’t care what you do gland)</td>
</tr>
<tr>
<td><strong>Free T4</strong></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Thyroxine</td>
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TSH: Thyroid Stimulating Hormone
Hyperthyroid

• Order of treatment?
Hyperthyroid

• Order of treatment?
  – Beta block (propranolol inhibits T4 to T3 conversion)
  – Antithyroid
    • Methimazole - easier to take
    • PTU - classic for pregnancy (controversy)
  – Iodine
  – Steroids
    • Dexamethasone blocks T4 to T3
Adrenal Insufficiency

• Primary Adrenal Insufficiency
  – ACTH?
Adrenal Insufficiency

• Primary Adrenal Insufficiency
  – ACTH?
    • Elevated
  – Skin?
Adrenal Insufficiency

• Primary Adrenal Insufficiency
  – ACTH?
    • Elevated
  – Skin?
    • Brown
  – Na?
Adrenal Insufficiency

- Primary Adrenal Insufficiency
  - ACTH?
    - Elevated
  - Skin?
    - Brown
  - Na?
    - Low
Adrenal Insufficiency

- Primary Adrenal Insufficiency - Addisons
  - ACTH?
    - Elevated
  - Skin?
    - Brown
  - Na?
    - Low
  - K?
    - Elevated
Adrenal Insufficiency

- Secondary insufficiency is outside the adrenal gland. Most common cause?
Adrenal Insufficiency

• Secondary insufficiency is outside the adrenal gland. Most common cause?
  – You! Suppression from long term steroid use

• Treatment of any adrenal insufficiency?
Adrenal Insufficiency

• Secondary insufficiency is outside the adrenal gland. Most common cause?
  – You! Suppression from long term steroid use

• Treatment of any adrenal insufficiency?
  – Hydrocortisone OR
  – Dexamethasone plus fludricortisone
Heat Illness

• 4 types of heat loss/gain? Most effective?
Heat Illness

• 4 types of heat loss/gain? Most effective?
  – Conduction, Convection, Radiation, Evaporation

• Minor heat illnesses?
Heat Illness

• 4 types of heat loss/gain? Most effective?
  – Conduction, Convection, Radiation, Evaporation

• Minor heat illnesses?
  – Heat rash
  – Heat Cramps
  – Heat edema
  – Heat Tetany
  – Heat syncope (yes…minor)
Heat Illness

• Differentiate heat stroke on the exam?
Heat Illness

• Differentiate heat stroke on the exam?
  – Altered mental status

• Two types of heat stroke
Heat Illness

• Differentiate heat stroke on the exam?
  – Altered mental status

• Two types of heat stroke
  – Classic - Elderly
  – Exertional - Younger, running, etc

• Lab that might be predictive of prognosis?
Heat Illness

• Differentiate heat stroke on the exam?
  – Altered mental status
• Two types of heat stroke
  – Classic - Elderly
  – Exertional - Younger, running, etc
• Lab that might be predictive of prognosis?
  – LFT (specifically AST)
• Most effective cooling?
Heat Illness

• Differentiate heat stroke on the exam?
  – Altered mental status

• Two types of heat stroke
  – Classic- Elderly
  – Exertional- Younger, running, etc

• Lab that might be predictive of prognosis?
  – LFT (specifically AST)

• Most effective cooling?
  – Bypass. Most effective you’ll find in the ED is the fan and mist thing
Cold Injuries

• Chillblains- Frozen fat, little painful nodules
• Trenchfoot- wet, cold water exposure
• Frostnip- Superficial without tissue loss - reversible
• Frostbite- tissue loss
  – Blisters?
Cold Injuries

- Chillblains: Frozen fat, little painful nodules
- Trenchfoot: wet, cold water exposure
- Frostnip: Superficial without tissue loss - reversible
- Frostbite: tissue loss
  - Blisters? Aspirate or leave intact. Good sign if early clear blisters
  - Amputate?
Cold Injuries

- Chillblains- Frozen fat, little painful nodules
- Trenchfoot- wet, cold water exposure
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  - Blisters? Aspirate or leave intact. Good sign if early clear blisters
  - Amputate? In June- after demarcation
# Hypothermia

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<td>32-35 °C</td>
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<td>&lt;28 °C</td>
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- EKG finding?
Hypothermia

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- EKG finding? J wave (osborne wave)
- Cardiac arrest management?
Hypothermia

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- **EKG finding?** J wave (osborne wave)
- **Cardiac arrest management?**
  - Single defibrillation
  - One round of meds
  - Bypass or ECMO
Hypothermia

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- EKG finding? J wave (osborne wave)
- Cardiac arrest management?
  - Single defibrillation
  - One round of meds
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<th>Passive Rewarming</th>
<th>Active External</th>
<th>Active Core</th>
</tr>
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<tbody>
<tr>
<td>Blankets</td>
<td>Bear Hugger</td>
<td>Foley, chest tubes, g tube, peritoneal Bypass/ECMO</td>
</tr>
<tr>
<td></td>
<td>Warm IV fluids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Warm oxygen</td>
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Electricity

• V=IR
• More dangerous AC or DC?
Electricity

• V=IR
• More dangerous AC or DC?
  – AC
• Tissue damage deep and not seen
• Remember renal dysfunction/rhabdo
• Labial artery in kids (3-5 days later die)
Lightening

- Lichtenberg sign
- Keraunoparalysis- cold pulseless extremity
- Paralyzed pupils
- Reverse triage
- TM rupture
Altitude

• Acute Mountain Sickness
  – Hangover like, self limited and will acclimatize
  – Can prevent with acetazolamide

• High Altitude Pulmonary Edema
  – Dexamethasone WILL NOT HELP
  – Nifedipine
  – Must descend

• High Altitude Cerebral Edema
  – Ataxia most sensitive sign
  – Dexamethasone and descent
Diving

• Descent dysbarisms (pressure) - squeezes
  – Ear pain, TM rupture, hearing loss, petechia, pulmonary edema

• Nitrogen narcosis
  – Breathing normal mixture at >100ft, act crazy, slow ascent

• Ascent dysbarisms (pressure)
  – TM rupture, vertigo, hemoptysis
Arterial Gas Embolism

- Sudden onset after ascent or during ascent (within 10 minutes)
- Stroke or ACS symptoms
- Rapid recompression in hyperbaric chamber
Decompression Illness (Nitrogen bubbles)

- Type I (the bends)
  - Skin, joints, extremities
- Type II (the chokes)
  - More serious
  - AMS, vertigo, spinal cord paralysis
- Treatment - hyperbaric
Submersion

- No more wet or dry drowning
- No difference in salt or fresh water
- Do not treat aspiration with antibiotics
- Cold water immersion
  - Immersion syndrome- adults vagal into arrest
  - Kids- Might trigger diving reflex and help them live
Otitis

• Externa
  – Mostly staph
• Malignant Externa
  – Diabetics, pseudomonas
  – Aspergillus (fungal)
Otitis Media

• Most specific sign?
Otitis Media

• Most specific sign?
  – Loss of mobility pneumatic otoscopy

• Most common complication?
Otitis Media

• Most specific sign?
  – Loss of mobility pneumatic otoscopy
• Most common complication?
  – TM rupture or hearing loss
• Watchful waiting with antibiotics?
Otitis Media

• Most specific sign?
  – Loss of mobility pneumatic otoscopy

• Most common complication?
  – TM rupture or hearing loss

• Watchful waiting with antibiotics?
  – Sure, unless toxic or immune compromised
Hearing Loss

- Rinne near the pinna - conductive loss
- Weber - forehead
  - Hear sound in bad ear with conductive loss
  - Hear sound in good ear with sensorineural loss
Epistaxis

• Most common anterior source?
Epistaxis

• Most common anterior source?
  – Kiesselbach plexus (Little’s area)

• Most common posterior source?
Epistaxis

• Most common anterior source?
  – Kiesselbach plexus (Little’s area)

• Most common posterior source?
  – Sphenopalantine artery (Woodruffs plexus)

• Most common cause?
Epistaxis

• Most common anterior source?
  – Kiesselbach plexus (Little’s area)

• Most common posterior source?
  – Sphenopalantine artery (Woodruffs plexus)

• Most common cause?
  – Epistaxis digitorum

• Admit whom?
Epistaxis

• Most common anterior source?
  – Kiesselbach plexus (Little’s area)
• Most common posterior source?
  – Sphenopalantine artery (Woodruffs plexus)
• Most common cause?
  – Epistaxis digitorum
• Admit whom?
  – Elderly
  – Posterior (nasopulmonary reflex, choking)
  – Bilateral
Hematomas

- Open and drain auricular and nasal septal hematomas to prevent:
  - Ear:
  - Nose:
Hematomas

• Open and drain auricular and nasal septal hematomas to prevent:
  – Ear: Cauliflower ear
  – Nose: Saddle deformity
Basilar Skull Fractures

• CSF otorrhea
  – Most sensitive test is B2 transferrin
• Battle sign (behind ear)
• Raccoon eyes
• No need for prophylactic antibiotics
Face antibiotics

• ENT physicians only know:
  – Augmentin (unasyn or zosyn IV)
  – Clindamycin

• Dentists only know:
  – Penicillin
  – Clindamycin
Mandibular Dislocation

- Push it down and back like a filing cabinet
Cavernous Sinus Thrombosis

- CN 6 most common presenting nerve
- Toxic appearance
- IV antibiotics
- IV heparin
Abscesses

• Ludwig’s angina
  – starts from the teeth
  – Brawny edema crossing midline
• RPA
  – 6 at 2 and 22 at 6
  – More likely in small children
• PTA
  – More likely in adolescents
  – Drain superior to inferior for best success
Strep complications

• Scarlet fever
  – Sandpaper rash. No one cares

• Rheumatic fever
  – Joints
  – ❤ carditis
  – Nodules
  – Erythema marginatum
  – Sydenham chorea
Ellis classification

FIG. 19-11. Ellis classification for fractures of anterior teeth.
ANUG

- Must invade non-necrotic tissue
- Immunodeficiency
- IV antibiotics and needs debridement
Eye

• Hordeolum- outside the eyelid
• Chalazion- inside the eyelid
• Call your ophtho for the following lacerations:
  – Lid margin
  – Through the canalicular system
  – Tarsal plate showing
  – Fat sticking out
  – Tissue loss
Staining

Corneal abrasion

Herpes SIMPLEX keratitis- dendrite

Corneal ulcer

Varicella zoster- pseudodendrite. Ramsey Hunt Syndrome clue

VCUHealth™
Eye

- Acid- coagulation necrosis- better because it stops
- Alkali- liquifactive necrosis- never stops
- Irrigate until pH of 7
- Ok to anesthetize first
Glacoma Treatment

• Timolol
• Acetazolamide
• Mannitol
• Pilocarpine
Cellulitis

• Pre-septal or periorbital (around the eye)
  – Antibiotics

• Post septal or orbital (behind the eye)
  – Surgery
Iritis/Uveitis

- Consensual photophobia
- May be post trauma
- Steroids (consult ophtho)
- Mydriatics (dilator/paralyzer)
- Pain meds
Acute Painless Vision Loss

• Retinal detachment
  – Flashers, floaters
  – Laser, surgery

• Central Retinal Artery Occlusion
  – Cherry spot on retina
  – Massage, paper bag breathing, call ophto

• Central Retinal Vein Occlusion
  – Blood and thunder retina
  – Call ophto
Frontal Sinusitis

- Erodes forward – Potts puffy tumor
- Erodes backward- brain abscess and die