100 CARDINAL PED PRESENTATIONS

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CASES 31-40

What is this lecture about?

- Pediatric – exclusive to or commonly seen in kids
- Not a Zebra (ie something I've either seen during my career or know has been seen in our PED)
- Not a horse either – ie something you may make it through training without seeing
- Emergency practitioner can make the diagnosis or at least suspect it
- Emergency practitioner *should* make the diagnosis or at least suspect it, and can make a difference by either getting diagnostic studies, appropriate consultations, and starting initial management or by not doing unnecessary work-up

Quick info in 3 slides

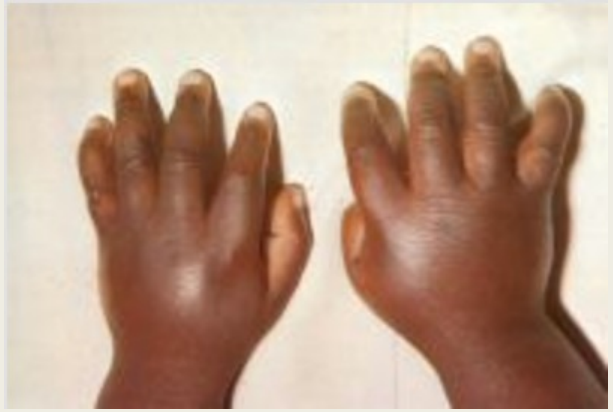
- Classic case – build on illness scripts to reinforce when you should suspect this entity
- What should make you suspect this diagnosis
- Basics of diagnosis and ED management
- You can look it up for more detail, but you can’t look it up until you at least suspect it
- FOAM resources for additional readings

How to use this lecture

- After the initial case presentation, think about the differential diagnosis
- Helpful framework: SPIT
  - *What is the most Serious diagnosis?*
  - *What is the most Probable diagnosis?*
  - *What is the most Interesting diagnosis?*
  - *What is the most Treatable diagnosis (ie what diagnosis should the EP do something about ASAP)?*
- Write down what you think is the diagnosis – commit!
  - *At the end, see how many you got right*

15 month old with swollen hands and feet

- 15mo old boy with a few days of gradually progressive painful swollen hands and feet
- Patient moved here from Africa at age 6 months
- This occurred once before at age 8 months, but was milder and resolved on its own
- Temp 38.3, HR 150, RR 28, BP 78/38
- Dorsum of hands and feet diffusely swollen (non-pitting), tender, non-erythematous, distal neurovascular intact



http://medical-photographs.com/

16 month old with cyanotic episode

- 16 month old previously healthy, immunizations up to date
- Became upset when sibling took his blankie
- Cried, then turned blue in the face, then became limp for approximately 1 minute
- Currently back to baseline
- VS temp 37.2, HR 120, RR 24, BP 80/48, O2 sat 100% on room air
- PE: fearful of examiner but otherwise nontoxic, no nuchal rigidity, lungs clear, cardiac RRR no murmur, abdomen benign, no rash, neuro nonfocal

17 month old girl with recurrent UTIs

- 17 month old girl has had 3 UTIs in past 3 months
- Mom was changing her diaper and was concerned about appearance of her genitalia
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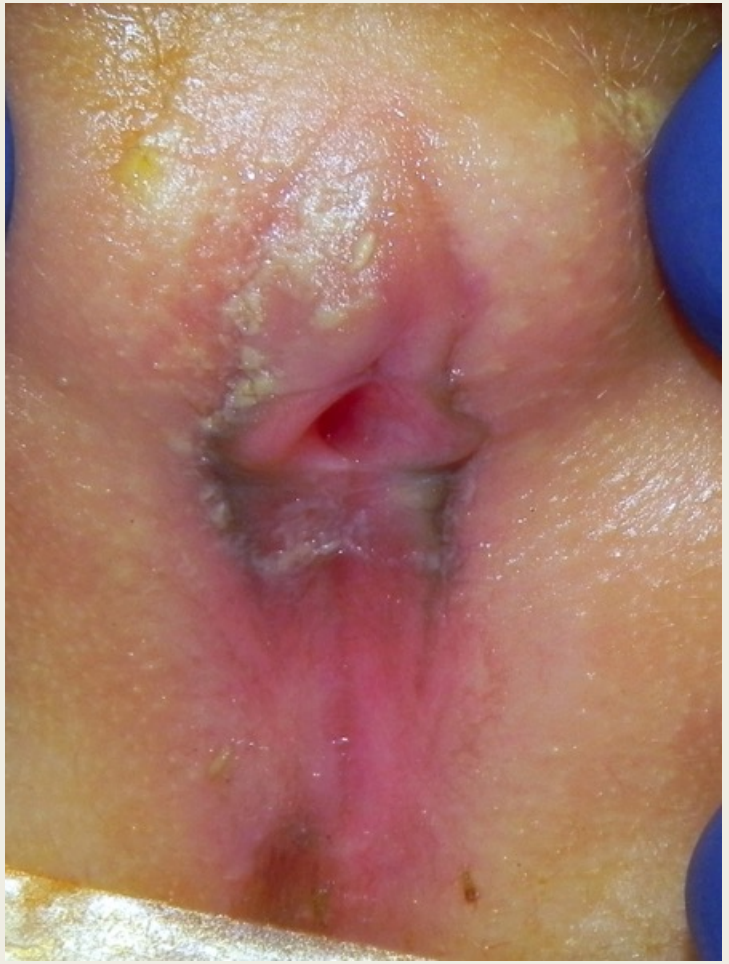

omahapediatricurology.wordpress.com

18 month old with refusal to walk

- 20 month old boy brought in with one day of refusal to walk
- Last night, first noticed not wanting to walk, put him to bed thinking it would go away, but today still refusing to walk
- No known trauma, no fever
- First walked at age 13 months
- On exam, temp 37.6 C, HR 120, RR 24, BP 76/38
- No deformities, swelling, erythema, warmth, joint effusions, external signs of trauma other than old abrasions on bilateral knees (skinned knees)
- FROM passively hips, knees, ankles, and no discernible localized tenderness to palpation although child cries intermittently throughout exam

19 month old with eye problem

- 19 month old with left “lazy” eye, parents note that it drifts outwards at times
- Ex full term infant, born NSVD, no complications, negative past medical history, normal development and growth
- Parents noted in a picture of child with “red eye” in the right, that the left pupil was white
- VS: temp 37.7, HR 110, RR 26, BP 78/40
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20 month old with rash to bilateral cheeks

- 20 month old boy ex full term with no significant past medical history presents with one day of rash on bilateral cheeks
- Bilateral cheeks with poorly demarcated firm nodule-like areas of erythema, mildly tender, not warm (actually a little cold)
- No fever, otherwise well and nontoxic
- Playful, eating normally, only unusual food was popsicles at brother's T-ball game yesterday
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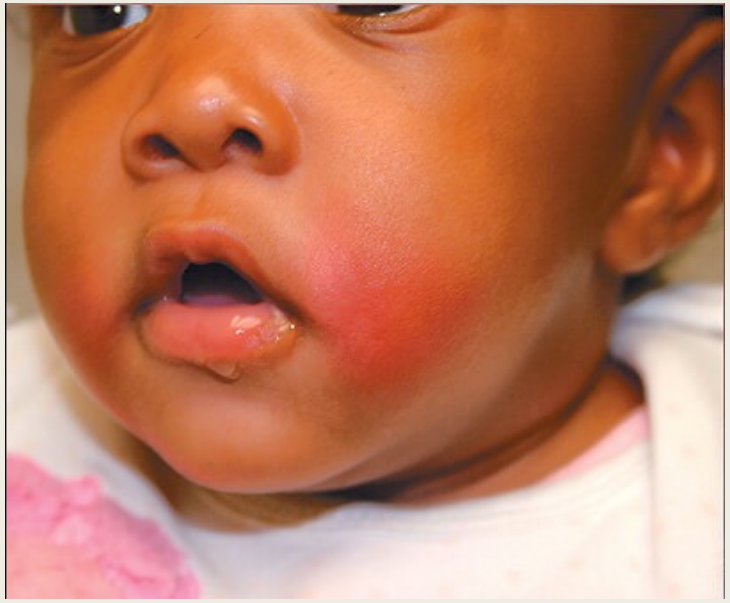

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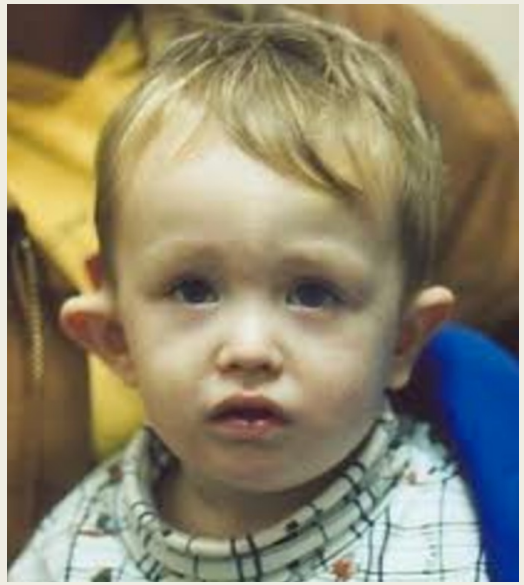
- Previously healthy, birth hx no complications, immunizations up to date
- VS temp 39, HR 120, RR 24, BP 80/40
- Left periorbital erythema, edema, and warmth. Extraocular muscles intact w/o apparent pain on eye movement, no chemosis, no proptosis

http://cdn2.momjunction.com

22 month old with right ear pain

- 22 month old with right ear pain x 3 days
- Seen 2 days ago by primary physician and diagnosed with right otitis media, Rx'd high-dose amoxicillin
  - *Has h/o otitis media x 3 episodes in the past, most recent 3 months prior*
- Over last 2 days, worsening pain despite ibuprofen treatment, and ear appears to be sticking out compared to other side
- Temp 38.2, HR 120, RR 24, BP 78/35
- TM not visible, purulent drainage in canal; erythema, edema, and tenderness behind ear



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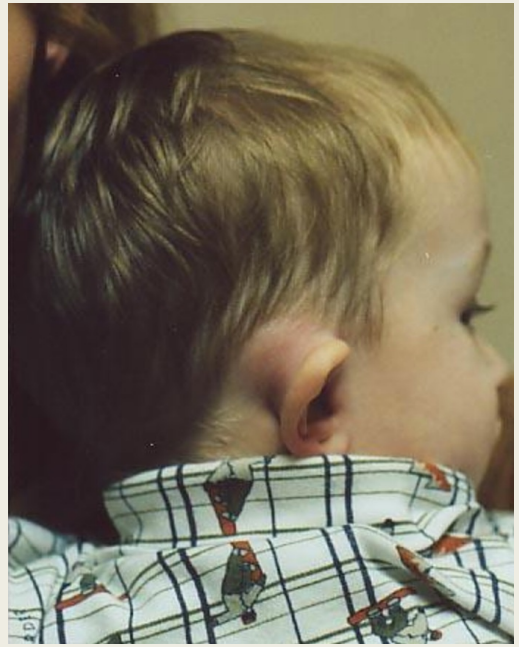

2 year old girl not using right arm

- 2yo girl alone in room with 5yo brother, unclear mechanism of injury
  - *Children both deny that she fell*
  - *No fever, previously healthy child*
- Child not using right arm and cries when parents attempt to manipulate or examine it
- On exam, arm in adducted and internally rotated position with elbow slightly bent, no deformity, redness, swelling, external signs of trauma
- No localized area of tenderness to gentle palpation with child distracted

2 year old boy with abdominal pain, vomiting, fever, jaundice

- 2yo boy presents with epigastric abdominal pain and vomiting for 2 days, decreased po's for a week, jaundice and fever first noted today
- PMH significant for an iron burn at age 14 months treated as an outpatient, a radius fracture s/p fall 6 months ago, and an ED visit for abdominal pain and vomiting diagnosed as AGE 1 month ago
- Temp 38, HR 140, RR 24, BP 80/40
- Abdomen soft, tender in epigastrium, indistinct abdominal fullness or mass palpable, normal active bowel sounds, no ecchymoses on abdomen
- Mild jaundice and scleral icterus, mild dehydration

Did you write down what you thought the answers were? Answers on following slides

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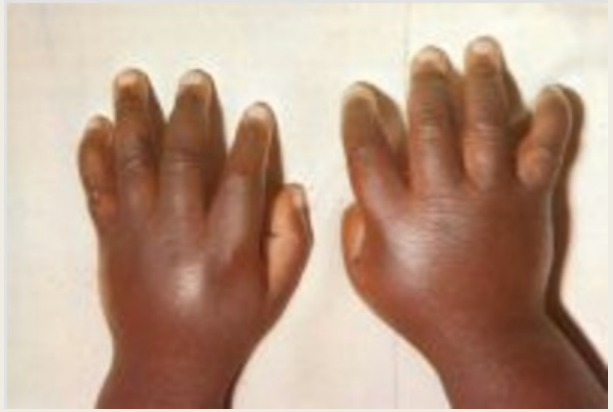

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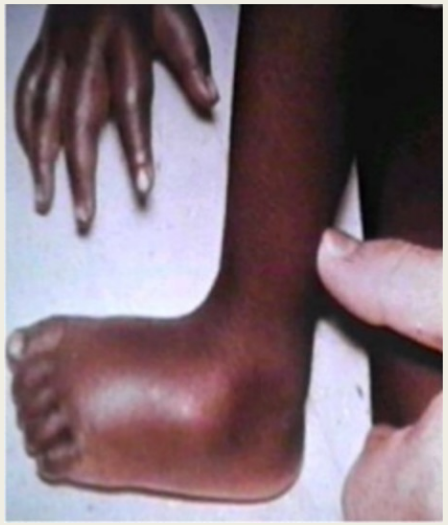
Sickle cell disease associated dactylitis – suspect it

- AKA hand-foot syndrome
- Vaso-occlusive crisis of the metacarpals / metatarsals and phalanges, often symmetric and involving hands, feet, or both
  - *Pain and tenderness*
- Age 6 months to 4 years
- Often associated with low-grade fever
- Usually resolves spontaneously over 1 to 4 weeks



http://www.slideshare.net/sandipgupta77770194/sickle-cell-disease-sandip

Sickle cell disease associated dactylitis – diagnose and manage it

- Clinical diagnosis based on h/o or suspicion of sickle cell disease
- CBC with anemia, smear with sickle cells
- Radiographs are normal
- Treat with supportive care
  - *Pain management*
  - *Fluids / hydration*
- Fever, however, must be worked up as sickle cell disease patient + fever = concern for bacterial infection
  - *Blood cultures, empiric antibiotics, evaluate for acute chest syndrome*
- For more info on sickle cell disease https://pedclerk.bsd.uchicago.edu/page/sickle-cell-disease and on other causes of dactylitis http://mddk.com/dactylitis.html

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Breath-holding spell – suspect it

- Clinical diagnosis based on the history – helps if parents have video!
- 5% of children, age 6mo-6yo, usually first episode at < 18mo (toddler tantrum time), 25-30% have a +FH
- **Cyanotic** m/c type: child upset, cries, holds breath, turns blue and passes out / becomes limp
  - *If significant apnea, can have seizure, posturing*
- **Pallid** less common: usually minor trauma or fright leads to pallor, limp, loss of consciousness, +/- diaphoresis
  - *Vagal phenomenon with bradycardia*
- Classic cyanotic breathholding spell: https://www.youtube.com/watch?v=2bKVHSe6hVQ
  - *Many more have been loaded on YouTube by helpful parents*

Breath-holding spell – diagnose and manage it

- Classic history, normal physical exam
- Rule out other emergent conditions
  - *If significant syncope or seizure, check blood sugar and consider Na, Ca for first episode in young infant*
  - *ECG is reasonable to r/o long QT*
  - *Breath holding spells more frequent / severe in children with iron deficiency anemia – check Hemoglobin +/- MCV, Fe, and treat as needed*
  - *No imaging, LP, EEG, other labs indicated*
- Mainstay of treatment is education and reassurance, f/u with pediatrician
- For more info: http://pedemmorsels.com/breath-holding-spell/
  - *Short podcast at http://pemcincinnati.com/blog/breath-of-the-wild-a-podcast-on-breath-holding-spells/ and from a neurologist http://www.childneurologyfoundation.org/disorders/breath-holding-spells/*

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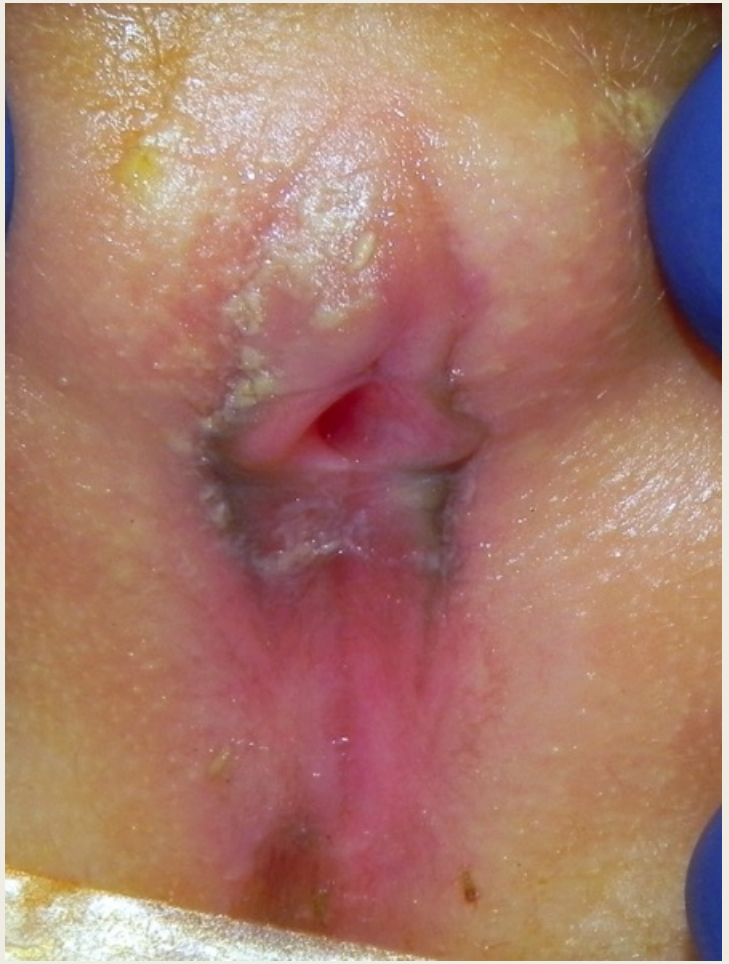
- Labia majora have a zipped close appearance



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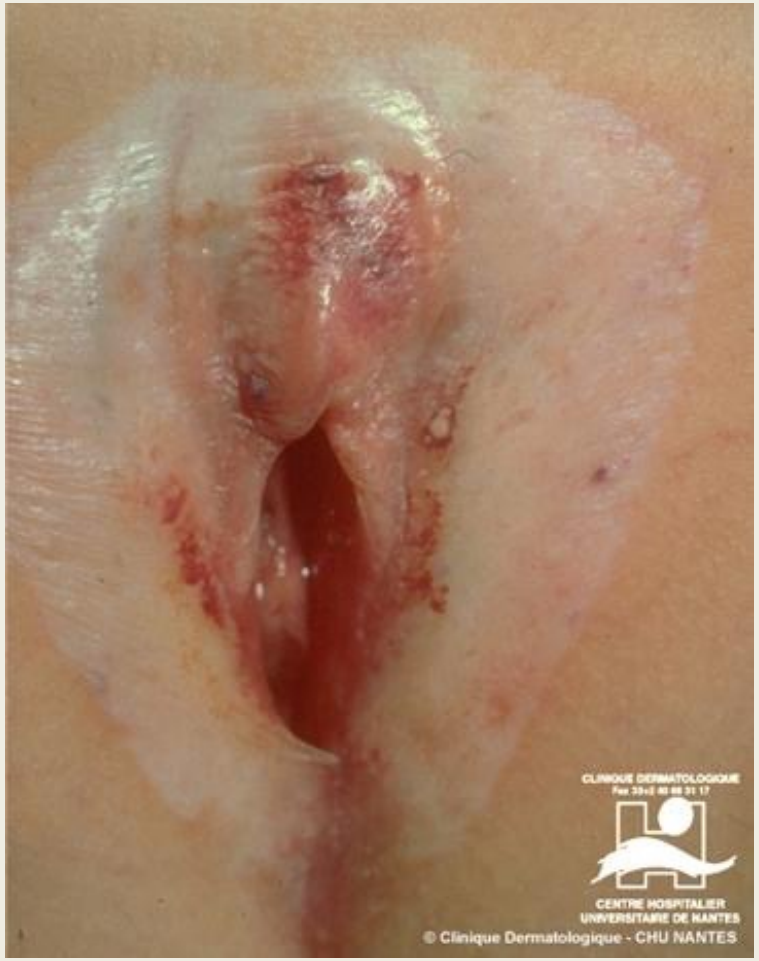
Labial adhesion – suspect it

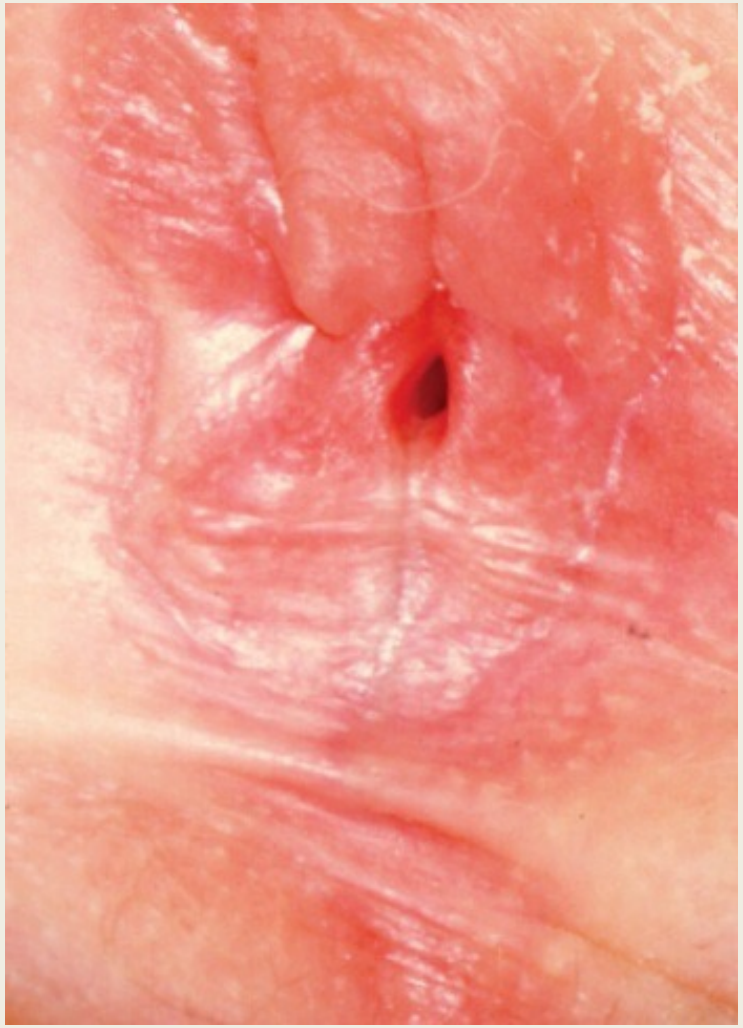
- Prepubertal (low estrogen) girls
  - *Peak age 13-23 months old*
- May be exacerbated by poor hygiene, trauma, abuse, lichen sclerosus (pictured)
  - *Lichen sclerosus is a chronic inflammation of the genitalia causing thin white plaques, blistering and bleeding, itching and pain*
  - *May be mistaken for abuse*
- Suspect if difficulty with urination, vaginal pain or discharge, recurrent urinary tract infections, urinary dribbling in previous potty-trained child



dermis.net

Labial adhesion – diagnose and manage it

- Must do genitourinary exam to diagnose it
- Clinical diagnosis
  - *Partial or complete fusion of the labia majora*
- If asymptomatic, no treatment necessary
- Topical estrogen cream thin layer BID
  - *Resolution typical in 2-8 weeks*
  - *After resolution, maintain good hygiene, apply bland ointment (eg A&D or petroleum jelly) daily*
- Do NOT perform manual separation
- For more info: https://pedclerk.bsd.uchicago.edu/page/labial-adhesions



http://top10rxlistodacx.cf/

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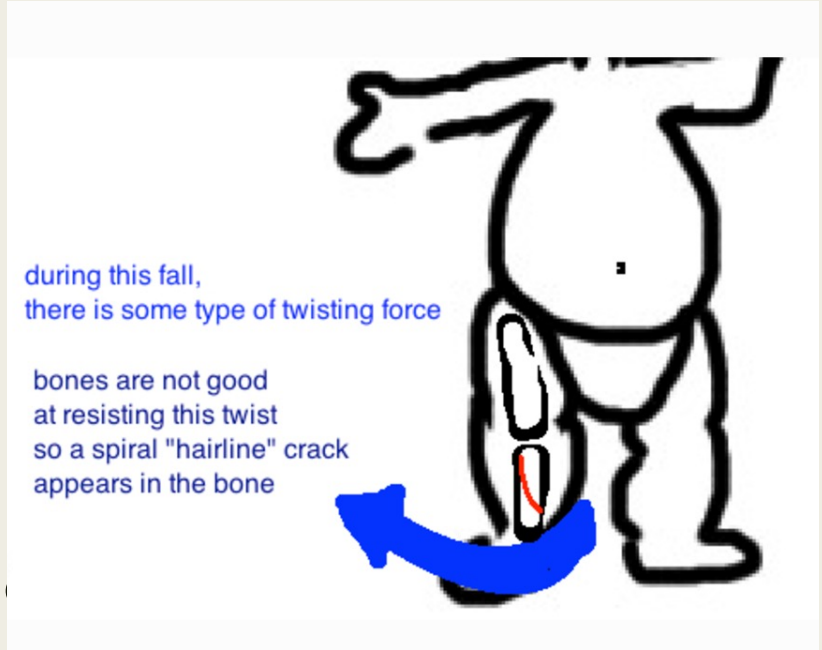
- FROM passively hips, knees, ankles, and no discernible localized tenderness to palpation although child cries intermittently throughout exam
- You can only have ONE diagnostic study – which one maximizes your yield?

Toddler's fracture – suspect it

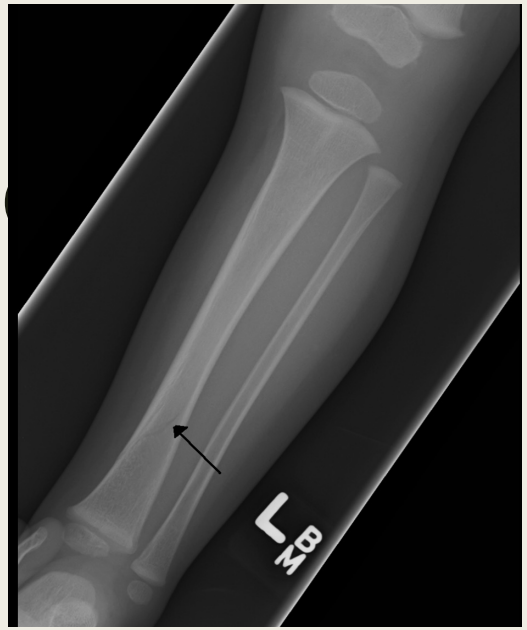
- Answer: radiograph of tibia and fibula
- Toddler / preschool age
- Mechanism: twisting as fall on planted foot, causes an oblique nondisplaced fracture of the tibia
- Presents as limp or refusal to walk in otherwise well appearing afebrile child with either normal exam or possibl tenderness to tibia
- Often no known h/o trauma or fall



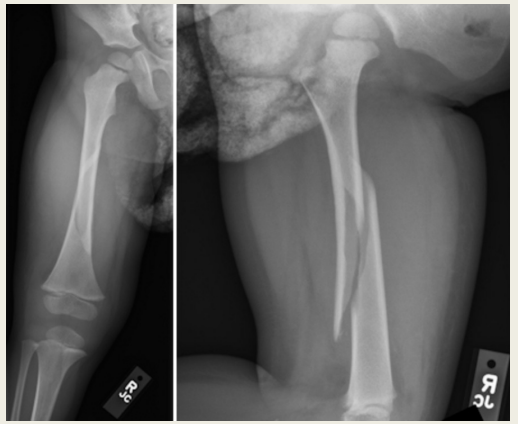
http://www.bonetalks.com/pedstoddlerfracture/

Toddler's fracture – diagnos and manage it

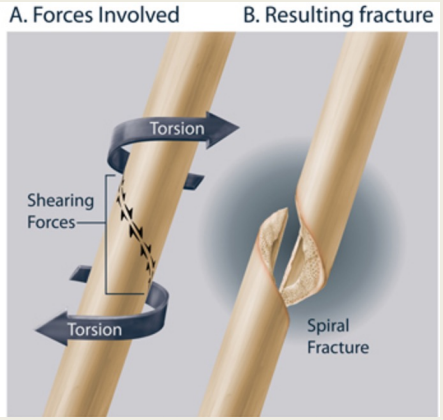
- Look for hairline oblique fracture of tibial shaft
  - *May need multiple views (lateral, oblique) and see on only one*
  - *Ddx from spiral fracture seen in non-accidental trauma (DON'T report toddler fracture w/o other concerning findings to child protective services)*
- Need for casting is controversial
  - *Orthopedics for cast, f/u in 10-14 days OR*
  - *Consider removal splint and f/u*
- Pain management
- For more info: http://www.bonetalks.com/pedstoddlerfracture/ and https://radiopaedia.org/articles/toddler-fracture



https://en.wikipedia.org/wiki/Toddler%27s_fracture



http://cephalicvein.com/2016/06/spiral-fracture/



https://sites.google.com/site/holforensicanthro/home/lesson-3-was-it-murder

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https://islaslab.wikispaces.com/Retinoblastoma+-+A+Child%27s+Cancer

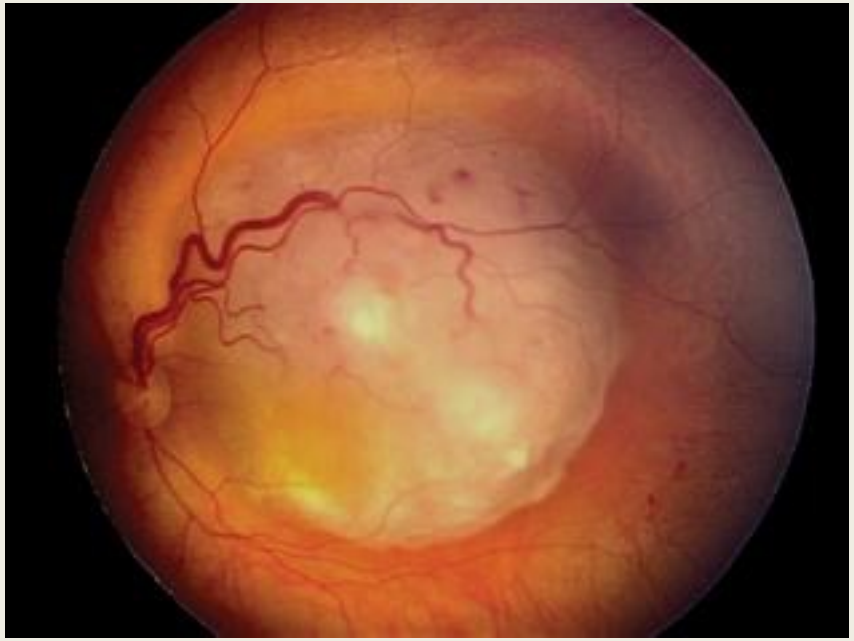
https://i.ytimg.com/vi/B6Pva17VZjw/maxresdefault.jpg

Retinoblastoma - suspect it

- Parents often notice abnormality
  - *Leukocoria, may be first noticed in a picture of the child*
  - *Strabismus*
- May present with nystagmus, eye inflammation, iris heterochromia, glaucoma, spontaneous hyphema, proptosis when advanced
- May metastasize locally, causing neurologic symptoms, headache, soft tissue mass, vomiting
- Presents at < 2yo (median 18-20 months) for unilateral, at < 1yo (median 12 months) for bilateral
- Family history of retinoblastoma in 10%

Retinoblastoma – diagnose and manage it

- If suspect at all, refer to ophthalmologist urgently
- If suspect advanced disease, metastases, admit for work-up
- Diagnosed by fundoscopic exam
- MRI of brain and orbits to characterize tumor
- Treatment may include surgery, local or systemic chemotherapy, radiation therapy



https://www.aao.org/topic-detail/retinoblastoma--middle-eastnorth-africa

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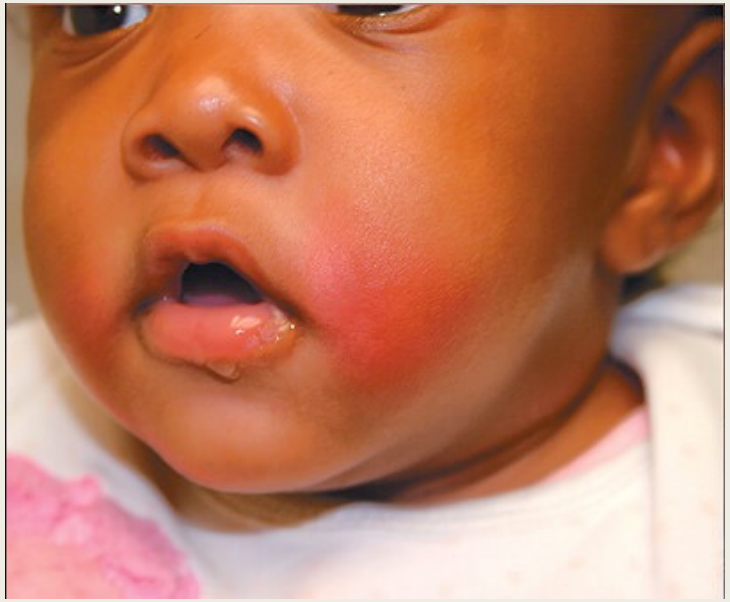


http://www.medbullets.com/step2-3-ear-nose-and-throat/20130/panniculitis

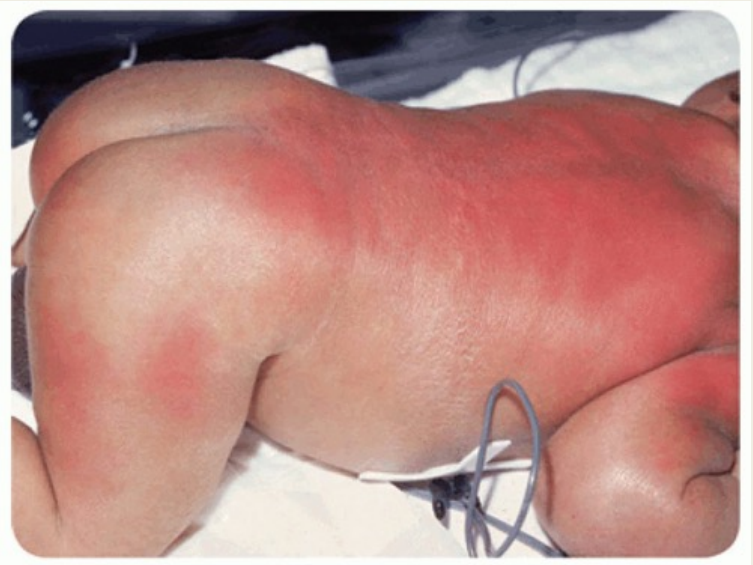
Cold (popsicle) panniculitis – suspect it

- Exposure to cold leads to damage to subcutaneous adipose tissue
- Primarily infants and young children (tends to be face, eg cheeks and forhead), and obese adult women (tends to be buttocks, thighs, arms, under chin)
- Get history of exposure to cold, eg popsicles
- Firm indurated erythematous to violet poorly demarcated localized nodules that resemble erythema nodosum
- Differential includes frostbite (which children can get from leaving an ice pack on too long after a sprain or fracture injury) https://www.burn-injury-resource-center.com/2012/01/ice-packs-can-cause-serious-burns-frostbite.html

Cold (popsicle) panniculitis – diagnose and manage it

- Cold panniculitis is a clinical diagnosis based on history and classical appearance; treatment is supportive (oral analgesics as needed)
- Frostbite, however, requires rewarming
- Subcutaneous fat necrosis of the newborn is a type of panniculitis with multiple nodules, typically on the trunk, arms, buttocks, thighs, cheeks, in an infant in the first several weeks of life; it resolves spontaneously over weeks to a few months
  - *Often h/o obstetric trauma at delivery, hypothermia, perinatal stressor*
  - *May have associated hypercalcemia – monitor biweekly until fat necrosis resolved*
- For more info on cold panniculitis https://www.youtube.com/watch?v=e6JwEkcXzjc
- For more info on subcutaneous neonatal fat necrosis http://www.neonet.ch/files/8514/2591/5178/February_2003.pdf

Subcutaneous fat necrosis of the newborn



http://plasticsurgerykey.com/pediatrics-2/

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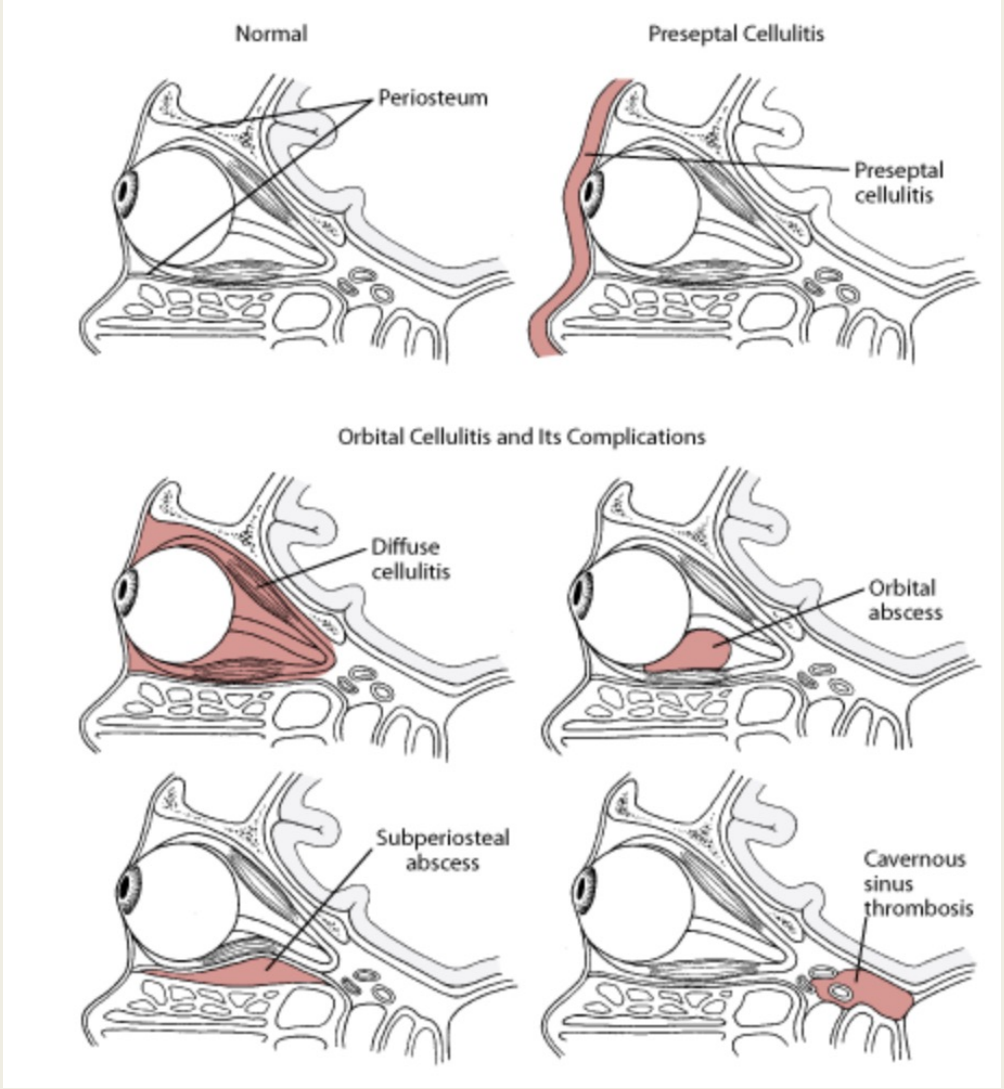
Preseptal cellulitis – suspect it

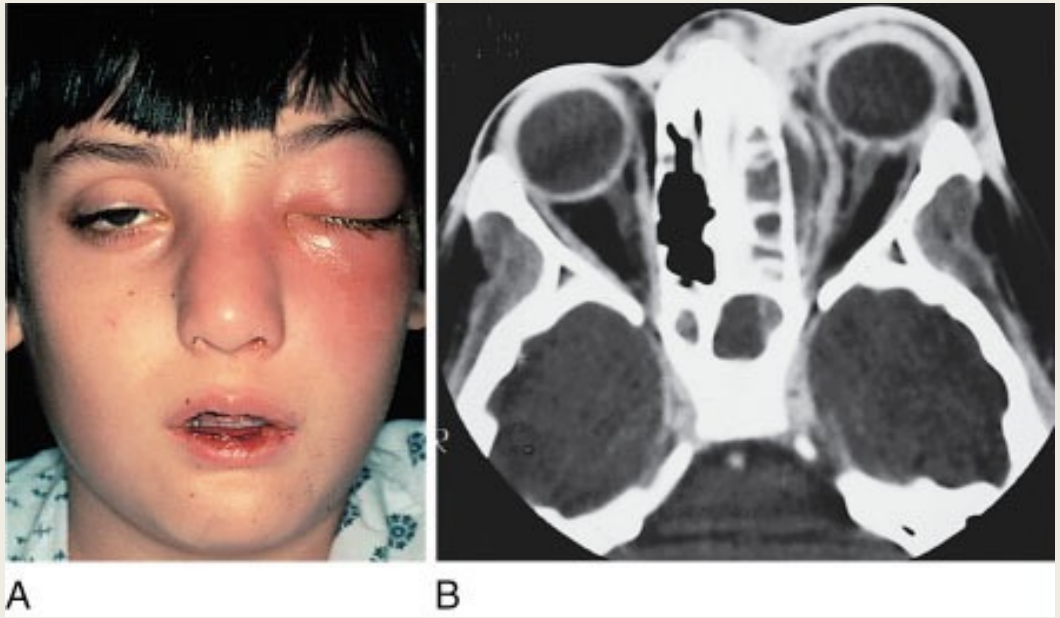
- Preseptal or periorbital cellulitis anterior to orbital septum vs. orbital cellulitis
  - *Hematogenous or local spread from sinusitis or complication of minor trauma*
- Differentiate from orbital cellulitis
  - *Preseptal usually toddler, orbital usually adolescent*
  - *No proptosis, limitation of or pain with eye movement, diplopia or vision change; chemosis unusual*



merckmanuals.com

Preseptal cellulitis – diagnose and manage it

- Clinical diagnosis
- CBC, ESR, Blood cultures, admit for IV antibiotics to cover staph & strep (unless very very mild can try po antibiotics and close f/u)
- LP only if clinical signs of meningitis
- If suspect possible orbital cellulitis, CT scan w/contrast with orbital cuts
  - *Ophthalmology consult*
- For more info: http://pedemmorsels.com/category/2013-morsels/ and http://pedemmorsels.com/orbital-cellulitis/



https://medicine.academic.ru

Orbital cellulitis

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- Seen 2 days ago by primary physician and diagnosed with right otitis media, Rx'd high-dose amoxicillin
  - *Has h/o otitis media x 3 episodes in the past, most recent 3 months prior*
- Over last 2 days, worsening pain despite ibuprofen treatment, and ear appears to be sticking out compared to other side
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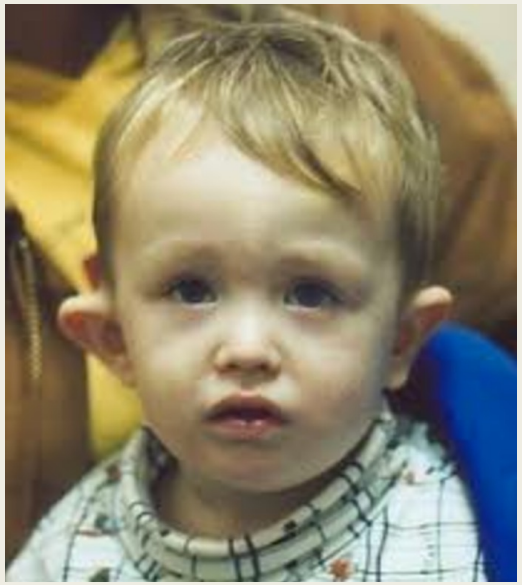

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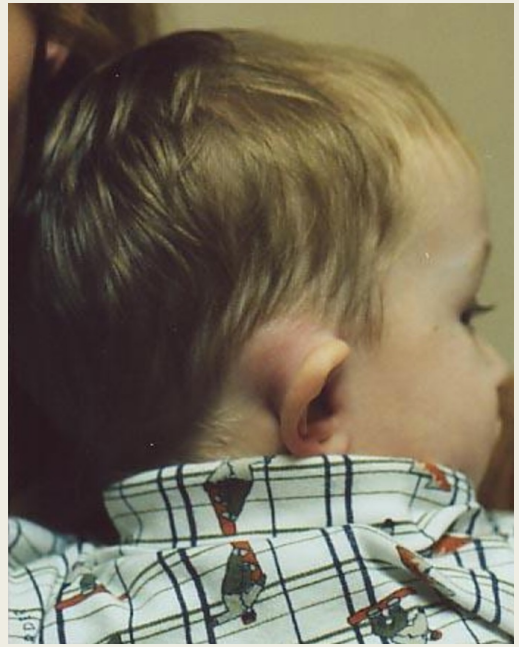


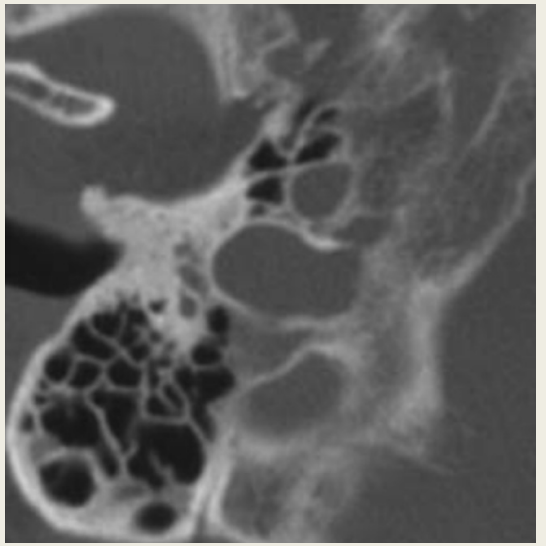
Mastoiditis – suspect it

- Acute mastoiditis usually after recent acute otitis media episode
- Chronic mastoiditis may present more subtly with prolonged otitis media symptoms / ear drainage
- Acute presents with post-auricular tenderness, swelling, erythema, sometimes fluctuance over mastoid bone in majority
  - *Swelling may cause the ear to stick out more relative to other ear*
- May have fever (76%), ear pain (67%), otorrhea (50%)
- Peak incidence age < 2 years, similar to otitis media
- Always examine the mastoid process in patients with otitis media, especially if prolonged symptoms / not improving on antibiotics

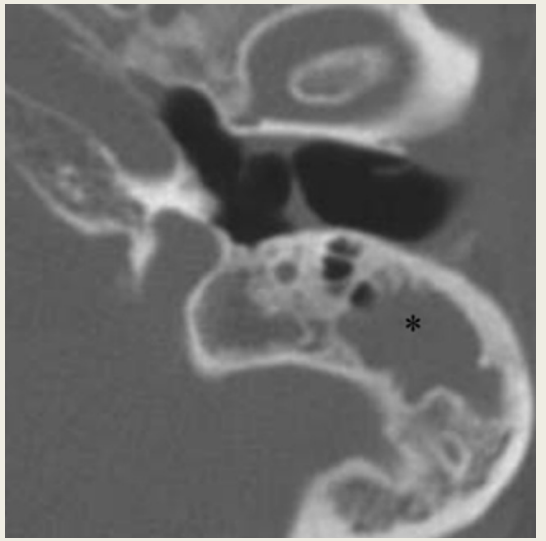
Mastoiditis – diagnose and manage it

- Can be a clinical diagnosis if classic symptoms, but often imaging is performed to assess extent of disease and complications
- CT with contrast to r/o complications such as abscess or dural venous thrombosis
  - *Opacification (fluid-filled) mastoid air cells*
  - *May see destruction of mastoid bony septae*
- Baseline CBC, ESR or CRP, blood cultures
- IV vancomycin; if recurrent OM or recent oral antibiotics, add ampicillin-sulbactam or piperacillin-tazobactam
- Consult with head and neck surgeon
  - *May require drainage procedure or mastoidectomy*
- For more info: http://www.emdocs.net/acute-mastoiditis-pearls-and-pitfalls/ and https://radiopaedia.org/articles/acute-mastoiditis

Normal



http://radiologykey.com/the-middle-ear-and-mastoid/



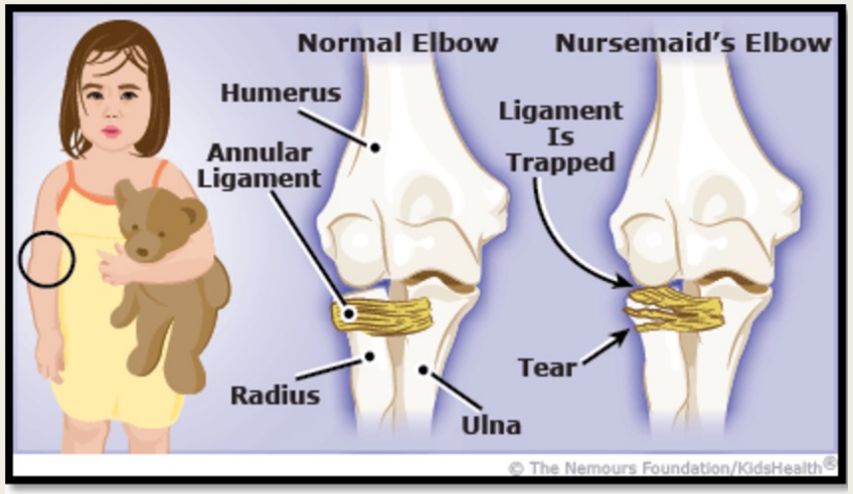
Abnormal

2 year old girl not using right arm

- 2yo girl alone in room with 5yo brother, unclear mechanism of injury
  - *Children deny that she fell*
  - *No fever, previously healthy child*
- Child not using right arm and cries when parents attempt to manipulate or examine it
- On exam, arm in adducted and internally rotated position with elbow slightly bent, no deformity, redness, swelling, external signs of trauma
- No localized area of tenderness to gentle palpation with child distracted

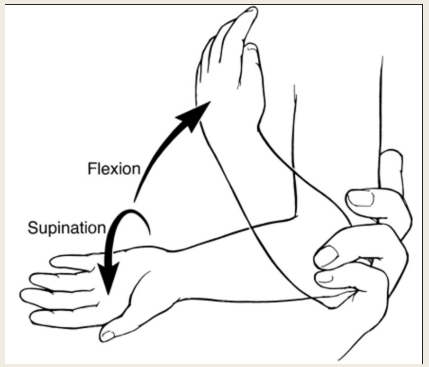
Nursemaid's elbow – suspect it

- AKA radial head subluxation (not a dislocation)
  - *Annular ligament torn and trapped in joint*
- Classic history of axial traction (pulling)
  - *Not always present*
- Most common in 1-4 years old, typically "outgrow" by 6 years old
- History and physical has nothing of concern for fracture (FOOSH, swelling, point tenderness, deformity, ecchymoses)

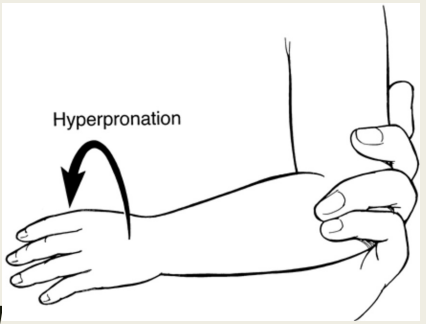


http://www.mccpoman.com/web/common-child-care-illness/

Nursemaid's elbow – diagnose and manage it



- Clinical diagnosis based on classic history and physical = no imaging
- If unsure, can image first to r/o fracture
  - *Positioning of patient for imaging may reduce nursemaid's elbow*
- Two main methods of reduction
  - *Hyperpronation*
  - *Supination and flexion*
  - *Hyperpronation more successful on first attempt in several studies*
  - *Place thumb on radial head as reduce, may feel a click or pop*
  - *Child typically cries – leave and return in 10-15 minutes and child using arm will indicate successful reduction*
- For more info and video of reduction methods: http://www.nejm.org/doi/full/10.1056/NEJMvcm1211809?af%3DR%26rss%3DcurrentIssue=&



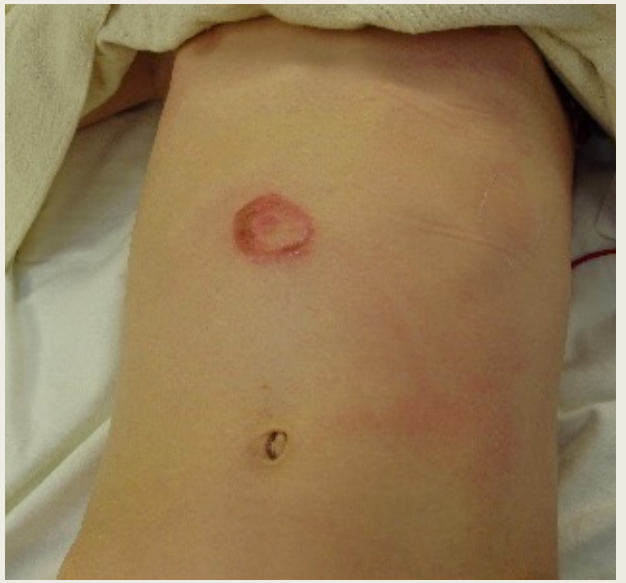
2 year old boy with abdominal pain, vomiting, fever, jaundice

- 2yo boy presents with epigastric abdominal pain and vomiting for 2 days, decreased po's for a week, jaundice and fever first noted today
- PMH significant for an iron burn at age 14 months treated as an outpatient, a radius fracture s/p fall 6 months ago, and an ED visit for abdominal pain and vomiting diagnosed as AGE 1 month ago
- Temp 38, HR 140, RR 24, BP 80/40
- Abdomen soft, tender in epigastrium, indistinct abdominal fullness or mass palpable, normal active bowel sounds, no ecchymoses on abdomen
- Mild jaundice and scleral icterus, mild dehydration

Pancreatic pseudocyst – suspect it

- Pancreatitis or pancreatic duct disruption leads to pancreatic secretions released -> secretions become walled off by granulation tissue, forming a pseudocyst (takes 30+ days)
- Most common pediatric cause is trauma
  - *The case scenario gives clues to non-accidental trauma*
  - *A classic mechanism is handlebar injury to the abdomen when falling off a bike over the top of the handlebars (duodenal hematoma is another classic injury from this mechanism)*
  - *Other causes: hereditary pancreatitis, anatomic abnormality (eg pancreas divisum), infections, biliary disease*
- Epigastric pain, vomiting, tender epigastric mass or abdominal fullness, +/- jaundice, fever, chest pain

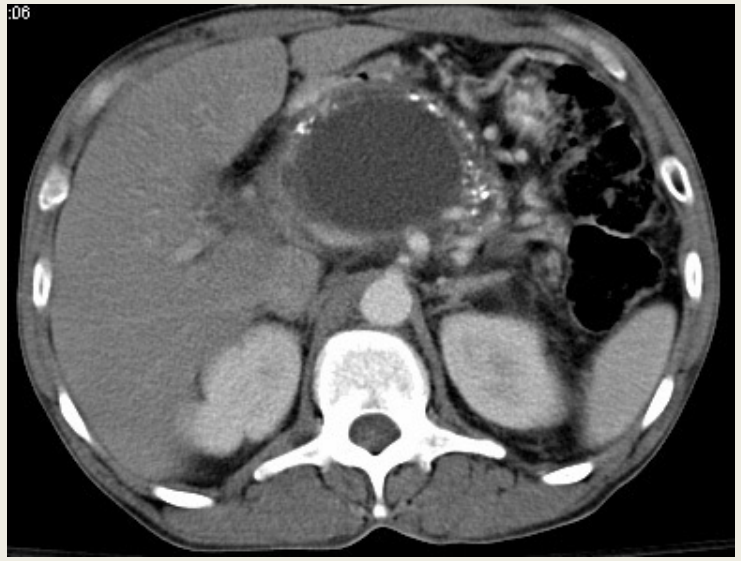
Handlebar sign



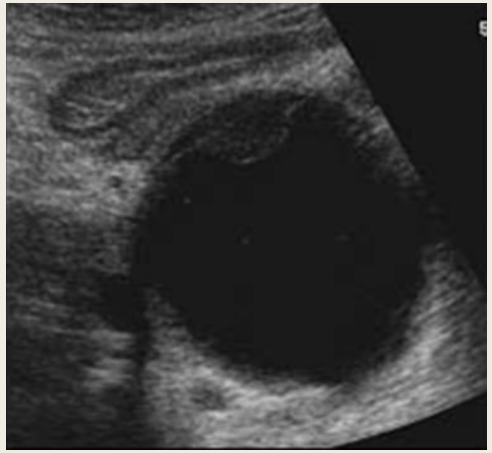
http://regionstraumapro.com/post/19002580052

Pancreatic pseudocyst – diagnose and manage it

- Can screen with bedside ultrasound
- CT scan diagnostic, also screens for other trauma and is better for evaluating inflammation and necrosis
- Amylase, lipase, bilirurin, serial hematocrit
- NPO, NGT decompression, analgesia as needed
- Consult pediatric surgeon
- Monitor for complications: rupture (esp cysts > 10 cm), hemorrhage, infections
- For more info: https://radiopaedia.org/articles/pancreatic-pseudocyst-1 and http://surgery.ucsf.edu/conditions--procedures/pancreatic-pseudocysts.aspx



http://insidesurgery.com/



http://www.ultrasoundcases.info/