100 CARDINAL PED PRESENTATIONS

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CASES 41-50

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

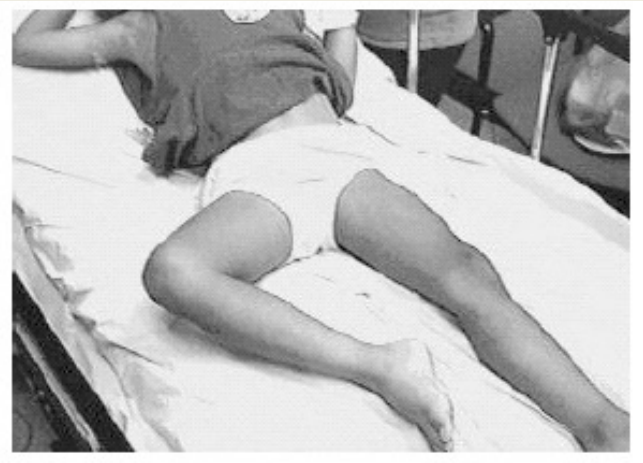
- Classic case – build on illness scripts to reinforce when you should suspect this entity
- What should make you suspect this diagnosis
- Basics of diagnosis and ED management
- You can look it up for more detail, but you can’t look it up until you at least suspect it
- FOAM resources for additional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

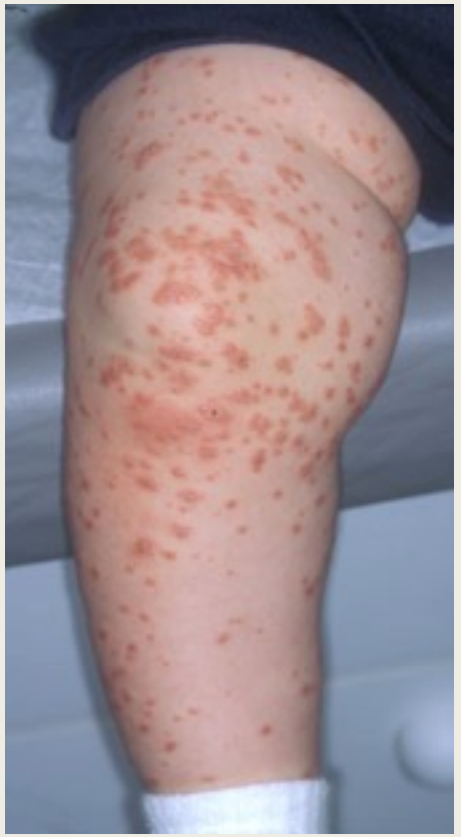
2 year old with limp

- 2 year old boy noted to be limping for last 2 days, now this AM won't walk at all
  - *Tactile fever x 2 days also*
  - *No known trauma, no significant past med hx*
- VS Temp 38.9, HR 130, RR 24, BP 78/34
- Patient prefers to hold right leg flexed, abducted, and externally rotated at hip
  - *Decreased passive ROM at hip, full ROM at knee*
  - *No point tenderness, redness, swelling noted*
- Peripheral WBC 18.6, 80% N, ESR 63

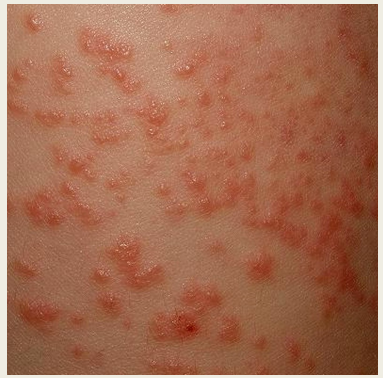


2 year old girl with rash

- 2yo girl with rash that developed over 3-4 days
- Hx of recent viral infection
- Buttocks, thighs, knees, outer arms, face
  - *Mucous membranes and trunk spared*
- Brown-red flat-topped papules 1-5mm in diameter, some appear fluid-filled
- Temp 37.8, HR 110, RR 24, BP 78/44
- Well appearing, nontoxic
- Palpable nontender, mobile inguinal and axillary lymphadenopathy



www.crutchfielddermatology.com



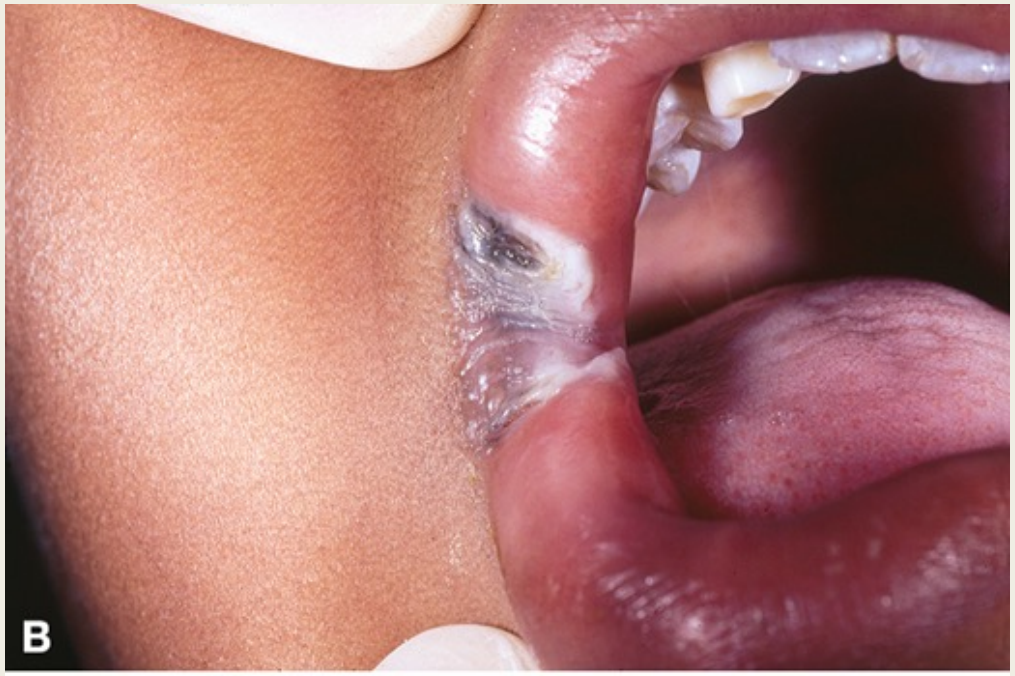
www.patienthelp.org

2 year old with recent bloody diarrhea

- 2 year old previously healthy girl had bloody diarrhea and fever starting 7 days ago for which she was seen in the ED 5 days ago and treated with IV fluids
- Currently in clinic for follow-up and diarrhea has improved but patient is now noted to be pale, less active / fatigued
  - *On history, patient has also had fewer wet diapers*
- Diet history includes no meat but does drink unpasteurized goat milk from family goats
- VS: temp 37.6, HR 120, RR 24, BP 110/55, O2 sat 100% room air
- PE: pale, alert but less active than usual, no murmur, lungs clear, abdomen soft, nondistended, nontender, no rash

2 year old brought in after chewing on electrical cord

- 2 year old boy chewed on an electrical cord and sustained a burn to his oral commissure yesterday
- Parents went to PMD's office yesterday and were told to go to ED if concerned
- It seems to be healing and he is in no distress, but they didn't like the color, so came to ED
- No fever, otherwise well and no evidence of other injuries

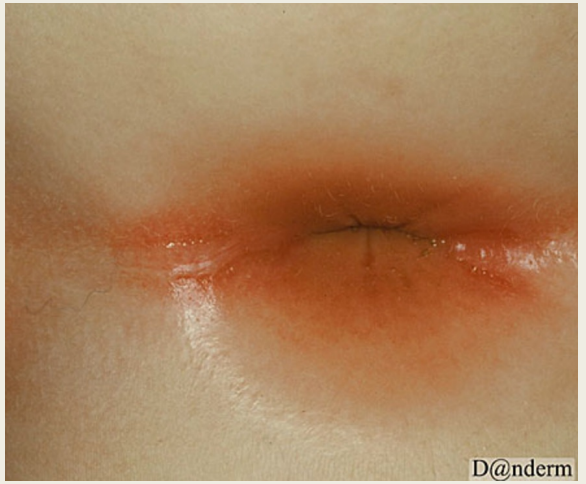


2 ½ year old with vomiting, altered mental status

- 2 ½ year old male brought in by ambulance
- One day of vomiting, non-bloody, non-bilious, and increasingly altered
- Patient has history of several previous ED visits for viral gastritis
- Picky eater normally, went to grandparents' house and ate some new foods, symptoms began on return from their house
  - *Parents and grandparents deny available medications or toxins*
- VS temp 37.7, HR 110, RR 40, BP 78/36, weight 11.1 kg (< 5th percentile), length 90 cm (25th percentile)
- Lethargic, minimally responsive, no nuchal rigidity, no rash, heart no murmur, lungs clear, abdomen benign, no hepatosplenomegaly
- Family history of mom's brother died in infancy of presumed sepsis

2 ½ year old girl with peri-anal rash and blood-streaked stools

- 2 ½ year old previously healthy girl complains of rectal area itching and pain with defecation
  - *Mom then noticed bright red blood streaks in her stools*
  - *Area around the anus is bright red*
- She attends daycare and has one older sibling, age 5 years
- Parents are divorced and she spends weekends with her father
  - *Mom is unsure whether she suspects any possibility of sexual abuse*
- Temp 37.5, HR 98, RR 20, BP 80/35
- Exam unremarkable except for well-demarcated, bright red, peri-anal rash; abdomen soft and nontender, patient well-appearing. Behavior and interactions with mom appropriate.



http://www.danderm-pdv.is.kkh.dk/atlas/5-4-4.html

3 year old with malodorous nasal discharge

- 3 year old girl with malodorous right nasal discharge x 1 week
- Previously healthy, full term born NSVD, no complications
- Denies fever, cough, h/o allergies, trauma, headache, foreign body
- Recently started preschool last month, doing well per teachers
- VS: temp 37.7, HR 90, RR 24, BP 80/45, O2 sat 99% room air
- Malodorous unilateral right nasal yellow-white discharge
- Left nares unremarkable, right nares after discharge bulb suctioned, mildly swollen mucosa and turbinates, no septal hematoma, no foreign body seen

3 year old with fever and limp

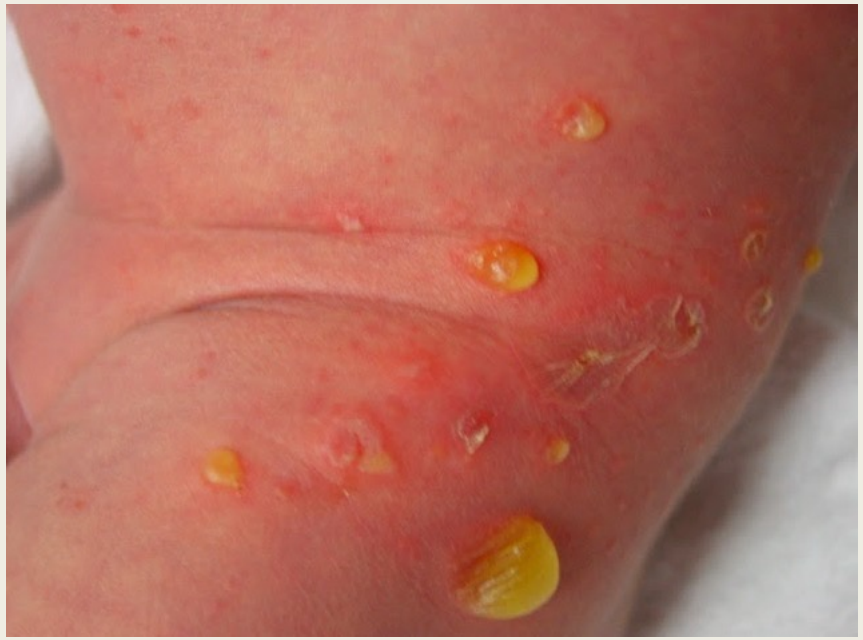
- 3 year old boy with fever for 6 days, complaining also of pain in right leg in the knee area and limp
- No known h/o trauma, no significant past medical history
- VS temp 39.4, HR 120, RR 20, BP 80/40, O2 sat 99%
- Right proximal tibia with area of point tenderness with redness and warmth of overlying skin, no fluctuance, antalgic gait
- FROM knee and hip joints passively
- WBC 18.8, 80% N, ESR 90
- Xrays of pelvis, femur, tibia, fibula negative

3 year old boy with sore throat, fever, neck stiffness

- 3yo boy with 24 hours of sore throat, fever, neck stiffness, decreased po intake
- Negative PMH, no vomiting, diarrhea, headache, abdominal pain, coughing, known ill contacts
- Temp 39.4, HR 150, RR 24, BP 80/40, O2 sat 97% room air
- Patient ill-appearing, holding head midline and reluctant to range neck, alert and oriented
- Oropharynx (quick look) erythematous, no exudate
- Tender cervical lymphadenopathy

3 year old with rash

- 3yo boy with rash for 2 days on left lower abdomen extending onto upper outer thigh
- Previously healthy, no fever, no rash contacts
- Rash includes clear yellow fluid-filled bullae, some of which have ruptured and have a thin colarette of scale
- Temp 37.7, HR 110, RR 20, BP 80/40, O2 sat 100%, rash as shown, remainder of exam normal



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

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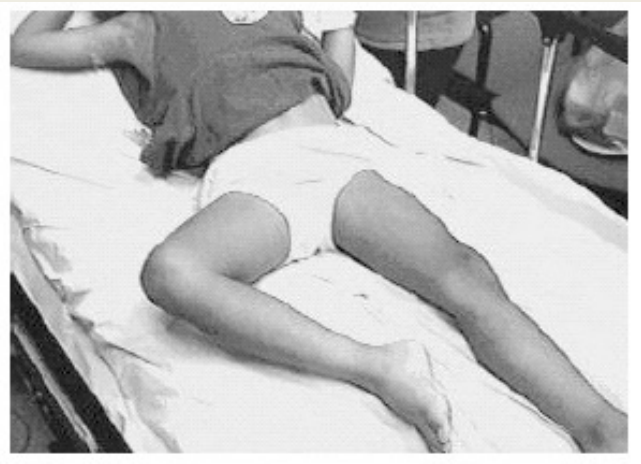
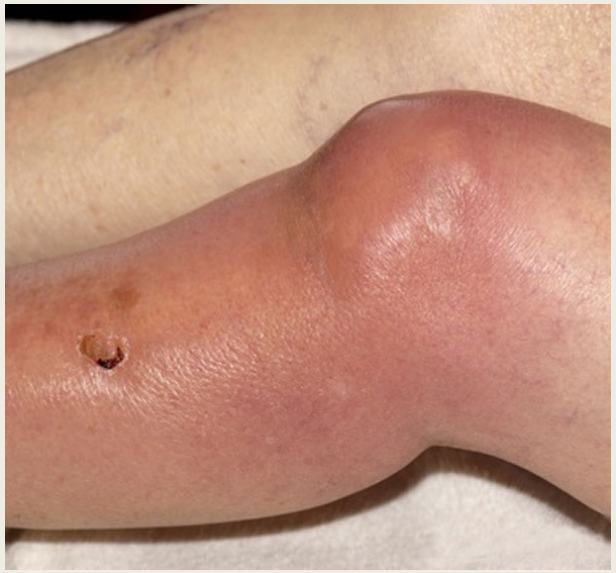


https://www.ahcmedia.com/articles/7863-evaluation-of-the-child-with-a-limp

Septic arthritis – suspect it

- Increased in younger children ≤ 2 years old
- 80% lower extremity, mainly hip and knee
  - *Decreased passive range of motion, limp if lower extremity*
  - *Hip held flexed, abducted, externally rotated due to joint effusion*
  - *Visible joint effusion, erythema, warmth in elbow or knee*
  - *If child is able to indicate, pain at joint*
- Neonates may present with sepsis-like picture
- May be local spread from minor trauma or skin infection or hematogenous spread
- Must ddx from transient synovitis in hips
- Kocher's Criteria: fever, non weight-bearing, ESR > 40, peripheral WBC > 12000
  - *0 predictors risk < 0.2%, 1 – 3%, 2 – 40%, 3– 93%, 4 – 99%*



http://www.orthopaedicsone.com/display/Clerkship/What+is+septic+arthritis

Septic arthritis – diagnose and manage it

- CBC, ESR, blood culture (positive in about 40%0
- Joint aspiration for cell count, gram stain & culture
- Imaging: plain radiographs and ultrasound may detect effusion
  - *MRI is highly sensitive and may also detect associated osteomyelitis, but is not as readily available*
- IV antibiotics to cover staph (including MRSA), strep (group A and B), Kingella kingae in < 5yo, salmonella in sickle cell patient, gonorrhea in sexually active patient
- Consult orthopedic surgeon early – may need joint washout in O.R.
- For more information http://pedemmorsels.com/septic-arthritis/ and http://www.hawaii.edu/medicine/pediatrics/pedtext/s19c05.html and for general discussion of limping http://pemplaybook.org/podcast/please-just-stop-limping/

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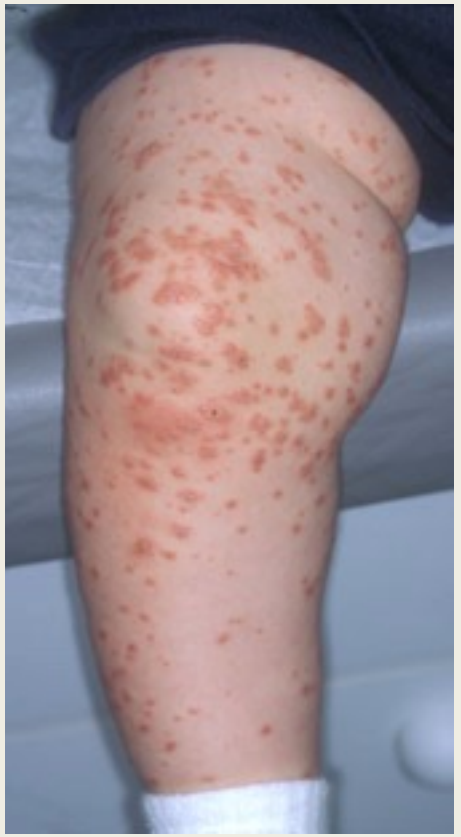

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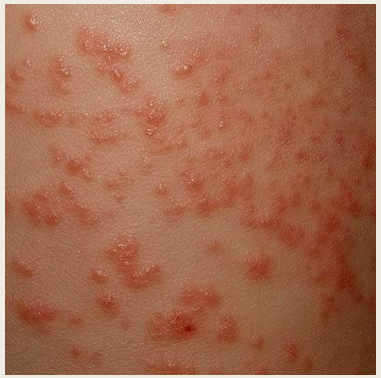

www.patienthelp.org

Gianotti-Crosti – suspect it

- AKA infantile or childhood papular acrodermatitis
  - *3mos – 15yrs, peak incidence 1-6 year olds, 90% of patients < 4 yo*
- Associated with recent viral infection or live virus immunization
  - *Hepatitis B, EBV, CMV, Enterovirus, RSV, Adenovirus, etc.*
- Rash presents over a few days
  - *Extensor surfaces of extremities, face, buttocks*
  - *Spares mucous membranes and trunk*
  - *1-5mm flat-topped flesh colored to red-brown, may form vesicles*
- May have hepatosplenomegaly and lymphadenopathy, low-grade fever

Gianotti-Crosti – diagnose and manage it

- Clinical diagnosis
- Liver function tests if jaundiced, viral serology or PCR as indicated
  - *Often mildly elevated liver enzymes with Gianotti-Crosti*
- Will fade on own, but takes 4 to 12 weeks
- Symptomatic care if itchy with antihistamines, mild topical corticosteroid cream
- Treatment and follow-up for underlying viral illness as indicated
- For more information: http://www.dermnetnz.org/topics/infantile-papular-acrodermatitis/ and http://www.foamem.com/2014/09/08/what-is-gianotti-crosti-syndrome/

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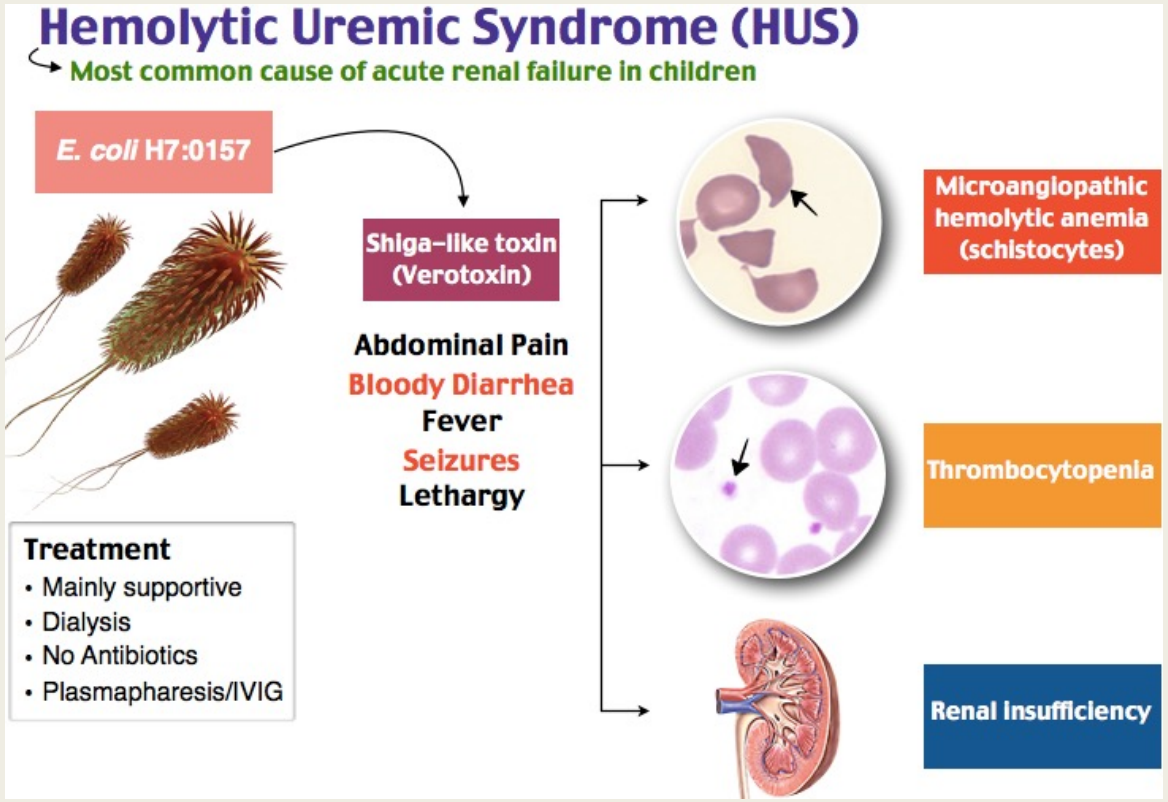
Hemolytic uremic syndrome – suspect it

- Usually caused by shiga-toxin producing E. coli (STEC), most commonly E Coli 0157:H7
  - *Risk factors: undercooked meat (esp beef), unpasteurized milk & juice*
- Triad of hemolytic anemia, thrombocytopenia, renal dysfunction or failure
  - *2-7 days after prodromal gastroenteritis with bloody diarrhea*
  - *Most common in age 1-4 years*
  - *May have seizures, hypertension*



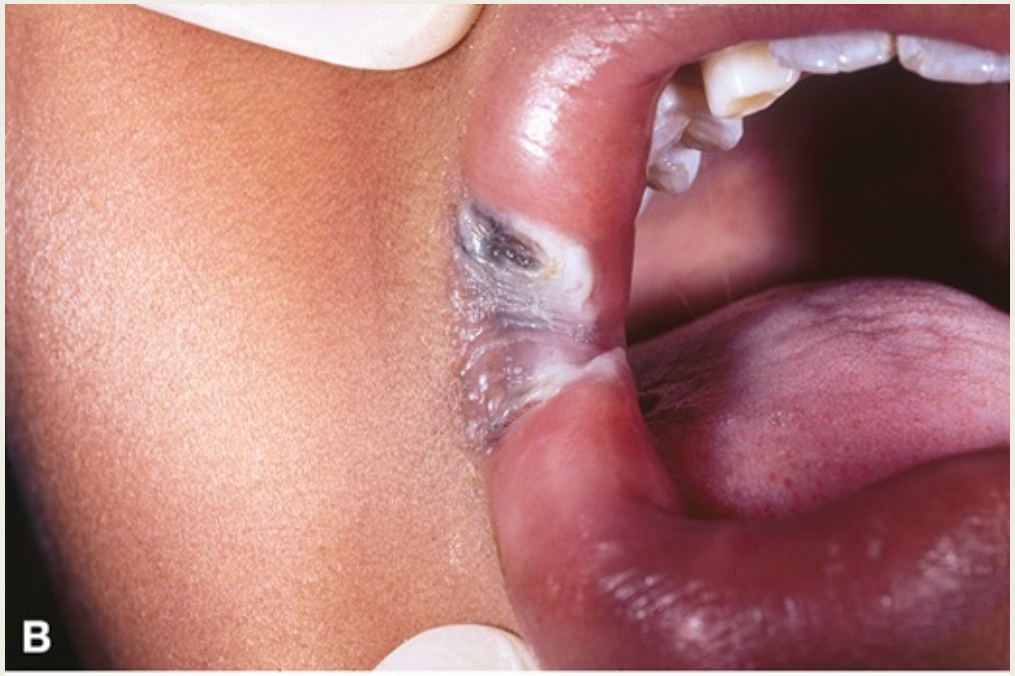
roshreview.com

Hemolytic uremic syndrome – diagnose and manage it

- CBC with manual differential shows anemia (often severe), schistocytes indicating hemolysis, thrombocytopenia; send T&S
- Metabolic panel, BUN/Creatinine – assess for renal dysfunction
- Urinalysis may show hematuria, proteinuria
- Stool for 0157:H7 (separate test from routine stool culture)
- Admit to ICU and consult with nephrologist to assist in managing fluid balance, hypertension
- Transfusion for Hgb < 6 g/dL
- Antibiotics may increase risk of HUS – do not start unless patient septic
- For more info: http://www.emdocs.net/hus-pearls-and-pitfalls/

2 year old brought in after chewing on electrical cord

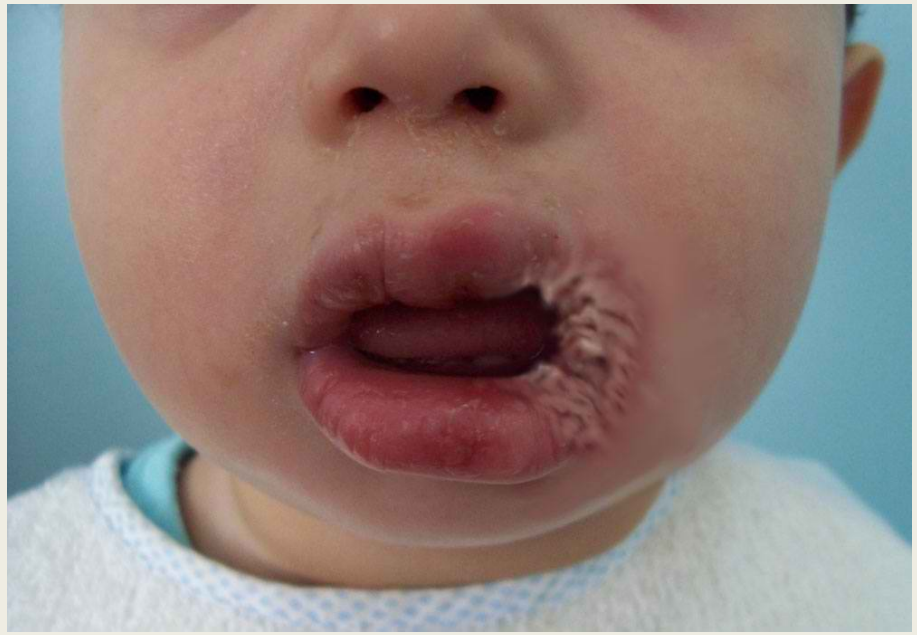
- 2 year old boy chewed on an electrical cord and sustained a burn to his oral commissure yesterday
- Parents went to PMD's office yesterday and were told to go to ED if concerned
- It seems to be healing and he is in no distress, but they didn't like the color, so came to ED
- No fever, otherwise well and no evidence of other injuries
- What delayed complication can occur?



Source: Shah BR, Lucchesi M, Amodio J, Silverberg M: *Atlas of Pediatric Emergency Medicine*: www.accessemergencymedicine.com

Electrical labial burn delayed labial artery bleeding – suspect it

- Electrical burns to the mouth are commonly seen in young children from biting or chewing on electrical cords
- The labial artery is in proximity to the oral commissure (corner of the mouth) where these burns often occur
- During healing, an eschar forms. When it sloughs 3 days to 2 weeks later, the labial artery may start to bleed
  - *Up to 10% of patients affected*



knowledge.statpearls.com

Electrical labial burn delayed labial artery bleeding – diagnose and manage it

- Acutely, gently debride the wound and apply bacitracin
- Ensure tetanus is up to date
- No role for prophylactic antibiotics
- Refer to plastic surgeon due to potential for poor cosmetic outcome
- Warn parent about potential for labial artery bleeding
  - *Instruct them to put firm pressure on the bleeder if this occurs and come to ED or go to surgeon immediately while continuing to hold pressure*
- For more info: http://www.eplasty.com/images/PDF/eplasty-d-08-00121.pdf and re: electrical burns http://pedemmorsels.com/electrical-burn/

2 ½ year old with vomiting, altered mental status

- 2 ½ year old male brought in by ambulance
- One day of vomiting, non-bloody, non-bilious, and increasingly altered
- Patient has history of several previous ED visits for viral gastritis
- Picky eater normally, went to grandparents' house and ate some new foods, symptoms began on return from their house
  - *Parents and grandparents deny available medications or toxins*
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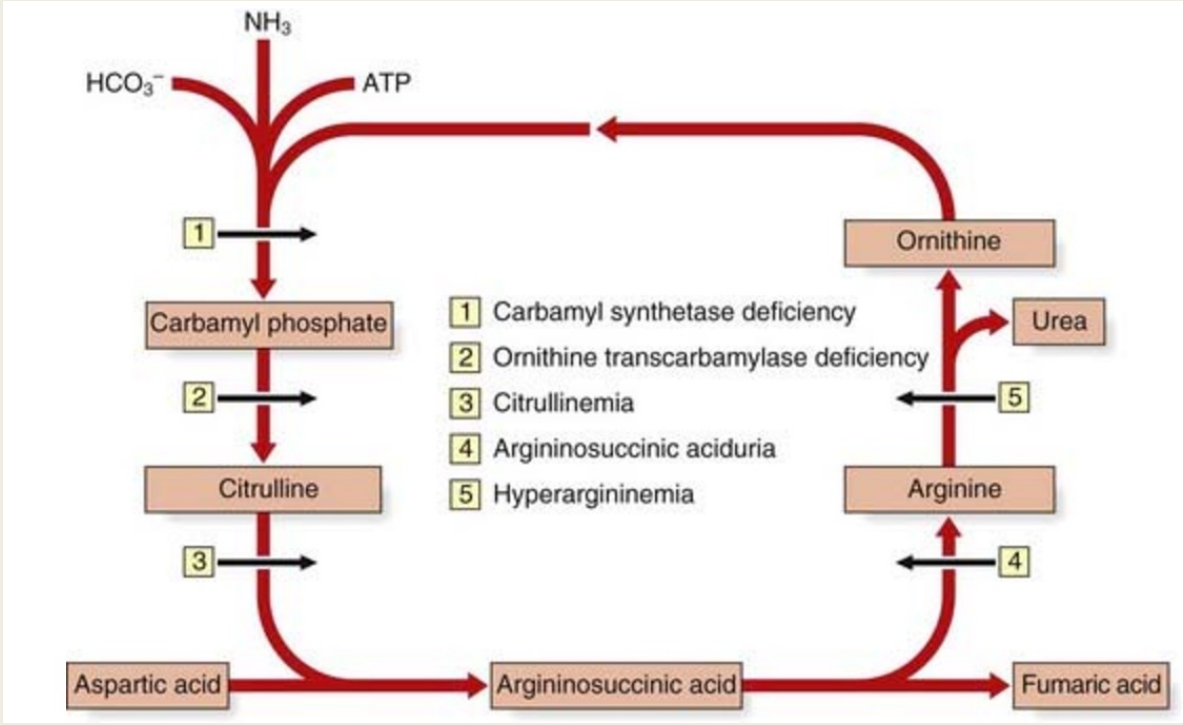
- Lethargic, minimally responsive, no nuchal rigidity, no rash, heart no murmur, lungs clear, abdomen benign, no hepatosplenomegaly
- Family history of mom's brother died in infancy of presumed sepsis

Inborn error: urea cycle disorder – suspect it

- OTC most common, x-linked
- Severe form in newborn males w/ OTC
  - *DOL 2-3, hypotonia, lethargy, coma*
  - *Hyperventilation, resp alkalosis*
  - *May have seizures*
- Milder forms of OTC may present later
  - *Males, and occ. female carriers*
  - *May even present in teens and adults*
  - *Stressor, protein load, certain drugs may precipitate (valproate, steroids)*
  - *FTT, recurrent vomiting episodes, lethargy & coma, encephalopathy*



http://clinicalgate.com/biochemical-genetics/

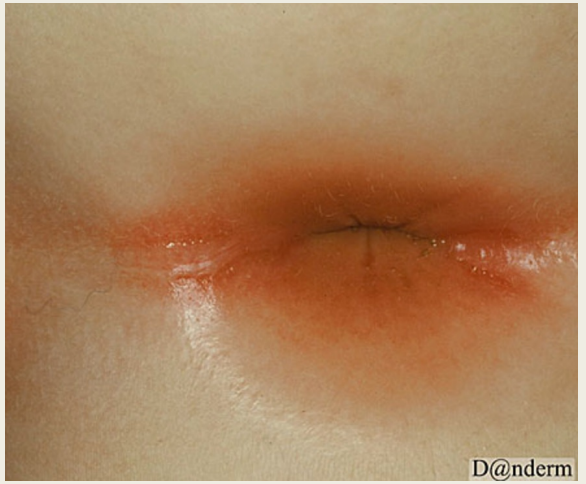
Non-OTC urea cycle disorders also may present in severe form in neonates (both sexes) and in some cases milder forms later

Inborn error: urea cycle disorder – diagnose and manage it

- Hallmark is **high ammonia**, typically > 500-1000 mcg/dL
  - *Ddx from organic acidemias, which have less elevated ammonia*
- Suspect inborn error? Order CBC, Chem panel (iStat if ill appearing or seizure), LFTs, VBG, ammonia, lactate, pyruvate, bedside glucose, urine/serum ketones
- Respiratory alkalosis typical early finding in urea cycle disorders
- NPO (remove substrate), D10 ½ NS at 1.5 x maintenance
  - *May need to add insulin to avoid hyperglycemia*
- Rapid reduction of ammonia to < 200 mcg/dL essential
  - *Hemodialysis if > 1000 mcg/dL*
  - *Ammonia scavengers: sodium phenylacetate and sodium benzoate, arginine HCl*
- Supportive care, avoid valproate (increases ammonia), consult genetics immediately, admit to PICU

2 ½ year old girl with peri-anal rash and blood-streaked stools

- 2 ½ year old previously healthy girl complains of rectal area itching and pain with defecation
  - *Mom then noticed bright red blood streaks in her stools*
  - *Area around the anus is bright red*
- She attends daycare and has one older sibling, age 5 years
- Parents are divorced and she spends weekends with her father
  - *Mom is unsure whether she suspects any possibility of sexual abuse*
- Temp 37.5, HR 98, RR 20, BP 80/35
- Exam unremarkable except for well-demarcated, bright red, peri-anal rash; abdomen soft and nontender, patient well-appearing. Behavior and interactions with mom appropriate.



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Peri-anal strep: suspect it

- Peri-anal streptococcal dermatitis caused by Group A beta-hemolytic strep (just like strep throat)
- Occurs in children age 6 months to 10 years, particularly infants
- Bright red, sharply demarcated, peri-anal rash
  - *May spread to penis or vulva*
  - *Fissures, mucopurulent discharge, yellow crusting sometimes present*
- Other symptoms include: peri-anal itching, rectal pain, blood-streaked stools (1/3 of patients)
- No fever, nontoxic

Peri-anal strep: diagnose and manage it

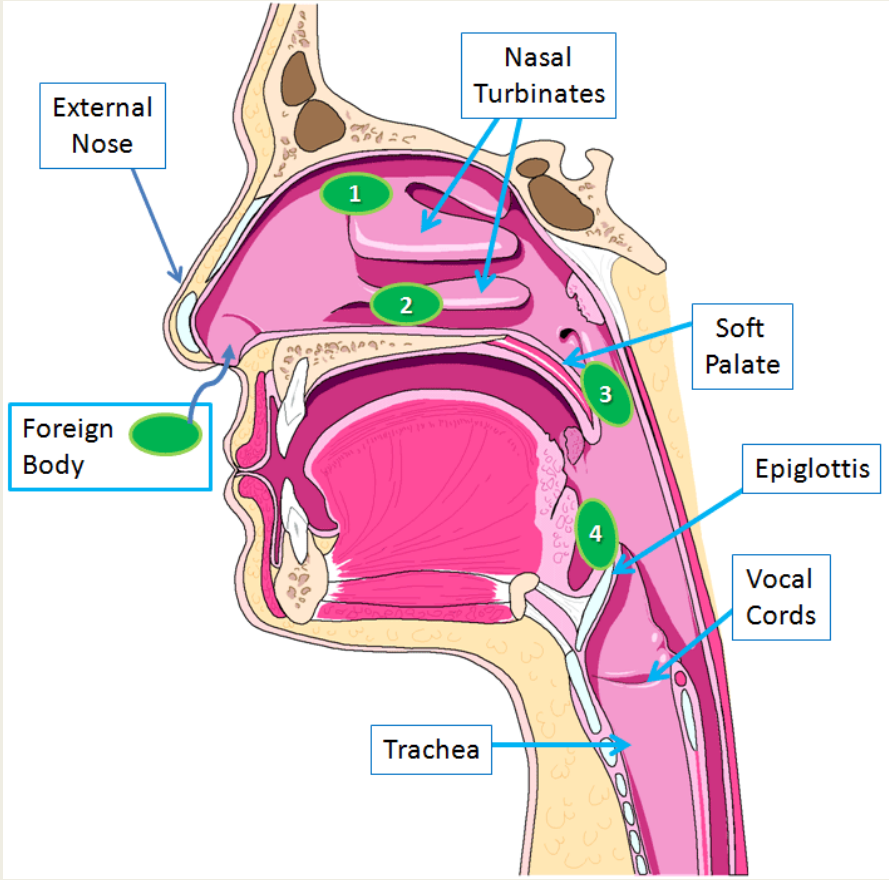
- Can diagnose with rapid group A strep swab or culture similar to strep throat
- Treatment with antibiotic course x 10 days
  - *Penicillin VK*
  - *Amoxicillin may be better tolerated*
  - *Alternatives: clindamycin, clarithromycin, erythromycin*
  - *Topical mupirocin may be added an an adjunct to hasten resolution and for symptomatic relief*
- Relapses common and require re-treatment
- For more information: http://pedemmorsels.com/perianal-strep-infection/ and for a good review of different types of diaper area rashes http://www.consultant360.com/articles/review-diaper-dermatitis-clinical-features-diagnosis-and-management

3 year old with malodorous nasal discharge

- 3 year old girl with malodorous right nasal discharge x 1 week
- Previously healthy, full term born NSVD, no complications
- Denies fever, cough, h/o allergies, trauma, headache, foreign body
- Recently started preschool last month, doing well per teachers
- VS: temp 37.7, HR 90, RR 24, BP 80/45, 02 sat 99% room air
- Malodorous unilateral right nasal yellow-white discharge
- Left nares unremarkable, right nares after discharge bulb suctioned, mildly swollen mucosa and turbinates, no septal hematoma, no foreign body seen

Nasal foreign body – suspect it

- Most common chief complaint is patient admits to or was observed inserting FB
- BUT, always suspect with unilateral (esp malodorous) nasal discharge
- Even if FB not visualized, may be deep or tucked behind swollen turbinate or covered with mucus and not visible
- Common FB: beads, buttons, food, pebbles, small toy parts, disc batteries
- Commonly toddler (need manual dexterity) through preschool age



boogordoctor.com

Nasal foreign body – diagnose and manage it

- Diagnose by looking into nares
  - *Suction any discharge out first*
  - *If swollen mucosa, consider phenylephrine drops*
  - *Use nasal speculum if available & otoscope with bright light*
  - *Place a c-collar on the child to prevent side to side head motion*
- Only 2 FB need to be seen emergently by ENT now: disc battery or multiple magnets stuck across septum – can cause necrosis
  - *Radiograph to r/o these if suspect FB but don't see one*
- Various techniques for removal including balloon catheter, forceps, positive pressure "parent's kiss"
  - *Always check the other nares and the ears for more FB*
  - *If prolonged or much swelling / discharge, give antibiotics for sinusitis treatment / prevention*
- For more info: http://pemplaybook.org/podcast/foreign-bodies-in-the-head-and-neck/ and http://pedemmorsels.com/nasal-foreign-bodies-positive-pressure-technique/ and http://pedemmorsels.com/button-battery-nasal-foreign-body/

Button battery in nares

3 year old with fever and limp

- 3 year old boy with fever for 6 days, complaining also of pain in right leg in the knee area and limp
- No known h/o trauma, no significant past medical history
- VS temp 39.4, HR 120, RR 20, BP 80/40, O2 sat 99%
- Right proximal tibia with area of point tenderness with redness and warmth of overlying skin, no fluctuance, antalgic gait
- FROM knee and hip joints passively
- WBC 18.8, 80% N, ESR 90
- Xrays of pelvis, femur, tibia, fibula negative

Osteomyelitis – suspect it

- Most common in pre-adolescent children
- Prolonged fever, pain and point tenderness of a bone (limp if lower extremity), may have overlying redness and warmth
  - *> 50% lower extremity, 5-15% humerus, also pelvis, spine, radius / ulna, clavicle*
- Most commonly hematogenous spread, but may be from local spread after minor trauma or skin infection
- Neonates may present with sepsis
- Elevated peripheral WBC with left shift, significantly elevated ESR and CRP

Osteomyelitis – diagnose and manage it

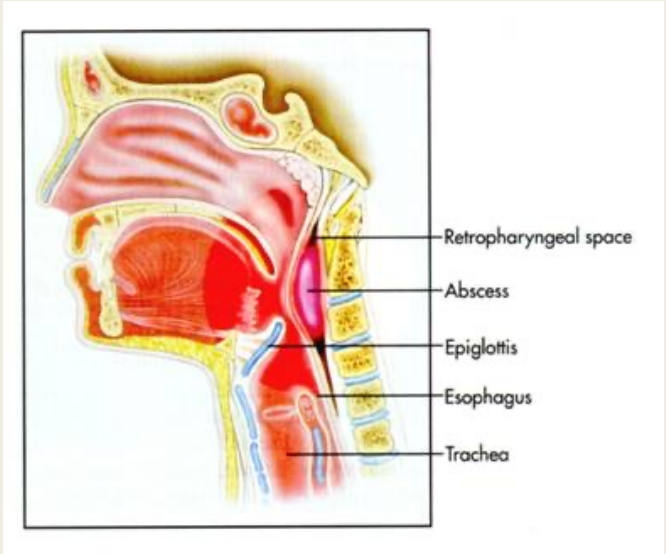
- Order CBC, ESR and/or CRP, blood cultures (40% positive)
- Plain films typically negative until 2nd-3rd week of illness, then may show lytic lesions, periosteal elevation or reaction
- MRI to diagnose; if not available, scintigraphy (bone scan)
- Consult orthopedic surgeon to obtain bone specimen for culture and evaluate for need for surgical drainage
- Give IV antibiotics: organisms to cover: staph (including MRSA), strep, kingella kingae in < 5 yo, salmonella in sickle cell patients
- For more information: http://pedemmorsels.com/osteomyelitis-kids/ and https://www.hawaii.edu/medicine/pediatrics/pedtext/s19c04.html and for a general approach to limping http://pemplaybook.org/podcast/please-just-stop-limping/

3 year old boy with sore throat, fever, neck stiffness

- 3yo boy with 24 hours of sore throat, fever, neck stiffness, decreased po intake
- Negative PMH, no vomiting, diarrhea, headache, abdominal pain, coughing, known ill contacts
- Temp 39.4, HR 150, RR 24, BP 80/40, O2 sat 97% room air
- Patient ill-appearing, holding head midline and reluctant to range neck, alert and oriented
- Oropharynx (quick look) erythematous, no exudate
- Tender cervical lymphadenopathy

Retropharyngeal abscess – suspect it

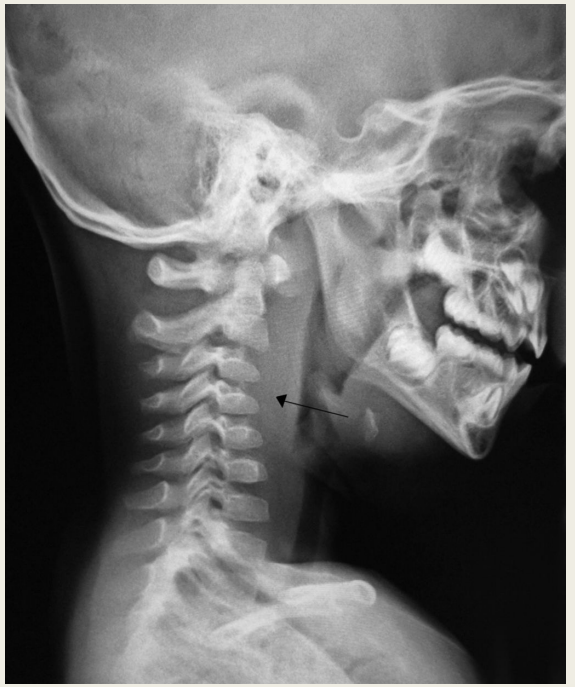
- Retropharyngeal space posterior to pharynx, anterior to prevertebral fascia, between carotid sheaths
- Sudden onset sore throat, fever, neck pain and stiffness, dysphagia, usually ill-appearing
  - *May hold neck in extension, have torticollis and/or decreased neck ROM*
  - *Pain with movement of larynx & trachea side to side "tracheal rock sign"*
- Stridor, trismus, drooling, airway obstruction are late signs
- Children majority 6mo to 6yo (peak 2-4yo) but can occur in older / adults
  - *Pharyngeal trauma from, eg, foreign body is a risk factor*



pedclerk.uchicago.edu

Retropharyngeal abscess - diagnose and manage it

- Screening plain film may show retropharyngeal soft tissue swelling, gas formation
  - *False positive if neck not adequately extended*
- Definitive diagnosis: CT scan
- Baseline CBC, ESR/CRP, blood cultures
- Keep in position of comfort, give O2 as needed / tolerated, be prepared for difficult airway management / needle cricothyrotomy
- 3rd generation cephalosporin or ampicillin-sulbactam + clindamycin, add vancomycin if severe disease
- Consult ENT surgeon early, admit to ICU setting
  - *May require surgical drainage; may require airway management*

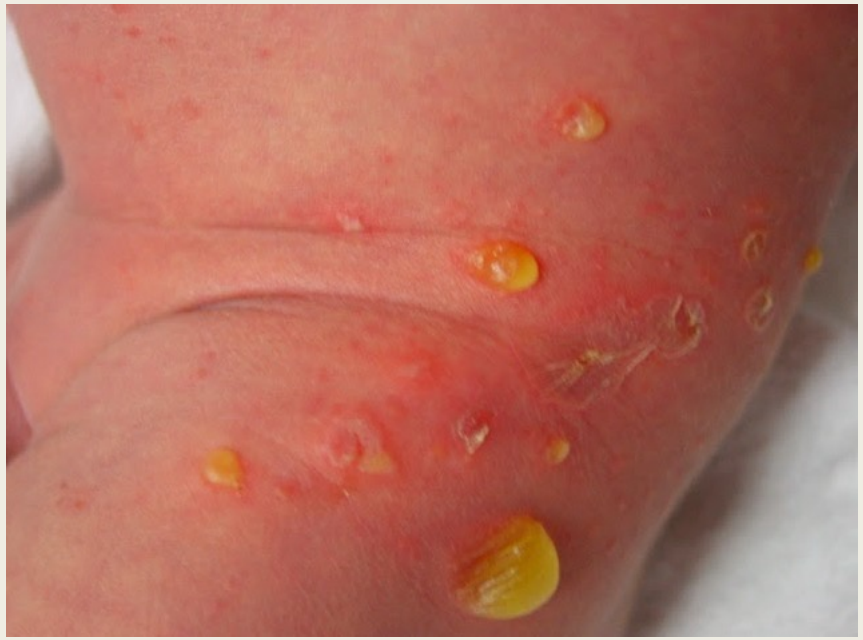


en.wikipedia.org

For more info:
https://pedclerk.uchicago.edu/page/retropharyngeal-abscesses
and
http://pedemmorsels.com/retropharyngeal-abscess-look-for-limited-rom-of-neck/

3 year old with rash

- 3yo boy with rash for 2 days on left lower abdomen extending onto upper outer thigh
- Previously healthy, no fever, no rash contacts
- Rash includes clear yellow fluid-filled bullae, some of which have ruptured and have a thin colarette of scale
- Temp 37.7, HR 110, RR 20, BP 80/40, 02 sat 100%, rash as shown, patient nontoxic, remainder of exam normal



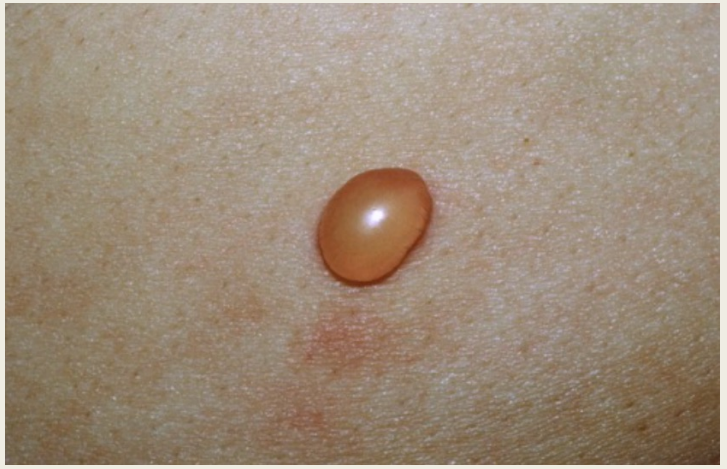
http://paedsid.blogspot.com/2014/06/common-skin-infection-among-children-in.html

Bullous impetigo – suspect it

- Most common in children < 5 years old
- Hot, humid weather predisposes
- Large (but usually < 3cm) thin-roofed bullae with clear yellow fluid, rupture to form erythematous base with collarette of scale (but no hone—crust as is typical for non-bullous impetigo)
  - *Negative Nikolsky sign*
- Common on trunk, extremities, buttocks and perineum
  - *Usually localized, as opposed to Staph Scalded Skin Syndrome*
- Due to *Staph aureus* strains that release exfoliative toxin A
- A video on SSSS and bullous impetigo: https://www.youtube.com/watch?v=WWTgcNGNouY

Bullous impetigo – diagnose and manage it

- Clinical diagnosis
- Small area of localized disease can be treated with topical mupirocin
- Larger areas, prescribe oral anti-staphylococcal antibiotics (against MRSA if prevalent in local geographic area)
- Differential diagnosis includes bullous reaction to a bug (eg flea) bite
  - *Itchy, no erythematous base, typical bug bites nearby* *http://www.regionalderm.com/Regional_Derm/files/insect_bites.html*
- For more info on impetigo http://dontforgetthebubbles.com/impetigo/ and on differentiating from staph scalded skin syndrome http://www.pediatricsconsultantlive.com/articles/bullous-impetigo-neonate and for more pictures http://www.dermis.net/dermisroot/en/27052/diagnose.htm



Differential diagnosis: bullous reaction to bug bite