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Deaconess REGIONAL TRAUMA CENTER

Non-Accidental Trauma (NAT) in the Pediatric Patient

Purpose: To provide a guideline for evaluation and treatment of the pediatric patient with suspected non-accidental trauma (a/k/a child abuse or child maltreatment). Refer to Hospital P&P 40-03S Abuse/Neglect/Domestic Violence for additional information.

Guidelines:

A. Have a high index of suspicion of non-accidental trauma in patients who exhibit any of the following signs, symptoms or indications
   a. History of present injury
      i. No history or inconsistent history
      ii. Changing history
      iii. Unwitnessed injury
      iv. Delay in seeking care
      v. Mechanism of injury is implausible based on child's developmental age
      vi. Prior ED visit
      vii. Domestic Violence in the home
      viii. Premature infant (< 37 weeks)
      ix. Low birth weight/IUGR
      x. Chronic medical conditions
   b. Physical exam findings
      i. Torn frenulum
      ii. Failure to thrive ("FTT")
         1. Weight, length, head circumference
      iii. Large head in infants
         1. Consider measuring OFC in children < 1 year
      iv. Any bruise in any non-ambulating child
      v. Any bruise in a non-exploratory location in children < 4 years
         1. Especially the TEN region – torso, ears, and neck
      vi. Bruises, marks, or scars in patterns that suggest hitting with an object
   c. Radiographic findings
      i. Metaphyseal fractures
      ii. Rib fractures in infants
      iii. Any fracture in a non-ambulating infant
      iv. An undiagnosed healing fracture
      v. SDH and/or SAH on neuro imaging in young children
         1. Particularly in the absence of skull fracture < 1 year

B. Consult Social Work to advise of suspected non-accidental trauma.
    a. Social Work will contact Child Protective Services (CPS) and law enforcement as necessary and document accordingly in the EMR

C. Major Areas of Evaluation
    a. Evaluation and patient testing/imaging/procedure should be based on the mechanism of injury and/or suspicion of NAT.
        i. Avoid unnecessary invasive assessments and radiation procedures unless indicated by thorough examination
    b. Complete history
        i. Document from/by whom and if it contradicts any prior story
        ii. Include review of prior Primary Care Physician (PCP), Emergency Department (ED), and inpatient records as well as prior radiologic studies performed if available to look for sentinel injuries

D. Head to Toe Physical Exam with Particular Attention to
    a. Growth parameters
    b. Thorough skin exam, including scalp and hair, on undressed patient
    c. Palpation of legs, arms, hands, feet, and ribs to feel for crepitus or deformities
    d. Complete neurological examination
    e. Oral examination with attention to the lips, tongue, buccal mucosa, frenula, palate, and teeth
    f. Auricle examination
    g. Genitalia examination

E. Head Imaging
    a. Infants < 12 months of age should have a CT scan without contrast or MRI of the brain to evaluate for intracranial injuries
        i. MRI preferred if patient has no sign of injury and normal mental status
        ii. Imaging should be performed regardless of the presence or absence of neurological findings
    b. Children > 12 months of age should have a CT scan without contrast in there is mental status depression or any other signs of neurological injury
        i. This may also include external signs of head injury, such as facial bruising or scalp hematoma
    c. If the CT scan without contrast or MRI indicates signs of trauma, MRI of the c-spine should be considered
    d. If there is suspicion of a skull fracture, consider ordering a CT scan with 3D reconstruction to better clarity fracture versus suture

F. Abdominal Imaging
    a. Any child who presents with signs/symptoms of abdominal trauma, bruising to the abdomen or torso, or at ALT/AST that is higher than twice normal should have a CT of the abdomen/pelvic with contrast
    b. Consider abdominal CT if urinalysis has >10 RBCs and/or positive stool guaiac

G. Skeletal Survey
    a. Children <3 years of age should have a skeletal survey to evaluate for occult fractures.
        i. When ordering a skeletal survey, be sure to include oblique x-rays of the ribs
    b. Children >3 years of age can have x-rays focusing on areas of concern rather than the entire skeleton
    c. Consider getting a full skeletal survey in children >3 years of age with developmental delays
    d. Follow up skeletal survey should be ordered to be obtained 2 weeks following the suspected trauma to check for fractures that are too acute to show up on initial survey (i.e. rib fractures)
        i. This should be performed as an outpatient with follow up by child's pediatrician or family practice provider
            1. If patient does not have an established pediatrician or family practice provider, a referral should be made prior to patient discharge

H. Ophthalmology Evaluation
    a. Children <12 months of age should have an ophthalmologic evaluation to look for retinal hemorrhages
        i. Retinal photographs should be obtained when possible
    b. Children >12 months of age should have an ophthalmologic evaluation when eye injuries are suspected, when head injury is suspected, and/or when there is facial bruising
    c. Ophthalmologic examination should be obtained as soon as possible
        i. However, the dilated eye exam should be deferred in children with head injuries pending neurosurgery clearance

I. Lab Evaluation
    a. The following labs should be ordered on all children suspected of NAT
        i. CBC with diff and platelets
        ii. Amylase
        iii. Lipase
        iv. CMP
        v. PT/PTT/INR
        vi. Urinalysis with microscope
    b. Consider a UDS/toxicology evaluation if there is clinical suspicion of exposure to substances or in children < 2 years of age with altered mental status
    c. Consider Vitamin D 25 Hydroxy, Calcium, Phosphorus and PTH if clinically indicated

J. Medical Photography
    a. Medical photography should be taken as soon as possible to document any skin findings at the time of presentation, since they can change rapidly

K. Forensic Evidence
    a. Victims of severe abuse should have a toxicology evaluation
    b. Victims of severe abuse should have a Sexual Assault Nurse Examination (SANE) if clinical concerns regarding sexual abuse or other need for forensic evidence collection

L. Siblings
    a. All siblings or other at risk children in the home of the patient who is a victim of suspected NAT should be evaluated by the PCP within 24 hours
    b. Upon identification of other possible at risk individuals in the home of a NAT patient, the ED should consult Social Work and request Child Protective Services (CPS) be made aware of those individuals and document accordingly in the EMR

M. Admission
    a. Admit all patients who have clinical indication
        i. Patients with identified traumatic injuries or who are undergoing NAT work up will be admitted to Trauma Services with consultation to the Pediatric Intensivist
    b. Patients undergoing NAT work-up meet criteria for inpatient status
    c. Admit patients where there is a concern about the safety of the patient, especially if there is a disagreement between the provider and CPS

References:

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- Child abuse. (2018, October 05). Retrieved from https://www.mayoclinic.org/diseases-conditions/child-abuse/symptoms-causes/syc-20370864
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- Pediatric Trauma Society; pediatrictraumasociety.org
- Hospital P&P 40-03S Abuse/Neglect/Domestic Violence