

Pediatric Essentials: Caring For Kids With Heart

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“

Children are the world's
most valuable resource
and its best hope for the
future.

”

John F. Kennedy

United States Committee for UNICEF, July 25, 1963

Allergic Reactions

- Triggers
 - Food, Medications, Insect stings, Pollen, Other substances
- Signs & Symptoms
 - Mild
 - Itchiness, skin redness, slight swelling, stuffy/runny nose, sneezing, itchy/watery eyes, red bumps(HIVES) over body
 - Severe
 - Swelling of mouth/tongue, difficulty swallowing/speaking, wheezing/respiratory distress, belly pain/nausea/vomiting, dizziness/fainting
- Treatment
 - Contact physician if more than mild or concerns you
 - Mild – Benadryl (diphenhydramine)
 - Severe – EpiPen (if you have it), call 911.

Animal Bites

- Rabies- Animal bites from wild animals (bats, raccoons, skunks, foxes) (RARE)
- Animal Bites/scratches that break skin can cause infection
 - Some need suture closure, others heal on their own. Wash bite area with soap and water, apply pressure if bleeding, apply antibiotic ointment, cover with bandage/gauze.
- Seek Medical Care
 - Bite from wild/stray animal, animal not up to date on rabies shot/unknown, animal acting strangely
 - Bite has broken skin, on face/head/neck/hand/foot/near joint
 - Area becomes red, hot, swollen, more painful
 - Child is behind on shots / Tetanus shot not within 5 years
- Think Prevention! – many animal bites can be prevented!

Asthma Flare-Ups

- Wheezing, coughing, chest tightness, shortness of breath
 - Follow asthma action plan, if enters Red Zone call 911 → ED
- Severe Flare-Up: trouble breathing when at rest, difficulty speaking without pausing, feeling tired/drowsy, blueness around lips, retractions.
 - Call 911 → ED
- Think Prevention!
 - Avoid asthma triggers
 - Use controller medications as prescribed, have meds at school / trips
 - Yearly flu shot
 - Follow asthma action plan
 - DON'T RUN OUT OF ASTHMA MEDS!

Broken Bones (Fractures)

- All broken bones need medical care!
- Fracture or not?
 - “snap” or grinding noise during an injury
 - Swelling, bruising, tenderness
 - Difficult to move, hurts when moving/touched/bearing weight
- What to do:
 - Remove clothing from injured area
 - Apply ice pack wrapped in cloth
 - Keep injured limb in position you find it
 - Place a simple splint on broken area
 - Go to ED→ DO NOT LET EAT OR DRINK!
- Call 911 if suspected injury to head/neck/back, fracture thru skin
 - Keep child lying down, don't wash wound or push bone back in
- Think Prevention! – Safety gear, bike helmets, safety gates

Burns

- Scald burns from hot water/liquids most common in early childhood
- Severe burns → call 911
 - Remove clothing from burned area unless stuck to skin
 - Cool (NOT COLD) water over burn until pain lessens
 - Lightly apply gauze bandage
 - If child awake and alert can give Ibuprofen/Acetaminophen
 - DO NOT PUT ANYTHING ON BURN
 - DO NOT BREAK BLISTERS
- Go to ED
 - Area is large
 - Burn came from fire, electrical wire or socket, or chemicals
 - Burn is on face, hands, feet, joints, genitals
 - Burn infected (swelling, pus, increased redness or red streaking of skin)
- Think Prevention!

Choking

- Can be a Life-Threatening Emergency
 - Gasping/Wheezing
 - Can't Talk, cry, or make noise
 - Turns blue in face
 - Grabs at throat/waves arms/appears panicked
- Call 911!
- Abdominal Thrusts / Heimlich maneuver
- If gagging/coughing but can breathe and talk best to do nothing
- If unconscious and not breathing begin CPR!
- ED → after any serious choking episode, persistent cough/wheezing, difficulty breathing/swallowing
- Think Prevention! – avoid foods/objects that are easy to choke on, **BUTTON BATTERIES**, Learn CPR!!!

Common Cold

- Kids can get 8+ colds a year
- Stuffy/runny nose, itchy/sore throat, sneezing, cough, headache, mild fever, feeling tired, loss of appetite.
- Home TX: acetaminophen (15 mg/kg), ibuprofen (10 mg/kg), nasal suctioning gently with saline, cool-mist humidifier, encourage fluids, rest, NO ASPIRIN
- Go to Doctor: cold symptoms worsening or last more than a week, barky cough (croup), respiratory distress, high fever, appears ill, any fever in a baby less than 3 months old (100.4° / 38°), sore throat with difficulty eating/drinking, bad headache.
- Think Prevention! – avoid sick people, wash hands well and often, sneeze/cough into shirtsleeves or tissues (not hands)

Constipation

- Fewer poops than usual
- Straining/pain with defecation, poop is hard and dry, larger stools than usual, feeling full/bloated, abdominal pain, a little bit of blood on toilet paper after a poop.
- TX:
 - Give child plenty water/juice; for baby talk to PCP about adding prune, apple, or pear juice to diet
 - Increase fiber – apples, pears, oranges, beans, popcorn, oatmeal, whole-grain breakfast cereals/breads
 - Encourage daily exercise to encourage bowel movements
- Seek Medical Care/ED:
 - Constipation lasting a week, liquid stools in underwear, belly pain, vomiting, loss of appetite

Croup

- Viral infection (Parainfluenza Type 3) in upper airway, around vocal cords and trachea.
- Barky (seal-like) cough
- High pitched sound when child is breathing (stridor)
- Fast or difficult breathing
- Stuffy/runny nose
- Fever
- Home TX: cool-mist humidifier, steam-filled bathroom, cold air
- ED → difficult breathing, retractions, cyanosis (bluish color around mouth), drooling / difficulty swallowing, becomes tired easily
- Think Prevention! – frequent handwashing and avoiding ill people

Cuts (Lacerations)

- Most cuts/scrapes handled at home, clean/wash area, dry, antibiotic ointment, bandage.
- ED → cut is deep or its edges are widely separated, cut continues to ooze/bleed even after applying direct pressure, human/animal bite
- Call 911
 - A body part is cut off (put part in a clean, sealed plastic bag right away and then put bag in a container with ice water)
 - Blood is squirting out of the cut and is difficult to control
 - Cut is bleeding so much that bandages are becoming soaked
- TX:
 - Rinse cut with water and apply direct pressure with gauze/cloth
 - If blood soaks bandage apply new bandage over old one
 - Raise injured body part
 - When bleeding stops cover wound with new clean bandage
 - DO NOT APPLY TOURNIQUET

Dehydration

- Not drinking enough fluids or large fluid loss thru vomiting/diarrhea
- Mild/Moderate
 - Dry tongue, few/no tears, rapid HR, fussy infant, no wet diapers in 6 hours in infant, no urination in 8 hours in child
- Severe
 - Very dry mouth (looks sticky), dry/wrinkly/doughy skin, inactivity/sleepiness/lethargy, sunken eyes, sunken fontanelle, no wet diapers in 8 hours in infant, no urination in 8 or more hours in child, deep/rapid breathing, rapid/weak pulse
- Home TX: encourage fluids, popsicles, Pedialyte, Gatorade, Ice chips
- ED → signs of severe dehydration, unable to keep any fluids down
- CAPILLARY REFILL!!!
- Think Prevention! – handwashing, small frequent amounts of fluid, if vomiting only give clear fluids

Diarrhea

- Loose and frequent stools, cramping abdominal pain, fever, loss of appetite, feeling tired, weight loss, dehydration
- Home TX: continue on regular diet and give more fluids, offer additional formula/breastmilk to infants, can use Pedialyte/Gatorade, DO NOT GIVE WATER to infants
- ED → younger than 6 months old, severe or prolonged diarrhea, younger than 12 months old and has a fever of $102^{\circ}/38.8^{\circ}$, vomits repeatedly or refuses to drink fluids, decreased urine output, severe abdominal pain, diarrhea that contains blood or mucous.
- Think Prevention! – Frequent handwashing, avoid food poisoning, wash fruits and vegetables thoroughly before consuming/cooking, food safety.

Febrile Seizures

- Seizures/convulsions that occur in some children with fevers.
 - 6 months to 6 years old
 - Usually on first day of fever
 - Most patients outgrow them
- During a febrile seizure a child will have jerking movements, may shake or twitch, may moan, and will become unconscious.
- TX:
 - Call 911, stay calm, make sure child is in safe place and cannot fall down, lay child on their side to prevent choking, monitor breathing, try to keep track of how long the seizure lasts.
- Febrile seizures can run in families and once a child has one they are prone to having more in the future every time they are febrile.
- RX: Tight fever control with Acetaminophen and Ibuprofen and frequent temperature checks

Fever

- Can be frightening in a child but causes no harm and is actually a good thing since it is the body's way of fighting an infection.
- Fussy, uncomfortable, warm to touch, flushed, sweaty
- Home TX: keep child home from school/daycare, sponge bath in lukewarm water, offer plenty of fluids/popsicles, acetaminophen/ibuprofen (6 months or older), NO ASPIRIN.
- ED →
 - If an infant is younger than 3 months of age and has a temperature of 38.0° C or 100.4° F.
 - Appears sick, skin rash, diarrhea/vomiting (persistent), signs of dehydration, recurring fevers for 5 days, chronic medical problems such as sickle cell disease, cancer, heart disease, lupus, etc.
- Think Prevention! - fevers are virtually unavoidable.

Flu

- Sometimes mistaken for the common cold but more severe and more symptoms
 - Fever, chills, headache, muscle aches, loss of appetite, cough, sore throat, runny nose, nausea/vomiting, diarrhea, dizziness, tiredness
- Home TX:
 - Call PCP, encourage rest, keep child hydrated, supportive care, acetaminophen/ibuprofen
- ED →
 - Symptoms worsening, severe cough, trouble breathing, fever and less than 3 months of age, a stiff neck, persistent headache
- Think Prevention! – Flu vaccines, avoid large crowds during flu season, frequent handwashing

Head Injuries

- Mild Head Injury:
 - minor scalp swelling, cut on scalp, mild headache, vomiting 2-3 times
- Potential Serious Head Injury:
 - Loss of consciousness, obvious serious wound, blood or clear fluid from nose or ear, changes in behavior such as sluggishness, agitation, confusion, sleepiness, dizziness/stumbling, seizure, vomiting more than 2-3 times or vomiting hours after injury, severe or worsening headache
- Call 911 for any serious head injury
 - Do not move an unconscious child. If not breathing start CPR.
- ED → for evaluation of all head injuries in infants or a child of any age has neck pain or won't stop crying.
- Think Prevention! – childproof your house, protective gear / helmets

Headaches

- Usually brief and can be caused by many things including too little sleep, eye strain, sinus infections, or a bump to head.
- Tension HA:
 - feeling of squeezing or pressure around front, sides, and back of head; dull, steady pain; pain is not worsened with activity; no nausea/vomiting; muscles of scalp/face/shoulders may be sore to touch
- Migraine HA:
 - pounding, throbbing pain on one or both sides of head; pain worsened by rapid motion; dizziness, feeling tired; nausea/vomiting, belly pain; seeing spots or halos; sensitivity to light/noise/smells
- Home TX:
 - lie down in a dark, quiet room; Ibuprofen/Acetaminophen; cool, moist cloth across forehead/eyes
- PCP:
 - Occur one a month or more; don't go away easily; more painful than usual; prevent child from participating in everyday activities; following head injury

Headaches (continued)

- ED→
 - Decreased alertness / confusion
 - Fever or persistent vomiting
 - Seizures
 - Changes in vision
 - Weakness
 - Skin rash
 - Neck pain/stiffness
 - Balance issues
- Think Prevention! – avoidance of triggers such as: too little sleep, certain medications, not drinking enough fluids, using computer/phone or watching TV for a long time

Heat Illness

- Heat Exhaustion:
 - Increased thirst, weakness, fainting, muscle cramps, nausea/vomiting, irritability, headache, increased sweating, cool clammy skin, fever < 105° F
- Heat Stroke:
 - Severe headache, weakness, dizziness, confusion, rapid breathing and HR, loss of consciousness leading to coma, seizures, may not be sweating, flushed, hot and dry skin, fever of 105°F or higher
 - Call 911 immediately!
- TX:
 - Bring child indoors or into shade immediately, undress the child, lay child down and elevate feet slightly, if alert place in cool bath water; if outside spray with mist from garden hose (check water temp), if alert and coherent give sips of cool, clear fluids, if vomiting turn onto side to prevent choking
- Think Prevention! –
 - drink plenty of fluids, wear light-colored loose clothing, prevent strenuous activity during hottest time of day, come inside if feeling overheated

Insect Stings and Bites

- Mild reaction:
 - Red bumps, itchiness, mild swelling
- Severe Allergic Reaction:
 - Swelling of face or mouth, difficulty swallowing or speaking, chest tightness, wheezing, difficulty breathing, dizziness or fainting
- Home TX:
 - If child stung and stinger is visible, remove it as quickly as possible by scraping skin horizontally with credit card or fingernail, wash area with soap and water, apply ice or cool wet cloth to relieve pain and swelling
- Call 911, ED →
 - sting or bite is inside or near mouth, child has a known severe allergy to a stinging/biting insect, EpiPen was used, or the site looks infected

Scorpion Envenomation

- Arizona Bark Scorpion (*Centruroides sculpturatus*) causes neuromuscular toxicity
- Stings are usually accidental, usually when someone steps on a scorpion (baby is put on one), or reaches under wood or rocks
- Majority cause no pain or local pain with minimal to no inflammation
- When present, symptoms begin immediately and maximal severity is in 5 hours
- Young Children <5 are most likely to develop life-threatening envenomation requiring intensive supportive care
- Grade I:
 - Localized pain / paresthesias (tingling, burning, prickling, numbness) at site
 - TX: pain management (Ibuprofen), local wound care, Tetanus prophylaxis
- Grade II:
 - local and remote pain or paresthesias
 - TX: As above, regional anesthesia for severe local pain, IV opioids

Scorpion Envenomation (continued)

- Grade III:
 - As above **AND** Cranial Nerve Dysfunction (abnormal eye movements, dysphagia, drooling, and/or slurred speech) **OR** somatic skeletal neuromuscular dysfunction (undulating and writhing restlessness, fasciculations, extremity shaking and jerking, opisthotonos (arching of back), emprosthotonos (tetanic forward body flexion) with preservation of alertness
 - Autonomic Dysfunction: salivation, vomiting, bronchoconstriction, diaphoresis, and tachycardia
- Grade IV:
 - All above features are present
- TX:
 - Antivenom
 - Supportive care: frequent suctioning of secretions, intubation if needed, monitor for MI, heart failure, rhabdomyolysis; treat pain, if no antivenom use Benzos, provide local wound care

Nosebleeds

- Quite common in children
- Home TX:
 - Have child sit up with their head tilted slightly forward (DO NOT HAVE THEM LEAN BACK)
 - Pinch the soft part of the nose for at least 10 minutes
- PCP:
 - Frequent nosebleeds, may have inserted something in their nose, tends to bruise easily or has heavy bleeding from minor wounds, recently started a new medication
- ED →
 - Heavy bleeding, dizziness or paleness, continues after 2-3 attempts at 10 minutes of nose-pinching each, is the result of a blow or a fall
- Think Prevention! – prevent nasal dryness (saline drops, Vaseline), discourage nose-picking and keep fingernails short

Poisoning

- Nearly 90% of childhood poisonings happen in the home and most can be treated at home with help of Poison Control
- Drowsiness, sudden change in behavior, unusual odor, pill fragments on lips or clothes, excessive drooling, vomiting, confused mental state, listlessness
- Home TX: Banner Poison Control Center 1-800-222-1222
- ED/Call 911 → child took something and has change in mental status. Bring in bottle of what they might have taken. **DO NOT GIVE IPECAC!**
- Think Prevention! –
 - Meds in locked cabinet, cleaning products/alcohol out of reach/locked, button battery safety, never tell a child a med tastes like candy, never put cleaning products into old food or drink containers, no insect poison on floor
 - Narcan (naloxone)

Seizures

- Can be scary, many last only a few minutes, stop on their own, and are almost never life-threatening
- Unusual sensations or twitching before seizure, uncontrollable muscle spasm, loss of consciousness, uncontrolled voiding/stooling
- Home TX:
 - Gently place on floor and remove any nearby objects, loosen any clothing around head/neck, let them “shake”, do not place anything in their mouth, roll child onto their side especially if vomiting, do not give anything to drink, let them sleep after seizure (post-ictal), call PCP / neurologist
- ED/Call 911 ->>
 - Seizure lasts more than 5 minutes or is having repeat seizures, difficulty breathing, bluish color on lips, tongue, or face, remains unconscious for more than a few minutes, falls or hits their head before or during event, seems to be ill, has any symptoms that concerns you
- Think Prevention! – if child has epilepsy make sure that they get adequate rest and take their seizure meds as prescribed

Sore Throat

- Common at any age, can be first sign of another illness, can be caused by Streptococcus infection.
- Painful throat, fever, swollen glands in neck, bad breath, scratchiness in throat, redness in back of mouth
- Home TX: sip warm liquids, popsicles, gargle with salt water, suck on hard candy or throat lozenges (if 4 or older), use acetaminophen and ibuprofen as needed
- ED → difficulty swallowing or breathing, drooling (in young child), tires easily, has pus in back of throat, sore throat that lasts longer than one week
- Think Prevention! – handwashing, not sharing food utensils and glasses with others, avoid contact with others that have sore throat
- Group A Strep Pharyngitis (Strep Throat)- contagious until 24 hours after antibiotics started, throw away toothbrush

Stomachaches (Abdominal Pain)

- Caused by many things
- Common symptoms:
 - Vomiting, nausea, diarrhea, constipation, sore throat (strep), heartburn, fever, bloating, cramping, painful urination
- ED→
 - Pain that frequent, increasing, or severe
 - Pain that starts near bellybutton and moves to right lower side
 - Difficulty walking due to pain
 - Persistent vomiting, especially if greenish-yellow
 - Signs of dehydration
 - Trouble having a bowel movement
 - Bloody or black poops
 - Loss of appetite for more than a day or two

Strains and Sprains

- Strains – injuries to muscle due to overstretching
- Sprains – stretch or partial tear of ligaments (connect two bones) or tendons (connect muscle to bone)
- Pain in joint or muscle, swelling and bruising, warmth and redness of the injured area, difficulty moving the injured part
- Home TX: **RICE**, acetaminophen/ibuprofen for pain
 - **Rest**: rest injured part until less painful
 - **Ice**: icepack in a towel over injured part immediately, 20 min 4-8x day
 - **Compress**: Ace wrap for at least two days
 - **Elevate**: raise injured part above the heart to decrease swelling
- ED→
 - Severe pain when touched or moved, trouble bearing weight, increased bruising, numbness/ pins and needles, limb looks bent or misshapen, signs of infection, no improvement in 5-7 days

Sunburn

- Can happen within 15 minutes of being in sun but “burn” may not be noticed for a few hours, repeated sunburns can lead to cancer
- Mild:
 - Skin redness and warmth, pain, itchiness
- Severe:
 - Skin redness and blistering, pain and tingling, swelling, headache, nausea, fever and chills, dizziness
- Home TX:
 - Remove child from sun ASAP, cool (not cold) shower or bath, give extra fluids next few days, ibuprofen/acetaminophen for pain, aloe gel/moisturizing creams, when outside all sunburned areas should be covered until fully healed
- ED →
 - Sunburn forms blisters or is extremely painful, facial swelling from sunburn, sunburn covers a large area, fever or chills, headache, confusion, lethargy, dehydration
- Think Prevention! – Sunscreen and repeat application, avoid sun

Urination Pain (Dysuria)

- Can be caused by infection in urinary system (UTI), irritation or injury of genital area, or stones in urinary tract.
- Symptoms:
 - Burning or stinging with urination, urge to urinate more often; bad-smelling, bloody, or discolored urine; fever or chills; decreased appetite or activity; irritability; nausea/vomiting; lower back pain or belly pain; bedwetting
- Home TX: encourage liquids and acetaminophen/ibuprofen
- PCP/ED → needs urine sample, clean-catch vs catheter specimen for UA and culture, antibiotics.
- Think Prevention! – avoid bubble baths and perfumes soaps, wash genital area with only mild soap/lukewarm water, change soiled/wet diapers immediately, go to bathroom often, teach girls to wipe front to back and make sure no tiny pieces of TP left behind, STD screening for sexually active teens

Vomiting

- Caused by many things, most common gastroenteritis.
- Home TX:
 - Do not feed child milk products and solids, give small amounts of fluid often, gradually increase the amount of fluids once no vomiting 3-4 hours, after 8 hours without vomiting babies can be breastfed as usual and gradually reintroduce formula and kids can be served bland foods (BRAT diet – Bananas, Rice, Applesauce, Toast)
- ED→
 - Signs of dehydration: dry eyes, sunken eyes, decrease in urination
 - Inability to keep clear fluids down
 - Vomit is greenish-yellow, contains blood, looks like coffee grounds
 - Hard, bloated, painful belly
 - Extreme irritability
 - Swelling, redness, or pain in boy's scrotum
 - Projectile or forceful vomiting in a newborn

Pediatric Pearls

- Please vaccinate your children according to the Vaccination Recommendations by the AAP.
- Water Safety! → watch your kids around water (pools, tubs, lakes, buckets)
- Learn CPR!
- Home Medicine Cabinet:
 - Acetaminophen (15 mg/kg) every 6 hours
 - Ibuprofen (10 mg/kg) every 6 hours
 - Diphenhydramine (1 mg/kg) every 6-8 hours
 - Ondansetron ODT (Zofran)
 - Triple antibiotic ointment
 - Bandages, gauze
 - Keep it locked and away from children.

“A child’s smile is worth
more than all the money
in the world.”

- Lionel Messi

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Questions?



References

- www.uptodate.com
- www.aap.org
- www.kidshealth.org