

Tots Too Hot!



The Cute, The Bad & The Ugly
of Pediatric Fever

Pediatric Education

✦ PEPP

PEPP

✦ PALS

Pediatric
Advanced Life
Support

✦ PEARS

Pediatric Emergency
Assessment,
Recognition,
and Stabilization

✦ APLS

APLS
The Pediatric
Emergency
Medicine Resource
REVISED FOURTH EDITION

✦ EPiC

NAEMT
EPiC
Emergency Pediatric Care

How bad is it?



Do healthcare providers
over-react or under-react
to pediatric fever?

Fever



The reason for 1 in 5 ED and office visits for kids.

Phobia

Moms & Dads
Doctors & Nurses
Paramedics & EMTs



Goal

Patient Outcome/Patient Comfort



Myths

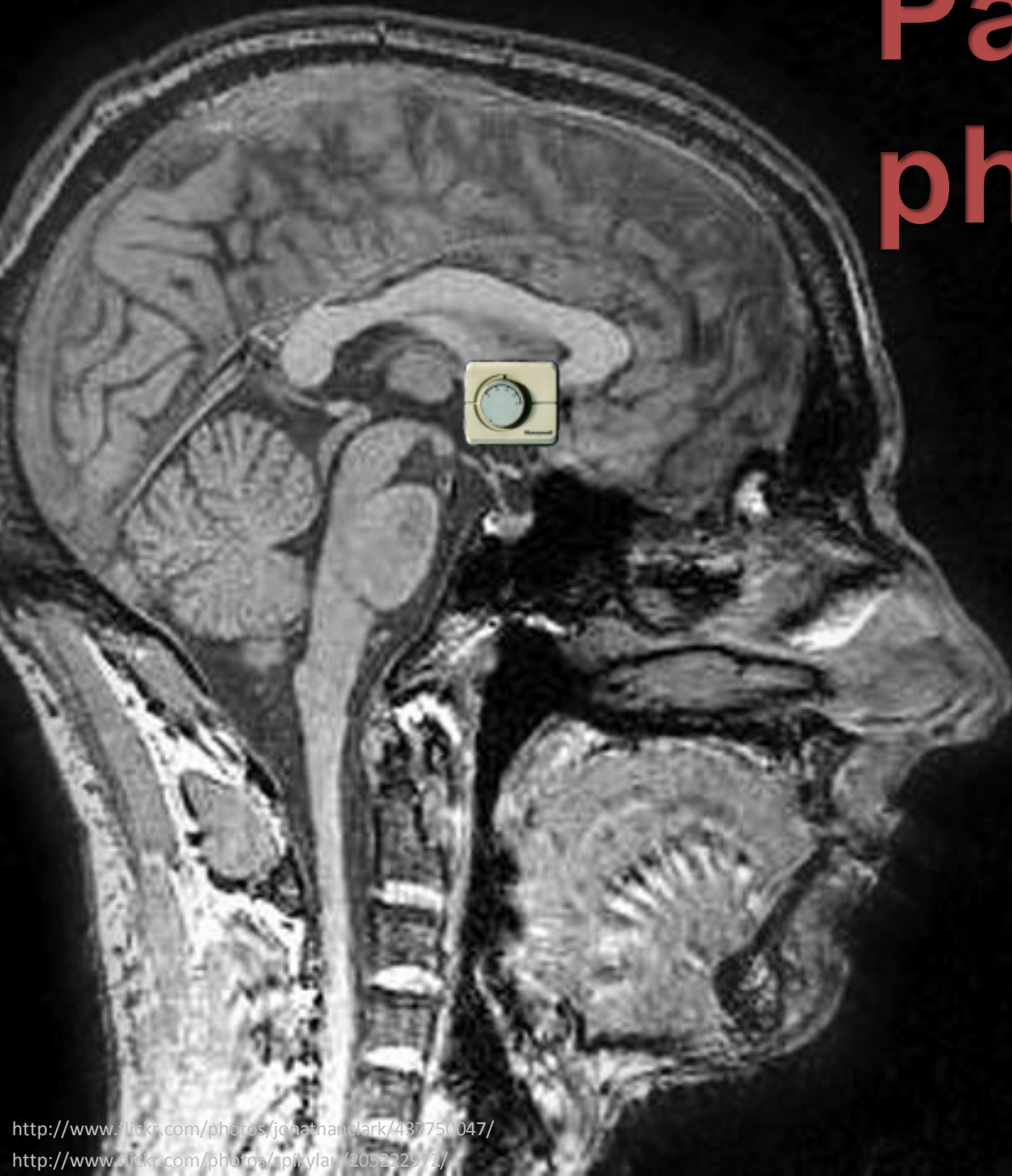


Fever is a dangerous medical condition!

Fever can fry the brain!

Fever can predict outcome!

Patho physiology



The Body's
Thermostat
is the
Hypothalamus

Pathophysiology



What temp indicates Fever?

What is a normal temp?

What is a normal BP?

Pathophysiology



Normal Range 35.6 (96.0) – 38.2 (100.8)

FEVER = Rectal temperature $>38^{\circ}\text{C}$ (100.4°F)

FEVER = Oral temperature $>37.2^{\circ}\text{C}$ (99.0°F)

American College of Emergency Physicians. Clinical policy for the initial approach to children under the age of 2 years presenting with fever. *Ann Emerg Med* 22(3):628–637, 1993.

Pathophysiology

Pyrogens
Exogenous
Endogenous



Pathophysiology

Exogenous Hyperthermia

Hot environment

Trauma / Surgery

Medications / Poisoning



Pathophysiology



Endogenous Hyperthermia

Infection

Stroke

Cancer

Pathophysiology

A detailed 3D rendering of a cell, likely a red blood cell, shown in a cross-section. The cell is pinkish-red and has a textured surface. Several green, spherical pathogens are attached to the cell's surface. One large green sphere is on the left, another is on the right, and a smaller one is at the bottom. There are also some smaller, yellowish, spherical structures near the top. The background is a light blue, slightly blurred, suggesting a microscopic environment.

Pathogen

S

Bacteria

Viruses

Fungi

Parasites

Pathophysiology

A microscopic view of various bacteria and viruses. The background is a dense field of green, rod-shaped bacteria. Scattered throughout are several blue, spherical viruses with spiky surfaces. A few larger, more complex structures in shades of yellow and orange are also visible.

Common Bacterial Illnesses:

Otitis Media

Urinary Tract Infections

Appendicitis

Pharyngitis

Sinusitis

Pathophysiology



Common Viral Illnesses:

Gastroenteritis

Upper Respiratory
Infections

Bronchiolitis

Pathophysiology

A scanning electron micrograph (SEM) showing a dense population of cells. The larger, spherical cells are colored yellowish-brown and have a textured, granular surface, characteristic of macrophages. The smaller, more irregularly shaped cells are colored light blue and appear to be pathogens or bacteria. The background is dark, making the cells stand out.

Immune Response

Pathogen invades.

Pathogen releases endotoxins.

Endotoxins attract macrophages.

Macrophages eat the pathogens.

Pathophysiology

A microscopic image showing numerous green, spherical bacteria, likely Staphylococcus aureus, clustered together on a purple, fibrous, and textured surface. The bacteria are arranged in a somewhat organized pattern, with some appearing to be in the process of dividing or budding.

Fever Response

Macrophages exude cytokines.

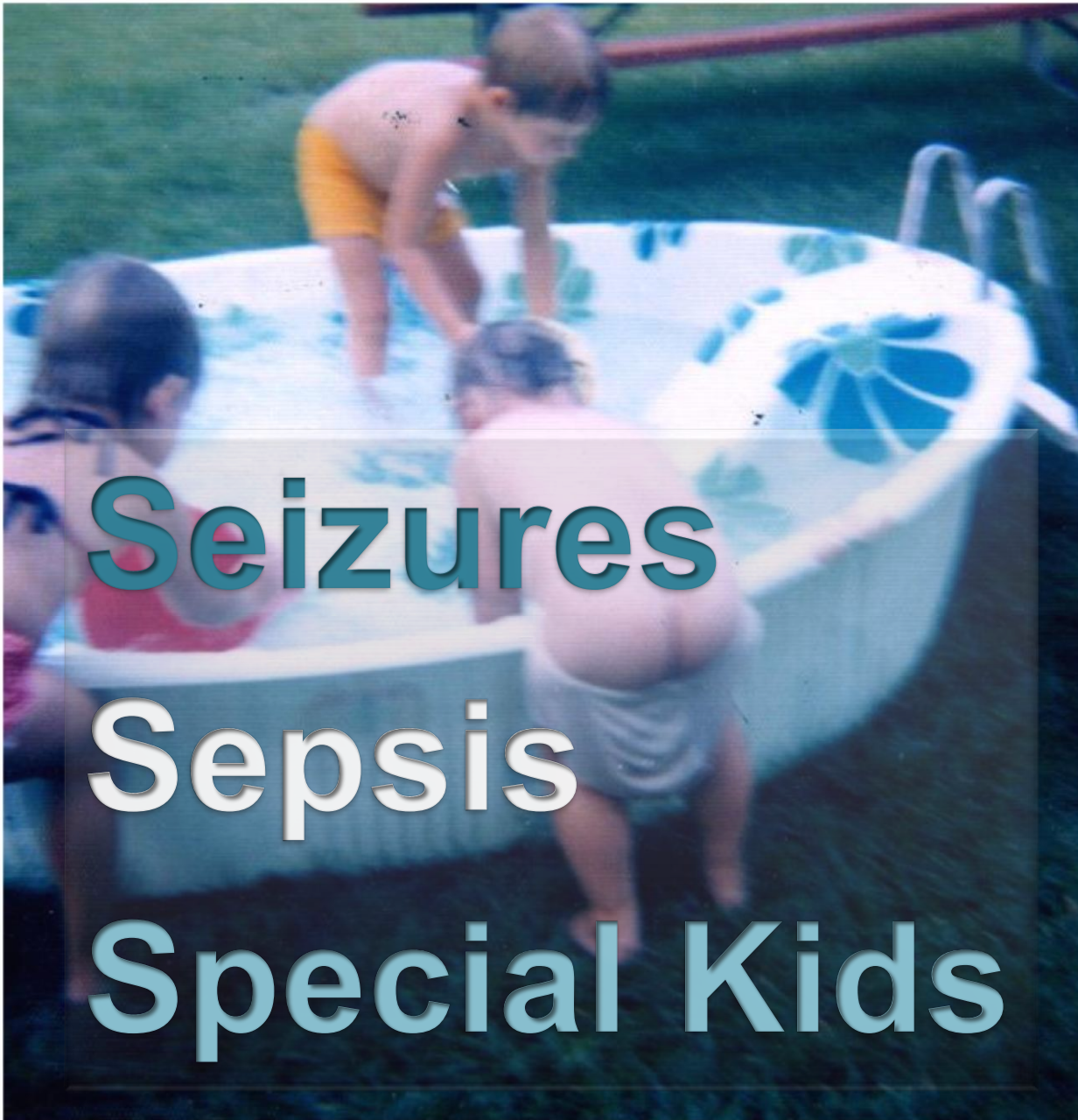
Cytokines (through a series of chemical reactions) resets hypothalamus.

More difficult for temperature sensitive pathogens to replicate.

Increases activity & mobility of macrophages and immune system.



FEVER



**Butt
wait.**

**There's
more...**

Seizures

Febrile Seizure

vs

Seizure with Fever



Seizures



They're more scary than dangerous.
Most resolve without anticonvulsants.
Not all seizures with fever are febrile
seizures.

Kids with seizure disorders tend to have
more seizure when febrile.

Even well controlled kids may be "reset" when
febrile.

Seizures

A young boy with dark hair is lying on a couch, appearing to be asleep or sedated. He is wearing a clear oxygen mask over his nose and mouth, secured with green straps. A clear plastic reservoir is attached to the bottom of the mask. On his left arm, a white blood pressure cuff is inflated. A person's hands are visible on the right side of the frame, adjusting the cuff. The background consists of a grey couch and a green cushion.

Treatment for Seizure with Fever?

Treatment for Febrile

Febrile Seizures



6 mo – 3 yrs, median 18-22 mo.

85% of all F.S. last for <15 min and don't recur within 24 hrs.

1/3 will have recurrence of F.S.

Simple F.S. are generalized tonic-clonic with brief post-ictal period.

Complex or atypical F.S. can be focal, atonic, or prolonged.

Febrile Seizures

There is no set Seizure temp.
Even with the same child.
Dropping temp neither stops
nor prevents seizures.

F.S. has a genetic

Sepsis



Infection

Triad

Tachycardia, Tachypnea, Fever

SIRS

More Sx

AMS, Cap Refill \wedge or v , Bounding Pulses, Cool Extremities, Rash

Cellular Hypoxia / Lactic Acidosis

MODS

Death

Special Kids



Immunocompromised

Immunotherapy

Chemotherapy

Steroids

AIDS

Special Kids



Sickle Cell

Cystic Fibrosis

Poor Respiratory Function

Poor Cardiac Reserves

Significant Burns

Liver or Splenic
dysfunction

Special Kids



Under 3 months old

Pediatric Assessment

Critical=
QUICK



Not Critical=
Not QUICK

Adapted from the AAP's Pediatric Education for Prehospital Professionals (PEPP) course. www.PEPPsite.com

General Appearance



Tone
Interactiveness
Consolability
Look/gaze
Speech/cry

Are they with it or out of it?

Work Of Breathing



B
e
W
A
R
E

Work

Abnormal Sounds

Retractions

Extreme Nasal Flaring

Are they fighting for air?

Circulation to Skin



T
T
P

Temperature - Skin

Time - Capillary Refill

Pulse

Are they compensating?

History

Recent infections
from

Parents / Caregivers

Siblings / Peers

Recent Hospital Stays

Antibiotic Use

Fever Reducer

Immunization Status



History



Food & Fluid Intake
Food & Fluid Output

History

A firefighter in a blue uniform is standing in a living room, talking to a woman in a black top. The firefighter is holding a clipboard and a pen, and appears to be taking notes. The woman is looking at him. The room has a fireplace, a painting, and a small table with a blue bowl.

Sickle Cell

Cystic Fibrosis

Poor Respiratory Function

Poor Cardiac Reserves

Significant Burns

Liver or Splenic
dysfunction

Indwelling devices

Exam

Respiratory Distress

Grunting

Stridor

Nasal flaring

Retractions

Barking

Exam

Skin

Temperature

Fontanel

Pale / Cyanotic

Cap Refill Time

Rash

Vitals

PAT

BP, Pulse, Resp. out of range

SpO₂ < 94%

etCO₂ < 32

Glucose < 60

Temp > 100.4

Thermometry



- Gold standards are rectal temp for children.
- Oral for older children and adults.
- Axillary temps are not reliable for temp.
- There is no reliable conversion factor for axillary vs rectal temps 0.6°C (1.0°F)
- Tympanic thermometry is technique-dependent
- There is no reliable tympanic conversion.
- Infrared temporal artery (TA) thermometry is only slightly better than tympanic.

Treatment



ABC's

Treatment

A collection of children's medical supplies is arranged on a dark surface. From left to right: a green sippy cup with a clear body and a green lid; a white bottle of acetaminophen oral suspension liquid with a white cap and a label that reads 'dye free children's acetaminophen oral suspension liquid'; a blue water bottle with a blue cap and a blue straw; and a white digital thermometer with a blue display screen. The background is softly blurred, showing other bottles and containers.

Reasons to Treat Fever

Interferes with activities

Patient Comfort

Parent Comfort

Treatment

A close-up photograph of a polar bear's head and front paws in dark water. The bear's fur is wet and matted. Its black nose is visible, and its large, dark claws are extended. The bear appears to be in a state of distress or discomfort, with its paws held near its face.

Trying to drop body temp while pt. is shivering is no good.

Passive Cooling: Exposure

Active Cooling: Water

Treatment

Tylenol or Motrin

Approx 30 minutes

Until they feel better, not until afebrile

Not Aspirin!

Treatment



Fluids

20cc/kg

Glucose

>60

Patient Hand-Off



Patient Hand-Off



Pediatric Fever



The Cute

Pediatric Fever Typically Ain't So Bad

Pediatric Fever



The Bad

Except when it is!

Pediatric Fever

A photograph of a baby lying in a hospital bed. The baby is wearing a white hospital gown and is looking towards the camera with a slightly open mouth. A large white bunny toy is positioned behind the baby's head. The bed has white linens and a yellow headboard. The overall scene is brightly lit, typical of a hospital room.

The Ugly

So we have to know the difference.







Email:

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Resources:

bit.ly/EMSPedFever



Websites:

www.RescueDigest.com

www.RomDuck.com