

FEVER

Bruna Varalli-Claypool, MHS, PA-C, DFAAPA
Professor
University of Oklahoma
Physician Associate Program

- Identify the types of thermometers utilized in the pediatric patient
- Discuss the determinants of temperature
- Outline the types of antipyretics utilized in the pediatric patient
- Discuss the mechanism of action of antipyretics
- Discuss fluid requirements in the febrile patient
- Calculate IV fluid needs in the febrile patient
- Discuss the benefits of a fever
- Calculate pediatric antipyretic dosages
- Discuss adjuvants fever treatments
- Correctly articulate proper components of a septic work up when given a case presentation

Objectives

- Oral
 - 98.6 F +/- 1.0 F
 - 36.7 C +/- 0.5 C
- Rectal will read 1 F or 0.5 C
 - Higher than oral
- Axillary will read 1 F or 0.5 C
 - Lower than oral
- Tympanic
- Forehead
- Both vary too much
 - But frequently used in outpatient setting

Rectal most
accurate

should be used
on all pt's under 3

especially if they
are sick

- Genetically programmed
 - “set point”
- Determined by hypothalamus
- Fever occurs when mediators
 - Act on hypothalamus neurons
 - To raise “set point”
- Body response
 - Increase heat production...chill
 - Decrease heat loss...vasoconstriction
- Prostaglandin hypothesis
 - Mechanism of action of
 - ASA?
 - Ibuprofen?
- What about APAP’s mechanism?

Determinant of Temperature

- Ibuprofen
 - Motrin & Advil
 - Antipyretic
 - Analgesic
 - Anti-inflammatory
 - Mechanism of action
 - Reduce prostaglandin synthesis
- ASA
 - Acetylsalicylic acid
 - aspirin
 - Same as ibuprofen
 - Irreversible inhibit platelet aggregation
- Acetaminophen
 - Tylenol
 - Mechanism beyond comprehension
 - Antipyretic effect
 - Directly on hypothalamus
- Have handout for dosing
 - Samples on next slides

Ibuprofen

ASA

Never...ever
Ever to children
under the age of
18

Acetaminophen

Dosing for Infants and Children

Infants'
TYLENOL

Children's
TYLENOL

From Your Healthcare Professional

DOSE: Every 4 hours as needed. DO NOT GIVE MORE THAN 5 DOSES IN 24 HOURS.

If possible, use weight to dose; otherwise use age.

mL = milliliter
tsp = teaspoon



Infants' TYLENOL® Oral Suspension

Active Ingredient:
Acetaminophen 160 mg
(in each 5 mL)

Available in:
 Grape
 Cherry

Use only as directed.



Children's TYLENOL® Oral Suspension

Active Ingredient:
Acetaminophen 160 mg
(in each 5 mL or 1 tsp)

Available in:
 Grape
 Cherry

Use only as directed.

WEIGHT	AGE	Infants' TYLENOL®	Children's TYLENOL®
6-11 lbs	0-3 mos	1.25 mL	—
12-17 lbs	4-11 mos	2.5 mL	—
18-23 lbs	12-23 mos	3.75 mL	—
24-35 lbs	2-3 yrs	5 mL	5 mL (1 tsp)
36-47 lbs	4-5 yrs	—	7.5 mL (1½ tsp)
48-59 lbs	6-8 yrs	—	10 mL (2 tsp)
60-71 lbs	9-10 yrs	—	12.5 mL (2½ tsp)
72-95 lbs	11 yrs	—	15 mL (3 tsp)

If possible, use weight to dose; otherwise use age. Always ask a healthcare provider which product is right for your child.

mL = milliliter
tsp = teaspoonful

DOSE: Every 6-8 hours as needed. DO NOT GIVE MORE THAN 4 DOSES IN 24 HOURS.



Infants' MOTRIN® Concentrated Drops

Active Ingredient:
Ibuprofen 50 mg (NSAID)*
(in each 1.25 mL)

*Nonsteroidal anti-inflammatory drug.
Use only as directed.

Available in:
dye-free
Berry





Children's MOTRIN® Oral Suspension

Active Ingredient:
Ibuprofen 100 mg (NSAID)*
(in each 5 mL or 1 tsp)

*Nonsteroidal anti-inflammatory drug.
Use only as directed.

Available in:
Original Berry
dye-free
Berry

WEIGHT	AGE		
6-11 lbs	0-5 mos	Do not use	—
12-17 lbs	6-11 mos	1.25 mL	
18-23 lbs	12-23 mos	1.875 mL	
24-35 lbs	2-3 yrs	—	5 mL (1 tsp) 
36-47 lbs	4-5 yrs	—	7.5 mL (1½ tsp) 
48-59 lbs	6-8 yrs	—	10 mL (2 tsp) 
60-71 lbs	9-10 yrs	—	12.5 mL (2½ tsp) 
72-95 lbs	11 yrs	—	15 mL (3 tsp) 

- Greatest in pediatric patient
- Weakest in geriatric patient
- Degree of fever
 - Cautiously applied to severity
 - High fever...not good
 - But...low-grade in serious illness
 - May not be able to mount fever
 - Example...sepsis...newborn
- Fever changes fluid & insulin requirements
 - Every degree increase
 - Basal metabolic rate increases
 - 7% F or 14% C
 - Keep a close eye on FSBS
 - Fluids
 - Increase by 2.5ml/kg for
 - Each degree above 98.6 F
 - Next slide – review calculation
 - 70 kg pt with temp of 101.6

Febrile Response

- 1-10 kg...100cc/kg
- 11-20 kg...50cc/kg
- >20kg...20cc/kg

- 70kg patient
 - 1000 (10 x 100)
 - 500 (10 x 50)
 - 1000 (50 x 20)
- **2500 cc/24 hr = 104.2 cc/h**

- This is just **MAINTENANCE**
- **Add $2.5 \times 3 \times 70 = 525\text{cc}/24\text{hr}$**
 - **21.875 cc/hr**
- **Or ~ 22cc/hr**

- **Our 70kg pt needs**
 - **$104.2 + 21.875 = 126.041/\text{hr}$**
 - **Or $104.2 + 22 = 126.2/\text{hr}$**

IV fluids calculation

- Unknown
 - Presumed beneficial
- Bacteria grow best in narrow range
- Viruses shouldn't care
- Concerned
 - Prolonged rectal > 106 = brain damage
 - > 106 is true medical emergency
 - Rectal > 109 = death
 - Caution when 102

Benefit of Fever

Is there such a
thing?

- ASA
 - Never...ever...ever in pediatric patient
 - Disease concerned about?

- Tylenol
 - Get chart & give copy to parents
 - 15mg/kg q 4 hours
 - Different formulations...caution
 - Infant concentration of 80mg/ml?

- Ibuprofen
 - Get chart & give to parents
 - 10mg/kg q 6 hours

- Alternate q 3-4 hours

- No Tylenol in liver disease
 - How metabolized & excreted?
 - How about ibuprofen?

Treatment of Fever

- Febrile seizure

- Sponge baths
 - Room temperature water

- ***Never...ever...ever ETOH baths***
 - Still have to remind parents of this
 - AND no ASA use
 - Even though “***baby***” aspirin available
 - What’s baby ASA dose?
 - What do we call this now?

- Check dose of Ibuprofen or APAP
 - If temp unresponsive

Treatments &
other things to
remember about
fever

- Mom calls you in clinic and states
 - 2 week old child crying constantly
 - For past six (6) hours
 - Has tried consoling child
 - Mylicon drops made no difference
 - Decreased oral intake
 - Only one 2 ounce bottle in past 6 hours
 - Decreased wet diapers
 - Not changed diaper in past 12 h

- What do you do?

Case presentation

- CBC= complete blood count
- CXR = chest x-ray
- UA = urinalysis
 - Must be cath
 - No pedi bags
 - And must order culture
 - Not “...culture if indicated...”
- 2 sets of blood cultures
 - From 2 separate sites @ the same time
 - Same IV site 15 minutes apart
 - Will not have results until 48-72 hours
- Broad spectrum antibiotic
 - What are they?
 - Name some
- CXR & UA show no source of infxn
 - Lumbar puncture
- Hospital admission

Septic work up

Emergency
Department



Questions?