Approach to Fever in Children

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Educational Objectives

– By the end of this session, audience should be able to:

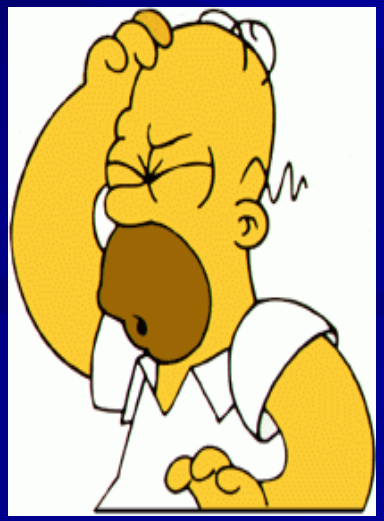
- Know the definition of Fever, FWS, & SBI
- Know the impact of this topic on PEM practice
- Stratified febrile children according to their risk factors
- Know the guidelines for management of children with FWS

Case # 1

- 4 days old baby boy brought by his parents with H/O fever since last night clinically looks well temp 38.5 C rectal
- How would you approach this child ?

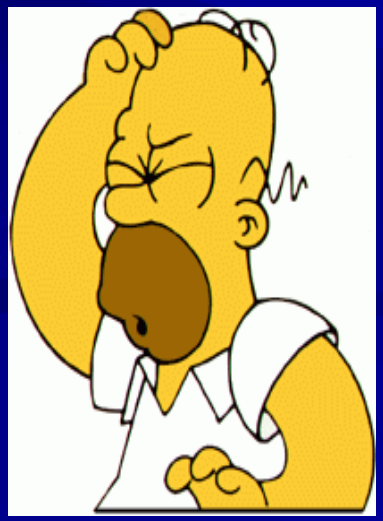
Case # 2

- 3 weeks old baby girl brought by her grandmother complaining of fever for 2 days. Clinically looked well temp 37.5 C rectal
- How would you approach this child ?



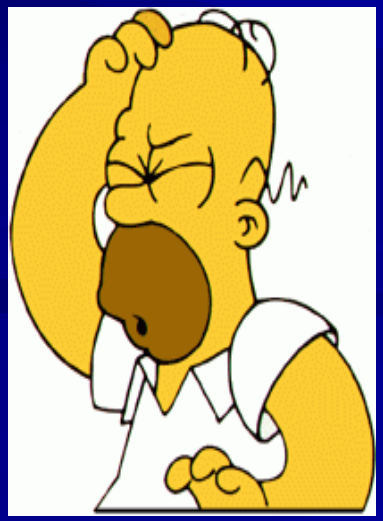
Case # 3

- 6 month old boy brought to ED with H/O fever for 3 days associated with skin rash clinically looked sick lethargic temp 40 C rectal
- How would you approach this child ?



Case # 4

- 2 months old baby girl presented with fever for 3 days. Clinically looked well temp 38.9 C rectal
- How would you approach this child ?



Definitions

- Temperature > 38 C (100.4 F) rectal
- Fever due to an infectious origin in children are rarely above 42 C
- Serious bacterial infection
  - Bacteremia
  - Meningitis
  - Osteomyelitis
  - Septic arthritis
  - UTI
  - Bacterial enteritis
  - Periorbital cellulitis
  - Abscess
  - Cellulitis

What is the normal temperature?

- Rectal 36.6 to 38 ° C
- Ear 35.8 to 38 ° C
- Oral 35.5 to 37.5 ° C
- Axillary 34.7 to 37.3 ° C

Canadian pediatric society statement, Pediatric Child Health 2000

Measurement sites

Child's age	Rectal	Oral	Axillary
Newborn to 3 months	x		
3 months to 3 years	x		x
4 to 5 years	x	x	x
5 years and older		x	x

Definitions *cont'd*

- Fever without a source **(FWS)**
  - No apparent etiology from history and physical examination

Pathophysiology

- Raising of hypothalamic set point in CNS
  - Infection
  - collagen vascular disease
  - malignancies
  - lowered by antipyretic medication and removing heat
- Heat production exceeding heat loss
  - salicylate overdose
  - Hyperthyroidism
  - environmental heat
- Defective heat loss
  - ectodermal dysplasia
  - heat stroke
  - poisoning with certain drugs

Epidemiology

- 65% of children 0-2 years visit a physician for a febrile illness
  - 10 to 20% of all pediatric visits to EDs
  - 20 to 30% of pediatric office visits
- Fever without a source accounts for as many as 50% of these visits
- A self limited illness in the vast majority
- **A small percentage will have a SBI**

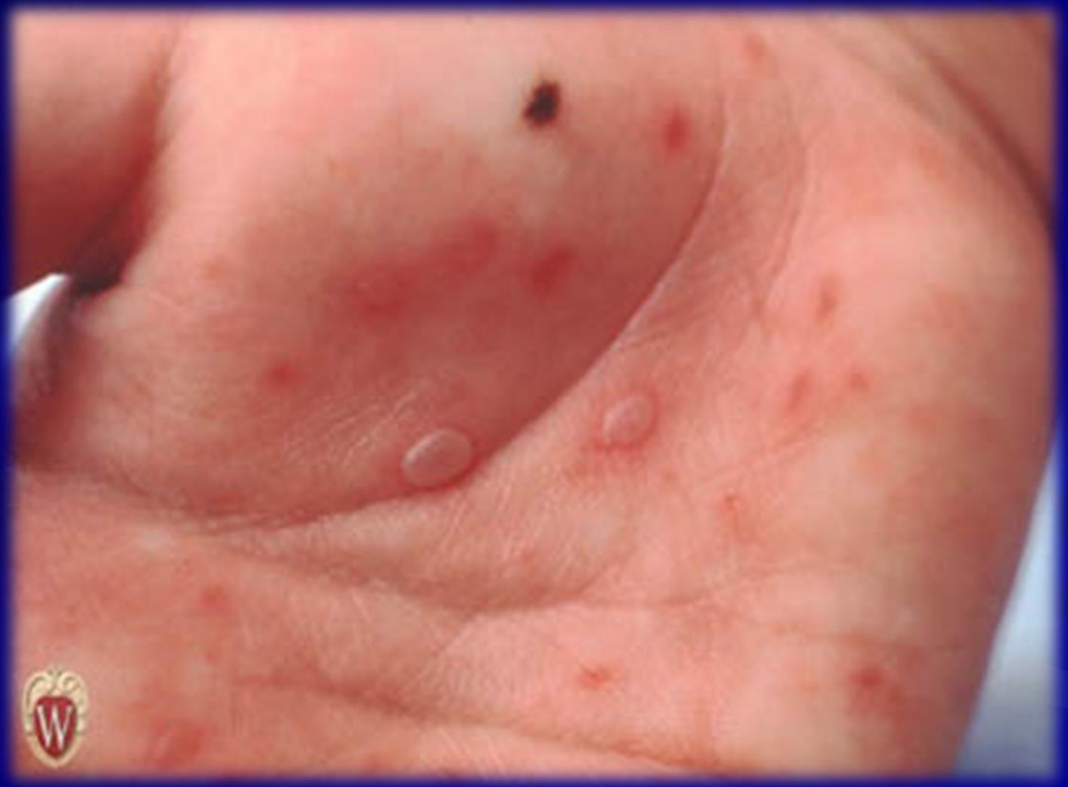
Approach to febrile child ….

- Age dependant
- Documentation of fever
- Detailed History
- Duration of fever
- Associated symptoms

- Look for the focus
  - History
  - Physical exam
  - Investigations
- Management options
  - Age
  - General condition
  - Focus of the fever

Approach to sick young febrile child …

- Acute care area
- ABC
- Quick IV access is important
- Consider all of the following
  - Infection
  - Metabolic
  - Cardiac
  - Abuse
- Abx should be given even before definitive C/S



WHAT IS THE SCIENCE ?

PEDIATRICS/ORIGINAL RESEARCH

Benna K. Bonsu, MB ChB
Marvin B. Harper, MD

Iden

ELSEVIER
SAUNDERS

PEDIATRIC CLINICS
OF NORTH AMERICA

Pediatr Clin N Am 53 (2006) 167–194

Fever Without Source in Children 0 to 36 Months of Age

Paul Ishimine, MD

...o Medical Center,
...A

Management of Infants and Young Children with Fever without Source

Larry J. Baraff, MD

Pediatric Annals, Volume 37, Issue 10, October 2008

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Predictin...
without apparer

Eur J Pediatr (2001) 160: 95–100

ORIGINAL PAPER

Annick Galetto Lacour ·
Pascale Roux Lombard ·

Procalcitonin, I
C-reactive prote
infections in children with fever without localising signs

Clinical Policy for Children Younger Than Three Years Presenting to the Emergency Department With Fever

Policy statements and clinical policies are the official policies of the American College of Emergency Physicians and, as

See editorial, p. 546.

[*Ann Emerg Med.* 2003;42:530-545.]

Fever in Children 0-36 months

Relevant Age Groups

and development

- Age stratification of risk for SBI
- 0……4w
- 0……8w
- 0……12w
- 0……3y
- > 3 years old
- Why?

0- 1 month

Clinical judgment and febrile infant protocols do not work in neonates

Bacteriology /Virology

- *GBS*
- *E.coli*
- *Enterococcus*
- *Staph.aureus*
- *Listeria monocytogenes*
- *HSV*
- *Enterovirus*
- *RSV*

Management

- CBC with diff
- UA and cath culture
- Blood C/S
- CSF
- Chest X ray if symptomatic
- Rx IV Abx & Admission

Treatment options

Ampicillin 200 mg/kg/ day q 6h

Gentamycicn 7.5 mg/kg/day q 8h

(if CSF negative)

OR

Ampicillin 200 mg/kg/ day q 6h

Cefotaxime 200 mg/kg/day q 6h

1 – 3 months

Low risk infants 29- 90 days

- Non-toxic, normal exam
- No focus of infection
- Negative past history
- WBC 5- 15,000/mm
- Band <1500/mm
- Normal UA

Components of Fever Protocols

Avner J, Baker MD: EMCNA 2002; 20:49

	Boston	Philadelphia	Rochester
Age (days)	28-89	29-56	0-60
Temp (^{0}C)	≥ 38.0	≥ 38.0	≥ 38.0
Infant Obs. Score	Yes	Yes	No
Peripheral WBC	< 20,000	< 15,000	5-15,000
CSF obtained	Yes	Yes	No
Antibiotic given	Yes	No	No
SBI in low risk pts (%)	5.4	0	1.1
NPV (%)	94.6	100	98.9
Sensitivity (%)	Not stated	100	92.4

Risks in infants <12 weeks

Problem	Toxic	Non-toxic	Low risk
Bacteremia	11%	2%	1.1% (0.2-2.6)
Meningitis	4 %	1 %	0.5 % (0.0-1.0)
SBI	17%	8.6%	1.4 % (0.4-2.7)

Consensus Panel Guidelines

- Low-Risk Infants 28-90 Days of Age
  - Obtain urine culture and provide close follow-up

    - OR -

  - Full sepsis evaluation (blood, urine, CSF) and treat with IM ceftriaxone
  - All children who receive presumptive therapy should have an LP

Treatment options in low risk group

Option one

- No Abx and return in 24 – 48 hour

Option tow

- Ceftriaxone: 50 mg/kg and repeat examination at 24 h and 48 h

3 - 36 months

- Overall rate of bacteremia if fever> 39 C is 4-7%
- Increases percent as temperature increases
- Most common organism of sepsis is S. pneumoniae
- Treatment of the focus e.g. OM, UTI

Antibiotics options

Age Group	ETIOLOGIC AGENTS	IV ANTIBIOTICS
Neonate< 2 months	E. coli. Group B streptococci Listeria	**Ampicillin** 50 mg/kg/dose q 4-6 hrs +**Cefotaxime** 50 mg/kg/dose q 12 hrs ***or*** **Gentamicin** 2.5 mg/kg/dose q 8 hrs
2 months – 9 years	N. Meningitidis S. Pneumoniae Group A Strep H. Influenzae (rare)	**Cefotaxime** 50 mg/kg/dose q 6 hrs **Ampicillin** 50 mg/kg/dose q 4-6 hrs
> 9 years	N. Meningitidis S. pneumoniae	**Penicillin** G250,00 u/kg/24 hrs q 4 hrs **or Cefotaxime**50 mg/kg/dose q 6 hrs

Note: any third generation cephalosporin can substitute for cefotaxime

Common bugs of OB

- S.pneumoniae
- Salmonella non-thyphoïd
- N.meningitidis

Consensus Panel Guidelines

- Toxic-Appearing Infants and Children
  - Hospitalize, evaluate and treat for presumed sepsis, meningitis, or SBI
  - This holds for all age groups
  - THIS SHOULD BE A NO BRAINER

Consensus Panel Guidelines

- Low-Risk Infants 3-36 Months of Age
  - Urine culture for males < 6 mo & females < 2 yrs
  - Stool culture if blood or mucus or > 5 WBC/hpf
  - Chest x-ray if decreased breath sounds or SOB
  - Blood culture if T > 39.0 ^{0}C and WBC > 15,000
  - Empiric therapy if T > 39.0 ^{0}C and WBC > 15,000
  - No diagnostic tests or antibiotics if T < 39.0 ^{0}C

Thank you…..