Fever Without Source (FWS)

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1. Definition

Fever Without Source (FWS) is:

- **Temperature ≥38.0°C (100.4°F)** with **no identifiable cause after history and physical examination.**
- Applies mainly to **previously healthy infants and young children (2–36 months).**

Important distinction

Term	Definition
Fever without source (FWS)	No source found after examination
Fever of unknown origin (FUO)	Fever >38.3°C for >3 weeks with no diagnosis despite evaluation

2. Clinical Presentation

History

Ask about:

- Duration and maximum temperature
- Appearance (well vs ill-looking)
- Feeding and hydration
- Urine output
- Respiratory symptoms
- Vomiting/diarrhea
- Rash
- Irritability or lethargy
- Vaccination status
- Sick contacts
- Travel
- Previous antibiotics
- Underlying disease or immunodeficiency

Physical Examination

General appearance (most important)

- Toxic appearance
- Poor perfusion
- Altered consciousness
- Respiratory distress
- Signs of dehydration

Examine carefully for hidden infection

- Ears
- Throat
- Skin
- Neck stiffness
- Lungs
- Abdomen
- Joints
- Genital area
- Costovertebral angle tenderness

Red Flags

- Age **<28 days**
- Toxic appearance
- Poor feeding
- Persistent lethargy
- Cyanosis
- Respiratory distress
- Petechiae/purpura
- Neck stiffness
- Bulging fontanelle
- Persistent vomiting
- Seizure
- Capillary refill >3 sec
- Hypotension

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3. Diagnostic Approach

Step 1 – Is the child sick?

Ill-appearing child

Treat as **possible serious bacterial infection (SBI)**

Immediate:

- ABCDE assessment
- IV access
- Blood cultures
- Broad-spectrum antibiotics
- Admit

Well-appearing child

Management depends mainly on:

- Age
- Immunization status
- Risk factors

Age-Based Approach

Neonates (<28 days)

All fever is high risk

Perform full septic work-up:

- CBC
- Blood culture
- CRP ± Procalcitonin
- Urinalysis
- Urine culture
- Lumbar puncture
- Consider CXR

Hospital admission

Empiric IV antibiotics

Infants (29–60 days)

Risk stratification using validated criteria (e.g., AAP 2021 guideline)

Low-risk infants may avoid lumbar puncture or admission depending on:

- Clinical appearance
- Inflammatory markers
- Urinalysis
- Reliable follow-up

Children (2–36 months)

If:

- Well appearing
- Fully vaccinated

Most have viral illness.

Main bacterial infection to exclude:

Urinary tract infection

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4. Differential Diagnosis

Infectious

Viral (most common)

- Viral URI
- Influenza
- COVID-19
- Enterovirus

- Adenovirus
- Roseola

Bacterial

- UTI
- Occult bacteremia
- Pneumonia
- Meningitis
- Osteomyelitis
- Septic arthritis
- Sinusitis
- Deep soft tissue infection

Noninfectious

- Kawasaki disease
- MIS-C
- Juvenile idiopathic arthritis
- Malignancy (leukemia)
- Drug fever
- Autoimmune disease

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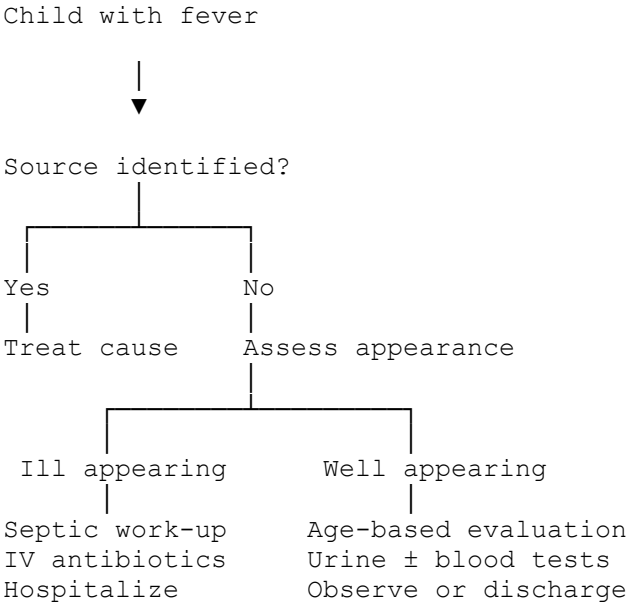
5. Investigations

Investigations depend on **age and appearance**.

Test	Indication
CBC	Ill appearance or infants
CRP/Procalcitonin	Assess SBI risk
Blood culture	Neonates, ill child
Urinalysis	All infants; girls <2 yr; uncircumcised boys <1 yr; circumcised boys <6 months or urinary symptoms
Urine culture	Abnormal UA or infants
Lumbar puncture	Suspected meningitis, neonates, selected infants
Chest X-ray	Respiratory findings or high fever with leukocytosis
Respiratory viral PCR	During viral season if clinically useful
Stool culture	Bloody diarrhea
Electrolytes	Dehydration or severe illness

6. Management Algorithm



7. Drug Summary Table

Medication	Dose	Indication
Paracetamol (Acetaminophen)	**10–15 mg/kg/dose PO every 4–6 hr** (maximum 75 mg/kg/day or 4 g/day)	Fever/discomfort
Ibuprofen (>6 months)	**10 mg/kg/dose PO every 6–8 hr** (maximum 40 mg/kg/day)	Fever/discomfort
Ampicillin	**50 mg/kg IV every 6 hr**	Neonatal sepsis (with gentamicin or cefotaxime when indicated)
Gentamicin	**4–5 mg/kg IV once daily** (adjust for age/renal function)	Neonatal sepsis
Ceftriaxone	**50–75 mg/kg/day IV/IM** (avoid in neonates with hyperbilirubinemia or receiving calcium-containing IV solutions)	Serious bacterial infection (>28 days, when appropriate)
Cefotaxime	**50 mg/kg IV every 6–8 hr**	Neonatal or infant sepsis/meningitis (where available)
Cefalexin	**25–50 mg/kg/day PO divided every 6–8 hr**	Selected outpatient UTI/skin infections
Cefixime	**8 mg/kg/day PO once daily**	Selected outpatient UTI

Remember: Antibiotics are **not indicated** for presumed viral infections.

8. Admission Criteria

Admit if:

- Age <28 days
- Toxic appearance
- Suspected sepsis
- Meningitis suspected
- Significant dehydration
- Poor feeding
- Persistent vomiting
- Respiratory distress
- Hypoxia
- Immunocompromised child
- Unreliable caregivers or follow-up
- Positive blood culture
- IV antibiotics required

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9. Referral Criteria

Urgent pediatric referral for:

- Septic shock
- Meningitis
- Persistent altered consciousness
- Complex febrile seizure
- Suspected Kawasaki disease
- MIS-C
- Osteomyelitis
- Septic arthritis
- Persistent fever >5 days without diagnosis
- Recurrent unexplained fever

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10. Follow-Up

Outpatient follow-up if:

- Well appearing
- Low risk
- Good oral intake
- Reliable caregivers

Parents should return immediately if:

- Fever persists >48–72 hours
- Child becomes lethargic
- Breathing worsens
- Rash develops
- Poor feeding
- Decreased urine output
- Persistent vomiting
- New focal symptoms

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11. Clinical Pearls

- **General appearance is more important than the temperature itself.**
- **UTI is the most common serious bacterial infection in well-appearing young children with FWS.**
- Neonates with fever require urgent evaluation even if they look well.
- Vaccination has markedly reduced occult bacteremia due to *Streptococcus pneumoniae* and *Haemophilus influenzae* type b.
- A normal examination does **not** exclude early meningitis.
- Procalcitonin is generally more accurate than WBC count alone for identifying serious bacterial infection.
- Avoid routine antibiotic use in well-appearing children without evidence of bacterial infection.

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12. Common Mistakes in Exams and Practice

❌ Missing a UTI by not obtaining a urine sample.

❌ Assuming high fever always means bacterial infection.

❌ Discharging febrile neonates without evaluation.

❌ Giving antibiotics before obtaining indicated cultures.

❌ Missing early meningitis because neck stiffness is absent.

❌ Ignoring vaccination status.

❌ Treating the thermometer instead of the child—clinical appearance is paramount.

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13. Key Take-Home Messages

1. Fever without source is a **clinical syndrome**, not a diagnosis.
2. **Age and appearance** are the two most important determinants of management.
3. **All febrile neonates (<28 days)** require prompt evaluation for serious bacterial infection and hospital admission.
4. In well-appearing children aged **2–36 months**, **UTI is the most common occult bacterial infection** and should be actively excluded when indicated.
5. Fully immunized, well-appearing children usually have **viral illnesses** and often need only observation and supportive care.
6. Obtain appropriate cultures **before** starting antibiotics when feasible.
7. Reserve empiric antibiotics for children at increased risk of serious bacterial infection or those who are clinically ill.
8. Provide caregivers with clear return precautions and arrange reliable follow-up for children managed as outpatients.
9. Recognize **red flags** (toxic appearance, petechiae, altered mental status, respiratory distress, poor perfusion, seizures) that require immediate escalation.
10. Always treat the **child, not the fever**.

High-Yield Examination Points

Question	Answer
Most common SBI in FWS	**Urinary tract infection**
Highest-risk age group	**<28 days**
Most important predictor	**Overall clinical appearance**
First investigation in a well-appearing infant	**Urinalysis ± urine culture (age/risk dependent)**
Most common overall cause of FWS	**Viral infection**
Immediate management of an ill-appearing child	**ABCDE, cultures, empiric IV antibiotics, admission**