Clinical Pathway

Fever/Suspected Sepsis (documented Temp >38.2 R in infants 30-90 days)*

Updated: December 2011

Outcomes/Goals	1. Identification and treatment of infants 30-90 days with presenting complaint of documented fever >38 R 2. Create a team-oriented approach to efficient and timely evaluation and work-up. **3. Antibiotic administration within 60 minutes for acutely ill/toxic appearing infants**
NURSE documentation	Chief complaint. Onset of fever. Documented route of measuring temperature. Associated symptoms. Birth and medical history, immunization history, medications, allergies, vital signs, weight.
INTERVENTIONS Initiate on arrival	ESI Triage level II Full set of vitals including rectal temperature and weight Evaluate for use of infant warming table Oxygen to maintain SaO2 > 93% LMX to LP site LP tray to bedside IV placement for all ill appearing/toxic presentations. Consider IO per policy guidelines
DIAGNOSTICS	Bedside CBG for ill appearing/hypoglycemic symptoms/vomiting/decreased po intake Catheter specimen UA Micro and Mandatory Culture CBC with differential BMP / CMS – draw and hold. Send if indicated/physician order Blood culture CSF (gram stain, cell ct, protein, glucose, culture, hold extra fluid)–physician discretion Chest x-ray if applicable (tachypnea, hypoxia, WBC >20) Stool sample if indicated for c/o diarrhea
PHYSICIAN (LIP)	
Fluids (if indicated)	Normal Saline bolus 20 ml/kg
Medication Hypoglycemia	D10 4-5ml/kg for CBG <50
Antipyretics	Acetaminophen 12.5 mg/kg PO Acetaminophen 15-30 mg/kg PR
Antibiotics*	**Acutely Ill/Toxic appearing infant/Positive Workup** Cefotaxime 50 mg/kg/dose IV q6-8 hours **OR** If suspected meningitis or unclear CSF results (bloody or cloudy) Cefotaxime 100mg/kg/dose q8 hours + Vancomycin 10-15 mg/kg/dose q 6 hours **Febrile Infant with Negative Workup/Low Risk Criteria** Ceftriaxone 50 mg/kg IM/IV at the discretion of the treating physician. Follow-up in 24 hours for re-eval with primary MD or ED. *****If administering antibiotics – must have LP prior to discharge home*****
ADMISSION*	Call primary care physician Call peds ward attending Prepare family/infant for admission to ward or PICU as appropriate
*Antibiotic and Admission considerations and criteria	Incidence of neonatal fever with SBI occurs in as many as 3-15% of infants less than three months of age, despite a negative clinical examination (Baker 1993, Baskin 1992) Identified SBI by diagnosis include: Urinary tract infection 24%, Bacteremia 19%, Gastroenteritis 13%, Meningitis 9%, Cellulitis 6%, and Adenitis (unidentified) 1% (Baker 1993) **Admission Criteria / High Risk Factors** (Modified Philadelphia Criteria) ◦ Acutely ill/toxic appearance ◦ WBC >15 or <5 ◦ CSF >8 ◦ Urinalysis leukocytes >10 ◦ Positive focal finding (chest x-ray, cellulitis) **Discharge Criteria/Low Risk Factors** (Modified Philadelphia Criteria) ◦ BNR <0.2 ◦ Negative workup ◦ Available by phone/reliable care provider ◦ Agree to return to ED or follow up with primary MD within 24 hours

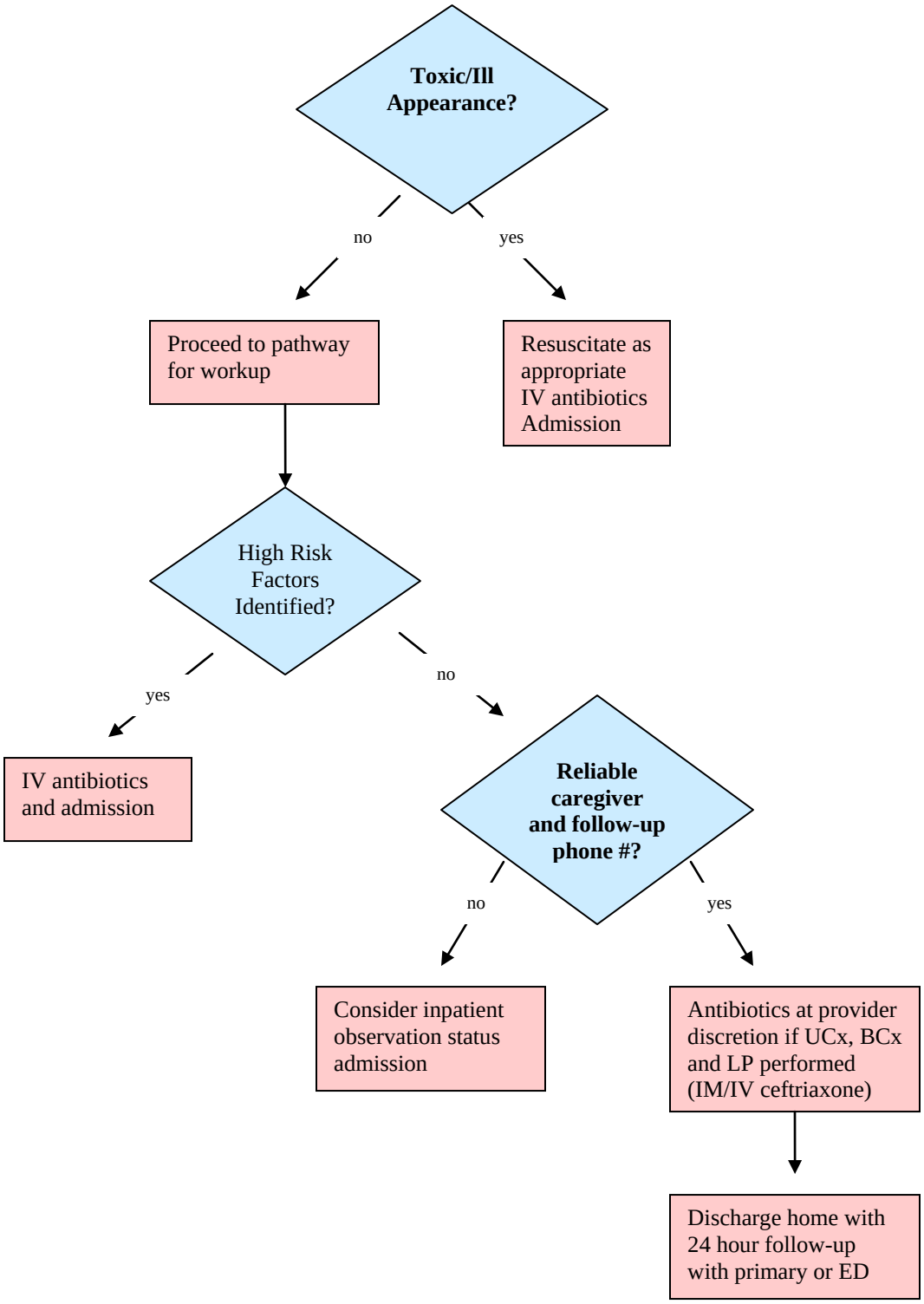
Clinical Pathway Decision Making Process

Fever/Suspected Sepsis

Temp >38 R in infants 30-90 days)*

(* Rectal temperature by parent, clinic or ED)

Updated: December 2011



Neonatal Fever / Suspected Sepsis Rationale and Data

Goals of Clinical Pathway

1. Rapid identification and treatment of infants 30-90 days with presenting complaint of documented fever >38R
2. Create a team-oriented approach to efficient and timely evaluation and work-up.
3. Antibiotic administration within 60 minutes for acutely ill/toxic appearing infants

Data Considerations	Interventions	Rationale
Fever	Documented rectal temperature	Defined as rectal temperature >38°C (100.4F). Hooker 1993 demonstrated low correlation between tympanic temperature and rectal temperature. Correlation is worse when fever is present. *Note: Parental report of tactile fever is likely to be accurate. Range of reported sensitivity 82-89%, specificity 76-86% (Graneto 1996, Hooker 1996, Singhi 1990)*
Urine collection	Catheter specimen collection	Bladder catherization or suprapubic bladder aspiration is the methods of choice for obtaining urine samples. (AAPQI 1999) *Note: Bag collection sample has an increased risk of contamination, false-positive rate ranging from 12-83%.*
Urine Analyisis	Mandatory urine culture	Urine culture should be obtained in conjunction with dipstick and microscopy. Pyuria is not a sensitive marker in infants. Crain 1990 reported 52% of febrile infants (<8 weeks) with UTI had a normal urine analysis. Landau 1998 reported absence of pyuria in 28% of the infants with UTI.
WBC	Lumbar puncture	Decision to perform or withhold LP should not be based on total peripheral WBC. (Bosnu 2003) Total peripheral WBC is an inaccurate screen for bacteremia in febrile young infants. Cut-off of 5,000 has sensitivity of 79%, specificity of 5%. Cut-off of 15,000, sensitivity is 45%, specificity 78%.. (Boxnu 2003)

Serious Bacterial Infection (SBI) in infants less than 30 days

Fever in this age group should be presumed to have a SBI (ACEP Clinical Policy, 2003)

Numerous studies have assessed the applicability of Rochester, Philadelphia, and Boston criteria to this age group. All found an increase in rate of SBI in this age group.

- Ferrera 1997 found that 6.3% of infants identified as low risk by the Rochester criteria in this age group have SBI
- Baker 1999 reported a SBI prevalence of 12.6% in this age group. In addition, 43% of infants identified as low risk by the Philadelphia criteria (studied in infants 2-3 months) in this age group have SBI
- Kadish 2000 reported a 12% SBI prevalence in this age group. 3% would have been sent home with a SBI based on the Boston and Philadelphia criteria

Serious Bacterial Infection (SBI) in infants 0-60 days

Low Risk "Rochester Criteria" (Jaskiewicz et al 1994)

1. Well appearing
2. Previously Healthy
   - Born at term ≥ 37 weeks
   - Did not receive perinatal antimicrobial
   - Was not treated for unexplained hyperbilirubinemia
   - Has not received and was not receiving antimicrobial agents
   - Had not been previously hospitalized
   - Had no chronic or underlying illness
   - Was not hospitalized longer than the mother
3. No Evidence of skin, soft tissue, bone, joint, or ear infection.
4. Labs:
   - WBC 5,000-15,000
   - Absolute band count ≤ 1,500
   - ≤ 10WBC on UA microscopy
   - ≤ 5 WBC on stool smear microscopy (only for infants with diarrhea)

Bacterial Pathogen Consideration

Most common pathogens isolated (Baker 1999)

- Escherichia coli (39%)
- Klebsiella (11%)
- Group B streptococcus (6%)
- Enterobacter cloacae (6%)
- Listeria monocytogenes (6%)

Note: NNT for Ampicillin for prevention of an enterococcal or listeria infection is 138 (Brown 2002)

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