Febrile Infants at Low Risk for Serious Bacterial Infection—An Appraisal of the Rochester Criteria and Implications for Management

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ABSTRACT. Objective. Prospective studies were conducted to test the hypothesis that infants unlikely to have serious bacterial infections (SBI) can be accurately identified by low risk criteria.

Methods. Febrile infants (rectal T ≥ 38°C ≥60 days of age) were considered at low risk for SBI if they met the following criteria: 1) appear well; 2) were previously healthy; 3) have no focal infection; 4) have WBC count 5.0–15.0 × 10⁹ cells/L (5000–15,000/mm³); 5) ≤10 WBC per high power field on microscopic examination of urine sediment, and ≤5 WBC per high power field on microscopic examination of stool smear (if diarrheal). The recommended evaluation included the culture of specimens of blood, cerebrospinal fluid, and urine for bacteria. Outcomes were determined. The negative predictive values of the low risk criteria for SBI and bacteremia were calculated.

Results. Of 1057 eligible infants, 931 were well appearing, and of these, 437 met the remaining low risk criteria. Five low risk infants had SBI including two infants with bacteremia.

The negative predictive value of the low risk criteria was 98.9% (95% confidence interval, 97.2% to 99.6%) for SBI, and 99.5% (95% confidence interval, 98.2% to 99.9%) for bacteremia.

Conclusions. These data confirm the ability of the low risk criteria to identify infants unlikely to have SBI. Infants who meet the low risk criteria can be carefully observed without administering antimicrobial agents. Pediatrics 1994;94:390–396; febrile infants, bacteremia, low risk criteria, serious bacterial infection.

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These data were presented in part before the Society for Pediatric Research in Washington, DC, in May, 1989 (McCarthy et al) and the Ambulatory Pediatric Association in Baltimore, Maryland in May, 1992 (Jaskiewicz et al).

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ABBREVIATIONS. SBI, serious bacterial infection; CSF, cerebrospinal fluid; UTI, urinary tract infection.

Strategies to identify infants less than 2 to 3 months of age with serious bacterial infection (SBI) lack sufficient sensitivity to be clinically useful. Therefore, the conservative management of febrile infants ≥60 days of age includes a complete evaluation for sepsis (blood, urine, and cerebrospinal fluid specimens for culture), hospitalization, and parenteral antimicrobial therapy for a minimum of 48 hours. Despite such recommendations, practice varies widely. Our group has attempted to use low risk criteria to determine whether infants unlikely to have SBI can be identified with sufficient accuracy to consider less aggressive management for these infants.

The low risk criteria evolved from studies designed to test the hypothesis that well appearing febrile infants who meet defined history, physical examination, and laboratory criteria are unlikely to have SBI. These low risk criteria are known as the Rochester criteria for the evaluation of febrile infants (rectal T ≥ 38°C ≤60 days of age) (Table 1).

The purpose of the present analysis was twofold. First, we determined the ability of the Rochester criteria to identify infants unlikely to have SBI and, particularly, bacteremia, based on the negative predictive value of the criteria when applied to a large number of prospectively evaluated febrile infants. Second, we used these data to determine if refinements of the Rochester criteria should be studied further.

METHODS

The present analysis includes data collected during three prospective studies (Table 2). For each study, only infants ≥60 days of age who had a documented rectal temperature ≥38°C at home or at the time of medical evaluation were eligible for inclusion in the study. Written informed consent was obtained for all infants enrolled in a study in which an intervention (eg, antimicrobial therapy) was tested, and these studies were approved by all appropriate human investigation committees.

Patient Populations (Table 2)

Study 1

From July 1, 1987 to June 30, 1992 consecutive febrile infants seen in the Emergency Department or Pediatric Clinic at Strong Memorial Hospital in Rochester, NY were prospectively evaluated. Eighty-six infants participated in a previously published intervention study and are included in the present analysis.
Infiltrate on chest roentgenogram in association with a bacterial pathogen isolated from the blood or the presence of capsular polysaccharide in the urine detected by counterimmunoelectro- phoresis. All evaluations were performed and data recorded by the house officer and/or supervising attending physician in the emergency department or pediatric clinic where the infant was seen. An investigator verified age, temperature, and completeness of data collection for each infant by chart review. All infants in each study for whom complete data were available were classified as low risk or not low risk by the Rochester criteria in Table 1 (excluding stool smear examination for infants in Study 2, Table 2). Since well appearing infants who do not meet at least one of the low risk criteria are excluded from the low risk group, such infants were included in the analysis in the not low risk group. Evaluation of all classifying data were not available. Treatment decisions were made on an individual basis by the evaluating physician, except when the infant was enrolled in a protocol mandating treatment versus no treatment (Study 1\textsuperscript{2} and Study 3 (Table 2)).

**Statistical Methods**

Chi square analysis was used for comparisons of sex, age, and race between low risk and not low risk infants and for comparisons of the proportion of SBI among low risk infants from the three studies (Table 2) was not statistically significant; therefore data from low risk infants in each study were combined. Since only low risk infants were included in Study 3, these data were not used to calculate the negative predictive value of the low risk criteria. The differences in the proportion of SBI among low risk infants and among not low risk infants between Studies 1 and 2 were not statistically significant. Therefore, data from Studies 1 and 2 were combined for complete analysis and calculation of the negative predictive value of the criteria. The operating characteristics of the low risk criteria and the criteria components were calculated by the following: sensitivity, the rate of a positive test in infants with disease; specificity, the rate of a negative test in infants without disease; and negative predictive value, the rate of no disease in infants who test negative. The 95\% confidence intervals of each test’s operating characteristics were calculated using the method of Fleiss.\textsuperscript{20}

**RESULTS**

From 1984 to 1992, 1057 febrile infants \( \leq 60 \) days of age were identified as eligible for analysis (Studies 1 and 2 (Table 2) and Fig 1). Infants with insufficient data to determine risk (N = 54) and ill appearing infants (N = 72) were excluded from further analysis. Of 931 evaluable, well appearing infants, 437 met all low risk criteria and 494 did not (Fig 1). An additional 74 low risk infants (Study 3 (Table 2)) identified by the Rochester criteria were included in discussion of the low risk group only, bringing the total number of low risk infants to 511 (Fig 1). Table 3 shows the distribution of the low risk and not low risk infants by age. There were no differences in sex, race, or age between low risk and not low risk infants. SBI was documented in 66 (7.1\%) of 931 study infants and bacteremia in 13 (1.4\%). The distribution of SBI and bacteremia by age and risk group is shown in Fig 2.

Specimens cultured for bacterial pathogens and isolation rates from the study infants are shown in Table 4. Sixty-six infants had SBI. No bacterial pathogens were isolated from seven infants with skin or soft tissue infections and from one infant with pneumonia. The same pathogen was isolated from blood and urine in three infants and from urine and soft tissue in one infant.
TABLE 2. Studies Included in Present Analysis

<table>
<thead>
<tr>
<th>Study</th>
<th>Years</th>
<th>Total</th>
<th>Low Risk (SBI/Bacteremia)</th>
<th>Not Low Risk</th>
<th>Ill Appearing</th>
<th>Insufficient Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 McCarthy CA and Jaskiewicz JA, et al†</td>
<td>1987 through 1992</td>
<td>978</td>
<td>381 (5/2)</td>
<td>472</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>2 Dagan R</td>
<td>1984</td>
<td>79</td>
<td>56 (0/0)</td>
<td>22</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total 1</strong></td>
<td></td>
<td><strong>1057</strong></td>
<td><strong>437 (5/2)</strong></td>
<td><strong>494</strong></td>
<td><strong>126</strong></td>
<td></td>
</tr>
<tr>
<td>3 Febrile Infant Collaborative Study Group</td>
<td>1985 through 1988</td>
<td>74</td>
<td>74 (0/0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total 2</strong></td>
<td></td>
<td><strong>511</strong></td>
<td><strong>511 (5/2)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not included in analysis.
† Reference 19.

![Diagram](image)

Fig 1. Algorithm to identify low risk febrile infants. *Difference from low risk group: P < 0.05. **Febrile Infant Collaborative Study Group.

**Low Risk Infants**

SBI occurred in five (1.0%) of 511 low risk infants. Three infants, age 25, 41, and 54 days, had UTI caused by Group B streptococcus, *E. coli*, and *E. coli*, respectively. None of the three infants were initially treated with antimicrobial agents, but all were treated as soon as cultures became positive and all did well. One 34-day-old infant was hospitalized for observation and did not receive empiric antimicrobial therapy. When *Yersinia enterocolitica* was isolated from a blood specimen on the second hospital day, antimicrobial therapy was begun and the infant did well. A repeat blood specimen for culture was not obtained before antimicrobial therapy was begun.

One 29-day-old infant, enrolled in a study of outpatient management of selected low risk infants, was treated with intramuscular ceftriaxone at the time of evaluation. At the 24-hour follow-up, the infant was afebrile and appeared well, but the blood culture was positive for *Neisseria meningitidis*. The infant was hospitalized and received a total of 7 days of once daily intramuscular ceftriaxone and did well. At the time of hospitalization two doses of ceftriaxone had already been given, therefore a repeat blood culture was not obtained.

Of 511 low risk infants, 308 (60.3%) were initially treated with antimicrobial agents and 203 (39.7%) were not. Eighty-six low risk infants were enrolled in a study of outpatient management of febrile infants and all received intramuscular ceftriaxone (Study 1 (Table 2)). Seventy-four low risk infants were randomized to receive either parenteral antimicrobial agents following hospitalization (N = 41) or hospitalization and observation alone (N = 33) (Study 3 (Table 2)). The remaining low risk infants were given antimicrobial therapy at the discretion of the evaluating physician.

**Negative Predictive Value of the Rochester Criteria**

Five of 437 low risk infants in Studies 1 and 2 (Table 2) had SBI and two had bacteremia. The statistical analysis did not include the 74 infants from Study 3 (Table 2). Based on these data, the negative predictive value of the Rochester criteria is 98.9% with a 95% confidence interval of 97.2% to 99.6% for any SBI, and 99.5% with a 95% confidence interval of 98.2% to 99.9% for bacteremia.

**Not Low Risk Infants**

SBI occurred in 61 (12.3%) of 494 infants who did not meet the low risk criteria, including UTI (31 infants), skin or soft tissue infection (18), bacteremia (11), gastroenteritis (4), and pneumonia (3), lobar infiltrate and urine positive for *S. pneumoniae* antigen.
by counterimmunoelectrophoresis. Three infants with UTI also had bacteremia, and one infant with UTI had mastitis. (Complete data are available from K.R.P. upon request.)

Evaluation of the Components of the Rochester Criteria

**Global Assessment**

Infants who were not well appearing were managed expectantly and not included for data analysis. Of 72 ill appearing infants who had outcomes ascertained, the 16 SBIs included eight UTI, three meningitis, two bacteremia, two mastitis, and one gastroenteritis.

**Medical History**

Of the 494 infants excluded from the low risk group, 181 (36.6%) were not previously healthy by history. Forty-four (7.7%) of these infants had SBI, including five (2.8%) infants with bacteremia. A history of not being previously healthy was the only reason for excluding 92 infants from the low risk group. One infant with only a history of phototherapy for unexplained hyperbilirubinemia had Group B streptococcus bacteremia. One infant with a history of both prior hospitalization and prior antimicrobial therapy had *E. coli* UTI. Twenty-one infants excluded from the low risk group by history did not have urinaries performed. Of these infants, one who had only a history of prematurity had *Salmonella* bacteremia. Only two infants had a history of chronic illness and neither had SBI. No infant excluded solely because of perinatal antimicrobial therapy (N = 7), hospitalization longer than the mother (N = 1), or both (N = 16) had SBI.

**Physical Examination**

Skin, soft tissue, or ear infection was observed in 97 (20.0%) of the 494 infants excluded from the low risk group. Seventy-nine infants had otitis media, and in 36 otitis media was the only reason for exclusion from the low risk group. None of the 79 infants with otitis media had bacteremia or meningitis. Four infants with otitis media had *E. coli* UTI. One of these infants was also excluded from the low risk group by history, and three had abnormal laboratory assessments.

Eighteen infants had skin or soft tissue infection, including cellulitis (9), omphalitis (3), mastitis (2), abscess (3), and paronychia (1). Specimens from these sites were obtained from 11 infants and all yielded pathogens. Isolates included *Staphylococcus aureus* (6), *E. coli* (3), Group B streptococcus (1), and *Neisseria* sp. (1). Seven infants with skin or soft tissue infection were excluded from the low risk group on that basis alone. No infant with skin or soft tissue infection had bacteremia or meningitis. No study infant had a bone or joint infection.

**Laboratory Assessment**

Of the 494 infants excluded from the low risk group, 325 (65.8%) had at least one abnormal laboratory test. One or more abnormal laboratory test was the only reason for excluding 226 infants from the low risk group. Specificity, sensitivity, and negative predictive value for each test was calculated. No individual test or combination of tests had a sensitivity of $\geq 75\%$. The band form count was $1.5 \times 10^5$ cells/L ($\leq 1500$ cells/mm$^3$), and the urine WBC count was $\leq 10$ for most infants without SBI, having specificities of 96% and 98%, respectively.

**Urinalysis**

Urinaries were obtained from 907 (90.2%) of 1005 infants. Urine specimens from 42 (4.6%) of 909 infants had $> 10$ white blood cells per high power field on microscopic examination of spun sediment. Twenty infants with $> 10$ WBC on urinalysis had UTI (17 *E. coli*, 1 Group B streptococcus, and 2 *Enterobacter cloacae*), 2 had *E. coli* UTI and bacteremia, and 1 had *S. aureus* bacteremia. Results of urinaries were recorded in 32 of 34 infants with UTI. Of these, 11 specimens had $\leq 10$ WBC per high power field. Eight of these infants were excluded from the low risk group by other criteria, and three met all low risk criteria.

Urinaries were not recorded for 98 infants excluded from the low risk group by one or more of the other criteria. Eleven of these infants had SBI; three of them were bacteremic.

**Stool Smear**

Four infants with diarrhea had $> 5$ WBC per high power field on microscopic examination of a stool.

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**TABLE 4.** Isolation Rates of Bacterial Pathogens in 931 Study Infants

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Patients Number</th>
<th>Bacterial Pathogen Number</th>
<th>Bacterial Contaminant Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>922 (99.0%)</td>
<td>13 (1.4%)</td>
<td>48 (5.2%)</td>
</tr>
<tr>
<td>CSF*</td>
<td>902 (97.0%)</td>
<td>0 (0.0%)</td>
<td>47 (5.2%)</td>
</tr>
<tr>
<td>Urine</td>
<td>694 (74.5%)</td>
<td>34 (4.9%)</td>
<td>108 (15.6%)</td>
</tr>
<tr>
<td>Stool</td>
<td>63 (6.8%)</td>
<td>4 (6.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>131 (14.1%)</td>
<td>11 (6.4%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

* CSF, cerebrospinal fluid.
smear. Cultures of stool specimens from two of these infants revealed no pathogens, no stool specimen was sent for culture from the third infant, and both Salmonella sp. and Yersinia enterocolitica were isolated from a stool specimen from the fourth infant. Salmonella enteritidis was isolated from stool specimens from three additional infants. Stool smear results were not recorded for two infants, and one had a normal stool smear. All four infants with bacterial gastroenteritis had either an abnormal peripheral blood WBC count, band form count, or both.

**DISCUSSION**

A recent meta-analysis of studies of febrile infants ≤60 days of age showed that infants meeting the Rochester criteria had a lower probability of having SBI than if other strategies were employed. The present study prospectively evaluated a large number of febrile infants to further test the ability of the Rochester criteria to accurately identify infants unlikely to have SBI. The negative predictive value of the Rochester criteria was chosen as the most appropriate test to identify infants unlikely to have SBI. The 95% confidence interval for the negative predictive value of the Rochester criteria for SBI (97.2% to 99.6%) and for bacteremia (98.2% to 99.9%) confirm the ability of the Rochester criteria to identify febrile infants unlikely to have SBI.

Because the Rochester criteria were designed to identify infants unlikely to have SBI, only well appearing infants were included in the present study. By excluding ill appearing infants from the study population, the prevalence of SBI in our study is lower than that observed in previous studies (7% vs 9%). While the negative predictive value of the Rochester criteria may be lower when the criteria are applied to a population including ill appearing infants (higher prevalence of SBI in this group), it is most appropriate to apply the Rochester criteria only to well appearing febrile infants. Although not stated as a criterion in early studies, ill appearing infants have always been excluded when evaluating the low risk criteria. Most investigators agree that ill appearing infants have a higher likelihood of SBI than well appearing infants, and there is little controversy regarding their management. The consensus is that such infants should be hospitalized and treated with antimicrobial therapy regardless of the remainder of their evaluation.

The present study shows that among well appearing infants the Rochester criteria work well. We believe the narrow confidence interval around the negative predictive value of the Rochester criteria supports the clinical use of these criteria.

**Management of Infants Who Meet the Rochester Criteria**

Our data strongly suggest that infants who meet the Rochester criteria can be carefully observed without parenteral antimicrobial agents. Over one-third of the low risk infants in the present study were not initially treated with antimicrobial therapy, and all did well. Four of five low risk infants with SBI did not receive antimicrobial therapy until cultures became positive. With careful observation and follow-up, appropriate therapy was initiated when SBI was diagnosed and no infant experienced untoward effects. One low risk infant with N. meningitidis bacteremia initially received antimicrobial therapy, and the outcome of this particular infant without antimicrobial therapy remains unknown. It has been shown, however, that in some cases bacteremia with this organism has resolved without antimicrobial therapy. Other investigations support observation for low risk infants. In a study by Wasserman et al., five infants less than 3 months of age were hospitalized and observed without antimicrobial therapy until cultures of blood (1), urine (3), and stool (1) were reported positive for bacterial pathogens. Outcomes “did not appear to be altered by the delay in diagnosis and treatment”. A recent study by Baker et al. also demonstrated that selected febrile infants 29 to 56 days of age may be managed without antimicrobial therapy.

An alternative strategy for the management of the low risk febrile infant is to administer a single dose of intramuscular ceftriaxone following a complete laboratory evaluation for suspected sepsis (cultures of specimens of blood, CSF, and urine (obtained by bladder tap or catheterization)) and to provide as careful outpatient follow-up as possible. This approach was studied in infants ≤60 days of age by McCarthy et al. with no bad outcomes. Baskin et al. also managed selected febrile infants between 28 and 89 days of age as outpatients following a single dose of intramuscular ceftriaxone. All of the infants with SBI subsequently received appropriate antimicrobial therapy and except for a 7-day delay in the diagnosis of osteomyelitis in one patient, all were well at follow-up. Outpatient management of selected febrile infants with a single dose of intramuscular ceftriaxone was found to be cost effective as analyzed by Lieu et al. This strategy mandates that a lumbar puncture be done and blood, CSF, and urine specimens be obtained for culture.

It is important to recognize that the administration of parenteral antimicrobial agents to a febrile infant is not a substitute for careful observation. The decision to observe a low risk febrile infant at home with or without administering a parenteral antimicrobial agent should be made only after careful assessment of the caregiver and guaranteeing the availability of a responsible physician. The caregiver must appreciate that the infant's condition may change and should be told what to watch for and when to call. Parents of infants managed as outpatients can be given written instructions to assess the infant at least every 4 hours and to call the physician for any concerns or for any changes, such as onset or change in skin rash, cyanosis or mottling, poor feeding or vomiting, difficulty consoiling or arousing, jerking movements or eye rolling, or bulging fontanelle. Caregivers should have a telephone, have the telephone number of the responsible physician, and if the infant's condition changes, be able to meet the physician within 30 minutes. Obviously, such rigid standards cannot be met in many urban Emergency
Department settings, and hospitalization may be necessary.

**Recommendation**

Based on data from this study and other reports, we make the following recommendation:

- Febrile infants ≤60 days of age who meet the Rochester criteria may be managed by observation without antimicrobial therapy or alternatively may receive intramuscular ceftriaxone as a single dose. Blood and urine specimens for bacterial culture should be obtained on all infants, and, if antimicrobial therapy is chosen, a lumbar puncture should be performed and cerebrospinal fluid cultured for bacterial pathogens prior to the administration of the antimicrobial agent. These management options may be exercised in either the inpatient or outpatient setting. Infants who are managed as outpatients require close observation by competent caregivers at home and availability of a responsible physician for follow-up. Infants who meet the Rochester criteria but who cannot be adequately observed at home should be hospitalized though not necessarily treated. In our study, low risk infants randomized to be observed in hospital without receiving antimicrobial agents were discharged from the hospital an average of one day earlier than low risk infants who were hospitalized and treated (Febrile Infant Collaborative Study Group).

**Reappraisal of the Rochester Criteria**

While the Rochester criteria identify febrile infants who are unlikely to have SBI, 88% of the infants studied who did not meet the low risk criteria also did not have SBI. Evaluation of the individual components of the low risk criteria suggest that the criteria could be modified to include additional infants in the low risk group without missing SBI. Three components of the criteria warrant further discussion and evaluation:

**Medical History**

Seven history items were used to define previously healthy infants (Table 1). In our study, no infant who had received perinatal antimicrobial therapy, had been hospitalized longer than the mother, or both, but was otherwise low risk had SBI. Neither of the two infants with chronic illness had SBI. Each of the other history items identified infants with SBI who would otherwise have been classified as low risk. Though the numbers are small in this study, the data suggest that perinatal antimicrobial therapy and hospitalization longer than mother could be omitted as medical history components of the low risk criteria.

**Physical Examination**

Skin, soft tissue, skeletal, and ear infections in young infants have been associated with SBI. Dagan et al reported that none of 13 infants excluded from the low risk group only because of otitis media had systemic infections. In a second study, Dagan and colleagues performed tympanocenteses on 40 febrile infants ≤60 days of age. Ten of 11 infants with nonpurulent middle ear fluid met all low risk criteria and did well without antimicrobial therapy. In the present study no infant excluded from the low risk group only because of otitis media had a systemic infection. In a recent study, 60 of 827 well appearing febrile infants ≤2 months of age had no evidence of bacterial infection except otitis media and only 1 had SBI (UTI). These results support the findings of the present study and suggest that infants who are excluded from the low risk group only because of otitis media are at low risk for systemic bacterial disease. Outpatient management with oral antimicrobial therapy for infants with otitis media who meet all other low risk criteria merits further study.

Skin, soft tissue, and skeletal infections were used to exclude infants from the low risk group, but, because of the potential for bacteremic disease, were also used in the definition of SBI. Infants with skin and soft tissue infections are similar to infants who appear ill, because antimicrobial therapy is clearly indicated. Such infants should be completely evaluated for possible sepsis, but it may be possible to manage selected infants as outpatients with appropriate systemic antimicrobial agents.

**Urinalysis**

Previous studies have suggested that as many as 50% of infants with UTI may have a normal urinalysis. In our study, 35% of the infants with UTI had a normal urinalysis, and three of these infants met all low risk criteria for SBI. Although bacteriuria in the absence of inflammatory cells in the urine could represent asymptomatic bacteriuria, these infants met the study definition for having a UTI. Since urinary tract infections comprised over half of the SBI in the present study, there is a clear need for improved methods to identify UTI before culture results are known. A recent study demonstrated that, when fresh urine (<10 minutes after collection) is evaluated for the presence of bacteria by Gram stain or phase microscopy in addition to testing for either nitrite and leukocyte esterase or WBC, most UTIs can be diagnosed. Urinalysis should continue to be part of the evaluation of febrile infants. How the urine should be analyzed needs clearer definition.

**Conclusion**

The suggested modifications of the low risk criteria will need to be prospectively validated on a large cohort of febrile infants ≤60 days of age. Until UTI can be more accurately diagnosed by urinalysis all febrile infants should have a sterile (bladder catheterization or suprapubic tap) urine specimen cultured. Final management decisions for all febrile infants in this age group will depend upon the ability of caregivers to carefully observe their infants, the ease of access to medical care if the infants should clinically worsen, and the assurance of careful follow-up.

**ACKNOWLEDGMENTS**

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REFERENCES


MOUNTING SENSE OF JOB MALAISE PROMPTS MORE HEALTH-CARE WORKERS TO JOIN UNIONS

In search of job security and a voice in health-care reform, a growing number of workers at hospitals, nursing homes, and rehabilitation facilities are joining labor unions.

Hospital workers filed 158 petitions for union elections in 1993, up from only 19 in 1989, according to a study by Management Science Associates, Inc, a labor consulting firm. And unions won 58% of health-care elections in 1993—the highest win rate in the industry since 1984, according to Modern Health Care, an industry journal.


Noted by J.F.L., MD