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Cover: Two Young Girls at the Piano, by Pierre August RENOIR (© 1989
The Metropolitan Museum of Art; Robert Lehman Collection, 1975.
(1975.1.201)). Two Young Girls at the Piano is one of at least five versions
of the same scene by Renoir, including a lovely pastel recently sold at
auction. Renoir was 51 years of age at the time he did this work in 1892,
and at the height of his popularity. This lovely presentation evokes a former
era when adolescents, at least those in favored economic status, spent their
leisure learning skills such as playing the piano and singing. One of the
major tasks of adolescence is to develop one’s identity and sense of
competence. Whether it is the charming skills so beautifully depicted in this
painting or others, the task of pediatricians is to assist young people in
developing skills of which they can be proud.

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Commentary
Follow-up on "The Case of Donnie J"

Few review articles published in Pediatrics in Review have elicited such strong disagreements with the recommendations of the author as "The Case of Donnie J," published in our July 1990 issue. The disagreements were in three areas: (1) the extensiveness of the workup and large number of immunizations recommended by Dr Burg at the first visit; (2) the pejorative nature of descriptions of the mother, such as that she was a "dead head"; and (3) the practicality of treating such a patient in private practice. Dr Burg was asked to comment on these letters.

APPROPRIATENESS OF A COMPLETE WORKUP OF DONNIE J AT THE FIRST VISIT

Several readers made the point that the extensiveness of the workup suggested by Dr Burg was both extremely expensive and likely to drive the mother and patient away from future contacts. This was especially true regarding the number of immunizations proposed: "Four separate pinpricks at the first visit is not likely to lead to good doctor-patient rapport." Others questioned Dr Burg's recommendation for a second diphtheria-tetanus toxoids-pertussis immunization in 1 month. The inclusion of a rectal examination in the absence of evidence of sexual abuse was another procedure criticized by most of those who wrote in. Dr Burg responded that these comments were well taken, and he emphasized that the "art" of medical care leads to differences of opinion among responsible physicians. He accepted the concern of writers that his recommendations may have been too intrusive for a first visit. He did defend his recommendation for a second immunization in 1 month rather than, as the Red Book recommends, in 2 months to obtain immunity as soon as possible.

DESCRIPTION OF DONNIE J'S MOTHER

It is easy to see how prejudicial statements can creep into all of our expressions. Dr Burg apologized for using the term "dead head," but the problem remains of how best to deal with a mother and child when there is considerable evidence of past medical neglect. Several readers felt the best way was to try to develop a positive relationship with the mother and child at the first visit, doing relatively little in the way of specific workup then but ensuring future return visits through the favorable relationship developed. One can never anticipate which approach would be best, but a "go slow and develop a relationship" approach is clearly a very viable alternative in a case such as this one.

LACK OF PAYMENT FOR PRIVATE PRACTICE SERVICES

Several readers suggested that they would not attempt to care for a patient such as Donnie J in the context of a private practice, because coverage by insurance is unlikely. They would refer Donnie J and his mother to local health department clinics. All of us agree that it is unfortunate in a country that can spend so much on so many other things that we do not have universal health insurance coverage for children. Let this be a stimulus for all of us to support the American Academy of Pediatrics' program for ensuring that all children have access to needed health care.

In this article and previous articles, Dr Burg taken the approach that active reader participation is an important aspect of meaningful learning. Whether readers agree or disagree with his approach to the challenges presented by "The Case of Donnie J," there is no doubt that he has succeeded in encouraging active reading; and, to that degree, the goal of Pediatrics in Review to assist the pediatrician in providing better care through effective continuing education has been achieved. R. J. H.
distinguish between infected and noninfected foci of inflammation. Unlike radionuclide imaging, MRI cannot scan the entire body because of its limited field of view. MRI is more sensitive to body movement than radionuclide scans and more dependent on precise positioning of the patient. Control of movement and position is often particularly difficult in children. MRI cannot be performed if the patient suffers claustrophobia within the apparatus.

As with any other imaging procedure, proper interpretation of MRI depends on providing accurate clinical information to the reader. In a study of 23 patients who had culture-proven osteomyelitis, MRI, technetium, and iodine images were read independently by three experienced radiologists who were provided no clinical data. The sensitivities of MRI, technetium bone scan, and iodium WBC scan were 66%, 64%, and 49%, respectively (not significantly different).

Thus, although MRI can provide superb pictures of the detailed anatomy of osteomyelitis, it is unlikely that it will ever be a widely used diagnostic procedure in the investigation of children suspected of having osteomyelitis. It use will probably be limited to the uncommon cases of vertebral osteomyelitis, to complicated cases of chronic osteomyelitis, and to situations in which the anatomic detail that this method can provide is necessary for planning surgical intervention.

**SUMMARY**

The early diagnosis of acute hematogenous osteomyelitis depends on a high index of suspicion whenever the physician is confronted with a child experiencing acute onset of bone pain or limited motion of an extremity, regardless of the presence or absence of signs of infection such as fever, local tenderness, redness, swelling, or heat (Table 4). Early diagnosis is aided greatly by the use of plain radiography to exclude other conditions and radionuclide bone scans to detect evidence of inflammation at the site of bone pain. "High-tech" procedures such as CAT and MRI should be reserved for situations in which the diagnosis cannot be made by the simpler methods, such as osteomyelitis of the spine or pelvis, or when the anatomic detail provided by MRI is required for planning of surgery. It is very unlikely that CAT or MRI will ever be required in the majority of cases of uncomplicated osteomyelitis in children.

**SUGGESTED READING**


### Table 4

<table>
<thead>
<tr>
<th>Steps in Diagnosing Acute Hematogenous Osteomyelitis in a Child Who Has Acute Onset of Bone Pain or Limitation of Motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain history of onset, course, associated symptoms, and trauma</td>
</tr>
<tr>
<td>Examine for presence of fever, local tenderness, redness, swelling, heat, and limitation of motion</td>
</tr>
<tr>
<td>Perform routine laboratory tests, including white blood cell counts, erythrocyte sedimentation rate, and sickle cell test (if patient is black)</td>
</tr>
<tr>
<td>Obtain blood samples for culture</td>
</tr>
<tr>
<td>Perform plain radiography to exclude such etiologies as trauma and malignancy</td>
</tr>
<tr>
<td>Perform needle aspiration of bone if local point tenderness is present or if presence of subperiosteal pus is suspected</td>
</tr>
<tr>
<td>Perform bone scan if diagnosis is not apparent after completing previous steps</td>
</tr>
<tr>
<td>Order computerized axial tomography scan of magnetic resonance imaging only if diagnosis cannot be made by already listed methods or if anatomic detail is required for planning of surgery</td>
</tr>
</tbody>
</table>

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**Self-Evaluation Quiz**

1. Confirmation of the diagnosis of acute osteomyelitis requires 2 of 4 criteria to be met. Each of the following is a criterion, except:
   A. Pus aspirated from bone.
   B. Positive culture from blood or from needle aspirate of bone.
   C. Local signs of inflammation (pain, tenderness, redness, swelling, limitation of motion).
   D. Radiographic changes (bone lysis, periosteal new bone formation) or positive bone scan.
   E. Elevated white blood cell count and erythrocyte sedimentation rate.

2. Acute hematogenous osteomyelitis is the most common type of bone infection occurring during childhood. All of the following statements are true, except:
   A. Appropriate bone aspiration may yield a positive culture for several days after the initiation of therapy.
   B. Unless a pathogen is isolated, oral antibiotic therapy is inappropriate.
   C. Needle aspiration of bone shows significant markers on subsequent bone scans.
D. Early diagnosis is aided greatly by the use of plain radiography to exclude other conditions and radionuclide bone scans to detect evidence of inflammation at the site of bone pain.
E. Blood culture and needle aspiration of the involved bone will yield a positive culture in 75% to 80% of cases.

3. Which one of the following is correct regarding the statements about acute hematogenous osteomyelitis listed below?
   A. One I and III are correct.
   B. Only II and IV are correct.
   C. All statements are correct.
   D. Only II, III, IV, and V are correct.
   E. Only I, II, III, and IV are correct.

I. Staphylococcus aureus causes 80% of this disease.
II. The peak age of distribution during childhood is 2 to 5 years.
III. The disease is more prevalent in boys than girls.
IV. The disease localizes in the lower extremities in 70% of cases.
V. The infection begins in the diaphysis.

4. Each of the following statements is a true statement regarding osteomyelitis, except:
   A. Group B streptococcus, coliforms, and Candida are the causes of most cases of neonatal osteomyelitis.
   B. In the neonate, an additional route of spread of osteomyelitis is into the epiphysis via transphyseal vessels.
   C. The most common early sign of osteomyelitis during the first few months of life is soft tissue swelling and decreased spontaneous motion of the affected limb.
   D. In the neonate, infection of the epiphysis may rupture into the joint space causing an associated septic arthritis.

5. The best choice for the initial radiologic evaluation of a child who is suspected of having osteomyelitis is:
   A. A plain radiograph of the bone plus a radionuclide bone scan.
   B. A plain radiograph of the bone plus a computed axial tomography scan.
   C. A plain radiograph of the bone plus magnetic resonance imaging.
   D. A radionuclide bone scan plus magnetic resonance imaging.
   E. Magnetic resonance imaging.

**Educational Objective**

83. The pediatrician should have appropriate knowledge of the risks of smokeless tobacco use by children and adolescents. (Recent Advances, 90/91)

**Smokeless Tobacco**


Smokeless tobacco, such as snuff, chewing tobacco, or other forms that are put in the mouth or nose, has increased in popularity among older children, adolescents, and young adults.

Given the fact that it is a carcinogen with the potential for inducing significant precancerous changes within the tissues of the buccal cavity, the long-term use of which can ultimately lead to oral cancer, use of tobacco by young people must be prevented. In addition to such serious conditions as leukoplakia and cancer, it has the potential for leading to a state of nicotine dependency and conditions such as gum recession and dental caries, as well as the systemic effects of tachycardia, increased blood pressure, dizziness, and predisposition to coronary artery disease.

As a matter of public health, it is important to issue warnings about the potential dangers that exist, informing the public that smokeless tobacco is neither more acceptable nor safer than smoking tobacco. For pediatricians, there is a very important opportunity to minimize the influence of peer pressure and commercial advertising by being aware that many young people, not just athletes and rodeo performers, are using smokeless tobacco with increasing frequency. Intervention before first use of smokeless tobacco quite often precludes the use of cigarettes, which at times are more socially acceptable as the individual gets older, and in many instances may deter an individual from the use of other potentially addictive substances.

Comment: There seems to be a very real and direct correlation between early use of smokeless tobacco and subsequent long-term use of cigarettes. For pediatricians, pediatric dentists, coaches, and parents, awareness of the popularity of this potentially addictive substance and recognition of its use by the clinical signs—including those often noted at the time of a general examination and the more obvious signs of a puckered cheek, stained teeth, or traces of the "wad"—can allow effective prevention of a potentially life-threatening condition. (Fernando A. Guerra, MD, Editorial Board)
Self-Evaluation Quiz

6. A newborn infant for whom you are caring dies of overwhelming bacterial sepsis, despite prompt administration of appropriate antibiotics and supportive therapy. All of the following may have contributed to the demise, except:
   A. Deficiency of opsonic antibody and complement.
   B. Depletion of bone marrow neutrophil storage pool.
   C. Marked peripheral neutropenia.
   D. Low blood immature:total neutrophil ratio.
   E. Defective neutrophil chemotaxis.

7. You are caring for a critically ill newborn who has possible bacterial sepsis. Among the following, the weakest justification for a granulocyte transfusion is:
   A. Blood neutrophil count of 900.
   B. Blood immature:total neutrophil ratio of 0.9.
   C. Bone marrow neutrophil storage pool of 15%.
   D. Positive blood culture.
   E. Low blood pressure.

8. Granulocyte transfusion in septic newborns has been demonstrated in some studies to be beneficial, but ineffective in others. A careful evaluation of available studies reveals that such differences might be explained by each of the following, except:
   A. Method of collection of neutrophils.
   B. Dosage of neutrophils transfused.
   C. Presence of complicating conditions other than bacterial sepsis.
   D. Small sample sizes.
   E. Failure to randomize patients to treatment and control groups.

9. The potential hazards of granulocyte transfusion include each of the following, except:
   A. Disseminated intravascular coagulation.
   B. Pulmonary failure.
   C. Cytomegalovirus infection.
   D. Congestive heart failure.
   E. Graft-versus-host disease.

10. Improvement in the outcome for neonates suffering from overwhelming bacterial infections is least likely to come from research involving:
    A. Intravenous immunoglobulin administration.
    B. Monoclonal antibodies.
    C. Isolated complement components.
    D. Recombinant human cytokines.
    E. New antimicrobial agents.

EDUCATIONAL OBJECTIVE

132. The pediatrician should have an appropriate familiarity with the various migraine-related syndromes. (Recent Advances, 90/91)

Amaurosis Fugax: Migraine Variants


Amaurosis fugax, a sudden, transient monocular loss of vision, is believed to represent a migraine variant, especially when these episodes are recurrent. These episodes typically last for 5 to 10 minutes, although they may last for 30 minutes or more. Often the transient blindness is preceded by a “mosaic” or “jigsaw” pattern of isolated scotomata that enlarge slowly and eventually coalesce, resulting in complete visual loss. This loss of vision may or may not be accompanied by a headache. There may be a history of classical migraine headaches in the patient or in a family member. The mechanism of blindness may relate to ischemia of the choroid secondary to initial spasm of choroidal arterioles or the ciliary arteries that supply these arterioles.

In addition to migraine, differential diagnosis of amaurosis fugax includes atheromatous disease of the internal carotid arteries, cardiac disease, Raynaud disease, temporal arteritis, polycythemia, sickle cell disease, tumor of the optic nerve or chiasm, tobacco and substance abuse, glaucoma, papilledema, eclampsia, and hysteria. In adolescents, the most likely diagnosis for this recurrent, transient disorder is migraine, and cerebral angiography is not indicated in the absence of other historical or physical findings suggestive of any of the other possible diagnoses. This migraine variant typically makes its initial appearance during adolescence, and the prognosis is excellent. The effectiveness of usual forms of migraine treatment is inconsistent, and reassurance may be most helpful.

Comment: Asking the adolescent to draw the scotomatus pattern that occurs before the total visual loss may be helpful in diagnosing the condition as a migraine variant. The aura of visual disturbance may include hallucinations or visual distortions of size, color, or arrangement. (Lonnie Zeltzer, MD, Editorial Board)
TABLE 6. Perceived Barriers to Pediatric Participation Under Public Law 99-457

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Remedial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes of other providers to pediatrician</td>
<td>Clarify role as advocate but be ready to consider alternate points of view</td>
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<tr>
<td></td>
<td>Display willingness to negotiate and discuss issues in nonauthoritarian manner</td>
</tr>
<tr>
<td>Attitudes of pediatrician to the handicapped child and family</td>
<td>Seek familiarity and learn through sensitive interviews</td>
</tr>
<tr>
<td></td>
<td>Seek out patients and learn from their experiences</td>
</tr>
<tr>
<td>Lack of appropriate remuneration</td>
<td>Advocacy action through the American Academy of Pediatrics</td>
</tr>
<tr>
<td></td>
<td>Careful review of patient coverage</td>
</tr>
<tr>
<td></td>
<td>Review of billing practices, use of appropriate CPT code, follow-up with third-party payers</td>
</tr>
<tr>
<td>Lack of confidence in knowledge or skill required</td>
<td>Review cases with peers</td>
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<tr>
<td></td>
<td>Seek postgraduate education</td>
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<tr>
<td></td>
<td>Use consulting sources as advisors</td>
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<tr>
<td></td>
<td>Work on patients with ad hoc supervisory relationship</td>
</tr>
<tr>
<td>Lack of time</td>
<td>Build developmental approach into scheduled health care visits</td>
</tr>
<tr>
<td></td>
<td>Postgraduate education in efficient developmental care</td>
</tr>
<tr>
<td></td>
<td>Use alternative communication routes with brief telephone, fax, or letter communications</td>
</tr>
<tr>
<td>Text of Public Law 99-457 and the related regulations</td>
<td>Be familiar with relevant literature</td>
</tr>
<tr>
<td></td>
<td>Use all encounters with Early Intervention Program personnel as an educational tool</td>
</tr>
<tr>
<td></td>
<td>Use preventive guidance for families to anticipate problems</td>
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</tbody>
</table>

in the management of developmental disabilities. When possible, the pediatrician should become involved directly as a member of state or community interagency council for early childhood intervention. This will improve the overall delivery of services to disabled children. Physicians serving on these councils may also act as liaisons between the medical community and other professionals who serve children. In this way, the pediatrician will have an opportunity to become a catalyst to help insure that change takes place and that it takes place in a manner consistent with the best child health.

SUMMARY

New federal legislation involving infants at risk for handicaps and their families, in the form of Public Law 99-457, will rely on interaction between pediatricians and other professionals to maximize health and social benefits. Involvement in early identification and remediation of infants at risk is a role well suited to the primary care pediatrician.

Early Intervention Programs offer remediation and enhancement of development for children at biologic or environmental risk. Pediatricians should be alert to screen, identify, and assess children who may be helped by Early Intervention Programs. The primary care pediatrician should work with children who have these problems, help coordinate care, and serve as an advocate for the child and family.

SUGGESTED READING


Meisels SJ, Provence S. Screening and Assessment: Guidelines for Identifying Young Disabled and Developmentally Vulnerable Children and Their Families. Washington, DC: National Center for Clinical Infant Programs; 1989


Self-Evaluation Quiz

11. Existing models of community screening programs, consisting of consortia of public and private agencies, pediatricians, and community groups cannot give assurance that screening is:
   A. Linked to appropriate education for families.
   B. Important to assessment, diagnosis, and planning.
   C. Essential to the provision of suitable care.
   D. Sensitive, specific, and cost-effective.

12. Public Law 99-457 specifies family control of involvement in the entire assessment process. However, families may not:
   A. Withhold information bearing on the onset of the developmental delay.
   B. Limit the degree of professional help in the assessment.
   C. Refuse entrance to the assessment process.
   D. Require the service of the child’s pediatrician in the assessment.
13. The results of all assessment procedures shall accomplish each of the following except:
   A. Determination of the need for service.
   B. Establishment of a firm diagnosis.
   C. Formulation of a plan for provision of needed help.
   D. Full disclosure of medical information to parent.

14. The most specific screening test for assessing development of children of 0 to 3 years of age is the:
   A. Minnesota Child Development Inventory (MCDI).
   B. Clinical Linguistic and Auditory Milestone Scale (CLAMS).
   C. Denver Developmental Screening Test (DDST).
   D. Infant Rapid Screen (IRS).

15. A 6-month-old female infant is brought to you for well baby care. The mother’s pregnancy was uneventful. The family lives in a remote, rural area. The baby was delivered by a midwife and had not been seen by the midwife, a visiting nurse, or a physician since birth. The baby was breast-fed for 2 months, then fed an evaporated milk formula. The baby responds slowly, smiles infrequently, and has not attempted to roll over. Because this is the first postpartum examination, your examination and assessment include a test for phenylketonuria. The result of this test is positive. The most important immediate follow-up step should be to:
   A. Refer the family to an Early Intervention Program.
   B. Prescribe a diet for the baby.
   C. Recheck the PKU test.
   D. Outline an Individual Family Service Plan for the family.

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EDUCATIONAL OBJECTIVE

The pediatrician should be aware of methods being developed to ascertain the degree of neuronal damage which has occurred in comatose children. (Recent Advances, 90/91)

Neuron-Specific Enolase


Enolase is one of a group of cerebrospinal fluid enzymes whose activity levels may correlate with central nervous system disease. The γ-subunit of enolase has been shown to be a specific marker of neuronal damage (whereas the α-subunit originates from glial cells) and has been dubbed neuron-specific enolase. Neuron-specific enolase can be measured in both the cerebrospinal fluid and the serum; furthermore, changes in serum levels appear to correlate with changes in cerebrospinal fluid levels.

There is now evidence that levels of neuron-specific enolase activity correlate with the degree of brain damage in comatose children. Normal children have neuron-specific enolase levels of 9.1 and 12.4 ng/mL in cerebrospinal fluid and serum, respectively. In comatose children, those with Glasgow coma scale scores of greater than 7 had neuron-specific enolase levels below 35 ng/mL in cerebrospinal fluid and below 55 ng/mL in serum. Furthermore, the levels increase steadily as the Glasgow coma scale scores decrease. Similarly, when patients are divided into groups by good prognosis and poor prognosis, based on outcome at follow-up, neuron-specific enolase levels can distinguish the two groups. Patients with poor prognosis have neuron-specific enolase levels greater than 80 ng/mL in cerebrospinal fluid and serum, and patients with good prognosis have peak levels of less than 35 ng/mL in cerebrospinal fluid and 55 ng/mL in serum.

Neuron-specific enolase is a major component of the cytosol in neurons and serves as a biochemical index of neuronal damage. Severe brain damage appears to correlate with an earlier and greater rise in neuron-specific enolase levels. The correlation between cerebrospinal fluid and serum levels makes serum analysis a useful clinical tool.

Comment: Anything that can help us to understand what is going on inside the head of a comatose child is welcome. Neuron-specific enolase is clearly an important marker of neuronal damage, but our understanding of its clinical application in children is still at a preliminary stage. Nara’s study reports findings concerning only 20 patients. We will need much larger numbers to determine the sensitivity and specificity of abnormal neuron-specific enolase levels and to determine the accuracy of this test in predicting long-term outcome. The correlation between serum and cerebrospinal fluid levels is particularly encouraging because it offers the possibility of relatively noninvasive monitoring of neuron-specific enolase levels. (Alan L. Goldbloom, MD, Editorial Board)
One area of great concern for children with leukemia and for their parents is the long-term impact of therapy upon fertility. This impact is difficult to estimate for the individual patient. Preservation of fertility may be more likely in prepubertal boys and in girls of any age than in boys who have entered puberty already by the time of treatment. It is important to emphasize, however, that, despite the various endocrinologic abnormalities already discussed, many survivors of childhood leukemia are fertile. Equally important, there is no evidence of increased risk of birth defects or cancer in the offspring of survivors.18

Second Malignancy. There is a small increase in the incidence of second malignancies in survivors of childhood acute leukemias. It has been estimated that the cumulative incidence of second malignancies is around 2% at 10 years after the first remission; however, the risk may be higher in patients who have leukemia with certain phenotypic and genotypic features and in those who have been treated with epipodophyllotoxins.19 Additionally, children who have received cranial irradiation are at increased risk for the development of central nervous system tumors. In a review of children registered on Children's Cancer Study Group protocols, although the overall incidence of second malignancy was very low, central nervous system tumors accounted for half of all second neoplasms.20

CONCLUSION

Many thousands of children and young adults now are undergoing therapy for leukemia or are survivors of the disease. Their pediatricians, in concert with their pediatric oncologists, will be managing a broad array of problems during the course of antileukemic therapy. Furthermore, the pediatrician may have to deal with a wide range of consequences of both disease and treatment in long-term survivors. While some of these complications will be unmistakable, others are subtle, such as late neuropsychologic or endocrine sequelae. The pediatrician must be familiar with the entire spectrum of complications of leukemia and antileukemic therapy to provide optimal care for this growing segment of the pediatric and young adult population.

REFERENCES


Self-Evaluation Quiz

16. A 3-year-old girl who has acute lymphoblastic leukemia is in remission following an initial chemotherapeutic program. She suddenly develops a temperature of 39°C, measured rectally. The only findings on physical examination are that she is alert, flushed, and irritable but consolable. The results of a chest radiograph are unremarkable. Results of a complete blood count reveal the following: hemoglobin, 10.0 g/dL; white blood cell count, 1200/mm² with absolute neutrophil count, <500/mm²; platelet count, 120 000/mm³. The most appropriate next step is to:
   A. Obtain an emergent bone marrow study.
   B. Perform a lumbar puncture.
   C. Initiate broad spectrum antibiotic coverage.
   D. Obtain serial blood cultures.
   E. Reverse methotrexate-induced bone marrow depression by folic acid therapy.

17. Antitumor chemotherapy is associated with an immunocompromised state in children who have leukemia. Frequently encountered infectious agents causing disease in these children include all of the following except:
   A. Escherichia coli.
   B. Staphylococcus epidermidis.
   C. Pseudomonas aeruginosa.
   D. Streptococcus pneumoniae.
   E. Staphylococcus aureus.

18. In the febrile neutropenic child who has leukemia and is receiving antibiotic treatment, the most appropriate principle in management is to:
   A. Stop treatment when the patient has defervesced for 48 hours.
   B. Augment circulating neutrophils by fresh whole blood transfusion.
C. Restrict treatment to a 72-hour course in the presence of negative blood cultures.
D. Add antifungal therapy to the treatment plan for children who have fever and neutropenia for longer than 7 days.

19. A 2-year-old girl who has leukemia completed chemotherapy 1 week ago and is in remission. She has not had varicella, and today has had a close exposure to a child who has it. The most appropriate management is to:
A. Begin oral acyclovir therapy immediately.
B. Administer varicella-zoster immunoglobulin within 72 hours of exposure.
C. Initiate steroid therapy with onset of skin lesions.
D. Anticipate benign course if neutrophil count is >5000/mm³.

20. Long-term complications of antileukemic therapy in children include all of the following except:
A. Subacute leukoencephalopathy.
B. Azoospermia.
C. Memory deficits.
D. Ovarian failure.
E. Increased birth defects in offspring.

Chlamydia and Fitz-Hugh-Curtis Syndrome


The Fitz-Hugh-Curtis syndrome is a perihepatitis with inflammation, which is usually localized to the upper anterior surface of the liver and the adjacent parietal peritoneum. If untreated, this condition may progress to the formation of fibrinous adhesions between the liver and the diaphragm. The most common etiologic agents are _Chlamydia trachomatis_ and _Neisseria gonorrhoea_. Spread to the liver capsule is believed to occur most commonly by direct extension from the cervix, through the fallopian tubes, into the peritoneal cavity, and along the pericolic sulci to the subphrenic space and hepatic surface. However, the findings of Fitz-Hugh-Curtis syndrome in male patients suggest hematogenous spread or spread by retroperitoneal lymphatics as alternative routes.

Fitz-Hugh-Curtis syndrome can occur with or without direct evidence of pelvic inflammatory disease. Diagnosis is made by the direct cervical (or urethral) culture of _N gonorrhoea_ or _C trachomatis_. If partial antibiotic treatment has eliminated the likelihood of a positive culture, then serologic microimmunofluorescence tests should be used for _C trachomatis_. Diagnosis can then be made on the basis of one or more of the following criteria: 1) IgM antibody; 2) a fourfold change or greater (increase or decrease) of IgM and/or IgG antibody; and 3) IgG antibody titer ratio of 1:1024.

The presenting symptoms are usually right upper quadrant abdominal pain, sometimes occurring with associated right shoulder pain. Pain that originates in the left upper abdominal quadrant or that shifts to this quadrant from the epigastrium has also been reported. The pain can be severe and pleuritic in nature, with or without rebound tenderness. A friction rub may be heard during respiration. Lower abdominal pain may be present if there is concomitant pelvic inflammatory disease. Pain lasts usually less than 48 hours, but it can be present for months. Nausea, fever, leukocytosis, and an elevated erythrocyte sedimentation rate may or may not be present. Liver enzyme levels are typically not elevated because the infection does not involve liver parenchyma.

_C trachomatis_ infection is treated with tetracycline (500 mg orally, four times per day for at least 7 days) or doxycycline (100 mg orally, twice daily for at least 7 days). If tetracycline is contraindicated, erythromycin (500 mg orally, four times per day for at least 7 days) is recommended. These regimens are also effective for coexisting gonococcal infection. Sexual partners should be examined and treated. If symptoms warrant hospitalization, initial treatment can include intravenous doxycycline or erythromycin and analgesics for pain.

Comment: Unlike _N gonorrhoea_, tissue culture methods are required for isolation of _C trachomatis_. Calcium alginate swabs and cotton-tipped swabs on wooden applicator sticks are toxic for the _C trachomatis_ tissue cell culture and reduce the likelihood of isolation of the organism. Thus, only cotton-tipped swabs on plastic applicators should be used for sampling of specimens. Serologic testing also enhances the likelihood of a positive diagnosis of _C trachomatis_. (Lonnie Zeltzer, MD, Editorial Board)