Infections:
Yesterday, Today, and Tomorrow

When I started to practice medicine over 55 years ago, I remember thinking to myself that a child's road to health was virtually a minefield of infections and infectious disease. We were in the early era of protection against diphtheria and tetanus by the use of toxoids—but cases of diphtheria were not uncommon, and I still remember with horror a child suffering from tetanus.

We expected almost all of our children to contract the usual contagious diseases of measles, mumps, scarlet fever, varicella, and pertussis. And occasionally we had tragic epidemics such as the polio epidemic of 1931. As a member of the polio study group of the New York City Department of Health, I examined over 1,500 patients suffering from the disease.

To add to the potential dangers were such conditions as tuberculosis, pneumococcus pneumonia, erysipelas, retro-pharyngeal abscesses, rheumatic fever and mastoiditis.

How was science going to overcome this massive array of troublesome and at times painful or even dangerous pitfalls? We had several approaches through the vaccination against smallpox and the toxoids already mentioned. That was all.

And then, in 1935, sulfanilamide was discovered and within a few years a new and amazing group of antibiotics emerged. Almost immediately scarlatina, pneumococcus pneumonia, erysipelas, mastoiditis, and retro-pharyngeal abscesses and rheumatic fever disappeared as threats. A few years later tuberculosis was added to this list of bygone diseases.

In the meantime, the approach of immunizations against specific diseases was going on. Among these were typhoid vaccine and pertussis vaccine, the polio vaccines of Salk and Sabin (which effectively ended the dread of poliomyelitis), and the vaccines against measles, mumps, and rubella.

But we are still, in 1986, faced with numerous problems, some on the way to resolution, some still unsolved, in the treatment and prevention of many infectious conditions. We are practically at the outset of antiviral chemotherapy with reports of the successful treatment of herpes simplex, varicella zoster, cytomegalovirus, and influenza A. Also, we are at the onset of the effective immunization against varicella and Haemophilus influenzae type B.

In the rapidly advancing area of protection against infections and infectious diseases, it is of the utmost importance that the practicing pediatrician be constantly aware of the progress that has been made to date and what appears to be closely at hand.

There are still many questions which must be answered:
1) How can one decide which of the numerous antibiotics to use effectively against a specific infection?
2) If bacterial resistance arises, how can one shift successfully to another antibiotic? What would be the first choice?
3) What about antibiotics that carry a certain, although slight, potential danger—such as chloramphenicol?
4) What about immunizations that carry a certain,
although slight, potential danger—such as pertussis vaccine!

To bring us broad and up-to-date coverage, and to organize a symposium on these important questions, we have called on Dr. Blaise L. Congeni, Director of Pediatric Infectious Diseases, and Associate Professor of Pediatrics and Medical Microbiology at the Children's Hospital Medical Center of Akron and the Northeastern Universities College of Medicine.

Dr. Congeni has selected a wide range of subjects for discussion including topics such as anaerobic infections and the new cephalosporins, to the newer knowledge of antiviral chemotherapy.

The first contribution discusses “New Applications of Old Antimicrobials,” and has been written by Dr. Melvin I. Marks, Director of the Pediatric Infectious Disease Program, Professor of Pediatrics, and Adjunct Professor of Microbiology/Immunology at the University of Oklahoma.

Dr. Marks reviews three antibiotics which have been used and studied for many years—chloramphenicol, trimethoprim-sulfamethoxazole (Bactrim and Septra), and vancomycin. All three drugs are of special importance, and all have been used by most pediatricians from time to time. Dr. Marks discusses the many important features of chloramphenicol therapy, but also speaks of the minimal chance of a dangerous prognosis.

The special value of trimethoprim-sulfamethoxazole in urinary tract infections and the treatment of otitis media, and the value of vancomycin in the treatment of infections due to organisms resistant to penicillin and the cephalosporins is also presented.

The second article deals with “Antiviral Chemotherapy” and is contributed to Dr. George A. Nankervis, Chairman of Pediatrics at the Children's Hospital Medical Center of Akron, and Professor and Chairman of the Department of Pediatrics of the Northeastern Ohio Universities College of Medicine. Our present knowledge of the various antiviral drugs—vidarabine, acyclovir, amantadine, and ribavirin is clearly discussed here.

The antiviral agents and their effectiveness are well-described. Of special import is acyclovir, a recent compound, which has proven effective in the treatment of certain herpes virus infections. This can be given, orally, intravenously, or topically.

Certain antiviral drugs have been shown to be effective in the treatment of varicella, cytomegalovirus, Epstein-Barr virus, and the respiratory syncytial virus.

The third article discusses “Anaerobic Infections” and is authored by Dr. Lisa M. Dunkle, Professor of Pediatrics and Director of the Division of Infectious Diseases and Hospital Epidemiology of the St. Louis University School of Medicine.

Dr. Dunkle, who has had a special interest in this field for some years, notes that from her experience these infections are largely opportunistic when normal skin barriers have been breached. She describes the clinical features of anaerobic infections and the usual management by surgical debridement and antibiotic therapy. The article contains an excellent review of the various antibiotics for use in the treatment of both gram-positive and gram-negative anaerobes.

The fourth contribution deals with “Pertussis Immunization,” a subject which has been publicized considerably in recent months by the media. This article has been written by Dr. Lawrence D. Frenkel, Professor, Department of Pediatrics and Microbiology and Director of the Division of Immunology, Allergy, and Infectious Diseases, Department of Pediatrics, University of Medicine and Dentistry of New Jersey, Rutgers Medical School.

Dr. Frenkel briefly reviews the legal problems that complicate reactions to the vaccine. He then describes the real severity of the pertussis infection with its high morbidity and possible mortality. Against these he compares the value of the vaccine in spite of its occasional side effects and adverse reactions. He further notes that presently, a new acellular pertussis vaccine is being produced and tested. Those of us who practiced pediatrics before the advent of the pertussis vaccine can fully support the stand of Dr. Frenkel. This is potentially a very serious, and, at times, dangerous disease, especially for young children.

The next article discusses the “Treatment of Bacterial Meningitis,” and is presented by Dr. Congeni, the Guest Editor of this symposium. The opening statement is ominous—“Despite recent advances in treatment, mortality and morbidity associated with bacterial meningitis remains high.”

Dr. Congeni concentrates in his article on the antibiotic treatment of bacterial meningitis. At first, neonatal bacterial meningitis is considered, followed by the treatment of infants and children.

The pathogenic organisms responsible for the meningitis differ in these two periods of infancy. Dr. Congeni advises on the selection of the most effective antibiotic, the patterns of resistance found, and the duration of therapy.

This is a valuable review for pediatricians faced with the seriousness of an infant or child with bacterial meningitis.

The following contribution considers the “Haemophilus Influenzae type B Polysaccharide Vaccine” and is discussed by Dr. K. Lynn Cates, Division of Infectious Diseases, Department of Pediatrics of the University of Connecticut School
of Medicine. This is a new vaccine, first licensed in the United States in April 1985. Its full effectiveness has not as yet been determined—although a Finnish study was very supportive. However, the dangers of Haemophilus Influenzae B meningitis are so severe that this vaccine has been recommended by the Committee on Infectious Diseases of the American Academy of Pediatrics for immunization of children at 24 months of age. The main limitation to this vaccine, according to Dr. Cates, is its failure to produce protective levels of antibody in children under 18 to 23 months of age—the most precarious age group when infected with the Hib infection.

Dr. Cates further discusses the future of more effective vaccines now being studied, expressing the feeling that these will be licensed in the not-too-distant future.

The final article on the new cephalosporins has been written by Dr. Ram Yoge, Associate Professor of Pediatrics at the Northwestern University Medical School, and Division of Infectious Disease of the Children's Memorial Hospital, Chicago.

This is an excellent approach to clarifying the choice of the many new cephalosporins in the therapy of specific infactions of infancy and childhood. Dr. Yoge sorts out 13 cephalosporins in this review, separating them first into three categories according to their value in the treatment of gram-positive and gram-negative infections. He then compares their in vitro activity against six common aerobic and anaerobic bacteria. But before deciding on the use of a cephalosporin, Dr. Yoge asks, is it the drug of choice or are currently available antibiotics as good or better? As an example, he points to a urinary tract infection where cheaper and highly effective antibiotics are already available.

If the use of cephalosporin is decided upon, the author suggests that the penetration to the area of infection be considered as well as the half-life of the drug use so that it may be administered less frequently.

This is a very clear and beautifully organized discussion and should prove valuable and interesting to all modern pediatricians.