

*A new medical statement, issued by the American Heart Association's Council on Rheumatic Fever and Congenital Heart Disease, gives current preventive measures. Prepared by the council's Committee on Prevention of Rheumatic Fever and Bacterial Endocarditis, the statement was first published in "Circulation," February 1955, and has had special distribution as part of the "Stop Rheumatic Fever" campaign.*

## Rheumatic Fever Prevention

A new statement on the prevention of rheumatic fever and bacterial endocarditis, issued in January by the American Heart Association, incorporates the important advances made in the field during the past 2 years.

The statement, a revision of the January 1953 report, presents techniques for treating and preventing streptococcal infections to forestall both initial rheumatic fever attacks and recurrences. It also recommends measures for preventing bacterial endocarditis, an occasional aftermath of rheumatic fever.

Among the new developments is the emphasis on eradication of streptococcal infections from the throat by full doses of penicillin. Recommended for the first time are intramuscular injections of long-acting benzathine penicillin G. In the long-term prevention of rheumatic fever recurrences, one tablet of penicillin a day has been found adequate.

With the issuance of the revised statement, the Public Health Service and the American

Heart Association are planning a cooperative campaign, starting this spring, to help communities establish rheumatic fever prevention programs, aimed at eventual eradication of this disease. A new film, booklet, and other education material have been prepared for distribution to the general public through local heart associations and health departments in the "Stop Rheumatic Fever" campaign.

Although the number of rheumatic fever deaths has been declining, some 1,500 children and young persons under 25 years of age and more than 19,000 others above age 25 died of rheumatic fever and rheumatic heart disease in 1953. Many thousands of new cases of rheumatic fever occur each year, and there are many more thousands of "old" cases.

Following is the revised statement entitled "Prevention of Rheumatic Fever and Bacterial Endocarditis Through Control of Streptococcal Infections."

### Treatment of Streptococcal Infections in the General Population

In the general population about 3 percent of untreated streptococcal infections are followed by rheumatic fever. Adequate and early penicillin treatment, however, will eliminate streptococci from the throat and prevent most attacks of rheumatic fever.

#### Diagnosis of Streptococcal Infection

In many instances streptococcal infections can be recognized by their clinical manifestations.

In some patients, however, it is difficult or impossible to determine the streptococcal nature of a respiratory infection without obtaining throat cultures. The following section on diagnosis has been included in order to reduce diagnostic errors and to assist physicians in avoiding unnecessary therapy.

The accurate recognition of individual streptococcal infections, their adequate treatment, and the control of epidemics in the community

presently offer the best means of preventing initial and recurrent rheumatic fever.

### COMMON SYMPTOMS

**Sore throat**—sudden onset, pain on swallowing.

**Headache**—common.

**Fever**—variable, but generally from 101° to 104° F.

**Abdominal pain**—common, especially in children; less common in adults.

**Nausea and vomiting**—common, especially in children.

### COMMON SIGNS

**Red throat.**

**Exudate**—usually present.

**Glands**—swollen, tender lymph nodes at angle of jaw.

**Rash**—scarlatiniform.

**Acute otitis media** } frequently due to  
**Acute sinusitis** } the streptococcus.

In the absence of the common symptoms and signs, occurrence of any of the following symptoms is usually not associated with a streptococcal infection: simple coryza, hoarseness, cough.

### LABORATORY FINDINGS

**White blood count**—generally over 12,000.

**Throat culture**—positive culture for hemolytic streptococci is almost always diagnostic.

### Treatment of Streptococcal Infections

When streptococcal infection is suspected, treatment should be started immediately. Penicillin is the drug of choice. Effective blood levels should be maintained for a period of 10 days to prevent rheumatic fever by eradicating the streptococci from the throat.

Penicillin may be administered by either intramuscular or oral route. Intramuscular ad-

ministration is recommended as the method of choice since it insures adequate treatment. Oral therapy by contrast is dependent upon the cooperation of the patient. On the other hand, some physicians and patients prefer repeated oral medication and object to injections.

### Recommended Treatment Schedules

#### INTRAMUSCULAR PENICILLIN

##### Benzathine Penicillin G

*Children*—one intramuscular injection of 600,000 units.

*Adults*—one intramuscular injection of 600,000 to 900,000 units.

or **Procaine Penicillin** with aluminum monostearate in oil.

*Children*—one intramuscular injection of 300,000 units every third day for 3 doses.

*Adults*—one intramuscular injection of 600,000 units every third day for 3 doses.

#### ORAL PENICILLIN

*Children and adults*—250,000 units 3 times a day for a full 10 days.

To prevent rheumatic fever by eradicating streptococci, therapy must be continued for the entire 10 days even though the temperature returns to normal and the patient is asymptomatic.

#### OTHER MEDICATION

It has not been established that the broad spectrum antibiotics are as effective as penicillin in preventing rheumatic fever. They should be used only if the patient is sensitive to penicillin. As with penicillin, the regimen of full therapeutic dosage for a full 10 days should be followed.

The following therapy is not effective in preventing rheumatic fever when used as treatment for streptococcal infections: sulfonamide drugs, penicillin troches or lozenges.

### Prevention of Streptococcal Infections in Rheumatic Individuals

Many streptococcal infections occur without producing clinical manifestations. For this reason, prevention of recurrent rheumatic fever

must depend on continuous prophylaxis rather than solely on treatment of acute attacks of streptococcal disease.

## General Rules for Prophylaxis

### Who should be treated?

All individuals who have a well established history of a previous attack of rheumatic fever or chorea or who show definite evidence of rheumatic heart disease should be placed on continuous prophylaxis.

### When should prophylactic treatment be initiated?

*Active rheumatic fever*—As soon as the diagnosis of rheumatic fever is made or any time thereafter when the patient is first seen. The streptococcus should be eradicated with penicillin (see Treatment Schedules) following which the prophylactic regimen is instituted.

*Inactive rheumatic fever*—In inactive rheumatic fever, prophylaxis should be instituted when the patient is first seen.

### How long should prophylaxis be continued?

Throughout life, or until new knowledge makes this recommendation invalid.

### Should prophylaxis be continued during the summer?

Yes, continuously. Streptococcal infections can occur at any season although they are more prevalent in the winter.

### What are the exceptions to continuous prophylaxis?

Uncertainty as to the validity of a history of a previous attack of rheumatic fever or chorea.

Heart disease of questionable etiology.

In rare circumstances where exposure of the adult patient to streptococcal infection is unlikely.

### Prophylactic Methods—Oral and Intramuscular

Oral medication depends on patient cooperation. In most instances failures of sulfonamide or penicillin prophylaxis occur in patients who fail to ingest the drug regularly. This can be avoided by long-acting depot penicillin given intramuscularly once a month.

## SULFADIAZINE—ORAL

This drug has the advantage of being easy to administer, inexpensive and effective (other newer sulfonamides are probably as effective). Although resistant streptococci have appeared during mass prophylaxis in the armed forces, this is rare in civilian populations.

*Dosage*—from 0.5 to 1.0 gm. taken each morning throughout the year. The smaller dose is to be used in children under 60 pounds.

*Toxic reactions*—infrequent and usually minor. In any patient being given sulfonamides, consider all rashes and sore throats as possible toxic reactions especially if they occur in the first 8 weeks. In patients on this prophylactic regimen it is hazardous to treat toxic reactions or intercurrent infections with sulfonamides. The chief toxic reactions are:

*Skin eruptions: Morbilliform*—continue drug with caution. Urticaria or scarlatiniform rash associated with sore throat or fever—discontinue drug.

*Leukopenia: Discontinue* if white blood count falls below 4,000 and polynuclear neutrophils below 35 percent because of possible agranulocytosis which is often associated with sore throat and a rash. Because of these reactions, weekly white blood counts are advisable for the first 2 months of prophylaxis. The occurrence of agranulocytosis after 8 weeks of continuous prophylaxis with sulfonamides is extremely rare.

## PENICILLIN—ORAL

Penicillin has the desirable characteristics of being bactericidal for hemolytic streptococci and of rarely producing serious toxic reactions. A careful history of allergic reactions and previous response to penicillin should be obtained.

*Dosage*—200,000 to 250,000 units once a day, before breakfast.

*Toxic reactions:*

*Urticaria and angioneurotic edema.*

*Reactions similar to serum sickness*—includes fever and joint pains and may be mistaken for rheumatic fever.

Although many individuals who have had reactions to penicillin may subsequently be able to tolerate the drug, it is safer not to use penicillin if the reaction has been severe and particularly if angioneurotic edema has occurred.

#### **BENZATHINE PENICILLIN G INTRAMUSCULAR**

*Dosage*—1,200,000 units once a month.

*Toxic reactions*—same types as with oral penicillin but occur more frequently and tend to be more severe. Some local discomfort usually experienced.

### **Protection of Rheumatic Fever Patients in Hospital Wards**

Patients with rheumatic fever or rheumatic heart disease are often exposed to increased hazards in hospital wards as the result of contact with streptococcal carriers or patients with active streptococcal infections. Protection of the rheumatic patient is imperative because of the high rate of recurrence of rheumatic fever following streptococcal infection. In addition to the customary precautions employed to prevent cross infections, the following procedures are recommended:

All hospital patients with streptococcal infections should be fully treated by one of the methods outlined in Recommended Treatment Schedules in order to eliminate streptococci and avoid the carrier state.

Patients admitted with acute rheumatic fever should immediately receive a full course of antibiotic therapy, whether or not streptococci are isolated from the throat (see Recommended Treatment Schedules). As soon as the therapeutic course is completed, continuous streptococcal prophylaxis should be instituted (see Prophylactic Methods—Oral and Intramuscular).

Patients with inactive rheumatic fever or rheumatic heart disease should be placed on continuous streptococcal prophylaxis on admission to the hospital or as soon thereafter as the diagnosis is established (see Prophylactic Methods—Oral and Intramuscular).

### **Prophylaxis Against Bacterial Endocarditis**

In individuals who have rheumatic or congenital heart disease, bacteria may lodge on the heart valves or other parts of the endocardium, producing bacterial endocarditis. Transient bacteremia which may lead to bacterial endocarditis is known to occur following various operative procedures including dental extractions and other dental manipulations which disturb the gums, the removal of tonsils and adenoids, the delivery of pregnant women, and operations on the gastrointestinal or urinary tracts. It is good medical and dental practice to protect patients with rheumatic or congenital heart disease by prophylactic measures.

#### **Recommended Prophylactic Methods**

Penicillin is the drug of choice for administration to patients with rheumatic or congenital heart disease undergoing dental manipulations, or operative procedures in the oral cavity.

Although the exact dosage and duration of therapy are somewhat empirical, there is some evidence that for effective therapeutic prophylaxis reasonably high concentrations of penicillin must be present at the time of the operative procedure. The dosage regimens employed for long-term prophylaxis of rheumatic fever are inadequate for this purpose. There is reason to believe that continuous maintenance of penicillin in the blood over a period of several days will result in the death of those organisms which have lodged in the heart valve during the period of transient bacteremia.

Not only should penicillin prophylaxis be designed to afford maximum protection, but the method must also be practical. In general, the parenteral route of administration is preferred. All patients should be instructed to report to their physician or clinic should they develop a fever within a month following the operation.

### INTRAMUSCULAR PENICILLIN

*Dosage*—600,000 units of aqueous penicillin and 600,000 units of procaine penicillin in oil containing 2 percent aluminum monostearate administered intramuscularly 30 minutes before the operative procedure.

### ORAL PENICILLIN

As an alternative, although considered less desirable, penicillin may be administered by the oral route.

*Dosage*—250,000 to 500,000 units one-half hour before each meal and at bedtime, beginning 24 hours prior to the operation and continuing for 5 days. At the time of the operative pro-

cedure it is advisable to give an additional 250,000 units.

*Contraindications*—Patients who give a history of sensitivity to penicillin.

### OTHER ANTIBIOTICS

The broad spectrum antibiotics should be employed as prophylaxis in patients who are sensitive to penicillin or in those who are undergoing surgery of the urinary or lower gastrointestinal tract. Oxytetracycline, chlortetracycline, or erythromycin should be administered in full dosage for 5 days, beginning treatment the day prior to the surgical procedure.

---

### Public Education Materials

Education materials for the general public on rheumatic fever prevention include:

A 12½-minute, 16-mm. film, entitled "Stop Rheumatic Fever," produced by Transfilm, Inc., for the National Heart Institute with the cooperation of the American Heart Association.

A new booklet for adults, "Stop Rheumatic Fever," summarizing the film content and illustrated with stills from the film. The booklet tells about streptococcal infections and what to do about them to prevent rheumatic fever and rheumatic heart disease.

A discussion guide to aid users of the film and

other educational material in arranging programs for parents, teachers, and community health meetings.

A pamphlet, entitled "Now You Can Protect Your Child Against Rheumatic Fever," which features a chart advising on "when to call the doctor and what to tell him about your child's sore throat."

A question-and-answer leaflet presenting background information on rheumatic fever.

These materials are available from local heart associations and health departments as well as from the American Heart Association, 44 East 23d Street, New York 10, N. Y., and the Heart Information Center, National Heart Institute, Public Health Service, Bethesda 14, Md.



# PHS films

## Infective Larvae of *Ancylostoma caninum*

16 mm., sound, black and white, 4 minutes, 157 feet. 1954.

**Audience:** Parasitologists, students of parasitology and biology, and others interested in the study of intestinal parasites.

**Available:** Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE., Atlanta 5, Ga. Purchase—United World Films, Inc., 1445 Park Ave., New York 29, N. Y.

Infective larvae of the dog hookworm is the subject of this motion picture, which has been filmed especially for parasitologists and students of parasitology and biology. It shows the migration upward from beneath the surface of the soil of large numbers of infective hookworm larvae. Another phase of the larva behavior pictured is the vertical position assumed on soil particles, either singly or in tufts composed of dozens of worms.

## *Ancylostoma caninum* in the Intestine of the Dog

16 mm., sound, black and white, 5 minutes, 184 feet. 1954.

**Audience:** Parasitologists, students of parasitology and biology, and others interested in the study of intestinal parasites.

**Available:** Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE., Atlanta 5, Ga. Purchase—United World Films, Inc., 1445 Park Ave., New York 29, N. Y.

'Bloodsucking activities and copulation of adult hookworms in the intestine of the dog are featured in this motion picture. The hookworm species *Ancylostoma caninum* is used in the demonstration. Characteristics of the parasite shown are the large numbers of living hookworms



***Ancylostoma caninum* in the  
intestine of the dog**

able to attach themselves to the intestinal mucosa; the worms ingesting blood and eliminating it from their posterior end; and the continued feeding of the parasites while the male and female are in copula. The amount of blood lost by the host through the feeding of a single worm is an interesting depiction.

## An Outbreak of *Salmonella* Infection

16 mm., sound, black and white, 13 minutes, 481 feet. 1954.

**Audience:** Pathologists, nutritionists, dietitians, sanitarians, and others interested in foodborne disease control.

**Available:** Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE., Atlanta 5, Ga. Purchase—United World Films, Inc., 1445 Park Ave., New York 29, N. Y.

A simulated case study of foodborne illness is used in this motion picture to illustrate to viewers the problems caused by an outbreak of foodborne infection. Organisms of the *Salmonella* group have been chosen for this demonstration of typical food contaminants.

The film depicts the sources of *Salmonella* organisms; factors contributing to the survival and transfer of the organisms; and ways in which contamination may occur. It describes an illness outbreak in terms of persons exposed to and susceptible to the infection. Recommended

methods for sanitary food handling under ordinary circumstances are shown.

## Transmission of Anthrax— Animal to Man

35 mm. filmstrip, sound, color, 12 minutes, 70 frames. 1954.

**Audience:** Pathologists, physicians, medical students, and others interested in disease transmission control.

**Available:** Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE., Atlanta 5, Ga. Purchase—United World Films, Inc., 1445 Park Ave., New York 29, N. Y.

Using both artists' sketches and clinical photographs, this filmstrip traces the history of anthrax from the time of the Pharaohs to the present, emphasizing particularly the work of Chabert, Koch, and Pasteur. It shows how anthrax spores are brought into the United States on imported animal products such as wool, hair, and hides; and how human anthrax infection generally can be traced to diseased cattle, sheep, or swine in rural areas and to animal products used by industry.



**A healing anthrax lesion**

The appearance of anthrax lesions and response to clinical treatment are demonstrated in pictures of several cases of human anthrax.

On maps is shown the distribution in the United States of human and of animal anthrax during 1953; and on a bar chart is indicated the number of reported cases of human anthrax in the United States for the years 1944 to 1953.