

STAPHYLOCOCCAL INFECTIONS

By Warren E. Wheeler, M.D.

Department of Pediatrics, University of Ohio

THE STAPHYLOCOCCUS problem has been placed high on the agenda of the Public Health Service for this year. Last year it was Asian flu vaccine. The year before it was poliomyelitis vaccine. This year it is the problem of hospital-acquired staphylococcus infection.

It is pleasing to me to see the position pediatricians have taken as one of the first national organizations to realize the importance of this situation. The Academy was one of the first bodies to urge the formation of hospital infection committees. Pediatricians by training, experience, tradition and in many other ways are eminently qualified to lead in this regard.

We have seen the establishment of many of these hospital infection committees. Some of these committees find themselves in the position of consultants, and they sometimes hardly know what to do. So, my remarks this morning will be directed to you as though half of you were serving on infection committees in your hospitals and the other half were chiefs of services of newborn nurseries. I shall confine my remarks to the newborn nursery. One word regarding hospital infection committees—the formation of such a committee, even of an active committee, does not abrogate the responsibilities of a chief of service nor the individual physician. One cannot delegate to others the responsibility of protecting your patients from hospital-acquired disease. You cannot as chief of a nursery expect the committee to protect you from the staphylococcus problem.

I should like simply to state a few principles, and then tell you a little bit about where you can obtain some help as members of infection committees (summarized in the table).

The first principle is that as far as the newborn nursery goes, most of the staphylococcal lesions appear after the baby goes home, and you may not know about them. This indicates that one must look hard for trouble. One can't wait until it comes to him. The primary function of the infection committee is surveillance, and knowing when you have trouble and when you don't. The best way I know of to assess this situation is to establish some kind of survey after babies go home. Dr. Thomas Shaffer has devised a list of nine simple questions which can be mailed back to the hospital by mothers of newborns sometime between 2 and 4 weeks after they go home. This questionnaire does not alarm the public and, in fact, promotes good public relations and is ideally suited for long term surveillance. Dr. Reimert Ravenholt has devised a more elaborate form for gathering data by telephone. These two examples of effective questionnaires are printed in an appendix of the Proceedings of the National Conference on Staphylococcal Infections held in August, 1958, and are available through state health departments.*

What is an epidemic? How many cases do you have to have to have an epidemic? To my way of thinking, two known cases of staphylococcal infection occurring in babies delivered within a couple of weeks of each other, due to the same identical strain of staphylococcus, represents an epidemic until proven otherwise. Even one breast abscess in a baby is an indication of a strain of staphylococcus so virulent that it probably should be considered an epidemic strain. Certainly two breast abscesses or sev-

* E. R. Squibb & Sons have reprinted these Proceedings for distribution to hospitals.

Present in a Symposium on Infectious Diseases at the Annual Meeting of the American Academy of Pediatrics, October 23, 1958.

ADDRESS: 561 South 17th Street, Columbus 5, Ohio.

TABLE
CONTROL OF STAPHYLOCOCCAL DISEASE IN NURSERIES*

<i>Principle</i>	<i>Procedure</i>	<i>Help for Infection Committee</i>
I. The majority of hospital-acquired staphylococcal infections in newborn infants develop <i>at home</i> after discharge from hospital.	Survey of <i>discharged babies</i> for lesions: a) by questionnaire b) by phone c) by routine culture	a) Proc. Nat. Conf. on Staph. Dis.† b) Proc. Nat. Conf. on Staph. Dis. c) Recommended only in special situations (e.g., post-epidemic)
II. <i>Myriads</i> of strains of coag. neg. staph. <i>Thousands</i> of strains of coag. pos. staph. <i>Many</i> highly virulent coag. pos. staph. <i>Few</i> epidemic strains of coag. pos. staph. <i>One</i> predominant strain of coag. pos. staph. (Antibiotic resistant, 80/81)	Culture, isolate, and <i>identify</i> staphylococci from lesions. Compare strains from lesions for identity.	Urge better hospital support of bacteriology laboratories. Use techniques recommended in Proc. Nat. Conf. on Staph. Dis. Use bacteriophage typing facilities of regional reference laboratory. (Ask your state health department.)
III. Newborns are usually infected by staphylococci acquired from <i>nursery personnel</i> —not mother.	Search for nursery personnel with minor and hidden staphylococcal <i>lesions</i> —match with infant's strains for identity. If epidemic strain has been identified, search for <i>this strain</i> in nasopharynx, etc. of personnel Remove only those <i>carriers</i> with strains of staphylococci identical with those from lesions in infants. Beware of systemic antibiotic treatment of <i>asymptomatic carriers</i> .	Ask internists to conduct "dermatologic" type of physical examination of personnel. Use techniques recommended in Proc. Nat. Conf. on Staph. Dis.
IV. In heavily contaminated environment personnel carriers play a <i>minor</i> role. In relatively clean environment personnel carriers play a <i>major</i> role.	Apply standard operating procedures for nurseries recommended by American Academy of Pediatrics. If in doubt, sample environment bacteriologically.	<i>Standards and Recommendations for Hospital Care of Newborn Infants**</i> Alter hospital structure only if necessary to comply with above recommendations. Good housekeeping need not be expensive and it can be documented. Use techniques recommended in Proc. Nat. Conf. on Staph. Dis.

* After Shaffer *et al.*: Staphylococcal infections in nurseries. *Advances Pediat.*, 10:243, 1958.

† Proceedings of the National Conference on Hospital-acquired Staphylococcal Disease, U. S. Department of Health, Education, and Welfare, Public Health Service, Bureau of State Services, Communicable Disease Center, Atlanta, Georgia, 1958.

** Standards and Recommendations for Hospital Care of Newborn Infants. Evanston, Ill., American Academy of Pediatrics, 1957.

eral lesions in different babies due to the same strain constitute an epidemic.

Routine cultures of babies at the time of discharge from newborn nurseries, we look upon as a research tool and not to be recommended for the usual staphylococcus committee. This is because one has to know what the epidemic strain is before one can look for it. The epidemic strain you are interested in is that brand of staphylococcus that is causing lesions in your nursery. It does not necessarily need to be one that has caused lesions in other nurseries or even the nefarious 80/81 strain.

The next principle upon which we have to operate is the principle that only a few uncommon strains of vigorous staphylococci,

which not only cause severe lesions, but also spread widely, are really apt to cause epidemics. These are the ones to look for. You can't concern yourself with all coagulase-positive staphylococci. If cultures of lesions all turn out to be due to different strains, you either are having incredible misfortune or probably dealing with a dirty nursery.

The determination of phage types of strains is a problem in most laboratories. It is not a routine hospital procedure, but the Public Health Service is establishing a centralized bacteriophage reference laboratory which will supply standard phages to about 15 regional phage-typing laboratories that will be set up as state laboratories.

Your own state health officer knows where the laboratory will be in your region. These laboratories will probably be operative soon. This will give you access to phage-typing facilities for the control of epidemics, but probably not for the supervision of the nursery at other than epidemic times.

Another principle is that the strains which cause lesions in the babies practically never come from the mother. A number of investigators have confirmed the fact that strains of staphylococci which are troublesome come from the hospital personnel. This means oftentimes great decisions as to what you will do about personnel carriers. In general you don't do anything about personnel carriers unless you are in trouble. You certainly don't eliminate carriers from a nursery simply because they carry coagulase-positive staphylococci.

Systemic treatment of personnel with antibiotics for the purpose of permanently eradicating carriage of specific strains of staphylococci is not particularly successful and should generally be avoided. Whether local treatment by lesser used antibiotics such as nasal sprays containing bacitracin or neomycin will be effective for this purpose remains to be seen.

The last principle is that, in general, it has been our conclusion, and the conclusion of most of the workers in the field, that if you have a heavily contaminated nursery you may not be able to detect the role of the personnel carrier. Most newborn nurseries, if operated according to the standards

published by the American Academy of Pediatrics, will not be in this category. In well-run nurseries that have staphylococcus problems, by and large you are apt to find that the personnel carrier is at the bottom of the problem.

The big question that develops from this last consideration is: How much attention do you pay to personnel carriers in comparison to the attention paid to housekeeping procedures? There are all sorts of proposals being aimed at hospital infection committees at the present time. Many of these proposals promise fantastic results in the eradication of staphylococcal problems. Germicide manufacturers, air-conditioning concerns, even hospital architects, are anxious to sell their products or services to provide relief from staphylococci. In many cases no distinction is made as to whether they are concerned with pathogenic staphylococci or all staphylococci. My conclusion about this is: Keep a clean house. See that your nursery meets the standards published by the American Academy of Pediatrics. Know whether babies are acquiring staphylococcal disease after they go home. If they are, culture the lesions and identify the strains of staphylococci and compare them to see if they are identical. If they are, find out where that strain is coming from and stop the dissemination at its source. Most hospital nurseries in this country give creditable performance year in and year out. Be sure yours does.

STAPHYLOCOCCAL INFECTIONS

Warren E. Wheeler
Pediatrics 1959;23:977

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/23/5/977>

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://www.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

STAPHYLOCOCCAL INFECTIONS

Warren E. Wheeler

Pediatrics 1959;23:977

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/23/5/977>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 1959 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

