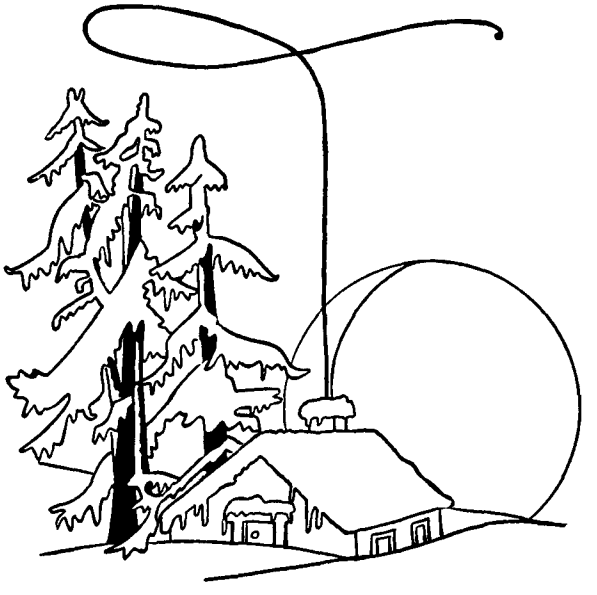
Staff Meeting Bulletin
Hospitals of the ★ ★ ★
University of Minnesota



Staphylococci In Urine

Volume XII | Friday, December 20, 1940 | Number 10

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
UNIVERSITY OF MINNESOTA

Volume XII | Friday, December 20, 1940 | Number 10

INDEX

Published for the General Staff Meeting each week during the school year, October to May, inclusive.

Financed by the Citizens Aid Society.

William A. O'Brien, M.D.

I. LAST WEEK

Date: December 13, 1940

Place: Recreation Room
Powell Hall

Time: 12:15 - 1:00 P.M.

Program: Movie: "Bill Posters"

Hazards of the Inlying Catheter
Baxter A. Smith

Discussion
C. D. Creevy
M. Levine

Present: 148

Gertrude Gunn
Record Librarian

- - -

II. MOVIE

Title: "Sea Scouts"

Released by: R-K-O

- - -

III. ANNOUNCEMENTS

1. MARRIED

William M. Bogart and Bertha Johnson, Clifton Forge, Virginia, November 9th.

Congratulations!

- - -

2. BIRTHS

To Dr. and Mrs. E. James Brady, a son, Dennis James, December 15.

To Dr. and Mrs. Alex Kugler, Physician, Health Service Staff, twin daughters recently.

Congratulations!

3. HOLIDAY SCHEDULE

Wednesday - Nurses' Party

Thursday - Surgery Party

Friday - 3:00 to 5:00 - Staff Party, Nutrition Clinic

Saturday - Wrapping presents - Traffic Club

Monday - Traffic Club dinner and decoration of tree.

Tuesday - 2:00 P.M. Children's Party - Powell Hall

Wednesday - Christmas Carols - Choir of North High School

- - -

4. NEXT MEETING

Friday - January 10, 1941.

Same time - same place.

- - -

M E R R Y C H R I S T M A S

HAPPY NEW YEAR

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IV. STAPHYLOCOCCI IN URINE

Milton Levine
W. P. Larson

The ubiquitous distribution of staphylococci on the skin of man has stood in the way of a more rapid solution of the problem of the relationship of this organism to the lesions with which it is associated. From the lesions of furunculosis and osteomyelitis, the organism may be isolated repeatedly in pure culture, and its etiological significance in these diseases cannot be doubted. Furthermore, in infectious foci closed to the outside of the body, and in infections of the kidney from which it is constantly isolated and where the clinical symptoms of abscess are clear, its role is also definite. However, in infections of the eye, ear, nose, throat, cervix, vagina, urethra, lungs, and in urinary infections not associated with clinical symptoms of nephritis, its significance may be difficult to prove because of the presence of the staphylococcus in these areas in normal individuals. Add to this the factor of contamination, which looms as a barrier to the acceptance of the organism as a causative agent even when isolated from the blood or viscera, and the problem becomes more involved. The possibility of contamination assumes greater importance when we consider that the organism is the most common skin and air contaminant.

Working on the assumption that not all staphylococci are capable of producing infection, the bacteriologist has directed his research toward uncovering those characteristics of the various species which might be utilized in differentiating between the strains causing infection and the harmless saprophytes and parasites. It is obviously impossible to set up distinct divisions of pathogens and nonpathogens, since there must be, as in all other species, intermediary types. Nevertheless, if progress is to be made, we must start with arbitrary criteria, and these have included pathogenicity for experimental animals, and source of the organism. In almost all cases, these two factors correlate to a high degree. Strains isolated from unquestionable staphylococcus lesions in the human are infectious for rabbits when injected by any one of a number of routes. Thus either or both of these criteria are useful in evaluating diagnostic tests.

Until recently, most workers have stressed pigment formation as a property indicative of species differences associated with pathogenicity. Staphylococcus aureus, producing a golden endopigment, was thought to be the cause of most staphylococcic infections. The albus strains were considered less pathogenic, and the citreus harmless, although in isolated instances this lemon-yellow organism has been considered the causative agent. Two factors interfere with the accuracy of pigment estimation: the obvious fallibility of the subjective evaluation of color, and the variation occurring in formation of pigment. The first is evident to anyone who has attempted to distinguish between a light yellow citreus and a light aureus, or between either of these and the yellow saprophytic auranticus. The formation of the pigment itself is slow and requires, at times, special media. For example, strains grown on blood agar plates may never show pigment, although the same strains form pigment on nutrient agar slants. However, preparations on agar slants or on special media usually are time-consuming, and the discouraging results in the interpretation of pigment, as previously mentioned, precludes the routine use of chromogenesis as a diagnostic procedure.

Hemolysis has also been offered as a criterion of pathogenicity. Of the two methods employed in testing for hemolysis, namely, the use of blood agar plates, and the use of bacterial washings added to suspensions of red cell, the former is inadequate. The ability of the organism to form a soluble hematoxin is in no way related to its hemolytic action on blood agar plates (1). Cruikshank (2) has demonstrated that saprophytic staphylococcus strains may cause hemolysis in rabbit blood agar plates without producing a soluble hemolysin, and suggests a pro-

cedure in which 1 cc. of saline is added to a 24-hour agar slant culture. The mixture is permitted to stand for from 2 to 3 hours, and is then pipetted off, centrifuged, and titrated against 3 per cent rabbit cells. Using a method similar to this, Glenny and Stevens (3) have demonstrated two distinct hematoxins, the α-hematoxin, frequently characteristic of human pathogenic strains, and β-toxin which may be produced by human, but are more often formed by animal strains of the organism. The two may be separated by testing against sheep and rabbit erythrocytes. The α-toxin is active against sheep and rabbit cells, the β against sheep cells only. Human corpuscles are hemolyzed by both types of toxin.

Sollman (4) has reported that 91 per cent of 480 strains of staphylococci from nasal mucous membranes hemolyzed human blood agar, but that only 67 per cent of these were potentially pathogenic. Chapman, et al (5) found that only 75 per cent of coagulase positive strains were hemolytic on rabbit blood agar. In a series of 350 air strains isolated by us, none were coagulase positive, but 42 per cent were hemolytic on 5 per cent human blood agar.

Undoubtedly the soluble hematoxin plays a role in pathological processes, but since it is characteristic of only a portion of the pathogenic strains, it cannot be used exclusively in diagnosis. Chapman (6) has suggested that hemolysis be considered as a test supplementary to the coagulase and pigment reactions. He states that "hemolytic non-coagulating albus strains are probably nonpathogenic, but hemolytic aureus strains are usually pathogenic, regardless of coagulase." Acceptance of this premise will depend on further experimental work with the red cells of various species. Other toxins of the staphylococcus have been studied in relation to the lesions formed, but they have not been studied extensively for the purpose of tagging the pathogenic strains. It is very likely that the enterotoxin, the lethal toxin, and the dermonecrotoxin are characteristic of only some of these strains. Finally, the need for animals in the identification of these toxins places their routine use beyond the reach of most clinical laboratories.

Fibrin liquefaction has been studied in a large number of bacteria, including staphylococcus. In the latter, it appears to be predominantly a property of the pathogenic strains. However, this statement is not accepted by all investigators, and therefore fibrinolysis cannot, as yet, be used for the determination of pathogenicity. Tillett and Garner (7), Fisher (8), and Neter(9) reported that few human strains liquefy plasma clots. Fisher found that the number of pathogenic fibrinolytic strains increased when a fibrinogen clot was used. Neter suggested that the anticoagulant property of some strains be considered along with the fibrinolysin. Madison (10) was very successful with the test, reporting that 90 per cent of the strains isolated from "internal lesions" dissolved human fibrin clots, whereas 77 per cent of those isolated from superficial lesions did not. Differences in technique may account for the variation in results. Neter used plasma clots while Madison employed a serum-free fibrinogen gel. Here again further study is necessary before routine adoption of the test.

Passing over staphylococcus leucocidin because of the difficulties encountered in studying this factor, we come to that property of the pathogenic staphylococci which has given the most clear-cut results in identifying the pathogenic members of the genus, namely the production of staphylocoagulase. Loeb in 1903 (11) demonstrated that goose plasma could be clotted by inoculating it with staphylococcus aureus. This observation was confirmed, and extended by later workers to include the plasma of other species. At the same time, many investigators described an increase in clotting capacity of blood taken from patients suffering from staphylococcus infections. Since then it has been established that both aureus and albus strains have the ability to clot plasma, and that this ability correlates to a high degree with the pathogenicity of the organism.

The exact mechanism involved in the clotting of the plasma is in doubt, and little is known about the actual factor involved, the staphylocoagulase. Gross (12) found it in broth culture filtrates. Fisher (13) reported it only partially destroyed by heating to 100°C. for 1/2 hour. Walston (14) attempted to get at its chemical structure by fractionation, and reported coagulase to be insoluble in alcohol, acetic acid, and half saturated ammonium chloride. Those who tried to test its antigenicity arrived at conflicting and incomplete conclusions.

Rabbit and human plasma have both been used with varying testimonials as to their relative merits. In general, both are acceptable, although human plasma is capable of picking up a larger percentage of pathogenic strains. Dog plasma has been employed with some success, but cow plasma has proved unsatisfactory. As to the merits of the test, Blair (15) states, "The value of the coagulase reaction has been established in identifying staphylococci of potential pathogenicity. Its close association with pathogenicity is evident from reports of a correlation of better than 96 per cent, with a corresponding lack of ability to coagulate plasma on the part of non-pathogenic staphylococci. This correlation, the persistence of the reaction when other in vitro properties are lost, and its simple technique make it a readily performed, reliable laboratory procedure of undoubted value." Our own experience with the test has led us to report all cultures of staphylococcus as either coagulase-positive or coagulase-negative. We have omitted reporting the hemolysis or pigment reactions because of their unreliability on the 5 per cent human blood agar medium used routinely in our laboratory. It is, however, possible to include reports of hemolysis in cell suspensions or pigmentation on special media, where such information is vital for supplementary identification of the organism.

Despite the value of the coagulase test, it is not widely used because of difficulties in technique. Taking into consideration both time and accuracy, our procedure has proved very satisfactory. Material submitted to the laboratory is cultured on blood agar plates, liver peptone broth, brain broth, and, where Gram negative rods are suspected, on Endo's agar. If staphylococci are found on both the liquid and solid media, a colony is transferred from the plate to a nutrient agar slant. If all the colonies have the same morphology, only one colony is picked; if not, a colony of each type is picked, and transferred to a slant. These are then incubated for 12 hours, after which time a loopful of the culture is transferred to the plasma.

Human plasma has been used both full strength and in saline dilutions of 1 to 3 and 1 to 10. We find that both dilutions work equally well. Small amounts of sulfanilamide in the plasma (1.5 grams per 500 cc. of whole blood) do not seem to interfere with the test. Plasma must be fresh and must be tested against control strains. Plasmas have been encountered which did not clot when inoculated with known positive strains. We have also discovered that plasma more than one week old gives unreliable results. The diluted plasma is pipetted sterilely into small tubes, one-half cubic centimeter of the fluid being adequate. The test is read after six to eight hours incubation at 37°C. At that time any semblance of a clot is read as positive, since there is no known relationship between the size of the clot and the degree of pathogenicity of the organism. After this initial reading, the tubes are incubated at room temperature for 6 to 8 hours, and examined again. Time is an important factor in the test. The early observation uncovers those strains which may later dissolve the initial clot with fibrinolysin. The later examination will pick up those strains which form a clot slowly. The majority of cultures form a clot in six hours, which clot then persists for at least 14 hours. Some staphylococci, within 14 hours, will liquefy the clot formed at 6 hours.

The error introduced by contamination is minimized by microscopic exam-

ination of the growth on the agar slant. Contamination of the plasma is rare, since few organisms will grow appreciably in diluted plasma within the time limits of the test. Some difficulty may arise from confusing a slight clot with a clump of sedimented bacteria. The latter break up with gentle shaking, whereas the clot retains its form. The clot usually floats on the surface of the plasma, while the sediment sinks to the bottom. The test is now used routinely on all staphylococci isolated in the Bacteriological Laboratory at the University Hospitals. In almost all cases, there has existed a very high correlation between the type of lesion and the results of the pathogenicity test. Where the causative organism is in doubt, results have been obtained which offer excellent material for a reconsideration of the role of the organism in chronic infections, acute urinary and wound infections, as well as in infections of the eye, ear, nose throat and other organs. Occasionally the test has been inadequate in itself. In one such case, coagulase positive staphylococci were isolated repeatedly during life, but post-mortem specimens yielded only a coagulase negative aureus strain. Despite the relatively high degree of stability of the coagulase reaction, variation must undoubtedly occur, as shown by this example.

A brief examination of the data on blood cultures taken during the period from June 1 to October 1, 1940, raises a question which must be considered in any study of staphylococcus infections, namely the importance of contamination as an explanation for the presence of organisms in the lesion concerned. Of 604 cultures taken during this time, 34, or 5.6 per cent, were coagulase positive, and 97, or 16.6 per cent, were coagulase negative. The 34 positive strains were isolated from 20 patients, whereas the 97 negative strains were cultured from 82 patients. The number of times each patient yielded a positive blood culture is demonstrated in the following table.

Staphylococci in Blood Cultures

Number of cases showing positive coagulase test	Number of isolations per case	Number of cases showing negative coagulase test	Number of isolations per case
2	5	3	3
2	3	11	2
2	2	68	1
14	1		
20		82	

Statistically, the results obtained for the coagulase positive and the coagulase negative strains are very similar. Assuming that the coagulase negative organisms are nonpathogens, and probably skin or air contaminants, must we then conclude that the positive strains arise from the same source? Whereas the former are ubiquitous on the skin of man, and in the air in the vicinity of man, this is not at all true of the positive strains. They may be isolated from the skin, but not consistently. Using the skin-plate technique of Novak (16), we found that most individuals yielded only coagulase negative strains. A few, notably those with a staphylococcus dermatitis, either chronic, healed, or of recent origin, carried coagulase positive cocci on the skin. Our work, as well as that of other investigators, on the flora of the air, indicates that less than 1 per cent of the staphylococci are potential pathogens.

In addition to the air and the skin, nasal and oral spray may be an important factor in accounting for coagulase positive contaminants on blood culture. More than 50 per cent of normal nose and throat cultures yield coagulase positive staphylococci. However, streptococci are even more numerous on normal throats and yet rarely do we find streptococcus contaminated blood cultures, which may indicate, on the contrary, that spray is not important as a source of contamination. The only other alternative to contamination as an explanation for most of the positive staphylococcus blood cultures is Spink's (17) contention that transient bacteremia, secondary to a primary focus in any part of the body, may account for most positive blood cultures.

Our prime interest in studying the pathogenicity of staphylococci was for the purpose of clarifying the role of staphylococci in urinary infections. Although the pathogenesis of staphylococcus abscess of the kidney is well known, relatively little is known about the significance of the staphylococci isolated from the urine in cases where abscess is not definitely diagnosed. Hellstrom (18) states the difficulty by repeating a quotation from Young (19): "There is no way in which we can divide the staphylococci which gives us the least useful information concerning source, pathogenicity, or treatment. The classic differentiation by means of pigment production, into aureus, albus, etc., is of no practical value. Staphylococcus albus is just as apt to be virulent as staphylococcus aureus." Hellstrom attempts to clarify this by an opinion to the effect that "staphylococcus albus as a rule produces milder infections in the urinary passages than does staphylococcus aureus."

In approaching this problem, we adopted the coagulase test as a routine procedure in the identification of all staphylococci isolated from the urinary tract. By means of this test, we have been able to separate the pathogenic from the non-pathogenic forms, so that an evaluation of their significance in urinary tract infections is now possible. Our intention has been to find a common factor to account for infections with coagulase-positive organisms, especially where bacteruria is the only manifest urinary symptom, and also to assess the importance of the non-pathogenic strains under similar conditions. Sixty-two cases giving coagulase-positive cocci were studied in detail in an attempt to correlate the presence of this organism in the urine with foci either in the urinary tract, near the tract, or at some distance from the tract. In the case of foci in the urinary tract, we assumed direct passage of the organism from the primary focus into the urine, with a resulting bacilluria. In the case of infections close to the urinary tract, in the region of the rectum or pubis, we assumed that the most likely method of spread would be by direct passage from the wound to the urethra, although there are a number of investigators who feel that the lymph channels in the area may spread the infection. In the last case, where the focus is at a distance from the urinary tract, it may be assumed that the organisms spread through the blood stream to the kidneys, and then into the urine, causing a bacteruria.

Of the 62 cases, those having potential foci directly in the urinary tract included 13 cases of benign prostatic hypertrophy. These represented 21 per cent of the cases, which were not a selected series, but were picked consecutively from routine laboratory cultures. In trying to incriminate the inflamed areas of the prostatic tissue as a source of the pathogenic staphylococci, we cultured a number of specimens of prostatic punch material obtained by Dr. Creevy. Although the study has not been completed, we are able to say that the tissues yielded a large variety of organisms including coagulase-positive staphylococci, so that it is quite logical to hypothesize that continued catheterization, which is common in such conditions, introduces the organism into the urethra, and from there it finds its way into the inflamed tissues, where it multiplies and spreads to the urine.

In the group having foci of infection in the urinary tract, there were eight cases of hydronephrosis, which condition has been thoroughly investigated, and is known to be associated with infections due to the staphylococcus and other organisms. Also included in this group are individual cases diagnosed as prostatitis, periurethral abscess, polycystic kidney, perirenal abscess, renal calculi and carcinoma of the prostate, urethra or bladder. The traumatized or inflamed tissue present in all these cases offered an excellent nidus for the spread of the staphylococci to the urine.

Among the cases displaying foci in the area near the urinary tract, we find colostomy as the predominant predisposing condition. Here post-operative wound infections may well be the source of the pathogenic staphylococci which spread to the urine. Finally there are a number of cases with foci of infection at a distance from the urinary tract. Among these, we find one case of mastoiditis which showed pathogenic staphylococci in the urine on the day following mastoidectomy. Since a great deal of work has been done which indicates that a bacteremia may occur after operations on infected areas, we may consider the possibility that the kidneys filtered out a few of the organisms from the blood, and a bacilluria resulted. One other case yielded the organism in the urine following the development of a wound infection subsequent to cholelithiasis. Another gave repeated positive cultures over a period of two months (the period of observation) during a siege of osteomyelitis in one of the extremities.

The repeated isolation of the organism from the urine in cases with symptoms of kidney involvement, is suggestive of abscess of the kidney. Two patients, on whom a diagnosis had not been made, suggested this condition, although it was not possible to confirm it. One had a suspicious history of nephritic abscess nine years before, and complained of a marked pain in the sacral region, but had negative findings on the urogram. When last examined, the patient yielded repeated positive cultures for pathogenic staphylococci. This case is still under consideration. The other individual gave a history of frequency, dysuria, and lumbar pain, with repeated positive urine cultures for pathogenic staphylococci. A follow-up on this patient was not possible, and no definite diagnosis was made.

The presence of the non-pathogenic strains of staphylococci in the urine offers an excellent opportunity for speculation on the general subject of pathogenicity and infections of the urinary tract. It is one part of the body where organisms which are non-pathogenic in the usual sense of the word lose their innocuous nature and give rise to pathological processes. To label an organism as a non-pathogen is difficult. Although under most conditions it will be noninvasive, there may be times when it does become invasive. The best example of this is Escherichia coli. In the intestinal tract, it is harmless; and in fact, there are those at the present time who are reviving the old theory of bacterial antagonosms, and who feel that E. coli may even play a beneficial role in the intestinal tract in keeping down intestinal pathogens. However, we also know that this organism

will cause infections in all parts of the body, especially in children, and its importance in peritonitis cannot be doubted. This organism probably is the most common bacterial invader of the urinary tract, where in most cases it causes a simple bacilluria, although it has been known actually to invade the tissue to form abscesses in the tract. Although more often than not it is a non-pathogen, it must be considered a potential pathogen.

Bacillus pyocyaneus is not uncommon in the urine, and is thought to be an organism introduced primarily by catheterization. Its degree of pathogenicity to man was formerly thought to be slight. Older writers ascribed to it the properties of a secondary invader growing in the pus of wounds and in purulent secretions of the pharynx. However, the organism has been shown to be pathogenic to experimental animals and occasional infections in humans have been reported. New-born infants occasionally develop a septicemia after infection of the naval by this organism. Bacillus proteus is another example of an organism introduced by catheterization which is non-pathogenic under most conditions, but is capable of causing infection in any part of the body.

A few organisms responsible for urinary infections have not been proven to be pathogenic at any time. Most important of these, from the point of view of frequency of occurrence, are the diphtheroids, yeasts belonging to the genus Saccharomyces, and in our opinion, the coagulase-negative staphylococci. Repeated attempts to cause infections by injecting the yeasts and staphylococci have failed, whereas the diphtheroids have been reported to cause local lesions in the skin but only after repeated injection. The action in urine of these organisms as well as the action of those organisms which are potential pathogens must be due to irritating excretion products of the bacterial cell, although there is no reliable experimental work on the subject. In many instances these organisms may prove harmful because of the formation of irritating substances from the urine, and the formation of calculi. Organisms causing an alkaline reaction in the urine will cause the precipitation of the urates, phosphates, and carbonates, and this condition is said to be conducive to stone formation. Our own work on the coagulase-negative staphylococci has uncovered the fact that the majority of such strains produce an alkaline reaction in sterile urine in vitro.

The statistics on the occurrence of staphylococci in a series of 1659 specimens of urine submitted to the laboratory from June through October, 1940, follow:

Number of urines cultured	1659		
Number showing staphylococci	425	or	25.1%
Number showing coagulase positive staphylococci	70	or	4.2%
Number showing coagulase negative staphylococci	281	or	17.0%
Specimens on which coagulase test was not performed	74	or	3.9%

Of the 351 cultures yielding staphylococci on which the coagulase test was done, 80 per cent were coagulase-negative, and 20 per cent were coagulase-positive.

Following are the results on specimens obtained directly from the kidney:

Number of specimens cultured	229		
Number showing coagulase-positive staphylococci	5	or	2.1%
Number showing coagulase-negative staphylococci	17	or	7.4%
Number on which coagulase test not performed	10	or	4.3%
	32	or	13.8%

There is no way of comparing the above

results with those of other workers, since in most cases their criterion of pathogenicity was pigment formation alone. The aureus strains were considered pathogenic, and in most cases correctly so, whereas the albus strains were either disregarded as being non-pathogenic, or were looked upon as being as pathogenic as the aureus forms. Young (19), in his series of 356 cases of urogenital infection, found staphylococci in 49.1 per cent of these. This was only slightly less than the incidence of the coliform group in infection, which occurred in 51.7 per cent of the cases.

Before going further it might be well to review the bacteriological procedures employed in examining urines for the presence of bacteria. We culture specimens on 5% human blood agar plates, on eosin-methylene-blue or Endo's agar plates, and in liver peptone broth. The blood agar plates are important in the differentiation of the streptococci, and in the isolation of all organisms other than the Gram negative rods, which are more conveniently isolated from the Endo's agar. The liver peptone is able to pick up anaerobes as well as organisms which are present in small numbers, and which therefore do not appear on the plates. The customary procedure is to inoculate the plates with a loopful, and the liver peptone with 1 cubic centimeter of the urine. These were the methods used in the series listed above.

The high percentage of coagulase-negative organisms, however, suggested the possibility of contamination as a factor in such cases. It was finally decided that examination of the urine sediments would aid in the evaluation of their significance when isolated from the urine. The use of urine sediments in bacteriological diagnosis is not new, but in most cases the sediment has been used as the sole source of information as to the organism involved. Hellstrom has labeled Gram negative rods seen in the sediment as E. coli or B. pyocyaneus without any substantiating tests, a procedure which seems inaccurate to a bacteriologist, but which is utilized quite widely by some urologists. It is possible to differentiate the streptococci from the staphylococci, and these in turn from the Gram negative and positive rods, but it is impossible to identify any of these organisms by sediment examination. However, in our opinion, the sediment is very useful in determining whether the organism is causing a bacteruria. Thus, if the organism is isolated on the liver peptone and is not seen in the sediment, we may conclude either that it came from a focus of infection somewhere in the urinary tract without growing in the urine itself, that it was filtered out of the blood stream by the kidneys without growing in the urine, or that it is a contaminant. If the organism has invasive powers, it is difficult to tell which is the case, but if the organism is non-invasive, as we believe is the case for the coagulase-negative staphylococci, then its presence in the liver peptone and not in the sediment is indicative of contamination.

With this in mind, we have examined the sediments of all urines submitted to the laboratory for culture. This was started after our first data had been collected, but since consecutive cultures were used in both cases, and selection avoided, we feel that the two series are comparable. The following table includes 286 specimens of urine submitted to the laboratory from November 1 to November 25, 1940:

	Number of positive specimens	Percentage of total
Staphylococci in the urine	57	20.0
Staphylococci in the sediment	19	6.6
Coagulase positive staphylococci in sediment	6	2.1
Coagulase negative staphylococci in sediment	13	4.5
Coagulase negative in culture only	35	12.2
Coagulase positive in culture only	3	1.2

From the above it is evident that in only a fraction of the sediments are staphylococci seen. In the case of the coagulase positive forms, the possibility of foci in the urinary tract may account for organisms being present in such small numbers that they are not seen in the sediment. However, the coagulase-negative strains are important only in a bacilluria and, when not present in the sediment, must be labeled as contaminants. If we do so, we find that the number of infections with this organism is markedly decreased. Using this same procedure on infections with the coliform groups (E. coli, A. aerogenes, and intermediates) in the same series of 286 urines, we obtained the following figures:

	Number of specimens	Percentage of total
Coliform in urine	62	21.7
Gram negative rods in sediment	56	19.6
Coliform in culture only	6	2.1

Total: 286 specimens of urine.

The data for the coliform group act as a partial check on technique. If the absence of organisms in the sediment were due to faulty technique, we would expect to find the same distribution for the coliform group as for the staphylococci. That this is not the case is obvious. From the figures it is evident that the coliform group, as found in culture and sediment, is far more prevalent than staphylococcus in the urine, and that only occasionally are coliform organisms found in culture but not in the sediment. A few specimens show staphylococci in sediment but not on culture, a condition which has been observed by other investigators. This may be due to the fact that the organisms seen in the sediment are dead, or that growth may be inhibited by antiseptic substances carried along in the urine.

Summary

A practical test is discussed for routine use in differentiating pathogenic from non-pathogenic staphylococci in the urine. The importance of pathogenic staphylococci in the urine is discussed with emphasis on associated foci of infection. The value of the bacteriological examination of the sediment in conjunction with cultural methods in the diagnosis of bacteruria due to coagulase-negative staphylococci is discussed.

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Philadelphia, 1927.

V. GOSSIP

Word from Radiologist Jack Sagel, of Gary, Indiana, indicates that he enjoyed the football season immensely. He belongs to an organization known as the Gary Gophers. Although there are only four members, they make up in volume what they lack in numbers - Maury Fadell, sports editor of the Minnesota Daily in 1926 and 1927, Frank Mooney, graduate of the School of Mines, 1923, now with the U. S. Steel Corp., W. P. Cottingham, City Engineer, graduate in Engineering in 1911, and Jack, himself. The Gary paper, commenting on the meeting of the Minnesota Club in the Chicago District, made the following statement: "The Gary contingent reported that the alumni group is ready 'to let the whole world know that at Minnesota they still play football the old-fashioned way and still count victories and defeats according to figures on the scoreboard at the end of the game.'"....Dr. Lloyd Cullimore, of Provo, Utah, one time special Commonwealth Fund student in obstetrics and pediatrics, remembered his hospital friends with generous gifts of Pascal celery. The boxes contained modest descriptions of how good the celery really was when grown in the particular part of Utah from which it came. There is no mistake about this and we are very grateful to Dr. Cullimore for sending it to us....Urologist C. Donald Creevy is in New York this week to address the New York Academy of Medicine on the subject of Bacillus Proteus and Urinary Calculi. This work which was reported here last week is attracting a great deal of attention....The program today is in charge of the division of Bacteriology, a comparatively recent development in this hospital. The original activity along this line was in charge of pathologist Rudolph W. Koucky, now in charge of the laboratory at St. Mary's, Abbott, and Eitel Hospitals. Prior to that time we had some bacteriological service but it was not well organized. Since then, the division has grown until it is an important part of our institution. With the development of a blood bank it was necessary to move the unit from the regular laboratory location to the main entrance of the Hospital in order to expedite blood grouping, matching and collection of blood. Dr. Novak, who was the immediate successor of our present Bacteriologist is now connected with the University of Illinois. The work which he started here is now attracting national attention. It goes without saying that a good active clinical bacteriological service is an important hospital asset. An orchid to the chief, W. P. Larson, who is unable to be here today because his son is being married.. ..The old Christmas Spirit is with us at last. When we were youngsters getting ready for Christmas and hoping that it would come is no longer with us. Today it has become a definite program. At the stores, I am told that they have special departments where men are known to go at the last minute to buy things. These departments are anticipating the last minute rush and stocks and personnel are being prepared for Monday and Tuesday.. An organization which gets a kick out of Christmas is the Traffic Club which takes care of our patients. These people, largely employed by railroads, do things in a big way. Every hospital patient receives a gift. The children get two from Santa Claus, one of which represents their own request. Santa Claus has a big party for them on the day before Christmas. This year C. J. Royce, of the Green Bay and Western Lines, will do the trick. There will be a magician, music, and movies. Another feature will be the visit of Santa Claus to those children who cannot be taken to the party in Powell Hall. The adult patients receive a basket of fruit with a cheery Christmas message on Christmas morning. The Traffic Club has given us the Christmas tree decorations for the annual event. On Monday evening after the dinner, the trees will be decorated. After the Christmas holidays the decorations are put away for another year. This remarkable program has been carried out for years in a most efficient manner with the result that most of our patients have, for the first time, a fuss made over them.....A last minute suggestion to everyone:- Please order as little work as possible on Christmas. Some years research programs have actually been started on Christmas. Be scientific the rest of the year, but be a little sentimental for a few hours.....

Merry Christmas!