Malpresentations, being more frequently overlooked, are more apt to be allowed to persist and therefore greater care is needed in abdominal examination to prevent this. Where there is doubt concerning the presentation of the foetus after the 34th week it is advisable to carry out x-ray examination. Likewise, because such malpresentations are more difficult to correct in the obese subject, it is more often necessary to employ anaesthesia during corrective manipulation. In labour greater use should be made of vaginal examination if such malpresentations are not to be missed.

It was Sheldon (1949) who pointed out that after each pregnancy there was apt to be a progressive gain in weight; hence the importance of following these patients up in the puerperium and later. It is probably not a good thing to recommend strict dieting to a mother who is breast-feeding, but once this has finished a strenuous effort should be made, both by exercise and by dieting, to get a return to normal weight. Even while breast-feeding the *status quo* can be maintained if a liberal but controlled diet is given.

Finally, let it be said that obesity, although such a common condition that it is too often taken for granted, should be recognized as a disease and as a disease which during the reproductive phase of a woman's life may have disastrous results both to the mother and to her child. It is, however, a condition which can be cured or at least which can be controlled given sufficient will-power on the part of the patient and an equal amount of perseverance on the part of her medical attendant.

Summary

From the case notes of 3,000 consecutive deliveries, 1,145 were found suitable for a study of how obesity could complicate pregnancy.

One in five patients of those investigated were regarded as overweight according to the criteria accepted for the purpose of the investigation.

The results show that where obesity is present pregnancy is much more likely to be attended by essential hypertension and pre-eclamptic toxæmia; breech presentations are diagnosed less frequently, and when diagnosed are less amenable to correction; also ante-partum haemorrhage occurs more frequently.

Labour is induced more often in such patients, is more likely to be prolonged, and often results in delivery either by forceps or by caesarean section. Haemorrhage in the third stage is also more common.

Foetal loss is much higher in these patients; their infants are larger and breast-feeding fails more often.

Some suggestions are made for the management of obesity when associated with pregnancy.

REFERENCES

- Armstrong, D. B., Dublin, L. I., Wheatly, G. M., and Marks, H. H. (1951). *J. Amer. med. Ass.*, **147**, 1007.
 Browne, F. J., and Dodds, G. H. (1939). *J. Obstet. Gynaec. Brit. Emp.*, **46**, 443.
 Leitner, Z. A. (1955). *Report of the 3rd International Congress of Nutrition, Amsterdam, 1954*, p. 83.
 Lowe, C. R. (1961). *J. Obstet. Gynaec. Brit. Emp.*, **68**, 622.
 Sheldon, J. H. (1949). *Lancet*, **2**, 869.
 Sinclair, H. M. (1953). *Brit. med. J.*, **2**, 1424.
 Stewart, A., and Hewitt, D. (1960). *J. Obstet. Gynaec. Brit. Emp.*, **67**, 812.
 Williams, C. D. (1957). *Brit. med. J.*, **1**, 1338.

STAPHYLOCOCCUS PYOGENES AND THE BARBER'S SHOP

BY

KEVIN ANDERSON, M.D., M.R.A.C.P.
M.C.P.A.

Medical Bacteriologist

FRANCES McDONALD, B.Sc.

Graduate Assistant

AND

L. M. PRYOR

Health Inspector

From the Institute of Medical and Veterinary Science and the Department of Public Health, Adelaide, South Australia

The public may be exposed to pathogenic staphylococci from a number of sources during normal daily activities. Nisbet and Skeoch (1949) found that 20% of bank notes examined by them were contaminated with pathogenic bacteria, including haemolytic streptococci and *Staph. pyogenes*. Ward and Tanner (1921), studying the bacteriology of coins, found only spore-bearing organisms, and concluded that the toxic action of metallic surfaces accounted for the absence of common pathogens. The importance of these findings will relate to the circumstances under which contact takes place, and in many instances there will be little danger to public health.

The part played by friction and minor traumata in the initiation of staphylococcal skin sepsis has been well established since the original observation of Garré (1885). We have been impressed by the number of patients who complain that crops of boils or furuncles appear after a visit to the barber. The high incidence of staphylococcal lesions on the head and neck make it likely that the barber's instruments will become heavily contaminated during the course of a day's hair-cutting. The large number of customers passing through the shop in quick succession permits widespread transmission of the organisms, while the friction and minor skin traumata associated with hair-cutting may initiate active sepsis.

Present Investigation

This investigation was undertaken to determine the extent to which hairdressing establishments may be responsible for the spread of staphylococcal sepsis among the general public. It was further designed to test the efficiency of antibacterial measures that are commonly adopted for the protection of the customer.

Scope of Investigation.—A total of 197 shops were visited over a period of three weeks. Approximately equal numbers of male and female hairdressing establishments were examined (109 male, 88 female), and these were widely scattered over the city and suburban areas (see Fig.). Testing was carried out during the course of a routine inspection by the Department of Health, and, in addition to bacteriological investigations, records were made of the general state of cleanliness of the premises and of the methods, if any, used to clean and disinfect instruments after use.

Materials and Methods.—Cotton-wool swabs, moistened in nutrient broth, were taken from a variety of instruments, brushes, and other equipment. Towels and cloths were examined by the percussion

technique, using a 200-g. weight dropped through a distance of 25 cm. on to an area 9.8 cm. in diameter. All cultures were made on blood-agar medium incubated at 37° C. for 18 hours. Colonies showing suspicious pigmentation were tested for coagulase production by

Map of Adelaide and suburbs showing: ●, uncontaminated barber's shops; X, contaminated shops. A=Royal Adelaide Hospital. E=Queen Elizabeth Hospital.

the slide technique of Cadness-Graves *et al.* (1943). Antibiotic sensitivity was determined by the disk diffusion method of Morley (1945), and bacteriophage typing was routinely carried out by one of us (F. McD.) using the technique of Williams and Rippon (1952). Gram-negative bacilli isolated from a variety of antiseptic solutions were tentatively classified by standard biochemical tests, and strains of *Pseudomonas pyocyanea* were identified by pyocyanin and fluorescein production when grown on an agar medium containing 0.2% of KH_2PO_4 and 0.03% of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$.

Results

General Incidence of Pathogenic Staphylococci.—Of the 197 shops examined, coagulase-positive staphylococci were isolated from 39 (19%). The incidence of contamination in male hairdressing shops was at least twice that detected in female shops. A total of 109 in the former category yielded 30 positive investigations (27%), while of 88 female shops only 9 were positive (10%). The extent of contamination within any given shop is shown in Table I.

TABLE I

No. of articles contaminated	1	2	3	4
" " shops	27	8	3	1

Geographical Distribution.—The shops from which positive isolations were obtained are shown in the Figure. There appears to be no significant geographical distribution, the incidence relating to the total number of shops examined in each area.

Contamination of Individual Instruments.—The distribution of pathogenic staphylococci amongst instruments used in hair-cutting is shown in Table II.

TABLE II

Item	Total No. Examined	No. Contaminated with <i>Staph. pyogenes</i>	Percentage
Scissors	252	8	3
Clippers	240	10	4
Hairbrushes	203	12	6
Neck	160	2	1
Combs	188	2	1
Razors	136	2	1
Strops	81	1	—
Shaving brushes	110	2	2

Contamination of Towels and Cloths.—Of 99 towels examined, 4 yielded pathogenic staphylococci. Of 156 neck cloths, 11 (7%) were positive.

Contamination of Miscellaneous Items.—Seventy-three plastic capes and caps, and 93 rollers, curlers, and clips were examined, with negative results. A further 102 items yielded three positive cultures—two from clipper brushes and one from a neck-rest.

Antibiotic Sensitivity.—Strains were tested for sensitivity to penicillin, streptomycin, chloramphenicol, tetracycline, and erythromycin. The results are shown in Table III.

TABLE III

Antibiotic Spectrum	No. of Strains
Sensitive to all antibiotics	35
Resistant to penicillin only	19
Sensitive to chloramphenicol and erythromycin only	2

Bacteriophage Type.—The distribution of bacteriophage groups is shown in Table IV. Three strains belonging to type 80/81 were isolated. Two were from neck cloths and one was cultured from a pair of scissors. In six shops two separate articles yielded strains of staphylococci of dissimilar phage type.

TABLE IV

Bacteriophage Group	No. of Strains
Group I	10
" II	2
" III	16
Groups I and III	2
Non-typable	23
Group IV	1
Groups I, II, and III	2

Contamination of Antiseptic Solutions.—This was noted early in the investigation. Of 126 solutions examined, 54 (43%) were infected with a variety of micro-organisms. The types of substance tested are shown in Table V. A tentative classification of the organisms isolated is shown in Table VI. Questioning revealed that few shops used the antiseptics in the concentration recommended by the manufacturer.

TABLE V

Antiseptic Principle	No. Examined	No. Contaminated
Eucalyptus and other essential oils	81	39 (48%)
Phenols, cresols, and chlorxylenols	16	5
Quaternary ammonium compounds	4	2
Hypochlorite	1	—
Formalin	2	2
Unknown	22	6
Total No. examined	126	54 (43%)

The fact that pathogenic staphylococci were not isolated from any of the solutions was not regarded as evidence that the antiseptics possessed activity against this organism, since Gram-positive cocci rarely multiply in aqueous solutions of feeble antiseptics.

TABLE VI

Tentative Classification	No. of Strains Isolated
<i>Achromobacter</i> sp.	34
<i>E. coli aerogenes</i>	9
<i>E. coli faecalis</i>	1
<i>Ps. pyocyanea</i>	3
<i>Str. viridans</i>	3
Aerobic spore bearer	3
<i>Proteus</i> sp.	1
	54

The majority of antiseptics in use were of a type generally regarded as having little activity against common pathogenic bacteria, the substance most frequently encountered having eucalyptus oil as its active ingredient and said to be antiseptic, though the Food and Drugs Act (1908-54) states that any substance bearing this label should be capable of preventing the development of germs in the concentration recommended by the manufacturer. The futility of employing such solutions for the destruction of pathogenic staphylococci on instruments is obvious. It was decided, however, to examine the activity against pathogens of one such compound containing eucalyptus oil.

Experimental: (a) The compound was diluted to the concentration recommended by the manufacturer and compared with a substance of known activity containing chlorhexidine and cetrimide ("Savlon," I.C.I.): 1 ml. of an overnight broth culture of *Staph. pyogenes* was added to 10 ml. of the respective solutions, and subcultures were made with a standard loop into large volumes of nutrient broth at intervals up to 24 hours. Broth cultures were incubated for 72 hours and examined for growth at the end of this period. The results are shown in Table VII.

TABLE VII

Test Substance	Exposure Time						Control
	Minutes					Hours	
	3	5	10	15	30	24	
Eucalyptus oil compound	+	+	+	+	+	+	+
Chlorhexidine-cetrimide mixture	-	-	-	-	-	-	+

+ = Growth.

(b) Agar plates were poured containing the antiseptic in the recommended strength and inoculated with a number of pathogenic Gram-negative bacilli. After incubation at 37° C. for 18 hours, the presence or absence of growth was recorded. The results are shown in Table VIII.

TABLE VIII

Test Organism	Agar Plus Eucalyptus Oil Compound	Control Agar
<i>Salm. typhi</i> (2 strains)	+	+
" <i>paratyphi A</i>	+	+
" " <i>B</i>	+	+
" " <i>C</i>	+	+
<i>Shigella flexneri</i> type I	+	+
" <i>sonnei</i>	+	+
<i>E. coli aerogenes</i>	+	+
" <i>faecalis</i>	+	+
<i>Ps. pyocyanea</i>	+	+

+ = Growth.

Use of Bactericidal Ultra-violet Lamps.—Of the 197 shops, 21 (10%) were found to be using ultra-violet lamps operating at bactericidal wavelengths. No tests were made, however, to ensure that the tubes were still functioning satisfactorily. Pathogenic staphylococci were isolated in two shops using these lamps. The numbers involved in these tests are regarded as too small to warrant any deductions regarding the efficiency

of ultra-violet irradiation for the sterilization of instruments.

Additional Trading Activities.—Nine shops were noted to be acting as dry-cleaning agencies. Of these, two yielded coagulase-positive staphylococci on investigation. Two other shops were found to be shoe-repair depots, but neither gave positive cultures.

Discussion

On a purely numerical basis, the percentage of positive isolations might not be regarded as high, being at least half the average nasal carrier rate detected during a recent survey of mothers admitted to a maternity unit in this city (Anderson *et al.*, 1961). However, opportunities for dissemination of the strains and initiation of infection are great, and when viewed in this light the results assume greater significance. The low incidence of contamination in ladies' shops may have been due to the fact that sepsis of the head and neck is seen less frequently in women. Alternatively, the common practice of starting hairdressing with a shampoo may have significantly reduced the transfer of pathogenic staphylococci to instruments.

Of the metallic instruments examined, clippers showed the highest incidence of contamination, which might be expected of an article which is in intimate contact with the skin of the neck and face. A greater percentage of isolations was obtained from the neck-cloths and hairbrushes, but this may be related to the ability of staphylococci to survive for long periods on fibres and bristles as compared with toxic metallic surfaces. The antibiotic sensitivity of the strains isolated was characteristic of "out-patient" staphylococci, with the exception of two organisms which were sensitive only to chloramphenicol and erythromycin. These strains are typical of the pathogenic staphylococci isolated from hospital infection in this city, but, owing to the small number isolated in this investigation, conclusions cannot be drawn regarding the transfer of such strains from hospitals to the general community.

These results represent only one facet of a rapidly changing situation in which infection appears and disappears in shops throughout the city. A contaminated shop might well prove to be free of pathogens if swabbed 24 hours later, and a negative shop could yield pathogens after cutting only one additional head of infected hair. It is not the purpose of this investigation to suggest that any single shop is "clean" or "contaminated" but rather to present a composite picture of infection from which the risk to public health may be assessed.

The results obtained from the examination of antiseptic solutions are of interest for two reasons. Firstly, they show the relative inefficiency of the substances employed; and, secondly, they suggest a means whereby the degree of contamination could be materially reduced. What little activity the compounds possessed was nullified by failure to use them at the recommended concentration. Barbers complained that higher concentrations of compounds containing essential oils either damaged their instruments or produced a powerful odour to which the customer objected. A number of powerful odourless bactericides which are active in high dilution are now available at little cost. The use of a compound such as chlorhexidine, either alone or in combination with cetrimide, would provide the barber with a rapid method for the cleaning and disinfection of instruments. Unfortunately, a certain section of the public distrusts an antiseptic which does not possess

a pungent smell and which does not produce an opalescent solution when poured into water. However, accurate information covering the use of potent bactericides could be given to barbers during their period of instruction at the trade school. Much confusion exists in the lay mind regarding the multiplication of bacteria on the surface of inanimate objects, and it is doubtful if any significant increase in numbers takes place on many surfaces. With metals of known toxicity, the number of viable cells may actually decrease. Immersing an infected instrument in a solution having feeble bacteriostatic activity cannot prevent the spread of infection, and, since staphylococcal skin sepsis is common, it seems not unreasonable to ensure that active bactericides are used by barbers to prevent further spread of infection within the community.

Summary

A bacteriological survey of 197 barbers' shops is described, and the incidence of infection with *Staph. pyogenes* is recorded.

The degree of contamination amongst individual instruments is noted, together with the antibiotic sensitivity and bacteriophage type of the strains isolated.

Attention is drawn to the relatively feeble activity of the antiseptic solutions commonly in use, and recommendations are made for the use of potent bactericides to reduce the dissemination of pathogenic staphylococci.

We are indebted to Dr. Philip Woodruff, Director-General of Public Health, whose interest and co-operation made this investigation possible. Our thanks are also due to Mr. J. A. MacDonald for the preparation of the Figure.

REFERENCES

- Anderson, K. F., Coulter, J. R., and Keynes, D. Ruth (1961). *J. Hyg. (Lond.)*, **59**, 15.
Cadness-Graves, B., Williams, R., Harper, G. J., and Miles, A. A. (1943). *Lancet*, **1**, 736.
Garre, C. (1885). *Fortschr. Med.*, **3**, 165.
Morley, D. C. (1945). *J. Path. Bact.*, **57**, 379.
Nisbet, B. R., and Skeoch, T. (1949). *Med. Offr.*, **81**, 225.
Ward, C. B., and Tanner, F. W. (1921). *Amer. J. med. Sci.*, **162**, 585.
Williams, R. E. O., and Rippon, J. E. (1952). *J. Hyg. (Lond.)*, **50**, 320.

DIABETIC AMYOTROPHY

IMPORTANCE OF GOOD DIABETIC CONTROL

BY

D. R. REDWOOD, M.A., M.B.

House-physician to the Neurological Unit, Atkinson Morley's Hospital, London

Little has been written on the value of good diabetic control in the treatment of the complications of diabetes mellitus, although it is generally assumed that such control is necessary. In this paper three cases of diabetic amyotrophy are described showing the value of adequate control in this condition.

Bruns (1890) first described this condition in three cases of diabetes with pain in the hips and thighs followed by weakness and wasting in the leg muscles, without sensory impairment—all three patients improving on dietary control alone.

Garland and Taverner (1953) recognized this condition, which they called "diabetic amyotrophy," and as originally described it consisted of a progressive weakness and wasting of muscles accompanied by an aching or stabbing pain, usually limited to the muscles of the pelvic girdle and thigh, the quadriceps being most commonly affected. This wasting, characteristically asymmetrical in its distribution, was accompanied by loss of the tendon reflexes, extensor plantar responses, and an increased protein in the cerebrospinal fluid. There was no sensory impairment.

It was thought that the cause of the condition was probably to be found in the spinal cord, but since the original description an increasing number of patients have been seen with flexor plantar responses and electromyographic changes which suggest a peripheral lesion.

Three patients, two men and a woman, have recently been seen with this condition.

Case 1

A man aged 69 was admitted to hospital on January 24, 1961, with a history of increasing weakness in the lower limbs for six months, and nocturnal knife-like pains in the thighs and knees for five months. He was known to have had diabetes mellitus for the previous two and a half years, being treated with tolbutamide and diet.

On admission he was found to have diabetic retinopathy, gross wasting and weakness of both quadriceps and the

adductor groups of the thighs, and of both calves, the right more than the left. The knee- and ankle-jerks were absent on both sides, with flexor plantar responses. Vibration sensation was bilaterally impaired in the legs. Peripheral pulses were present. The blood sugar was: morning, 255 mg./100 ml.; evening, 230 mg./100 ml. Electromyography excluded the presence of a peripheral neuropathy.

A diagnosis of diabetic amyotrophy was made and he was treated with globin zinc insulin, being controlled with 24 units a day—blood sugar then being: morning 160 mg./100 ml.; evening 105 mg./100 ml.

The pain diminished over the succeeding month and the power in his legs steadily improved until by March 3 he could walk the length of the ward with the aid of sticks. He was readmitted on April 23—that is, three months after starting insulin—for reassessment, when it was found that the wasting in the affected muscles was much less and the power correspondingly greater; when seen two months later there had been further improvement.

Case 2

A woman aged 59 was admitted to hospital on April 15, 1961, with a history of increasing pain and weakness in the left thigh for six months, necessitating confinement to bed for the previous month. She was known to have had diabetes mellitus for three years, which had been treated with tolbutamide but without dietary restrictions.

On admission she was found to be overweight and to have considerable weakness and wasting of the quadriceps with minor degrees of weakness in the left hamstring and peroneal muscles. The knee-jerk on the left was absent although it was present on the right, and both ankle-jerks were elicited. There were bilateral flexor plantar responses, loss of vibration sensation in both legs, and good peripheral pulses. She had mild osteoarthritic changes in the knees, more pronounced on the left side. Blood sugar was: morning, 298 mg./100 ml.; evening, 318 mg./100 ml.

A diagnosis of diabetic amyotrophy was made although the osteoarthritis complicated the picture. She was treated initially with tolbutamide and a 1,000-calorie diet without success—blood sugar being: morning, 332 mg./100 ml.; evening, 225 mg./100 ml.—and was therefore put on globin