fect ed eczema, and 1 case of sycosis barbae (Table I). The average time of cure in these cases was six days; some were cured in three days, the longest took 14 days.

2. *Streptococcus haemolyticus* only was found in six cases of impetigo (Table I). The average time of cure in these cases was 11 days. The shortest time of cure was seven days and the longest 21 days.

3. *Staph. aureus haemolyticus* and *Str. haemolyticus* were found in 3 cases of impetigo, 4 cases of infective dermatitis, and 1 case of secondarily infected eczema (Table I). The average time of cure in these cases was 11 days; the shortest time of cure was six days, and one case was not clear after three weeks' treatment.

4. *Staph. aureus haemolyticus*, *Staph. aureus*, and *Str. haemolyticus* were found in 4 cases of impetigo and 1 case of infective dermatitis. The average time of cure in these cases was eight and a half days; the shortest time of cure was four days; and the longest 15 days.

The other cases were made up as follows: Impetigo—*Staph. aureus haemolyticus* and *Str. viridans* (1 case); Infective dermatitis—*Staph. aureus haemolyticus* and *Staph. albus* (1 case); infective dermatitis—*Staph. albus* (1 case). No organisms were isolated in six cases of clinical impetigo. Table II shows the sensitivities of the organisms isolated.

TABLE II.—Sensitivities of All *Staph. aureus haemolyticus* and *Str. haemolyticus* Organisms

	<i>Staph. aureus Haemolyticus</i>		<i>Str. Haemolyticus</i>	
	Resistant	Sensitive	Resistant	Sensitive
Penicillin	27	11	1	18
Chlortetracycline	4	34	0	19
Framycetin	0	38	14	5

No undesirable reaction to the antibiotic was noted in the series, though this was carefully sought. The ointment has been used in over 100 patients without ill effect; many cases were statistically valueless because the patients failed to return for re-examination.

Discussion

The cure rate of 69% of cases of impetigo cleared within one week indicates that framycetin sulphate is an effective cutaneous antibiotic and compares favourably with neomycin; Church (1954) reported 60% cure in one week. It also compares favourably with chlortetracycline (Solomons, 1951), bacitracin (Miller *et al.*, 1949), and chloramphenicol (Newman and Feldman, 1951). However, general statements about its effectiveness must be guarded, because 65% of the streptococci isolated in this series were resistant, and it may be that its apparent effectiveness in this small series was due to the high proportion of cases from which the very sensitive *Staph. aureus haemolyticus* only was isolated. A 0.1% solution was used for *in vitro* testing, and a 1.5% concentration of antibiotic in water-soluble ointment is hardly ever likely to exceed 0.1% concentration in the tissues.

The *in vitro* findings appeared to be confirmed in three ways. (1) The two cases which framycetin sulphate failed to cure were both due to the haemolytic type of streptococcus. (2) In one case of these—a case of clinical impetigo—a sensitive *Staph. aureus haemolyticus* was grown originally. As there was no response to treatment after one week, a further swab was taken, and this produced a pure growth of resistant haemolytic streptococcus. (3) The average time of cure of cases in which a haemolytic streptococcus was isolated, either in pure or in mixed growth, was twice that of those cases from which only *Staph. haemolyticus* was grown.

Summary

The results of treatment of 50 cases of skin infection with a new antibiotic—framycetin sulphate (soframycin) have been investigated.

Only two cases failed to respond to this antibiotic. Of the 32 cases of impetigo, 22 (69%) were cured within one week.

In 38 cases, all of which responded to the antibiotic, a *Staph. aureus haemolyticus* was isolated. In 19 cases *Str. haemolyticus* was isolated, and only five were sensitive to the antibiotic. The latter finding may reduce its effectiveness in general use, and clinical evidence is given to support this.

No example of contact sensitivity or irritation was noted in this series.

My thanks are due to Drs. McCaw, Hall, and Beare, for permission to study their cases and for their helpful advice. The Clinical Pathology Laboratory of the Royal Victoria Hospital was responsible for the bacteriology.

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Medical Memoranda

Management of Tetanus, using Chlorpromazine and Mephenesin

A 13-year-old boy was admitted to the Royal Victoria Infirmary on May 1, 1956, with moderately severe tetanus. Four days earlier he had developed a stiff neck. The next day trismus appeared, and during the 48 hours preceding admission he had increasing spasms of his back muscles and backache. There was no history of recent injury. He was a well-developed boy with severe trismus. Even when first seen he was having strong tetanic spasms at three- to four-minute intervals, but without cyanosis. There were dry superficial abrasions on his knee and wrist, but *Clostridium tetani* was not recovered from them.

MANAGEMENT

Sedation began with 50 mg. of chlorpromazine intramuscularly. There was a striking response, and within 20 minutes he was able to open his mouth. Mephenesin, 1 g., was then given orally. For the first 24 hours his spasms were well controlled with 50 mg. of chlorpromazine four-hourly and 1 g. of mephenesin three-hourly. During the second 24 hours he required larger doses of mephenesin, up to 1 g. hourly, with 25 mg. of chlorpromazine intramuscularly every four hours. On the third day the mephenesin was increased still further, and for the next nine days he was given a daily total of 36 g. of mephenesin by intragastric tube and 150 mg. of chlorpromazine intramuscularly (see Table). In addition 100,000 units of tetanus antitoxin

Amounts of Intramuscular Chlorpromazine and Oral or Intragastric Mephenesin Administered Daily

Day:	1	2	3	4	5	6	7	8	9	10	11	12
Chlorpromazine (mg.) ..	100	250	300	225	300	225	175	150	150	150	150	150
Mephenesin (g.) ..	3	16	20	32	33	34	32	33	36	36	36	—

had been given intravenously just before admission, and 120,000 units were given intramuscularly over the next two days. He was also given penicillin, but after five days this was changed to chlortetracycline because of developing consolidation in the left lung.

The pharynx and upper air passages were first kept clear by posture and aspiration, but on the third day, after a severe cyanotic attack, tracheotomy was carried out. (It

would have been wiser to do this on the second day.) Milk, with added dried milk, was given through the intragastric tube, and a daily intake of some 1,700 calories was maintained. There was a little loss of weight.

COMMENT

Mephenesin was used in this case for two main reasons. First, it is effective when given orally. But, because of its local anaesthetic action and the consequent very real danger of inhalation, it should be given in tablet form or by intragastric tube rather than as a mixture. Secondly, it acts on the spinal cord and not on the neuromuscular junctions, and therefore the danger of death from sudden respiratory arrest is negligible. Chlorpromazine has a variety of actions. The two called upon here were its excellent sedative qualities, which render the patient amnesic and drowsy without loss of consciousness, and its specific anticonvulsant action, which in this case greatly decreased the tetanic spasms within 20 minutes of the first injection.

With the method of treatment described here the child remained conscious, intravenous therapy was not required, and there was no real danger of death from sudden respiratory arrest. And, in spite of being drowsily aware of what was going on around him, the boy was not upset by the procedures, nor did he have unpleasant memories of what had been done. This treatment seems to merit a wider trial.

We thank Dr. Armstrong Davison, of the department of anaesthetics, who suggested this approach and helpfully supervised its application, and Mr. Munro Black, who carried out the tracheotomy and shared with Professor D. Court in the care of the child.

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A Paper Strip Test for Proteinuria

Recent laboratory trials of a simple paper strip test for proteinuria ("albastix") have been described (Baron and Newman, 1958; Frazer, 1958), and Carne (1958) has given his impression of the use of this diagnostic aid from the viewpoint of a general practitioner. Frazer, in particular, has commented upon its sensitivity and reproducibility, and upon the stability of the agent. The same preparation has been recently tested in various departments of a large teaching hospital, and the results are briefly reported here to indicate its considerable potentialities when applied as a routine clinical test for proteinuria.

The test consists in dipping impregnated paper strips into urine: the presence of protein causes a change of colour from yellow to a shade of green, the depth of which depends upon the concentration of protein. No difficulty has been experienced in demonstrating the technique of the test, and previously uninstructed nurses have been able to interpret the directions given on the bottle.

CLINICAL TRIAL

A total of 1,119 urines were tested by nursing staff or house-physicians in two medical wards, a general medical out-patient department, and a diabetic out-patient department. All urines were tested with albastix and with the sulpho-salicylic acid test for proteinuria (Harrison, 1957).

No attempt has been made in this study to indicate the depth of the colour reaction. The makers of albastix issue a colour scale with the preparation which purports to indicate the approximate protein content of the urine. Experience showed that it was preferable to interpret the result of the test with albastix as either "protein-free," "some protein present," or "much protein present." An appreciable number of urines caused a reaction less intense than the lowest positive colour on the chart, presumably indicating the presence of protein in a concentration of less than 30 mg./100 ml. The level at which proteinuria can be regarded as significant is, as yet, still undecided.

Of the 1,119 urines tested, the albastix and sulpho-salicylic acid (S.S.) test agreed in 98.1%, both being negative in

856 and both positive in 242 urines. There was a close parallelism between the intensity of the reaction in both tests, a "one-plus" or trace reaction with S.S. corresponding to the first colour change on the makers' chart, and a heavy precipitate on S.S. corresponding to the intenser shades of the albastix chart.

Discrepant results between the two tests were noted in only 21 urines (1.9%), indicating that essentially the same information is obtained by both tests. Of the 21 discrepant tests, 11 were in urines in which the albastix test was negative, whereas the S.S. test showed the presence of a trace of protein. Six of these 11 urines were available for re-testing, and of those re-examined the opinion expressed at the time of first testing was confirmed. These urines also showed the presence of a detectable trace of protein on applying the heat coagulation test. It is possible, therefore, to record false-negative reactions with albastix; for this series of observations, however, especial care was being taken to observe the S.S. reactions, and it is possible that, in some instances, at any rate, a trace reaction might not otherwise have been recorded. This is probably not a significant defect of this diagnostic agent, but Frazer (1958) also noted, on progressive dilution of protein-containing urines, that it was possible to achieve dilutions at which the S.S. and heat coagulation tests showed a faint positive reaction but the albastix test was negative.

The remaining 10 urines in which discrepant results were noted were those in which a colour change was recorded on the albastix strip but no result was recorded following the S.S. test. Five of these urines were rechecked. In three the S.S. test did in fact show a positive trace reaction, although this had not been noted when originally the urine had been tested. The discrepancy, therefore, was due to faulty interpretation of the standard, not of the new test. One urine on retesting was definitely negative to both tests, and the originally recorded positive albastix reaction may have been due to the presence of mucus. Streaks of mucoprotein cause a positive but streaky and patchy reaction with the albastix strips, and this was usually ignored and a further sample of the same urine was re-tested. Only one of the retested urines, with a pH of 6.4, had an inexplicable positive albastix reaction and a negative S.S. and heat coagulation test. Dr. S. C. Frazer found this urine to have a heavy bacterial content (24 hours after being passed), and this may have affected the buffering capacity of the urine. No protein was detected in a centrifuged specimen, but the albastix reaction remained positive. The patient, a diabetic, had had urinary infections previously, but was asymptomatic, and subsequent samples examined were normal.

COMMENT

For all practical purposes albastix strips give the same order of information as is obtained by testing the urine with S.S. An error of only 1.9%, on the basis of a presumably correct interpretation of the S.S. test, is negligible; and, in any case, some of the discrepant tests were due to faulty interpretation, not of albastix but of the S.S. test.

This paper strip test, requiring no glassware, no reagents, and no heat source, and being standardized, constant, and stable as a testing agent, has obvious advantages which will commend it for more general use in hospital and domiciliary practice. Any slight increase in cost per test carried out is amply compensated for by its speed, reliability, and portability.

I am indebted to Mr. D. H. Vobes, of Ames Company (London) Ltd., for the supply of albastix strips, to Dr. S. C. Frazer for his advice, and to Sister Kathleen Rose for her enthusiastic help.

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