

However, the trend in the other children was in an opposite direction, the association being between increasing eosinophil counts and improvement. Indeed, 12 of the 14 correlation coefficients were of the same (positive) sign, and by the sign test this trend is significant at the 5% level. There was no obvious clinical difference between Case 2 and the other children, but if he were excluded the correlation coefficient for the remainder would be positive and significant ( $r = +0.203$ ;  $n = 167$ ;  $P < 0.05$ ).

### Discussion

Though the association of asthma and eosinophilia is well known, it is surprising to find that random eosinophil counts in a group of asthmatic children so often show abnormally high levels. That this state of affairs is not commonly recognized is revealed by a question published in the *Journal of the American Medical Association* (1955), which sought an explanation for persistent eosinophilia in a child with asthma. Two experts, in answering the question, regarded the finding as unusual and suggested investigations for parasitic infection.

In this material eosinophilia is very persistent in asthmatic children and in general is unrelated to the severity of the asthma. The trend, if anything, is the opposite of that expected, the higher levels of eosinophilia being associated with the better ventilatory performances.

By chance, marked falls in the eosinophil count were noted in response to apparent possibly influenzal infections. This observation should be extended by further observations on a variety of infections in asthmatics.

In children with bronchiectasis there is no evidence of an associated eosinophilia, and because of this the eosinophil count may help to differentiate the two conditions. This may be unnecessary in clear-cut examples, but, in fact, the clinical syndromes may overlap. Thus children with bronchiectasis have attacks of noisy breathing which have been described as wheezing (Field, 1949), and they can be shown frequently to have a ventilatory impairment associated with bronchial obstruction (Strang, to be published). In addition, the bronchial dilatations long regarded as the characteristic feature of the disease may be quite insignificant and unrelated to the extent of severity of bronchial damage (Whitwell, 1952). On the other hand, asthmatic children sometimes develop a persistent cough and sputum, which in a few of them is purulent. Both conditions probably include examples of early or potential chronic bronchitis, which may be a final common path for some of these children.

In any scientific study of bronchitis in children it would be very important to distinguish asthma from bronchiectasis or other categories. Eosinophilia appears to be a sufficiently constant feature of asthma to serve as a basis for such a differentiation.

### Summary

Eosinophilia is common and very persistent in children with asthma. The height of the eosinophil count is unrelated to the severity of the condition as measured by the F.E.V.<sub>1</sub>. The eosinophil count is not raised in bronchiectasis, and it may serve as a means of distinguishing these conditions in borderline cases and in scientific investigations of bronchitis in childhood.

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## DOG-BITES AND LOCAL INFECTION WITH PASTEURELLA SEPTICA

BY

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Dog-bites are common; we see over a hundred new patients with this injury in our accident service annually. The present investigation was carried out to examine the therapeutic management of dog-bites, and, in particular, bites infected with *Pasteurella septica*. Human *P. septica* infection following these bites is thought to be rare—only five cases have been recorded in this country (Allott *et al.*, 1944; Brunson and Mallett, 1953; Emson, 1957); we found 12 additional cases in a review of our records.

### Present Investigation

*Material.*—The records of 69 patients (1952–7) who had suffered dog-bites which had been investigated bacteriologically were reviewed. (No bacteriological examination had been made of the wounds of the other patients who suffered dog-bites during this period.) Of this number, 39 were adults and 30 were children under 13 years of age. Swabs from 59 of these wounds were taken on the first day of attendance at hospital, as they were thought to be contaminated wounds. The remaining 10 were swabbed some days later, when it became apparent that a wound infection had developed. All swabs were cultured both by aerobic and by anaerobic methods.

*Site of Injury.*—The location of these bites was: face, 19 (17 children); upper limb 32 (8 children); lower limb, 18 (5 children).

*Treatment.*—Tetanus toxoid or antiserum was administered. No situation arose in which it was considered necessary to give antirabic serum or vaccine. Wounds were cleansed with a detergent and left unsutured in 39 instances in accordance with accepted practice. In 30 patients it was thought advisable to carry out excision and suture after careful wound toilet. Prophylactic penicillin therapy was given in only nine cases, in three of which the bite had been sutured; all these nine patients attended hospital on the day of injury.

*Wound Infection.*—Frank infection of wounds developed in 20 (29%) cases. Of the 17 children bitten on the face, five developed wound infection. Of the 30

wounds that were sutured, 14 (47%) became infected. Only one of the nine patients who received prophylactic penicillin developed a wound infection.

### Bacteriology

The culture reports on the 20 bites which became infected are shown in Table I.

*P. septica* was cultured from 12 (17%) wounds. Ten of these became infected, accounting for 50% of infected bites. Prophylactic penicillin had been given to the two patients who did not develop a wound infection; one of these wounds had been sutured.

TABLE I.—Organisms Found in 20 Infected Bites

	No. of Cases
* <i>P. septica</i> (in pure culture) .. .. .	5
* <i>P. septica</i> .. .. .	1
Beta-haemolytic streptococcus, Group C } .. .. .	1
* <i>P. septica</i> .. .. .	1
Paracolon } .. .. .	1
<i>P. septica</i> .. .. .	1
Micrococci .. .. .	1
<i>Streptococcus viridans</i> } .. .. .	1
<i>P. septica</i> .. .. .	1
<i>Str. viridans</i> } .. .. .	1
<i>P. septica</i> .. .. .	1
Neisseria .. .. .	1
<i>Staph. aureus</i> (penicillin-sensitive) .. .. .	2
Micrococci .. .. .	1
<i>Staph. aureus</i> (penicillin-sensitive) .. .. .	1
Beta-haemolytic streptococcus, Group A } .. .. .	1
<i>Clostridium welchii</i> .. .. .	1
<i>Staph. aureus</i> (penicillin-sensitive) } .. .. .	1
<i>Staph. aureus</i> (penicillin-sensitive) .. .. .	1
Alpha-haemolytic streptococcus .. .. .	1
Beta-haemolytic streptococcus, Group G } .. .. .	1
<i>Str. viridans</i> .. .. .	1
"Sterile" .. .. .	4

\* Bacteriological examination of these wounds and three of the "sterile" wounds was carried out because infection developed.

In six instances one or more micro-organisms were cultured in addition to *P. septica*. Five of these wounds, all sutured, developed frank infection. The one bite that did not become infected was not sutured but received systemic prophylactic penicillin. One bite that was sutured under penicillin cover became infected; bacteriological examination of this wound on the ninth day revealed a penicillin-sensitive *Staph. aureus*, and on the 24th day *P. septica*. This was the only instance in which the two organisms were associated.

From the 49 wounds that did not become infected the following organisms were cultured in addition to those found in the infected wounds: *Pseudomonas pyocyanea*, *Achromobacter Bacillus anitratus*, pneumococci, diphtheroids, *Proteus vulgaris*, aerobic spore-bearing organisms. Ten of these 49 wounds were sterile on culture. Six of these 49 patients received prophylactic penicillin, but there was no common bacteriological pattern in the wounds so protected.

### Other Data

**Average Duration of Hospital Attendance.**—Patients who for various reasons completed part or most of their treatment under the care of their family doctor are not included except as shown.

Not infected .. .. .	9.5 days
All types of wound infection .. .. .	22.5 "
* <i>P. septica</i> wound infection .. .. .	21.7 "

\* Three other patients were referred to the care of their own practitioners to carry on dressings after 23, 21, and 15 days respectively.

**Seasonal Incidence.**—This is shown in Table II; we have included the five previously reported cases for comparison. G. H. Tee (personal communication) isolated *P. septica* from 12 dog-bites during the period April to September, and 16 dog-bites from October to March, during the past three years. The above distribution is of interest in the light of the observations

TABLE II.—Seasonal Incidence

Month:	J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.
Allott <i>et al.</i> (1944) .. .. .	1									1		1
Brunsdon and Mallett (1953) .. .. .								1	1		1	
Emson (1957) .. .. .	1			1	1		1	1	3	3		1
Oxford .. .. .	2			1	1		1	1	4	4	1	2

by Smith (1955), who isolated *P. septica* from the nose, tonsils, or both nose and tonsils of 55% of healthy dogs; he also noted that the higher incidence of *P. septica* in the nose during the winter months may also be connected with the epidemiology of canine distemper, a disease which is most prevalent during the colder half of the year, particularly in the late autumn and early spring. The seasonal variations in the nasal carrier rate of *P. septica* in dogs resemble those recorded by Straker *et al.* (1939) for pneumococci in the human subject.

### Discussion

*P. septica* (*P. multocida*) has been reported as an upper-respiratory-tract commensal in dogs, cats, rabbits, pigs, and other animals. Human infection with this organism following cat-bites has been noted fairly often. Apparently only five examples of human infection with *P. septica* following dog-bites have been previously recorded in this country (see Table II).

Wounds infected by this organism are generally characterized by a prolonged period of treatment and occasionally complicated by infection of underlying bone. Allott *et al.* (1944) gave an account of six patients whose wounds were infected with *P. septica*—three following dog-bites and three following cat-bites; these patients attended hospital for treatment for an average period of nearly 50 days; "subacute osteomyelitis was a complication in three of the cases." Allin (1942) and Cooper and Moore (1945) also recorded bone infection following *P. septica* infection of a soft-tissue cat-bite. None of our patients with *P. septica* infection had bone involvement.

Emson (1957) summarized the literature on human infections with *P. septica* and covered in detail the bacteriology, biochemistry, serology, and classification of this organism.

Schipper (1947) studied 14 strains of *P. septica* (*P. multocida*) and additional strains from other laboratories; all strains were sensitive *in vitro* to less than 0.2 unit of penicillin per ml. of media. This extreme sensitivity to penicillin is rather unusual for a Gram-negative rod, and he suggested that this might be used as an additional method for differentiating this organism from other Gram-negative micro-organisms. Olsen and Needham (1952) reported 37 cases of *P. septica* isolated from patients with suppurative diseases of the respiratory tract and noted that this organism "is rapidly eradicated by penicillin therapy."

### Summary and Conclusions

Of 69 cases of dog-bite investigated bacteriologically 20 (29%) developed frank wound infection.

Fourteen (47%) of the 30 wounds that were sutured became infected.

Only one of the group of nine patients who had prophylactic penicillin therapy developed a wound infection.

*P. septica*, an organism sensitive to penicillin in normal therapeutic doses, was cultured from 12 (17%) wounds. Ten of these became infected, accounting for 50% of infected lesions. Only five other local infections with *P. septica* following dog-bites have been reported in this country. Routine bacteriological examination of these bites might show that this type of infection is fairly common.

Infected bites are characterized by prolonged treatment and unsightly scars. Since many children are bitten by dogs and the bite is commonly received on the face, it is obviously desirable to ensure healing with minimal scarring.

There is evidence here to suggest that prophylactic penicillin therapy should be given to all patients with serious dog-bites and particularly to those whose bites have been sutured.

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## HAEMATEMESIS AND/OR MELAENA FROM PEPTIC ULCER SHORTER CONSERVATIVE MANAGEMENT

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The ideal duration of hospital treatment after haematemesis or melaena from peptic ulcer once massive bleeding has stopped is undecided. Most authorities have disregarded what the necessary length of bed rest should be, but it is often suggested that four to six weeks' bed rest is required, as for active chronic peptic ulcer.

The records from the Central Middlesex Hospital for 1956 show that after haematemesis or melaena 63 males and 40 females were treated conservatively as in-patients for an average of 21 days (males 22; females 19.5). The same average stay of 21 days was found for 34 patients treated at the Middlesex Hospital between

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August, 1957, and June, 1958. In the Portsmouth Group of Hospitals, however, they are kept in longer: an average of 34 days for 44 patients admitted between January and November, 1958. Many factors may be involved in this difference, but among them must be a difference of policy respecting bed rest. This is borne out by the variation found if the figures are analysed for each physician separately.

In view of the obvious social and economic benefits from early discharge from hospital it is important to establish whether there is any medical contraindication to early mobilization. We have therefore compared two groups of patients, one mobilized immediately major bleeding ceased and the other kept in bed, and therefore also in hospital, for one week longer.

### Material and Methods

85 male patients were admitted to the department of gastro-enterology, Central Middlesex Hospital, between October 15, 1957, and September 1, 1958, with major gastro-duodenal bleeding assumed to be due to peptic ulcer. For administrative convenience, and because a review of earlier records showed no difference with regard to sex in customary management, only males were studied. Nineteen patients were excluded for the following reasons: emergency surgery for haemorrhage (16), death from cerebral hypoxia shortly after admission (1), mediastinal emphysema after oesophagoscopy (1), and complicating pneumonia and cerebral thrombosis (1). There thus remained 66 patients.

Patients were allocated to one of two groups, "Up" and "Bed," by drawing lots as soon as bleeding had ceased ("D day"). This was judged particularly by the cessation of haematemesis or loose melaena stools, and by a stable pulse and blood-pressure. The haemoglobin level was above 7.4 g./100 ml. (50%) at this time, and blood transfusions were given where necessary to ensure this.

The up group was then mobilized as follows:

Day D+1—Sitting out for three hours and one visit to toilet.  
 Day D+2—Walking for two hours and visiting toilet at will.  
 Day D+3 and thereafter—Ambulant all day.

The bed group was kept at rest for a further week and then mobilized in the same way.

All patients received a standard convalescent gastric diet with antacids as desired. Blood transfusion was used to treat shock and to keep the haemoglobin at a satisfactory level (Avery Jones, 1952). Oral iron (ferrous gluconate tablets, *B.P.*, 300 mg. t.d.s., or ferrous sulphate tablets, *B.P.*, 200 mg. t.d.s.) was given to all anaemic patients from D day onwards. Barium-meal examination was performed in all except two patients as soon as practicable after mobilization. Gastroscopy was carried out in 38 patients. When no lesion was seen by either radiology or gastroscopy, and bleeding appeared on clinical grounds to be due to peptic ulceration, an acute ulcer was presumed responsible. Haemoglobin levels were estimated daily before D day and at least twice a week thereafter, using a standard procedure. On leaving hospital, patients were fully ambulant, free from anaemia, and without significant dyspepsia. They were seen in the out-patient department at three weeks and six weeks after D day, when symptoms were reassessed and the