and are commonly treated by surgical footwear. In a few of these patients in whom the hallux deformity is the overriding cause of disability, the osteotomy operation has proved very successful.

Summary

A study of 149 operations for hallux valgus, using a wedge osteotomy at the base of the first metatarsal, is recorded. These operations had been carried out from two to ten years previously. The technique of the operation and after-treatment are described, and the technical difficulties of this operation as a cause of unsatisfactory results are referred to. Comparison is made between the osteotomy operation and the more commonly employed arthroplasty and arthrodesis of the metatarso-phalangeal joint, which, although successful in relieving symptoms, inevitably reduce the efficiency of the foot. Results are considered in regard to symptomatic relief, anatomical correction of the deformity, and functional recovery; they show, further, that there is a higher prospect of success in the younger age groups. It is claimed that osteotomy of the first metatarsal can deal effectively with all the characteristic features of hallux valgus, and in the absence of other deformities will leave a normally functioning foot. It is an operation of particular value for adolescents and young adults.

REFERENCES

- Bonney, G., and Macnab, I. (1952). *J. Bone Jt Surg.*, **34B**, 366.
 Cholmeley, J. A. (1958). *Proc. roy. Soc. Med.*, **51**, 903.
 Lake, N. C. (1952). *The Foot*. Baillière, Tindall and Cox, London.
 Lapidus, P. W. (1934). *Surg. Gynec. Obstet.*, **58**, 183.
 Rocyn Jones, A. (1948). *Proc. roy. Soc. Med.*, **41**, 392.
 Stamm, T. T. (1957). *Guy's Hosp. Rep.*, **106**, 273.
 Trethowan, W. H. (1932). In *System of Surgery*, edited by C. C. Choyce, 3rd ed., 3, 940. Cassell, London.

PEAK EXPIRATORY FLOW MEASURED BY THE WRIGHT PEAK FLOW METER DISTRIBUTION OF VALUES IN MEN AGED 30-59 WHO DENIED RESPIRATORY SYMPTOMS

BY

C. M. TINKER, M.D., M.R.C.P.

Graduate Research Assistant, Department of Medicine,
Postgraduate Medical School of London, Hammersmith

A full account of the peak flow meter has been given by Wright and McKerrow (1959), but there is as yet little information about the range of values which may be encountered in normal men and women at different ages.

During a survey carried out on a random sample of 462 men aged 30-59 at London Transport Executive Works at Acton and Chiswick between February and April, 1959 (Fletcher and Tinker, 1961), the ventilatory capacity was estimated by each observer at the end of an interview during which a questionnaire on respiratory symptoms was filled in. Three Wright peak flow meters were used—Nos. 217, 173, and 242—which had been shown to agree closely when calibrated on human subjects (Wright and McKerrow, 1959). After a demonstration of technique by the observer, five readings were taken from each subject, and the mean of the three highest readings was recorded. Other observers (Higgins, 1957; Mork, 1960) have recorded the mean of the third, fourth, and fifth readings, but the College of General Practitioners (1961) found that this convention gave results only 3% lower than those obtained by the method used in this survey.

To obtain an estimate of the mean and standard deviation of "normal" values for men at different ages, all men who gave a history of cough, phlegm, wheeze, dyspnoea, or chest illness, or who produced any morning sputum in the specimen bottles provided, were excluded from the sample. The wide scatter of results in these symptom-free men is shown in the Chart. There is, however, a regression with age given by the formula:

$$y = 768 - 4.64x,$$

where y = P.E.F. in litres per minute, and x = age in years. The Table gives the mean values, standard deviations, and coefficients of variation in quinquennial age-groups. Symptom-free non-smokers showed no significant difference in peak flow rate from symptom-free smokers on the small numbers available.

For practical purposes the expected peak expiratory flow for normal men at any age is roughly $770 - 4\frac{1}{2} \times \text{age}$. It must be remembered, however, that values as much as 200 l./min. greater or less than this figure are within normal limits. Since the regression line of F.E.V., which is closely correlated with P.E.F., on age appears to be linear between the ages of 20 and 64 (Carpenter *et al.*, 1956; Sadoul and Dosapin, 1959) it might be justifiable to extend the regression line for P.E.F. below and above the age limits of our population.

The sitting height of the subjects (seat to vertex in sitting position) was also measured in this survey. After

Decline of peak flow with age in 116 symptom-free men aged 30-59.

Peak Expiratory Flow of Men Without Respiratory Symptoms or Sputum (Wright Peak Flow Meter, 1959)

Age	No. of Men	Mean Peak Expiratory Flow in l./min.	Standard Deviation in l./min.	Coefficient of Variation
30-34	17	622	94	15.1
35-39	18	586	98	16.7
40-44	12	583	86	14.8
45-49	24	552	75	13.6
50-54	22	496	94	19.0
55-59	23	517	112	21.7

standardizing the peak expiratory flow to age 40 it was found that the regression equation for mean peak expiratory flow with sitting height in centimetres was

$$y_s = 247 + 3.82h,$$

where y_s is the peak expiratory flow standardized to age 40 and h is the sitting height in centimetres.

Mork (1960), who surveyed a group of transport workers in Bergen and Post Office workers in London, found a relationship of P.E.F. with age that did not differ significantly from ours. His mean figures standardized for age were significantly lower than ours, but this may have been due to the fact that his "non-bronchitic group" included men with cough and sputum

which did not persist for as much as three months in the year. Sitting height was not found to be significantly related with P.E.F. when allowance was made for age.

The College of General Practitioners (1961) also found a similar rate of decline of mean P.E.F. with age in non-bronchitic subjects, and their values were uniformly lower than those found among "normal" men as defined in this study. The College of General Practitioners gave figures for non-bronchitic women indicating a rate of decline of P.E.F. with age about half that experienced by the men.

Higgins (1960, personal communication) found that the decline of P.E.F. with age in symptom-free men in the population he studied was similar to that found in our sample, and parallel to the decline in P.E.F. in symptom-free women. His values for P.E.F. in symptom-free men were a little higher than those given here. The values for P.E.F. in symptom-free women were approximately 200 l./min. lower than values for symptom-free men in the same age-group.

I wish to thank Dr. Charles Fletcher and Dr. A. S. Fairbairn, and Dr. J. C. Gilson and his colleagues of the Pneumoconiosis Research Unit, for their encouragement and help in the preparation of this paper.

REFERENCES

- Carpenter, R. G., Cochrane, A. L., Gilson, J. C., and Higgins, I. T. T. (1956). *Brit. J. industr. Med.*, 13, 166.
College of General Practitioners (1961). In preparation.
Fletcher, C. M., and Tinker, C. M. (1961). *Brit. med. J.* In press.
Higgins, I. T. T. (1957). *Ibid.*, 2, 1198.
Mork, T. (1960). Ph.D. Thesis, University of London.
Sadoul, P., and Dosapin, M. (1959). *L'Expertise de la Silicose Pulmonaire*. Masson, Paris.
Wright, B. M., and McKerrow, C. B. (1959). *Brit. med. J.*, 2, 1041.

DERMATITIS MEDICAMENTOSA

BY

C. F. H. VICKERS, M.D., M.R.C.P., M.R.C.P.Ed.
*Senior Registrar, Rupert Hallam Department of
Dermatology, Sheffield Royal Infirmary*

Contact dermatitis caused by medicaments is a common complication in the treatment of skin diseases. It is this violent reaction to some topical application which often necessitates referral of the patient to hospital. While it is true that one cannot practise dermatology without occasionally causing dermatitis medicamentosa, it is as well to recognize and avoid those substances which are frequent sensitizers. In an attempt to assess the relative dangers of topical applications commonly used in the Sheffield area, a survey of all patients who attended the department of dermatology suffering from dermatitis medicamentosa between July, 1959, and July, 1960, has been undertaken.

Present Investigation

A total of 136 patients thought to be suffering from dermatitis medicamentosa were investigated. The diagnosis was confirmed by positive patch tests in 117. When a patch test was negative it was repeated on skin that had been stripped by repeated applications of "cellophane" tape (Wells, 1957). If multiple patch tests were indicated, these were performed a few at a time; none were performed in the presence of widespread active disease.

The offending applications were prescribed in this department in 9 cases, obtained without prescription in 21, and prescribed by a doctor in 87. The results of all patch tests are given in the Table. Of the applications

mentioned, only chlortetracycline cream, neomycin ointment, and crothamiton ("eurax") cream are used in this department; the incidence of proved sensitization to these in a three-month period was 0.09%, 2.7%, and 4.6% respectively.

Results of Patch Tests

Preparation	Offending Constituent	Positive Patch Test		
		Normal Skin	Stripped Skin	Total
"Chloromycetin"	Chloramphenicol Base	18 1		19
"Locan"	Cinchocaine	16		17
"Proctosedyl"	Amethocaine	1		
"Caladryl" lotion	Cinchocaine	12		12
"Anthisan" cream	Diphenhydramine	2	10	12
"Aureomycin"	Mepyramine maleate	3	9	12
"Eurax"	Chlortetracycline Base	2		10
"Menopax"	Benzocaine	8		6
	Amethocaine	5		6
Neomycin ointment	Neomycin sulphate	1		
"Dettol"	Base	2*	4	6
"Killsperm"		8		8
"Germolene"		5		5
		4		4

*By exclusion.

Discussion

These results clearly confirm the known dangers of topical applications of local anaesthetics and antihistamines. Cinchocaine appears to be the most potent sensitizer among the former, though benzocaine and amethocaine may produce sensitization. The presence of hydrocortisone in the preparation does not prevent dermatitis medicamentosa, as proctosedyl was a common offender. Of the antibiotics, chloramphenicol still tops the list as the most potent sensitizer, though its dangers have been recognized for many years (Sneddon, 1957). Chlortetracycline seems to be the safest local antibiotic (cf. Sarkany, 1960); of the 10 patients in this series sensitive to this application only two were sensitive to the antibiotic itself. Sarkany (1960) has reported one case which was sensitive to parabens contained in the base of aureomycin cream, but six of our patients were sensitized to a locally produced chlortetracycline cream in which the base was anhydrous "eucerin."

Considerable difficulty was found in proving sensitivity to local antihistamines and neomycin. With regard to the former, it is interesting that trouble seemed to occur more often when the application was used on an eroded surface, and it was this observation that led us to use the stripping technique, which was found to be both easy and reliable. Calnan and Sarkany (1958) had the same experience with neomycin, and suggested the use of an intradermal test with neomycin sulphate (1%), while Phillips (1946) used a scratch test to confirm sulphonamide sensitivity. In the present group the intradermal test with neomycin sulphate was performed in all patients thought to have neomycin sensitivity, and the results were exactly similar to those obtained with the stripping technique.

It is, of course, impossible to assess the true incidence of sensitivity to those drugs not used in this department, though Eckersley, Dunlop, and Catterall (1960) have reported an 8% incidence of sensitization to locan in patients treated for trichomonal vaginitis with this preparation. In the case of the other preparations, we can only point out those which appear to give the greatest trouble.

Summary

A review of 117 patients suffering from dermatitis medicamentosa seen in the Rupert Hallam Department