

# Asthma - a clinical dilemma

by M Plit MBBCh FCPSA

## Denial of asthma

The occurrence of wheeze and mucous hypersecretion in young children, particularly if associated with current or past features of atopy such as hayfever, eczema and allergic conjunctivitis, together with a positive family history of asthma, should not make the diagnosis of asthma difficult.

If this is further substantiated by positive skin tests to common allergens, the diagnosis is left in little doubt.

Notwithstanding these clear cut features there remains a stubborn reluctance on the part of many doctors to be assertive, and diagnose asthma. There is a host of substitute diagnoses, including "wheezy bronchitis", "bronchitis", "bronchial obstruction", "mucousy child", and many others which all serve to deny the existence of asthma, hoping that denial will result in mystical disappearance of the disease.

This lack of assertiveness is compounded by suboptimal therapy.

Fringe therapy results in fringe benefits.

The natural progression of such actions is the persistence of asthma, and, consequently, a potential life threatening situation.

When asthma, which is readily apparent, is being relegated to the non-descript, what are the prospects for proper recognition and management when asthma presents atypically?

## Age of onset

A common error, and one to be avoided, is the misconception that asthma is the prerogative of childhood.

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Although many asthma attacks start in childhood, statistical analyses have shown that up to 59% of asthma attacks may start after the age of 15.

In all large clinics, physicians are faced with patients whose first asthma attack had started after the age of 70. In this group, an important minority will have asthma specifically related to their occupation, and the working environment. They need to be identified since removal from the sensitizing agent may effect a cure.

In some, unfortunately, once the asthma has been triggered, even removal from their occupational environment, may not alleviate their symptoms, since like most other asthmatics, not only allergens or immunological mechanisms are responsible for the asthmatic attacks.

*Fringe therapy results in fringe benefits.*

In women, asthma may start for the first time after childbirth. Pregnancy itself is unpredictable, in that some asthmatic sufferers are unaffected by pregnancy while others get worse. A percentage get better during the course of pregnancy, only to relapse after delivery.

## The outcome of asthma

In the belief that asthma will spontaneously subside, many asthmatic sufferers are either denied treatment altogether or are given marginal therapy.

In reality, the spectrum of asthma starting in childhood presents a varied pattern. Approximately, 80%

of childhood asthma will disappear during the teens, in 10% it will persist in a mild form and in another 10%, as severe persistent asthma.

Of these 80% who went into remission, approximately 40% will relapse in adulthood, of which half will remit and the other half presenting either with mild or severe asthma.

Although clinical recovery from asthma may be apparent, tests for airway "twitchiness" years later may still reveal degrees of hyper-reactivity, and children with previous asthma should be given guidance in terms of personal cigarette pollution and factors responsible for obstructive lung disease. (See Table 1)

## Recognition of asthma

The patho-physiology of asthma encompasses two major facets, bronchospasm and mucous hypersecretion. (See Fig 1).

Oedema, vasodilatation and basement membrane thickening also being accompanying factors. When the wheeze is the predominant symptom and sign, most doctors will recognize the problem.

However, airway obstruction may be severe without wheeze and furthermore, the mucous component may predominate and under such circumstances the asthma may go undetected.

A number of variant asthmatic patterns have been recognized: a) chronic cough; b) exercise induced asthma; c) dyspnoea; d) chronic bronchitis; e) nocturnal asthma; f) aspirin sensitivity.

## Chronic cough

Oedema, vasodilatation and mucous hypersecretion represent the "inflam-

*Continued overleaf*

**Age of onset (First attack)**

**12 000 Asthmatic studies (Australia)**

Under 5 years	- 24%
5 - 14	- 16%
15 - 19	- 16%
30 - 44	- 14%
45 - 59	- 15%
60 +	- 3%
(In 59% of the cases, age of onset was over 15 years.)	

making the child exercise, and measuring peak flow rates before and after six minutes of running, would reward the diligent.

This manoeuvre results in a fall in peak flow of 15% or more, and this is diagnostic of asthma.

voking factor of asthma particularly in children.

The recognition of this form of asthma by the clinician is of paramount importance. When it occurs in children, they often are unable to take part in the social and exercise activities with their peer groups.

Disastrous physical, emotional and withdrawal symptomatology may ensue. Parental over-protection, aided and abetted by uninformed medical advice are further problems faced by the young asthmatic, when engaging in a programme of physical activity.

Up to the time of the Munich Olympic games, records reveal that asthmatics have won gold medals at the last five Olympiads, all in swimming events.

It is apparent that some forms of exercise are more asthmogenic than others. For example free range running would cause far more bronchospasms than swimming.

For many years the discrepancy in the magnitude of the airways response had no known pathophysiological explanation. More recent work suggests that one of the mechanisms of the bronchoconstrictor response to exercise is due to the inhalation of large volumes of inadequately conditioned air. This leads to heat loss and cooling of the respiratory mucosa and subsequent bronchospasm.

In the great majority of asthmatics with exercise-induced asthma the attack can be effectively prevented by pretreatment with a B<sub>2</sub> sympathomemetic aerosol and in some

Fig 1 Age of onset (first attack)

matory" response of the pathophysiological process of mediator release.

Persistent chronic cough may be the only symptom of asthma seen both in children and to a lesser extent in adults. The cough is often productive of yellowish green sputum due to the excessive numbers of eosinophils present.

The prevalence of episodic cough and mucous production which is green in colour, is one of the factors which leads to the erroneous diagnosis of infection and subsequent unnecessary antibiotic therapy.

The application of a good history often revealing the atopic status, accompanied by examination of the sputum for eosinophils and appropriate skin testing will clinch the diagnosis. If uncertainty persists, a simple and yet elegant diagnostic test, namely inducing bronchospasm by

If there is still doubt, the patient could be given a therapeutic trial with sympathomemetic bronchodilator, stimulants, or methyl xanthines, and failing this, a short trial of steroids may be embarked upon. Clinical experience has shown that most of these patients respond to B<sub>2</sub> sympathomemetic aerosols.

The return of cough when bronchodilators are discontinued, the disappearance of cough with reinstitution of this medication, and the subsequent development of wheeze in many of these patients is ample evidence of this representing a variant group of asthma.

The hyperreactivity of the airways can be demonstrated by histamine and metacholine challenge testing.

**Exercise induced asthma**

This in itself is an atypical variant of asthma, and yet is one of the most common if not the commonest pro-

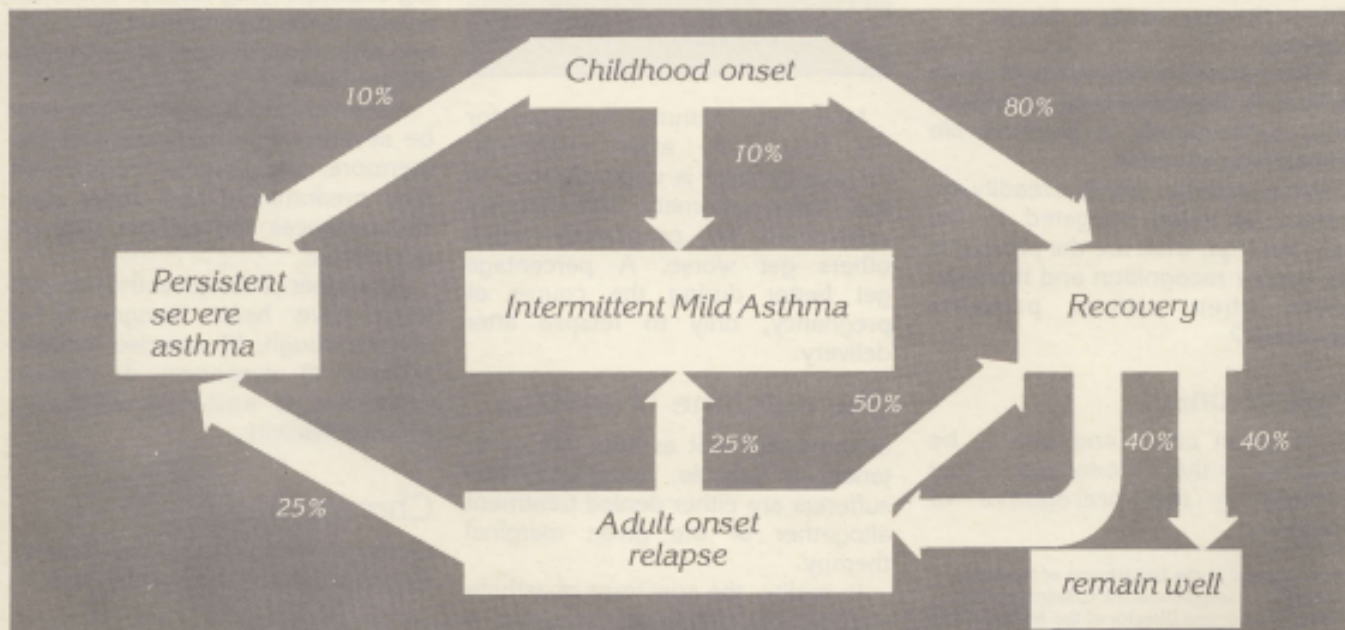
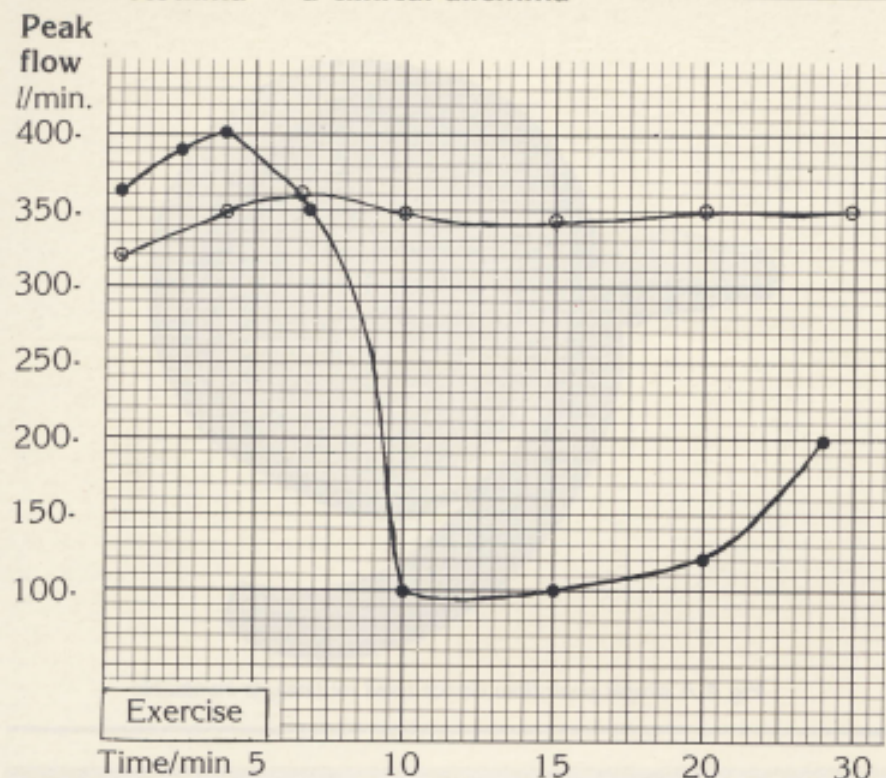


Table I Outcome of asthma



●● Typical response in peak flow following six minutes of running in on asthmatic child  
 ○— Response in peak flow in a healthy subject.

Fig 2 Exercise response in asthma

related amongst other factors to the fourth power of the radius,

$$\text{(Resistance)} \frac{8 \times \text{length} \times \text{viscosity}}{\pi \times r^4}$$

a reduction of airway diameter by half, will increase the resistance, 16-fold, and consequently the work of breathing will be dramatically increased. This reduction in airway calibre however, may not produce wheeze.

The small airways are involved in this reduction in radius, and consequent hyperinflation occurs. The absence of wheeze, the presence of hyperinflation both clinically and radiologically result in the label of emphysema, even in the absence of cigarette consumption, and the patient banished to the corridors and halls of the chronic lung outpatient departments.

### Chronic bronchitis

A substantial minority of patients masquerade as chronic bronchitics by virtue of chronic cough and mucous production, the hall mark of

by pretreatment with sodium cromoglycate (Lomudal).

With pre-exercise protection, sport and physical activities in the asthmatic could be identical to that of the normal subject. Since 1976, B<sub>2</sub> specific aerosols have been permitted by the Olympic Games Committee.

### Dyspnoea

In the absence of wheeze, cough and mucous production, the diagnosis of asthma may be difficult. Dyspnoea, due to bronchoconstriction, in the absence of wheeze, may be profound.

The presence of wheeze will depend on two major factors, the degree of airway narrowing and the rate of air flow.

In a minority of asthmatics the degree of airway narrowing may not be critical enough to produce wheeze and yet the reduction in radius, sufficient to produce a marked increase in the work of breathing.

Due to the intimate relationship between resistance and airway radius, where the airway resistance is

### THE PATHOLOGY OF ASTHMA

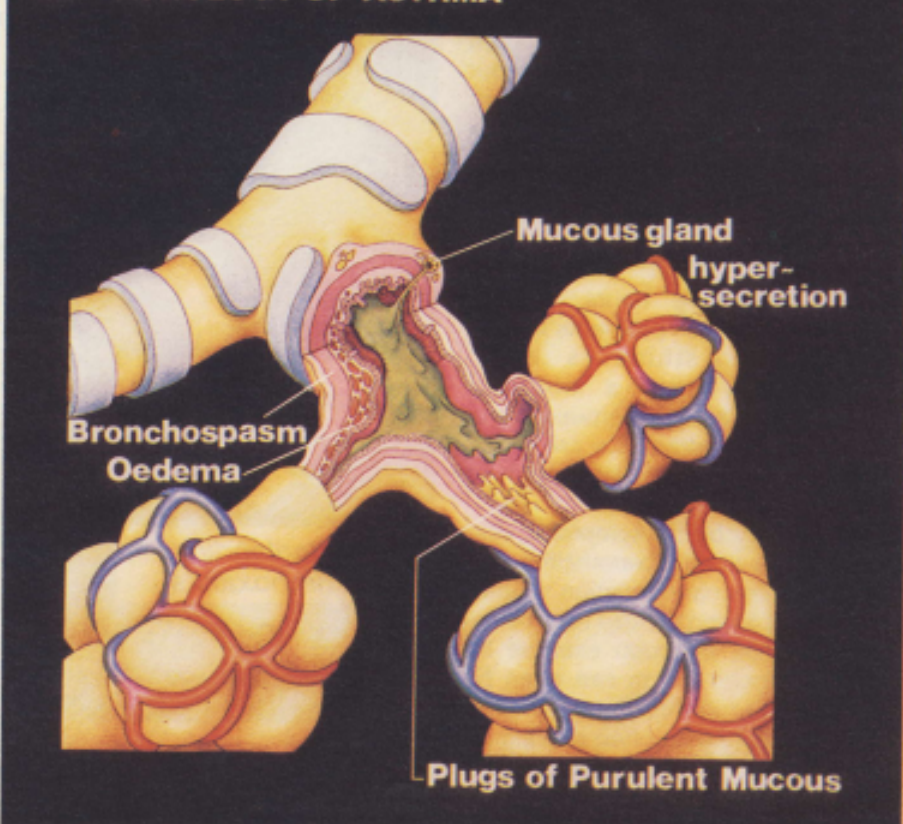


Fig 3 The pathology of asthma

chronic bronchitis.

If a patient develops asthma late in life (and a lot of asthma develops after childhood) it is not a disease exclusive to childhood; and if they have cough and sputum, they are quickly labelled as chronic bronchitics.

If the patient is a non-smoker, generally a younger patient, female, has a personal history of atopy, is symptomatic at night — beware! If they have positive prick tests to common antigens; have marked diurnal variation in symptoms; sputum and blood eosinophilia; they are asthmatic and should be treated as such.

In both this group and the dyspnoeac variety, if there is any doubt a recourse to a short trial of steroid establishes very quickly the scale of improvement and the diagnosis. Once the improvement has occurred, they can be switched over to conventional non-steroidal therapy.

A cautionary note — for the need for objective assessment in these groups, particularly if embarking on a therapeutic trial of steroids, is mandatory. I have found that I cannot adequately manage my patients without some form of measurement.

A simple peak flow device used routinely is invaluable. The thought of controlling hypertension without blood pressure readings is as abhorrent as treating asthma without a peak flow assessment, and where necessary, a daily diary card in the severe asthmatics.

### Nocturnal asthma

The bewitching hours, namely night-time, heralds problems for the asthmatic. Asthma is often predominantly only a nocturnal issue. There exists a group of patients, often children who are symptomatic at night only, with cough or wheeze.

There may be no symptoms during the day at all. Examination and routine pulmonary function studies carried out during the day may be entirely normal, although exercise induced broncho-spasm can often be demonstrated in this group.

This is more than often passing interest for it focuses attention and highlights the increased severity of bronchospasm in the hours between 1 and 8 am., a time shown to be particularly lethal for asthma sufferers.

To page 18

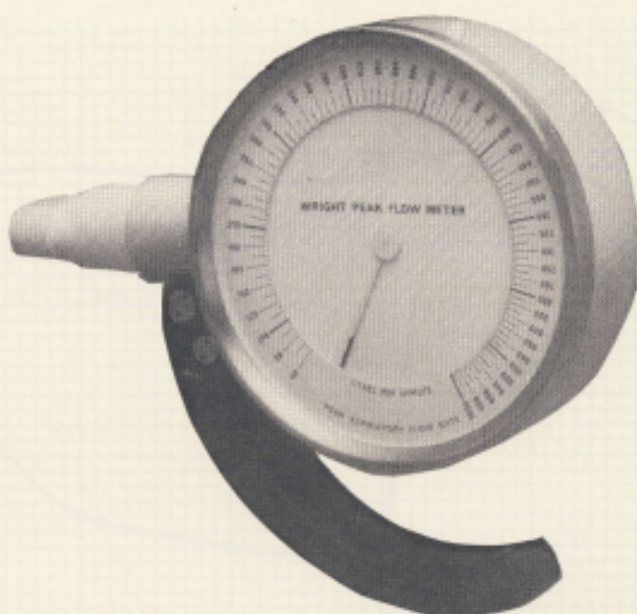
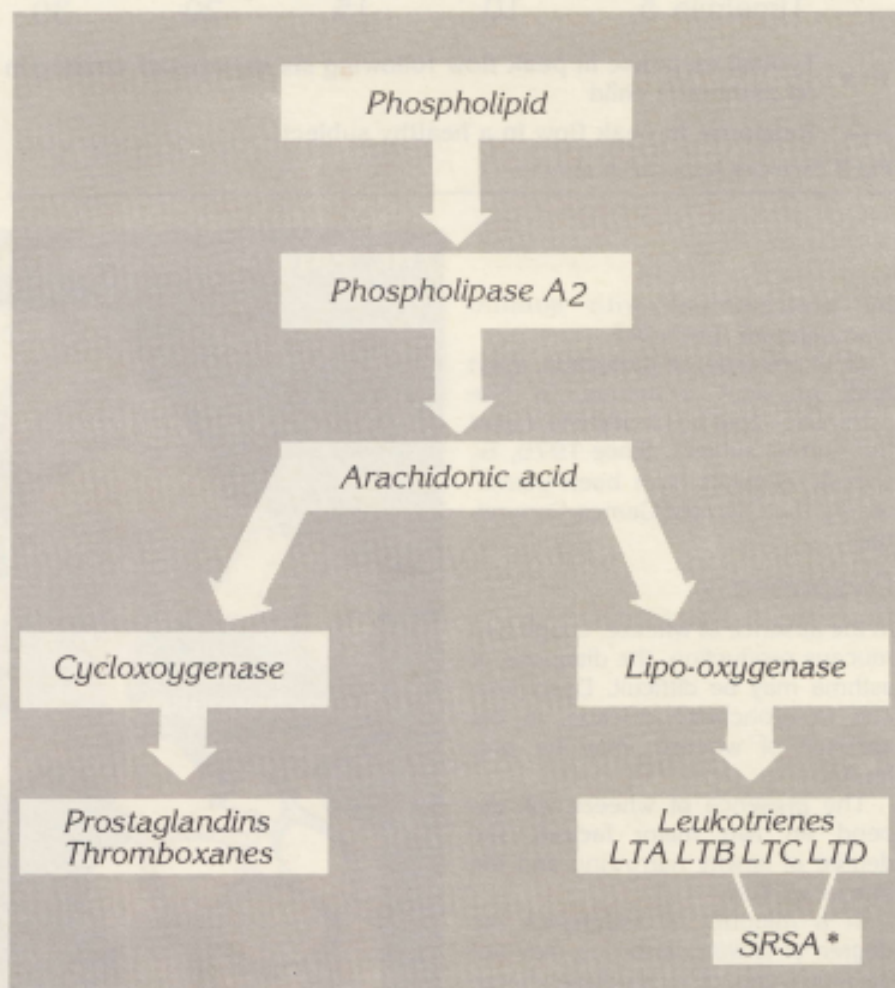


Fig 4 A simple peak flow device used routinely is invaluable



\*SRSA = Slow reacting substance of anaphylaxis

Table II Schematic diagram of arachidonic acid metabolism

# When Acid Attacks the Upper g.i. Tract



5K 9900

## Asthma — a clinical dilemma

From page 12

A study done in the Greater London Hospitals in 1975 showed that 13 out of 19 deaths, between the ages of 35 and 64 years occurred between 1 am and 8 am.

The patient is obviously most vulnerable at a time when medical assistance is least available.

Records of peak flow charts have demonstrated a characteristic pattern in many patients which has been labelled as "morning dipping". This refers to a decrease in peak flow in the early hours of the morning, and which is maximal later in the day.

In view of the potential hazard that nocturnal asthma poses, it demands an alert doctor to pry out and establish unequivocally the status of children with nocturnal symptoms who are well when examined in the surgery.

The dictum that no matter how well an asthmatic is during the day, he requires further control if he is symptomatic at night, needs no further emphasis.

### Aspirin sensitive asthma

Within the trigger factors that cause asthma, there are a group of substances that deserve special mention.

A very small percentage ( $\pm 2\%$ ) of asthma sufferers, often women in their middle ages, with associated nasal polyposis, but even young asthmatics may be inordinately sensitive to aspirins, and the non-steroidal anti-inflammatory agents. This is not an allergy to these drugs.

The mechanism for asthmatic attacks which may be very severe after ingestion of these agents, and may be accompanied by anaphylaxis is not accurately known. It is postulated that these drugs interfere with the cyclo-oxygenase reaction of arachidonic acid metabolism and thereby promote the formation of leukotrienes with severe bronchospasm resulting therefrom.

There may be a familial tendency for aspirin sensitivity.

The explosion in the use of Beta blockers, has increased the burden of

the asthmatic enormously. The prudent doctor prescribing Beta blockers today should clearly establish the status of his patient's airways before subjecting the person to Beta blockade therapy.

The axiom, all that is asthma may not wheeze, is presented.

### References

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- 5 Chronic cough as the sole presenting manifestation of bronchial asthma. William M Corrae, Sidney S Braman, & Richard S Irvin, the NEJM, 1979, No 12, Vol 300, page 633.
- 6 Enhancement of exercise induced asthma by cold air, R H Strauss, ER McRadden, RH Gregson et al, NEJM. No 14, Vol 297, page 743.

# Carbuterol — a more effective bronchodilator

Oral carbuterol at 3 mg q i d has been found to be a more effective bronchodilator than salbutamol at the same regimen in a study in which 21 patients with reversible airway obstruction, due to chronic asthma, were assessed.

The study was undertaken by Guleria et al, and has been reported in the "Annals of Allergy" (August, 1979).

The 21 patients, 12 males and nine females, were of a mean age of 28.3 years and had no associated

cardiopulmonary disease.

In most cases, their asthma was extrinsic.

The patients were administered carbuterol 2 mg q i d for one week, 3 mg q i d for one week, and salbutamol, 4 mg q i d for one week.

The order of the administration was randomised and was not known to the investigator or patient.

"The parameters measured included forced vital capacity (FVC), forced expired volume in the first second (FEV<sub>1</sub>) maximum mid-expiratory flow rate (MMFR) and peak flow rate (PFR)", the researchers explain in their report.

They add that during each regimen the bronchodilator efficacy of a single oral dose of the drug was assessed on the first and seventh day.

"On the seventh day no further drugs were allowed to permit the washout of the previous week's regime.

"Carbuterol 3 mg," they conclude, "was found to be a more effective bronchodilator than salbutamol 4 mg."

## Leading asthma authority to visit SA

Professor Simon Godfrey is one of the world's leading authorities on the treatment of asthma. He is the author of many published pieces of original research and has edited and written chapters in many medical text books. His interests are general paediatrics, the intensive-care of the new-born and pulmonary disease of children, in addition to asthma.

In recent years, Professor Godfrey has held many academic positions in the United Kingdom and is currently Professor of Paediatrics at the Hadasah University Hospital, Jerusalem.

He is to visit South Africa in May and will be holding a countrywide series of symposia for the Medical Profession.

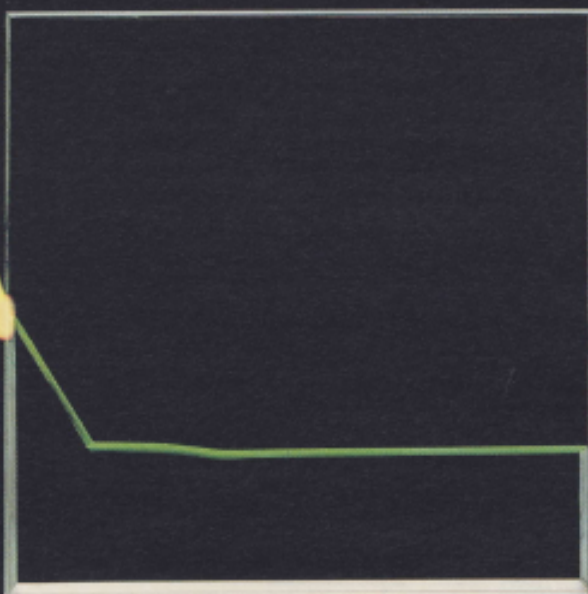
Traditionally confusion has always existed as to exactly when, in the treatment of asthma, should a person be treated with steroids and also for how long. These and other problem areas will be covered by Professor Godfrey in his lectures entitled the "Steroid Control of Asthma".

Invitations will be given to the Medical Profession by the representatives of Allen and Hanburys, approximately one month prior to each of the lectures. If, however, further information is required, please contact Mr Paul Stiff, Allen & Hanburys, Division of Glaxo (Pty) Ltd., P.O. Box 726, Germiston, 1400. Telephone: (011) 349172.

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