PRACTICE OBSERVED

Emergencies in the Home

Severe breathlessness, respiratory failure, and asphyxia

O C PARRY-JONES, N G HODGES

Severe shortness of breath is a common emergency to which the doctor should have a calm but hurried approach, balancing the priorities of urgent treatment against the time needed to acquire the diagnostic information that might make treatment more effective. The working diagnosis should be constantly evaluated as the clinical condition changes, as time becomes available to gather more information, or in the light of the patient's response to treatment.

The doctor may know the patient well and, for example, that there is a history of repeated attacks of asthma. This is helpful and so is reflecting on the common causes for breathlessness in patients at that age, for that sex, and on the time of day and week. In a seaside holiday practice, for example, the stressful Saturday change-over of holidaymakers is often associated with cardiac infarction in the young, and our local geriatric patients, as those elsewhere, often have left ventricular failure in the night-time. The clinical features and the probabilities are to be evaluated in each case, however. For temporary residents for whom there is no background information, a telephone call to their own general practitioner may supply useful information.

Reassurance is needed as well as drugs and manoeuvres, and this is much easier to give patients who are known to you. The family as well as the patient with frightening respiratory difficulty will benefit from calm command and a relaxed but competent history and examination.

Bealick, Gwynedd, Wales
O C PARRY-JONES, LCPHARM, general practitioner
C & A Hospital, Bangor, Gwynedd, Wales
N G HODGES, MB, MRCP, consultant physician

Asthma

Asthma is a common cause of shortness of breath in which there is usually a previous history, and the patient or the parents of children are usually known the diagnosis and often give an account of increasing symptoms that have not responded to the usual treatment. The diagnosis of first attacks may be helped by a history of stopy or of precipitating factors such as respiratory infection, exposure to allergens, emotional upset, nasal polyps, or ingestion of aspirin. The physical signs are usually dominated by wheezing and equal wheezing with tachypnoea, tachycardia, and pulsus paradoxus, and whose sleep is disturbed with little or no relief from the usual inhaler should ultimately be admitted to hospital (corresponding to stage 2A in the scheme of clinical grading of severity of asthma devised by Skewwood Jones¹). The treatment before admission and after admission is to give a β_2 -agonist such as salbutamol for less advanced asthma or a β_2 -agonist type nebuliser at 5 to 10 mg of salbutamol as a 0.5% solution. The next most useful measure is to give aminophylline intravenously in a bolus dose of 5 to 8 mg/kg over 15 minutes. The patient should respond in between 30 and 60 minutes.

Parenteral salbutamol or terbutaline is theoretically better than subcutaneous adrenaline for adults in view of the unwanted cardiac effects, but there is little reported experience of these drugs given parenterally. In children it is probable that subcutaneous adrenaline is still the treatment of choice, given carefully in two doses of not more than 0.01 mg/kg (0.1 ml of 1:1000 adrenaline) and not less than half an hour apart. Salbutamol may also be given orally in a dose of 0.15 mg/kg six-hourly or nebulised as 0.5 ml of 0.5% solution six-hourly. Aminophylline should be given if adrenaline and oral salbutamol fail as an intravenous bolus dose of 5 mg/kg over 10 minutes and preferably then as an infusion. The reported dangers in children are probably due to exceeding this dose. In any but the most mild attacks steroids are indicated, and the aim should be to achieve a high blood concentration of cortisol and to give a subsequent infusion to maintain the dose. Oral steroids should be started at the same time and any improvement related to steroids will probably not occur for

to below 80 per minute, and the treatment is artificial respiration with external cardiac compression and a morphine antagonist if that drug had been given to the mother.

Other causes

The adult respiratory distress syndrome arises in a variety of situations and is due to a similar lung reaction from a number of different causes. The main clinical features are tachypnoea with respiratory distress and circulatory impairment. It may occur after inhaling irritants (irritant vapours such as occur during a modern house fire, irritant gases, drowning, aspiration of vomitus) and there are then obvious rhonchi and moist sounds as well as the signs mentioned above. The same response, however, may occur in trauma with haemorrhage, septicaemia, fat or amniotic fluid embolism, blast injury, and also in acute viral pneumonia.

Pathologically there has been epithelial and endothelial damage to the lungs with interstitial and intra-alveolar oedema, perivascular and sometimes intra-alveolar haemorrhage with vessel thrombosis, and fibrinous exudation into the alveoli. In the non-inhalational causes of the syndrome rhonchi and moist sounds may be sparse, presumably because the main abnormalities are interstitial. There is usually a latent period after the initial disturbance in the lung although it may be the presenting feature in septicaemia.

The diagnosis may be made from the history and the circumstances in which the respiratory distress arose. The emergency treatment is directed towards the primary cause—for example, clearing the airway from inhaled vomit or aspirated food by lifting and suction, treating the septicemia or the circulatory collapse of fresh-water drowning—and providing a high concentration of inspired oxygen until a full assessment can be made in hospital. High-dose steroid treatment for this syndrome is controversial and should probably wait until objective investigations can be serially studied after starting treatment.

Acute shortness of breath may occur with an acute allergic alveolitis of the farmer's lung or bird fancier's variety. The history is usually of exposure to the relevant allergen and the physical signs are severe shortness of breath with fine high-pitched crepitations. Such cases may be difficult to distinguish from left ventricular failure in the appropriate age groups. Chest x-ray examination, electrocardiogram, and lung function studies may be needed for the diagnosis, and the emergency treatment is a high concentration of oxygen combined with steroids.

Occasionally metabolic conditions may present with the symptom of shortness of breath in which the direct to ventilation arises from an acidosis as in diabetes mellitus or renal failure. Other physical signs, especially the presence of anaemia and the absence of any respiratory abnormal signs, usually lead to the diagnosis.

Hysterical hyperventilation may present as shortness of breath. Apart from the chest appearing completely normal, there may be signs of tetany and tachycardia. Mild sedation and a detailed inquiry into the history will usually provide evidence of this condition. Pulmonary emboli may produce mild shortness of breath with very little in the way of clinical physical signs in the chest. There may be a history of immobilisation or recent abdominal surgery, and if there is any suspicion of this diagnosis further investigation is needed with a chest x-ray examination, lung scans, and venograms. Should the emboli interfere grossly with the lung circulation, then the dominant features will be circulatory.

Asphyxia

Asphyxia due to exposure to gases that displace oxygen is uncommon and will usually be evident as circulatory and respiratory arrest. It may occur in farmers going into silos in which there is a high concentration of carbon dioxide. Unless rescue and oxygenation is effected quickly there is no chance of revival. Rescuers need to be protected against the nitrogen dioxide themselves. A further agricultural cause of shortness of breath is poisoning with cyanide or inhibitors used as weed killers, which may be absorbed through the bronchial mucosa, skin, and alimentary tract. The history of exposure to weed killers and then vomiting, diarrhoea, and shortness of breath, wheezing, and copious bronchial secretions with miosis is usually clear. If the poison is of the organophosphate type, pralidoxime should be given early to hydrolyse the organophosphate enzyme bond

and free the cholinesterase. If the poison is of the carbamate group and in any case large doses of atropine as well as supportive measures are indicated. Admission to hospital is obviously preferable.

Oxygen

To deal adequately with all possible causes of shortness of breath, the doctor must give not only reassurance and the usual drugs but also oxygen. Oxygen should be given to all patients in whom there is a reduced transfer except for those with chronic bronchitis and possible chronic respiratory centre depression. Oxygen is best given from a cylinder with a flow meter delivering 8 to 10 litres of oxygen a minute. Other equipment required to deal with all emergencies, as mentioned above, should include an MC mask, which allows an inspired oxygen concentration of between 60 and 80%; a flow of 8 to 10 litres per minute; an ambu bag; a face mask; a Wright's type nebuliser; a small thoracic catheter gauge size 14 (possibly with pointed scalpel blade); a Heimlich valve; and a cylinder or foot-operated suction. It is our contention that very few doctors are equipped in this way. In fact flow meters delivering 8 to 10 litres per minute, MC masks, and the other items are not readily available, and we believe that they should be so that faced with the above emergencies the doctor is at least adequately equipped.

The doctor first on the scene must stabilise the patient's condition before deciding on the timing and safest mode of transport to hospital. It is usually advisable for the doctor to accompany the patient to hospital in case there is a relapse.

References

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- 3 Baskett PJE. In: Zorab JSM, Baskett PJE. *Immature care*. Philadelphia and London: WB Saunders, 1978:100.
- 4 Knight RK. A pneumothorax valve. *Lancet* 1967;1:190.

OF BLEEDING.

No operation of surgery is so frequently necessary as bleeding; it ought therefore to be very generally understood. But though practised by Midwives, Gardeners, Blacksmiths, &c. we have reason to believe that very few know when it is proper. Even physicians themselves have been so much the dupes of theory in this article, as to render it the subject of ridicule. It is, however, an operation of great importance, and must, when judiciously and properly performed, be of singular service in a wide variety of cases.

BLEEDING is proper at the beginning of all inflammatory fevers, as pleuritis, peritonitis, &c. It is likewise proper in all topical inflammations, as those of the eyelids, nose, bladder, stomach, intestines, throat, &c. as also in the affections, gastric pains, coughs, head-aches, rheumatism, the apoplexy, epilepsy, and bloody flux. After falls, blows, bruises, or any violent hurt received either externally or internally, bleeding is necessary. It is likewise necessary for persons who have had the misfortune to be thronged, drowned, suffocated with foul air, the fumes of metal, or the like. In a word, whenever the vital motions have been suddenly flopped from any cause whatever, except in fevers, occasioned by more weakens or hysterical affections, it is proper to open a vein. But in all disorders proceeding from a relaxation of the solids, and an impoverished state of the blood, as dropsies, cacochymies, &c. bleeding is improper.

(Bachan's Domestic Medicine, 1786.)

some hours. In adults a bolus dose of 200 mg of hydrocortisone and the subsequent infusion of about 1 g a day is needed, and in children the initial dose of hydrocortisone is 2 mg/kg as a bolus dose. A high concentration of oxygen should be given to all asthmatic patients during a severe attack unless there is coincidental chronic bronchitis and airflow obstruction in which hypercapnia might be suspected. Ventilation failure may occur after severe asthma when the patient shows exhaustion, collapse, and diminishing respiratory effort. Such patients require oxygen combined with ventilatory support, preferably with endotracheal intubation and an ambu bag. An ambu bag, a face mask, and a high flow of oxygen may be used, however, with all the above measures while urgent admission to hospital is arranged.

Pulmonary oedema

Pulmonary oedema due to left ventricular failure may have very clear diagnostic features, such as a history of high blood pressure or cardiac infarction and signs of left ventricular distress (tachycardia, pulsus alternans, rattle rhythm) and of autonomic overactivity (cold peripheries, sweating, agitation), as well as coarse crepitations extending upwards from the lung bases. Some patients, however, may have signs of wheezing only, and if the circulatory evidence is not clear a chest x-ray examination may be needed to distinguish between asthma and left ventricular failure. In both conditions oxygen are effective treatments in both conditions and may allow time to collect more diagnostic information.

For left ventricular failure rapid acting diuretics such as furosemide intravenously may produce a rapid reduction in left ventricular end diastolic pressures, and other helpful measures include vasodilation with nitrites, small doses of chlorazepate, hydrocortisone to reduce the limbs, or even venesection. Rapid digitalisation with intravenous digoxin 0.75 mg to 1 mg or, preferably lanatoside C 1.2 mg (which acts more quickly, in 10 to 30 minutes, as compared to digoxin's 15 to 60 minutes) is useful. Diamorphine is useful to sedate the patient and probably also reduces pulmonary capillary permeability. Any arrhythmia that might have precipitated left ventricular failure should be treated. Unless there is a rapid and complete response and the attack was mild, hospital admission is necessary for full assessment once the circulatory state has been stabilised.

Chronic bronchitis

Patients with chronic bronchitis may develop severe breathlessness during an exacerbation with usually a clear history of recent respiratory infection. The signs are airflow obstruction with marked overinflation and possible cor pulmonale. The breathlessness is not usually severe enough to require emergency treatment at home, but hospitalisation is necessary to treat with antibiotics, steroids, bronchodilators, physiotherapy, and humidification. If breathlessness is particularly severe and sudden, then as in asthma the possibility of a pneumothorax should be considered and treated as below. If a patient becomes progressively drowsy then this is probably an indication to give respiratory stimulants such as nikethamide or doxapram to act temporarily, and consideration must be given to ventilatory support as with severe asthma. The drugs used in asthma may be helpful in chronic bronchitis, but oxygen should be deliberately excluded because of the possibility of chronic respiratory centre depression. Such patients need to have arterial blood gases measured before any decision can be taken about oxygen treatment.

Other airways obstruction

Severe shortness of breath in a child may be due to asthma, even under the age of three years, and hospitalisation is indicated with similar treatment regimens as for older children. There may also be bronchiolitis giving a clinical picture like asthma and requiring oxygen, humidification, and admission to hospital. Both these conditions need to be distinguished from upper airways obstruction, which inspiratory stridor and respiratory distress are the dominant features. There is usually a history of a recent upper respiratory tract infection, and the illness may be due to a viral laryngotracheitis or an epiglottitis due to *Haemophilus influenzae* or, rarely, to diphtheria. Panic and apprehension in the parents, who are often young, are

conveyed to the child who cries out the more causing greater distress. It is then necessary for the practitioner to build on his relationship with the family to reassure them, and to try to break the vicious circle of fright and stridor. There will then be time to assess the severity and if possible perform a gentle physical examination. If the child is ill or has evidence of epiglottitis admission to hospital will be necessary, but the head and neck must be handled carefully so as not to precipitate laryngeal spasm. Treatment before admission to hospital should probably be penicillin and oxygen.

Upper airways obstruction, usually laryngeal, that produces variable respiratory distress may result from various causes such as inhalation of food or other foreign bodies, strangulation or hanging, or other laryngeal trauma or asphyxia due to, for example, a plastic bag. Acute laryngeal oedema may result from an allergic reaction or be hereditary angioedema. Apart from the history, difficulty with inspiration with a marked larynx where suggests an upper airway cause. A history of acute stridor or collapse while eating should suggest food impaction, and the Heimlich's manoeuvre should be done to rapidly remove the residual air within the thorax by a sudden upward thrust on the diaphragm from the epigastrium.

For laryngeal oedema, adrenaline given subcutaneously as 0.5 ml of a 1 in 1000 solution (0.5 mg) is the treatment of choice. Oxygen should be given in a high concentration, and if the laryngeal obstruction is not relieved a tracheostomy should be done, or at least several number 1 needles placed through the cricothyroid membrane. Although this latter procedure and even an emergency tracheostomy are feasible in an adult, the chance of success in a small child outside hospital is small. Below the larynx the impact of a foreign body occurs in a main bronchus, and produces obstructive pneumonia, distress and localised stridor. This is not, however, an immediate threat to life.

Pneumonia and pneumothorax

Pneumonia, which produces rapid respiratory distress at all ages, may be diagnosed by fever, sputum, and signs of consolidation. There is usually time to make a full assessment, and rarely is the distress so great that pneumonia causes severe breathlessness. If, so, oxygen, antibiotics, and admission to hospital are required.

Sudden shortness of breath with a pleuritic type of chest pain may be due to a pneumothorax that is clinically obvious with unilateral reduced movements, hyperresonance, and quiet tubular breath sounds, and perhaps tracheal deviation if the pneumothorax is big enough to produce marked shortness of breath. Admission to hospital for pleural drainage is indicated. Rarely a tension pneumothorax occurs, and this may have to be treated in an emergency.

Chest trauma

Chest trauma is an important cause of respiratory distress that often affects patients who were previously fit, and is said to account for 30% of the mortality of injured persons before admission to hospital.² The exact disturbance and its treatment are often not immediately clear, but a large open pneumothorax should be closed as far as possible with a pad to prevent air being sucked in and to allow ventilation of the opposite lung. A drain with a Heimlich's or other non-return device should be used for this and when there is any question of a tension pneumothorax, rapid blood loss from fractured ribs needs to be quickly corrected by expanding the plasma volume, and draining a haemothorax can usually wait until admission to hospital. A large flat segment may require urgent artificial ventilation with an endotracheal tube and a ventilating device if there is tachypnoea and resulting circulatory collapse. It is important to ensure that the upper airways are clear, and oxygen should be given.

Asphyxia neonatorum

Asphyxia neonatorum is an unusual cause of asphyxia outside hospital. The incidence is said to be 6% of live births so that this complication should be considered possible in all deliveries. The baby is initially cyanosed with absent or slow respiratory effort, flaccid limbs, and no response to external stimuli. The pulse slows

Pitfalls in Practice

Finding a practice

III: The contract

JOHN OLDROYD

This article is based on an additional presentation made for vocational trainees in general practice by the MSD Foundation.

Three days after Dr Ian Keen accepted a junior partnership with Dr Jack Sharpe and Dr Alfred Idle, the partnership contract, drawn up by their long-time friend and associate, Peter Bonamic, arrived. It looked very complicated and seemed to contain a lot of important legal information. Ian Keen was impressed and began to wonder whether he had misjudged his future partners by being so suspicious. It appears that he should be: some points that he should query in the contract are included with it.

Contract

This partnership Agreement was made the 1st day of February 1981, between Jack Sharpe and Alfred Idle of The Registry House, Market Cross, Elyham on Thames in the County of Thameshire of the one part hereinafter called the PRINCIPAL PARTNERS and Ian Keen of Odipus Villa, The Drive, Meturbury, Homschire of the second part, hereinafter called the JUNIOR PARTNER.

WHEREAS the PRINCIPAL PARTNERS are undertaking to provide general medical services in and around Elyham on Thames being medical practitioners on the list of Thameshire Family Practitioner Committee they have agreed that as from the 1st day of April 1981 they will take into partnership the Junior Partner to carry on in partnership with The Registry House, Market Cross, Elyham on Thames a practice as medical practitioner upon the terms hereinafter provided until determined as hereinafter determined.

? Definition.—The agreement was made between Drs Sharpe and Idle on the one hand—the principal partners—and Dr Keen on the other—the junior partner receiving a guaranteed share of the profits.* A new agreement without this definition will probably have to be written if Dr Keen is to be offered a true profit-sharing partnership at a later date.

Now This Deed Witnesseth as follows:

(1) The partnership shall begin on the 1st day of April 1981. The rent rates and taxes of the professional accommodation used for the purposes of the practice at the above-mentioned premises and all expenses of repairs and insurance and other expenses relating and all expenses of providing drugs and other articles and

*Hereafter called the "junior partner"; the BMA believes that the use of "shared partner" is a misleading description for principals working in partnerships who receive a guaranteed share of the profits.

Secretariat for London Local Medical Committees, Tavistock House North, London WC1H 8PT
JOHN OLDROYD, MB, MRCP, Secretary

effects required for the practice and all salaries and of expenses in connection with servants employed by the partnership and all other charges and outgoings related to the practice shall be paid by the Principal Partners.

? The principal partners accept that they pay all expenses of the practice premises and staff employed. This is unusual if the partnership is based on a guaranteed share of the profits, but if Dr Keen does leave the partnership and wishes to stay as principal on the list of the registered FPC he will have no right of access to these premises and will have to find an alternative surgery.

(3) The Principal Partners will pay a guaranteed share of the profits of the partnership at an amount not less than £2000 per annum with an increase of £500 per annum up to £2500. The said sum shall be payable in twelve monthly instalments on the last calendar day of the month in arrears. Provided always that if at the end of any year the guaranteed share is less than one-third of the profits of any of the Principal Partners then the Junior Partner's share shall be increased from the amount guaranteed so that it is one-third of the share of the Partner holding the highest share of the net profit.

(4) On the 1st day of April 1981 the Partners will review the above paragraph and any further agreement as to redistribution of shares shall be not regarded as a determination of this Agreement but may be witnessed as an addendum to it.

? A guaranteed share of the profits at the start of the agreement is agreed at £2000 a year, with an increase of £500 a year to a maximum of £2500 a year—but if this is less than one-third of the share of the highest-paid principal partner then the principal partners will make up the junior partner's share to this level. Quite clearly Dr Keen should be asking how long this goes on for. If he does not have a no profit-sharing basis with parity in time, or if there is no movement of salary towards equality, then he should be thinking of rejecting the offer at this stage.

(5) The Principal Partners shall be entitled to deduct from the Junior Partner's share such proportions of contributions to the National Health Service Superannuation Scheme that may fall from time to time to be deducted from the remuneration of general medical practitioners under the regulations of that scheme.

(6) All monies received from the business of the practice by the Junior Partner shall be delivered for payment into the partnership account which will be held at Messrs Williams Bank, Tulse Burn Street, Elyham on Thames. He shall do this without deduction of forthwith and be required to furnish true and just accounts of all work done and monies paid or received by him to the Principal Partners.

(7) Throughout the duration of this Agreement the Junior Partner shall: (a) provide for his own board lodging and upkeep and private telephone; (b) devote the whole of his time and attention to the work of the practice undertaking such duties as the Principal Partners direct. He will attend morning and evening surgery on the premises from Monday to Saturday with the exception of Saturday evening when no

surgery is held on Wednesday evening. He will be off duty from such time as he has completed the visits and other practice work assigned to him by a Principal Partner at the end of morning surgery on Wednesday. He will attend to the business of the practice on Mondays, Tuesdays and Fridays after evening surgery each week and from midday Saturday to 8 am the following Monday for three of every four weeks. During the absence from the practice of one of the Principal Partners he shall undertake such other duties as the remaining Principal Partners direct.

(9) Clause 7(b) provides food for thought. Dr Keen is being exploited. He shouldn't sign. This clause doesn't even specify what absences of the principal partners means—just holidays? And what is their holiday entitlement? Dr Keen's appears later as: "The junior partner shall be allowed three weeks' annual leave for each twelve months of completed service and one week's study leave where the course of study is approved by the principal partners." Dr Keen may be interested in a course on practice management. I doubt if Drs Sharpe and Idle would approve. They would have to see the lad lose his trusting innocence if he had agreed all that had gone so far.

(c) not disclose the business or secrets of the Practice or information in respect of the Principal Partners or their families, patients or affairs to any other person (except to the Principal Partners or any other person having lawful right to such disclosure).

(d) provide and maintain at his own expense a motor car for use in connection with the work of the practice.

Dr Keen must provide for his own board, lodging, laundry, telephone, and motor car. This is probably an invalid agreement as his motor and telephone expenses could be reckoned as practice expenses, and these affect his guaranteed share at one-third that of the highest paid principal partner.

(e) maintain membership of the Medical Protection Union of England.

(f) maintain his name on the Medical List of the Family Practitioner Committee for Thameside.

Dr Keen may adjudge that clause 7(f) sounds reasonable, but not if he reads it in the next section.

On termination of this Agreement he shall forthwith give notice to the FPC of his intention to withdraw from the said Medical List and shall do all in his power to effect such a withdrawal and to have transferred to the Principal Partners all those patients who may be upon the Junior Partner's list and also authorises the Principal Partners to give such notice on his behalf if this agreement is terminated.

It is for any reason the junior partner's service is terminated he shall inform the FPC of his desire to withdraw from the medical list and transfer all patients on his list to those of the principal partners or their nominee. He also authorises and empowers the principal partners to give such notice on his behalf and sign all documents on his behalf if this agreement is terminated. This clause is probably not legally enforceable, but does Dr Keen really want to be associated with two colleagues like these? Ill-health would be far more attractive than Elysium if this is the best he can do for himself in the green and pleasant part of the country.

(g) not display his nameplate on the practice premises nor will he accept the medical records of any person to be on the list of the FPC in his name but will arrange such patients to be placed on the list of one of the Principal Partners. Where the list of both Principal Partners is at a level which the FPC determines is the maximum level allowable, then all patients seeking acceptance will be placed on the list of the Junior Partner.

(8) The Junior partner shall be allowed three weeks' annual leave for each twelve months of completed service and one week's study leave where the course of study is approved by the Principal Partners. And pro rata for any shorter period of service provided that if the Junior Partner's period of service is less than six months, he shall not be entitled to such absence for holiday or study leave.

(9) This Agreement may be determined by either party after giving not less than three calendar months' previous notice in writing to the last known address of the other party.

(10) In the event of sickness causing absence of the Junior Partner, he shall be responsible for the payment of all fees and expenses of a locum tenens employed by the Principal Partners and carry out his duties. The Junior Partner will be entitled to such payments paid by the Thameside Family Practitioner Committee as additional payments during sickness as detailed in para 48 of the NHS General Medical Services Statement of Fees and Allowances as a direct payment to himself where he has such absences and such payments will not form part of the Practice monies. Provided always that if the Junior Partner is incapacitated for a period exceeding thirteen consecutive calendar weeks the Principal Partners have the right to terminate this Agreement forthwith.

(11) (1) If the Junior Partner
(a) commit any breach of this Agreement
(b) absent himself from the Practice without consent of the Principal Partners
(c) shall become bankrupt
(d) is guilty of immoral behaviour, dishonesty, misconduct or neglect prejudicial to the interests of the Principal Partners
(e) shall have his name removed from the Thameside Medical List

the Principal Partners may forthwith terminate this Agreement without prejudice to their other rights and remedies of the Principal Partners.

2. If the Junior Partner's name be removed from the Medical Register, this Agreement is terminated on the date such removal becomes effective.

12. The Junior Partner shall not during the term of this Agreement practice on his own account or act as a locum tenens, deputy in any department of medicine, surgery or midwifery without the consent in writing of the Principal Partners.

13. The Junior Partner hereby agrees that on termination of this Agreement by any means whatsoever

(a) not after termination of this Agreement for a period of eight years and within an area of radius of ten miles from the Market Cross Elysiun on Thames to provide any service of the kind normally provided by a general medical practitioner to any person known to be a member of a household in the said area.

(b) not at any time during a period of eight years following termination of this Agreement apply for or hold any professional appointment whether whole time or otherwise whether salaried or honorary within ten miles' radius of the Market Cross Elysiun on Thames which during the subsistence of this Agreement has been held by the Principal Partners, Junior Partner or any of them.

(c) not for any time during a period of eight years directly or indirectly make use to his own advantage or that of any other practitioner and to the detriment of the business or practice of the Principal Partners or any knowledge acquired during the subsistence of this Agreement of the patients of the practice.

(14) Any and every dispute or difference of opinion which shall at any time arise between the Partners hereto touching the construction, meaning or effect of this Deed or any Clause herein contained or the rights, duties or liabilities of the said parties respectively under this Agreement or any knowledge acquired during the subsistence of this Agreement of the patients of the practice shall be referred to arbitration under the Arbitration Act 1950 or any modification or re-enactment thereof for the time being in force.

IN WITNESS WHEREOF the Parties hereto have hereunto set their respective hands and seals the day and year first written above.

Signed by the said

Signed by the said

Signed by the said

Signed by the said

The agreement goes on to specify that the junior partner shall pay all monies he receives from the FPC and other professional fees to the principal partners. He will insure himself with a defence society and for cover for locums for himself in periods of sickness. He shall undertake no other medical appointments during the term of the agreement. He is restricted, if the agreement is terminated, from acting in any form of medical, surgical, or obstetric practice within a wide range of the practice premises for a long period. Needless to say the agreement can be terminated by the principal partners by repelling the junior partner virtually at their whim, and occasionally, if they decide not to terminate in the event of transgression, to fine at a specified figure.

Fantasy may be the opinion of many experienced GPs on reading this section. Happily this is not the normal agreement offered to incoming partners. But each and every one of these conditions is known to local medical committee secretaries and to the defence societies, who are visited by the unethical Dr Keen who sign such agreements and then five or 10 years later present themselves for advice. Only too often they are known as

well to the lawyers who specialise in partnership law—and run even more elegant cars than Drs Sharpe and Idle.

THE MESSAGE IS SIMPLE

Agree nothing. Sign nothing until you have obtained advice on your offer from someone you trust who has experience in this field. A lawyer is an obvious choice, but do you know one who understands the nuances of NHS terms and conditions of service? An accountant who looks after the accounts of GPs in a locality could vet an agreement critically and advise on the general points for a lawyer to consider. Many GPs—including trainees—can spot glaring anomalies in agreements. Most local medical committee secretaries would advise the parties generally and vet an agreement, but they have no legal skill. Some suggestions of what a contract should include will be published in the next article.

This is the third of four articles on finding a practice.

Beyond the Surgery

General practitioner and the World Health Organisation

B J ESSEX

On this planet in the year 1981 the vast majority of people are poor, illiterate, and unhealthy. The World Health Organisation (WHO) has the goal of health for all by the year 2000. This can only be achieved if we have good food, safe water and sanitation, and effective primary health care. I believe that primary care is the most intellectually demanding specialty of medicine. It covers a vast, complex, and interrelated range of physical, mental, social, and cultural problems. In developing countries these problems have to be managed by health personnel who are not medically qualified. If group practice in the United Kingdom is difficult, imagine how much harder it would be if we had to deal with over 100 patients in each surgery, if we saw 200 women in an antenatal clinic, if our health centre was 100 miles from the nearest hospital and was without a telephone, and if drugs and transport were often unavailable.

Does Western medical training provide the skills needed to work effectively within these constraints? This was the question I asked myself when I worked as a teacher of primary health care in Tanzania in 1972-4. There I saw doctors training health auxiliaries to do a "proper" history and full examination in the wards in preparation for seeing a new patient every three minutes in the clinics. Training never indicated what to do if drugs were out of stock or transport not available. A conventional medical training was being used with total disregard for the constraints under which primary care is practised in less developed countries. It is easier, however, to identify problems than to solve them.

Formulae are used to describe chemical reactions; an artist can draw the picture he has in mind; how can a doctor describe the complex thought processes that enable him accurately to identify a health problem and its management in less than five minutes. It is not organ transplants that are needed, but transplantation of best experiences to avoid learning at the expense of the health of the people. Developing accurate, problem-oriented diagnostic flow charts in Tanzania rapidly increased the diagnostic accuracy of all students in a class.¹ This minimised the dependence on outpatient teaching, which was rarely provided. The combined experience of many clinical specialists that had taken years to acquire was described in a flow chart (algorithmic) form that could be readily used by health personnel who would never have special training in all of these areas. Not only did such initially increase diagnostic accuracy but they also standardised referral patterns, thus making the best use of scarce resources. In 1974 I returned to general practice in Britain and thought that my work in primary health care in developing countries was finished.

Working for WHO

In 1976 I was invited by WHO to Geneva to show how my work developed for the disease patterns of one country could be adapted for different disease patterns in other developing countries. I proposed research studies that would develop and evaluate the use of algorithms, games, and action-oriented record systems for different tasks and health personnel. WHO called this programme the development of technologies to aid decision-making in primary health care. I had to decide how to do this research within the context of daily practice, without tak-

ing time off or putting in locums. I decided to start at 5 am and get through my work day before getting to the practice at 8.30. I also decided to reduce my holidays to two weeks a year and to use the remaining holiday and study leave for WHO research and travel. At that time I did not imagine this would be long-term project. Research funds provided by grants from WHO and the Ministry of Overseas Development were administered for me through a WHO collaborative centre in London.

ALGORITHMS

In 1976-7 I developed a set of 64 interlinked flow charts for intermediate-level health workers to use to identify over 200 illnesses found in most developing countries. These included the universally prevalent conditions as well as diseases specific to certain regions. Each illness could be identified from any of its possible presenting symptoms. The methodology used to develop this work owes much to Mr Richard Parkhurst, a senior biologist, who is an expert in developing computer programs for biological classifications. He and I worked together in the Natural History Museum, where we had an on-line terminal to computer facilities at Cambridge University. WHO evaluated the accuracy of these flow charts in a separate study in Guinea Bissau.² I also wrote a training manual for teachers to train health workers in the skills and rules needed to use the charts effectively.³ This work has now been translated into Spanish, Portuguese, and French, and is being introduced into national training programmes in many countries in Africa and South America.

I also did a feasibility study on the development of algorithms for identification and management of obstetric emergencies by midwives in health centres in developing countries. This work attempted to analyse the decisions that have to be made about obstetric emergencies in a health centre when resources are limited and transport is not always available. The management of 14 obstetric emergencies in optimal and suboptimal conditions was analysed by submitting draft charts to experts in different developing countries. It took 18 months and 20 drafts to get a consensus of expert opinion on the appropriate management for each problem given the constraints under which the midwife has to work. These flow charts were then presented in a way that allowed for further adaptation to local conditions. An example of a flow chart for management of a retained placenta is shown in the figure. It answers the following questions: What are my goals? What do I do? In what order do I do things? When do I do it? If transport is delayed or I do not have a particular skill? What do I do if there is no change? If management was successful; or if a new problem has now developed? Management procedures were standardised to ensure the highest quality of care within existing constraints. This rationalised the use of scarce resources and skills and made it possible to evaluate the quality of care provided. WHO has given maximum support for field testing, adaptation, and translation of this work in many countries.

In 1978 I was asked by the Mental Health Division of WHO to study the feasibility of using algorithms for identifying and managing mental health problems in developing countries. This extensive research project required collaboration with psychiatrists, behavioural scientists, psychologists, anthropologists, sociologists, and nurses in many different countries. I worked on this project in Ghana, Colombia, and Egypt, where it was part of the WHO collaborative study for extending mental health care. At various stages the work was sent out to experts in 19 countries for critical review, and the final eight flow charts were redrafted 28 times.⁴ They are now being translated and extensively evaluated in different countries. Management has to be adapted to local customs and local constraints. Health workers in many different countries can now identify appropriate management for a range of disturbed

behaviours that do not have Western disease labels. This helps to measure the extent of mental health problems, standardises the quality of mental health care, and helps to evaluate its effectiveness.

In 1978-80 WHO provided funds to extend the flow chart and action-oriented record approach to the tasks of the village health worker and the traditional birth attendant (TBA). With TBA trainers in 22 different countries a project was started to obtain a consensus of agreement on appropriate strategies for 40 health problems of mothers and infants seen by TBAs. These were first outlined as simple, interlinked, problem-oriented flow charts. The next phase was to develop a training programme that aims to improve the effectiveness of the TBA and at the same time teach her basic literacy skills.

An algorithm has also been developed for use by village health workers to identify accurately preventable causes of death in children under 5 years of age⁵ and is being evaluated in India and Bangladesh.

MICROPROCESSORS

These algorithms enable health workers on different levels to identify health problems in the community and the appropriate management. When collected and analysed, this information could provide a moving picture of changing patterns of

Management of retained placenta by midwife in health centre.

mortality and morbidity in different places at different times. This could be used to plan and manage as well as evaluate the effectiveness of basic health services. How can such an intelligence system be created? In 1979 I began, with computer experts from the Middlesex Polytechnic, to examine the feasibility and cost effectiveness of a microprocessor-based intelligence system to help plan, manage, and evaluate basic health services in less developed countries. When the initial prototype was recently shown to the heads of major programme areas within WHO it stimulated great interest in the many possible applications of microprocessors and in the need to develop software and hardware appropriate for potential users in developing countries. We shall continue this research project during the next two years, collaborating with scientists from the European Organisation for Nuclear Research (CERN).

Keeping your feet on the ground

I believe it has been good for WHO to have a practising general practitioner doing basic research into ways to increase the effectiveness of primary health care. Seeing 50 to 60 patients a day keeps your feet on the ground. I also think that some of the ideas and research methods used may be relevant to general practice, including the use of algorithmic techniques to explore decision-making; the use of action-oriented antenatal record systems;⁶ and the development of a consensus of agreement with

experts on how health workers outside hospitals should manage and evaluate many kinds of problems.

What seemed initially to be a short research project has continued for five years, and now seems destined to continue for another year or two. I am grateful to the many WHO staff members in different divisions who have supported and encouraged these research projects. We are asking questions which are as old as illness itself. What is new is that by using new methods we are finding some exciting and more appropriate ways of helping people to help themselves. We may all benefit. We are all learning.

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El Dorado

Fourteen months ago our middle partner had another of his frequent brainstorms. He rushed into the consulting room, between patients, laughing and shrieking nonchalantly about the latest venture he had just decided on. I gathered something about a new surgery site amid the latest housing development in our area. "Terrific," I said, "we can barely cope with the practice we have let alone expand." All such protests were swept aside with the ghastly dazzling smile which throws terror into the hearts of those who know him. "Come along with me on the bus," he yelled, jumping up and down and waving his hand. "I'll show you the site. Some houses were convinced that it wasn't just treating my partner for an acute episode of mania, we zoomed out to the country in Sunbeam." In route, above the car, the enormous gold mine just waiting for us. We turned off the main road and entered a no-man's land of bulldozers, mounds of earth, excavation sites, and a swamp of mud. Some houses protected themselves proudly above the quagmire and were apparently inhabited. With a typical localy gesture he compassed the horizon: "All this could be ours." "No thank you," I muttered. "Anyway, there isn't a surgery yet." "We'll rent a caravan." "We couldn't," I stammered. He hid.

A month later we were practising from a beat-up old caravan. The list of patients stood at about 40, the caravan stood next to the old airport control tower, and the snow and ice set in. Our new receptionist sat weathed in sweaters, jumpers, and boots, with blue fingers, huddled over the Coker gas fire. The temperature dropped steadily, and unbelievably the list grew. There were no shops, no buses, and only a few roads on the estate. People came sliding down the frozen dirt track to see us and were amazed to find us there on dark winter nights dressed up like polar explorers waiting to sign prescriptions with fingers frozen stiff. We felt the pioneer spirit springing up in our veins and spent New Year's Eve reading Robert Service's poems of the Yukon aloud around a roaring fire. These patients with sufficient sense of humour loved it, and despite all weathers the motto was: "The road show must go on." Visiting was

a nightmare, physical examination was a torture for everybody—cold hands attempting to palpate the always rigid abdomens of shivering patients.

Summer came. The caravan became a hot-house full of people with hay fever and asthma. Gone for ever was that glorious morning when the clerk of works had lit a brazier outside our frozen sundown, and I had conducted a surgery in the open air—the sky brilliant blue, the air crystal clear, and the atmosphere reminiscent of spa medicine in Baden-Baden or the "Cure" at Davos.

By autumn the list was approaching a thousand, and on Friday nights the caravan rocked like a ship in mid-Atlantic as the gales swept us and people crowded in to be seen. The acoustics were awful—nobody could converse personally unless our ever-loquacious receptionist kept the transistor turned up to full volume, thereby giving a disco atmosphere outside our one tiny consulting room.

The Saturday before Christmas was the end of an era. We moved to our new premises—a large Portakabin, which looks too permanent for my liking. The ever-thrifty Scot announced we would do the moving ourselves, using the receptionist's Dormobile. Husband, wives, and children turned up, and the move was accomplished in the morning. Perhaps it is too soon to say, but I think I won't like it nearly as much as the caravan. Signs such as: "Care please on entering the PORX." "Reception Area," etc., all seem too posh. We haven't got used yet to the luxury of a flush loo or night storage heaters. The empty pharmacy next door awaits the new chemist; let's hope we won't have to play Bowry to Plaubert's Homais.

The dream begins to come true. The Scot with vision speaks as a charlatan when he tells sagely of days of full and plenty to come; the great El Dorado has been discovered, but the spirit of the gold rush seems lost for ever.—PATRICIA LINNEMANN, general practitioner, Perrow, Staffs.

We wish to be placed to consider for publication other interesting or amusing observations made in general practice.—Ed, BMJ.