

# REFRESHER COURSE FOR GENERAL PRACTITIONERS

## MANAGEMENT OF ACUTE PNEUMONIAS IN ADULTS

BY

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Since the introduction of chemotherapy most patients with pneumonia have been treated in their own homes. This means that therapy is often begun without the establishment of a specific diagnosis by laboratory methods; and, indeed, from the practical standpoint such a procedure is unnecessary in most cases, even though in a minority it is an essential guide in therapeutics. In the practical management of pneumonias, therefore, it is desirable to adopt a procedure which, while not leading to unnecessary calls on laboratory facilities for the general run of patients, makes available the maximal degree of help from the laboratory for the minority in which such aid is required.

As a working classification acute pneumonias may be divided into three main groups.

### Acute Bacterial Pneumonias

Of these, pneumococcal pneumonia is the most frequent, constituting 70% to 80% of the group. Haemolytic streptococcal, staphylococcal, and Friedländer's bacillus pneumonias are the most important other members. The pneumococcus and haemolytic streptococcus are, in general, sensitive to sulphonamides, and most strains of staphylococcus show some sensitivity. All three are sensitive to penicillin, though resistant strains, especially of the staphylococcus, are encountered. Friedländer's bacillus is not responsive to either of these agents, but is fully sensitive to streptomycin; fortunately, acute pneumonias due to Friedländer's bacillus are rare in this country.

### Virus Pneumonias

This is a group to which much attention is being directed at present. It may be subdivided as follows:

1. *Pneumonias Associated with Epidemic Influenza*.—There is good evidence that these are due to the combined effects of the influenza virus and a variety of independently pathogenic bacteria, the relative contribution of the virus and the bacteria to the pathological picture varying from case to case. These pneumonias are essentially of mixed origin, and it is certainly misleading to regard them as characteristic of virus pneumonias. It is probable that the bacterial component of the infection is susceptible to treatment by appropriate specific agents, but there is as yet no satisfactory evidence about the specific treatment of the group as a whole.

2. *Psittacosis-Ornithosis Group*.—Viruses of this group may give rise to illness in, or be carried by, birds of the parrot family, pigeons, certain other birds, and possibly by some small mammals. There is some evidence that the human infection is susceptible to very large doses of penicillin, but the newer antibiotic aureomycin appears to be fully effective.

3. *Pneumonias Due to Other Viruses*.—There are certainly other viruses which can cause pure virus pneumonias in man. The identification of these viruses has hitherto proved very difficult, and is a research project rather than a practical clinical procedure. Pneumonias due to viruses

of this group generally show no response to sulphonamides, penicillin, or streptomycin; they may respond to aureomycin and possibly to chloromycetin.

### Aspiration Pneumonias

Under this heading are included all those pneumonias which are occasioned rather by a breakdown of the normal mechanical defences of the lower respiratory tract than by the presence of specific invasive organisms. The most obvious examples are the hypostatic and terminal pneumonias, in which the prognosis is that of the underlying condition. Many other pneumonias belong to this group, notably some of those which occur in persons who have excessive secretions in the respiratory tract for one reason or another—e.g., the chronic bronchitics, sufferers from chronic nasal catarrh, and patients with acute respiratory catarrhs of various sorts. These pneumonias may be diffuse or localized. The former will present as basal bronchopneumonias in bronchitic subjects; the latter often do not present clinically as acute pneumonias at all, and will therefore not be further discussed here. In this group as a whole the organisms most frequently found in the sputum are *Str. viridans*, non-haemolytic streptococci, pharyngeal neisseriae, Pfeiffer's bacillus, and possibly some of the less invasive types of pneumococcus—in fact, a flora similar to that of the upper respiratory tract.

### Treatment

With these considerations in mind we may consider the management of a patient who presents with acute pneumonia. In such a case the invading agent will not be known at the beginning of treatment. Hence the most reasonable procedure is to obtain material for the later establishment of an aetiological diagnosis if required; to treat immediately on standard lines; and to modify treatment later, if necessary, in the light of any information which may become available about the aetiology. This standard treatment may be considered under two headings: general and symptomatic measures, and specific treatment.

#### General Measures Applicable to all Pneumonias

The patient with acute pneumonia must be kept in bed with adequate nursing care. He should occupy a well-ventilated room maintained as far as possible at an equable temperature of about 65° F. (18.3° C.). Patients are often more comfortable if kept slightly propped up with pillows, but some prefer lying flat, and the patient's comfort should decide the position in which he is nursed. In gravely ill patients slight changes of position should be made every few hours in order to avoid hypostatic effects. Physical examination should be done carefully, but not more frequently than once daily. If there is difficulty in diagnosis, either of the primary disease or its complications, bedside radiography imposes little strain on the patient and should be employed. It should be remembered that all drugs

used in symptomatic treatment can have undesirable effects, and no such drug should be prescribed unless there is a real indication for it.

#### Diet

In the acute stages of pneumonia the patient usually has complete loss of appetite, and as the duration of the disease is short there is little point in attempting to force unwanted food upon him, provided an adequate intake of fluid and carbohydrate is maintained. For an adult, a total fluid intake of about 4 pints (2,500 ml.) daily is suitable. Part of this may be given in the form of drinks sweetened with as much glucose or cane sugar as his taste will permit, flavoured with any suitable fruit juice, and made up in plain or soda water. Milk may be given, hot or cold, preferably with extra sugar and flavoured in any acceptable way. If the patient does not like sweet drinks lactose may be used instead of glucose or cane sugar; lactose may also be useful in cases with abdominal distension, as it gives rise to less intestinal fermentation. Eggs, cereals, custards, thin buttered bread or toast, fish, minced lean meat or chicken, mashed potato, and vegetable *purées* can be added when the patient's condition permits.

#### Relief of Pain

Pleuritic pain may be relieved by a kaolin poultice. Care should be taken that this is applied in such a way as to avoid interference with respiratory movement. If pain is severe, morphine or other opium derivatives, or pethidine may be required (see below). Occasionally the pleuritic pain may be extreme, and if in such a case it is well localized the injection of 5 to 10 ml. of 2% procaine just external to the parietal pleura in the painful area may be helpful.

#### Sleeplessness

The combination of restlessness, pleuritic pain, and irritating unproductive cough often demands the use of morphine or one of its analogues to secure sleep. The only danger of these drugs arises from their depressing action on the respiratory centre and the intestinal motility. They should not be given to patients with cyanosis due to a complicating bronchitis, or to those with any signs of abdominal distension. In all other patients morphine, 1/6 to 1/4 gr. (10 to 15 mg.), or pethidine, 50 to 100 mg. hypodermically, can be used if necessary to secure sleep. If ineffective cough is the chief obstacle to sleep, codeine phosphate, 1/2 to 1 gr. (30 to 60 mg.), may be sufficient. Should it be necessary for the relief of pain and to secure sleep to administer morphine to a cyanosed patient, oxygen must be given by an efficient method. If there is so much complicating bronchitis or severe abdominal distension that morphine and its analogues are contraindicated, paraldehyde is generally the most useful hypnotic. It may be given by mouth in a dose of 2 drachms (7.5 ml.) in a suitably flavoured mixture, or in 1/2 oz. (30 ml.) of whisky or brandy; or by rectum, 4 drachms (15 ml.) in 6 oz. (180 ml.) of water.

#### Delirium

This complication may require treatment. Reduction of temperature by tepid sponging and the relief of anoxia by oxygen administration may be effective. Phenobarbitone soluble, 1 to 2 gr. (60 to 120 ml.) subcutaneously, or paraldehyde by rectum as suggested above may be helpful. In patients known to be alcohol addicts, whisky or brandy, 1/2 oz. (30 ml.) four-hourly, should be given if there is delirium. Apart from this, alcohol is of no value in the treatment of pneumonia.

#### Cough

Distressing and ineffective cough should be controlled with a suitable linctus containing codeine or, in more

troublesome cases, diamorphine (heroin). A productive cough is to be encouraged by supporting the patient during bouts of coughing, by simple postural methods if the general condition permits, and by the relief of pleural pain.

#### Meteorism

Abdominal distension may become troublesome. In such cases treatment should be started with a simple soap enema and the passage of a flatus tube. If these measures are not sufficient, turpentine or bile enemas and the subcutaneous injection of pituitary extract, 0.5 ml., or of prostigmin, 1 mg., may be effective. The administration of oxygen in a concentration as near 100% as possible from a B.L.B. or similar mask may lead to diminution of the distension by causing absorption of the gases into the blood stream.

#### Oxygen Administration

The anoxaemia of pneumonia is probably responsible for many of the so-called toxic symptoms. It is due to many factors, some of which can be relieved by oxygen administration. In any cyanosed patient, therefore, oxygen should be administered by an effective method. This applies particularly to those forms of pneumonia which are complicated by much bronchitis. An efficient mask of the B.L.B. type or a tent should be used.

#### Cardiovascular System

Pneumonias mainly affect the heart indirectly, through the peripheral vascular system and by anoxia, though there may be some direct toxic effect on the myocardium. There is no justification for the routine use of drugs alleged to have an effect on the heart. In particular, digitalis should be given only if there is pre-existing cardiac disease for which its use is indicated or if an abnormal rhythm develops. The form of circulatory collapse most commonly seen in patients gravely ill with pneumonia presents a picture of falling blood pressure with rising regular pulse rate. Digitalis and similar drugs have no effect in cases of this sort. Analeptics such as camphor, nikethamide, and "cardiazol" are widely used to combat this condition but since the essential cause is a peripheral vasomotor failure, and any stimulating effect that may be produced by these agents is of central origin, their value is doubtful. Adequate oxygen therapy and the administration of glucose are the most rational procedures.

#### Specific Treatment

In the case of apparently primary pneumonias of lobar extent the pneumococcus is so frequently the causative organism that, pending an aetiological diagnosis, it is reasonable to treat all cases of this sort in the first instance as if they were caused by the pneumococcus; but whenever possible material should be obtained for bacteriological examination before beginning treatment. Sputum is the best material, if a good specimen is available, and this can generally be produced by encouraging the patient to cough. If sputum is unobtainable a throat swab may give useful information, but is less reliable. Lung puncture is justifiable only for special purposes. In any gravely ill patient a blood culture should also be taken before treatment is begun.

#### Sulphonamides

In a case of average severity, after a specimen of sputum has been obtained for culture sulphonamide treatment should be instituted. Of the commonly available sulphonamides, sulphamezathine causes relatively little nausea and vomiting and, having an acetyl derivative of high solubility, very rarely gives rise to renal complications. It is therefore

suitable for routine treatment. Adequate dosage is essential: for an adult an initial dose of 3 g. should be given, followed by 1 g. four-hourly, or in severe cases 1.5 g. four-hourly. This dosage should be continued for two or three days; if there has been a favourable response it may then be reduced to 0.5 g. four-hourly. In the average case treatment should be continued for five or six days, giving a total dose of 25 g. to 30 g. Adequate fluid intake should be ensured while sulphonamides are being given.

If there is a poor response to treatment, with no improvement in the patient's condition after 48 hours, the cause should first be sought. If material for bacteriological examination has been obtained at the beginning of treatment, the reports should then be available and may provide a clue to the failure to respond. It may be that the organism is poorly sensitive or not sensitive at all to the sulphonamide in use—e.g., infection with *Staph. aureus* or Friedländer's bacillus. The possibility of acute tuberculous pneumonia, or of the pneumonia being secondary to some underlying lesion of the lung, such as a carcinoma obstructing a bronchus, should also be considered. If all these possibilities can be excluded, local complications, especially the early development of empyema, should be suspected; if there is any suspicion of empyema the chest should be needled over the area most dull to percussion. If none of these factors is present and the organism is sensitive both to sulphonamides and to penicillin, or relatively insensitive to sulphonamides and sensitive to penicillin (such as *Staph. aureus*), penicillin treatment should be instituted.

#### Penicillin

Penicillin is not only indicated in cases which have failed to respond to sulphonamides or which are caused by organisms resistant to these drugs, but in certain instances is required from the beginning of treatment. Penicillin is indicated in cases of staphylococcal infection and those in which sulphonamides are contraindicated—for instance, in patients known to be sensitive to sulphonamides or in whom there is antecedent renal disease. In addition, in patients who are severely ill at the time when treatment is begun, who are severely dehydrated, or who have troublesome vomiting, penicillin from the beginning is a preferable form of treatment to sulphonamides in spite of the greater difficulty of its administration. In some severe cases it may be advantageous to give sulphonamide and penicillin treatment simultaneously. The most reliable way of giving penicillin remains the three-hourly intramuscular injection: 15,000 to 25,000 units three-hourly will maintain an effective blood concentration in most cases of pneumonia due to penicillin-sensitive organisms. The inconvenience of such frequently repeated doses may be avoided by giving larger amounts of soluble penicillin less frequently—e.g., 100,000 to 200,000 units six-hourly—but the maintenance of a constantly effective blood concentration is not entirely certain by this method. The most convenient way of administration of penicillin is by using one of the slowly absorbed preparations, such as procaine penicillin in oil. Of this, 100,000 to 200,000 units every 12 hours will usually, but not certainly, maintain an adequate concentration.

#### Treatment of Virus Pneumonias

The diagnosis of virus pneumonia is unlikely to be made in practice except as a result of exclusion of other diagnoses or in the presence of an epidemic.

*Pneumonias Associated with Epidemic Influenza.*—These should be treated on the lines applicable to the bacterial component of the infection. There is no indication at present of any agent effective against an influenza virus itself.

*Pneumonias of the Psittacosis-Ornithosis Group.*—These cannot be diagnosed with certainty clinically, but may be suspected when the illness starts with severe constitutional symptoms, when there is the later development of signs of consolidation, and if there is a history of contact with parrots or pigeons. Proof of the diagnosis will generally rest upon a positive complement-fixation test in blood taken during convalescence. If the diagnosis is suspected, very large doses of penicillin (up to 2,000,000 units a day) may be effective. Aureomycin appears to be curative in oral doses of 0.5 g. six-hourly, and should be used if available. Chloromycetin may also be effective.

Pneumonias presumably due to unidentified pneumotropic viruses ("primary atypical pneumonia") may be suspected clinically when the illness starts with constitutional symptoms, the signs of pneumonia appear late (about the third to fifth day), the leucocyte count remains low, and there is no response to sulphonamides or penicillin. The suspicion would be supported by the occurrence of similar cases in the neighbourhood and by the development of a high titre of "cold agglutinins" in the blood during convalescence. In such cases aureomycin has been reported to be of value. It would be reasonable to give it by mouth in doses of 0.5 g. six-hourly to a severely ill patient, but the great majority recover after a relatively brief illness, and the drug is at present scarce and expensive.

#### Treatment of Aspiration Pneumonias

The mildest pneumonias of this group are unlikely to be recognized clinically without the aid of radiography; the most severe occur as complications of other serious illnesses. The types which are most likely to present clinically as "pneumonias" are the patchy basal bronchopneumonias of the bronchitic subject and some of the post-operative bronchopneumonias. In these, as in all pneumonias of this group, there is a considerable mechanical factor, early attention to which may cause rapid alleviation of the condition before there has been any severe invasion by bacteria, although infection by specifically invasive organisms may occur at any stage. It is therefore wise in such cases to start as with apparently primary pneumonias by obtaining material for bacteriological examination and instituting standard sulphonamide or penicillin therapy. At the same time the mechanical factors should receive careful attention. The patient must not be allowed to remain constantly in the unfavourable posture which he will naturally tend to adopt. He will most often be found lying in the position which prevents him from coughing—i.e., that in which the affected area of lung is least favourably placed for the expulsion of secretions. He should be made to change his position into a more favourable one and encouraged to cough. Deep breathing is helpful; administration of 7% carbon dioxide in oxygen may have a comparable effect in uncooperative patients. In post-operative cases no tight bandages which might obstruct full respiratory movement should be permitted. Abdominal distension, if present, should receive attention. Only in special circumstances will more drastic measures be required, such as bronchoscopy or bronchial suction. If these steps to deal with the mechanical factor result in rapid relief of symptoms and disappearance of physical and radiological signs it is usually safe to discontinue sulphonamide or penicillin treatment. If, however, this happy result does not ensue, it may be assumed that infection by an invasive organism has occurred, and investigation and treatment as suggested for apparently primary pneumonia are indicated.

### Convalescence

Convalescence after pneumonia proceeds at a very variable pace. In a case of pneumococcal pneumonia of average severity the patient may be allowed out of bed after the temperature has been normal for seven days. In cases of greater or less severity appropriate periods of bed rest are needed. In pneumonias of the aspiration type the patient should be allowed out of bed as soon as his general condition permits. Breathing exercises, which should be applied as therapy in aspiration pneumonias, are helpful in convalescence from acute specific pneumonias by hastening the return to normal lung function, and should be started soon after the temperature falls. After resolution appears to be complete clinically it should be confirmed radiographically. An adequate period of convalescence should be enforced, the duration of which will depend upon the sort of life to which the patient has to return.

### A SNOOP AT N.H.S.

Mass Observation, which since 1937 has been uncovering the opinions of the British people on such contrasting topics as juvenile delinquency, clothes rationing, and public houses, has now investigated their attitude towards doctors. In a report published this week<sup>1</sup> the observers conclude that the National Health Service is, so far, a welcome innovation, and record general appreciation and some surprise that the attitude of the family doctor underwent no noticeable change on the appointed day. "I called in the doctor to my baby son on the day of the inception of the new Service," said a young father who was interviewed. "I don't know what I expected, but I did feel mildly surprised when the doctor arrived at the house and behaved precisely as he had always done."

This survey not only records universal resentment against the size of the weekly contributions, but the inquisitors fall into the error of their witnesses in believing the entire sum of the National Insurance contribution to be paid into the Health Service. The reply from one housewife is typical: "... We never paid a doctor 5s. a week, but received the same attention from the hospital under the H.S.A. scheme for 4d. a week."

The report attempts to throw light on the ways in which patients occupy themselves in the waiting-room. All are resigned to a long wait, but appreciate that the doctor's slowness with each patient indicates a painstaking consultation for themselves. They complain they cannot afford to spend so long away from their own homes, and all condemn the person taking advantage of "free" treatment to worry the practitioner with a trivial complaint or a request for an unnecessary bottle of medicine. The conversation among the waiting patients is predominantly concerned with each other's pathology. An incidental disclosure of the report is the number of patent medicines still kept in British households despite the removal of the financial barrier to medical consultation. Three families in five maintain a medicine cupboard, the most popular contents of which are aspirins, laxatives, vitamin preparations, antiseptics, "tonics," and cough cures. The advantage offered by patent medicines is one of time—it is easier and quicker to swallow a dose in the house than to go out and visit the doctor.

The opinions of only two doctors are included in the survey, though a larger number of practitioners were interviewed by the authors. These two are anonymous partners with conflicting opinions about the N.H.S., but both are agreed on the increase in their medical and paper work since its inception, and on the inadequacy of the capitation fee.

The report is far from comprehensive and leaves the serious reader with considerable doubt whether it mirrors the true opinions of the public at all. It makes entertaining reading, however, and Mr. Ronald Searle's illustrations are scrupulously fair in their ungenerosity to the profession and the patients.

<sup>1</sup>Meet Yourself at the Doctor's, by Mass Observation, with drawings by Ronald Searle. (3s. 6d. The Naldrett Press, 1949.)

## Correspondence

### Alcohol and Cirrhosis of the Liver

SIR.—Your leading article entitled "Alcohol and Cirrhosis of the Liver" (November 5, p. 1030) raises several interesting points. There is evidence that in occupations which involve an excessive intake of alcohol there is a high mortality from cirrhosis of the liver. Thus the standard mortality ratio from cirrhosis of the liver in inn- and hotel-keepers is 1158—i.e., 11½ times the mortality from cirrhosis in the population as a whole. In barmen the standard mortality ratio is 600, or six times the rate in the population as a whole.

In inn- and hotel-keepers there is also a high mortality from diabetes, with a standard mortality ratio of 325, or three and a quarter times the rate in the population as a whole. The relationship between alcoholism and diabetes is an interesting one, and the association is partly explained by the fact that in many alcoholics the calorie intake is in excess of energy requirements. This will lead to obesity and hence a predisposition to diabetes. In diabetes, as in chronic alcoholism, there is often a fatty infiltration of the liver, as well as nutritional deficiencies caused, possibly, by deficient intake, defective absorption, or ineffective utilization of vitamins and amino-acids.

It has been pointed out that the addition of choline to alcoholic or saccharine beverages may be of benefit, but there arises the additional possibility that an excessive intake of sweets in children may lead to liver damage, as it would appear from the work of Professor C. H. Best and his colleagues (November 5, p. 1001) that alcohol and sugar are equally effective in producing cirrhosis of the liver, at any rate in experimental animals. There is a danger, therefore, that a child who is eating large quantities of sweets will have a diet which is unbalanced and defective in protective foodstuffs; this may lead not only to dental defects but possibly also to liver damage, a damage which may not show any immediate clinical effect but may possibly lead to a reduced resistance to hepatotoxic agents.

There is some evidence that an excessive intake of sweets during pregnancy may lead to an excess mortality in the infant. Thus the mortality is high among infants of mothers whose husbands are employed in certain occupations associated with sugar confectionery, as may be seen from the following table.

Code No.		Deaths of Legitimate Infants, 1930-2	Legitimate Births, 1931	Annual Rate per 1,000
375	Sugar confectionery makers, moulders, and coverers	24	101	79
671	Retailers of sugar confectionery (sweets)	79	252	105
701	Salesmen of sugar confectionery (sweets)	22	52	141
	Total	125	405	103

The combined rate of 103 per 1,000 legitimate live births, with a standard error about nine, must be regarded as significantly high in comparison with the national rate of 61.6 at that time. The adverse effects during pregnancy of an increased intake of sugar or alcohol may be due to liver damage and an increased liability to toxæmia. We know, for example, that there was a decreased mortality from toxæmia during the war years. It is interesting to note that during the period 1939-49, when sweets and sugar were rationed, there was a marked decrease in maternal and infant mortality, in dental defects in children, and in mortality from diabetes and cirrhosis. There are, of course, many factors involved in these decreases, but no doubt the diminished intake of alcohol and sugar was responsible for some of these effects.

If the suggestion of adding choline to alcoholic drinks is to be taken seriously, why not include sweets at the same time? At any rate mothers should be warned of the undesirability of giving large quantities of sweets to their children, a warning