

Interim report of the Inter-Departmental Committee on Rehabilitation of Persons injured by Accidents.

Contributors

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Interim Report of the
Inter-Departmental Committee
on the
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INTER-DEPARTMENTAL COMMITTEE ON THE
REHABILITATION OF PERSONS INJURED
BY ACCIDENTS

CONSTITUTION AND TERMS OF REFERENCE OF
COMMITTEE.

We hereby appoint—

- Sir Malcolm Delevingne, K.C.B., K.C.V.O.
- Lieut.-Colonel W. T. Brain.
- Miss Muriel C. Bywaters, M.D., B.S.
- W. A. Cochrane, Esq., M.B., Ch.B., F.R.C.S.Ed.
- G. L. Darbyshire, Esq.
- W. S. Douglas, Esq.
- Bailie W. Elger, J.P.
- T. Ferguson, Esq., M.D., D.Sc., F.R.C.P.
- E. W. Hey Groves, Esq., M.D., D.Sc., M.S., F.R.C.S.
- G. F. Johnson, Esq.
- W. Lawther, Esq.
- J. Marchbank, Esq.
- A. W. Neville, Esq.
- Alderman Sir Harold Pink, J.P.
- H. S. Souttar, Esq., C.B.E., M.D., M.Ch., F.R.C.S.,
F.R.A.C.S.
- G. de Gruchy Warren, Esq.
- A. C. T. Woodward, Esq., M.B., Ch.B., F.R.C.S.

to be a Committee to inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents, and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on " Fractures ".

We further appoint Sir Malcolm Delevingne to be Chairman, and A. E. Quine, Esq., M.B., F.R.C.S., of the Ministry of Health, and J. A. Simes, Esq., O.B.E., to be Secretaries of the said Committee.

(Signed) JOHN SIMON,
Secretary of State for Home Affairs.

(Signed) KINGSLEY WOOD,
Minister of Health.

(Signed) GODFREY P. COLLINS,
Secretary of State for Scotland.

April, 1936.



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We hereby appoint J. F. E. Prideaux, Esq., M.R.C.S., an Assistant Director of Medical Services, Ministry of Pensions, to be a member of the Inter-Departmental Committee on the Rehabilitation of Persons Injured by Accidents appointed in April, 1936.

(Signed) JOHN SIMON,
Secretary of State for Home Affairs.

(Signed) KINGSLEY WOOD,
Minister of Health.

(Signed) GODFREY P. COLLINS,
Secretary of State for Scotland.

May, 1936.

We hereby appoint H. H. Wiles, Esq., Assistant Secretary, Ministry of Labour, to be a member of the Inter-Departmental Committee on the Rehabilitation of Persons Injured by Accidents appointed in April, 1936, in the place of W. S. Douglas, Esq., who has resigned from the Committee.

(Signed) JOHN SIMON,
Secretary of State for Home Affairs.

(Signed) KINGSLEY WOOD,
Minister of Health.

(Signed) WALTER E. ELLIOT,
Secretary of State for Scotland.

February, 1937.

Note:—The estimated gross cost of the preparation of this Report (including the expenses of the Committee) is £352 4s. 1d. of which £16 15s. 0d represents the estimated gross cost of printing and publishing the Report.

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INTER-DEPARTMENTAL COMMITTEE ON THE
REHABILITATION OF PERSONS INJURED
BY ACCIDENTS

INTERIM REPORT.

To

The Right Honourable Sir JOHN SIMON, G.C.S.I., K.C.V.O.,
O.B.E., K.C., M.P., His Majesty's Secretary of State
for Home Affairs.

The Right Honourable Sir H. KINGSLEY WOOD, M.P.,
Minister of Health.

The Right Honourable WALTER E. ELLIOT, M.C., M.P.,
His Majesty's Secretary of State for Scotland.

SIRS,

The Committee was appointed in April of last year "to inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents," and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto"; and we were directed to have regard to the recommendations made in a Report* on "Fractures" issued by the British Medical Association in the previous year.

It was apparent from that Report and from information available to us from other sources that the question of the treatment of fractures was of special urgency, and for this reason, and with the approval of the Ministry of Health, we decided to deal first with this part of our subject.

The recommendations in the Report issued by the British Medical Association laid down certain principles both of organisation and of treatment. The principles of organisation may be summarized as concentration of cases in one department under a single control, continuity of treatment and supervision by that department until rehabilitation, i.e. restoration of working capacity, has been effected to the fullest possible extent, and a system of records of cases which will permit the history of each case to be followed from start to finish, and the final results ascertained. The principles of treatment aim at securing exact reduction of the fracture, fixation in correct position and immobilisation of the broken part, and active movement from the earliest possible moment of the uninjured parts of the limb to prevent wastage of muscles and stiffness of joints (see Appendix I).

* The Report of the British Medical Association Committee on "Fractures" is obtainable (price 3*d.*, or 4*d.* post free) from the offices of the British Medical Association, British Medical Association House, Tavistock Square, W.C.1., or through any bookseller.

We were given to understand that these general principles were accepted by the Government Departments concerned, and that the object in view was the provision throughout the country of fracture services which would place within the reach of every injured person the benefits of the improved methods of treatment, with the threefold result of mitigating suffering, reducing the period of disablement and the loss of working and earning power, and securing wherever possible complete restoration of working capacity.

SURVEY OF PRESENT POSITION.

The initial task which confronted the Committee was to ascertain the present position in the hospitals of the country, in particular the number of fracture cases treated at each, distinguishing between in-patient and out-patient cases; and the manner in which the treatment is organised, i.e., whether under the general surgical routine of the hospital or in a department specially organised for the purpose, and, in the latter case, whether the treatment is supervised throughout its course by one member of the surgical staff and whether the organisation includes a "follow-up" system by which the results of the treatment can be traced.

Inquiries were accordingly addressed to all appropriate voluntary hospitals and to the local government authorities having hospitals under their control. In all, information has been furnished in respect of 808 voluntary and 121 municipal hospitals. Of these, 84 voluntary hospitals and 20 municipal hospitals rarely or never treat fracture cases. Forty-five voluntary hospitals have not replied; and not all those that replied were able to furnish the number of cases treated. The Committee therefore has information as to 724 voluntary and 101 municipal hospitals which treat fractures, a total of 825 hospitals.

The Committee is greatly indebted to the hospitals for their willingness to reply to its inquiries.

The information so obtained showed that, in the course of 1935, the numbers of new fracture cases treated in the voluntary hospitals which supplied figures were 132,702 treated as out-patients only and 45,478 as in-patients, or about 75 and 25 per cent. respectively of the total number treated; the numbers treated in the municipal hospitals were 9,372 as out-patients only and 14,180 as in-patients. (It must be borne in mind that many municipal hospitals have no out-patient departments.) These figures give a total of 201,732 new fracture cases treated. The total number of new cases treated in *all* hospitals during the year must have been considerably over that number. The cases are not, of course, evenly distributed over the country. Roughly, the distribution may be said to correspond to the density of the population, but it is liable to be affected by various factors such as the character of the local industries and road traffic.

As regards the arrangements made at the hospitals for the treatment of fractures, the replies showed that in 650 hospitals all cases were treated under the general surgical routine; 59 hospitals (treating a total of 49,870 fracture cases) stated that they had special departments organised on lines which appeared to conform with the general principles indicated above; and 116 other hospitals reported the existence of partially organised fracture clinics or of special arrangements of some kind.

Of the 172,802 cases of fracture reported as treated in 682 voluntary general hospitals, 49,992 were treated in 34 hospitals with medical schools; and, as regards other voluntary general hospitals, 41,438 were treated in 45 hospitals of 200 or more beds; 22,211 in 36 hospitals of from 150 to 200 beds; 9,645 in 25 hospitals of from 125 to 150 beds; 13,515 in 46 hospitals of 100 to 125 beds; 28,311 in 227 hospitals of from 30 to 100 beds; and 7,690 in 269 hospitals of less than 30 beds. In addition 5,378 cases were reported as treated in 42 voluntary children's and orthopaedic hospitals.

Of the 22,993 fractures reported as treated in the 98 municipal general hospitals, 5,023 were treated in 50 hospitals of 500 beds or less, 13,938 in 37 hospitals of 501 to 1,000 beds, and 4,032 in 11 hospitals of over 1,000 beds. There were also 559 cases reported as treated in 3 municipal children's and orthopaedic hospitals.

In addition to the 201,732 cases reported as treated in hospitals, 2,241 cases were reported as treated in poor-law infirmaries.

These figures indicate in a general way the distribution of the cases between hospitals of different degrees of importance, but the distribution is by no means even; some of the smaller hospitals are called upon to deal with a large number of cases.

POSSIBLE LINES OF DEVELOPMENT.

The Committee has also proceeded to prepare a scheme for the organisation of fracture clinics, on the basis of the general principles recommended in the British Medical Association's Report. We use the term "fracture clinic" in this Report to mean a fracture service organised and conducted on the principles indicated above; in the case of a hospital, this will involve the arrangement of a special department for the treatment of such cases, but not to the exclusion of the treatment of other classes of accident if that is found convenient and desirable. In the preparation of this scheme the Committee has been able to draw on the experience already obtained in this country as well as abroad.

It was evident that while the general principles of concentration of cases, unity of control and continuity of treatment were of general application and should be maintained, the

staffing, accommodation, equipment and routine must vary according to the size of the hospital and the number of cases treated.

Obviously, too, there is a limit in point of size of a general hospital below which it would as a rule be impracticable to provide a fracture clinic. Small hospitals are mainly to be found in the country or less populous areas; and the needs of these areas call for special treatment to which reference is made later.

Before coming to a conclusion as to the recommendations to be made under this head, the Committee considered it desirable to communicate the draft of the scheme prepared by it to a number of representative hospitals and authorities and to ask for their observations and suggestions. The scheme was sent to all hospitals in Great Britain with medical schools, 11 other hospitals situated in different parts of the country, eight county medical officers of health, and the medical officers of health of 14 large cities. Replies have been received from 22 of the 34 hospitals with medical schools, seven other hospitals, five county medical officers of health and 10 medical officers of health of large cities.

In the meantime, as a result partly of the attention which has been called to the Report of the British Medical Association, copies of which were sent by the Ministry of Health to all county and county borough councils in England and Wales in February, 1935, partly of the growing dissatisfaction—particularly in industry—with the results obtained under the old methods, the question of the provision of fracture clinics has been receiving consideration in many different quarters, by hospital authorities, local government authorities, employers and their organisations, the workers' organisations,* etc. Some clinics have already been established since the Committee was appointed and the establishment of others is being planned or is under consideration. In a number of cases, requests have been made to this Committee for guidance, or action is being postponed until the Report of the Committee is available. There are many indications that a wide-spread movement for the establishment of fracture clinics has begun and is likely to make rapid headway.

It appears to the Committee to be most important that this movement should be so directed as to secure that the clinics are

* A conference on the subject was held at Manchester in October last by the General Federation of Trade Unions, and recently a Joint Committee has been appointed by the Trades Union Congress and the British Medical Association to consider among other matters of common interest the question of the rehabilitation of injured workers.

established on right lines and are so distributed as to supply the needs of all, to prevent overlapping and to provide the maximum of efficient service. We have accordingly decided to submit an Interim Report embodying the scheme which we have drawn up for the organisation of fracture clinics without waiting to complete our inquiry into other questions, such as the manner in which any additional expenditure involved in establishing and carrying on such clinics should be met, methods of "rehabilitation"* and provision for other classes of injury. These questions and others are engaging our attention and we hope to present a further report upon them without delay. In presenting this scheme, we have taken into account the observations and suggestions received from the hospitals and the medical officers of health to whom it was communicated; and we believe it to represent the views, and to have the support, of a large body of medical opinion in this country.

The scheme is based on the assumption that the clinics will be established at, and as an integral part of, existing hospitals, though the possibility and desirability of establishing independent clinics in a few centres at which methods of treatment would be made the subject of special study, and post-graduate courses could be organised, should not be ruled out.

It envisages therefore different types of clinic suitable to different classes of hospital, and arrangements for co-operation between the larger and smaller hospitals which would permit of the transfer of cases from one to the other.

SCHEME OF ORGANISATION OF A FRACTURE CLINIC.

The object to be aimed at is—as stated above—to bring all fracture cases under a unified control and to ensure that the treatment continues under the same supervision until the process of rehabilitation is complete.

On the material side, this can best be ensured by concentrating all cases in a separate department of the hospital with complete provision for the various services required (see Appendix III); but where it may not be possible under existing conditions to set aside separate wards for the purpose, certain beds in the general wards should be definitely assigned to the fracture department as a temporary arrangement pending the provision of separate accommodation.

On the personnel side, the department should be placed, as a general rule, under the charge of one of the visiting surgeons, and one or more whole-time assistant surgical officers will be needed, according to the size of the clinic and the number of

* We use the term "rehabilitation" here to mean the process of reconditioning which will be required in certain cases after clinical treatment, in order to obtain full restoration of working capacity.

cases treated. Adequate clerical assistance will be necessary for the keeping of the records of cases treated and the maintenance of an adequate follow-up system of all cases; and an X-ray technician must always be available at any time day or night, so that there may be no delay in the X-ray examination by which alone the treatment of fractures can be accurately controlled.

The provision of the necessary staff will entail a certain expenditure, but it must be remembered that except in so far as the establishment of a clinic attracts additional patients the clinic will simply organise in a more efficient manner the normal services of the hospital, and make no alteration in the number or character of the cases treated. There should, therefore, subject to the exception just mentioned, be little, if any, addition required to the general administrative staff or the nursing or massage staff, or to the almoner's department. It is probable, indeed, that a smaller proportion of cases will require admission to hospital for in-patient treatment.

We recommend one departure from ordinary practice in respect of the remuneration of the surgeon-in-charge. It is not the custom for the visiting staff of a hospital to receive any remuneration for their services; but as the surgeon-in-charge of a fracture clinic organised on the lines proposed will undertake much more onerous duties than those usually falling to a visiting surgeon (see below) and will probably be compelled to give up other remunerative work for the purpose, it is desirable that he should receive some honorarium for his services. Unless this is done, we apprehend that it may be difficult in many cases to secure the man best qualified for the work. As it has been put bluntly, there is "no money in fractures" so far as practice outside the hospital is concerned.

Apprehensions have been expressed that the concentration of fracture cases under the control of one surgeon may affect prejudicially the position and reputation of the other visiting surgeons, by breaking existing connections with private practitioners who send cases to the hospital, and excluding them from contact with fracture cases. There is no reason why other members of the visiting staff should not be associated in the treatment of any case or cases in which they may be specially interested; but the proved advantages of unified control are so great that the interests of individual members of the staff should give way to the general interests of the community.

At most hospitals, the size of the fracture department will, in the first instance, be determined by the number of fracture cases normally brought to it for treatment, but it is to be

anticipated that with the development of specialised fracture services and with the linking up of the rural areas with central clinics (see below), more and more of the fracture cases occurring in any district will come to the clinics. At the same time, under modern methods a much larger proportion of cases will be treated as ambulant cases in the out-patient department instead of being admitted as in-patients. The question arises, what is the advisable maximum size of a fracture department, or in other words, what is the largest staff which can efficiently be controlled by the surgeon-in-charge?

The standard of work of a fracture clinic will depend primarily upon the detailed supervision and the personal direction of the treatment of cases by the surgeon-in-charge. The surgeons assisting, whether holding the position of registrars (or chief assistants) or house surgeons, will not be permanent members of the staff; and it will devolve upon the surgeon-in-charge to train and supervise a succession of such men. This will involve the surgeon-in-charge giving frequent attendance at the clinic and a considerable part of his time. It will perhaps be accepted that a staff of four assistants, one of whom will be a chief assistant, would be the maximum staff that can, at any one time, be supervised and trained. Such a team should be sufficient, with the application of modern methods, to deal with between 3,000 and 3,500 cases a year, of which on a general average rather more than two-thirds would be out-patients only. On the assumption that the average duration of the in-patient treatment of a case would be two weeks the accommodation required for such treatment would be about 40 beds.

It may be added here that at present, according to the statistics furnished by the hospitals, the proportion of fracture cases given in-patient treatment varies considerably at different hospitals. The proportion will be affected to some degree by local conditions such as the nature of the local industries, geographical considerations and the like; but as stated above the tendency of the modern methods of treatment is to increase the proportion of cases treated as ambulant or out-patient cases.

Another question that has been raised is that of the relation of the fracture clinic in a hospital to the orthopaedic department of the hospital. In most of the hospitals which have already established fracture clinics the clinic is closely associated with the orthopaedic department, the same surgeon being in charge of both. Such an arrangement has certain definite advantages, though it is not essential to the Committee's scheme. In any case, as the work of the two departments will in many respects be so closely related, it will be desirable that a close contact should be maintained between them.

II

The following are submitted as approximate estimates of the special staff that would be required for different types of fracture clinics and the cost of such staff:—

1. The large clinic in a city hospital of 500 to 1,000 beds dealing with 2,000 to 2,500 fractures per annum.

Surgeon-in-charge; one of the visiting staff of the hospital who should, however, receive an honorarium for the special and onerous duties he would undertake	£ 500
2 whole-time assistants of the standing of registrars, (say) £400 and £200	600
1 resident radiographer	200
	and board
2 resident house surgeons (on the staff of the hospital).	
1 stenographer }	350
1 records clerk }	
Total cost of staff per annum ...	<u>£1,650</u>

Nursing and massage staff, who will, of course, require special training, would be supplied by the hospital as part of its general services.

2. A hospital of 200 to 500 beds dealing with a proportionate number of fractures would require a similar staff but on a smaller scale. There would, however, be required:—

Surgeon-in-charge	£ 300
1 whole-time assistant	300
2 resident house surgeons (on the staff of the hospital).	
1 resident radiographer	200
	and board
Clerical assistance	200
Total cost of staff per annum	<u>£1,000</u>

These two groups will, as appears from the statistics given on page 6, account for about half the total number of fractures treated annually.

3. In the case of hospitals ranging from 50 to 200 beds, it may not be practicable, at any rate immediately, or necessary, to provide an entirely full-time staff; but arrangements could probably be made to make part-time use of some of the existing

staff. It is estimated that, if this is done, the special salaries involved should not exceed from £400 to £600 per annum. The general organisation should, however, be on the same lines.

Hospitals falling within the three groups just mentioned will mainly be found in the towns. What arrangements can and should be made to provide for the needs of the rural or semi-rural areas? (It has to be remembered that—under modern traffic conditions—a large number of road traffic accidents happen in country districts, and provision is needed for these cases as well as for cases occurring among the resident population. The strain thrown by these road traffic cases on the resources of the small country hospitals is sometimes very great.) In the case of the small country or cottage hospitals which have not the expert staff or the resources for maintaining a fracture clinic, it is desirable that the cases should be sent as quickly as possible to the nearest fracture clinic. With a properly organised ambulance service there should be no special difficulty in arranging for this and incidentally relieving the pressure of road traffic cases, and we recommend that arrangements for such transfer should be made, the local country hospitals in an area being linked up with a central fracture clinic. This will involve the mapping out of areas to be served by such central clinics, a matter which must be left to be settled locally by the authorities of the hospitals, the local government authorities concerned, i.e., the councils of counties, county boroughs, and in Scotland, of large burghs, and the other interests concerned. The co-operation of the private medical practitioners in the area will also have to be enlisted.

Arrangements for the transference of cases to a central clinic will not, however, entirely solve the problem. The majority of such cases will be ambulant or out-patient cases for which no in-patient treatment in the central clinic will be required. Normally, the routine of the clinic requires the attendance of such cases at the clinic at frequent intervals (see Appendix II), but in the case of a patient living at a distance that might be difficult if not impossible. To meet such cases it might be arranged that after the initial treatment (e.g., X-ray examination, reduction, application of plaster) had been applied at the central clinic and the patient had returned to his home, observation of the case could be carried out at or near the patient's home by the staff of a local hospital, or the patient's medical attendant, with whom the clinic should be in communication, the patient attending occasionally at the clinic for further X-ray examinations, change of plaster and the like. It would be very desirable that such arrangements should be supplemented and strengthened by periodic visits of the surgeon-in-charge of the central clinic or his chief assistant to the local hospitals in the

area for the purpose of consultation and advice and of exercising some supervision over the progress of the current cases. Already many of the smaller hospitals appoint visiting surgeons from larger hospitals on their staff.

We consider that there should be no serious difficulty in establishing and operating arrangements of this kind. Such arrangements are already in existence and working most efficiently, as, for example, in connection with the Robert Jones and Agnes Hunt Orthopaedic Hospital at Oswestry.

We add to this Report four Appendices dealing with the principles of modern fracture treatment, the routine of a fracture clinic, its planning, and its equipment.

CONCLUSION.

The provision of a net-work of fracture services covering the whole of the country will call for careful planning and will involve the adjustment of the scheme in points of detail to meet local needs and conditions. The provision of a fracture clinic for any area and the mapping out of the area to be served by the clinic, is a problem which can only be satisfactorily solved by those in the locality who are concerned in its establishment; and if it is to be solved so as to render the most effective service there must be consultation and co-operation between the interests involved—the local government authorities, the larger voluntary hospitals in the more important centres, the smaller institutions in the rural areas, the medical profession, the ambulance services, and we would add the employers and workers and their respective organisations. Such consultations are already beginning in some areas, and it is greatly to be desired that they should be set on foot generally as soon as possible. The experience gained in working out the arrangements for the application of the scheme under varying local conditions will be of immense value to the Committee in the completion of the task entrusted to it.

In a recent public speech the Parliamentary Secretary to the Ministry of Health suggested that groups of employers or workers who were contemplating taking steps to promote the provision of fracture clinics should put themselves in touch with the Committee; and the Committee takes this occasion to say that they will welcome the opportunity of consultation with the authorities and others interested in any area which desire it and of considering and discussing with them any difficulties which they may experience in working out the application of the scheme.

SUMMARY.

1. The Committee has taken as its starting point the principles of the organisation and methods of treatment of fractures which are laid down in the Report issued by the British Medical Association in 1935.

2. The object to be aimed at is the covering of the country with a network of "fracture services", organised and conducted on those principles; which for the most part must be attached to existing hospitals, whether voluntary or controlled by the local government authorities.

3. The number of fracture cases treated annually in the hospitals of the country is well over 200,000, of which perhaps not more than 50,000 are treated in departments organised in accordance with those principles. The establishment of organised fracture services may be expected to have widespread results in mitigating suffering, reducing the period of disablement and helping to secure the utmost possible restoration of working capacity.

4. Public interest has been aroused, and is rapidly growing, in the question of improving existing arrangements; and proposals for the establishment of "fracture services" or "clinics" are already being considered in many quarters.

5. For the assistance of those engaged in the consideration of such proposals, a "model" scheme has been prepared by the Committee, capable of adaptation to the varying circumstances and needs of different localities and areas.

6. The scheme suggests the arrangements, staffing, accommodation and equipment required for fracture clinics of varying sizes; the maximum size compatible with an efficient unified control may be put at one capable of dealing with 3,000 to 3,500 cases a year, of which about one-third would, on a general average, need in-patient treatment, involving the provision of, say, 40 beds.

7. The needs of the areas, particularly rural areas, not served by any local hospital capable of maintaining a fracture clinic, should be met by linking them up with a fracture clinic at some convenient centre to which cases could be transferred. In the case of patients needing out-patient treatment only, the subsequent supervision could be carried out, if more convenient, locally, subject to a certain degree of supervision from the centre.

8. Arrangements for the establishment of fracture clinics will, in many instances, necessarily be matter for consultation between the authorities and interests locally concerned; and it is

to be hoped that such consultations will be initiated without delay. The Committee is ready to assist in the consideration of any difficulties which may be presented in the application of the scheme by local circumstances.

We have the honour to be,

Sirs,

Your obedient Servants,

MALCOLM DELEVINGNE,
(*Chairman*).

W. T. BRAIN.	WILL LAWATHER.
MURIEL C. BYWATERS.	JOHN MARCHBANK.
W. A. COCHRANE.	A. W. NEVILLE.
G. L. DARBYSHIRE.	HAROLD R. PINK.
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GUY F. JOHNSON.	H. H. WILES.
A. C. T. WOODWARD.	

A. E. QUINE, }
J. A. SIMES. } (*Joint Secretaries*).

6th May, 1937.

APPENDIX I.

THE PRINCIPLES OF MODERN FRACTURE TREATMENT.

These are set out and discussed fairly fully in the report of the British Medical Association Committee on "Fractures"; but it may be desirable briefly to illustrate the application in practice of the three main principles of treatment.

The importance of the early application of the appropriate treatment cannot be too much emphasised.

1. *Reduction of deformity.*

The broken bone-ends must be put into correct position. An anaesthetic is usually necessary, not only to avoid pain but to abolish the spasm of muscles. Unless the tightly-drawn muscles and sinews are relaxed the bones cannot be placed in correct position; a local anaesthetic is often sufficient.

The exact position of the bones is shown by X-rays, used before and after manipulation. The reduction of the deformity, or "setting the fracture", may be done by simple manipulation, by the pull of an apparatus or by the constant pull of a weight attached to the limb, usually by means of a transfixing wire. Rarely, an open operation is necessary to effect reduction.

It is important that exact reduction should be made so as to satisfy four criteria; viz.:

- (1) The limb must be the right length.
- (2) The bone must be in correct line.
- (3) There must be no twisting or rotation.
- (4) Joint surfaces must be correctly restored.

It is essential that correct reduction or setting should be made before the limb is fixed.

2. *Fixing the broken limb in correct position.*

In most cases this is done by applying a slab or cast of plaster of Paris, which may lie next to the skin, without any padding, bony points being, of course, protected from pressure by adhesive pads. In other cases, especially the thigh, fixation is maintained by the pull of a weight, which is kept up until early bony union occurs. In all cases the fixation is so arranged as to allow active movements of the uninjured parts of the limb from the earliest possible moment.

3. *Moving the muscles and joints of the injured limb and the restoration of active use.*

Once the fracture has been set and fixed, the muscles and joints are exercised by the patient's own voluntary efforts. In this way not only are the circulation and nutrition maintained, but stiffness is prevented, so that when at the end of one, two or three months the fixing agent (plaster or weight) is removed the limb quickly regains its function. A broken wrist has the fingers and thumb left free, and active hand exercises with light work can be done within a few days of the accident. A fractured ankle can be so supported that a patient may walk two or three days after his injury. A man with a fractured spine, having had the displacement reduced and his back fixed in plaster, may shortly begin to walk and do exercises, such as carrying weights on his head, and at the end of three months may be able to do light work, perhaps resuming full work three months later. It is the recognition of the value of active use of the limb which forms the basis of the modern treatment of fractures, but active use has only been rendered possible by the development of modern technique in reduction and fixation.

APPENDIX II.

ROUTINE OF A FRACTURE DEPARTMENT.

The following outline of the essential features of the routine of a fracture department is based on the most modern practice in this country and elsewhere.

The routine includes:—

1. The primary treatment of cases which can be dealt with as out-patients.
2. Daily fracture clinics at which all such out-patient cases attend.
3. Weekly fracture clinics for the review of all cases under active treatment, whether out-patients or former in-patients.
4. Arrangements for the care of in-patients.

1. *Primary treatment of out-patient cases.*

These cases will have been transferred from the casualty department of the hospital. A case is immediately examined by an assistant who gives instructions for a suitable X-ray photograph to be taken. As soon as this is ready the fracture is reduced by the surgeon-in-charge or by one of his assistants, and suitably secured in plaster or otherwise. The limb thus secured is again X-rayed. If the result is satisfactory the patient is sent home with instructions to report at the daily fracture clinic on the following day. If the result is unsatisfactory or if any complication arises the patient should be retained in hospital.

A concise history of the circumstances of the accident, a brief description of the physical signs, together with particulars of the method of reduction and fixation, and the X-ray findings, are recorded on a fracture card (case-sheet), which is sent to the office of the fracture department.

2. *Daily fracture clinics.*

The daily fracture clinics are attended by all ambulatory cases which have to be seen daily, or almost daily, for some days after the initial treatment. The clinics are conducted by a senior assistant, assisted by a house surgeon. They are also attended by the plaster sister and a recording secretary.

On the first attendance of the patient after the initial reduction and fixation of the fracture, the accuracy of the reduction is "checked," the plaster and splinting inspected, a correct diagnosis entered on the record card, and the notes amplified where necessary. If the primary reduction is considered not to be satisfactory, arrangements are made to readjust the position of the fracture. If all is well, the patient is then instructed regarding the use of the limb as a whole, and the use of those joints which are not immobilised (e.g., fingers, elbow, shoulder, in a Colles fracture). In addition, for many of the common fractures, typewritten copies of such instructions are distributed to all patients concerned. A letter is sent to the patient's practitioner informing him of the nature of the case and the treatment given, and inviting his co-operation.

The new patients are now told when to attend the fracture clinic again, which may mean a daily visit for a few days if the limb needs careful supervision. They are warned to return immediately should any signs of undue pressure become apparent.

The whole programme of fracture treatment from beginning to end—reduction; fixation until union is present; protection until consolidation is complete; with an appropriate scheme of exercises both before and after removal of the splintage—is carried through in the out-patient fracture clinic.

If the fracture department includes a physio-therapeutic section, masseuses attend at the daily fracture clinic. They instruct the patients about the use of the limb and of the free joints, and note the surgeon's

prescriptions for special physio-therapeutical treatment (massage, faradic stimulation of muscle, special exercise schemes).

If the physio-therapy department is separate from the fracture department, the directors of the two departments arrange for close co-operation. The prescription for special physio-therapeutical treatment recommended by the surgeon is entered on the patient's case-sheet, and transmitted to the physio-therapy department; a copy of the records of the treatment subsequently given in that department is also entered on the case-sheet kept in the fracture department. The patient continues to attend the fracture clinic.

3. *Weekly fracture clinics.*

The weekly fracture clinic is a review clinic of all cases under active treatment. For convenience, the clinic may be held twice weekly, if the number of patients requiring to be reviewed in any one week is too unwieldy for a single session.

The patients attending include:—

- (a) All out-patient cases of fracture under treatment.
- (b) All former in-patient cases of fracture.
- (c) Cases reporting at varying intervals for follow-up purposes.

The weekly clinic is conducted by the surgeon-in-charge and attended by the assistant surgical staff and the full auxiliary staff. Two stenographers may be required in a large clinic. At a teaching hospital senior students accompany the surgeon for instruction on cases.

All patients under treatment are seen at first every week, later perhaps every second or third week. Every patient is examined either by the surgeon-in-charge or a senior assistant, house surgeons assisting. By this means the work of the daily fracture clinics is closely supervised by the surgeon-in-charge.

Most fractures are re-X-rayed every third week to exclude re-displacement within the plaster. If any plaster is changed, the limb is re-X-rayed, by routine, to ensure that the position of the bones remains unchanged. All X-ray films are incorporated in the case-sheet. After plasters are removed the ranges of joint movement are accurately measured and recorded. Muscle development is noted. The patient continues to attend until recovery is complete.

When the patient is considered fit to be discharged, he is instructed to report after a certain interval in order to ascertain if the function of the injured part has been fully restored and to learn if he has resumed work.

4. *Arrangements for the care of in-patients.*

Patients requiring in-patient treatment are admitted, preferably to special wards, under the care of the surgeon-in-charge of the fracture department. The practice varies in different hospitals with respect to fractures of the skull and of the pelvis, and as regards cases of accident involving injuries to the abdomen in addition to a fracture or fractures; such cases are commonly admitted under the surgeon of the week, who consults the surgeon-in-charge of the fracture department about the treatment of fractures of the limbs or spine.

If the condition of the patient allows, an X-ray examination may be made in the casualty department, or in the X-ray department on his way to the ward, thus saving him disturbance later.

If a house surgeon has authority to admit a fracture case to the wards, he notifies the resident assistant forthwith. It is the duty of the resident assistant to see the case without delay in the absence of the surgeon-in-charge of the department. In cases of special difficulty the surgeon-in-charge must himself be notified.

A case-sheet of the uniform type used in the department is made out for an in-patient, as for an out-patient. It is kept in the ward, and continuation notes regularly dictated and typed.

All in-patient fractures are seen at least once daily by the resident assistant, and weekly or bi-weekly by the surgeon-in-charge.

If an operation is necessary the patient's doctor is notified of the time of the operation and invited to attend. After the operation, notes for the case-sheet are dictated, including instructions as to after-treatment, and a letter is sent to the patient's doctor.

On discharge from the ward, the patient is instructed to report at the weekly fracture clinic at a specified date, and the case-sheet is sent to the out-patient department.

5. *Follow-up organisation.*

For the great majority of the less serious fractures the weekly fracture clinic acts as a follow-up clinic. For other cases special follow-up clinics may be held.

No patient is discharged as not requiring further treatment until the fracture is firmly consolidated, until nerve injuries and other complications have recovered, and until joint movement and muscle development are as far as possible restored. In any case where it is probable that, with the lapse of time, there will be further change (for better or worse) the patient may be discharged but is given a card, advising him in his own interest, to attend the follow-up clinic.

The case-sheet may be stamped with a special mark, and the number of the case-sheet entered in a diary. Six months later the patient is sent a card instructing him to attend the follow-up clinic. The clinic may be held weekly, fortnightly or monthly. All the cases or selected cases discharged in the corresponding period six months earlier are examined, final notes are made on the case-sheet, and the follow-up index card is completed.

If the patient does not attend, he may be sent a second letter. If he still does not attend he may be asked to fill up a form of questionnaire, from which the follow-up index card is completed as far as possible.

6. *Records.*

In a typical fracture department a uniform records system is used with a single dossier, which follows the patient from his first admission to the fracture department until his discharge. The system comprises the following files and documents:—

- (1) Name index file.
- (2) Fracture case-sheets.
- (3) Disease index file.
- (4) Statistical records; weekly and yearly.

APPENDIX III

PLANNING OF THE CLINIC.

The work of a normal fracture clinic may be summarised briefly as follows:—

- (1) Accident cases of all kinds are received, examined and provisionally diagnosed. The more severe cases are admitted as in-patients.
- (2) The cases of fracture which may be treated as out-patients are examined and X-rayed. Their treatment may require an anaesthetic, and fixation with splints or plaster of Paris. Notes are taken.
- (3) Many of the ambulant cases have to be seen daily for the first few days, and all must be seen frequently. All attend at least once weekly for noting progress and supervising treatment. All cases which have been discharged from the wards should also be seen in this weekly clinic.

(4) Treatment by massage and exercises has to be taught and carried out.

(5) Notes and records have to be made, filed and indexed.

For the above purposes the following rooms will be required, most of which can be found in the usual hospital out-patient department.

(a) Reception room.

For preliminary removal of clothes, cleansing, examination and note-taking.

(b) Operating theatre, such as is used for minor surgery in an out-patient department. It should have a table and equipment for applying and removing plaster of Paris.

(c) A room suitable for holding the daily and weekly clinics.

(d) An X-ray department, which should possess a portable set.

(e) Clerks' room, with records.

(f) The usual number of casualty beds (4-5) should be available for cases which it is desirable to keep under observation for a day or two, and for those suffering from shock. Serious cases should be admitted direct to the special fracture wards.

(g) Store rooms for splints, general surgical stores and instruments.

(h) Staff accommodation: Sister's room; Surgeon's room; sanitary accommodation, etc.

APPENDIX IV.

EQUIPMENT.

It is hardly perhaps within the province of the Committee to make recommendations as to the apparatus, instruments, etc., that would be required for an efficient fracture clinic; but for the guidance of authorities who may be considering the establishment of a clinic and desire to know the probable expenditure involved, the Committee has had a list drawn up of the articles which may be suggested for a fracture clinic and copies of this list may be obtained from the Secretary, Rehabilitation Committee, Ministry of Health, Whitehall, S.W.1. The list does not purport to state how many of each article would be needed, and does not include gymnastic or physio-therapeutical apparatus. It would enable a surgeon to select the kind and number of the articles he would require, and easily reckon the total cost. The estimated cost of the special equipment which might be required is approximately:—

Special furniture	...	...	...	...	...	...	...	£	160
Apparatus	...	...	...	...	...	...	...	...	25
Splints	...	...	...	...	...	...	...	...	60
Instruments	...	...	...	...	...	...	...	...	50
Materials	...	...	...	...	...	...	...	...	10
Examination room furniture	...	...	...	...	...	...	...	...	15
Developing room	...	...	...	...	...	...	...	...	20
Office furniture	...	...	...	...	...	...	...	...	60
Total (exclusive of portable X-ray set)	...	...	...	...	...	...	...	...	£400

A portable X-ray set may cost from about £160 to about £350.

In hospitals with general surgical, orthopaedic and physio-therapy departments little additional equipment would probably be required; but a portable X-ray set is essential.