

Reflections on training in orthopaedic techniques*

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When considering the present state of orthopaedic provision worldwide, crass differences can be observed which can often only be eliminated by the training of suitable personnel. These include those who are needed for medico-technical measures within the framework of rehabilitation of the physically handicapped and disabled.

In connection with the setting up of comprehensive training programmes, designed to meet the actual situation, three questions are of paramount importance:

- a) What type of personnel are required?
- b) How many personnel are required?
- c) How should they be trained?

In order to answer the first question it is appropriate to divide those employed in Technical Orthopaedics into two groups who differ characteristically with regard to features of their activity.

One group consists of skilled personnel who exclusively or predominantly are employed in the workshop area with the execution of manual tasks connected with the production of orthopaedic-technical remedial aids and do not normally come into contact with patients except in an assisting function. They bear such professional titles as, journeyman, specialist or technician.

The other group is composed of the most highly-qualified people who bear the main responsibility for the execution of all measures concerned with the preparation and fitting of remedial aids, as well as for instruction and training as part of the treatment, and who moreover issue the appropriate instructions to those employed in the workshop area and, if necessary, supervise them. Beyond this they may be entrusted with the training of trainees.

Typical professional titles for members of this group are master, prosthetist or orthotist.

This division—about which worldwide agreement exists—reduces the difficulty in answering the first question in the individual case.

With regard to the number of staff required this depends first of all on the total number of physically handicapped and disabled needing provision. Experience shows that in countries with a well-regulated orthopaedic provision the total number of those provided for and the total number of the providers stand in an approximately definable ratio.

In the Federal Republic of Germany for example, for the orthopaedic-technical or medical-technical provision of 700,000 to 750,000 physically handicapped and disabled there are about 7,500 workers available, a ratio of about 100 to 1. A further differentiation of the requirement is possible on consideration of a second factor, namely, the average personnel structure of existing or projected institutions of provision.

If the Federal Republic of Germany is again considered, it can be observed that the numerical ratio of top personnel (e.g. masters, prosthetists or orthotists) to those members of the other group (e.g. journeymen, specialists or technicians) lies between 1:4 and 1:5. This means that around 80 to 85% of the overall required personnel are journeymen, specialists, technicians or persons with equivalent qualifications and "only" 15 to 20% are masters, prosthetists or orthotists.

For a country which has personnel of neither category at its disposal, clear implications can be deduced from this as to training.

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Measured against the deliberations hitherto the answering of the third basic question as to the "how" of training is comparatively difficult, especially if concepts which deviate from the ISPO philosophy are to be considered in individual training programmes.

However, these differences are clearly distinguishable from differences whose causes are to be sought in national training policy, professional policy, training structure and similar factors not related to the specialisation on the one hand and/or in a differing composition of the patients to be provided for, in differing manufacturing techniques or in a more or less strong specialisation of individual personnel, and which in my view must be tolerated.

In this view of the situation a satisfactory similarity is apparent in the various training programmes for the group of journeymen, skilled workers and technicians, from which may be deduced that on a worldwide scale extensive agreement must exist about features of employment and resulting demands.

Variations exist primarily in the choice of the place of training and the fixing of the duration of training. The recognisable limits offer a scope for centrally, as well as dually organised training courses with a duration of between one and three years.

The situation in the field of training of top personnel is fundamentally different. The differences presented here stem to a considerable degree from concepts which deviate from one another, which becomes especially clear on consideration of the two extremes, i.e. manual training and the training at university level.

Without going into great detail it may be observed that one of the basic points of the discussion is the level of training necessary to provide the master, prosthetist or orthotist with all the essential technical knowledge and skills.

Representatives of the manual skill take the view that, besides the skills which are basically essential for looking after patients and co-operating with medical partners, manual skills are of prime importance, and theoretical knowledge need not go beyond that necessary for the understanding and execution of these procedures.

Therefore manual training up to master or state technician level is accomplished by further training of the best of that group who have

qualified themselves for the workshop area and have gained professional practice of several years in private workshops or clinics. This further training is carried on centrally or dually in terms of courses of varying duration which are constantly being adapted as technology develops.

An expert, for example, trained at the specialist school in Frankfurt, although he has no academic title, possesses nevertheless an extensive knowledge which enables him to carry out efficiently the medical-technical rehabilitation procedures expected of him, as well as comprehensive knowledge and expertise for the management or co-ordination of all that goes on in the workshop.

The road to this goal is long; it lasts at least $5\frac{1}{2}$ to 6 years. It is open to everyone to judge whether this is to be interpreted as lack of efficiency or thoroughness.

The representatives of a university training, as also envisaged by the ISPO philosophy, proceed on the assumption that only the intellectual mobility needed for the exploitation of technological progress and the degree of theoretical knowledge required for this justify this level of training. In this they represent the view that these conditions are scarcely compatible with the tradition of manual work, since manually employed workers are inclined to go on indefinitely applying what they have once learnt without much sign of readiness to change.

This reasoning, when one applies objective criteria, is not valid even from the viewpoint of an academic. If it were, all manually orientated provision would be in a desolate state. However, even under critical examination the situation in the Federal Republic of Germany proves the opposite to be the case.

Therefore the neutral observer cannot escape the conclusion that with the introduction of this training course possibly other reasons have played a part, for example the adapting of the training level of the prosthetist/orthotist to that of the other rehabilitation personnel in order to promote his recognition in this circle as a most important condition for the realisation of the clinic team concept.

This conclusion is further supported by the fact that prosthetist/orthotists according to the ISPO philosophy are presented as paramedical

personnel and thus predominantly associated with the medical sphere.

This leads on to the second main point of the discussions: the categorising of top personnel.

In Germany the master is unambiguously graded as a technical specialist and thus associated with technology. Employment in the health service is made clear by the addition of medical experience—as with the bio-engineer who is categorised in Germany according to the same viewpoints.

It is easy to recognise the advantages and disadvantages of the one or the other association and the consequent training guidelines, if one sees the master, prosthetist or orthotist, as a key figure between medicine and technology. If both specialist areas are to be combined through him, he must be in the position to fill completely the borderline region between them in his capacity as an expert and as a human being. If he is not capable of this or if his capacity is restricted in the sense of one-sidedness then a gap will arise either between him and medicine (i.e. the rehabilitation team) or between him and technology (i.e. those employed in the workshop area) a gap which can lead to problems in communication, co-operation, loss of authority and other disturbing influences which can have a negative effect on the rehabilitation programme and on the patient.

Depending on the character of the training course the risk of such a gap will be found on one side or the other; in the case of university orientated training between prosthetist/orthotist and workshop and in the case of manual training between master and medical specialist staff. Examples from practice prove the correctness of this hypothesis.

Some ideas about training in orthopaedic technology have been put forward. It is clear that we are still a long way from applying an international training system as recommended by ISPO.

The reason for this lies in the fact that differing national conditions and demands must be taken into account. It is one thing to recommend the establishment of recognised training schemes which are related to educational levels, it is quite another to implement them in countries where the required educational levels are limited or do not exist.

Since it is unlikely that the appropriate ministries of countries thus concerned will change an entire national educational system, just because a few specialists in technical orthopaedics so wish, one ought perhaps in future, before the establishment of training programmes, to give rather more careful thought to determining the peculiarities of individual national educational systems.