SWIMMING AND THE PARAPLEGIC

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Abstract. This paper deals with the teaching methods of swimming sport of spinal paraplegics.

INTRODUCTION

THE first use of clinical sport in this country was made by Sir Ludwig Guttmann who introduced archery as part of the treatment of paraplegics and tetraplegics (Guttmann & Mehra, 1973). It was, in fact, discovered that in this activity the paraplegic can compete on equal terms with the able-bodied sportsman. Ingenuity coupled with a knowledge of sport enabled a whole programme of activities to be introduced, with the result that today the disabled athlete is able to enjoy many and varied activities. In 1961, the British Sports Association for the Disabled (B.S.A.D.), was founded at Stoke Mandeville Hospital, and this has become the governing body controlling competition in a wide field. The Stoke Mandeville Games, now world famous (the first annual sports festival for the disabled), was founded in 1948, on the occasion of the Olympic Games in London (Guttmann, 1965).

Swimming is an activity which lends itself to the disabled (Guttmann, 1967), and in the course of time many organisations in Great Britain have made a contribution to its employment in a recreational and competitive field. These include the Amateur Swimming Association, The British Sports Association for the Disabled, The Association of Swimming Therapy, the Chartered Society of Physiotherapists, the English Schools Swimming Association, the Institute of Baths Management, the National Association of Swimming Clubs for the Handicapped, the Royal Life Saving Society, the Society of Remedial Gymnasts, and the Swimming Teachers Association. In 1969, the Central Council of Physical Recreation set up a coordinating committee of representatives of these bodies along with observers from the Department of Education and Science and the Sports Council. Since that date representation has been invited from the British Association of Occupational Therapists, the British Orthopaedic Association and observers from the Sports Councils of Scotland, Wales and Northern Ireland.

The terms of reference of this committee are to 'encourage the promotion of swimming for the handicapped'.

MATERIALS AND FACILITIES

Swimming for the disabled is best enjoyed in a swimming pool, although disabled swimmers have indeed swum the English Channel (McMillan). Swimming pools vary in size and facilities from the small pool in the physiotherapy department of a hospital to pools of international standards. From the point of

view of the disabled swimmer, however, the most important factors are accessibility and safety. All swimming pools should be capable of being used by the disabled as well as the able-bodied. With a little thought in the planning stage this can be easily brought to fruition. Much information can be obtained from *Swimming Pools and Sports Centres* by Felix Walters (1972) which should be studied by all concerned with the planning and design of new pools.

In some respects, the older pools of Victoriana were more suitable for the handicapped swimmer. The pool in which the club I am associated with, Wallasey, was built in 1908, has a direct approach from a car park with only one small step to negotiate, this being covered by a ramp for wheel chairs on club days. Entry to the water is by stone steps, easily negotiated by the paraplegic or by a simple seat on an inclined plane which is a device the club has acquired and which can be easily stored in a side room when not in use.

Pool lighting is an important factor. In many of the newer pools, this is by large side windows. Total reflection from the surface of the water makes it impossible to see a swimmer underneath the surface when standing on the pool side opposite the windows. This is an obvious hazard. The older pools were built with roof ventilators and skylighting which gave a uniform light over the whole pool area. If artificial light is used, this should be of an intensity of at least 300 Lux (Bleasdale, 1973).

Some pools built for the handicapped are too shallow. For a swimmer who has difficulty in walking on land, shallow water creates a hazard in that it can cause him to trip when walking on the pool floor. Water of waist depth is recommended as suitable for teaching purposes.

TEACHING METHODS

The paraplegic learns to swim easily. The limbs from the hips downwards are light and in water do not possess the torque experienced in the able-bodied. Consequently the body is buoyant. Personally I have a preference of teaching swimming on the back and sculling with the arms as an early exercise. At a later stage the pupil should be taught to immerse the face keeping the eyes open and visualising the floor of the pool. Later still, skill in regaining a balanced position from the face downwards float to the supine float by use of the arms should be taught. If a swimmer is to be well versed in the art, time spent in learning how to use the water is well spent and this contributes to the swimmer's safety. All movements must be propulsive and smooth, creating as little turbulence as possible. It is an advantage if the pupil has the same instructor on each occasion so that progress can be assessed and a friendly relationship established.

Once swimming has become established, the thrill of being capable of moving with precision in a new environment induces enthusiasm and the student will wish to acquire additional expertise. There are targets for all ages. An adult might wish to obtain the A.S.A. adult swimming awards, or gain a badge for personal survival which is a good all-round test of watermanship and non-competitive.

In watching the paraplegic swimmers perform in our club in Wallasey, one or two fine points have come to mind. In the backstroke, the most efficient stroke to use is the back crawl. The arms circle alternately and a more continuous movement is achieved than in the earlier double over arm movement. If the

shoulders are flexible, the arms may move without much disturbance of the body position in the water. This stroke lends itself to lady swimmers for this very reason. The head should be held with the occiput in the water. This places less strain on the neck muscles and allows free airway through the trachea. Navigation is achieved by watching the pool roof. If the lights are linear this is helpful.

The arms when pulling and recovering should be kept straight at the elbow. Advanced technicians bend the elbow during the pull in order to allow the arm to accelerate, but this may be taught at a later stage. Breathing may be as and when required as the mouth is clear during the whole stroke cycle. In a race it is advantageous to have one arm behind the head on starting. Starting in this way ensures a smooth acceleration from the wall of the pool, whereas if both arms are used in the initial stroke they will finish by the side of the body leaving a phase in the stroke where no propulsion can be obtained.

The breast stroke is a stroke which requires propulsion with the arms and the legs in almost equal proportions if a speed of two metres per second is to be obtained. Nevertheless, there is a phase in the stroke when arms and legs are recovering when the body makes no progress whatever. The paraplegic can swim the stroke well with arms alone. This is a training method used by the able-bodied swimmer. The body position should remain as flat as possible on the water surface. The paraplegic swimmer is liable to swim with a 'bouncy' action but this can be corrected by a small modification of the arm movement. The arms pull as in the traditional stroke until they reach a depth of about one foot below the surface. At this point, the elbows are bent and the arms pulled directly under the chest, the distance between the hands in this position being from six to nine inches. This movement will result in forward progression without causing an undue lift of the body in the water, and yet will give sufficient clearance of the mouth above the surface for breathing purposes. The breast stroke is an excellent exercise for flexion and extension of the spine.

The crawl stroke is the most efficient method of swimming and the least tiring. The modern distance able-bodied swimmer uses the legs very little, and therefore, the paraplegic should be able to reach a considerable degree of skill in this movement. As in the other strokes, the body position should be horizontal with the face looking towards the pool floor. For breathing purposes, the face is rotated so as to bring the mouth clear of the surface. Usually, the face is turned away from the stronger arm when it is pulling. The arms are pulled downwards alternately in the midline of the body and carried backwards until the hip is reached when they are recovered above the water to the starting point. Some swimmers prefer to bend the arms when pulling so as to lessen the tendency to roll and to accelerate the speed of the pulling arm. The Australians, who hardly move the legs when using this stroke swim with a very rapid action of the arms. Swimming thus, they have established many world records.

My experience with the paraplegic swimmer using the butterfly stroke is limited because in the narrow circle of the club in Wallasey to which I belong we have no paraplegics who swim this stroke. It is however, used efficiently with some of our mongoloid members.

The teaching points in this article are the result of observation combined with personal experience as a swimmer and by trial in the water maintaining the lower limbs in passive capacity. It is hoped that they may be of use to paraplegic swimmers in whatever company they swim.

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REFERENCES

- BLEASDALE, H. N. (1973). Accidents in the Swimming Pool and their Prevention. *Transactions of the F.I.N.A. Medical Conference, Barcelona, 1973*. In publication.
- GUTTMANN, SIR LUDWIG & MEHRA, DR. N. C. (1973). Experiential studies on the value of archery in paraplegia. *Paraplegia*, **11**, 150-165.
- GUTTMANN, SIR LUDWIG (1965). Reflections on sport for the physically handicapped. *Physiotherapy*, **51**, 252-253.
- GUTTMANN, SIR LUDWIG (1967). Water Therapy and Water Sport for the Physically Handicapped with special reference to the paralysed. *Proceedings of 37th Annual Conference, Blackpool, Institute of Baths Management*, pp. 128-140.
- MCMILLAN, J. Founder, Association of Swimming Therapy. Personal communication.
- WALTERS, FELIX (1972). *Swimming Pools and Sports Centres*. Disabled Living Foundation.