

WHEELCHAIRS AND MARATHON ROAD RACING

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1. Why

At its annual meeting in March 1983, the British Marathon Runners Club agreed on the following statement

"The British Marathon Runners Club recognises that wheelchair racing is a valid sport in its own right for people with certain kinds of disability, and that in combined events it realises that wheelchair athletes are not competing against runners but are taking part with them. The club is of the opinion that the decision to hold a wheelchair race within a road-race must be made by the individual race director, and that when such a decision is made for a properly-organised combined event then the club would support such a race."

Wheelchair road-racing can only exist in the context of mass road-racing (just as elite running athletes can only have public roads closed in the same context, so using places like Tower Bridge, the Embankment and the Mall.) Both are thus dependent, in different ways, on the ordinary, everyday runner. The specific arguments for wheelchairs are about inclusion: about wheelchair athletes being seen as part of the whole spectrum of athletics, but with their own, necessarily distinctive, way of doing things. As the BMRC statement makes clear, it is necessary to recognise the differences between running and pushing oneself in a wheelchair, and to ensure that a wheelchair section is properly organised. For all but a very few road-races there is unlikely to be more than a handful of wheelchair entrants, and that number is easily coped with both organisationally and medically. The guidelines below, on both these matters, are intended to help race organisers meet the needs of intending wheelchair participants.

2. How

a. Entry. It is useful to know as early as possible whether there are any wheelchair entrants. The easiest way to find out is to have an additional box on the entry form as follows:

"If you intend to take part in a self-propelled wheelchair, tick this box."

It is for individual race organisers to decide whether to admit, or encourage, this kind of entry.

b. The start. A wheelchair takes up twice the width and three times the length of a runner, cannot easily be spotted ahead through a crowd of runners, and cannot easily be heard as it comes from behind. It is vital, therefore, to ensure that wheelchairs and

runners are separated at the point of maximum congestion: the start.

Self-propelled athletes in wheelchairs are nearly always faster than the slowest runner, and may be up to 20 minutes faster than the fastest runner in a full marathon. These wheelchair athletes should be started in front, with a time-lag (head-start) between them and the start of the foot-race.* The head-start ensures that the wheelchair competitors are strung out by the time runners catch up and overtake: in this way, wheelchairs constitute neither an obstruction nor a danger. The "stringing-out" happens more quickly with wheelchairs than runners, and is almost always achieved within a mile or two of the start.

Factors affecting the length of the head-start:

A *longer* head-start is indicated if:

- there is a large wheelchair entry
- there is a large running entry
- there is an uphill start (especially if followed by a downhill section)
- the course is generally hilly

A *shorter* head-start is indicated if:

- there is a small wheelchair entry
- there is a small running entry
- the course is flat
- there is a downhill start
- the police will only close the roads immediately before the arrival of athletes.

Fifteen minutes would be considered a long head-start, a short one can be as little as one minute. Combinations of the above factors may suggest that organisers should perhaps restrict the number of wheelchair entrants to maintain the safety element. Wheelchair entries of up to 65 have been successfully achieved in the USA in events as short as 10 km, and as long as full marathons.

Runner-pushed wheelchairs (RPWs) In the opinion of the writer, these wheelchairs should be started at the back, behind the runners, with the responsibility for safety being that of the runner-pushers rather than of the wheelchair occupants.

*If these wheelchairs are started at the back — still an all-too-common practice — they spend the whole race trying to overtake slower runners who can neither hear nor see them approach, and to whom they thus represent a danger. The Great North Run (always) and the London Marathon (1984 onwards) have both successfully used the "head-start" model, with larger wheelchair and running entries than any other such races in the country. Their practice should be adopted more widely.

c. The course. Very few courses will in fact be found totally unsuitable for wheelchair participation.

- (i) **Surface** The smoother the surface the better for wheelchairs. Rolling resistance is less, and less effort is required to keep a given speed. No course can, of course, maintain a uniform surface throughout, and the kinds of surface likely to give wheelchairs problems — pot-holes, man-hole covers, cobbles, and so on — are also likely to do so for runners. Cobbles in particular are very uncomfortable and slow, but they have no intrinsic danger for wheelchairs. The only occasion where these features may cause a problem is if they are in the middle of a downhill section (see 'Gradient').
- (ii) **Width** Obviously, the wider the road the better, for the less the degree of congestion, the more easily wheelchairs are noticed (and hence avoided), and so on. However, it is *not* necessary for successful wheelchair participation to be restricted to roads of motorway width: the first 'integrated' marathon in this country (People's Marathon, 1981) included a half-mile of narrow twisting (and bumpy!) footpath, negotiated safely by runners and wheelchairs alike. Width is another matter which should be considered in relation to the length of the head-start and the point in the race at which any very narrow section occurs.
- (iii) **Gradient** Wheelchairs tend to be slower than runners uphill and faster downhill. The limiting uphill gradient for racing wheelchairs is about 1 in 6. There is (in principle) no limit to the downhill gradient, but (in practice) chairs can be safely controlled on similar gradients. Very high speeds can, however, be reached on much shallower gradients: with a suitable combination of surface, width and gradient (and nerve!), speeds of 45 mph have been recorded by racing wheelchairs in the USA (though this is exceptional). 25 mph has been reached in the UK, at the start of the Great North Run. Again, the length of the head-start needs consideration in relation to the location within the race of any sustained downhill section, particularly if the latter is narrow. All wheelchair athletes should be instructed before the start to take particular care on downhill stretches after they have been caught by the runners.
- (iv) **Camber** This is the worst physical problem wheelchairs have to contend with. The front caster wheels will follow the steepest downhill line unless continual correction is made by the athlete. Thus, in pushing along the left-hand side of the road, there is a continuous drag towards the gutter, resulting in increased strain on the left arm.

The ideal position for a wheelchair, then, is on the crown of the road, with the front wheels 'balanced'

either side of the crown. It is recognised that it is not possible for many race organisers to arrange for more than half the road to be closed, but camber is the reason why some wheelchair athletes ignore bollards and instructions to stay inside them. One solution may be to place marker bollards two feet into the other lane, thus allowing wheelchairs (and runners) the use of the crown.

The seriousness of the issue will depend on a number of matters: first and foremost, of course, is whether the whole road or only half of it can be closed, but there is also the matter of the general volume of traffic to be expected, the attitude of the police to infringements of the bollards, the relationships between them and the race organisers and marshals, and so on. It should be made clear to the wheelchair participants before the race whether infringement of bollards is likely to result in disqualification.

- (v) **Corners** These are not a problem except when sharp, and on downhill stretches. Wheelchair athletes should be warned in advance of any such places, and possibly advance warning arranged. A distinctive flag waved or placed (say) 50 yards before a corner should be adequate to avert any danger. Straw bales are an additional safety device, though they have only been used once in this way (London, 1984) without being required to perform.
- (vi) **Kerbs** A few courses have unavoidable kerbs. Depending on the location of the kerb within a race, and on who *owns* it (!), arrangements have been made either to provide a temporary ramp (tarmac or wood), or muscle to lift wheelchairs over the edge. If the kerb is in the middle of a downhill section, the athletes should again be warned in advance.
- (vii) **Feeding stations** These are a second major area of congestion. All wheelchair athletes should be advised to be very careful in their vicinity, and to be aware of the possibility of sudden, sharp changes of direction by runners when approaching a feeding station.

If there is sufficient supporting manpower, consideration may be given to identifying one or two individuals at each feeding station to run along with the wheelchair and hand over the water at speed. (Obviously this is not possible if the wheelchair is travelling very fast). If this arrangement is felt to be practicable, the "wheelchair feeders" could be on the opposite side of the road from the normal station, and the athletes need to be told of this. Again, this is only possible if the road is closed to traffic.

(One or two North American athletes have arranged for cyclists to accompany them with

drinking bottles. This phenomenon has not yet arrived in Britain, but then neither have N. American times). It would provide an additional hazard to runners.

Undoubtedly the most satisfactory arrangement is for wheelchair athletes to take their own fluid with them and thus to avoid using feeding stations altogether. This is quite practicable, and could be one of the specific suggestions made in the advance literature.

- d. The finish. To comply with IAAF, AAA and WCCA regulations, and for safety reasons, separate finishing chutes may be required. All wheelchair competitors should be advised of this before the start of the race, and of the location of the "wheelchair chute" in relation to the finishing line, i.e. right or left. The chute should be at least 36" (1.1 metres) wide.
- e. Sweep-up. Unless there is a large wheelchair entry, a wheelchair-specific sweep-up bus is not recommended. It should be made clear to the athletes that non-finishers will have to make their own arrangements for reaching the end. With a large wheelchair entry, sweep-up arrangements could become the responsibility of a special sub-committee charged with organising the wheelchair section. Local voluntary organisations and/or schools may be willing to loan suitable vehicles.
- f. Toilets. If possible, local institutions close to the start/finish, and with their own wheelchair toilets, should be identified, and the appropriate authorities contacted requesting permission for the wheelchair athletes to be allowed to use the toilets. Town Halls, sports centres, health centres, schools, colleges and hospitals are all possible sources for this help, and many will, one way or other, be involved in the race organisation anyway.
- g. Competition. Three matters are relevant to competition amongst wheelchair athletes in road-racing, and race organisers may wish to be made aware of these.
- (i) The wheelchair. International regulations place limitations on wheelchair design (in much the same way that there are limitations on, for example, the thickness of rubber in the soles of shoes used by high-jumpers).
- There shall be two main drive wheels, and at least one smaller caster wheel.
- The maximum (inflated) diameter of the main wheels shall be 70 cms.
- No crank-handles or gearing mechanism shall be allowed.
- Each drive wheel may have one (and only one) handrim, of any diameter, for propulsion.

The front caster wheel(s) may have (a) steering device(s).

Times cannot be validated by BSAD unless these regulations have been complied with.

- (ii) The athlete. There is a complicated classification system covering disabled athletes. The purpose of classification is to ensure that, so far as possible, athletes of equal disability are matched when times are compared. It is not expected that organisers shall be familiar with this system, though many athletes will know which class they belong to. Advice and information on the application of the classification system to road-racing are available from the Director, British Sports Association for the Disabled, Hayward House, Barnard Crescent, Aylesbury, Bucks. HP21 8PP.
- (iii) Timing. It is important to know the length of the head-start in order that that time may be added to the recorded finishing times of wheelchair competitors. It is helpful if the head-start is known and declared in advance (thus helping wheelchair athletes in their assessment of intermediate times), but circumstances may dictate that it cannot be adhered to exactly. To cope with this possibility, someone should be designated to take an exact timing of the head-start, and to ensure that all wheelchair athletes are informed at the finish or in writing afterwards.

3. Medical considerations

Wheelchair athletes taking part in road-racing are probably fitter than the average runner. The reason for this is simple: shifting a greater mass (body plus wheelchair) using smaller muscles (arms rather than legs), which is what wheelchair users do all the time, requires better cardiorespiratory function in order even to complete the course. However, they are in no way immune to the common physiological problems experienced in mass running.

Control of heat and cold. The principles are much the same as for runners, with the same advice on treatment in the event of hypo- or hyperthermia.

In wet, cold (and especially, windy) conditions, athletes should seriously consider wearing water- and wind-proof over-clothes. However, no-one likes carrying extra clothes, and close-fitting upper-body clothes which do not flap and get in the way of the pushing action are difficult to find. A light-weight zipped jacket may be more acceptable to athletes, in that it can be removed and tied round the neck by the arms if weather conditions change during the race. Alternatively, a close-fitting plastic bag/bin-liner can be used without getting in the way of pushing.

Some wheelchair athletes, those who have had broken

necks (tetraplegics) with their arms and hands affected, are poikilo thermic. That is, they are neither able to sweat properly to remove excess heat, nor to shiver properly to generate heat in cold conditions, but tend instead to adopt the temperature of their environment. In warm conditions, therefore, removal of body heat through sweating can only be achieved to a limited extent, and there may be a risk of rapid rise in body temperature. Fortunately, in road-racing this problem is very rare: most tetraplegics involved in heavy physical exercise will be well aware of the risk, and can thus be expected to take appropriate preventive measures; and the number of tetraplegics involved in road-racing in Britain is very small, probably no more than a dozen or so.

An example of a heat/cold control problem occurred when a self-propelled wheelchair athlete stopped in the middle of a race. A well-meaning runner took hold of the chair handles and continued to run pushing the chair in front of him. Two things happened. Firstly, by stopping pushing himself the wheelchair occupant stopped generating heat, without having any extra covering to prevent heat loss (such as space-blankets at the end of a race provide). Secondly, from an initial vaso-dilated state, the forced convection of cooler air on the body rapidly sent the wheelchair occupant into a hypothermic state. A light-weight jacket would be useful in these circumstances.

With all these problems, as with runners, the risk is greatest with the first-time athlete, and specific advice aimed at these should be included in the mailing.

RPWs Problems with overheating are unlikely to arise but, as indicated above, being pushed has a cooling effect on the wheelchair occupant, so there may well be problems in cold and wet conditions. It would be wise for them to be fully protected against the cold, with a water- and wind-proof jacket and (preferably) a hood.

Injuries. No scientific study has been made as to the occurrence of injuries in different joints or soft tissue amongst wheelchair road-racers, and so no comparison can be made with runners. Evidence from the USA suggests that in marathons the proportion of wheel-

chair starters who finish is considerably higher than that of the runners, and also that they tend to finish in a rather fresher condition. Even so, the usual musculo-skeletal problems are likely to affect everything from the shoulder to the finger-joints, though that kind of problem is more likely to be presented to the GP on the Monday morning than to a first aid station en route. Skin problems will include blistered fingers (most athletes use strapping and gloves, but some still develop blisters) and chafing under the arm where t-shirts and even vests are likely to rub unless the arm-holes are very loose. Scissors have been found useful in these circumstances. Friction burns on the inside of the upper arm, resulting from contact with tyres, have also been known, and may require dressing at the finish.

RPWs Consideration should be given to the wheelchair occupants' being "belted in". Not controlling the wheelchair themselves, they may be unable to make the rapid adjustments in posture and balance which may be necessary if the wheelchair is crossing kerbs and cobbles at (say) 6-7 mph. Much depends on the runner-pusher, and on the communication between them when moving.

4. Non-medical matters

All wheelchair athletes should ensure before beginning a race that the wheelchair is in good condition, with all nuts, bolts, screws, etc. fully tightened. Nevertheless, bolts occasionally work loose, and punctures have also occurred. The usual resource for coping with these eventualities is the man leaning over the garden fence watching the race; no specific arrangements can be made to guard against every possibility, and so no specific advice is appropriate.

In general, it may be useful to identify one individual with overall responsibility for co-ordinating and issuing advice and information to wheelchair participants. Preferably such a person should be on the organising committee, or in close contact with it; he need not necessarily be a wheelchair user himself, though he should be attuned to and aware of the aspirations and capabilities of wheelchair athletes.