



# Sports, recreation and employment following spinal cord injury – a pilot study

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**Study design:** A pilot postal survey.

**Objective:** To examine the levels of sporting/recreational activities, education and employment in people with spinal cord injury (SCI) and to assess if involvement in sport and recreation is associated with higher levels of education and employment.

**Setting:** National Spinal Injuries Centre (NSIC), Stoke Mandeville Hospital, Aylesbury, UK.

**Methods:** Forty-five subjects, who met the following criteria: SCI at level C5 or below, wheelchair dependent, aged between 18 and 50 at the time of injury, injured at least 10 years ago, admitted to the NSIC within 6 months of injury and resident in the UK, completed a 26-item postal questionnaire.

**Results:** Among the 45 subjects 47% participated in physical activities (20% in sport; 27% in recreation), 33% were employed (29% full-time) and 18.5% had undergone further education at the time of the survey. Participation in sports as well as employment status decreased after injury ( $P < 0.01$ ) usually as a result of poor access to sports and work facilities. Only 4% of investigated SCI patients started to practise physical activity after the accident whilst 42% stopped.

**Conclusions:** Levels of sporting/recreational activities and employment decreased significantly after injury. No significant correlation was found between sport/recreation involvement and education/employment status. Further investigation with a large number of participants that will enable additional analysis of subgroups, such as level of injury and functional independence, is required.

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**Keywords:** spinal cord injury; sports; recreation; education; employment

## Introduction

The main objective of sport and recreation activities for spinal cord injured (SCI) persons is physical improvement as well as perfection of wheelchair skills. It has been demonstrated that involvement in sports by wheelchair users improves their rehabilitation outcome, aids the adjustment to their disability, increases their independence, gives them greater self-confidence, improves their quality of life and gives them aspirations for their further development.<sup>1–7</sup>

Gainful employment is an important rehabilitation goal for SCI persons, not only for the individual concerned but also for the state in terms of tax and unemployment benefit. This goal is usually not achieved.<sup>8–24</sup> Paraplegic persons are more likely to return to work than those with tetraplegia,<sup>10,12,15</sup>

younger SCI persons than older ones<sup>8,10,12,15,18</sup> and better educated than less educated ones.<sup>10–12,15,18</sup> Work experience before SCI, marital status and time since injury are other important factors.<sup>8–11</sup> Little has been published on the relationship between physical fitness, habitual physical activity and employment status after SCI.<sup>18,25</sup>

In the early decades following the establishment of the National Spinal Injuries Centre (NSIC) at Stoke Mandeville Hospital many of the SCI patients were actively involved in sport.<sup>2</sup> Employment among the patients of the centre was also high. In recent decades involvement in sports has declined and employment has also fallen.

The purpose of this pilot study was to examine first the levels of sporting/recreational activities, education and employment in SCI people and second to assess if involvement in sport and recreation is associated with higher levels of education and employment.

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## Material and methods

### Sample

The sample consisted of 100 newly injured patients of the NSIC, who were consecutively admitted under the care of the fourth author of this study and who met the following criteria: spinal cord injured at level C5 or below, wheelchair dependent, aged between 18 and 50 at the time of injury, injured at least 10 years ago, admitted to the NSIC within 6 months of injury and resident in the UK.

These individuals were mailed a package that included a letter of explanation, a questionnaire and a stamped addressed envelope. Completed replies were received from 53 (53%) of individuals within the 30 day limit for returns. Eight questionnaires were excluded as they were inappropriately filled in, leaving 45 (45%) subjects as the study group.

This study was approved by the Aylesbury Vale Health Authority Ethics Committee.

### Measures

The data was gathered from a 26-item questionnaire (see Appendix 1) that covered demographic characteristics, injury data, education before and after injury, employment before and after injury, and details of pre-injury and current involvement in sport and recreation. All participants were asked about any medical problems that may have prevented them from pursuing these activities. The current level of independence was also checked. The questionnaire included open questions about important aspects that influenced their sport and vocational involvement.

### Analysis

Due to the small number of investigated SCI persons, paraplegic and tetraplegic subjects were analyzed together and variables were merged as follows: school (primary and secondary) and higher education (college and university); employed (part and full time) and those who did not earn money (student, homemaker, unemployed); sport (high physical activity: 2–7 times a week) and recreation (low activity: once or less than once a week) and non active group.

Descriptive statistics were used for the presentation of the results. Statistical analysis was performed using SPSS and Sigma-Stat. For comparisons between pre-injury and post-injury achievements Z-test for comparing proportions was used and for potential association between sport/recreation and education/employment, cross-tabulation and Chi-square test. Significance for all statistical analyses was fixed at the 0.01 level of probability.

## Results

The basic demographic and injury characteristics of the 45 patients are presented in Table 1. Eighty per cent of

**Table 1** Characteristics of 45 SCI wheelchair users

<i>Subjects (n = 45)</i>	
<i>Demographic characteristics (%)</i>	
<i>Sex</i>	
Male	36 (80.0)
Female	9 (20.0)
<i>Present age</i>	
20–30 years old	11 (24.4)
31–40	17 (37.8)
41–50	14 (31.1)
51–65	3 (6.7)
<i>Marital status</i>	
Single	22 (48.9)
Married/living with partner	20 (44.4)
Divorced/separated	3 (6.7)
Widowed	–
<i>Place of residence</i>	
Village	15 (33.3)
Town	21 (46.7)
City	9 (20.0)
<i>Accommodation</i>	
Fully adapted	17 (37.8)
Accessible for the disabled	26 (57.8)
Not accessible	2 (4.4)
<i>Spinal cord injury</i>	
<i>Level of injury</i>	
Tetraplegic	21 (46.7)
Paraplegic	24 (53.3)
<i>Cause of injury</i>	
Road traffic accident	22 (48.9)
Fall	3 (6.7)
Sport	9 (20.0)
Assault	1 (2.2)
Non traumatic	4 (8.9)
Others	6 (13.3)
<i>Age at time of injury</i>	
18–30 years old	28 (62.2)
31–40	14 (31.1)
41–50	3 (6.7)
<i>Mobility</i>	
Manual wheelchair	35 (77.8)
Electric wheelchair	10 (22.2)
<i>Getting up in the morning (dressing, washing)</i>	
Completely independent	19 (42.2)
Partially independent	10 (22.2)
Dependent on others	16 (35.6)
<i>Transfer bed, toilet, wheelchair, etc</i>	
Completely independent	21 (46.7)
Partially independent	9 (20.0)
Dependent on others	15 (33.3)
<i>Taking bath/shower</i>	
Completely independent	18 (40.0)
Partially independent	10 (22.2)
Dependent on others	17 (37.8)
<i>Getting to bed at night (undressing, washing)</i>	
Completely independent	21 (46.7)
Partially independent	7 (15.6)
Dependent on others	17 (37.8)

the subjects were males. More than half (62%) were aged between 20 and 40. About half were married or lived with a partner. Sixty-seven per cent lived in towns or cities. Two persons (4%) described their homes as being inaccessible to wheelchairs. Twenty-one (47%) were tetraplegic and 24 (53%) paraplegic. The most common cause of injury was road traffic accident (49%). At the time of injury 28 persons (62%) were relatively young (18–30). Thirty-five (78%) used manual wheelchairs and ten (22%) were dependent on electric ones. Twenty-seven (60%) were at least partially dependent in basic activities of daily living, the average number of hours of help required in each 24 h being 10, with the range 0.5–24 h. Eleven patients (24%) reported having had medical problems that interfered with their sports/recreation in the last year. Three of them reported continuous medical problems. The duration of medical problems was 12–107 days in the last year (mean 47).

### Sport and recreation

Involvement in sport and recreation before and after injury is presented in Table 2. The frequency of sporting activities fell from 19 (42%) before the accident to nine (20%) at the time of the survey. Of these nine, four were sportsmen, four were involved in recreation and one was non active before the injury.

The frequency of recreational activities also decreased after injury. Nineteen (42%) were involved in recreation before the injury compared with 12 (27%) at the time of the questionnaire. Amongst these twelve, five practised sport before the accident, six were involved in physical recreation and one was non active.

Of those active after injury, 15 preferred individual sports disciplines and six team games. The most

popular sports disciplines were: basketball, archery, swimming, wheelchair racing, weight-lifting, snooker and bowling.

The difference between sport/recreation involvement before and after injury was significant ( $P < 0.001$ ).

The respondents described different reasons for practising sport or other physical activities. For many of them maintenance of good physical condition and improving their upper body strength were the most important factors. The enjoyment of practising sport, competition, improved self-esteem and better weight control were also stated as very important. Other factors mentioned were: decreasing pain, getting out of the house and just keeping active.

The number not active in any kind of physical activity increased from seven (16%) before to 24 (53%) after the accident. Before injury, of these 24, ten were involved in sport, nine in recreation and five were non active.

Common reasons for stopping practising sport after the accident were non-existent sporting facilities for the disabled in their locality and dislike of 'traditional' disabled sports like bowls, table tennis, archery etc. Many of the respondents, especially tetraplegic individuals, emphasised the lack of opportunity for practising their favourite sport. For some the fear of further injury, lack of money or lack of time due to professional activities were factors that prevented them from pursuing these activities.

Only two (4%) from the pre-injury non-active group started to practise some kind of physical activity after the accident whilst 19 (42%) pre-injury active ones gave up sport/recreation after injury.

### Education and employment

Before the accident 27 (60%) had school and 18 (40%) higher education. After the injury five of the 27 (18.5%) graduated from college or university (Table 2).

Correlation between sport/recreation and educational status was not statistically significant. Of the 23 (51%) with higher education after injury five (22% of the 23) practised sport, six (26%) participated in recreation and 12 (52%) were non active. The corresponding figures for the 22 (49%) with only school education post-injury were four (18% of the 22), six (27%) and 12 (55%) respectively.

Thirty-nine (87%) were employed at the time of injury. Only 15 (33%) were employed at the time of the questionnaire, 13 (29%) being full-time. The difference between employment status before and after injury was significant ( $P < 0.001$ ).

Several features were described by the participants as adversely influencing their employment. The most frequently reported were: difficulties in finding wheelchair accessible places of work, lack of accessible transport and suitable housing sufficiently close to work. Less frequently reported were: the requirement for full time care and the reluctance of employers to consider a disabled person.

**Table 2** Involvement in sports, education and employment before and after SCI

	Subjects (n = 45)	
	Before SCI (%)	After SCI (%)
<i>Frequency of sport and physical activity</i>		
Sport	19 (42.2)	9 (20.0)
Recreational	19 (42.2)	12 (26.7)
Nil	7 (15.6)	24 (53.3)
<i>Sport discipline</i>		
Individual	27 (60.0)	15 (33.3)
Team games	11 (24.4)	6 (13.4)
None	7 (15.6)	24 (53.3)
<i>Educational achievements</i>		
School	27 (60.0)	22 (48.9)
Higher education	18 (40.0)	23 (51.1)
<i>Employment</i>		
Gainful employment	39 (86.6)	15 (33.3)
Not gainfully employed	6 (13.4)	30 (66.7)

Correlation between sport/recreation and employment status was not statistically significant. Of the 15 who had gainful employment, two (13% of the 15) did sport, five (33%) recreation and eight (54%) were non active. Among those not gainfully employed seven (23% of the 30) were involved in sport, seven (23%) in recreation and 16 (54%) were non active.

## Discussion

It has been assessed that the prevalence of SCI in the UK today is 35 000.<sup>26</sup> Our pilot study has shown that over two-thirds of SCI persons of younger working age do not achieve employment following their injury. This represents a very serious deficiency in rehabilitation for the individuals concerned as well as a major drain on the financial resources of the state, both in terms of reduced taxable income as well as increased unemployment benefit payments. It is essential that all reasonable steps are taken to address this.

It has been stated that active involvement by those with SCI in sports and recreation increases their likelihood of employment.<sup>18,25,27</sup> However there is no published evidence to support this contention in the UK context.

Our study has failed to demonstrate a significant link between post-injury sport/recreation and employment. A much larger study is required to examine this more fully.

One finding of particular concern in our study was the relatively low percentage (18.5) of our sample who improved their education post-injury compared with those of other studies. This merits further investigation.

In the following sections the findings of the key elements of this study, namely sports, education and employment, will be compared with those of other studies.

### Sports

In our study 47% of SCI patients were involved in some physical activity at the time of the questionnaire (20% sport and 27% recreation). This, as well as preferred sports disciplines, is similar to that described elsewhere in the literature. Van Asbeck *et al*<sup>23</sup> identified 48 patients (41%) (14 tetraplegics, 34 paraplegics) still active in sport after discharge from hospital. Basketball was played by 11, table tennis by nine, wheelchair racing by eight, tennis by four and other sports by nine. Sutton<sup>21</sup> described participation in sport as the most popular leisure activity in 24 (32%) out of 75 subjects.

In our study, the most important reason given for practising sport was to improve health, and the most common reason for not playing sport was lack of wheelchair access. Richards<sup>20</sup> found that 33% of SCI patients, in particular tetraplegics, expressed frustration at being unable to pursue their favourite sport.

### Education

In our study, only 18.5% improved their education following injury. This contrasts with other studies which report much higher level of post-injury educational improvement. For example, El Ghatit<sup>10,11</sup> reported 40% and Weidman<sup>24</sup> 43%.

Comparison with other studies is not always straightforward. For example, Kruse *et al*<sup>16</sup> did not give pre-injury education achievements in his sample.

### Employment

The percentage (33%) of SCI persons engaged in gainful employment in our study is broadly similar to that of others<sup>9,10,13–23,28</sup> even though these were from different countries where employment opportunities and unemployment benefits differed from those in Britain. The results of these studies, in comparison with ours, are given in Table 3.

However, more precise comparison is prevented by the dissimilarity of the patient characteristics and methodology of the different studies. Eleven authors did not mention a retired group.<sup>9,10,12,14–19,21,28</sup> Richards<sup>19,20</sup> did not mention ages. El Ghatit<sup>10</sup> and Kruse *et al*<sup>16</sup> gave only the mean age of evaluated subjects. De Vivo *et al*<sup>9</sup> had patients from 13–59 years of age. Noreau<sup>18</sup> had patients in the same age range (13–59), but only those free of any major medical complications that could influence physical working capacity. Kiwerski<sup>14</sup> had persons aged 18–60. Nakajima<sup>17</sup> had patients from 16 to 73. Sutton *et al*<sup>21</sup> interviewed only patients of working age. Van Asbeck *et al*,<sup>23</sup> who reported a very low percentage of unemployed persons (14.5%), treated voluntary work (8.5%) as employment which in other studies was considered a hobby. Krause,<sup>15</sup> who described a high percentage of employed people (48%), had only well-educated subjects. Lovell *et al*<sup>28</sup> interviewed athletes with SCI from several different countries including Britain (37 participants/eight employed), Egypt (13/0), Iran (14/0), Israel (6/2), Jordan (6/1), Poland (8/0), South Africa (7/7), USA (7/2) and Others (20/11).

In our study the main reason given for failure to be in employment was the absence of satisfactory wheelchair access. This contrasted with other studies. In Weidman's study,<sup>24</sup> 27% stated that they did not feel adequately trained for the job market. Other factors cited were inadequate transport, chronic pain and 'lack of desire'. In El Ghatit's study<sup>10</sup> the most frequent reasons given were inability to hold a steady job because long hours in the wheelchair caused pressure sores, inability to find a suitable job, domestic reasons and frequent hospital readmissions.

The finding of our study that post-injury employment decreased and education increased relative to pre-injury, is similar to that of Taricco *et al*.<sup>22</sup> Although two other studies recorded the level of pre-injury employment, comparison was not possible, because the data was recorded differently.<sup>9,18</sup>



**Table 3** Employment status of SCI persons post-injury

Author (Country)	Gainfully employed	Student	Household	Unemployed	Retired	Total
De Vivo <sup>9</sup> (USA)	46 (30%)	16 (10%)	13 (8%)	79 (51%)	–	154
El Ghatit <sup>10</sup> (USA)	179 (23%)	–	–	380 (50%)	–	760
Geisler <sup>12</sup> (Canada)	551 (46%)	–	–	–	–	1204
Goldberg <sup>13</sup> (USA)	5 (21%)	1 (4%)	–	17 (71%)	1 (4%)	24
Kiwerski <sup>14</sup> (Poland)	66 (35%)	9 (5%)	–	116 (60%)*	–	191
Krause <sup>15</sup> (USA)	137 (48%)	–	–	–	–	286
Kruse <sup>16</sup> (USA)	117 (30%)	–	–	–	–	391
Nakajima <sup>17</sup> (Japan)	271 (28%)	–	–	–	–	926
Noreau <sup>18</sup> (Canada)	39 (65%)	–	–	21 (35%)	–	60
Richards <sup>19</sup> (UK)	23 (23%)	14 (14%)	15 (15%)	48 (48%)	–	100
Richards <sup>20</sup> (Australia)	46 (29%)	14 (7%)	7 (4%)	86 (53%)	8 (5%)	161
Sutton <sup>21</sup> (UK)	13 (37%)	–	–	–	–	35
Taricco <sup>22</sup> (Italy)	31 (32%)	15 (16%)	13 (13%)	25 (26%)	13 (13%)	97
Van Asbeck <sup>23</sup> (Netherlands)	38 (32%)	6 (5%)	43 (37%)	27 (23%)*	3 (3%)	117
Lovell <sup>27</sup> (UK)	31 (26%)	–	–	–	–	118
This study (UK)	15 (33%)	3 (7%)	2 (4%)	25 (56%)	–	45

\*27 (23%) = 17 (14.5%) unemployment + 10 (8.5%) voluntary work. \*\*116 (60%) = 96 (50%) disability pension + 20 (10%) maintained by the family

In our study we found no significant correlation between sports involvement and education/employment activities. A larger number is required to examine this more fully, because the findings of other authors conflict in this area. Curtis *et al*<sup>25</sup> studied the relationship between sports involvement and vocational status in SCI persons and found that there was a greater involvement in work/educational activities in the athletic group. In contrast, Foreman *et al*<sup>27</sup> showed that although more participants in sport were currently employed and studying than were non participants, the difference was not significant. Noreau<sup>18</sup> found a positive relationship between physical fitness and gainful employment in persons with paraplegia. There were no significant differences in physical fitness or physical activity between workers with sedentary as opposed to physically demanding jobs.

#### Limitations of the study

Due to the small number of SCI people in our study it was impossible to divide them by neurological level. Further investigation with a large number of participants will enable additional analysis of subgroups, such as level of injury and functional independence.

#### Conclusions

- (1) Participation in sport and recreation activities decreased from 84% pre-injury to 47% after injury ( $P < 0.01$ ). The most frequently reported reason was poor wheelchair access.
- (2) Only two (4%) people not physically active pre-injury started practising some kind of activity after the accident, whilst 19 (42%) of those actively involved in sport/recreation before injury stopped.

- (3) After injury 18.5% patients improved their education. In spite of this the employment status dramatically decreased from 87% to 33% ( $P < 0.01$ ). The most frequent factor identified in reducing gainful employment was inadequate access and transport.
- (4) No significant correlation was found between sport/recreation involvement and education/employment status.
- (5) To enable more detailed analysis of subgroups, a larger study is required.

#### References

- 1 Guttman L. Sport and the spinal cord sufferer. *Nursing Mirror Midwives J* 1975; **141**: 64–65.
- 2 Guttman L. Significance of sport in rehabilitation of spinal paraplegics and tetraplegics. *JAMA* 1976; **236**: 195–197.
- 3 Jackson RW, Davis GM. The value of sports and recreation for the physically disabled. *Orthopaed Clin North Am* 1983; **14**: 301–315.
- 4 Jackson RW. Sport for the spinal paralysed person. *Paraplegia* 1987; **25**: 301–304.
- 5 Shephard RJ. Benefits of sport and physical activity for the disabled: implications for the individual and for society. *Scand J Rehabil Med* 1991; **23**: 51–59.
- 6 Stotts KM. Health maintenance: paraplegic athletes and nonathletes. *Arch Phys Med Rehabil* 1986; **67**: 109–114.
- 7 Tasiemski T. Skiing of the disabled: recreation, rehabilitation or sports achievement? Based on the example of the National Ability Center. *Postepy Rehabilitacji* 1996; **10**: 141–146.
- 8 DeVivo MJ, Fine PR. Employment status of spinal cord injured patients 3 years after injury. *Arch Phys Med Rehabil* 1982; **63**: 200–203.
- 9 DeVivo MJ, Rutt RD, Stover SL, Fine PR. Employment after spinal cord injury. *Arch Phys Med Rehabil* 1987; **68**: 494–498.
- 10 El Ghatit AZ, Hanson RW. Variables associated with obtaining and sustaining employment among spinal cord injured males: a follow-up of 760 veterans. *J Chronic Dis* 1978; **31**: 363–369.

- 11 El Ghatit AZ, Hanson RW. Educational and training levels and employment of spinal cord injured patient. *Arch Phys Med Rehabil* 1979; **60**: 405–406.
- 12 Geisler WO, Jousse AT, Wynne-Jones M. Vocational re-establishment of patients with spinal cord injury. *Medical Services Journal Canada* 1966; **22**: 698–709.
- 13 Goldberg RT, Freed MM. Vocational development of spinal cord injury patients: an 8-year follow-up. *Arch Phys Med Rehabil* 1982; **63**: 207–210.
- 14 Kiwerski J, Chrostowska T. Social and professional evaluation of para and tetraplegics. *Paraplegia* 1982; **20**: 97–102.
- 15 Krause JS. Employment after spinal cord injury. *Arch Phys Med Rehabil* 1992; **73**: 163–169.
- 16 Kruse D, Krueger A, Drastal S. Computer use, computer training and employment, outcomes among people with spinal cord injuries. *Spine* 1996; **21**: 891–896.
- 17 Nakajima A, Honda S. Physical and social condition of rehabilitated spinal cord injury patients in Japan: a long-term review. *Paraplegia* 1988; **26**: 165–176.
- 18 Noreau L, Shephard RJ. Return to work after spinal cord injury: the potential contribution of physical fitness. *Paraplegia* 1992; **30**: 563–572.
- 19 Richards B. An evaluation of home care after spinal cord injury. *Paraplegia* 1975; **12**: 263–267.
- 20 Richards B. A social and psychological study of 166 spinal cord injured patients from Queensland. *Paraplegia* 1982; **20**: 90–96.
- 21 Sutton RA et al. Review of the social situation of paraplegic and tetraplegic patients rehabilitated in the Hexham Regional Spinal Injury Unit in the North of England over the past four years. *Paraplegia* 1982; **20**: 71–79.
- 22 Taricco M et al. The social and vocational outcome of spinal cord injury patients. *Paraplegia* 1992; **30**: 214–219.
- 23 Van Asbeck FW, Raadsen H, Van de Loo ML. Social implications for persons 5–10 years after spinal cord injury. *Paraplegia* 1994; **32**: 330–335.
- 24 Weidman CD, Freehafer AA. Vocational outcome in patients with spinal cord injury. *J Rehabil* 1981; **43**: 63–65.
- 25 Curtis KA et al. Health, vocational, and functional status in spinal cord injured athletes and nonathletes. *Arch Phys Med Rehabil* 1986; **67**: 862–865.
- 26 Smith M. *Making the difference—efficacy of specialist versus non-specialist management of spinal cord injury*. London: Spinal Injuries Association 1999, pp 12–15.
- 27 Foreman PE, Cull J, Kirkby RJ. Sports participation in individuals with spinal cord injury: demographic and psychological correlates. *Int J Rehabil Res* 1997; **20**: 159–168.
- 28 Lovell ME, Thomas AF, Shakesby R, McNeilly P. Social adjustment and rehabilitation in international competitors with spinal injuries sustained in military service. *Disabil Rehabil* 1997; **19**: 92–96.

**QUESTIONNAIRE** (please tick [ ] chosen answers)

**Name &**

**Surname**.....

**I PERSONAL DETAILS**

*1. Sex*

1.1. Male [ ]

1.2. Female [ ]

*2. Present age*

2.1. 20 - 30 years old [ ]

2.2. 31 - 40 [ ]

2.3. 41 - 50 [ ]

2.4. 51 - 65 [ ]

*3. Place of living*

3.1. Village [ ]

3.2. Town [ ]

3.3. City [ ]

*4. Marital status*

4.1. Single [ ]

4.2. Married / living with partner [ ]

4.3. Divorced / separated [ ]

4.4. Widowed [ ]

*5. Accommodation*

5.1. Fully adapted [ ]

5.2. Accessible for the disabled [ ]

5.3. Not accessible [ ]

## II SPINAL CORD INJURY

### 6. *Level of injury*

6.1. Tetraplegic [ ]

6.2. Paraplegic [ ]

6.3. Please state your exact level of injury (if you know it) .....

### 7. *Cause of injury*

7.1. Road traffic accident [ ]

7.2. Fall from height [ ]

7.3. Sport accident [ ]

7.4. Assault [ ]

7.5. Nontraumatic [ ]

7.6. Others (please state).....

### 8. *Age at time of injury*

8.1. 18 - 30 years old [ ]

8.2. 31 - 40 [ ]

8.3. 41 - 50 [ ]

## III BEFORE INJURY

### 9. *Educational achievements*

9.1. Primary [ ]

9.2. Secondary [ ]

9.3. College [ ]

9.4. University degree [ ]

9.5. Additional qualifications (please state) .....

9.6. Occupation (please state).....



*10. Employment*

- 10.1. Student [ ]
- 10.2. Employed part time [ ]
- 10.3. Employed full time [ ]
- 10.4. House work [ ]
- 10.5. Unemployed [ ]
- 10.6. If employed, what kind of job was it (please state).....

*11. Sport discipline*

- 11.1. Individual [ ]
- 11.2. Team games [ ]
- 11.3. Your favourite sport (please state).....
- 11.4. Please list all other sports you practised.....

*12. Frequency of sport and physical activity*

- 12.1. Regular training (5 - 7 a week) [ ]
- 12.2. High activity (2 - 4 a week) [ ]
- 12.3. Low activity (once a week) [ ]
- 12.4. Less than once a week [ ]
- 12.5. Non active [ ]

**IV AFTER INJURY**

*13. Educational achievements*

- 13.1. Primary [ ]
- 13.2. Secondary [ ]
- 13.3. College [ ]
- 13.4. University degree [ ]
- 13.5. Additional qualifications (please state).....
- 13.6. Occupation (please state).....

*14. Employment*

- 14.1. Student [ ]
- 14.2. Employed part time [ ]
- 14.3. Employed full time [ ]
- 14.4. House work [ ]
- 14.5. Unemployed [ ]
- 14.6. If employed, what kind of job is it (please state).....

*15. Sport discipline*

- 15.1. Individual [ ]
- 15.2. Team games [ ]
- 15.3. Your favourite sport (please state).....
- 15.4. Please list all other sports you practise.....

*16. Frequency of sport and physical activity*

- 16.1. Regular training (5 - 7 a week) [ ]
- 16.2. High activity (2 - 4 a week) [ ]
- 16.3. Low activity (once a week) [ ]
- 16.4. Less than once a week [ ]
- 16.5. Non active [ ]

*17. Have you had any medical problems that prevented you from pursuing these activities?*

- 17.1. Yes [ ]
- 17.2. No [ ]
- 17.3. If yes, how many days in the last year?.....days

## V CURRENT LEVEL OF INDEPENDENCE

### 18. *Mobility*

18.1. Manual wheelchair [ ]

18.2. Electric wheelchair [ ]

### 19. *Getting up in the morning (dressing, washing)*

19.1. Completely independent [ ]

19.2. Partially independent [ ]

19.3. Dependent on others [ ]

### 20. *Transfer bed, toilet, wheelchair etc.*

20.1. Completely independent [ ]

20.2. Partially independent [ ]

20.3. Dependent on others [ ]

### 21. *Taking bath / shower*

21.1. Completely independent [ ]

21.2. Partially independent [ ]

21.3. Dependent on others [ ]

### 22. *Getting to bed at night (undressing, washing)*

22.1. Completely independent [ ]

22.2. Partially independent [ ]

22.3. Dependent on others [ ]

23. *How many hours of help on average do you need in each 24 hour period? .....*

**VI FINAL QUESTIONS (BLOCK CAPITALS)**

*24. If you stopped practising sport after your injury, please state the reason(s).*

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*25. If you started practising sport after your injury, please state the reason(s).*

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*26. If there are any important aspects which influence your employment please indicate them below. (In particular, aspects such as housing, personal factors, economic factors and levels of care should be considered.)*

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**Thank you very much for taking time to answer this questionnaire.**