Does access to computers improve employment rates for spinal cord injured clients?

Prepared by: Jacquelyn Compton
Occupational Therapist / Rehabilitation Consultant
CRS Australia, Maroubra.

Date: 28 November, 2002

Review Date: November, 2004

Clinical Question
Does access to computers improve employment outcomes for spinal cord injured clients?

Clinical Scenario
CRS Australia City East Region is in close proximity to the Prince Henry Hospital, Spinal Injuries Unit. The region's rehabilitation consultants liaise closely with the Spinal Injuries Unit to ensure early referrals are made to CRS to promote safe and early return to work. Access to computer technology is often recommended to enhance a spinal cord injured client's likelihood to return to work. What is the evidence that access to computers does improve spinal cord injured client's return to employment outcomes?

Summary of Key Findings
- 4 studies were located that met the inclusion/exclusion criteria.
- 2 studies were found to be relevant and appraised.

Clinical Bottom Line
Education, level of computer skill and computer training were found to be predictors of computer use for the spinal cord injured population. Computer use amongst the SCI population enhanced employment prospects and earning power of the SCI.
Similarly education and provision of computer technology and training to people with physical disabilities will improve their employment prospects.

Limitation of CAT
This summary of evidence has been individually prepared and has not undergone a process of peer review.

Methodology

Search Strategy
Using the levels of evidence as defined by the NHMRC (2000), the search strategy aimed to locate the following study designs:

Level I	Systematic Reviews and Meta-analyses;
Level II	Randomised Controlled Trials;
Level III	Controlled trials, cohort or case-control analytic studies;
Level IV	Case series: Post – test only, Pre - test/Post – test;
Level V	Expert opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies.

A search was also conducted for clinical practice guidelines based on these levels of evidence.

Search Terms

Patient/Client:	Spinal Cord Injury, Paraplegia, Quadriplegia
Intervention:	Computers Assistive technology Devices
Comparison:	Nil
Outcome:	Return to work outcomes Employment.

Sites/Resources Searched
- National Health and Medical Research Council
- New Zealand Guidelines Group
- Healthbase
- National Guidelines Clearinghouse
- UK Guidelines: National Electronic Library for Health, Clinical Guidelines Database
- Scottish Intercollegiate Guidelines Network (SIGN)
- Workcover NSW
- National Occupational Health and Safety Commission
- Cochrane Library
- PEDro – The Physiotherapy Evidence Database
- PubMed
- CINAHL

Inclusion/Exclusion Criteria

Inclusion Criteria

- Studies including computer use and training, spinal cord injured population and their return to employment.
- Studies published 1996 and onwards.
- Studies published in English.
- Studies that included other physical disabilities as well as spinal cord injury.

Exclusion Criteria

- Studies that examined factors that prevent of assist the use of assistive technology in the work place for people with spinal cord injuries.
- Studies that examined the psychological factors affecting employment following a Spinal Cord Injury.

Results

Results of Search

2 relevant studies were located and categorised as follows:

Table 1. Study designs of articles retrieved by search

Methodology of Studies Retrieved	Number Located	Source of Evidence
Clinical Practice Guidelines (Evidence Based)	0	N/A
Systematic Reviews or Meta – analyses	0	N/A
Randomised Controlled Trials	0	N/A
Controlled trials, cohort or case-control analytic studies	0	N/A
Case series: Post – test only, Pre - test/Post - test	0	N/A
Expert opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies	2	PubMed x 1 CINAHL x 1

Specific Results

The studies and appraisal findings are summarised in Tables 2 and 3.

Table 2. Description and Appraisal of the study by Kruse et al (1996)

Objective of Study
To examine if computer use and training may be of benefit to people with spinal cord injuries (SCIs) to help lessen the impact of mobility limitations and to enhance employment prospects.

The study explored the extent of computer training and use among people with SCI and how this compared to the general population.

Intervention Investigated
1. A telephone survey in August/September 1994 was conducted to anyone who could be located in the state of New Jersey, USA who suffered an SCI within the preceding 10 years, and was at least 15 years old at the time of the injury and at least 18 years old at the survey date.

2. The administrative earnings and employment records for the 1985-1994 period from the State of New Jersey was obtained as a supplement to the self reported survey data, to look at the earnings paths before and after injury.

3. Three comparison groups from the general population were utilised: 1) the Bureau of Labor Statistic's 1994 Current Population Survey; 2) a sample of administrative earnings records for New Jersey employees with Social Security numbers close to the SCI sample's;3) a sample of similarly aged co-workers from around the time of the SCI person's injury who were nominated by the individuals in the SCI sample.

Primary Outcome Measures

Key questions centred on demographic and injury characteristics, pre- and post- injury employment experiences, computer use, and computer training.

Results

The author claims that the main findings of the survey are:-

1. People with SCIs are less likely to use computers than those who do not have SCIs, primarily because most people learn to use a computer at work and SCI community ahs an extremely low employment rate;
2. The occurrence of an SCI greatly reduces individuals' employment and earnings prospects;
3. People with SCIs who have computer skills tend to return to work faster after suffering their injury, and to have higher earns, than other wise similar workers who lack computer skills.

These findings are made based on the results that are summarised below:-

- SCI individuals were less likely to use computers than their non-SCI former co-workers, with 20% of the SCI individuals using computers at work in comparison to 42% of the former non-SCI coworkers.

- Post injury computer training (from any source) was received by less than one forth (22%) of the SCI sample.

- A return to post injury employment was not significantly related to SCI clients who used a computer in their preinjury work. However, SCI clients who used a computer in their preinjury work, had a shorter time after injury in gaining employment. The time taken to achieve employment was approximately 40% less.

- The ability to use a computer at work appears to enhance significantly the earnings power of people with SCI. The weekly earnings amongst SCI workers who used a computer at work were found to have a wage more than 200% than SCI workers that were not users of computers at work.

- Educational level was said to be one of the most important predictors of individuals with SCI using computers and attending computer training. This is supported by data that suggests 72% of SCI college graduates used computers post injury, compared to 11% of SCI high school graduates and 6% of those SCI without high school degree.

- Education was also found to be a powerful indicator in determining whether an individual with SCI returned to paid employment and the time taken to achieve this. A majority of college graduates in the SCI sample were found to be employed, whereas only one sixth of high school graduates were employed. Higher education appeared to lead to a quicker return to work after SCI, with the chance of re-employment in any given month post injury, four times higher for college graduates than for those with high school graduation.

- Age was another strong predictor of computer use and training. 54% of those injured at age 30 or younger currently used a computer, whereas only 26% of those injured at older ages currently used a computer. However, the impact of age was found to disappear when looking just at current computer use at work, 18-20% of individuals in all age groups were found to use computers at work.

- Injury severity was associated with computer use and training. Among those that had never used a computer before, 35% of quadriplegics and 21% of paraplegics used a computer at time of the survey. The functional ability of dialling a telephone was used to determine the level of disability. It was found that those that could not dial a phone were more likely to use a computer at home or school and to have received computer training (48% compared to 38% who could dial a phone).

Authors Conclusions
The author goes on to conclude stating how critical computers have become for employment opportunities, and the importance of ensuring people with severe disabilities have adequate access and training in computer technology to enhance their employment prospects.

Reviewer Appraisal Comments

Validity (Methodology, rigour, selection, biases)
- Participants with unusable contact information or that were difficult to track were not apart of the survey.
- Respondents tended to have a higher preinjury earnings than those that were unreachable or refused participation.
- Participants were injured within 10 years of the survey being sent out.
- Participant eligibility criteria was established, and groups matched to ensure comparability of results.
- 392 people with SCI were interviewed.
- Slightly fewer than half who were employed at the time of injury provided adequate information to locate a nominated co-worker to form a paired sample (that is 71 paired samples).
- They obtained the administrative earnings records for 463 SCI people from the records of State of New Jersey.
- 5073 other New Jerseyans were chosen for comparison because their social security numbers fell close to those of the SCI sample.

Results (Favourable or unfavourable, specific outcomes of interest, size of treatment effect, stat. and clinical significance)
- Basic demographic and injury characteristics of the sample are presented and comparisons with a national representative of the general population are given.
- The definition of 'employment' is not given.
- There was a large the difference between the number of SCI who were surveyed and the number in the comparison populations. With the SCI population being significantly smaller.
- The stated findings are not clearly supported by the data provided in the article.
- There is no acknowledgement of other issues, which could effect employment outcomes for the SCI populations, such as adjustment to disability issues or access barriers.

Table 3. Description and Appraisal of the study by S. D. Pell et al.(1997)

Objective of Study
To examine the impact of using computers and assistive device use on the employability of people with physical disabilities in Australia, focussing particularly on those with spinal cord injuries.

Intervention Investigated
A questionnaire was distributed to people over 15 years in age with physical disabilities living in the Brisbane area. The questionnaire was divided into four sections; demographic information, details of present employment situation, level of computer use, skills and training, and use of assistive technology. The questionnaires were then analysed using logistic regression analysis.

Primary Outcome Measures
1. Demographics including gender, age, level of education and disability.
2. Employment situations.
3. Use of computers and assistive technologies.
4. Computer skills and abilities.
5. Computer training undertaken

Results
In total questionnaires were sent out to 250 people with spinal cord injury, 15 people with cerebral palsy and 30 people with muscular dystrophy. The number of respondents from each group was 71 with spinal cord injury, 8 with cerebral palsy and 3 respondents with muscular dystrophy.

Gender, present level of computer skill and level of education are the most significant predictors of employment status. Age and use of assistive technology were not significant predictors of employment.

Authors Conclusions
The results indicate that the provision of computer technology and training to people with physical disabilities will improve their employment prospects.

Appraisal Comments
Validity (Methodology, rigour, selection, biases)
- Participants with physical disabilities were identified only by their connection with the state support organization.
- Information was collected only from those participants willing to participate in the study. The overall response rate was 28%.
- No attempt was made to contact non-respondents.
- The study is limited by the comparisons measured. For example any key psychological factors (for example optimism, self-esteem, role models) associated with likelihood of achieving employment are not included. Similarly, environmental factors, such as monetary disincentives, access, and accommodation are not measured.
- Employment status prior to obtaining physical injury has also not been measured and considered in analysis.
- The study did not discriminate on the basis of time since onset.

Results
- Calculations are given to demonstrate a significant relationship at p∠ 0.1 for gender, level of education and present computer skills.

References

1. "Increasing the use of Research Evidence by Occupational Therapists in NSW" , 2-Day Training Workshop February 2002, Annie McCluskey and Meryl Lovarini, University of Western Sydney. A project funded by the Motor Accident Authority of NSW.

Articles critically appraised for this summary of evidence

1. Kruse, D., Krueger A., & Drastal, S. (1996). Computer use, computer training and employment. *Spine,* 21(7), 891-6.

2. Pell, S., Gillies, R., & Carss M. (1997). The Relationship between use of technology and employment rates for people with physical disabilities in Australia: implications for education and training programmes; *Disability and Rehabilitation,* 19 (8), 332-338.