



Effect of Discharge Recommendations on Outcome

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Abstract

Study Design

The incidence of two common discharge recommendations, return to work unrestricted (RTWU) and restricted (RTWR) suggested that most restrictions were applied on the basis of patients' subjective reports of pain or therapists' unfounded fears that return to full duty would result in physical harm.

Objectives

This prospective study compares the therapist's return to work recommendation to the patient's actual work status and analyzes the effect of that recommendation on outcome.

Methods

There were 1438 consecutive patients reviewed by structured telephone interviews during the two halves of the study: the control group when pain was accepted as a reason for restriction and the study group when it was not.

Summary of Background Data

In the control group, 44% of the patients were recommended to RTWU; for the study group, 81% received this recommendation. Compliance was 84% for the control subjects and 78% for the study group.

Results

The absolute number of patients who returned to unrestricted work doubled in the study group.

Conclusions

The probability of a successful return to normal duty increased with a recommendation of RTWU ($P = 0.0001$), whereas the probability of failure increased when restrictions were imposed ($P = 0.0001$). [Key words: recommendation, restriction, work, outcome] Spine 1994; 19:2033-2037

The effectiveness of early active treatment for acute low back pain has not been well validated. Approximately 80% of patients with back pain appear to resolve their symptoms within 3 months of injury regardless of the treatment administered {9,17,34}. The sooner the recommendation is made to return to work the more likely the patient is to comply. The probability of return to work decreases as length of time off work increases. {23,29} Gauging the value of any rehabilitation program requires assessment of a controlled follow-up or precise outcome data. This information is not readily available.

The basis for a return to work recommendation should be a comparison of objective patient measurements and anticipated job demands. This is not always the case and patients completing a back rehabilitation program are often advised to return either to full duty or to modified employment without objective medical justification for the distinction.

The return to work decision should not be based solely on the patient's report of pain. Hall {15} states that the patient's subjective complaints should not be the only determinant of disability. A correlation does not exist between subjective pain ratings and the patient's ability to accomplish physical activities. {19,25,27,28,31-33} Physical activity in the presence of pain can lead to physiologic improvement and is beneficial to overall function.{4,8,18} When integrated into the process of back rehabilitation, return to work can become an integral part of the treatment process.{3,5,6,16,24-26,29}

There is no conclusive evidence that an early return to work causes harm to the back. Nachemson {25} stressed that patients who do not have overt signs of disease and have not recovered after 6 to 8 weeks of treatment should still return to work and not be identified as disabled. A study of severe pain after brachial plexus injury demonstrated that distraction could usually abolish pain or control it for several hours. Patients absorbed in their work gained considerable periods of pain relief.{35}

Catchlove and Cohen {7} state that not insisting on a return to work acknowledges the patient's view of himself as "regressed, dependent, and incapable." The authors demonstrated a better return to work rate when patients were directed to do so either during or after treatment compared with a control group for whom return to work was not a component of therapy.

Estlander et al {11} studied 65 patients with chronic low back pain. At follow-up, 3 weeks and 12 months after treatment, there was a statistically significant decrease in subjective disability and pain. However, there was no correlation between the decrease in symptoms and the rate of return to work. The authors emphasized that the goal of return to work is met best by work-oriented rehabilitation efforts.

Disability is often a learned behavior. Patients having delayed recoveries should be convinced not to consider themselves disabled. {9}

Our belief is that many return to work restrictions are not based on clinical findings, but instead reflect the patient's report of pain and the therapist's fear that an unrestricted return to work will result in further physical harm.

There are two aspects to this study. First, we examined the final outcome of two groups of patients completing the same rehabilitation program, one group before and one group after a restructuring of the program's discharge recommendations. Second, we measured the correlation between the final outcome and the specific recommendation. Return to work was the defining variable of success.

This study demonstrated that a recommendation to return to work with no restrictions facilitated successful outcome. Conversely, a restriction intended to return a patient to a reduced level of function may prevent a return to work in any capacity.

Methods

Follow-up protocols after a rehabilitation program vary.^{1,2,12-14,21} No consensus exists regarding the optimum time frame or method of data collection. We arbitrarily selected a structured telephone interview, 4 months from the date of discharge. The method was chosen to allow uniform data collection. The follow-up interval was intended to provide a high rate of patient contact. All patients were on Ontario Workers Compensation and were treated in an early intervention program at 12 locations of the Canadian Back Institute (CBI). This study targeted acute back injuries. Eligible patients had lost time from work and were 0-70 days post-injury.

CBI facilities provide active physical therapy for back and neck pain. Back education and pain control techniques are followed rapidly by gentle stretching exercises and progressive isotonic strengthening of muscles in the trunk and extremities. The clinics advocate minimal bed rest ^{10,32}. The program includes walking, stationary cycling, free weight and machine training, and work conditioning. The importance of early entry and patient responsibility ^{16} are stressed. Objective measurements of functional capacity are repeated on a regular basis. Treatment continues up to 4 hours per day, 5 days per week for a maximum of 30 days. Both treating staff and patients have the option to conclude the program at any time that return to work becomes possible.

Sample. The Control Group. This study was divided into two prospective cohorts. The treatment protocol was the same for both the control group and the study group. In the control group (December 1991 to April 1992), the authors tracked 857 consecutive patients in the early intervention WCB program. Eliminating those patients treated for non-spinal pain, those seen for assessment only and those who could not be contacted at follow up, the total control sample size was 669 patients. The mean age was 37.4 years (with a standard deviation of 10.3). There were 472 men and 197 women. Patient data are summarized in Table 1.

Table 1
Characteristics of Patients

Variable	Control	Study
Age		
Mean	37.4	38.2
SD	10.3	10.5
Gender		
Males	71% (472:669)	70% (535:769)
Females	29% (197:669)	30% (234:769)
Treatment length (days)		
Mean	20.8	18.1
SD	8.2	8.3

The Study Group. For 5 months beginning in June 1992, in the study group, the authors included 1070 consecutive patients in follow-up. Using the same criteria as for the control subjects, the total sample size was 769 patients. The mean age was 38.2 years (standard deviation 10.5). There were 535 men and 234 women. Patient data are also summarized in Table 1. There were 1927 patients treated in the early intervention program between December 1991 and October 1992. We collected outcome information and performed statistical analysis on 1438 patients. No significant difference existed for age or sex between the patients entered in the control and study groups. We chose to maintain statistical validity by the use of equal time periods for each cohort rather than by closing the study group when it reached the same number of patients.

Transition Period. May 1992 marked the transition between the two data collection periods of this study. During that month, CBI staff were instructed to recommend an unrestricted return to work for all patients except in those cases that demonstrated a defined medical restriction. The persistence of pain in the absence of any objective findings was not judged an acceptable reason for suggesting a limited return.

Therapists were asked to justify in writing the reason for restricting a full return to work and to submit their decision for medical review.

The most common reasons given and accepted for restricting a return to work were objective evidence of nerve root irritation, conduction deficit, sciatic scoliosis, consistent and objective reduction in range of motion below job requirements, and recognized recent vertebral compression fracture.

Except for the emphasis on return to unrestricted work, there was no change in the treatment between the control and study groups.

Procedure

Success, defined as return to work, was determined by a structured telephone interview. The questions used are listed in Table 3. Patients were contacted 4 months from the date of discharge. The individuals conducting the interviews were not involved in the patients' treatment.

Table 3
Structured Telephone Interview Questionnaire

Yes	No, Last day worked: __/__/__	Other
A. working with symptoms working without symptoms B. same employer new employer C. previous occupation D. full hours partial hours E. full duty modified duty	A. position available position terminated B. waiting for placement <ul style="list-style-type: none"> • looking for work • disability pension • no direction • re-direction (select below) • pain management • vocational rehab • school/apprentice • specialist (select below) • orthopaedic surgeon • rheumatologist • family physician • unrelated medical problems • surgery • non-surgical management • physiatrist • neurosurgeon • other 	<ul style="list-style-type: none"> • patient withdrawal • physician withdrawal • re-injury • cannot trace

At discharge, each patient was to be given one of three recommendations:

- 1) return to unrestricted activity,
- 2) return to activity with restrictions,
- 3) referral for further evaluation at a comprehensive multidisciplinary center administered by the Ontario Workers' Compensation Board.

Patients who did not receive a specific recommendation were classified separately. This latter group, 6% for the control subjects and 5% in the study group, was omitted from the statistical analysis of compliance with the therapist's recommendations.

Patients with a successful outcome met one of the following criteria at the time of the telephone interview:

- 1) recommended to return to work and working, full duty or restricted.
- 2) recommended to return to work and stating they were capable of work but not working because there was no job available,
- 3) recommended to return to work but not working because of a new injury that was unrelated to the original problem. This last group had been working or were fit for work before the new injury occurred. No attempt was made to differentiate between full-time and part-time work.

The short duration between patient discharge and follow-up is a recognized limitation of this study. Successful contact was made with 87% in the control group and 84% in the study group. The short follow-up was designed to measure only the initial patient compliance to the recommendation and to decrease the attrition rate.

Statistical Analysis. Fisher's exact test was used to assess the correlation between recommendation and outcome and to examine the correlation between outcome and gender. Logistic regression was used to assess age, gender, and the return to work as predictors of outcome. The data for both groups in the study were analyzed separately for each clinic, but the overall results are presented. Age (t-test) and sex (Fisher's exact test) were analyzed to ensure no significant difference existed between the control and study groups.

Results

The frequency of each of the three discharge recommendations and the return to work rate for the control and study groups are listed in Table 2. For the control subjects, 44% of the patients were recommended to return to work unrestricted (RTWU) and 37% to return to work with restrictions (RTWR). In the study group, the recommendation to return to work unrestricted (RTWU) increased to 81%, whereas those recommended to return to work with restrictions (RTWR) decreased to 8%.

Table 2
Characteristics of Outcome for the Recommendations
Return to Work Unrestricted (RTWU)
Restricted (RTWR)
Regional Evaluation Center (REC), and
No Recommendations (NONE)

Variable	Control	Study
Recommendation at discharge		
RTWU	44% (293:669)	81% (621:769)
RTWR	37% (250:669)	8% (58:769)
RE	13% (89:669)	6% (49:769)
None	6% (37:669)	5% (41:769)
Success by recommendation		
RTWU	89% (262:293)	84% (524:621)
RTWR	73% (182:250)	47% (27:58)
Compliance by recommendation		
RTWU	83% (244:293)	78% (484:621)
RTWR	16% (39:250)	12% (7:58)

The return to work rate of each work recommendation was analyzed and is depicted in Table 2. The overall return to work rate for the RTWU group decreased from 89% for the control subjects to 84% in the study group. The return to work rate for the RTWR group decreased from 73% to 47%.

An 83% compliance to a recommendation given 44% of the time in the control group compared with 78% compliance to a recommendation given 81% of the time in the study group translates into an absolute increase in the number of patients who returned to work without restrictions from 262 to 524. Statistical significance is preserved by the equal time periods.

Compliance, defined as the patients' precise match with their discharge recommendations was assessed (Table 2). Compliance to the RTWU recommendation decreased slightly from 83% to 78% from the control to the study group. Although few patients complied with the RTWR recommendation in either group, the percentage decreased slightly from 16% to 12% between the two cohorts. There was a significant correlation between recommendation and outcome. Those recommended to RTWU had a higher success rate (89%) than those recommended to RTWR (73%) for the control subjects ($P = 0.05$).

The recommendation of RTWU also had a higher success rate (84%) than the restrictions group (47%) in the study group ($P = 0.05$).

Return to work recommendations had an even more significant effect on failure. Logistic regression revealed that the probability of failure increased with a RTWR recommendation for both control subjects ($X[2] = 24.994$, $P = 0.0001$) and the study group ($X[2] = 49.021$, $P = 0.0001$).

Further analysis of the higher return to work rate among the control subjects for those with RTWR recommendations revealed that 57% of the patients had exceeded the recommendations and were actually working without restrictions. For the study group, only 34% overachieved and were working without restrictions.

No correlation was found between outcome and gender for the control subjects ($P = 0.853$) or the study group ($P = 0.789$). There was no correlation between age and outcome for the control group. In the study group, the probability of a successful outcome decreased with age ($P = 0.01$). There was no statistical difference between the control and study groups.

Discussion

The increase in the return to work rate from the control to the study group supports the idea that an emphasis on return to unrestricted work and the elimination of a pain focus is reflected in a successful outcome.

The literature suggests a beneficial effect of return to work on a chronic pain population.^{9,20-22} Our evidence suggests that the same strategy is appropriate for short duration back pain. Treatment becomes even more effective when the emphasis is placed on a return to full duty rather than a return to work with restrictions.

Catchlove and Cohen ^{7} state that patients will view themselves as incapable of full recovery if a return to work is not stressed. Our study extends this view. It is a return to unrestricted work that must be emphasized. An unwarranted restriction implies disability and may become a self-fulfilling prophecy.

For the RTWU group, the process of requiring objective evidence and removing pain as a reason for recommending job restriction appears to have been beneficial. There was a statistically significant increase in the number of patients returning to unrestricted work, from 262 patients in the control group to 524 patients in the study group.

Many patients recommended to RTWR never return to work. In some cases, they are waiting until they are completely fit to return to full duty. Others have been told that no modified work is available. If restrictions are placed without objective confirmation and with emphasis on reported pain, there is a high percentage of overachievement and an increase in the failure rate. Return to work may be influenced by factors other than physical ability. Factors such as motivation, emotional reaction, economic and cultural impact, unemployment rate, job satisfaction, and WCB benefits may override improved physical function in the patient's decision to return to work.^{20-22} The added barrier of a return to work restriction appears to be another negative factor affecting outcome. Conversely, the added impetus of an unrestricted return to work recommendation may be a positive factor in the decision to resume an active lifestyle and return to work.

The probability of a successful outcome decreased with age for the study group. We believe this reflects the increased role of pain inhibition in the older patient. For this reason, we place extra emphasis on pain control for the older worker. We do not anticipate a return to work rate comparable to that of the younger patient until symptoms have been resolved.

Conclusion

This study demonstrates that the choice of how patients are instructed to return to work after an injury is important to their success. The choice between "with" or "without" restrictions has an effect on the outcome. Those patients recommended to return to work unrestricted had a higher success rate than those recommended to work with restrictions, for both cohorts. In the study group, the success rate for the RTWU group was 84%, compared with only 47% for the RTWR group.

The probability of failure increases significantly with the recommendation of RTWR. The recommendation of limited capacity can become a self-fulfilling prophecy and patients see themselves as no longer able to perform their normal work-related duties. In this study, the recommendation to return to unrestricted work doubled the number of people who went back to full duty.

The recommendation to return to work must be based on objective information and not on a subjective report of pain. Whenever possible, a return to unrestricted duty should become an integral part of acute back pain rehabilitation.

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References

1. Aronoff GM, Evans WO, Enders PL. A review of follow up studies of multidisciplinary pain units. *Pain* 1983;16:1-11.
2. Barnes D, Smith D, Gatchel RJ, Mayer TG. Psychosocioeconomic predictors of treatment success/failure in chronic low back pain patients. *Spine* 1989;14:427-430.
3. Biering-Sorensen P. Physical measurements as risk indicators for low back trouble over a one year period. *Spine* 1984;9:106-119.
4. Bortz WM. The disuse syndrome. *West J Med* 1984;141:691-694.
5. Cady LD, Bischoff DP, O'Connell ER, Thomas PC, Allan JH. Strength and fitness and subsequent back injuries in firefighters. *J Occup Med* 1979;21:269-272.
6. Cady LD, Thomas BS, Karwasky RJ. Program for increasing Health and physical fitness in fire fighters. *J Occup Med* 1985;27:110-114.
7. Catchlove R, Cohen K. Effects of a directive return to work approach in the treatment of workman's compensation patients with chronic pain. *Pain* 1982;14:181-191.
8. Colt EW, Wardlaw SL, Frantz AG. The effect of running on plasma beta-endorphin. *Life Sci* 1981;28:1637-1640.
9. Derebery VJ, Tullis WH. Delayed recovery in the patient with a work compensable injury. *J Occup Med* 1983;25:829-835.
10. Deyo RA, Diehl AK, Rosenthal M. How many days of bed rest for acute low back pain? *N Engl J Med* 1986;315:1064-1070.
11. Estlander A, Mellin G, Vanharanta H, Hupli M. Effects and follow-up of a multimodal treatment program including intensive physical training for low back pain patients. *Scand J Rehabil Med* 1991; 23:97-102.
12. Fredrickson DE, Trief TM, VanBeveren T, Yuan HA, Baum G. Rehabilitation of the patient with chronic back pain: A search for outcome predictors. *Spine* 1988;13:351-353.
13. Gallagher RM, Rauh V, Haugh LD, et al. Determinants of return-to-work among low back pain patients. *Pain* 1989;39:55-67.
14. Greenough CG, Fraser RD. Assessment of outcome in patients with low back pain. *Spine* 1992;17:36-41.
15. Hall H. Examination of the patient with low back pain. *Bull Rheum Dis* 1983;33:1-8.
16. Hall H. Passive versus active conservative treatment options. Presented at Occupational Spinal Disorders: Primary, Secondary and Tertiary Care and Prevention, Dallas, Texas, October 2, 1992.
17. Hazard RG, Fenwick JW, Kalisch SM, et al. Functional restoration with behavioral support. *Spine* 1989;14:157-161.
18. Hemborg B, Moritz U, Hamberg J, Lowing H, Akesson I. Intraabdominal pressure and trunk muscle activity during lifting--Effect of abdominal muscle training in healthy subjects. *Scand J Rehabil Med* 1985;15: 183-196.
19. Linton SJ. The relationship between activity and chronic pain. *Pain* 1985;21:289-294.
20. Mayer TG, Gatchel RJ, Kishino ND, et al. A prospective short term study of chronic low back patients utilizing novel objective functional measurement. *Pain* 1986;25:53-68.
21. Mayer TG, Gatchel RJ, Kishino ND, et al. Objective assessment of spine function following industrial injury: A prospective study with comparison group and one year follow up. *Spine* 1985;10:482-493.
22. Mayer TG, Gatchel RJ, Mayer H, Kishino ND, Keeley J, Mooney V. A perspective two year study of functional restoration in industrial low back injury. *JAMA* 1987;258:1763-1767.
23. McGill CM. Industrial back problems: A control program. *J Occup Med* 1968;10:174-178.
24. Mitchell RI, Carmen GM. Results of a multicenter trial using an intensive active exercise program for the treatment of acute soft tissue and back injuries. *Spine* 1990;15:514-521.
25. Nachemson A. Work for all: For those with low back pain as well. *Clin Orthop* 1983;179:77-85.
26. Porter RW, Adams MA, Hutton WC. Physical activity and the strength of the lumbar spine. *Spine* 1989;14:201-203.
27. Rainville J, Ahern DK, Phalen L, Childs LA, Sutherland R. The association of pain with physical activities in chronic low back pain. *Spine* 1992;17:1060-1064.
28. Sachs BL, David JF, Olimpio D, Scala AD, Lacroix M. Spinal rehabilitation by work tolerance based on objective physical capacity assessment of dysfunction. *Spine* 1990;15:1326-1332.
29. Spitzer WO, LeBlanc FE, Dupuis M. Scientific approach to the assessment and management of activity-related spinal disorders. *Spine* 1987;12 (suppl):S1-S59.
30. Sturgis ET, Schaefer CA, Sikora TL. Pain center follow-up study of treated and untreated patients. *Arch Phys Med Rehabil* 1984;65:301-303.
31. Tate DG. Workers' disability and return to work. *Am J Phys Med Rehabil* 1992;71:92-96.
32. Waddell G. A new clinical model for the treatment of low-back pain. *Spine* 1987;12:632-644.
33. Webster BS, Snook SH. The cost of compensable low back pain. *J Occup Med* 1990;32:13-15.
34. White AA, Gordon SL. Synopsis: Workshop on idiopathic low back pain. *Spine* 1982;7:141-149.
35. Wynn Parry CB. Pain in avulsion lesions of the brachial plexus. *Pain* 1980;9:41-53.