Outcome Analysis of Work-Hardening Programs

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The competitive marketplace and the demand for accountability by healthcare payers are strongly influencing the need for work hardening programs to participate in program evaluation and produce outcome data. This study compiled program performance data on 22 work programs in Wisconsin over an 11-month period. Client data related to demographics of gender, age, occupation, insurance coverage, diagnosis, services clients received, patterns of attendance, and outcomes upon discharge were collected. Results described the majority of the clients treated in the work hardening programs to be men, aged 26 to 46 years, with occupations classified in the miscellaneous category according to the Dictionary of Occupational Titles. The reimbursement source for the majority of work program clients was worker’s compensation. The most frequent condition treated was injury to the lumbar spine. Most clients were treated and discharged within a 3-week period. More than half of the clients served returned to their usual and customary jobs.

Program Evaluation

Program evaluation, as defined by the Commission on Accreditation of Rehabilitation Facilities (CARF), is the systematic process for determining how effectively and efficiently improvements in a client’s functional status are achieved (CARF, 1991). Effectiveness is the extent to which a program’s performance is congruent with its expectations. Efficiency is concerned with the relationship between an intervention’s output and inputs. It involves consideration, therefore, of an intervention’s effectiveness with respect to the resources consumed (Hoffman-Grotting & Ralph, 1991).

Program evaluation information is the basis on which to make decisions regarding performance. These decisions involve judgment of quality and standard. They depend on how outcomes of services are defined. Generally, program evaluation identifies aspects of care, establishes thresholds of care, collects and organizes data, evaluates and compares data against thresholds, and uses
these results to react to and assess the effectiveness of
actions taken on client care (Hoffman-Grotting & Ralph,

Program evaluation and consequential outcome
studies may have different purposes, reflecting the inter­
ests of the program managers or sponsors of the studies,
or the perceived needs of audiences for which the infor­
mation is intended (Fuhrer, 1987). New programs or ser­
vices such as work hardening are often created to meet
the needs of a consumer. Program evaluation then as­
sesses whether the program achieved its goals and publi­
cizes the program’s replicability.

Other reasons to install a program evaluation system
are for program modification and improvement to ensure
a higher-quality service, to fulfill quality assurance re­
quirements (e.g., CARF requires an outcome-based pro­
gram evaluation system for certification), to produce a
foundation of generalizable knowledge for the rehabilita­
tion disciplines and to meet the needs of policymakers
(Fuhrer, 1987; Stecher & Davis, 1987). Regardless of the
purpose, program evaluation is an essential activity for
assessing a program’s efficiency and effectiveness.

Work Hardening

Both the practice and definition of work hardening have
undergone a metamorphosis (AOTA, 1989). This treat­
ment approach is now applied to a wide variety of per­
sions with disabilities. Terminology and methods have
evolved to the point where they more specifically address
issues surrounding worker-related injuries. Thus, work
hardening is most frequently regarded as applying the
rehabilitation phase of returning the industrially injured
worker to the workplace (Isernhagen, 1988).

The ongoing evolution of work hardening has pro­
duced a wide variety of program types with differing
amounts of space, types of equipment, staff, and meth­
ods. Central to all work-hardening programs is the ulti­
mate goal of assisting clients to achieve a level of produc­
tivity that is acceptable in the competitive labor market.
Improvement in productivity may be measured in terms
of increased work tolerances, improved work rates, mas­
tery of pain, increased confidence, and proficiency with
work adaptations or assistive devices (Matheson, Ogden,
Volente, & Schultz, 1985).

A work hardening program’s effectiveness depends
on how closely its performance conforms with expecta­
tions. Outcome expectations are drawn from state­
ments describing measurable goals or from an explicit conceptu­
al model of the program drafted by persons either inter­
ally or externally (Fuhrer, 1987). An example of such a
goal would be to return clients to the job they held at the
time of diagnosis. A program performance expectation
comparative with this goal might be that 80% of clients
will return to their job upon successful completion of the
program. Until the program has some experience with its
own potential, such performance expectations may be
difficult to specify, especially in the absence of known
standards in the field (Wilkerson, 1991).

Outcome Analysis

Outcome analysis is a complex task. One can observe
improvements in clients following rehabilitation or note a
transformation from unemployment to employment.
However, these changes are not exclusively rehabil­
itation outcomes. They become so only if we infer that the
changes resulted from services provided. This raises
philosophical issues of causal attribution, identification of
 locus of control, and extent of responsibility for the pro­
gress incurred (Fuhrer, 1987). The degree to which a
therapist believes that his or her intervention has effected
the change and the degree to which a client feels motivat­
ed and responsible for progress greatly influence judg­
ments made in justifying outcomes.

Periodically comparing a work-hardening program’s
performance to itself through outcome analysis provides
valuable information for quality assurance purposes.
However, comparing rehabilitation outcomes is never a
straightforward task (Matheson, 1992). Each client enters
a program with different needs and desired outcomes.
The work hardening process is then individualized
through structured, graded, work-oriented activities to
increase psychosocial, physical, and emotional tolerances
(AOTA, 1986).

Analyzing outcomes on a broader scale to encom­
pass multiple work centers confounds the problem by
introducing diversity in program characteristics. Work
hardening programs differ in size, staff, equipment, meth­
ods, and services.

An abundance of external variables likewise present
obstacles to accurate and reliable outcome measurement.
The “systems” policies on worker’s compensation, dis­
ability benefits, and social security disability insurance
influence a client’s eligibility for services and motivation
to return to competitive work. Labor market forces of
unionization, the shift from manufacturing to service indus­
tries, and the shortage of vocational retraining and
placement services also affect return to work. The em­
ployee’s psychosocial dynamics related to the injury (i.e.,
symptom denial, symptom embellishment, and substance
abuse) also influence his or her rate of progress (Clifton,

Employer policies and procedures may either facili­
tate or impede an injured worker’s return to employ­
ment. Weak medical management, layoffs, and lack of job
modification or light duty options interfere with efforts
for an expedient return to gainful employment. Finally,
the differing agendas of the community players involved
in each case may further compound the issues. Com­
munity players include the employee, employer, physician,
attorney, therapist, insurance representative, and em­
ployee's family (Clifton, 1991).

Despite the number of issues influencing the success of work-hardening programs, providers can no longer ignore the increasing demand by consumers for outcome studies substantiating their effectiveness. Outcome measurement is every provider's responsibility, not only to address the economic self-interest of payers but to ensure high quality standards of care and service for those who are injured.

Study Purpose

The purpose of this study was to obtain data on clients treated in work-hardening programs. Specifically, data related to demographics of gender, age, occupation, insurance coverage, diagnosis, services received, patterns of attendance, psychological services received, and outcomes upon discharge were collected for trend analysis and outcome study.

Method

Subjects

Twenty-two work hardening programs, the total membership in the Wisconsin Work Programs Network, volunteered to participate in this 11-month study. Half of these programs operated within a hospital setting. Seven programs were located within a free-standing rehabilitation center affiliated with a hospital. The remaining four programs were affiliated with a national for-profit health care corporation.

Programs received a packet containing program evaluation software copied to four separate computer diskettes, an accompanying instruction manual, and four diskette mailers. Each diskette was designated for a three-month period (October-December, 1991; January-March 1992; April-June, 1992) with the exception of the fourth diskette, which covered 2 months (July-August, 1992) to accommodate the work programs' request.

The study participants were instructed to enter client data onto the diskettes following the prompts of the software program. Data were entered on each work-hardening client after his or her discharge from a work-hardening program. The data files from each of the 22 diskettes were compiled into a single file from which summaries and comparisons were computed.

Instrument

I developed an IBM-compatible computer software program to assist study participants in the collection of data. The software program required responses to 10 different categories: (a) gender, (b) age, (c) occupation, (d) source of reimbursement, (e) diagnosis, (f) services client received, (g) number of days per week in attendance, (h) length of treatment, in weeks, from admission to discharge, (i) psychological services received, and (j) outcome upon discharge. Each category contained a list of options to choose from and allowed only one response for each category, with the exception of the "services received" category. The respondent was allowed to indicate more than one activity if deemed appropriate. An "other" option was included within each category to allow an alternate choice if the respondent felt that none of the previous options pertained to a client's program. The instrument was pilot tested in three facilities.

Results

Data were gathered on 928 clients discharged from the 22 participating work programs. The majority of the clients (65%) were males. Most of the clients were between 16 and 65 years old (see Figure 1).

The choices for identifying occupations of the clients were provided within the framework of the nine occupational categories described by the Dictionary of Occupational Titles (U.S. Department of Labor, 1986). The largest number of clients (174) had occupations that were best described by the miscellaneous category (see Table 1).

Insurance coverage for the majority of work-hardening clients (85%) was identified as worker's compensation. Seven percent of the clients were covered under a group insurance plan. Private insurance was the source of reimbursement for 3% of the work-hardening clients. The remaining 5% were included in the "other" category for identification of insurance coverage. Categorization of diagnoses was identified according to the body part affected. A total of 33 choices were provided, including the options of "multiple/dual diagnosis" and "other." Injury to the lumbar spine was the most frequent condition treated, followed by carpal tunnel syndrome (see Table 2).

Respondents indicated the services the client received by answering yes or no to 14 identified services (see Table 3). Services most frequently received were a job analysis via client interview, evaluation of functional

Table 1

<table>
<thead>
<tr>
<th>Occupation Category</th>
<th>Number of Clients</th>
<th>% of Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional/Technical/Managerial</td>
<td>72</td>
<td>8</td>
</tr>
<tr>
<td>Clerical and sales</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>Service</td>
<td>148</td>
<td>16</td>
</tr>
<tr>
<td>Agricultural/Forestry/Forestry</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Processing</td>
<td>82</td>
<td>9</td>
</tr>
<tr>
<td>Machine trades</td>
<td>158</td>
<td>17</td>
</tr>
<tr>
<td>Benchwork</td>
<td>104</td>
<td>11</td>
</tr>
<tr>
<td>Structural work</td>
<td>117</td>
<td>12</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>174</td>
<td>19</td>
</tr>
</tbody>
</table>

Figure 1. Age distribution of work-hardening clients ($N = 928$).
The least performed services were pre-employment and preplacement screenings. Length of a client’s treatment in weeks from admission to discharge is indicated in Figure 2. Most clients served in the programs were discharged within a 3-week period. Respondents indicated that 59% of the clients did not receive psychological services, whereas 41% did receive these services.

Client outcomes were based on return to work criteria. Outcomes upon discharge from work-hardening programs were described by 10 different categories (see Figure 3). More than half of the clients (59%) returned to their usual and customary jobs with or without workplace modifications.

Comparisons were performed to determine the relationship between length of treatment and specific conditions. The three most frequent conditions treated in the work programs and the corresponding length of treatment for clients with those conditions are shown in Figure 4. Most clients diagnosed with an injury to the lumbar spine area (68%) were treated and discharged within 4 weeks. Seventy percent of these clients returned to their usual and customary jobs with or without modifications, to alternate jobs within the same occupational group. More than half of the clients diagnosed with carpal tunnel syndrome (62%) and those diagnosed with an injury to the cervical spine area (53%) were discharged from work programs within 3 weeks. Sixty-four percent of those clients with carpal tunnel syndrome and 46% of those diagnosed with an injury to the cervical spine area returned to their usual and customary jobs with or without modifications, to alternate jobs within the same company with or without modifications, or to jobs within the same occupational group.

The five conditions most frequently treated in work programs were compared to client outcomes (see Table 4). More than half of the clients in the diagnostic categories returned to their usual and customary jobs with or without modifications with the exception of those with injuries to the cervical spine area (46%). Eighteen percent of the total sample of clients from all 5 categories did not return to work or were referred for further medical services or both.

Study Limitations

Due to lack of uniform terminology and practice approaches in the area of work hardening, the activities

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<tr>
<th>Condition</th>
<th>Number of Clients</th>
<th>% of Total (N = 928)</th>
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<tbody>
<tr>
<td>Lumbar spine injury</td>
<td>434</td>
<td>47</td>
</tr>
<tr>
<td>Carpal tunnel syndrome</td>
<td>55</td>
<td>6</td>
</tr>
<tr>
<td>Cervical spine injury</td>
<td>52</td>
<td>6</td>
</tr>
<tr>
<td>Shoulder injury</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>Multiple/Dual diagnosis</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>Hand/Wrist tendinitis</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>Finger amputation</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Rotator cuff injury</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>Elbow injury</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Hand/Wrist laceration</td>
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Table 2
Ten Conditions Most Frequently Treated in Work-Hardening Programs

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Table 3
Service That Client Received (N = 928)

<table>
<thead>
<tr>
<th>Clients (%)</th>
<th>Service</th>
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<tbody>
<tr>
<td>82</td>
<td>Job analysis via client interview</td>
</tr>
<tr>
<td>78</td>
<td>Evaluation of functional limitations</td>
</tr>
<tr>
<td>78</td>
<td>Education for injury prevention</td>
</tr>
<tr>
<td>75</td>
<td>Reconditioning</td>
</tr>
<tr>
<td>74</td>
<td>Individualized graded work simulation</td>
</tr>
<tr>
<td>71</td>
<td>Physical capacity evaluation</td>
</tr>
<tr>
<td>63</td>
<td>Symptom control</td>
</tr>
<tr>
<td>45</td>
<td>Stress management</td>
</tr>
<tr>
<td>24</td>
<td>On-site job analysis</td>
</tr>
<tr>
<td>21</td>
<td>Vocational assessment</td>
</tr>
<tr>
<td>16</td>
<td>Other</td>
</tr>
<tr>
<td>12</td>
<td>Modification of workstation</td>
</tr>
<tr>
<td>8</td>
<td>Supported employment</td>
</tr>
<tr>
<td>1</td>
<td>Preemployment-preplacement screening</td>
</tr>
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modifications, or to jobs within the same occupational group. More than half of the clients diagnosed with carpal tunnel syndrome (62%) and those diagnosed with an injury to the cervical spine area (53%) were discharged from work programs within 3 weeks. Sixty-four percent of those clients with carpal tunnel syndrome and 46% of those diagnosed with an injury to the cervical spine area returned to their usual and customary jobs with or without modifications, to alternate jobs within the same company with or without modifications, or to jobs within the same occupational group.

The five conditions most frequently treated in work programs were compared to client outcomes (see Table 4). More than half of the clients in the diagnostic categories returned to their usual and customary jobs with or without modifications with the exception of those with injuries to the cervical spine area (46%). Eighteen percent of the total sample of clients from all 5 categories did not return to work or were referred for further medical services or both.

Study Limitations

Due to lack of uniform terminology and practice approaches in the area of work hardening, the activities
category of the instrument used in this study is susceptible to misinterpretation. For example, one facility may consider a specific assessment to be an evaluation of functional limitations; another facility performing the same function may identify it as a physical capacity evaluation.

Two work programs indicated entering data on clients seen for a 1- to 2-day physical capacity evaluation only. Upon completion of the evaluation, the clients were referred back to the physician. The length of treatment on these clients was then reported as being within a 1-week period with the outcome identified as "did not return to work—medical referral." These clients should have been excluded from this study as they did not receive treatment in a work-hardening program.

Additional information on whether or not the injury
conditions were presurgical or postsurgical, the length of
time from the onset of injury to initial treatment, and the
number of cases that were reinjuries should be consider­
ations in studying work programs' outcomes. These fac­
tors can have a major influence on the activities per­
formed, length of treatment, and outcomes.

Discussion

This study provided information regarding the demogra­
phics, treatment, and outcomes of work-hardening cli­
en clients in Wisconsin, but caution should be exercised in the
use of these data. The diversity in program characteris­
tics, external variables such as insurance reimbursement policies and clients' psychosocial situation, and the individualized nature of the treatment process must be considered when comparing program outcomes. Comparing a program to itself through periodic program evaluation minimizes the effects of some of these variables. Because information was collected in only one state, generalizations cannot be made to work programs outside the state.

As most of the occupations in this study fell within the miscellaneous category, the nine occupational categories defined by the Dictionary of Occupational Titles (U.S. Department of Labor, 1986) do not appear to be sufficiently discrete to adequately describe the occupations of clients treated in the work programs in this study.
Is it difficult to interpret and select the most appropriate category or do the occupations truly fall within the miscellaneous category? I suspect the latter to be true. For instance, several work programs indicated treating a large number of truck drivers, an occupation placed in the miscellaneous category in the Dictionary of Occupational Titles. A more detailed listing of specific occupations instead of general categories is necessary to obtain further information on clients' occupations. This information is important in the identification of jobs placing workers at high risk for injury. Once identified, these positions could become the target for injury prevention services.

Data in this study relating to diagnoses and insurance coverage are consistent with current literature indicating the prevalence of back injury and high worker’s compensation costs (Clifton, 1991; Sutherland, 1991). This finding further emphasizes the need for instituting injury prevention programs within the workplace.

Overall, the outcomes of the work programs in this study appear favorable. The largest percentage of clients returned to their usual and customary jobs with or without modifications. However, the number of clients who did not return to work or who received medical referrals or both (18%) indicates a need for further analysis of the characteristics of this subpopulation. What were the factors that prevented these clients from achieving a return to work outcome? One reason for the size of this subpopulation may be the inclusion of those who received a physical capacity evaluation only and were then referred for medical services. Further analysis of this category of clients is necessary to obtain insight into practice patterns and effectiveness of work programs treating certain diagnoses.

The future of work programs rests on their ability to accurately evaluate their performance and make informed decisions for continuous improvement. Program evaluation and outcome tracking systems that organize information needed to improve case outcomes and monitor results increase their ability to evaluate performance. From a business standpoint, referral, service, and outcome tracking provide valuable information on which to base decisions about marketing, provision of services, and alterations in practices. From a service perspective, tracking of program data allows for analysis of program effectiveness and efficiency in relation to client care.

Acknowledgments

I thank the Wisconsin Work Programs Network for serving as a vehicle for administration of this project and Theodore I. King II for computer programming assistance.

References