

WORK HARDENING MODEL FOR THE 80'S

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ABSTRACT: A search of the literature reveals that work hardening has a long history as a treatment process for the injured and disabled. This paper compares and contrasts work hardening models and describes a model for current practice that draws upon the best from the past and meets the needs of today.

Graded (progressively demanding) exercise and tolerance concepts were used very early in the treatment of tuberculosis patients. Briggs (1949) referred to the addition, in 1859, of graded exercise and work tolerance to the medical regimen of good food and fresh air for tuberculosis treatment. Graded exercise was introduced first, progressing to graded work tolerance in accordance with each patient's physical capacity as determined by their physician. The graded programs were used as a final stage of treatment or to accompany long periods of enforced bed rest. Exercise took the form of walking and "conversational" therapy progressing to more demanding tasks in terms of amount of physical exertion and satisfaction of social, vocational and economic needs. Group activity in occupational therapy was used for its objectives of work tolerance as well as social rehabilitation. Specific work tolerance tasks such as woodworking and various clerical tasks were prescribed based upon their usefulness in estimating resistance to breakdown from physical effort and emotional upsets.

In 1924 Kidner wrote about a program of "habit training" which he defined as development of the habits of industry that had been impaired by disease or accident. Such habits are more commonly referred to now as worker characteristics.

Work hardening appears in the psychiatric literature in the 40's especially in regards to preparing the patient for return to competitive life after the sheltered life of the hospital ward (Phelan). The programs featured realistic work environments, perhaps using the hospital laundry, barber shop or carpentry shop. Patients were observed by their physicians during progressively demanding work tasks for cooperation and friendliness as these were felt to be important personality traits if the person was to work "harmoniously" after discharge. Instruction and

training for specific skills were frequently undertaken by the manual arts therapists during the usually lengthy stays. Medical supervision was inherent and decisions were made at each step by the attending psychiatrist or physiatrist.

Work hardening programs of the 40's for physically handicapped shared many of the same goals and features as those for mentally disabled (Thompson). Work experiences were provided which were a representative of jobs available in the community. Programs were designed to make the worker quickly aware of the relationship of his work hardening program to a job which may support his family. While work speed was variable quality standards of work should not be, warned the author. The treating physician determined the time for resumption of employment. Following work hardening a detailed report was prepared by the supervising occupational therapist including information on personality traits and physical limitations gleaned from close acquaintance and observation.

In the 50's Watkins (1959) described a program using the non-medical departments of Massachusetts General Hospital for restoration of physical tolerances. Physiatrists directed the program of medical evaluation and therapy. Occupational therapists directed pre-vocational and work therapy with a vocational counselor responsible for establishing vocational goals and placement. In order to aid evaluation of progress, a progressive resistive exercise component was added. By measuring increased strength in pounds they were able to track progress in developing tolerances. This feature was reported rather as an afterthought but documents an early effort to objectify and quantify the program.

Wegg wrote in 1957 about moves to standardize and objectify the work therapy program at May T. Morrison Center for Rehabilitation in San Francisco, California. She described features of the occupational therapist supervised program which was designed along the

lines of the Workmen's Compensation Convalescent Centre in Malton, Canada. Features of the San Francisco program included simulation of on-the-job conditions and tasks for the individual patient which were used to estimate ability and as an exercise medium to develop work habits, confidence, increase physical and emotional tolerance, improve strength, range of motion, coordination and dexterity. Activities were graded as to length of time, resistances used, distance weights were lifted and carried, positions of work, etc., to maintain and improve strength and endurance for a full work day. All referrals were made by a physician and the number of hours of participation was prescribed by the physician.

Prior to testing, the vocational counselor, physiatrist, occupational therapist and industrial engineer drew up a work sample prescription and schedule for testing. The industrial engineer evaluated the finished product as to its acceptance by an employer. The occupational therapist differentiated innate dexterity or mechanical "know how" from defects in training (of prosthetics for example) or defects due to the disability. The occupational therapist also judged emotional aspects of work performance.

Reports of performance, recommendations for assistive equipment, therapeutic programs, length of work day and actual job classifications were made by the occupational therapist and industrial engineer. Little practical information was available in the literature at the time on work testing, work sampling or job simulation therefore original tests were developed and used. In reporting findings several programs were encountered when setting up standard procedure by which to evaluate individual program results. First was the setting of a point of reference or "norms." Second was the problem of evaluating trends in production speed. Third was evaluating the significance of errors. Fourth was the problem of

evaluating the worker on the basis of subjective observation of the previous qualities.

Just three years later, in 1960, Wegg described the same program but with significant changes. Work hardening had moved away from the medical model toward a vocational model and adherence to a scientific approach. A physician's prescription was no longer needed. Instead a recent physical examination or approval of worker participation was required. Physical conditioning and adjustment was seen as a distinct program to follow work evaluation since the purpose of hardening was to develop work habits or improve work assets as noted in the evaluation. To attempt to do both functions simultaneously would lead to loss of the scientific approach.

Ethridge proposed work as a treatment media for all disabilities. He described a program in a state psychiatric hospital which he stressed was applicable to any hospital and any occupational therapy department. Within the hospital environment 205 different work assignments were developed. A very popular and therapeutic work assignment was cigarette rolling! The finished product was sold to the patients at a cost much lower than commercially available. The advantages were obvious in that the work was gratifying meaningful, real, successful in building tolerances and it was motivating for personal financial reasons. Each work assignment combined these elements in that each was real, productive work and not merely exercise or diversion.

A similar emphasis on real work was incorporated into the work therapy program at UCLA Neuropsychiatric Institute, a short-term private hospital (Poussaint). He pointed to the benefits of work, persuaded that through work people derive their feelings of status, worth, satisfaction and sense of fulfillment that is of lasting value. Patients were referred to the program by psychiatrists and assigned and guided by the occupational therapy department to work tasks in the short stay community

hospital. Assignments to work therapy were as brief as one week with a work day of three to eight hours. Even the shortest duration assignments contributed substantially to recovery of patients and return to the community.

Societal changes in the 70's signaled major changes in the work force and access to jobs. Opportunities to work were, as never before, influenced by urbanization, technology and education (Johnson). These changes in the nature and meaning of work necessitated changes in the use of work as therapy. Jobs once performed by disabled people such as collating were, for the most part taken over by machines. Some jobs began to have a limited life expectancy. Preparation of disabled worker thus needed to incorporate the more generic tolerances and use transferable skills and the worker characteristics necessary for any job.

Diasio and Jones (1970), in their work with psychiatric clients also concentrated on development of worker characteristics along with specific work tolerances. Their program sought to foster development of new behavior repertoires which would bring greater vocational acceptance. They made it clear to their young adult clients that they were engaged in a voluntary collaborative relationship to develop these behaviors. The program, as in former decades, used realistic work settings within the hospital and they also moved out of the institution to use community settings.

The 1980's brought a new sophistication to the process of increasing a person's work place tolerance. The view of man has moved from a reductionistic, mechanical model to one of an integrated whole. This was facilitated by General Systems Theory (Von Bertalanffy, Simon) and the integration of various disciplines into an integrated network. Man was viewed as a system of interconnected sub-systems which when integrated into a "system" became more than

what the parts were separately. Man as a system was described in several ways (Lawton, Pfeiffer, Paulson, Kielhofner and Burke, McFarlane). Kielhofner and Burke developed a model of human occupation that included input, throughput, output, and feedback. The throughput was divided into the volitional subsystem, this included the person's goals, values, and sense of personal causation, the habituation subsystem, which included the personal internalized roles and habits, and the production subsystem, which included the person's skilled actions and cognitive abilities. This model also included the environment. The environment was composed of objects, people, and events. The environment was both the source of the input as well as receiver of the systems output.

In this model, the system is a hierarchy in that the subsystems are arranged in an order such that the higher subsystem control the lower order subsystem, however, the lower order subsystems need to operate effectively for the higher systems to be able to exist. In the human occupation model, the person's volitional subsystem controls their performance subsystem. Clinically, this is seen in the individual that may have the physical tolerances for employment, but is not motivated to use their capabilities. Another example is the severely involved spinal injured client who does not have extensive physical capabilities but whose motivation enables them to be employable. The habituation subsystem is most familiar to vocational counselors as the "worker traits or worker characteristics" of attendance, punctuality, grooming and self-care, and worker role behaviors. This subsystem maintains the system's behavior in routine patterns. Thus, the worker must get up at a set time, and follow a daily routine to not only get to work, but to carry out their daily duties once on the job. The performance subsystem consists of skills. The skills are the organized component actions that lead to the accomplishment of a goal. Skills entail both neurological and kinesi-

logical as well as cognitive areas. The performance subsystem produces action on the environment; a machinist tightening bolts or a salesman writing up an order.

The environment in the model consists of objects, people, and events. The objects in the work hardening environment are usually vocational oriented. There are few medical objects, such as stainless steel tables, white walls, and stethoscopes. There are work benches, secretarial desks and chairs, drafting tables, and machinery. The people in the environment are not dressed in white coats. They may be therapists, but they have replaced their medical cloak for vocational attire. They play the joint role of therapist and supervisor. Coffee breaks, lunch breaks, being assigned a new job task, and filling out time cards are a few of the events that take place in the environment.

Work hardening, using a general systems approach, gives the clinician a variety of variables to manipulate and explain a client's performance in the hardening setting. The model of human occupation tells the clinician to observe the client's interactions with the environment. The client's motivation, habituation, or performance subsystems may be hindering them from employability. Perhaps the environment is not supportive of the person. This inclusion of the environment into the work hardening process is exemplified in the growing body of literature on "ergonomics."

Ergonomics, the person-environmental fit in the workplace gives the work hardening clinician the tools to assess, change, and modify the work place. The literature of the past five years has grown since it was recognized that injuries and costly disability claims could be prevented by the proper environment-person fit (Chaffin and Anderson). The adjustment of chairs, desk heights, and lifting devices are a few of the common applications of ergonomics.

In the work hardening center, the work station is a laboratory in which the various elements can be altered to obtain the optimum performance. An example would be elevating the working surface of an electronic assembler with a platform so that the person does not have to lean over the bench and strain their back. Arms, legs, feet, and hands can be supported. Tools can be padded to prevent vibration. Chairs can be lowered or raised. The person's anthropomorphic dimensions, the job's biomechanics, and the work station's dimensions are all necessary components of a complete work hardening assessment and treatment regimen.

This need to apply diverse disciplines to a common problem, in returning the person to work, has led to the expansion of the work hardening programs to realization as in past decades, that a multidisciplinary approach would be needed. This current multidisciplinary approach was described by L. Matheson. Occupational therapists, vocational evaluators, physical therapists, and psychologists are part of the work hardening team. The application of the physiological and kinesiological backgrounds of the occupational and physical therapists, the biomechanical approach of the rehabilitation engineer are blended with the vocational evaluator approach to give the client the necessary therapeutic physical capacity program with an appropriate vocational focus. The psychologist and occupational therapist are able to provide insights into the client's adjustment, and motivation, and enable the use of behavioral techniques such as contingency reinforcement, behavioral schedules, and pain management techniques which are incorporated into the work hardening program. Thus, the breadth of the program and the services available increase the probability of success for the client.

The earlier programs operated on funds from the State and Federal level. As these funds fluctuated and were reduced in some cases, the feasibility of providing long-term

programs with expensive staff mandated a change. The work hardening programs of earlier decades reduced staffing. They were incorporated into the sheltered workshop model. The reemergence of the work hardening programs is based on the shift to private sector funding. The worker's compensation system and the long-term disability systems, not dependent on the political pressures of the Federal and State tax systems, have been able to support the new work hardening models of the 1980's. This is also due to the short term approach to treatment. The intensive staffing develops and implements the program on a 3-4 week schedule. Progress is measured in quantitative terms and monitoring is critical to be able to document progress. This is important for the legal implications in which all services in the highly litigated area of worker's compensation are involved.

REFERENCES

- Brigg, C.A. (1949). Graded exercise and work tolerance. American Journal of Occupational Therapy, 1949, 3(2), 78-81.
- Chaffin, D. and Anderson, G. (1984). Occupational Biomechanics. Wiley and Sons. New York.
- Diasio, K.B. and Jones, M.S. (1970). Prevocational services for young adult psychiatric patients. Hospital and Community Psychiatry, July, 217-220.
- Ethridge, D.A. (1963). Work - a treatment media for all disabilities. American Journal of Occupational Therapy, 17(1), 16-18.
- Johnson, J.A. (1971). A consideration of work as therapy in the rehabilitation process. American Journal of Occupational Therapy, 25(6), 303-308.
- Kidner, T.B. (1924). The hospital pre-industrial shop. Occupational Therapy and Rehabilitation, 4(3), 187-194.
- Kielhofner, G. and Burke, J. A model

- of human occupational, part 1, conceptual framework and content. American Journal of Occupational Therapy, 34(9), 572-581.
- Lawton, M.P. (1970). Assessment, integration, and environments for older people. The Gerontologist, 10, 38-46.
- Matheson, L. Work capacity evaluation. Trabuca Canyon, CA RISC 198.
- McFarlane, B. (1982). The Correspondence of the Self-Reported Performance of Stroke Persons to Hierarchy Theory. Unpublished master's thesis. University of Southern California.
- Paulson, C. (1980). Juvenile delinquency and occupational choice. American Journal of Occupational Therapy, 34,(1), 565-571.
- Pfeiffer, E. (1975). Multidimensional functional assessment; the OARS methodology. Durham, N.C.: Duke University Center for the Study of Aging and Human Development.
- Phelan, L.B. (1949). Role of manual arts therapy in a neuropsychiatric hospital. Journal of Rehabilitation, 14(3), 11-13.
- Poussaint, A.F. (1964). Work therapy in the short-term psychiatric hospital. American Journal of Occupational Therapy, 18(1), 12-14.
- Simon, H. (1973). Organizations of complex systems. In R. Patee (Ed.) Hierarchy Theory. New York: Briziller.
- Thompson, C.G. (1947). Prevocational activities for the physically handicapped. American Journal of Occupational Therapy, 1(3), 152-154.
- Von Bertalanffy, (1968). General systems theory. New York: Brayritter.
- Watkins, A.L. (1959). Prevocational evaluation and rehabilitation in general hospital. Journal of the American Medical Association, 171(4), 385-388.
- Wegg, L. (1957). The role of the occupational therapist in vocational rehabilitation. American Journal of Occupational Therapy, 11(4), 252-254.
- Wegg, L. (1960). The essentials of work evaluation. American Journal of Occupational Therapy, 14(2),

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