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A Technology Based ADA Physical Demands Pre-Employment /Post-Offer Assessment Tool for Industry

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Abstract

This article presents the results of a research and development project to design a technology-based pre-employment/post-offer assessment tool for industry that makes use of advances in computer and sensor technology. The goal of this project was to use criterion methods of isolated trait work sample physical demands testing that compliment changes brought about by the American's with Disability Act (ADA). The assessment tool measures the physical demands defined by the U. S. Department of Labor and used in the Dictionary of Occupational Titles. The tool allows the user to establish the job standards criteria based on the employer's measured physical demands analysis. It also allows the physical demands tests to be customized and compared directly to job standard criteria. The measured assessment results are immediately available electronically or to print after testing and are designed to meet legal requirements for candidate anonymity and test objectivity. The assessment tool can be administered in a variety of languages while maintaining the content and construct integrity of the instrument. Last, the assessment tool is portable if needed, and can be moved by the user to itinerant test locations. This project's goal is to economically provide the features listed above without the adverse impact to minority groups defined by the Uniform Guidelines on Employee Selection Procedures and without use of prejudicial normative performance comparisons.

A Technology Based ADA Physical Demands Pre-Employment /Post-Offer Assessment Tool for Industry

In the profession of vocational assessment, the traditional scope of practice has centered on the skills associated with aptitude, interest, behavioral, work skills and other types of testing critical to the development and transfer of usable work traits in various settings. It has been this author's interest to focus on one worker trait area since the late 1970's, that being physical demands assessment. This interest grew out of experience working as a case manager specializing in the placement of injured workers. In 1983 it was the author's privilege to work on the initial draft of what would become the American's with Disability Act (ADA). It became apparent as the law was winding itself through the legislative process that industry would need to change the way workers are qualified and hired. The ADA was the final piece of federal civil rights legislation affecting employment practices. It identified disabled people as a protected minority to be guaranteed equal access to employment (Equal Employment Opportunity Commission [EEOC], 1991). Unlike previous antidiscrimination legislation, the ADA required the employer to identify the essential physical demands that the employee candidate had to perform as part of their job duties. This meant that the employer could not inquire before hire whether a candidate had a disability, previous injury, disease, or perceived disabling condition. It became the employer's obligation to hire the candidate based on their ability to perform the essential demands required by the job. The ADA presented guidelines and rules for the hiring process, (EEOC, 1991). The ADA guidelines allowed the employer to test whether or not the candidate had the physical ability to safely perform the job without risk to themselves or their co-workers. The initial ADA rules offered limited guidance to either the employer or the person with a disability, but over time the courts have delineated the intent of congress. To make sure the employer does not discriminate because of artificially set physical performance standards, and to assure that they meet the federal hiring standards jointly agreed upon by the EEOC, Departments of Labor and Justice and the Civil Service Commission, an objective and measurable standard reflecting the true physical requirements of the job must be established (EEOC, 1991). This requires input from labor as part of process and must not conflict with existing collective bargaining agreements in place. The most effective method for the employer to meet this requirement is to have a quantifiable job analysis as the means of identifying the essential demands of the job. This is typically an expensive, labor intensive and ever-changing process. However, the employer has the option to establish "general" job descriptions if candidates are qualified into a hiring pool. Qualified workers in the hiring pool may be placed in several positions such as is common in manufacturing like the automotive assembly industry.

Pre-Employment and Post-Offer Testing

The terms pre-employment and post-offer are confusing for many and are often used interchangeably. They are, however, different, and distinct processes outlined in the ADA law. Under 42 U.S.C. § 12112 (d) (2) (A) and (B); 29 C.F.R. § 1630.13 (a) and § 1630.14 (a), a pre-employment test is considered a non-medical personnel exam and must not be conducted by a medically trained evaluator. Pre-employment assessments are typically referred to as "skills and agilities" tests and may include the same physical and other tests performed in the post-offer physical abilities medical examination. What makes pre-employment skills and agilities testing different from a post-offer exam is that it applies to situations where the employer chooses to assess all persons applying for a job opening as a first step and is viewed the same as any other personnel screening activity. Vocational evaluators, exercise physiologists, psychologists and personnel professionals are typically used as pre-employment assessors. The reason the pre-employment skills and agilities test must be conducted by a non-medically trained evaluator is that a conditional offer of employment has not been extended to the candidate at this point in the hiring process. Certain restrictions apply to the application of a pre-employment test, however. Because it is not a medical exam, biological monitoring of the candidate is not allowed. This means that recording heart rate response, blood pressure, respiration, range of motion and the like can not be conducted as part of the test. This, of course, increases the possibility that the candidate may be at injury risk during physical demands test activities. If the pre-employment skills and agilities test were administered by a medically trained examiner such as physical therapist, occupational therapist, nurse or physician's assistant, it would constitute a conditional offer of employment by default since only a medically trained examiner can provide a post-offer physical abilities medical examination.

As part of the conditional offer of hire, the employer has the option to perform a post-offer physical abilities medical examination. Under 42 U.S.C. § 12112 (d) (3); 29 C.F.R. § 1630.14 (b), a post-offer physical abilities medical examination can be conducted as part of the conditional offer of employment. Biological monitoring is allowed as part of the post-offer examination. Post-offer testing is usually preferred by employers who have high turnover or who find that a high number of candidates must be screened to qualify a candidate. The reason for this is simple economics since only persons meeting pre-screening criteria such as a background check, drug screening, education, or aptitude performance and/or licensure become candidates for a post-offer medical exam.

Establishing Valid Testing Methods

To prevent adverse impact on minority groups such as disabled people from occurring as part of the physical demands selection process, a measurable, documented and defendable hiring standard must be in place as supported by job analysis. The long-standing definition for physical demands has been the U.S. Department of Labor's Dictionary of Occupational Titles (DOT) criteria as defined in the Revised Handbook for Analyzing Jobs, (1991). The physical demands definitions used in the DOT are the direct result of the research conducted by Burt Hanman as part of the War Manpower Act of 1943 (Hanman, 1968). Originally known as the "Hanman Plan", it became part of the DOT in the late 1940's and is used in about 20 industrialized nations today as part of their repository of occupation definitions. In his book, *Physical Abilities to Fit the Job*, Hanman details the process of assessing the worker to specific job standards. As cited by Havranek (1988) even with the introduction of O*NET, the DOT continues to be used in Social Security determination, litigation, disability pension determination and insurance rating. The Canadian National Occupational Classification (NOC) is a modern hybrid of this system. The continued use of the DOT is often preferred since it is a governmental standard long in existence that defines the physical demands of work in categories of strength, work posture and worker interface. When the employer's job hiring standards are presented using the DOT's physical demands definitions it offers hiring criterion that is less likely to be challenged on definition alone as might be less well known, theoretical or arbitrary definitions. Using job analysis data that defines work using physical demands DOT definitions also provides the employer with a strategy for introducing new hiring standards prior to job analysis. It has been common practice for manufacturers to use an existing DOT job definition as a temporary standard for hire until job analysis criterion can be established. This system has been accepted by the EEOC as a temporary measure.

The Need for a Standardized Assessment

With the promulgation of ADA regulations, there exist far-reaching implications for pre-employment post-offer testing. ADA regulations go beyond most affirmative action and equal employment structures. For the first time it required the job applicant who is disabled to be treated on a better than equal basis (EEOC, 1991). Some estimates place greater than 50 million persons as being classified as disabled (National Organization on Disability [NOD], 2004). The ADA restricts employment tests and assessment methods from screening out a candidate with a disability unless the test or assessment method is shown to be job related. Only skills, knowledge, or abilities essential to the job can be used to qualify the job applicant. It mandates that the employer demonstrate that the test or assessment method measures only the skill, knowledge or abilities needed to safely perform the job. It has become increasingly important that the employer establish measurable essential job standards and that only this criterion be used to screen in otherwise qualified workers who may have a disability for selection and hire. As industry began to follow the ADA guidelines, it became apparent that performing pre-employment and post-offer assessment in-house comes with risk. Soon after the ADA was implemented, employers began to be challenged with legal action by persons with disabilities claiming that such in-house testing provided continuing prejudicial denials of hire. In response to this, most employers today contract their testing services to an outside provider. During the 1990's, a good number of health care providers adapted their functional capacity evaluation (FCE) units for this market. However, this transition has had its share of problems in that most medical providers of FCE services continue to focus on the elements of disability, pathology, disease, and inability as part of the assessment process. Consequently, there has been an ever-increasing need to incorporate work ability testing elements in the assessment process that does not make use of normative data, theoretical constructs, or inability focus. Instead, a criterion-based testing method was needed. Also needed were culture, gender, and age neutral comparison methods required by existing civil rights and equal employment regulations and as originally mandated under the Uniform Guidelines on Employee Selection Procedures (1978).

In 1996, a project to develop a pre-employment/post offer assessment tool that could provide these features in a system flexible enough to meet most employment testing environments began. Using evolving computer technology and previous experience in human performance test design, principals at Simwork Systems, Inc., in Tucson, Arizona initiated the research and development of the ERGOS® Sapphire Work Assessment System. Simwork Systems determined that the DOT physical demands definitions provided a defendable foundation for cataloging strength, work posture and worker interface elements found in most job analyses. The DOT physical demands system had worked well with the original development of ERGOS® Work Simulator technology starting in the mid 1980's. The original ERGOS® technology continues to be used throughout North America, Europe, and Australia for pre-employment testing, return to work assessment, and pension benefit testing. It was essential that the project develop a measurement and comparison tool that could match each defined physical demand to the matching DOT component. For each physical demand an isolated trait work sample test activity was developed. For strength physical demands including lift, carry, push and pull, select isometric and dynamic test activities were developed using much of the research of Dusik et al., (1993), Chaffin, (1975), Chaffin and Park, (1973), Chaffin et al. (1978), Chaffin et al., (1983), Ayoub, (1982a, 1982b, 1991), Ayoub, et al. (1982), Garg et al. (1978), Battie, et al. (1989), Jackson, (1990), Jackson et al., (1984), Keyserling et al., (1980), Mital, (1983), Snook et al., (1970) Snook and Ciriello, (1974) and others to define protocols and methods for comparison. For postural test activities such as standing, stooping, kneeling, crouching, forward reach, overhead reach, and bended reach, research information from Astrand et al., (2003), Waters, (1991), Reilly et al., (1979), and others was used to define protocols and methods. For worker interface test activities such as handling, fingering, feeling and response to stimulus research information from Greenberg and Chaffin, (1978), Mathiowetz, (1990a, 1990b) and others was used.

Developing the Test Hardware

Previous attempts to develop hardware strong enough to handle repeated testing use by industry had resulted in large, heavy and space consuming designs. As shown in Figure 1, the original EGROS® Work Simulator required about 350-400 square feet of floor space to operate. That system was originally developed in 1986 before the advent of more compact and efficient mechanical designs available today. It weighed over 1600 pounds and required a skilled technician to set-up and maintain. It was in the shape of a pentagon and provided five test stations that allowed for simultaneous test activities to be conducted. Still in use today, surveys by Simwork Systems found that users seldom more than two test stations were ever used at the same time.

Figure 3
Multiple Monopoles

The ERGOS® Sapphire project goal was to develop compact, light, and portable assessment hardware that was flexible enough to be used in most industrial screening environments. The hardware was constructed of aircraft grade aluminum to reduce weight. An industrial "t-slot" component system offered the needed flexibility and customizable features required for manufacture. As shown in figure 2, the resulting hardware design consisted of a single monopole containing a moveable shuttle that could house the various test components. These designs also allowed the user to expand the test system at will should their assessment need change. For example, these features allowed for multiple monopoles to be added for high volume testing as shown in Figure 3.

The test module hardware was designed to easily fit into the monopole shuttle with a simple mechanical latching system. In this way, test activities could be changed in minutes thus saving time and offering the ability to customize tests to meet the employer's job standards. Four test modules were developed. The first module consists of isometric hardware that measures static lifting, pushing, and pulling strength. As shown in figure 4, the hardware consists of two isolated handles that measure the evaluee's isometric strength. The handles are changed to vertical or horizontal axis by simply removing the knob at each end of the handle and re-positioning the hardware as dictated by the test activity. Like all hardware, the shuttle containing the isometric test hardware is moved up of down into test position and fastened in place using a hand break and quick re-lease pin through the shuttle and monopole. Strength performance is recorded via isolated load cell technology for left and right sides and compared to standards via computer electronic interface.

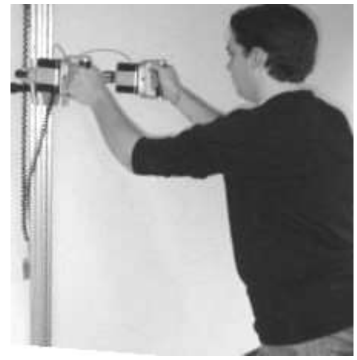


Figure 4
Isometric Strength Hardware

The second test module is a dynamic strength destination hanger that holds the lift box used to test dynamic lift and carry strength. Again, this hardware connects into the shuttle and can be moved and pined into position as required by the test activity. The hardware shown in Figure 5 includes a dynamic lift box containing weights that is lifted from the floor and placed in position on the destination hanger on the monopole. Additional hardware consisting of a scale on the floor records the weight lifted and a string potentiometer attached to the lift box monitors the speed, consistency, and location of each test activity.
The third test module is a touch panel used to assess forward reach, overhead reach, bended reach, stooping, kneeling, crouching, and standing work postures. The touch panel is carried in the shuttle and is moved into position and pined in place like modules one and two. The touch panel is mounted on a pivot arm that can be changed from vertical to horizontal orientation to correspond to the test activity. Figure 6 shows the work posture hardware set up for forward reach testing. The work posture test hardware consists of a panel containing 24 metal discs that have a two-color light above each. The test is a timed activity requiring the evaluee to touch the disc below the light in a random pattern. The evaluee touches the disc by responding with a tethered electronic wand to the appropriate light which lights either red or green. Red lights are touched with the right wand and the green light is touched with the left wand. Right/Left response time, overall performance time and other data is collected via computer and compared to the employer's performance standard.

Figure 5
Lift/Carry Hanger Hardware

Figure 6
Work Posture Hardware

Module four uses four test components that measure grip strength, pinch strength, pronation/supination forearm strength, flexion/extension wrist strength, handling dexterity, and fingering dexterity. Module four test components shown in figures 7 through #10 are not used on the monopole, but on a testing table near by. Each test component in module four connects to the test computer via an USB interface for test operation and recording the evaluee's performance.

Figure 7
Grip Strength Hardware

Developing Physical Demands Test Protocols

Of the three physical demands areas defined by the DOT (i.e., strength, posture, worker interface), strength test activities are the simplest to measure. When an employer measures the strength requirements for a job, the method is direct. It is a rather straightforward process to identify the weight a worker is able to lift, together with the frequency, start, and end destination heights and distance moved. This makes the establishment of strength performance criteria easy to understand. The ERGOS® Sapphire assessment tool tests and compares strength in a direct manner and enables the user to set the frequency load of the lift and/or carry test to match the employer's criterion standard. Unlike a number of approaches found in performance testing that use anthropometric landmarks for test comparison, the protocols developed for this project match the job standard directly. This prevents lawsuits by persons who may fail a test from claiming that the test was prejudiced because of height comparison criteria. The reality is that a specific job standard that can not be modified, or adapted under the reasonable accommodation mandate of the ADA law (42 U.S.C. § 12112 (b) (A)) requires the worker to be able to perform the essential lift standard as measured by the employer's job analysis.

Figure 8
Pinch Strength Hardware

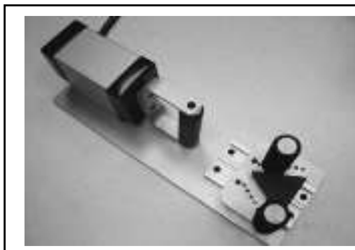


Figure 9
Combination Pronation/Supination-Flexion/Extension Strength Hardware

The development of objective criterion-based job standards for other than strength is more difficult. This was first researched by the author in the early 1970's. It became apparent as pre-employment testing programs came into vogue that physical demand performance comparisons needed to be ethnic, gender, age, and culture fair if it were to stand legal challenges. Unlike direct strength performance comparison, postural work and worker interface performances need to be compared to competitive criterion having a time-work measurement component. Postural and worker interface tests involve movement over time as an essential element of their structure. Traditional work sample tests record the set or number of work cycles in a standard amount of time for comparison to a group norm or standard. Because of their prejudicial nature, norms began to be dropped as an acceptable method of test

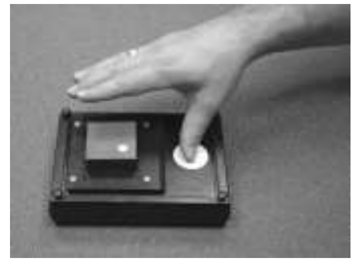


Figure 10
Handling/Fingering Dexterity Hardware

performance as ADA rules were implemented. This led to the acceptance of Methods-Time measurement (MTM) as the primary method of performance comparison. MTM performance comparison became an acceptable and defendable method of comparing the worker applicant to job standards since it is a work performance measurement system that uses only quantitative elements of work as the comparison criterion. The author's own experience started with graduate research in using MTM standards comparison standards in work sample design, Banks (1972) and continued in the years that followed through the revision of a number of popular work sample designs used at the University of Wisconsin-Stout (Banks, 1974). Considerable work in this approach was later pioneered by Bill Snellen in his development of MTM standards for companies such as Work Recovery, Inc., Valpar International, and Hanoun Snellen (1991, as cited in Banks 1986, pp. 78-81). The Snellen MTM approach was incorporated into all timed performance testing used in the ERGOS® Sapphire assessment tool. Because MTM's are age, gender, ethnic, and culture fair, it reduces the challenges often faced when normative test comparison is used in employment testing. The benefit of using MTM standards is that most large industry is familiar with its use and can readily establish the hiring criterion from existing job analyses with little added time or expense. This allowed ERGOS® Sapphire assessment results to be compared to standard job analysis performance standards for each test work sample. It also improved the purity of the isolated trait being tested and made comparison of the evaluee's MTM performance to DOT defined physical demands more accurate. The consequence of this is the evaluee's performance does not need interpretation. It directly compares to the employer's hiring standard.

To assure that each evaluee receives the same test each time it is administered, the ERGOS® Sapphire administers the instructions via computer using a pre-recorded script. The instruction set provides a practice trial to make sure that the evaluee does, in fact, know how to perform the test activity. If the evaluee is confused about, forgets, or has not learned the test sequence, the practice trial can be repeated. Since the test protocols have been factored for simplicity, learning and practice effect is dramatically reduced. Non-English speaking evaluees can take the test in their spoken language. It was determined during this project to include the selection of other language instruction sets to meet this need. The evaluator can select the evaluee's language if needed to assure that the test has been fairly administered. To assure that the same test is administered in the selected language, construct and content parity has been provided. When the test is administered, the printed instruction set is also shown on the computer screen together with visual graphics to allow the evaluee to use their usual method(s) of learning. This provides visual, auditory, and kinesthetic instruction on all tests. Informed consent is a requirement for pre-employment/post-offer assessment. It is critical that the evaluee is informed of what they are expected to do during the test and acknowledges such. It is also essential that the evaluee consents to participate in the activity prior to the start of the test. This eliminates claims that the evaluee was not informed of what was expected of them during the test or that they did not have the opportunity to ask questions about anything not understood prior to participation. The ERGOS® Sapphire protocol provides the opportunity at the end of the instruction set for the evaluee to ask any questions. As shown in Figure #11, the protocol also requires the evaluee to "touch" the computer touch screen to indicate that they understand the instructions, that they have no further questions and that they wish to start the test. Only the evaluee can make the test begin by touching the computer screen. This process has held up to challenges when an evaluee has failed a test and makes claim that they "did not know what to do" when they performed the test activity.

Figure 11

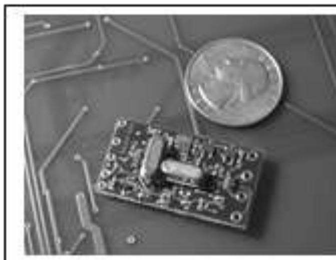
Touch Screen Acknowledgement

Developing the Electronic Interface

Coordinating the data measured by the ERGOS® Sapphire hardware with the test protocol instruction set required an electronic interface. A computer engine is required to operate the electronic interface. As shown in Figure 12, a touch screen computer is used so that the evaluee can provide a recorded touch response to the instruction set. The hardware measures performance in three ways, weight or effort lifted, carried, pushed, or pulled using load cell technology, by speed of lift or position of hardware using potentiometer technology, or by recording time by tuning on or off a clock using switches. The load cells, potentiometers and switches need to communicate with the computer through the electronic interface. Recording time is the easiest interface and uses the internal computer clock to start and stop timing. Load cell and potentio-meter measurement requires the hardware to convert analog data to digital so the computer understands the information. As shown in Figure 13, an analog to digital (A to D) electronic interface had to be designed that was small and robust enough to perform this. It needed to be able to communicate with the computer via the USB port so no special connection hardware would be required. This also allowed the hardware to be plugged into the computer and immediately recognized by the operating system. Other off the shelf interfaces were used in this project together with proprietary electronics that turns on and off test hardware lights in coordination with test protocols, amplify digital signals and record when test components are not operating within calibration standards. The computer design selected for the ERGOS® Sapphire project included touch screen interface. This meant that either a common tablet laptop computer or an all-in-one desktop computer with a LCD touch screen could be used. The tablet computer compliments the hardware designed for portable use. The all-in-one computer offers the benefit of a large screen area. The computer administers the test, records evaluee performance and the evaluator's notes and generates the reports. The computer touch screen makes for easy evaluee response to the test.

Figure 12

Touch Screen Computer



Picture 13

USB Electronic Interface

Assessment Program Operation and Recording

The ERGOS® Sapphire assessment program operates on a Windows™ software operating system. It is structured to measure all assessment performances as an evidentiary record. This provides documentation backup when an assessment is challenged. All assessment incidents generate a report containing detailed data. This includes the name of the facility, evaluator, the date, time, and duration of the test as well as any coded identifying information that might be used to keep the evaluee anonymous. Reports can be structured to present assessment data in an ADA job comparison format as shown in figure 14. All reports can be saved in secure and encrypted formats for electronic transfer and signature as mandated by HIPPA regulations. Assessment data can also be presented in a summary report format as shown in figure 15 that compares the evaluee's performance to DOT strength ratings or to MTM competitive performance standards. The ERGOS® Sapphire can also be used for other assessment markets such as functional and work capacity evaluation, return to work testing, disability determination, long term disability assessment and pension benefit eligibility testing to name a few. Options include detail reports containing clinical data as shown in figures 16 and 17. These reports provide the opportunity for input from evaluator through observations and the evaluee's recorded report of subjective discomfort or fatigue of body areas. Reports can be expanded by condensing them into a combined report or by selecting specific details for inclusion in the evaluator's report using word processing programs such as Microsoft Word™, OpenOffice Writer or WordPerfect® and make use of PDF or RTF formats. A work capacity report using the DOT or NOC classifications is also available for documentation of the evaluee's workday strength rating. The ERGOS® Sapphire project has produced an assessment tool that is flexible, economical, and easy to use. It continues to evolve as it is used in industry throughout North America, Europe and Australia and is covered under pending patents worldwide.

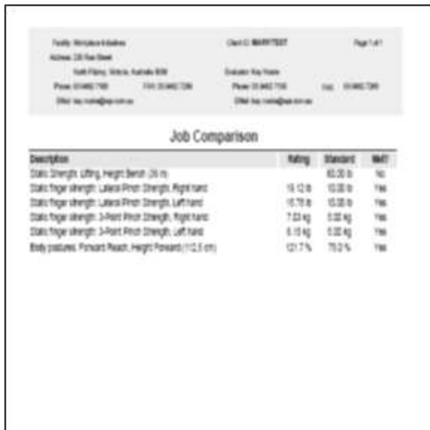


Figure 14

Pre-Employment or Post-Offer

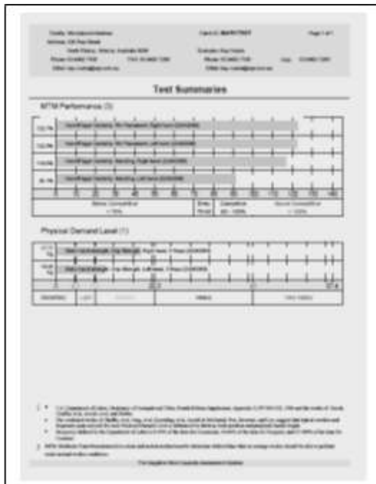


Figure 15

Test Summary Report

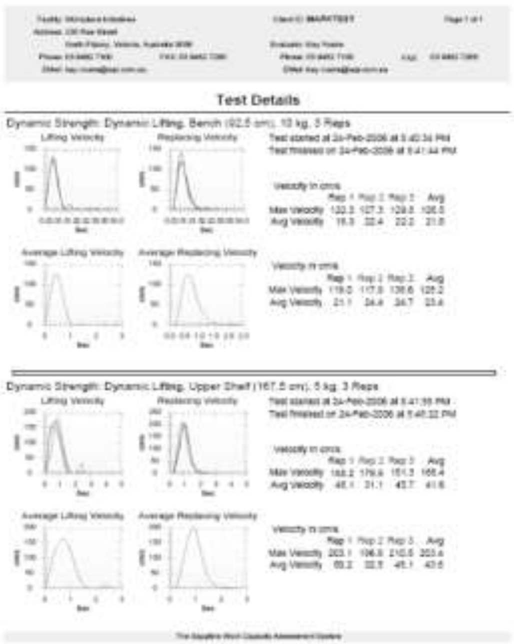


Figure 16
Detail Report Showing Dynamic Lift Data

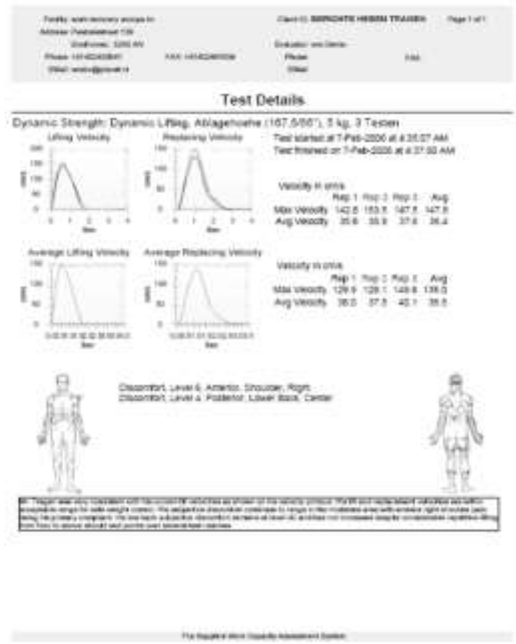


Figure 17
Detail Report Showing Discomfort Ratings and Notes

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About the Author

John J. Banks has been involved in many aspects of rehabilitation, public, private, for-profit, not-for-profit, and corporate business sectors. He began his career as Chief Vocational Evaluator working in the inner-city in Cleveland Ohio in 1971. Next, he went to New Hampshire and helped establish one of the first comprehensive state DVR operated vocational rehabilitation assessment centers in North America. He was Senior Vocational Evaluator for the State of New Hampshire. He then became Facility Director for the New Hampshire Easter Seal Society, operating the Industrial Training and Work Adjustment Program returning industrial and disadvantaged disabled workers to community employment using the "real work" adjustment model. His real work adjustment system integrated workers who were non-disabled and disabled in a factory production environment having two shifts.

Mr. Banks' rehabilitation success led to the establishment of one of North America's first private for-profit workers' compensation case management and assessment firms, Rehabilitation Consultants, Inc. (RCI), which he founded and served as Chairman of the Board. The corporation eventually grew to a regional business serving four New England states (New Hampshire, Maine, Vermont, and Massachusetts). RCI introduced the first workers' compensation managed care model in the U.S. RCI was sold to Cigna and is now part of the rehabilitation case management division of that company. During his tenure at RCI, Mr. Banks developed in 1977 the first predictive functional physical demands assessment protocol, and while on sabbatical, served as Executive Director of the National Rehabilitation Counseling Association where he worked with the initial congressional legislative sponsors of the Americans with Disability Act (ADA). From Washington he was recruited as the Director of Vocational Rehabilitation for the U. S. Territory of American Samoa serving a two-year appointment from 1984 to 1986.

In 1986, Mr. Banks helped establish Work Recovery, Inc. (WRI) initially as a consultant bringing his protocol for functional assessment that would be integrated into the computer-interactive ERGOS Work Simulator system. Mr. Banks continued to work for WRI serving as Director of Research and Development, Vice President of International Development, where he set up WRI's operations in Australia, Canada and Europe. In 1996 he assumed the position of Vice President of Research and Development until 1998 when Mr. Banks commenced computer-interactive work sample and human performance testing research as partner in Simwork Systems, and has assisted with the development of the patented Sapphire ™ Work Assessment System.

John established WorkEval™, a comprehensive assessment/testing and consultation Company in Colorado. WorkEval™ currently provides auto accident/personal injury work capacity assessment, ADA pre-employment worker testing, disability and employability risk management consultation and forensic work capacity assessment. WorkEval™ also provides consultation to manufacturing and health care businesses on issues of risk management, ADA hiring methods and employee fitness for duty/return to work assessment strategies.

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