Pre-Employment, Post-Offer Physical Testing

In the Construction Industry

by

Valerie F. Hannon

A Research Paper

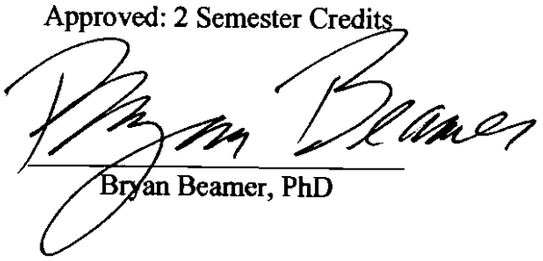
Submitted in Partial Fulfillment of the

Requirements for the

Master of Science Degree in

Risk Control

Approved: 2 Semester Credits



Bryan Beamer, PhD

The Graduate School

University of Wisconsin-Stout

November 2008

The Graduate School
University of Wisconsin-Stout
Menomonie, WI

Author: **Hannon, Valerie F.**

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ABSTRACT

As the work force ages and workers' compensation cost and injuries rise, employers are searching for cost effective, legal ways to identify potential employees who are able to complete the job with the least chance of injury.

The objective of this research is to explore the methods of pre-employment, post-offer physical testing currently available, discuss the similarities and differences, and provide employers a list of questions to be used as a starting place in their quest to begin a testing program.

The methods used in this research included interviews and a survey of individuals in the safety profession. In addition to the researcher's previous experience, the researcher actively participated in one of the testing methods.

Because the needs of individual organizations differ, this research cannot provide one definitive answer; only a discussion of the benefits and downfalls of

each method. The list of questions provided should serve as a starting place for any organization.

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ACKNOWLEDGMENTS

In loving memory of Molly Lou; you were always there.

The researcher would also like to thank family and friends for their undying support through the last two years.

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Chapter I: Introduction

Almost all of the job duties in the construction industry are labor intensive. Most require an employee to exhibit strength levels that the U.S. Department of Labor (DOL) defines as medium to heavy at the very least. Employees who are required to work above their strength level are more apt to experience a job related injury.

For years, the construction industry has been plagued with work related injuries. With the available work force aging and workers' compensation insurance premiums rising, employers need all the information they can get to assure them they have found the right employee for the job. Employers need a safe, cost effective, objective way to test potential employees that will match their physical abilities to the job duties and identify potential employees who are not suited to the position they are applying for.

Several different methods of pre-employment, post-offer physical testing are available to employers in the construction industry today. The use of these tests is sometimes controversial, leading to claims of discrimination.

Each of the methods will be explored at length in this paper. The testing must be administered fairly and within the law (Nicholson, 2000).

Purpose of the Study

The purpose of this study is to explore the major methods of pre-employment, post-offer physical testing available to employers in the construction industry.

Goals of the Study

The goal of this study is to 1) identify the different types of pre-employment, post-offer physical testing and provide employers, union representatives and prospective employees in the construction industry with the basic information they need to

understand the different types of pre-employment, post-offer physical testing available to them; 2) define the similarities and differences of these methods; 3) to gather data and opinions from those individuals in the construction industry who are currently using some form of pre-employment, post-offer physical testing and opinions from those employers who currently don't; and 4) provide employers in the construction industry who are considering a pre-employment, post-offer physical testing program with a list of questions to help them determine if pre-employment, post-offer testing could benefit their company.

This will be accomplished through a review of current literature, the compilation of informal interviews conducted by the researcher as an intern at Associated General Contractors of Minnesota (AGC of Minnesota), and a small formal survey of AGC of Minnesota safety committee members who indicated an interest.

Background and Significance

Muscular Skeletal Disorder (MSD) injuries can prove to be very expensive, long-term work related injuries. These types of injuries and disabilities are costly to an employer as well as debilitating to the employee and his/her family (Philson, 2000).

The ability to predict and screen out potential employees who are most likely to experience a MSD injury can save a potential employer money, keep workers' compensation insurance premiums low and prevent a serious injury on the job by removing a worker who is not physically capable of performing a job function safely from the roster of potential employees.

As the working population ages, the physical abilities of workers decreases leading to the increased possibility of serious, work-related MSD injuries and disabilities.

Many construction workers will not be physically capable of performing the same duties over the entire course of their lifetime.

The determination of physical ability to perform a physically demanding job task must be done in a medically sound, repeatable, reliable, non-discriminatory way that will stand up in court of law if the decision not to hire this person is contested by the job applicant.

Assumptions of the Study

It is assumed that those professionals interviewed will share their honest opinions. It is understood that there are trade secrets that cannot be revealed.

Definition of Terms

Body index score. The numeric value assigned by CRT to correspond to the DOL strength levels.

Isokinetics. Isokinetic testing attempts to measure the maximum force (or strength) that a muscle is capable of producing throughout the entire range of motion of the joint. Isokinetic is a method of measuring movement at a constant speed.

Isoinertial. Isoinertial testing attempt to measure the force applied to a muscle when a constant mass is applied. In this case, the resistance or weight is constant and the speed that the weight is moved changes.

Pre-employment, post-offer testing. The offer of employment is conditional; in the case of this paper, the employee must past the physical test as a hiring requirement.

Strength_levels. U.S. Department of Labor (DOL) descriptions of physical requirements of job categories as defined in the Dictionary of Occupational Titles. These

include sedentary, sedentary-light, light, light-medium, medium, medium-heavy and heavy. See Appendix A for a complete requirement description.

Chapter II: Literature Review

With workers' compensation premiums increasing and the available work force aging, many employers are searching for a way to determine if the person they wish to hire is physically capable of performing the tasks required by the position. An increasing number of employers are asking if pre-employment, post-offer physical testing is an effective method to determine employment standards. Will this type of testing enable an employer to reduce the incidents of an employee being injured while at work but not unjustly limit the dwindling available skilled workforce?

Today's employers need to know what pre-employment, post-offer physical testing methods are currently available and if these methods can actually help them reduce injuries. As Dr. Soderberg (2004) pointed out, there has been little interest or research comparing different methods of pre-employment physical testing relating to job ability.

Employers in the construction industry who wish to reduce their injury rate and their workers' compensation costs may wonder if pre-employment, post-offer physical testing would benefit them and, if so, what type of testing is best suited to their company's needs. Philson (2000) believed that assessing the physical abilities of new employees is money well spent. A study done at the University of Massachusetts estimated that 10% of employees are unable to safely perform their job and account for 75% of accident losses. An added bonus of pre-employment testing, as indicated in the Cost Reduction Technology (CRT) brochure and suggested by Philson, is that it also provides a baseline that can be used in the post-incident rehabilitation process if an injury should occur in the future.

The Decision to Test Employees

Work-related injuries cost companies millions of dollars each year. The Occupational Safety and Health Administration (OSHA) estimated that over 50% of workers in the United States will have some form of repetitive motion injury (Philson, 2000). The direct costs incurred not only include the injured employee's medical bills but also a reduction or loss of productivity among the remaining crew members because they are short handed, replacement of wages, lump sum payouts and increased workers' compensation premiums. In addition, as Legge and Burgess-Limerick (2007) pointed out, the indirect costs are estimated to be up to five times that of the direct cost. These indirect costs can include such items as morale issues resulting in a reduction in the work efficiency of the remaining crew members the injured employee worked with as well as increased overtime paid to remaining crew members. Welsh, Hunting and Nessel-Stephens (1999) also have stated that all of us pay for injured workers who cannot return to work in the form of Social Security disability benefits.

Employers who are able to screen out potential employees with pre-existing conditions such as degenerative disks are able to keep these pre-existing conditions from becoming a workplace injury. Often the potential employee may not be aware of the condition, as indicated by Philson (2000). In the past, the assumption had been made that the condition was work-related and the employer's workers' compensation insurance was responsible for the cost.

Methods of Testing

In the past, employers have tried a number of different ways to predict an applicant's ability to perform the required job tasks and assess their potential for injury.

These methods have included taking x-rays of the employee's back, specifically the lumbar region; evaluating the employee's medical history; and completing simulation activities, but as Legge (2007) found, none of these methods have proven to be a reliable indicator of an employee's ability to perform a given job over time without injury.

Different Testing Systems on the Market

There are several types of pre-employment physical tests on the market today that all claim to be beneficial to employers. They claim to be able to assist the employer in areas such as increased productivity and workplace safety, lowering the injury rate, reducing workers' compensation premiums and lowering administrative costs (Philson, 2000) or some combinations there of. All of these tests must meet the Americans with Disabilities Act (ADA) and Equal Employment Opportunity Commission (EEOC) guidelines.

These tests typically fall into the following basic two categories – isokinetics; isoinertial or isotonic.

Isokinetic and isoinertial testing both produce quantifiable data for the muscles tested as stated by Dr Soderberg (2004). The difference between these two methods of testing is as follows:

Isokinetic testing attempts to measure the maximum force (or strength) that a muscle is capable of producing throughout the entire range of motion of the joint. Isokinetic is a method of measuring movement at a constant speed ("Isokinetics Explained," n. d.). Isokinetic measurement is done by keeping the speed of the test equipment constant and increasing the resistance as the person being tested pushes harder. The Cost Reduction Technologies (CRT) test is a form of isokinetic testing.

Isoinertial testing attempts to measure the force applied to a muscle when a constant mass is applied. In this case, the resistance or weight is constant and the speed that the weight is moved changes ("Isokinetics Explained," n. d.). Isoinertial is a newer, more appropriate term to describe movement; in the past, this type of movement was often referred to as isotonic or constant tension movement (Abernethy, Wilson & Logan, 1995). Isoinertial and isokinetics are basically opposites of each other.

Functional capacity testing (FCT) falls into the isoinertial category and often includes a medical examination. Philson (2000) describes these tests as job specific. FCTs are typically administered by a physical therapist in a clinical setting. They have been designed for the specific job tasks with input from the hiring company. These tests often include evaluation of the musculoskeletal and cardiovascular systems, as well as body strength. Functional capacity tests can also include work simulation. While Philson believes that FCTs are the best choice for pre-employment testing, Dr Soderberg (2004) feels that there is not enough research data to indicate that FCT are a reliable method of determining that an applicant is a good fit for the position they have applied for.

Summary

A review of the literature indicates that many employers do feel a need for pre-employment, post-offer physical testing to screen potential employees and to determine that the employee is physically able to perform the tasks required by the job he/she is being considered for. This screening should protect the interests of both the employee and the employer.

A review of the available literature also revealed a number of different types of physical testing available to employers and the conflicting opinions as to which type is best. Employers have no clear answers when it comes to pre-employment, post-offer physical testing and further research is indeed needed.

Chapter III: Methodology

The aging workforce and dwindling number of available skilled employees in the workforce along with the rising workers' compensation premiums are making it necessary for employers to be very wary of whom they hire.

The objectives of this research therefore are to 1) identify the different methods of pre-employment, post-offer physical testing available to employers in the construction industry today and provide the basic information needed to understand each of these methods, 2) define the differences and the similarities among the tests, 3) to gather data and opinions from those individuals in the construction industry who are currently using some form of pre-employment, post-offer physical testing and opinions from those employers who currently don't; and 4) provide employers in the construction industry who are considering a pre-employment, post-offer physical testing program with a list of questions to help them determine if pre-employment, post-offer testing could benefit their company.

Data Collection Procedures

Phase 1. The first phase of the research for this project began while the researcher was working as an intern at the Associated General Contractors (AGC) of Minnesota. The data that was collected during the first phase of this research falls using two very different categories: the researcher's own hands-on experience completing the Cost Reduction Technology (CRT) test and the informal gathering of information and opinions from AGC of Minnesota member employees and others involved in the pre-employment, post-offer physical testing process. This information was gathered from June 1, 2008 through August 31, 2008.

Phase 1, part 1. The researcher completed the CRT pre-employment, post-offer physical test at two separate AGC of Minnesota member companies. The researcher also interviewed the persons administering the AGC of Minnesota member employees and others at the test sites. Test results from both CRT tests were obtained after each test. The researcher's impressions as well as all comments from the member employees were recorded when the researcher returned to the office. These are included in appendix G.

The appointment for the first CRT test was arranged by the researcher's supervisor on very short notice with a member company that owned their own CRT machine. The researcher went to this first CRT test with very little information just as a prospective employee might. The only instruction the researcher was given was to wear comfortable shoes. The member employee who administered the CRT test was very competent with regard to administering the test, but that is where the employee's knowledge ended. The researcher left with more questions than answers. This test was administered on June 6, 2007.

The researcher conducted an informational interview on June 11, 2007 with an occupational health consultant at another member company who offered CRT tests to their clients. The consultant was very knowledgeable with regards to the CRT test and even got the owner/designer of CRT on the telephone for a teleconference while the researcher was in the office.

Before this meeting the researcher review the notes recorded after the first experience. Since this was an information gathering interview the researcher began with very basic questions: 1) how does the CRT test work? 2) what are the advantages and disadvantages of the CRT test? The occupational health consultant took it from there.

It was suggested at this informational interview that the researcher schedule a second CRT test at this location, a clinical setting, to compare and contrast the testing procedure and also to see if the researcher's score could be improved with a second test. The researcher completed a second CRT test on July 24, 2007. The similarities and differences of the testing process, as well as the knowledge and skill of the technician administering the test were documented in the researcher's notes upon returning to the office. At this second CRT test the researcher also had the opportunity to view the informational video that is shown to each prospective employee before the CRT test is administered at this location.

Phase 1, part 2. The researcher also had the opportunity to meet many AGC of Minnesota members who voiced their opinions on pre-employment, post-offer physical testing. AGC of Minnesota members were interviewed both formally and informally over the course of three months. These interviews consisted of open-ended questions designed to get the member employee to express his/her feelings about pre-employment, post-offer physical testing. These conversations always began with the researcher asking if the member employee's company had any type of pre-employment, post-offer physical testing. The answer to this question directed the conversation.

These conversations took place during jobsite visits, information-gathering interviews, as part of special projects, at gatherings including monthly young constructor forum (YCF) social hours and other work sponsored events. Other members offered their opinions and knowledge in a more formal interview setting. A complete list of questions can be found in appendix B. The information gathered in all of these conversations was documented when the researcher returned to the office at the end of the day and is

complied in Appendix G. These interviews were conducted between June 1, 2007 and August 31, 2007.

The AGC of Minnesota member employees that the researcher met with were involved in many different areas of the construction industry including general construction, highway heavy construction, dry wall, electrical, steel erection and tiling as well as several members from the insurance industry. These members held positions throughout the construction industry and held positions such as environmental health and safety (EH&S) directors; safety engineers, safety coordinators, human resource managers, project managers and company owners.

This area of the data collection process also included informal interviews with others who are involved in some way with the pre-employment, post-offer physical testing. Other individuals encountered in this phase of data collection included an occupational therapist that works with employers in central Minnesota to create detailed job descriptions and is familiar with both the CRT and work simulation type methods of testing. An occupational ergonomist and several members from different areas of the insurance industry including those who specialize in loss prevention and risk control analysis. involved in the construction industry were also very willing to offer their opinions regarding pre-employment, post-offer physical testing after an ergonomic workshop the researcher attended on July 27,2007 that was sponsored by CNA.

Phase 2: The second phase of this research began with an attempt to reach more AGC of Minnesota members with a formal survey. With the assistance of the AGC of Minnesota safety committee coordinator, an e-mail was sent to all of the approximately 120 members of the AGC of Minnesota safety committee requesting that those members

who wished to express their opinions to please respond to the researcher via e-mail. The names and e-mail address of those who responded were compiled.

After filling the necessary paperwork with the IRB and obtaining their approval, a survey was sent to the 10 members who had responded to the initial request.

A very short survey was created and e-mailed to the 10 respondents of the first query. The survey was sent using the blind carbon copy (bcc) option so that the respondents would remain anonymous. See Appendix C– Survey and Appendix D– Implied Consent Statement.

This survey began by asking if their company used any type of pre-employment, post-offer physical testing. If their company did use some form of pre-employment, post-offer physical testing, they were asked to briefly explain what their company required. They were also asked to explain what benefits they felt they received from the testing and if they had data to support their opinions. If, on the other hand, their company did not use any form of pre-employment, post-offer physical testing, they were asked to share the reasons why their company chose not to test. See appendix C– Survey Questions.

Data Analysis

The data collected in phase 1 was used to increase the researcher's knowledge of the CRT testing process. The researcher had prior experience with other pre-employment, post-offer physical testing methods through past employment.

The data collected in phase 2 was recorded and organized according to whether the company used pre-employment, post-offer testing or not. It fell into the following two general categories with corresponding subcategories which will be elaborated on in chapter 4.

- Companies who do not use any type of pre-employment, post-offer physical testing. Subcategories relating to why testing was not used included
    - cost
    - not thought to be beneficial
    - more information needed to make a decision.
    - have not considered
- Companies who use some form of pre-employment, post-offer physical testing. Subcategories indicating the type used included
    - CRT
    - job simulation
    - general physical exams
    - a combination of these

Limitations of the Study

This study was limited in general by the availability of those in the construction industry to voice their opinions on the subject. Many who were initially contacted indicated informally that they could not find the time to participate. A few individuals said that they did not feel their employer would allow it.

Phase one, part one of this study was limited by the number of CRT machines owned in the Minneapolis-St Paul area and the individuals associated with these machines that the researcher came in contact with.

Phase one, part two of this study was limited by the population of employers in the construction industry in the Minnesota Twin Cities general area who belong to the

AGC of Minnesota and by those individuals the researcher met who were interested in discussing this topic.

Phase two of this study is limited by the number of AGC of Minnesota safety committee members who responded to the original e-mail.

Current pre-employment, post-offer testing methods on the market today also limit this study.

Chapter IV: Results

Commercial construction projects are getting bigger and more complicated. Customers are asking for more from contractors than just a quality finished product. Today's commercial construction contractor is expected to be environmentally responsible as seen by the growing number of contractors involved in leadership in energy and environmental design (LEED) and green building programs. They must also provide a safe, healthy workplace for all employees on their jobsites. General contractors typically require subcontractors to provide their workers' compensation experience modification rate (EMR) and their OSHA recordable injury rate as part of their contractors' pre-construction safety package. Those whose numbers are too high are not rewarded the bid. More and more, it is not necessarily the subcontractor with the lowest bid that is awarded the contract. This was expressed by several AGC of Minnesota member companies that were interviewed for this project.

With the number of available employees with solid construction experience dwindling and the focus on safety increasing, employers in the construction industry are searching for quick, efficient, inexpensive and reliable methods of testing prospective employees.

The purpose of this study is to 1) identify the different methods of pre-employment, post-offer physical testing available to employers in the construction industry today and provide employers, union representatives and prospective employees in the construction industry with the basic information they need to understand the different types of pre-employment, post-offer physical testing available to them; 2) define the differences and the similarities of the options currently available 3)) to gather data

and opinions from those individuals in the construction industry who are currently using some form of pre-employment, post-offer physical testing and opinions from those employers who currently don't; and 4) to provide employers in the construction industry who are considering a pre-employment, post-offer physical testing program with a list of questions that an employer can use as a starting place to help them determine if pre-employment, post-offer testing could benefit their company.

Results of data collection

Phase 1, part 1. The researcher completed two Cost Reduction Technology (CRT) pre-employment, post-offer physical tests over the course of the summer, one test in a clinical setting and the other at an employer's corporate setting. The researcher had completed several work simulation, pre-employment, post-offer physical tests in the past as a condition of employment and therefore did not find it necessary to seek out an AGC of Minnesota member company who used work simulation pre-employment, post-offer physical testing.

Similarities noted between the isokinetic and isoinertial testing. Both isokinetic and isoinertial testing meet all legal requirements defined by the Americans with Disabilities Act (ADA) and are generally accepted by the various trade unions within the construction industry. Both pre-employment, post-offer physical testing methods provide an employer with useful data on which to base their decision to hire the prospective employee. The test results from either method of pre-employment, post-offer physical testing can also provide a baseline if injuries occur in the future.

It is advisable for the employer to have a well defined, detailed job description completed before beginning a testing program as indicated by many of the professionals encountered in the course of this research. This can be done within the company or with the help of an occupational health professional.

Similarities noted between the two CRT tests.

The CRT machine looks like a piece of equipment that could be found in a health club. Its appearance does not differ from one location to another and the procedure is always the same although the testing may be performed in a different order.

The information entered into the computer attached to the CRT prior to the test was the same at both locations. The information includes name, gender, age, weight, height, right or left handed or both and is gathered for informational purposes only and does not affect how the computer calculated the score.

At both locations the prospective employee was given a waiver to sign and both times the researcher was instructed to work as hard and fast as physically possible.

After the test is completed, the prospective employee receives his/her score. The computer also prints out graphs that can be given to the employee if the employer so chooses. These graphs can also be filed in the employee's file for future reference. is the claim that this test is completely safe.

Differences noted between isokinetic and isoinertial

Methods. Isokinetic testing, measures the force exerted. This force can vary. The amount of work the individual exerts is dependent on how hard the individual works.

Isoinertial involves lifting a set amount of weight. This force does not vary. More weight can be added as the individual being tested successfully completes each series of lifts. This method may cause muscle fatigue and skew the test.

Appearance of the testing environment. The appearance of the isoinertial testing setting can vary from milk crates and shelves to simulate the work the employee will be required to do to simulated worksites the include wheelbarrows, shovels, sand, scaffolding and concrete blocks. Since the isokinetic testing equipment is more standardized its appearance does not vary as greatly, an employee who has completed a CRT test at one location know what to expect when sent to a different location.

Scoring. Each employee is given his/her score after completing the isokinetic testing. This score is calculated by a computer with little or no chance for human error. This method of testing is completely objective as the computer does all scoring. Because the test requires the individual to use specific muscle groups it is difficult to hide a pre-existing injury. Isoinertial or work simulation testing tends to be subjective. The individual's score is partially dependent on the skills and attentiveness of the technician administering the test. While technicians are instructed to look for scars or other evidence of injury, they can be overlooked, may have healed or can be covered with tattoos or makeup. Many individuals with pre-existing injuries have learned to compensate, in the short-term for weaknesses of the muscle groups being tested. This compensation may not fairly demonstrate the employee's ability or inability to perform the given task over the entire workday.

Differences noted between the two CRT testing sites and procedures

Instructions. In the clinical setting the researcher watched a video produced by CRT before the test that instructed the applicant on proper procedures and techniques. The researcher was also instructed to wear workout clothes; the corporate site indicated that street clothes or work clothes were acceptable.

Training of technicians. The technicians in the clinical setting all had medical training and backgrounds. The technician who administered the test at the construction company home office had been trained by CRT but had no medical background.

Use of back or knee braces, etc. Prospective employees are allowed to use back or knee braces in the clinical setting, if they have used them at work. They are also pads available to place behind the back, similar to those used in health clubs, for shorter or smaller employees to make the equipment more comfortable. The technician at the corporate office site was not sure if braces were allowed and had no pads to adjust the testing equipment for shorter or smaller employees. The technician stated that there had never been a request for such.

Phase 1, part 2. The researcher visited many AGC of Mn member company jobsites over the course of the summer and was fortunate to meet with members employed in all different areas of the construction industry. Information collected through conversations with AGC of Minnesota members indicated a wide range of opinions regarding pre-employment, post-offer physical testing. A list of the researcher's questions can be found in Appendix B. The researcher's notes from each of these interviews can be found in Appendix G.

Reasons cited for not testing. Of the companies who do not use any type of pre-employment, post-offer physical testing, cost and high turnover rate were most often cited as the reasons not to test. Lack of information regarding the options available to employers was also cited as a factor. Many of the smaller companies felt it was the responsibility of the union halls they hired through to send only those who met the physical job requirements. In addition, companies with good safety records indicated by a low incident rate of MSD injuries or an experience modifier rate (EMR) well below the industry average felt it was more cost effective to spend their limited resources elsewhere. In addition, those employers who retain workers on a short-term basis did not feel that pre-employment, post-offer physical testing would be cost effective.

Reasons cited for testing. Of the companies who indicated they use some form of pre-employment, post-offer physical testing, the methods used ran the gambit from a medical survey and doctor's review to the use of a detailed job description written up by a certified occupational therapist in conjunction with either the CRT test or doctor's examination and a work simulation test. These were AGC of Mn member companies who indicated they had experienced an increase in MSD injuries, a sharp rise in their worker's compensation insurance rates or who typical experienced seasonal layoffs.

None of the companies who use pre-employment, post-offer physical testing could provide definite data to backup their opinions as to the results of their testing. Some of the companies stated that they do not track this information while others thought it was too early to draw conclusions. In addition, many of the companies who have a pre-employment, post-offer physical testing program in place are also taking other proactive approaches to safety and health in other areas of their organization. While this is good

for business, it makes providing proof that pre-employment, post-offer physical testing is having a positive effect difficult.

Phase 2. The second phase of this research attempted to reach more AGC of Minnesota members using a formal survey. An e-mail was sent to all of the approximately 120 members of the AGC of Minnesota safety committee requesting that those members who wished to express their opinions to please respond to the researcher via e-mail. The names and e-mail address of those who responded were compiled. The response was very small. Of the approximately 120 members who were asked to participate, ten responded. After the paperwork was filed with the IRB (Appendix D) a very brief survey was e-mailed to each of the ten using the blind carbon copy (bcc). This survey can be found in Appendix C. Of the original ten respondents, two did not respond, two declined to participate and one could not be located.

The results of the survey that was e-mailed can be found in Appendix D. The researcher's interview notes can be found in Appendix F. A quick synopsis of the e-mail survey of those who did respondents indicated the following. The most common reason cited by those member companies who choose not to implement a pre-employment, post-offer physical testing program was that the testing did not address their company's major areas of concern such as slips, trips and falls. Therefore would not be beneficial. This was followed closely by the need for more information, concern for cost and an excellent safety record. Those member companies who employ labor on a short term basis also felt there was no need for testing and/or it would ot be cost effective. One respondent

indicated that there had been no time to consider a program because he/she was constantly busy putting out fires

Of those respondents who indicated their company used some type of pre-employment, post-offer physical testing, the majority stated they use general physical exams that consisted of one or more of the following: range of motion, back evaluation, written survey and/or a doctor's exam.

Over one half of the respondents indicated that they believe a behavior based approach is more effective in preventing injuries in the work place and have incorporated these into their overall program. Behavior based programs can include, but are not limited to wellness programs, mandatory or voluntary stretching programs or a whole life outlook on safety in both the employee's professional and personal life.

Discussion. Unfortunately, there is not an easy, one size fits all answer. Pre-employment, post-offer physical testing is not for every employer, nor is one type of testing best for every jobsite or job description. This can be seen in the differing opinions of those individuals interviewed (see Appendixes E and G). This is also supported by the results of the literature review.

From the interviews and survey results, a list of questions was developed to assist an employer in deciding if a pre-employment, post-offer physical testing program would benefit their company. An employer must define what he/she hopes to achieve from a pre-employment, post-offer physical testing program. Factors such as a rising workers' compensation rate with a large percentage of MSD injuries or a company who experiences regular seasonal layoffs may often benefit from a pre-employment, post-offer

physical testing program. An employer who typically employs workers for only a short term, has a low incident rate of MSD injuries or has an experience modifier rate (EMR) may be better off exploring other options. Companies who employ general laborers who perform a variety of task may need to consider a different type of testing program than a company whose employees are required to perform one primary task for most of the day. The type of testing chosen should compliment programs the company already in place such as stretching and the promotion of a healthy lifestyle life style. See Appendix E for the complete list of questions.

It is also important to note that almost everyone interviewed expressed the opinion that pre-employment, post-offer physical testing is one of many tools available to an employer in the hiring process. It was also stressed that the pre-employment, post-offer physical test results were a "snap shot" of the employee's physical condition on the day of the test. There are many factors that can influence future test results, both negatively and positively.

Chapter V: Conclusions and Recommendations

The aging workforce and dwindling number of available skilled employees in the workforce along with the rising workers' compensation premiums are a growing concern in the construction industry. Employers in the construction industry would like to find a foolproof method of screening perspective employees to ensure they never get seriously injured. Unfortunately, this will most likely never be possible.

The goal of this research was to 1) identify and explore the different types of pre-employment, post-offer physical testing available to the construction industry and define them; 2) define the similarities and differences of these methods; 3) gather opinions and data from those who are currently using some form of pre-employment, post-offer physical testing and to explore the reasons why those who are not testing choose not to; and 4) provide employers who are considering a pre-employment, post-offer testing program with a list of questions that can be used as a starting place to assist in determining if a pre-employment, post-offer physical testing program would be beneficial to their company.

Information was collected through informal interviews and site visits with safety personnel as well company owners and representative. These companies varied in size and specialty. All of those interviewed expressed a sincere wish to keep their employees safe as well as to keep workers' compensation costs low.

Conclusions

- Pre-employment, post-offer physical testing can be a useful tool in the hiring process but it is important to note that there is no single test that is right for every

situation. This can be seen in the various opinions expressed in the current literature and by safety professionals working in the construction field.

- As indicated by the opinions expressed by those who participated in this research, pre-employment, post-offer physical testing appears to be most successful in companies that are proactive with regard to their safety and health programs and have a positive safety culture. This type of testing is used along with other techniques to ensure the continued health and safety of the work force.
- A critical point with any type of pre-employment, post-offer physical testing is that the score or rating received the day of the test it is basically a "snapshot" of the employee's physical state at that time. Many factors can change the rating in the future including
    - Lifestyle changes. These changes can include weight loss or weight gain or moving from a sedentary to an active lifestyle. Positive changes may increase the employee's rating while negative changes may decrease it.
    - Poor work techniques. Repeatedly lifting improperly or jumping from equipment causes an accelerated rate of wear and tear on the musculoskeletal system. Over time, these poor practices may decrease the employee's score.
    - Changes that come with age. Strength and flexibility decline as an employee gets older. A score that was recorded when the employee was hired will typically be higher than one recorded years later.
- The results from pre-employment, post-offer physical tests can be used for more than just the pre-employment screening.

- After an injury, the initial results can be compared to the post-injury results. This comparison can be a useful tool in determining when an employee is able to return to work.
- Companies who experience long seasonal layoffs may wish to re-test especially if they have seen a trend in MSDs shortly after the return to work.
- Results from periodic testing may be used to assist the decision making process of moving an older worker to a less physically demanding position while capitalizing on their experience.

Recommendations

An employer who is considering beginning a pre-employment, post-offer physical testing program must define their reasons leading them to this decision and the outcomes they hope to achieve.

- Have they seen a rise in their workers' compensation rates or a rise in MSDs? Have they seen an increase in injuries to employees after a long layoff period? The occurrence of any of these events is an indication that the employer should continue with their pursuit.
- Indications that it may not be in the employer's best interest to pursue a pre-employment, post-offer physical testing program at this time would include a low incident rate of MSD injuries or an experience modifier rate (EMR). Those employers who only employ workers on a short-term basis may not benefit from this testing.

A complete list of questions is provided in Appendix F can be used by an employer as a starting point. This list is only a starting point and will have to be modified to meet the employer's needs at the time.

Once an employer has determined that a pre-employment, post-offer physical testing program will be beneficial, they should then take the following steps:

- Define the job duties the prospective employee will be required to perform. Do employees perform a specific set of tasks or are they required to fulfill a position where their tasks vary with the jobsite?

  In positions where an employee performs a specific task many of those interviewed indicated that isoinertial testing or work simulation may be the best choice. Employers who require employees to perform a variety of tasks indicated that they felt they would benefit from isokinetic testing as would employers who experience an increase in MSDs after a long layoff.

- Work with a qualified occupational therapist to develop a complete, comprehensive job description for each position. This step is essential without regard to which type of physical testing is chosen. The health professionals interviewed all indicated that were very knowledgeable in all forms of pre-employment, post-offer physical testing although most had their opinions as to which they thought was better.

  The more detailed the job description, the more accurate the definition of the physical requirements of work to be performed will be. The physical requirements of the job can then be assigned a corresponding strength level

designated by the U.S. Department of Labor. See appendix A for a definition of each strength level.

- Assess programs that are currently in place. Do they have any type of health and wellness program? Do they have a stretching program? Do they include information to about healthy lifestyles to their employees? Most everyone interviewed indicated that they felt that their success was a combination of many programs, not just one thing they were doing.

Knowing what programs are currently in place may assist the employer is the decision making process. These types of programs can complement the testing method chosen and contribute to the overall culture of the organization. The company's insurance provider may be able of offer insight and assistance in this process.

Areas of Further Research

Technology will surly bring improvements to the current methods of pre-employment, post-offer physical testing as well as new methods. Documentation and data collection are needed for all methods of pre-employment, post-offer physical testing. Dr Soderberg's (2004) remark regarding FCT can be applied to all methods of pre-employment, post-offer physical testing – there just is not enough data available to employers in the construction industry. As more companies implement pre-employment, post-offer physical testing in their quest to reduce injuries and workers' compensation costs, more data should become available. Information sharing among safety professionals will continue to be beneficial to all.

References

Abernethy, P., Wilson, G., & Logan, P. (1995). Strength and power assessment. *Sports Medicine, 19*, 401-417. Retrieved November 21, 2007 from Coaching Science Abstracts Volume 3(4): February 1998

Isokinetics explained. (n. d.). Retrieved November 21, 2007, from http://www.isokinetics.net/index2.htm

Legge, J., & Burgess-Limerick, R. (2007). Reliability of the JobFit system pre-employment functional assessment tool. *Work; A Journal of Prevention, Assessment, and Rehabilitation, 28*(4), 299-312.

Nicholson, G. (2000, October). Pre-employment screening. *Workforce, 79*(10).

Philson, C. S. (2000, January). Functional capacity testing. *Occupational Health & Safety, 69*(1), 78-83.

Soderberg, G. L. (2004, April). Scientific treatise on the bases, principles, validation and protocols for isokinetic testing in the workplace, *Southwest Missouri State University.*

Welsh, L. S., Hunting, K. L., Nessel-Stephens, L. (1999). Chronic symptoms in construction workers treated for musculoskeletal injuries. *American Journal of Industrial Medicine, 36*(5), 532-540. http://www.rohan.sdsu.edu/dept/coachsci/vol34/table.htm

Appendix A: Department of Labor Tables

U.S. Department of Labor and CRT Definitions of Strength Levels

STRENGTH LEVELS	OCCASIONAL 1 to 100 reps/8hrs	FREQUENT 101 to 300 reps/8hrs	CONSTANT 301 to 500 reps/8hrs	CRT BODY INDEX SCORE
Sedentary	0 - 10 lbs	NEGLIGIBLE.	_____	<100
Sedentary-Light	11 - 15 lbs	7 - 9 lbs	NEGLIGIBLE.	101 TO 126
Light	16 - 20 lbs	10 - 12 lbs	5 - 6 lbs	127 TO 150
Light-Medium	21 - 35 lbs	13 - 21 lbs	7 - 10 lbs	151 TO 170
Medium	36 - 50 lbs	22 - 30 lbs	11 - 15 lbs	171 TO 200
Medium-Heavy	51 - 75 lbs	31 - 45 lbs	16 - 22 lbs	201 TO 225
Heavy	76 - 100 lbs	46 - 60 lbs	23 - 30 lbs	226 TO 253
Very Heavy	>100 lbs	> 60 lbs	> 30 lbs	254 PLUS

Appendix B: Questions asked on AGC of Minnesota member company jobsite visits and other informal AGC of Minnesota gatherings

Does your company have any type of pre-employment, post-offer physical testing program?

If yes:

- What type of program does your company use?
- What does the program include?
- Is this program job specific?
- What do you think are the pro's and con's of this type of program?
- What changes or additions would you like to make to the program?

If no:

- Do you know why not?
- Do you think your company would benefit from a program like this? Why? Why not?

Appendix C: Survey Questions

Title: Pre-employment post-offer physical testing in the construction industry

Investigator: Valerie F. Hannon
hannonv@uwstout.edu
320.267.1045

Does your company require any type of pre-employment post-offer physical testing?
Yes or No

If Yes, please briefly explain what your company requires.

Do you feel this has reduced the injury rate at your company? In what ways?

If yes, do you have data to support this?

If No, please share why your company does not require pre-employment post-offer physical testing.

Appendix D: Implied Consent Statement

This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.

Consent to Participate In UW-Stout Approved Research

Title: Pre-employment post-offer physical testing in the construction industry

Investigator: Valerie F. Hannon
hannonv@uwstout.edu
320.267.1045

Description: As worker's compensation cost rise and the work force ages, many employers attempt to assess a worker's physical ability to perform job tasks. This research will address types of physical testing available to employers in the construction industry today that meet all legal and ADA requirements.

Risks and Benefits: There are no risks beyond normal, everyday risks. The questions being asked are about procedures already in place and your opinions of these procedures. The only benefit to you is the opportunity to contribute to this research and that the investigator may be contacted as a resource for this subject after the project is completed.

Time Commitment: The estimated time to complete this survey is 15 minutes or less.

Confidentiality: Your name will not be included on any documents. All responses will be kept confidential.

Right to Withdraw: You are under no obligation to complete this survey; your participation is voluntary. If you choose not to participate, the investigator would appreciate an e-mail at the above e-mail simply stating "not interested" so that you will not be contacted again.

IRB Approval: This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

Investigator: Valerie F. Hannon
hannonv@uwstout.edu

IRB Administrator
Sue Foxwell, Director,
Research Services

320.267.1045 152 Vocational Rehabilitation Bldg

UW-Stout

Advisor: Dr. Bryan Beamer Menomonie, WI 54751
beamerb@uwstout.edu 715-232-2477
foxwells@uwstout.edu

Statement of Consent: By completing the following survey you agree to participate in the project entitled, Pre-employment post-offer physical testing in the construction industry.

Appendix E: Survey Results

If no, please share why your company does not require pre-employment post-offer physical testing.
Respondent #1.
I think it is because we have not considered it. We in construction hire so many people and let them go sometimes in a short time. Turnover is high because of the nature of the work. This would be a significant expense.

If yes, please briefly explain what your company requires.

Respondent #1.
My company requires a physical after job offer. It includes a doctor's review, survey and exam.

I have no data on whether or not this has reduced the injury rate.

Respondent #2.
Drug Screen. Four pages questionnaire of personal and family history. Range of motion exam. Back evaluation.

We have approximately flagged 5% on drugs and 5% on the medical side. I figure if they would only flag one person a year that one person that could have been a w/c claim, I got all the others tested for free.

Respondent #3. DOT required physicals and a general physical (with reference to the job description) for non-DOT affected employees.

We have been able to assign new-hires to job tasks that are within any physical limitations they may have.

Physical testing is just one part of many proactive programs we implement. Although we don't have data specifically for physical testing and the effect it has had on our injury rate, we cans say that the combination of several proactive incident reduction techniques has driven our injury rates well below the industry average. A look at the 10-year history shows a consistent downtrend since the implementation of proactive programs (including physical testing). As far as hard data....our recordable injury rate for 2007 was 6.3 and our loss time injury rate was 1.2. our EMR was 0.72, 10 years ago our recordable injury rate was 15.6, our loss time injury rate was 9.2 and our EMR was 0.97.

Respondent #4. WE begin with a rapid 5 panel drug test followed by a physician check up and then off to a work strategies to test for range of motion, lifting, climbing etc.

We have also implemented a stretching program to go along with our health and wellness programs.

We feel that it is too early at this stage since we have only had this program in place for a couple of years. But we feel strongly that it will help reduce the injury rate.

Note: Two of the original 10 who responded to the initial request declined to participate.
Two of the original 10 did not respond to the survey.
One of the original 10 was no longer employed at an AGC of Minnesota member company and could not be reached.

Appendix F: Questions to assist Employers in determining if a Pre-Employment, Post-offer Physical Testing Program would be beneficial to their company.

1. Do I need to begin a pre-employment post-offer physical testing program?
   - Ask and answer these questions: Has the company seen a rise in workers' compensation claims?
   - Has the company experienced a large percentage of MSD injuries?
   - Does the company typically experience seasonal layoffs?
   - Does the company recall the majority of laid off employees?

   If you answered yes to any of these questions, your company should further explore pre-employment, post-offer physical testing programs.
   - Is the company's workforce is made up primarily of short term employment workers?
   - Does the company have a low incident rate of MSD injuries?
   - Does the company have an experience modifier rate (EMR) of less than 0.7?

If you answered yes to these questions your company would probably be better off exploring other avenues.

2. If you have determined that your company may benefit from a pre-employment, post-offer physical testing you should ask and answer the following questions to further define the type of pre-employment, post-offer physical testing program your company would benefit from most:
   - Do most of our employees perform one specific task?
   - What are the employee's job duties? Be as specific as possible, you may consider working with an occupational health specialist or ergonomist to develop a job task analysis.

If you answered yes, most of the employees perform one specific task then your company may benefit more from a job specific type of pre-employment, post-offer physical testing program.
If you answered no, your company may benefit more from a pre-employment, post-offer physical testing program such as the CRT test.

3. What other programs are already in place?
Many companies have health and wellness programs that include stretching, the promotion of a healthy lifestyle life style both on the job and off.
No matter what type of program your company chooses you will want it to compliment what is already in place.

Appendix G: Researcher's Interview Notes

Site visit – general contractor

- Current pre-employment program costs approximately $250 per potential employee. It is a work simulation type program of their own design. It is difficult to determine how the testing affects the overall incident rate.

Conversation with an occupational health employee

- Development of a job description. A job hazard analysis (JHA) is performed by an occupational therapist. The job requirements are defined and classified using the Department of Labor (DOL) Dictionary of Occupational Titles. In Minnesota these are job descriptions are written up on the State of Minnesota R-32 form.
- Retesting.
    - Some companies will allow a prospective employee to retest after working out for 3 to 4 weeks.
    - Other companies have been directed by their workers' compensation insurance companies not to allow prospective employees to retest; if their score is too low for the position they applied for, they are not hired. The belief is that the employee will revert back to their poor lifestyle behaviors after becoming employed.
- Other advantages of the CRT
    - The pre-employment graphs can be compared to graphs taken after an employee is hurt. Inconsistent curves can indicate 1) an employee is malingering, 2) an employee is not strong enough to return to their regular

position after an injury or 3) can be used to indicate loss of conditioning after a layoff.

- The body index score (BIS) is determined without consideration for age, height, weight or sex. Each company can adjust it. It is based on the level of physical activity required by the job duties.

Site visit – steel erection

- The union conducts pre-employment testing before sending employees to the jobsite.
- Testing is cost prohibitive to their small company and would not help with the type of injuries most commonly seen on the jobsite.

Jobsite visit – general contractor

- Programs in place are working extremely well and therefore it is not seen as cost effective to conduct pre-employment physical testing. It is felt that a good stretching program is more beneficial to the employees.
- A behavioral based approach it taken to safety as well as an attitude that safety is not just a work issue.

Informational interview – general contractor

- No type of pre-employment post-offer physical testing is currently being used. It had been discussed in the past but it is not currently something the company is

considering. General information gathered was conflicting and confusing, too much smoke and mirrors.

Jobsite visit – small specialty contractor

- Physical testing is cost prohibitive and would not address injuries that are most common.

Jobsite visit – general contractor

- While there are pro's and con's to physical testing it is felt that the pre-employment drug and alcohol testing did a very good job of keeping unwanted employees off the jobsite. While the concept of physical testing is intriguing, the overall incident rate does not indicate a need for it at this time.

Jobsite visit – highway heavy construction

- Pre-employment testing includes drug and alcohol testing and a doctor's exam. A low injury does not indicate the need for physical, job specific testing and the cost cannot be justified.
- Because of the low incident rate, the safety department has begun to concentrate more on the behaviors (researcher's comment – root causes) in the event an incident does occur.

Jobsite visit – highway heavy construction

- This member company uses CRT and feels it is the most effective option available to them. They also acknowledge that no testing system is right for everyone.
- Advise for anyone wishing to set up any type of physical testing:
    - Realize that there will be an initial investment of time and money to set the program up.
    - Work with an occupational therapist to develop very detailed job descriptions. These job descriptions determine the BIS needed to qualify for each position.
    - Having done all of the "homework" before starting a implementing a pre-employment post-offer physical testing program helped this company win in court when their decision not to hire an individual was questioned.
- This type of testing is only one part of an overall safety program that is successfully working for this company.

Jobsite visit – highway heavy construction

- This member company does not require any type of physical testing at the current time.
- The safety specialist was new to the position and had previously been employed as part of the company's labor force.

- The safety specialist had never heard of pre-employment physical testing but found the idea very interesting. It is not something that will be pursued in the near future, as other issues are more pressing.

Jobsite visit – highway heavy construction

- Pre-employment physical testing is not being conducted at this member company. It was the safety director's opinion that it would not be of use, as it does not test for their most common types of injuries (slips, trips and falls).
- The safety director is new to the highway heavy area of construction but had previously worked for a utility locating contractor as the office manager/ safety director for several years. That company also did not use physical testing.
- This company is smaller than the other highway heavy members previously visited and the safety director duties are combined with those of the HR manager.

Jobsite visit – wall and ceiling contractor

- This member company used the CRT in all areas of the country where it is available. They felt that this was the best choice for their company at the present time. The ability to refer back to the initial graphs in the future was seen as an added bonus of the system.
- The safety director came to the construction industry after working in the insurance industry for almost 20 years. This career move was seen as a way to prevent accidents from happening instead of investigating accidents after they happened.

Informational interview – electrical construction

- This member company see no need for pre-employment post-offer physical testing at this time. They do not feel that the companies who offer these services have proven themselves.

Site visit – electrical construction

- This member company does not use pre-employment physical testing. The current safety director is working to put together a system to present to top management similar to one implemented as a past employer.
- While working for a general contractor the current safety director help implement a job simulation type of pre-employment post-offer physical testing is used at this member company. This system was set up with the assistance of an occupational therapist. This system is very job specific right down to the donated materials used in the testing. Applicants perform many tasks including shoveling sand, moving blocks and stacking them repeatedly. This is a very time consuming test and an estimated cost was not available. This company looked into using the CRT but rejected it.
- Items to take into consideration when using a doctor's exam as part of a physical testing system:
    - Clothing can disguise scars from previous injuries and surgeries.
    - Individuals who have a past injury are very skilled at compensating for their injury in short-term tests.

Informational interview – occupational health specialist

- This occupational therapist performs Job Hazard Analysis (JHAs) at customer's jobsites. The therapist spends several hours on the jobsite observing employees performing the required job tasks, taking measurements and photos. Areas included in this analysis include essential work tasks; tools, equipment and vehicles necessary to the job positional demands; lifting demands; carrying demands; push/pull demands as well as other job specific demands. This information is used to write up a very detailed, in-depth job description (in Minnesota form R-32 is used). From this R-32 the job category can be determined (see Appendix A). This job category indicates the threshold from which the CRT number is determined.
- It should be noted that while this OT complies job descriptions that are used in conjunction with the CRT, this in no way implies any endorsement of the CRT. It is part of the OT's job description. This OT prefers the practical type testing over the CRT.

CRT test – consistent at both sites

- Information entered into the computer attached to the machine prior to the test include name, gender, age, weight (no scale is used rather the applicant is asked what they weigh), height, right or left handed or both.
- Applicants are directed to work as hard and as fast as they can.
- All applicants must sign a waiver before beginning the test.
- Test procedure are exactly the same for each applicant, removing all subjectivity.

CRT test – inconsistencies found between sites

- The technician who administered the test at the construction company home office had been trained by CRT but had no medical background. The technicians at the medical provider all had medical backgrounds.
- One site had applicants watch a video produced by CRT before the test that instructed the applicant on proper procedures and techniques. This site also instructed the applicant to wear workout clothes; the other site indicated that street clothes or work clothes were acceptable.
- On site allowed applicants to use back or knee braces if they have used them at work, or pads behind their back (similar to those used in health clubs) in the case of shorter employees to make the equipment more comfortable.

Informational interview – ergonomist at an ergonomics workshop

- It was the opinion of this individual that job specific physical testing was the preferred method and had a very strong, negative opinion of isokinetic machine testing in general and CRT specifically.
- It is interesting to note that this professional claims to know of several individuals who were injured while taking the CRT test while the inventor of the CRT and other occupational health professionals claim that it is impossible to be injured while taking the CRT test because of the design of the machine. This is the only such claim the researcher heard concerning injuries while participating in pre-employment post-offer physical testing.

Appendix H: Categories of Results of Survey

Do not use any type of pre-employment post-offer physical testing	
Cost	3
Not beneficial at this time:	
short term employment	2
excellent safety numbers	3
does not address areas of concern	4
More information needed to make a decision	3
Have not considered	1
Use some form of pre-employment post-offer physical testing	
CRT	2
Job simulation	3
General physical exam	4
(may include any combination of the following: range of motion, back evaluation, survey, doctor's exam)	
Stated that they believe a behavior based approach is more effective (may include stretching and wellness programs)	3