

Preemployment Examinations: How Useful?

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Abstract: *Background:* An article in the March-April 1991 *Journal of the American Board of Family Practice* noted a lack of consensus among family physicians regarding preemployment testing of workers. Family physicians do not seem to adhere to any explicit or uniform criteria in performing these tests. Previous writers have suggested how these examinations might help both the employer and the worker. The Americans with Disabilities Act, which went into effect 26 July 1992, however, appears to make true preemployment examinations illegal.

Methods: A review of the Healthline (1975 to 1991) and the MEDLINE (1980 to 1991) data bases using the MeSH headings "physical examination," "personnel management," "occupational medicine," and "personnel selection" yielded 13 articles dealing with the benefit of preemployment examinations to employees or employers. No studies appeared under the text word "preplacement."

Results: All of the published articles addressed the protection of the employer in some manner, but only three studies revealed any benefit to the employer or any protective value for the worker. The testing in these three investigations used detailed knowledge of the demands and duties of the job and, therefore, allowed for more task-specific examinations.

Conclusions: The paucity of evidence demonstrating the usefulness of preemployment examinations suggests the need for further research and the development of preemployment evaluations that would allow family physicians to examine employees in a consistently beneficial and more standardized manner. (*J Am Board Fam Pract* 1992; 5:617-21.)

A March-April 1991 article in this journal noted the dilemmas faced by family physicians when they perform preemployment examinations.¹ The authors discovered a lack of consensus among family physicians regarding not only the performance but also the ethical implications of these tests. Family physicians do not appear to adhere to explicit, uniform standards in performing preemployment examinations. This lack of consistency could stem from the absence of evidence that preemployment testing actually accomplishes the goals stated in the many articles and textbooks on occupational medicine.² Rodman³ listed the functions of preemployment examinations as protective and historical. The testing should protect the worker from job-related illness or injury and the employer from the financial loss and liability associated with hiring someone who might perform poorly, miss much work, or injure a fellow worker. The historical function identifies

health problems that require treatment and monitoring and establishes a base-line record for epidemiologic and medicolegal purposes.

Perhaps the diverse approaches documented in Holleman and Matson's research¹ demonstrate the ambivalence that family physicians feel toward their assignment as gatekeepers to employment.⁴⁻⁷ Whereas numerous thoughtful articles have commented on the ethical issues involved in the physician's role as an occupational health care provider, including the potential conflict of interest arising when the physician acts as the agent of the employer,⁸⁻¹² I reviewed the published literature to determine whether studies have shown that preemployment testing accomplishes either the protective or the historical goals.

Title I of the Americans with Disabilities Act, which went into effect 26 July 1992, appears to make true preemployment medical evaluations — occurring before hiring — essentially illegal unless all applicants regardless of disability are sent for physical examinations. The employer must make a job offer contingent upon passing the physical examination and must show a clear linkage between employment practices and the job descriptions. The clinician's task under this law is

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to show the association between the medical findings and decisions and the functions of the job. Therefore, the clinician must have access to a detailed job description and must specify which functions the employee should not perform. These examinations now must resemble what was previously called preplacement testing — occurring after hiring.

Literature Review

Methods

A review of the Healthline (1975 to 1991) and the MEDLINE (1980 to 1991) databases and references from the articles obtained therein yielded 13 relevant articles. The search used a combination of MeSH headings ("physical examination," "personnel management," "occupational health," "occupational medicine," "personnel selection") and the text word "preemployment." Under the text word "preplacement," no articles appeared (Table 1).

Results

The three studies demonstrating the efficacy of preemployment testing dealt with low-back injuries and were actually preplacement (the subjects had already been hired) as opposed to pre-employment examinations. In one study the frequency of low-back injuries was tabulated for 1652 Los Angeles County firefighters after they had undergone flexibility, strength, and fitness

testing.¹³ Higher levels of fitness did correlate significantly with fewer low-back injuries. Chaffin, et al.¹⁴ tested persons in six different plants, where the researchers attempted to simulate the work positions and weight demands. They found that the worker's likelihood of sustaining a back injury or musculoskeletal illness increased when the lifting requirements approached or exceeded the strength capability demonstrated by the individual on isometric testing. Snook, et al.¹⁵ substantiated these data by collecting 192 questionnaires from 32 states and analyzing information about low-back injuries and the selection and training techniques of the work place. Designing the job to fit the worker (ergonomics) and reducing the manual handling of materials seemed to control partially the number of low-back injuries.

Three other articles considered low-back problems. In a 1976 literature review, Montgomery¹⁶ questioned the hypothesis that developmental spinal abnormalities predisposed workers to an increased rate of low-back injuries. He cited 56 references published between the early 1920s and 1973 and listed nine comparative studies of radiographic examinations. In only two of these radiographic examination studies were there more symptoms in subjects who had congenital changes found on back radiographs. Two articles in 1988 substantiated Montgomery's review.^{24,25}

Table 1. Studies Evaluating Preemployment Testing.

| Author | Number of Subjects | Employee Characteristics | Study Design | Benefit to Employee | Benefit to Employer |
|---------------------------------|--------------------|---------------------------------------|-------------------------------------|---------------------|---------------------|
| Cady, et al. ¹³ | 1,652 | Firefighters | Prospective cohort | + | + |
| Chaffin, et al. ¹⁴ | 551 | Manual materials handling | Prospective cohort | + | + |
| Snook, et al. ¹⁵ | 192 | Manual labor | Cross-sectional | + | + |
| Montgomery ¹⁶ | 19,200 | Multiple occupations | Literature review | NE | 0 (7 of 9 studies) |
| Alexander, et al. ¹⁷ | 6,125 | Telephone office workers | Prospective cohort | NE | 0 |
| Collings ¹⁸ | 1,180 | Telephone office workers (women only) | Cross-sectional | NE | 0 |
| Lowenthal ¹⁹ | 400 | Health workers | Quasi-experimental controlled trial | NE | 0 |
| Parrish ²⁰ | 180 | Health workers | Prospective cohort | NE | 0 |
| Lewy ²¹ | 199 | Nonunion health workers | Descriptive | NE | NE |
| Williamson ²² | 470,00 | White and blue collar | Case series | NE | 0 |
| Leckey ²³ | 104 | Hourly wage manufacturing | Cross-sectional | - | - |

NE = not evaluated, 0 = no benefit demonstrated, + = benefit demonstrated, - = adverse effect.

Two large telephone companies have published research. One study included 6125 applicants for full-time permanent positions in nonhazardous assignments at the Pacific Bell Telephone Company.¹⁷ The applicants were randomly assigned to control or trial groups. Each group member was placed into one of three health risk categories after a screening health examination. Three months and 1 year later, supervisors answered detailed questionnaires relating to absenteeism and the work performance of each person hired. No differences distinguished control from trial groups for overall job performance, appropriateness of the job match, or work force losses. Investigators also found no cost effectiveness in performing the preemployment examination.

The New York Telephone Company conducted the second telephone study.¹⁸ Between 1968 and 1970, that company, after performing a baseline physical examination, classified into five health-risk groups the 1180 women who had remained on the payroll for 1 year. They then queried these workers' supervisors regarding job performance and attendance and asked these supervisors to indicate all individuals "who had been a problem to them during the year on account of health." The supervisors thought that the workers in the higher risk group demonstrated a higher percentage of health problems and that this group had a greater absentee rate. This study then compared the cost of performing preemployment examinations on all hirees with the amount of money lost to absenteeism and found the costs equal.

Hospitals provided the setting for three other investigations. Lowenthal¹⁹ looked at a medical center preplacement (participants already hired) screening of 400 new employees. One-half received comprehensive health evaluations and one-half minimal evaluations. Using retrospective chart reviews, he found no significant differences in the longevity of employment, reason for termination, workers' compensation claims experienced, or utilization of health care resources between the two groups.

Parrish²⁰ looked at drug testing as part of a preemployment examination in a teaching hospital. Twenty-two of 180 (12 percent) persons hired tested positive for one or more substances (barbiturates, opiates, benzodiazepines, propoxyphene,

meperidine, tetrahydrocannabinol, amphetamines, cocaine, phencyclidine, phenothiazines). One year later the investigators examined the rate of retention, supervisors' evaluations, and reason for termination. None of the workers with positive urine tests was fired, and they all performed at a level equal to their counterparts.

During the 1984 New York City hospital strike, 199 temporary employees underwent preemployment examinations.²¹ Sixty-three percent of the persons screened were inadequately immunized against diphtheria and tetanus, and 41 percent were unprotected against rubella. Twelve percent showed a positive tuberculin skin test and 3 percent gave urine samples positive for cocaine, heroin, or phencyclidine. A staff physician reported that 26 percent of the examinees had "potentially significant" physical findings, including hypertension, cardiac murmurs, known seizure disorders, breast masses, thyromegaly, or urethral discharge. Forty-one percent of the potential employees smoked cigarettes. Lewy concluded that these findings could reasonably lead to remedial intervention and, therefore, positively impact worker health.

The remaining two studies occurred in production plants. Between 1952 and 1970, the Boeing Company abandoned their prehire program and used only a health questionnaire.²² In 1971, Williamson reviewed this 18-year period and recounted the workers' compensation costs during this time. He stated that the company could have prevented only five or six claims by performing physical examinations, and to avoid these claims the company would have spent approximately \$5.6 million in preemployment testing. He concluded that the money spent on the claims did not justify the cost of the evaluations.

Finally, a company that planned to establish a new branch plant selected 104 men who had worked for more than 5 years for the company and possessed the most outstanding records.²³ These employees underwent a physical examination equivalent to the company's preemployment examination. Seventy-three of the examinees had positive or abnormal findings that would have precluded them from employment.

Discussion

This review casts doubt on the ability of preemployment examinations as currently per-

formed to protect the worker or employer or to provide valid historical information. All of the published articles considered the protection of the employer in some manner, but only the three strength and fitness studies reported any benefit to the employer or any protective value for the worker.¹³⁻¹⁵ Interestingly, the testing in these three low-back studies used detailed knowledge of the demands and duties of the job and, therefore, allowed for more task-specific examinations. In other words, these studies involved preplacement (posthiring) testing and seemed to comply with the Americans with Disabilities Act.

The remaining studies showed no positive outcome from performing preemployment examinations. In fact, three studies discredited the use of radiographs in screening for future low-back problems, and Leckey's work²³ even pointed out important false-positive findings that would rob the qualified worker of employment and deny the employer capable, loyal employees.^{16,23-25} None of the studies analyzed whether these examinations could aid in the long-term care of workers. In summary, the preplacement evaluations that attempted to imitate the demands of the employment proved useful. The true preemployment examinations either did not aid the employer or the worker, or the studies simply did not show a positive benefit.

Family physicians now asked to do preemployment examinations need to acknowledge the administrative function of these tests and recognize the lack of data supporting them. This realization could demystify preemployment testing.

Leckey's²³ view that only a trial of employment can measure the worker's ability could prove correct. Further study of the present system of occupational prework testing needs to occur, however, with the intention of structuring dynamic, multifaceted evaluations that would accomplish the needed protective and historical functions and would help fit the job to the worker.²⁶ Family physicians can contribute to this research and to the development of new methods.

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