

**THE BILL BLACKWOOD
LAW ENFORCEMENT MANAGEMENT INSTITUTE OF TEXAS**

Implementing and Managing Health and Fitness

Programs for Law Enforcement

**A Proposed Policy Research Project
Submitted in Partial Fulfillment
of the Requirements for the Professional Designation
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ABSTRACT

Researchers and police officers all agree that policing requires an above average physical fitness status. However, officers have failed to maintain the physical fitness they possessed when they graduated from the police academy. Data from studies of law enforcement physical fitness indicate that the veteran officer's fitness decreases every year he continues to serve. Researchers report that a police officer is twenty-five times more likely to die from heart disease than from a gunshot wound. Administrators, specifically those from small agencies, have failed to require adequate physical fitness standards. The purpose of this research is to inform administrators of the importance that physical fitness plays, not only as it relates to health, but also as it relates to an officer's ability to carry out his duties as a police officer. This researcher will offer some guidelines which the administrator can use to implement a physical fitness program that is legally defensible, cost effective, motivating, and fair, while at the same time helping the officer achieve the above average physical fitness that his job requires. Literature dealing with physical fitness programs, currently in use by other departments, will be used as a resource for this material. Additionally, training programs such as those offered at the Cooper Institute for Aerobic Research will be attended to gain some knowledge into physical fitness programs. Upon concluding the research, it is recommended that the agency adopt the evolutionary/rational approach. This type of program places an emphasis on the total program, not just a standard. The type of test recommended is a physical fitness test that measures aerobic power, strength, flexibility, and body composition. The norms or standards suggested by the Cooper Institute compare the participant health to the general population. The program should be gradually implemented through an eight step program consisting of medical screening, nutrition, and

fitness assessment, goal setting , exercise, nutrition, and feedback. The disciplinary process should be a gradual process that begins with counseling and personal training and resorting to dismissal only as a last resort. The implementation of the recommended program will bring the agency considerable savings in the order of sick leave on the job injury, and increased productivity. The individual officer will benefit from this program in that he/she will be better prepared physically to survive a physical confrontation, and survive the stress of the job. The public will also benefit in that it will insure that when an officer answers their call for help, there will be not doubt in the officer's capacity to provide that protection.

Introduction

The purpose of this research paper is to research and document guidelines which can be used by administrators of the Del Rio Police Department in implementing and managing a health and fitness program which is cost effective, non-discriminatory and will motivate personnel to attain the above average physical fitness required in law enforcement.

The Del Rio Police Department like many other police departments throughout the country has relied on three strategies to ensure that their officers possess the above average physical fitness required in law enforcement. These strategies consist of the use of a pre-employment physical agility test, replacement medical examinations, and academy physical fitness training (Carmen 42). Once the above cited strategies have been completed the agency just hopes that individual police officers will continue to maintain the physical ability to perform the job. However, according to Thomas R. Collingwood from the Institute for Aerobic Research, U.S. police officers are about 10 years behind in the area of physical fitness (Ness 74).

The Dallas Institute of Aerobic Research indicates that three out of five on-the-job injuries are fitness related. Research indicates that 56% of the country's police officers were overweight, with 20% of these being more than 20 pounds overweight (Hoffman 25). Despite the fact that individual police officers are aware of the benefits of maintaining good physical fitness, they fail to do so because there are too many other things to do, such as working overtime, spending time with fellow officers, or working on furthering their education.

Police administrators are failing to implement physical fitness programs and standards because they lack the knowledge necessary to establish a program that is cost effective, non-discriminatory and which will motivate personnel in attaining the required physical fitness.

This research is relevant because it will assist administrators in developing health and fitness programs which will benefit law enforcement officers, by lowering premature death in their ranks, decrease on-the-job injuries, improve family life, prepare police officers to survive street encounters and protect police agencies from liability for failure to adequately prepare law enforcement officers to do their job.

The majority of the sources used for this research paper are articles from professional journals dealing with health and fitness programs in Law Enforcement.

Historical, Legal or Theoretical Context

Police physical fitness has historically been left up to the individual officer. Police departments have concentrated much of their efforts on setting up physical agility testing for entry level recruits and physical fitness training for cadets at the police academy. Once the officer graduates from the academy, the officer is not tested to determine his level of physical fitness.

Historically, the longer an officer has been in a department, the lower his physical activity is, so is his physical fitness status (Collingwood and Hoffman 8). Despite all the data indicating the need for physical fitness programs in law enforcement, many agencies have failed to implement such programs. Even licensing agencies, such as the Texas Commission on Law Enforcement Officer Standards and Education or the Commission on Accreditation for Law Enforcement Agencies (CALEA), have failed to come up with a university accepted physical fitness standards. Accompanying this decrease in physical activity has been an increase in illness and the number of injuries and deaths due to a sedentary lifestyle (Carmen 25). In the 1970's, interest in physical fitness in law enforcement began to increase. In 1977, a comprehensive fitness study of the

police officer community was completed by the Cooper Institute for Aerobics Research, in conjunction with the International Association of Chiefs of Police. The study produced specific guidelines for police fitness programs (Ness 74). Many administrators have allowed myths and misinformation concerning the legality of a law enforcement agency's authority to deliver physical fitness programs and standards, to interfere with their need to maintain adequate physical fitness levels in their agency. Thomas Collingwood reports that many administrators have done away with fitness test and programs due to confusion over legislation, which they falsely believe, renders fitness indefensible as being job-related (Collingwood 1995:32). The impact of the American with Disability Act and the Civil Rights Act of 1991 on physical fitness implies that if a test has an adverse impact, it will be scrutinized by the courts. The administrator, however, should be aware that just because adverse impact occurs, it does not mean that the fitness standard is not valid. Instead, it means that the standard can only be maintained if the agency can show that it is job-related. In order to show job-relatedness, the agencies must conduct a validation of standards as defined by The Equal Employment Opportunity Commission (EEOC). This guideline defines three validation strategies, as listed in Appendix A.

A fourth validation method which is not included in EEOC guidelines is the Rational Validity Method. The method validates a test as being job-related, based on the experience of other agencies whose officers have similar functions. Although this test is less expensive to validate, it is also less defensible than the other three validations. Based on the four validity methods, an administrator can see that Content Validity refers to text which contains the performance of

specific tests, such as the ability of climbing stairs. Construct Validity measures underlying factors, such as those seen on Appendix C (Collingwood 23).

According to Thomas Collingwood, it is in this area where attorney lack an awareness of criterion and construct validity. While health promotion is sometimes used as a reason for implementing fitness program in law enforcement, fitness programs and standards must be aimed toward fitness being job-related as a factor determining the officer's ability to do his job. One of the strongest justifications for physical fitness testing as being job-related and construct valid is a court decision in U.S. vs Wichita Falls, Texas, 1988. The literature also revealed some confusion as to the intent of the Civil Rights Act of 1991. One interpretation is that the act stipulates that employee fitness test norms should not be adjusted for any particular group to allow individuals from an employee class to meet job requirements as a lower level. However, an opinion rendered by the Equal Employment Opportunity Commission suggests that the intent of this act was to address adjusted scores for employee cognitive tests only.

Another area that could present liability concerns is in the area of the training received by the physical fitness coordinator. This liability issue should be of prime concern and thus the administrator should make sure that the physical fitness coordinator is certified by an established and accredited organization. The administrator who desires to implement a physical fitness program, which will eventually call for mandatory compliance and disciplinary action for non-compliance, should consider allowing officers to have some time while on duty to work out. This can sometimes be difficult with undermanned shifts, but doing so will not only insure the success, but also could help the agency avoid legal problems. With all the legal issues involved in implementing physical fitness standards, the administrator might be tempted to not implement

any standards or physical fitness. However, he must realize that doing so also involves legal issues due to the fact that a department may incur legal liability for having unfit officers. Other areas of potential liability are: negligent retention, negligent assignment, negligent authorization of firearms, failure to supervise, failure to train, and/or a failure to direct officers to maintain a health status which is appropriate for an officer's optimum functioning in emergency situations. A case which illustrates this legal issue is Parker vs District of Columbia, 850 F. 2d 709 (D.C. Cir 1988). In this case, a police officer shot a suspect. The officer involved in the shooting had been off-duty with a fractured shoulder for two months prior to the shooting. The officer was not in adequate physical shape and his condition was of harm to others. The court held that the officer's physical condition was lacking due to his agency's deliberate indifference to his physical training program.

Review of Literature or Practice

A review of the literature related to implementing physical fitness programs for law enforcement revealed that the majority of the literature was based on a research project conducted in 1977 by The Cooper Institute for Aerobics Research. The results of the study consistently showed the need for police officers to maintain physical fitness through their career, not only for proper performance of their job, but also to minimize disease and poor health risk profiles (Carmen 25). This report describes specific guidelines which can be used by police administrators in implementing physical fitness programs, using the Rational/Evolutionary Administrative Approach. Appendix B gives an overview of the different stages of the Rational/Evolutionary Approach.

The Cooper Institute recommends that the program consist of mandatory testing, mandatory prescription, voluntary compliance, collection of data, setting of standards, the setting of sanction procedures and mandatory compliance. The Cooper Institute also recommends the use of referenced fitness tests which measure aerobic power, flexibility, anaerobic power, abdominal muscular endurance, upper body strength (absolute strength), and upper body strength (dynamic strength), and body composition.

Some researchers recommend agility testing which includes tasks such as crawling under low obstacles, dragging a subject, climbing through a window, and climbing stairs. Due to this controversy between the two different types of tests, numerous departments have gone to using both types of tests. The Cooper Institute argues that agility tests require expensive validation and that a typical agility test (with five items) tests only 20-25% of physical task performance (Collingwood 1988.22). Additionally, the Cooper Institute indicates that fitness testing measures basic and underlying fitness areas which account for between 50-80% of the variance of officer performance of approximately 20-25 physical tasks, some of which are illustrated on Appendix C.

The fitness standards recommended by The Cooper Institute are the most widely used standards, although some agencies combine them with agility standards. Those departments that combine agility and physical testing require officers to go through The Cooper test and offer as an option the physical agility test for those who do not pass the Cooper Test. Appendices G, H, I, and J, illustrate the basic Cooper Fitness Standards, which can be modified to meet the agencies' unique needs. Appendices G thru J show the standards for MAX VO₂, 12 minute run, 1.5 mile run, percent of body fat composition, sit-ups, bench press, leg press, sit and reach, 300 meter run

and modified pushups. As can be seen, Appendices G-H are for females and are separated by age. Appendices I and J are similar, but pertain to standards for male officers.

None of the police departments around the Del Rio, Texas, have a physical fitness program. A survey of state police agencies conducted in 1991 by Leigh Carl Hansen, M.S., Director of Health Risk Management, Blue Cross and Blue Shield, indicated that of 46 agencies who responded to the survey, 29 reported having physical fitness / wellness programs; 9 are developing programs; 7 agencies do not have programs (Hoffman 25). The survey also revealed that of the 29 agencies having programs, 22 reported having mandatory programs, and 7 reported having voluntary programs. While researching which law enforcement agencies have physical fitness programs, what quickly became apparent was that while larger police departments in Texas, such as Midland P.D., Austin P.D., and San Antonio P.D., have physical fitness programs, it is the medium to small police departments, such as the Del Rio Police Department, who do not have any such programs.

The physical fitness programs and standards recommended by the Cooper Institute are the most frequently used, not only by local and state police, but also by federal agencies, such as the F.B.I., Secret Service, A.T.F., and U.S. Marshall Service.

Despite the abundance of research information documenting the need for police officers to improve their fitness status, there is no universal fitness standards. Texas Commission on Law Enforcement Standards and Education has not implemented any physical fitness standards for police officers in the State of Texas. A more recent study conducted from 1983 to 1992 by The Cooper Institute revealed some improvement in officer's fitness when compared to the 1977 study. Thomas R. Collingwood, who worked for the Cooper Institute for 13 years, reports that he

trained more than 7,000 police fitness instructors and has helped more than 200 law enforcement agencies design fitness programs (Collingwood 131). Despite the encouraging data, which indicates that more departments are implementing physical fitness programs, it was discouraging to learn that it is the small to medium departments, such as the Del Rio Police Department in Del Rio, Texas, who have failed to implement physical fitness programs, as suggested by the research findings.

Discussion of Relevant Issues

During the implementation of a physical fitness program, the administrator will deal with many key issues. The administrator should also access his own departments sick-leave usage, medical reasons for early retirement, medical related deaths, and medical reasons given by persons placed on light or limited duty. The administrator can then use the results to do a cost analysis of sick time, on duty injuries, limited duties, early retirement, and premature deaths, thus revealing the current cost that could be reduced by a physical fitness program.

The administrator should prepare a “concept paper” to inform every member of the agency not only of the problem of low physical fitness, but also to define physical fitness, the purpose, and rationale of the program, along with the procedures and processes involved (Collingwood 1988.21). Another issue that the administrator must deal with is the medical screening and evaluation process. The medical screening process is very important in identifying potential health risks among the participants. The medical screening process can be the most expensive component of a physical fitness program. Due to the prohibitive cost of conducting medical

screening for every member of the agency, The Cooper Institute recommends that the recommendations shown on Appendix D be followed:

During the implementation of a physical fitness program, the administrator must deal with the issue of whether to implement a mandatory or a voluntary fitness program. The administrator should keep in mind that although it is tempting to go the easier route of a voluntary program, this type of program has failed to obtain sufficient participation (Ness 75). On the other hand, mandatory standards are more likely to improve the fitness level of every member of the agency. In implementing a mandatory program, the agency must ensure that the mandatory standards be reasonable and rational in order for them to be enforceable (Schofield 26).

Prior to implementing a physical fitness program, the administrator needs to develop an agency policy. The policy should establish acceptable levels of fitness for officers of all ages and gender. The policy should also describe the type of fitness program and the procedures that are to be used in implementing it. The policy should also indicate the time span in which all personnel will be required to be in compliance with the fitness standards. One of the biggest responsibilities the administrator faces in implementing a physical fitness program is to obtain adherence to the program by participants. Administrators can use the factors listed on Appendix E to motivate participants to adhere to exercise prescription.

The administrator must establish disciplinary procedures for noncompliance. The disciplinary measures should be gradual, going from mandatory supervised instruction, to dismissal. The administrator should consult with legal counsel prior to taking dismissal action for noncompliance (Ness 77).

Another area that the administrator must deal with is the issue of what type of to use. The two types of tests are job-related tests and health-related tests. Job-related tests usually consist of an obstacle course which includes tasks, such as scaling fences, climbing stairs, and dragging victims. The other type of test is a health-related test, which consists of measuring body composition, muscular, strength, flexibility, muscular endurance, and cardiovascular endurance. The administrator should ensure that physical fitness standards are not capricious or discriminating, but are instead fair and reasonable, as well as job related.

The administrator who embarks in implementing a physical fitness program will encounter numerous constraints and limitations, along with opportunities. The constraints include budget or financial constraints, legal constraints, and personnel and time constraints. The administrator will quickly realize that he will need funds from an already tight budget to cover expenses, such as medical exams, equipment, and training for physical fitness staff. to have a full time doctor and physical fitness expert to administer the fitness program.

Since the administrator will need to demonstrate that the physical fitness program benefits will result in cost savings, he should maintain records which will measure decreased medical costs determined by medical insurance and a decrease of sick leave, both of which can be attributed to increased physical fitness.

At the beginning of the program, the administrator can utilize research, such as the one conducted by the Dallas Police Department, Psychological Services Unit, which showed that a physical fitness program has an impact in savings of sick time, injury and health illnesses (Byrd 32). The administrator can also cite a study conducted by Prudential Life Insurance Company, in which 2,000 employees participated. The study reported that of the employees involved, 533

participated in an exercise program and during the year they averaged 3.5 days of sick leave, compared to 8.5 days for the rest of employees who did not participate in an exercise program (Cooper 160). Thomas Collingwood reports in his book "Fit for Duty" that studies with law enforcement report 27% to 42% less absenteeism for fit and active officers, compared to sedentary officers, with one agency reporting an 87% drop in sick time in reference to job-related injuries (Collingwood and Hoffman 10).

Conclusion / Recommendations

It is the purpose of this research to document guidelines that administrators of the Del Rio Police Department, and similar size departments, can utilize to implement and manage a health and fitness program that is cost effective and non-discriminatory. Physical fitness is very relevant and applicable to law enforcement, not only for its health benefits, but also because of its job-relatedness to an officer's ability to do his or her job. There is no question that a problem exists in the area of officer fitness, as illustrated by the studies that indicate the police officers are 25 times more likely to die from heart disease than from gunshot wounds. A May, 1996 police article states that an officer's overall health risk doubles every decade they serve and that their life expectancy is 15 years shorter than the general population (Lasley 3). It is recommended that as an initial step, the administrator select officers representing all levels and areas of the agency to evaluate the current health status of its officers.

Once this has been completed, the administrator should communicate these findings to every member of the department, and at the same time, request input and concerns from every officer. At this time, the administrator should inform personnel of the medical screening process and

fitness evaluation to be followed. Once this step has been completed, the next step is to write a physical fitness policy which establishes the department's acceptable fitness levels. The policy must also establish which officers are to be tested and held to the standards.

The policy should also set out type of fitness programs and the procedures that will be used to implement it. The program should follow the Evolutionary/Rational approach, eight-step delivery system outlined on Appendix F.

The personnel who the administrator assigns to coordinate the program should be sent to a physical fitness trainer certification program, such as that offered by The Cooper Institute, or by Fit Force. Finally, the administrator should insure that the disciplinary process be a gradual process that starts with counseling and uses dismissal as a last resort. By implementing this type of fitness program, the administrator will resolve issues described in this research. His officers will feel confident that due to their physical fitness, they will be better prepared to deal with the stress of the job and handle confrontations efficiently. The public also will benefit in such a way that when the officer responds to their call, there will be no question as to the officer's ability to protect them.

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APPENDIX A
VALIDATION GUIDELINES

- 1). Content validity - properties measured by a test as being the same as the properties of a specific job task or function. These tests are better as ability tests, which can consist of climbing stairs.

- 2). Construct Validity - refers to a test's ability to measure an underlying factor or dimension that is a characteristic of an officer's ability to perform a variety of job tasks. For example, a test which measures upper body strength also measures an officer's ability to perform tasks of lifting or carrying.

- 3). Criterion Validity - refers to a test which measures a dimension which can predict an officer's ability to perform a task or variety of tasks. For example, aerobic power is predicative of an officer's ability to complete a pursuit lasting over two or three minutes.

APPENDIX B

RATIONAL/EVOLUTIONARY ADMINISTRATIVE APPROACH

PLANNING STAGE	MAJOR TASK	MAJOR PRODUCTS
I. Developing a logic	1). Discussion and research to define justification	1). Concept Paper
II. Planning Process	1). Surveys 2). Research 3). Data Collection	1). Documentation
III. Program Objectives	1). Definition of project Objectives in terms of WHAT and WHY	1). Communication Statements
IV. Valid Tests	1). Selection of valid test 2). Expert Consensus 3). Age and Sex Norms	1). Test Protocols and Norms
V. Norms/Standards	1). Compare to general population 2). Compare to health norms 3). Compare to agency data	1). Cutoffs
VI. Delivery Program	1). 8 Step Process defined 2). Leadership provided 3). Time to Improve defined 4). Sanctions defined	1). Procedural Manual

APPENDIX C

UNDERLYING FITNESS AREAS

FITNESS AREA	RELATED TASK PERFORMANCE FOR PUBLIC SAFETY
AEROBIC POWER	Pursuit tasks, use of force lasting over 1-2 minutes
ANAEROBIC POWER	Lifting, carrying, pushing, dragging, extracting
ABDOMINAL STRENGTH	Use of force, lifting and carrying, dragging
UPPER BODY ABSOLUTE STRENGTH	Lifting, carrying, pushing heavy objects
OR	OR
UPPER BODY DYNAMIC STRENGTH	Use of force, lifting, carrying, pushing
LOWER BODY ABSOLUTE STRENGTH	Lifting, carrying, pushing, dragging, extracting
BODY COMPOSITION	Short and long sprints, use of force, lifting, carrying

APPENDIX D

MEDICAL SCREENING PROCESS

- 1). Informed Consent - informs the participant of the nature of the testing procedure.
- 2). Physical Activity Readiness Questionnaire - screening tool to identify persons who should not be tested without a physician's clearance.
- 3). Persons Under 36 years of age - Conduct a yearly blood pressure check along with completion of a medical history questionnaire.
- 4). Persons 36 to 49 years of age - Conduct a thorough medical screening every 2 - 3 years.
- 5). Persons 50 and over - Conduct a complete medical screening at least every year and request a doctor's signed opinionated correspondence of the safety of individuals participating in exercise and perform job duties.

APPENDIX E

MOTIVATION FACTORS

- 1). good supervision
- 2). proper exercise prescription
- 3). individual exercise prescription
- 4). group participation
- 5). setting realistic goals
- 6). intermittent goals
- 7). periodic evaluation
- 8). variety in the program
- 9). desirable environment
- 10). low-key competition for motivation
- 11). periodic awards
- 12). education
- 13). on-duty workout time
- 14). time off rewards for those showing improvement
- 15). involvement of whole family in fitness program

“Collingwood and Hoffman 106”

APPENDIX F

EIGHT STEP RATIONAL/EVOLUTIONARY APPROACH

- 1). Medical Screening - medical history, blood pressure, resting heart rate, and body composition.
- 2). Nutrition and Fitness Assessment - cardiovascular, strength, and flexibility.
- 3). Goal Setting - fitness, lifestyles, reevaluation.
- 4). Exercise and Nutrition Prescription - aerobics, strength, flexibility, weight control, nutrition.
- 5). Starter Program - supervision, group exercise.
- 6). Education - wellness facts, concepts, principles.
- 7). Motivation - reinforcement, behavior, management.
- 8). Feedback - communication, logs.

“Collingwood 1988.21-22”

APPENDIX G

**DEFINING STANDARDS CUTOFFS
FITNESS STANDARDS - AGE AND SEX BASED
FEMALE**

TEST	20-29	30-39	40-49	50-59	60+
MAX VO2:					
50TH	35.20ml	33.76ml	30.87ml	28.22ml	25.82ml
40TH	33.76ml	32.31ml	29.45ml	26.85ml	24.49ml
30TH	32.31ml	30.51ml	28.25ml	25.48ml	25.48ml
25TH	30.94ml	29.93ml	27.98ml	25.09ml	23.65ml
N	764	2049	1630	878	202
12 MINUTE RUN:					
50TH	1.29mi	1.25mi	1.17mi	1.10mi	1.03mi
40TH	1.25mi	1.21mi	1.13mi	1.06mi	.99mi
30TH	1.21mi	1.16mi	1.10mi	1.02mi	.97mi
25TH	1.17mi	1.13mi	1.09mi	1.01mi	.97mi
N	764	2049	1630	878	202
1.5 MILE RUN:					
50TH	14:55	15:26	16:27	17:29	18:16
40TH	15:26	15:57	16:58	17:54	18:44
30TH	15:57	16:35	17:24	18:23	18:59
25TH	16:26	16:58	17:29	18:31	19:02
N	764	2049	1630	878	202
%FAT:					
50TH	22.10%	23.10%	26.40%	30.10%	30.90%
40TH	23.70%	24.90%	28.10%	31.60%	32.50%
30TH	25.40%	27.00%	30.10%	33.50%	34.30%
25TH	26.60%	28.10%	31.10%	34.40%	35.50%
N	638	1336	1175	708	250
1 MINUTE SIT-UPS:					
50TH	34.5	27	22	17	8
40TH	32	25	20	14	5.8
30TH	29.5	22	17	12	4
25TH	28	21	15.5	11	3.8
N	144	289	249	137	26

APPENDIX H

**DEFINING STANDARDS CUTOFFS
FITNESS STANDARDS - AGE AND SEX BASED**

FEMALE

TEST	20-29	30-39	40-49	50-59	60+
1RM BENCH PRESS RATIO:					
50TH	0.65	0.57	0.52	0.46	0.45
40TH	0.59	0.53	0.5	0.44	0.43
30TH	0.56	0.51	0.47	0.42	0.4
25TH	0.53	0.49	0.45	0.41	0.39
N	191	379	333	189	42
1RM LEG PRESS RATIO:					
50TH	1.44	1.27	1.18	1.05	0.99
40TH	1.37	1.21	1.13	0.99	0.93
30TH	1.27	1.15	1.08	0.95	0.9
25TH	1.26	1.12	1.06	0.92	0.86
N	192	381	337	192	44
SIT AND REACH:					
50TH	20in	19in	18in	7.9in	16.4in
40TH	19.3in	18.3in	17.3in	16.8in	15.5in
30TH	18.3in	17.3in	16.5in	15.5in	14.5in
25TH	17.8in	16.8in	16.0in	15.3in	13.6in
N	183	376	332	192	44
300 METER RUN:					
50TH	74.8 sec. for all ages				
40TH	79.9 sec. for all ages				
30TH	84.0 sec. for all ages				
25TH	76.6 sec. for all ages				
N	16				
ONE MINUTE MODIFIED PUSH-UP:					
50TH	26	21	15	13	8
40TH	23	19	13	12	5
30TH	20	15	10	9	3
25TH	19	14	9	8	2
N	579	411	246	105	12

APPENDIX I

**DEFINING STANDARDS CUTOFFS
FITNESS STANDARDS - AGE AND SEX BASED**

MALE

TEST	20-29	30-39	40-49	50-59	60+
1RM BENCH PRESS RATIO:					
PR. RATIO:					
50TH	1.06	0.93	0.84	0.75	0.68
40TH	0.99	0.88	0.8	0.71	0.65
30TH	0.93	0.83	0.76	0.68	0.63
25TH	0.9	0.81	0.74	0.66	0.6
N	425	1909	2090	1279	343
1 RM					
PR. RATIO:					
50TH	1.91	1.71	1.62	1.52	1.43
40TH	1.83	1.65	1.57	1.46	1.38
30TH	1.74	1.59	1.51	1.39	1.3
25TH	1.68	1.56	1.48	1.36	1.27
N	424	1909	2089	1286	347
SIT AND REACH:					
50TH	17.5in	16.5in	15.3in	14.5in	13.5in
40TH	16.5in	15.5in	14.3in	13.3in	12.5in
30TH	15.5in	14.5in	13.3in	12.0in	11.3in
25TH	15.0in	13.8in	12.5in	11.2in	10.5in
N	424	1906	2090	1278	344
300 METER RUN:					
50TH	64.5 sec. for all ages				
40TH	69.8 sec. for all ages				
30TH	74.2 sec. for all ages				
25TH	76.8 sec. for all ages				
N	175				
1MINUTE PUSH UP:					
50TH	33	27	21	15	15
40TH	29	24	18	13	10
30TH	26	20	15	10	8
25TH	24	19	13	9.5	7
N	1045	790	364	172	26

APPENDIX J

**DEFINING STANDARDS CUTOFFS
FITNESS STANDARDS - AGE AND SEX BASED**

MALE

TEST	20-29	30-39	40-49	50-59	60+
MAX VO:					
50TH	42.49ml	40.98ml	38.09ml	35.20ml	31.83ml
40TH	40.98ml	38.86ml	36.65ml	33.76ml	30.15ml
30TH	39.53ml	37.37ml	35.13ml	32.31ml	28.70ml
25TH	38.09ml	36.65ml	33.76ml	31.06ml	27.89ml
N	1675	7094	6837	3808	1005
12 MINUTE RUN:					
50TH	1.50mi	1.45mi	1.37mi	1.29mi	1.19mi
40TH	1.45mi	1.39mi	1.33mi	1.25mi	1.15mi
30TH	1.41mi	1.35mi	1.29mi	1.21mi	1.11mi
25TH	1.37mi	1.33mi	1.25mi	1.17mi	1.08mi
N	1675	7094	6837	3808	1005
1.5 MILE RUN:					
50TH	12:18	12:51	13:53	14:55	16:07
40TH	12:51	13:36	14:29	15:26	16:43
30TH	13:22	14:08	14:56	15:57	17:14
25TH	15:26	16:23	15:26	16:23	17:32
N	1675	7094	6837	3808	1005
%FAT:					
50TH	15.90%	19.00%	21.10%	22.70%	23.50%
40TH	17.40%	20.50%	22.50%	24.10%	25.00%
30TH	19.50%	22.30%	24.10%	25.70%	26.70%
25TH	20.70%	23.20%	25.00%	26.60%	27.60%
N	1342	5611	5724	3275	984
1 MINUTE SIT-UPS:					
50TH	40	36	31	26	20
40TH	38	35	29	24	19
30TH	35	32	27	21	17
25TH	35	31	26	20	16
N	312	1431	1558	919	205