UNIT-VI: TEST AND MEASUREMENT IN SPORTS

Contents

- Motor Fitness Test – 50 M Standing Start, 600 M Run/ Walk, sit and Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x 10 M Shuttle Run.
- General Motor Fitness – Barrow three item general motor ability (Standing Broad Jump, Zig Zag Run, Medicine Ball Put – For Boys: 03 Kg and For Girls: 01 Kg).
- Measurement of Cardio-Vascular Fitness – Harvard Step Test/Rockport Test - Computation of Fitness Index: Duration of the Exercise in Seconds x 100 5.5 x Pulse count of 1-1.5 Min after Exercise.
- Rikli and Jones - Senior Citizen Fitness Test 1. Chair Stand Test for lower body strength 2. Arm Curl Test for upper body strength 3. Chair Sit and Reach Test for lower body flexibility 4. Back Scratch Test for upper body flexibility 5. Eight Foot Up and Go Test for agility 6. Six Minute Walk Test for Aerobic Endurance.

Learning Outcomes:

After completing this chapter, you will be able to:

- perform 50 M Standing Start, 600 M Run/ Walk, sit and Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x 10 M Shuttle Run
- demonstrate Barrow three item general motor ability test
- compute physical fitness Index through Harvard Step Test/Rockport Test
- describe the procedure of Rikli and Jones - Senior Citizen Fitness Test

Discussion

Discuss with your group

- What are the areas that a physical fitness test evaluates?
- How many of you can test your own fitness?
- What are the criteria that you will employ to test your own fitness?
- What is the aim of testing for physical fitness?
- Have you heard of motor fitness? What is it? How is it tested?
- Have you heard about broad jump?

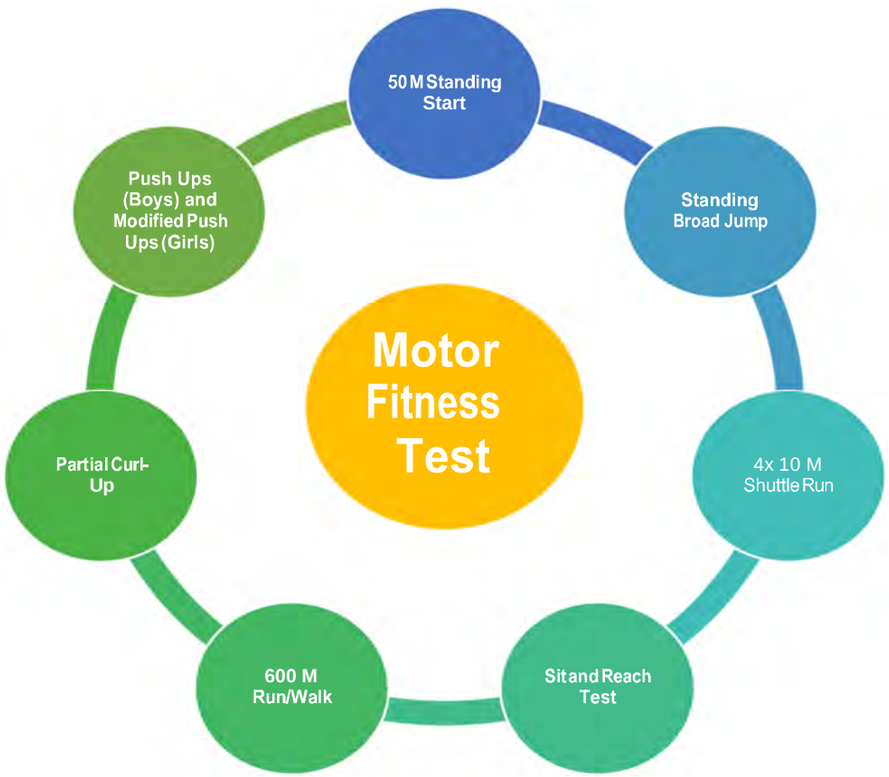
Do you Know

Test protocol is the correct procedure for carrying out a test. If a test is done incorrectly, it might affect the results.

Valid A test is valid if it measures what it sets out to measure e.g., a test for upper body strength should not measure leg strength.

Motor fitness refers to the neuromuscular components of fitness, which enable a person to perform successfully at a particular motor skill, game, or activity. Specific motor fitness components include agility, balance, coordination, power, reaction time, and speed. Motor fitness is sometimes referred to as skill-related fitness.

6.1.1 Motor Fitness Test



Testing motor fitness consists of measuring of all components of motor fitness (agility, coordination, balance, speed, reaction time). Motor fitness test provides to the student a score regarding the level of fitness, effectiveness of any training programme, and present status, thereby motivating her/him to do better etc.

Following tests are employed to test motor fitness:

6.1.2 50 M Standing Start: Boys and Girls

Purpose: To determine running speed and acceleration of a student.

Objective: To cover the set distance as fast as possible.

Equipment: Flat and clean field with markings; stopwatch.

Procedure: There will be distance of 50 meters between two straight lines – starting line and finishing line.

At least two officials are required to successfully complete the process, one who stands behind the standing line to give commands "On your mark" and "Go" along with a downward sweep of her/his arm thereby giving visual signal to the other official who stands perpendicular to the finishing line to clock the timing.

The student will take a standing start and run as fast as possible to give her/his best time.

Scoring: The total time taken to complete the distance between the command "Go" and when the student crosses the finish line to nearest tenth of a second.

6.1.3 600 M Run / Walk

Purpose: To determine the endurance of a student.

Objective: To cover the set distance as fast as possible.

Equipment: Flat and clean field with markings; stopwatch.

Procedure: Student should be informed about the distance before the start of the run/ walk.

One official will give command "On your mark" and "Go" with visual signal to the other official. The student will run or walk and cover the distance in the shortest possible time.

The test may be done in a group, but the number of officials must be the same as the number of participants.

Scoring: The total time taken to complete the distance between the command "Go" and when the student crosses the finish line to nearest tenth of a second.

6.1.4 Sit and Reach Test

Purpose: To determine trunk flexibility of a student.

Objective: To stretch trunk as far forward as possible.

Equipment: Sit and Reach Box; mat

Procedure: Student should sit without shoes, with the soles of her/his feet touching the sit and reach box.

Both knees should be locked and pressed flat to the floor (tester may assist the subject by holding the knees down).

Student to place both arms forward, palm downwards without stretching.

As instructions are given by the official to start the test, the student should stretch forward slowly, reaching as far as possible with both hands without a jerk and should hold the maximum stretch position for 2 seconds. Hands should remain at same level.

Scoring: The score is recorded to the nearest centimetre that is the distance between the initial position and final position.

6.1.5 Partial Curl-Up

Purpose: To determine abdominal strength and endurance of a student.

Objective: To perform as many as curl-ups as possible in the given time.

Equipment: Gym Mat with two parallel lines 6 inches apart; stopwatch.

Procedure: Student should lie in supine position on the mat with knee flexed at an angle of 90 degrees.

Feet should be placed apart and hands should be placed straight and parallel to the body.

The student will pull upper body, curling up at least 6 inches above the surface of the mat or 6 inches towards the parallel strip.

Movement should not be jerky and the upper body must come down slowly.

The complete cycle of rising up and going back down will be counted as one curl-up.

Scoring: Maximum number of partial curl-ups completed without rest in 30 seconds will be recorded.

6.1.6 Push Ups (Boys) and Modified Push Ups (Girls)

Purpose: To determine upper-body endurance of a student.

Objective: To perform as many as push-ups as possible in the given time.

Equipment: Gym Mat.

Procedure: Male students will take face down position in which hands should be placed slightly apart from shoulder. Knees, back and neck must be rigid and straight. In this position, the student's palms and toes will touch the ground.

The position will remain the same for Female students, except their knees should touch the ground.

Student will lower the body by flexing elbows till 90° flexion at elbow joint and come back to initial position. In both positions, back must be straight. Remember, in the starting position stomach should not touch the ground.

Scoring: The maximum number of push ups recorded without rest will be counted as the score.

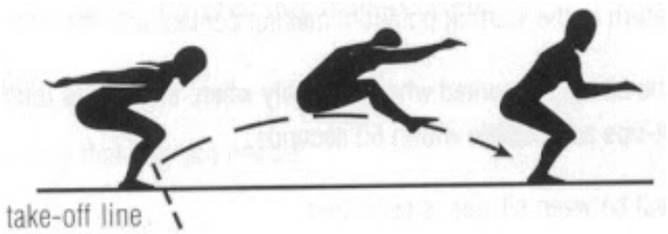
6.1.7 Standing Broad Jump

Purpose: To determine explosive leg strength of a student.

Objective: To perform horizontal jump as far as possible.

Equipment: Flat and clean field with markings; measuring tape.

Procedure: Student will stand behind the take off line, keeping both feet slightly apart and parallel apart to each.



Picture source[1]

The student will then lean forward, swinging arms back and bending both knees to gain momentum.

The jump will be performed by extending knees and swinging arms forward to provide forward drive.

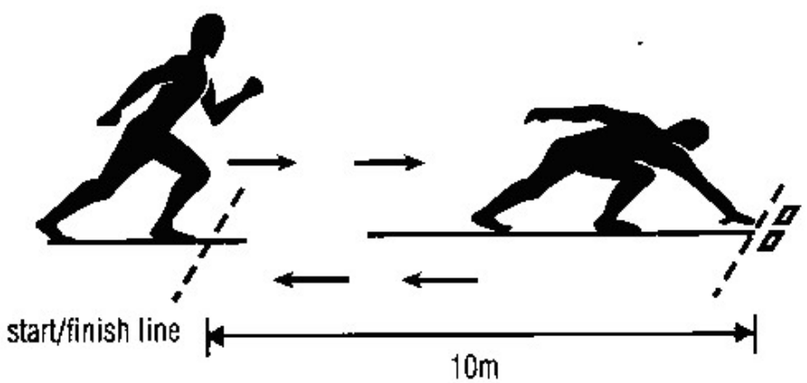
The student jumps forward as far as possible, landing on both feet without falling backwards.

Distance will be measured from the back of the heel to the take-off line.

Scoring: The longest distance jumped – the best of three attempts will be considered as score which will be measured in feet and inches.

6.1.8 Shuttle Run (4x10 M)

Purpose: To determine the agility and speed of a student.



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Objective: To run back four times between two parallel lines as fast as possible.

Equipment: 2x2x4 inches wooden blocks; stopwatch; non-slip surface with markings of two parallel lines having distance of 10 meters.

Procedure: Two wooden block each will be placed behind one of the parallel line opposite the starting line.

On the command "ready" and "Go" the student will run as fast as possible to reach the other line and pick up a block and return back to starting line.

She/He will place first block behind the line and continuously run to get another one.

Scoring: Record the best time out of two attempts. Score will be measured in seconds.

Extension Activity

Your school is holding trials for the following games. Which of the tests will you conduct for the candidates and why?

Game	Motor Fitness Test	Reason
Kho-kho		
Kabbadi		
Basketball		
Football		
Badminton		

I. Tick the correct options.

Q1. Partial curl up is to test .

(a) agility and speed

(b) leg strength and endurance

(c) **abdominal strength and endurance**

(d) upper body strength and endurance

Q2 Sit and reach test measures _ .

(a) endurance

(b) **flexibility**

(c) strength

(d) speed

II. Answer the following questions briefly.

Q1. Write down the process to determine the upper body endurance.

Q2. Explain the process of 600meter run/walk.

III. Answer the following questions in 150-200 words.

Q1. What is general motor fitness? How can it be measured?

Do you Know?

General Instructions before Exercise/Testing

Clothes- Students should wear comfortable, loose fitting sportswear during the test.

Food- Students should take food at least three hours before testing. Plenty of fluids should be taken 24 hours before testing. Alcohol and caffeine should be avoided 24 hours before testing.

Rest- Students should take proper rest and sleep on the night of testing. Any strenuous exercise should be avoided on the day of tests.

Warming up and cooling down- Students should do proper warm up and cooling down exercises before and after the testing respectively.

Equipment- Equipment should be calibrated, organized, sterilized and tested before the test. **Administration**- Temperature should not be too hot, cold, or humid. All stationary item should be ready before the test. Students should be informed about the procedure of the test and consent should be taken well in advance.

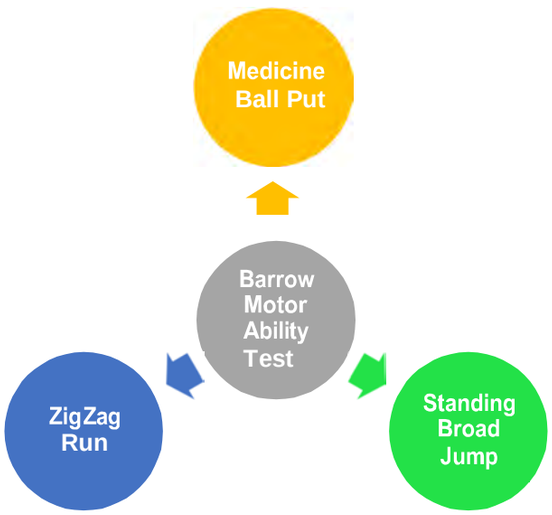
6.2.1 Barrow Motor Ability Test

Barrow motor ability test was developed by Harold M. Barrow in 1953. The purpose of the study was to measure general motor fitness. The test has three items:

(a) Standing Broad Jump,

(b) Zig Zag run and

(c) Medicine Ball Put (for boys: 03 kg and for girls: 01 kg).



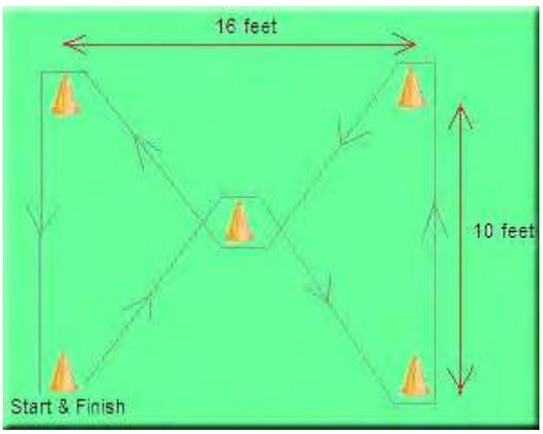
All three items can be administered through circuit method. There is no sequence to be followed.

6.2.2 Item I: Standing Broad Jump

You have already read about this test in 6.1.7

6.2.3 Item II: Zig Zag Run

Purpose: To determine agility and speed of the student.



Picture Source[3]

Objective: To complete a zig zag path as fast as possible.

Equipment: Stopwatch; cones; and a flat and clean field with markings.

Procedure: On the command "Go" student will run as fast as possible and complete zig zag pathway as illustrated in picture.

Scoring: Record the best time out of two attempts. The score will be measured in seconds.

6.2.4 Item III: Medicine Ball Put

Purpose: To determine strength, power, agility, coordination, speed and balance.

Objective: To throw the medicine ball as far as possible.

Equipment: Medicine ball for boys- 3kgs and girls – 1kgs; measuring tape; flat and clean field with markings.

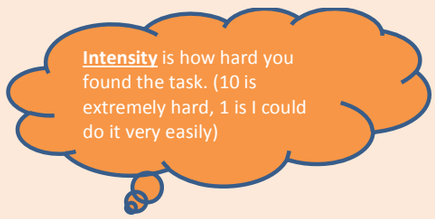
Procedure: Student will hold the ball as per guidelines and will throw the medicine ball as far as possible using one hand.

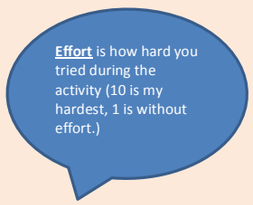
Scoring: Student will get three attempts and best will noted as score to the nearest foot.

Norms of three item Barrow motor ability test for 17 to 20 years

Extension Activity

Try the following Muscular Strength and Muscular Endurance activities with your partner. Note your findings.





Exercise	Number completed 30 secs	Number completed 45 secs	Intensity 1-10	Effort 1-10
Press ups				
Sit ups				
Squats				
Plank				
Tricep dip				

SBJ (inches)	ZigZag Run (sec.)	Medicine Ball Put (feet)	T-Score
Upto 68	29.5 and more	upto 22	20
69-72	29.4-28.7	23-25	25
73-76	28.6-27.9	26-28	30
77-80	27.8-27.2	29-31	35
81-84	27.1-26.4	32-34	40
85-88	26.3-25.6	35-38	45
89-92	25.5-24.8	39-41	50
93-96	24.7-24.0	42-44	55
97-100	23.9-23.2	45-47	60
101-104	23.1-22.5	48-51	65
105-108	22.4-21.7	52-54	70
109-112	21.6-20.9	55-57	75
113 and above	20.8 or less	58 and above	80

Norms Reference: Dr. D. K. Kansal (2008), Textbook of Applied Measurement, Evaluation and Sports Selection, Sports and Spiritual Science Publication, Delhi, ISBN No.8190228234

Do you know?

What is Vo_2 Max?

The maximum rate of oxygen used by heart, lungs and muscles during the exercise. It also known to measure aerobic capacity of an individual.

I. Tick the correct options.

Q1. Which is **not** an item of Barrow motor ability test?

(a) Medicine Ball Put

(b) Zig Zag Run

(c) Standing Broad Jump

(b) **Push-ups**

Q2. What is the weight of Medicine ball for boys in medicine ball put?

(a) 1 kg

(b) 2 kg

(c) **3 kg**

(d) 4kg

II. Answer the following questions briefly.

Q1. Explain an item of motor ability test for testing agility.

III. Answer the following questions in 150-200 words.

Q1. Explain the Barrow motor ability test.

6.3.1 Harvard Step Test

Harvard step test was developed by Brouha in 1943 for the purpose of measuring physical fitness for work and the ability to recover from work. The test was originally designed for young men of college age. In the original validation of the step test Brouha tested 2200 male students at Harvard.

Purpose: To determine aerobic fitness.

Objective: To perform step test continuously without break for 5 minutes or until exhausted.

Equipment: Bench or wooden block 20 inches in height; stopwatch; metronome.

Procedure: Student will start test at the command "Go" and will step up and down, on and off the wooden block or bench at the rate of 30 steps per minutes for 5 minutes.

If the student is unable to maintain the pace, then she/he is considered to be exhausted and the test is brought to an end.

After completion of the test student sits down and tester takes the hearts beats between 1 to 1½ minutes.

Scoring: Fitness Index score will be determined by applying following equation:

$$\frac{\text{Duration of the Exercise in Seconds x 100}}{\text{5.5 x Pulse count of 1 – 1.5 min after Exercise}} = \text{Fitness Index score}$$

Norms for Harvard Step Test

Upto 49	Poor
50-80	Average
81 or Above	Good

Norms Reference: Dr. D. K. Kansal (2008), Textbook of Applied Measurement, Evaluation and Sports Selection, Sports and Spiritual Science Publication, Delhi, ISBN No.8190228234

6.3.2 Rockport 1-Mile (1.6 KM) Walk Test

Rockport Test is a sub-maximal field test to estimate VO2 max. This test may be useful for those who are unable to run due to sedentary lifestyle and/or older individuals and/ or those of low fitness level and /or injury.

Purpose: To estimate VO2 max.

Objective: To complete one mile walk as fast as possible.

Equipment: Flat and clean field with markings; stopwatch.

Procedure: Student will stand behind the starting line and on command "ready" and "Go" he/she will walk as fast as possible to complete one mile.

Heartrate will be recorded immediately after completion of the walk through heart rate monitor or 15 second count of radial artery whichever is feasible. Exercise heart rate should be below 120 bpm.

To estimate VO2 max timing of 1 mile walking, gender, age, weight, heart rate taken immediate after the walk are required.

Scoring: Unit of VO2 max is ml · kg–1 · min–1

VO2max = 132.853 – (.0769) × wt – (.3877) × age + (6.315) × gv – (3.2469) × 1 mile walk time – (.1565) × heart rate

Wt = weight in pounds, age= age in years, gv= gender values (0 for female and 1 for males), timing of one mile walk in minutes (to hundred of a minute) and heart rate.

Extension Activity

Every student will prepare their own profile of fitness testing as per below format.

	Week 1	Week 2	Week 3	Week 4
Standing Broad Jump				
50M standing start				
600 M Run/ walk				
Sit and reach Test				
4x10 M shuttle Run				
Push-ups				
Partial Curl Up				
Zig Zag Run				
Medicine Ball Put				
Fitness Index (Harvard step test)				
VO2 max through Rockport Test				

I. Tick the correct options.

Q1. The test duration for the Harvard fitness test is .

(a) 3 minutes

(b) 4 minutes

(c) **5 minutes**

(d) 6 minutes

Q2. To determine VO2 max which of the following is **not** required?

(a) Weight

(b) Gender

(c) Age

(d) **Name**

II. Answer the following questions briefly.

Q1. What do you mean by aerobic fitness?

Q2. Write the procedure of Rockport 1 mile walk test.

III. Answer the following questions in 150-200 words.

Q1. Briefly describe the tests used for assessing cardio-vascular fitness?

6.4.1 Rikli and Jones Senior Citizen Fitness Test

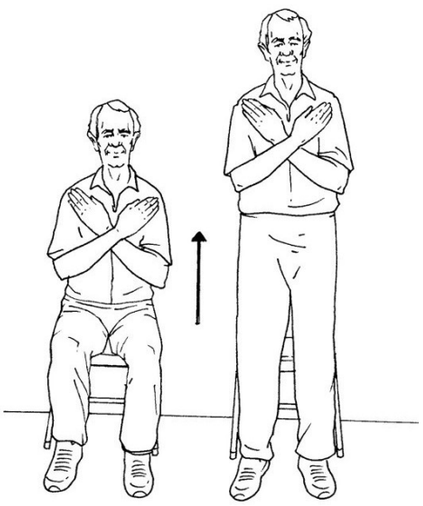
The senior citizen's fitness test (SFT) was developed by Rikli and Jones for older people aged between 60 to 94 years. The purpose of the test was to evaluate functional ability and monitor the physical fitness status of older people and to identify problems and work on the weakness. This test should not be practiced by those who have any medical conditions like chest pain, dizziness, high blood pressure, heart problems etc. This test is economical and easy to administer. The test includes the following items:

1. Chair Stand Test for lower body strength
2. Arm Curl Test for upper body strength
3. Chair Sit and Reach Test for lower body flexibility
4. Back Scratch Test for upper body flexibility
5. Eight Foot Up and Go Test for agility
6. Six Minute Walk Test for aerobic endurance

Source of all Pictures[4]

6.4.2 30 Second Chair Stand Test

Purpose: To determine lower body strength. **Objective**: To complete maximum stands in 30 seconds.



Equipment: Straight back chair without arms; stopwatch.

Procedure: The chair should be placed against the wall or somewhere where it gets stabilized.

Initially, the individual will sit on the chair, back straight, arms crossed and feet firmly on the floor shoulder width apart.

On the command "Go" the individual will stand up completely, then return back to the initial position. This will be counted as one stand. The individual should be motivated to do maximum stands in 30 seconds.

Scoring: Maximum number of complete stands will be counted as score. If the individual is in half way of the stand and time is over, then it will be counted as a full stand.

6.4.3 Arm Curl Test

Purpose: To determine upper body strength.

Objective: To complete maximum arm curls in 30 seconds.

Equipment: Straight back chair without arms; Dumbbell for men- 8 pounds(3.6kgs) and women- 5 pounds(2.3kgs); stopwatch.

Procedure: The chair should be placed against the wall or somewhere where it gets stabilized.

The individual sits on the chair with back straight, feet on floor, holing dumbbell with dominant hand using handshake grip.

On the command "Go" the individual flexes the elbow or curls the arm with full range of motion then returns back to its initial position.

In the down position dumbbell will return to handshake grip.

The individual can perform as many arm curls as possible in 30 seconds.

Scoring: Maximum number of correct arm curls in 30 second will be counted.

6.4.4 Chair Sit and Reach Test

Purpose: To determine lower body flexibility.

Objective: To stretch the lower body as far as possible. **Equipment**: Straight back chair without arms; 18 inches ruler.

Procedure: The chair should be placed against the wall or somewhere where the chair gets stabilized.

Participant sits on the chair with one foot flat on the floor and the other leg extended forward with the knee straight, heel on the floor, and ankle bent at 90°.

The participant, then, tries to touch the toe of that foot by bending at the hip and sliding her/his hands towards the toes.

To clock score participant must hold that position for 2 seconds.

Scoring: Measurement will be taken between extended long finger and tip of the toe and minimum to .5 inches will be recorded as score. If fingers cross the toe then + will be indicated before the score and if the participant is unable to touch the toe, then – sign will be indicated.

6.4.5 Back Stretch

Purpose: To determine upper body flexibility

Objective: To touch or overlap the finger of the both hands behind the back.

Equipment: 18 inches ruler

Procedure: In standing position participant will place one hand over the shoulder and one hand middle of the back and try to touch or overlap each other.

Scoring: Measurement will be taken by measuring the distance between the tips of the middle fingers. If the fingertips touch then the score is zero. If they do not touch, measure the distance between the finger tips (a negative score), if they overlap, measure by how much (a positive score).

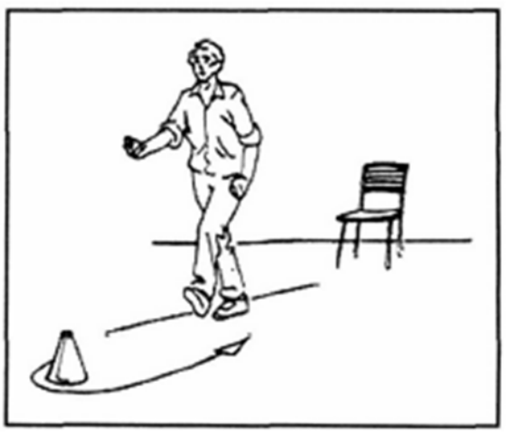
6.4.6 8 Foot Up and Go

Purpose: To determine physical mobility (power, speed, agility and balance).

Objective: To stand and walk 16 feet and sit back as fast as possible (without running).

Equipment: Straight back chair without arms; cone; stopwatch,

Procedure: A chair should be placed against the wall or somewhere where the chair get stabilized.



The participant sits on the chair with both feet on the floor.

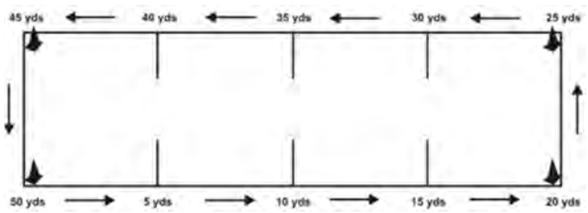
At the command “Go” he/she walks as fast as possible (not running) and returns back after walking to and around the cone which is placed 8 ft away from the chair.

There should be enough space around the cone from where participant can take an easy turn.

Scoring: Two attempts will be made and the best score will be taken for record. Fastest time taken between command “Go” and return to the chair will be recorded.

6.4.7 6 Minute Walk Test

Purpose: To determine aerobic endurance



Objective: To walk maximum distance in 6 minutes.

Equipment: Walking area of 20 yards each between parallel lines connected with 5 yards lines making rectangles; stopwatch; cone.

Procedure: Participant will start walking after the command “Go” and continuously walk on the track for 6 minutes.

He /she has to cover maximum distance in 6 minutes but without running.

Scoring: Maximum distance covered in 6 minutes will be recorded as score

6.4.8 2 Minutes Step Test

Purpose: To determine aerobic endurance.

Objective: To count maximum number of steps in 2 minutes. **This test is performed as an alternative to the 6- minute walk** test for people who use orthopaedic devices when walking, as well as in the case of people who have difficulty balancing.

Equipment: tape for marking the wall; stopwatch; wall. **Procedure:** The participant stands up straight next to the wall while a mark is placed on the wall at the level corresponding to midway between the patella (knee cap) and illiac crest (top of the hip bone).

The participant then marches in place for two minutes, lifting the knees to the height of the mark on the wall. Resting is allowed, and holding onto the wall or a stable chair is allowed.

Stop after two minutes of stepping.

Scoring: The total number of times the right knee reaches the tape level in two minutes is recorded.

Normal Range of Score for Men

	60-64	65-69	70-74	75-79	80-84	85-89	90-94
Chair stand (no. of stands)	14 - 19	12 - 18	12 - 17	11 - 17	10 - 15	8 - 14	7 - 12
Arm Curl (no. of reps)	16 - 22	15 - 21	14 - 21	13 - 19	13 - 19	11 - 17	10 - 14
6-Min Walk (no. of yds)	610 - 735	560 - 700	545 - 680	470 - 640	445 - 605	380 - 570	305 - 500
2-Min Step (no. of steps)	87 - 115	86 - 116	80 - 110	73 - 109	71 - 103	59 - 91	52 - 86
Chair Sit-&-Reach (inches +/-)	-2.5 - +4.0	-3.0 - +3.0	-3.5 - +2.5	-4.0 - +2.0	-5.5 - +1.5	-5.5 - +0.5	-6.5 - -0.5
Back Scratch (inches +/-)	-6.5 - +0.0	-7.5 - -1.0	-8.0 - -1.0	-9.0 - -2.0	-9.5 - -2.0	-10.0 - -3.0	-10.5 - -4.0
8-Ft Up-&-Go (seconds)	5.6 - 3.8	5.7 - 4.3	6.0 - 4.2	7.2 - 4.6	7.6 - 5.2	8.9 - 5.3	10.0 - 6.2

Reference: The Journal for Active Aging, March April 2003 Page No. 28

Normal Range of Score for Women

	60-64	65-69	70-74	75-79	80-84	85-89	90-94
Chair stand (no. of stands)	12 - 17	11 - 16	10 - 15	10 - 15	9 - 14	8 - 13	4 - 11
Arm Curl (no. of reps)	13 - 19	12 - 18	12 - 17	11 - 17	10 - 16	10 - 15	8 - 13
6-Min Walk (no. of yds)	545 - 660	500 - 635	480 - 615	430 - 585	385 - 540	340 - 510	275 - 440
Chair Sit-&-Reach (inches +/-)	-0.5 - +5.0	-0.5 - +4.5	-1.0 - +4.0	-1.5 - +3.5	-2.0 - +3.0	-2.5 - +2.5	-4.5 - +1.0
Back Scratch (inches +/-)	-3.0 - +1.5	-3.5 - +1.5	-4.0 - +1.0	-5.0 - +0.5	-5.5 - +0.0	-7.0 - -1.0	-8.0 - -1.0
8-Ft Up-&-Go (seconds)	6.0 - 4.4	6.4 - 4.8	7.1 - 4.9	7.4 - 5.2	8.7 - 5.7	9.6 - 6.2	11.5 - 7.3

Reference: The Journal for Active Aging, March April 2003 Page No. 28

Do you Know

We can improve fitness through following activities: Muscular Strength: Jumps, throws, weight training

Muscular Endurance: Pull ups, Push-ups, Sit-ups, weight training Cardiovascular Endurance: Long distance running, swimming, cycling Flexibility: Yoga Asana

Speed: 10m, 30m, 50m, 100m sprint etc.

Coordination: ball throw and catching, kicking and stopping ball Agility: Cone, ball, balloon and ladder drills

Case Study

Shyam, Vinay and Ram are engaged in regular fitness activity. Ram runs for an hour every day, Shyam goes to the Gym for a workout every day and Vinay, who is a national level football player, does two hours of vigorous physical fitness every day. They often discuss various aspects of their daily physical routine. Today their discussion turned into an argument, with each claiming that he was fitter than the others. They meet their physical education teacher and he suggests all three undergo a fitness test to determine their physical abilities. All agree and the teacher administers a few tests. Their results are given below:

Test	Shyam Score gym	Vinay Score foot	Ram run
50 M Standing Start	7.1 seconds	6.4 seconds	6.9 seconds
600 M Run/ Walk	2.14 minutes	1.40 minute	1.41 minute
Sit and Reach	40’	42’	39’
Partial Curl Up	29	27	18
Push Ups	22	19	13
4x 10 M Shuttle Run	7.0	7.3	8.2
Standing Broad Jump	7’2”	7’8”	7’4”
Zig Zag Run	29.2	21.6	24.1
Medicine Ball Put	56 feet	55 feet	32 feet
Harvard Step Test Index	56	89	82

Q. Which of the following friends had an 'average' score in Harvard step test?

(a) Ram

(b) Shyam

(c) Vinay

Q, Who has better agility, upper extremity strength and Physical Efficiency Index scores among the three friends?

(a) Shyam

(b) Vinay

(c) Ram

Q. 4x10 m shuttle run was conducted for assessment of which of the following ability of all three friends.

(a) Agility

(b) Speed

(c) Endurance

(d) Flexibility

Q. Suggest an alternative test other than mentioned that of mentioned in the case study, for assessment of the strength, speed and agility. Give your reasons for choosing the Test.

I. Tick the correct options.

Q1. Which is **not** an item of Rikli and Jones Test?

(a) 8 Foot Up and Go

(b) **Sit and Reach test**

(c) 6 Minute Walk Test

(d) Arms Curl Test

Q2. What is the weight of dumbbell for men in arm curl of Rikli and Jones Test?

(a) 5 pounds

(b) 6 pounds

(c) **8 pounds**

(d) 10 pounds

II. Answer the questions briefly.

Q1. Explain any two test that form part of the Rikli and Jones Test.

Q2. Write down the purpose of all the tests that form a part of Rikli and Jones Test.

III. Answer the questions in 150-200 words.

Q1. Discuss any three tests for testing the endurance and agility of senior citizens.

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