



LAB 4.1 Assessing Your Current Level of Muscular Strength



For best results, don't do any strenuous weight training within 48 hours of any test. Use great caution when completing 1 RM tests; do not take the maximum bench press or leg press test if you have any injuries to your shoulders, elbows, back, hips, or knees. In addition, do not take these tests until you have had at least one month of weight training experience.



The Maximum Bench Press Test

Equipment

1. Universal Gym Dynamic Variable Resistance machine
2. Weight scale

If free weights are used, the following equipment is needed:

1. Flat bench (with or without racks)
2. Barbell
3. Assorted weight plates, with collars to hold them in place
4. One or two spotters
5. Weight scale



Maximum bench press test.

Preparation

Try a few bench presses with a small amount of weight so you can practice your technique, warm up your muscles, and, if you use free weights, coordinate your movements with those of your spotters. Weigh yourself and record the results.

Body weight: _____ lb

Instructions

1. Set the machine for a weight that is lower than the amount you believe you can lift. For free weights, men should begin with a weight about 2/3 of their body weight; women should begin with the weight of just the bar (45 lb).
2. Lie on the bench with your feet firmly on the floor. If you are using a weight machine, grasp the handles with palms away from you; the tops of the handles should be aligned with the tops of your armpits.
If you are using free weights, grasp the bar slightly wider than shoulder width with your palms away from you. If you have one spotter, she or he should stand directly behind the bench; if you have two spotters, they should stand to the side, one at each end of the barbell. Lower the bar to your chest in preparation for the lift.
3. Push the bars or barbell until your arms are fully extended. Exhale as you lift. If you are using free weights, the weight moves from a low point at the chest to a high point over the chin. Keep your feet firmly on the floor, don't arch your back, and push the weight evenly with your right and left arms. Don't bounce the weight on your chest.
4. Rest for several minutes, then repeat the lift with a heavier weight. It will probably take several attempts to determine the maximum amount of weight you can lift (1 RM).

1 RM: _____ lb Check one : _____ Universal _____ Free weights _____ Other

5. If you used free weights, convert your free weights bench press score to an estimated value for 1 RM on the Universal bench press using the appropriate formula:

Males: Estimated Universal 1 RM = $(1.016 \times \text{free weights 1 RM } ______ \text{ lb}) + 18.41 = ______ \text{ lb}$

Females: Estimated Universal 1 RM = $(0.848 \times \text{free weights 1 RM } ______ \text{ lb}) + 21.37 = ______ \text{ lb}$

Rating Your Bench Press Result

1. Divide your Universal 1 RM value by your body weight.
1 RM _____ lb \div body weight _____ lb = _____
2. Find this ratio in the table below to determine your bench press strength rating. Record the rating here and in the chart at the end of this lab.
Bench press strength rating: _____

Strength Ratings for the Maximum Bench Press Test

Pounds Lifted/Body Weight (lb)

Men	Very Poor	Poor	Fair	Good	Excellent	Superior
Age: Under 20	Below 0.89	0.89–1.05	1.06–1.18	1.19–1.33	1.34–1.75	Above 1.75
20–29	Below 0.88	0.88–0.98	0.99–1.13	1.14–1.31	1.32–1.62	Above 1.62
30–39	Below 0.78	0.78–0.87	0.88–0.97	0.98–1.11	1.12–1.34	Above 1.34
40–49	Below 0.72	0.72–0.79	0.80–0.87	0.88–0.99	1.00–1.19	Above 1.19
50–59	Below 0.63	0.63–0.70	0.71–0.78	0.79–0.89	0.90–1.04	Above 1.04
60 and over	Below 0.57	0.57–0.65	0.66–0.71	0.72–0.81	0.82–0.93	Above 0.93
Women						
Age: Under 20	Below 0.53	0.53–0.57	0.58–0.64	0.65–0.76	0.77–0.87	Above 0.87
20–29	Below 0.51	0.51–0.58	0.59–0.69	0.70–0.79	0.80–1.00	Above 1.00
30–39	Below 0.47	0.47–0.52	0.53–0.59	0.60–0.69	0.70–0.81	Above 0.81
40–49	Below 0.43	0.43–0.49	0.50–0.53	0.54–0.61	0.62–0.76	Above 0.76
50–59	Below 0.39	0.39–0.43	0.44–0.47	0.48–0.54	0.55–0.67	Above 0.67
60 and over	Below 0.38	0.38–0.42	0.43–0.46	0.47–0.53	0.54–0.71	Above 0.71

SOURCE: Based on norms from the Cooper Institute for Aerobics Research, Dallas, Texas; from *The Physical Fitness Specialist Manual*, Revised 2002. Used with permission.



The Maximum Leg Press Test

Equipment

1. Universal Gym Dynamic Variable Resistance leg press machine. (If you're using a Universal Gym leg press with two sets of pedals, use the lower pedals.)
2. Weight scale

The ratings for this test were developed using the Universal Gym Dynamic Variable Resistance machine; results will be somewhat less accurate if the test is performed on another type of machine.

Preparation

Try a few leg presses with the machine set for a small amount of weight so you can practice your technique and warm up your muscles. Weigh yourself and record the results.

Body weight: _____ lb

Instructions

1. Set the machine for a weight that is lower than the amount you believe you can press.
2. Adjust the seat so that your knees are bent at a 70-degree angle to start.
3. Grasp the side handlebars and push with your legs until your knees are fully extended.
4. Rest for several minutes, then repeat the press with a higher weight setting. It will probably take several attempts to determine the maximum amount of weight you can press.

1 RM: _____ lb

Rating Your Leg Press Result

1. Divide your 1 RM value by your body weight.

1 RM _____ lb ÷ body weight _____ lb = _____

2. Find this ratio in the table below to determine your leg press strength rating. Record the rating below and in the chart at the end of this lab.

Leg press strength rating: _____



Maximum leg press test.

Strength Ratings for the Maximum Leg Press Test

Pounds Lifted/Body Weight (lb)

Men	Very Poor	Poor	Fair	Good	Excellent	Superior
Age: Under 20	Below 1.70	1.70–1.89	1.90–2.03	2.04–2.27	2.28–2.81	Above 2.81
20–29	Below 1.63	1.63–1.82	1.83–1.96	1.97–2.12	2.13–2.39	Above 2.39
30–39	Below 1.52	1.52–1.64	1.65–1.76	1.77–1.92	1.93–2.19	Above 2.19
40–49	Below 1.44	1.44–1.56	1.57–1.67	1.68–1.81	1.82–2.01	Above 2.01
50–59	Below 1.32	1.32–1.45	1.46–1.57	1.58–1.70	1.71–1.89	Above 1.89
60 and over	Below 1.25	1.25–1.37	1.38–1.48	1.49–1.61	1.62–1.79	Above 1.79
Women						
Age: Under 20	Below 1.22	1.22–1.37	1.38–1.58	1.59–1.70	1.71–1.87	Above 1.87
20–29	Below 1.22	1.22–1.36	1.37–1.49	1.50–1.67	1.68–1.97	Above 1.97
30–39	Below 1.09	1.09–1.20	1.21–1.32	1.33–1.46	1.47–1.67	Above 1.67
40–49	Below 1.02	1.02–1.12	1.13–1.22	1.23–1.36	1.37–1.56	Above 1.56
50–59	Below 0.88	0.88–0.98	0.99–1.09	1.10–1.24	1.25–1.42	Above 1.42
60 and over	Below 0.85	0.85–0.92	0.93–1.03	1.04–1.17	1.18–1.42	Above 1.42

SOURCE: Based on norms from the Cooper Institute for Aerobics Research, Dallas, Texas; from *The Physical Fitness Specialist Manual*, Revised 2002. Used with permission.

Predicting 1 RM from Submaximal Lifts

Values for 1 RM can be predicted by performing multiple repetitions using a submaximal weight. Although less accurate than direct measurement of 1 RM, this method may be safer for some people. To calculate 1 RM using this method, choose a weight with which you can perform about 5 repetitions. Follow the instructions given in the maximum bench press and maximum leg press test descriptions for warming up and performing the lifts—but do as many repetitions as you can using the amount of resistance you have chosen. Enter your resistance and number of repetitions into the formula below to predict your 1 RM on these tests. Then, enter your 1 RM values into the appropriate formula in the maximum bench press and maximum leg press tests to obtain your rating.

Bench press: 1 RM = (resistance _____ lb ÷ 2.2 lb/kg) ÷ (1.0278 – (0.0278 × number of repetitions _____))
= _____ kg × 2.2 lb/kg = _____ lb

Leg press: 1 RM = (resistance _____ lb ÷ 2.2 lb/kg) ÷ (1.0278 – (0.0278 × number of repetitions _____))
= _____ kg × 2.2 lb/kg = _____ lb

SOURCE: Brzycki, M. 1993. Strength testing: Predicting a one-rep max from a reps-to-fatigue. *Journal of Physical Education, Recreation, and Dance* 64:88–90.



Hand Grip Strength Test

Equipment Grip strength dynamometer

Preparation If necessary, adjust the hand grip size on the dynamometer into a position that is comfortable for you; then lock the grip in place. The second joint of your fingers should fit snugly under the handle of the dynamometer.

Instructions

- Stand with the hand to be tested first at your side, away from your body. The dynamometer should be in line with your forearm and held at the level of your thigh. Squeeze the dynamometer as hard as possible without moving your arm; exhale as you squeeze. During the test, don't let the dynamometer touch your body or any other object.
- Perform two trials with each hand. Rest for about a minute between trials. Record the scores for each hand to the nearest kilogram.

Right hand: Trial 1: _____ kg Trial 2: _____ kg Right hand best trial _____ kg

Left hand: Trial 1: _____ kg Trial 2: _____ kg Left hand best trial _____ kg

(Scores on the dynamometer should be given in kilograms. If the dynamometer you are using gives scores in pounds, convert pounds to kilograms by dividing your score by 2.2.)



Hand grip strength test.

Rating Your Hand Grip Strength

Refer to the table for a rating of your grip strength. Record the rating below and in the chart at the end of this lab.

Total score (sum of the best trial for each hand) _____ kg Rating for hand grip strength: _____

		Grip Strength* (kg)				
Men		Needs Improvement	Fair	Good	Very Good	Excellent
Age:	15–19	Below 84	84–94	95–102	103–112	Above 112
	20–29	Below 97	97–105	106–112	113–123	Above 123
	30–39	Below 97	97–104	105–112	113–122	Above 122
	40–49	Below 94	94–101	102–109	110–118	Above 118
	50–59	Below 87	87–95	96–101	102–109	Above 109
	60–69	Below 79	79–85	86–92	93–101	Above 101
Women						
Age:	15–19	Below 54	54–58	59–63	64–70	Above 70
	20–29	Below 55	55–60	61–64	65–70	Above 70
	30–39	Below 56	56–60	61–65	66–72	Above 72
	40–49	Below 55	55–58	59–64	65–72	Above 72
	50–59	Below 51	51–54	55–58	59–64	Above 64
	60–69	Below 48	48–50	51–53	54–59	Above 59

*Combined right and left hand grip strength.

SOURCE: *The Canadian Physical Activity, Fitness and Lifestyle Appraisal: CSEP's Plan for Healthy Active Living*, 2d ed., 1998. Reprinted by permission from the Canadian Society for Exercise Physiology.

Summary of Results

Maximum bench press test: Weight pressed: _____ lb Rating: _____

Maximum leg press test: Weight pressed: _____ lb Rating: _____

Hand grip strength test: Total score: _____ kg Rating: _____

Remember that muscular strength is specific: Your ratings may vary considerably for different parts of your body.

Using Your Results

How did you score? Are you at all surprised by your rating for muscular strength? Are you satisfied with your current rating?

If you're not satisfied, set a realistic goal for improvement: _____

Are you satisfied with your current level of muscular strength as evidenced in your daily life—for example, your ability to lift objects, climb stairs, and engage in sports and recreational activities?

If you're not satisfied, set some realistic goals for improvement:

What should you do next? Enter the results of this lab in the Preprogram Assessment column in Appendix D. If you've set goals for improvement, begin planning your strength training program by completing the plan in Lab 4.3. After several weeks of your program, complete this lab again and enter the results in the Postprogram Assessment column of Appendix D. How do the results compare?