1-RM BENCH-PRESS ASSESSMENT PROTOCOL

Objective: To evaluate upper-body strength using a fundamental upper-extremity movement: the bench press

Equipment:
- Barbell and bench
- Weights, ranging from 2.5-lb to 45-lb plates (1-kg to 20-kg plates)
- Collars
- Spotter (in addition to the personal trainer is preferred)

Pre-assessment procedure:
- After explaining the purpose of the assessment, explain and demonstrate the proper technique for the bench press.
  - The client is supine with eyes below the racked bar and both feet planted firmly on the floor or on a riser to accommodate a neutral or flat back. The head, shoulders, and buttocks should be placed firmly and evenly on a bench. The back and neck should be relaxed and the body should maintain all points of contact throughout the movement to maintain stability and support the spine.
  - The hands should be in closed pronated grip and positioned slightly wider than shoulder-width apart, so that the elbows are at a 90-degree angle (or slightly less) at the bottom of the movement range.
  - Proper range of motion during the bench press is from arms fully extended (bar positioned above the chest) to the bar lightly touching the chest (bar located over the lower part of the sternum).
  - The client should inhale while slowly lowering the bar and exhale while raising the bar. Breath-holding (or the Valsalva maneuver) should be avoided.
  - It is important for the client to communicate with the spotter if he or she cannot complete the repetition.
  - Instruct the client not to lock the elbows and not to bounce the bar off the chest. Poor technique can cause injuries, so the client should not contort his or her body in an effort to display strength beyond his or her capabilities.
- Encourage the client to perform a few practice trials to ensure proper technique.

- The responsibilities of the spotter include providing assistance in racking and unracking the barbell and raising the bar during an incomplete attempt.
  - *Single spotting:* The spotter stands behind the client in a split-stance position with a dead-lift or closed, alternated grip (i.e., a mix of an overhand grip and an underhand grip) on the bar with the hands placed in the area between the client's hands.
  - *Double spotting:* The two spotters grasp either end of the barbell.
- The goal of the assessment is to determine the maximal amount of weight that can be lifted one time (i.e., the one-repetition maximum, or 1-RM). It is important to avoid fatiguing the client by having him or her perform too many "unnecessary" repetitions. Finding a suitable starting weight is important for an accurate assessment of the client's strength.

Assessment protocol and administration:
- Administer the assessment protocol for a 1-RM bench press.
  - The client should warm up with one set of light resistance that allows five to 10 repetitions, and then rest for one minute.
  - Based on the client's warm-up effort, determine a suitable starting workload for the second set that allows for three to five repetitions, and then allow the client to rest for two minutes. Use the following guideline for determining workload increases throughout this assessment:
    > In general, increase by approximately 5 to 10%.
- Next, have the client perform one heavy set of two to three repetitions and rest for two to four minutes.
- Based on the client's third set, determine the next workload to find the client's 1-RM effort. The 1-RM repetition table below can be used to make these calculations.
- Allow the client to attempt this set. If the client is successful, he or she should rest for two to four minutes and repeat the 1-RM effort with a heavier load.
- If the attempt was unsuccessful, decrease the load accordingly (by 2.5 to 5%) and have the client try again after resting for two to four minutes.

- Continue to adjust the resistance level until a true 1-RM is achieved. *Ideally, the client should achieve his or her 1-RM in three to five sets.*

- Use the assessment form to record the weight, progression, sets, repetitions, and any comments on the client's progress. The final weight/load is recorded as the absolute strength.

- Calculate relative strength and record that value as well.

  - For example, if Jose's actual 1-RM was measured at 205 lb (93.2 kg) and he weighs 175 lb (79.5 kg), then his strength-to-weight ratio, or relative strength, would be 1.17 (205/175 or 93.2/79.5).

Interpretation:

Use the tables below to rank the client's ability, which should be recorded on the assessment form as well.

1-RM–Repetition Table

Repetitions	% 1-RM	Repetitions	% 1-RM
1	100	8	80
2	95	9	77
3	93	10	75
4	90	11	70
5	87	12	67
6	85	15	65
7	83		

Note: 1-RM = One-repetition maximum

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Upper-body Strength (Men)

One-repetition Maximum Bench Press (Bench Press Weight Ratio = Weight Pushed / Body Weight)							
		Age					
	%	< 20	20–29	30–39	40–49	50–59	60+
Superior	95	1.76	1.63	1.35	1.20	1.05	0.94
Excellent	80	1.34	1.32	1.12	1.00	0.90	0.82
Good	60	1.19	1.14	0.98	0.88	0.79	0.72
Fair	40	1.06	0.99	0.88	0.80	0.71	0.66
Poor	20	0.89	0.88	0.78	0.72	0.63	0.57
Very Poor	5	0.76	0.72	0.65	0.59	0.53	0.49

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Upper-body Strength (Women)

One-repetition Maximum Bench Press (Bench Press Weight Ratio = Weight Pushed / Body Weight)							
		Age					
	%	< 20	20–29	30–39	40–49	50–59	60+
Superior	95	0.88	1.01	0.82	0.77	0.68	0.72
Excellent	80	0.77	0.80	0.70	0.62	0.55	0.54
Good	60	0.65	0.70	0.60	0.54	0.48	0.47
Fair	40	0.58	0.59	0.53	0.50	0.44	0.43
Poor	20	0.53	0.51	0.47	0.43	0.39	0.38
Very Poor	5	0.41	0.44	0.39	0.35	0.31	0.26

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