Resistance Training Exercise Techniques

Some basic terms… Bar Grips

- Pronated (*overhand grip*), the thumb is wrapped around the bar in all of the grips shown; called a *closed grip*.
- Supinated (*underhand grip*).
- Alternated

Readings:

- NSCA text: Chapter 13 pp 287 –292
  - You are assumed to know the technique of basic weightlifting movements from the PE 108 recommended pre-requisite (pg 293-325)
Some basic terms... Grip Widths

Shoulder width most commonly used

Stable Body and Limb Positioning

- Enables the client to maintain proper body alignment during an exercise, which in turn places an appropriate stress on muscles and joints
  - **Standing**: typically the feet are positioned slightly wider than hip-width with the heels and balls of the feet in contact with the floor.

Seated or supine exercises: a five-point body contact position:

1. Head is placed firmly on the bench or back pad.
2. Shoulders and upper back are placed firmly and evenly on the bench or back pad.
3. Buttocks are placed evenly on the bench or seat.
4. Right foot is flat on the floor.
5. Left foot is flat on the floor.

**Stable Body and Limb Positioning**

- **Seated or supine exercises**: a five-point body contact position???
- **=** exceptions to every (NSCA) “rule” of thumb
Stable Body and Limb Positioning
Before performing machine exercises...

Adjust seat and pads to position the body joint primarily involved in the exercise in alignment with the machine’s axis of rotation.

Exercise Technique Fundamentals
- **Full** range of motion maximizes the value of an exercise

**Except... in squat**
- Squat down until either:
  - Thighs are parallel to the floor
  - Trunk begins to flex forward
  - Heels rise off floor

Exercise Technique Fundamentals
- **Breathing Considerations** (NSCA version)
  - The sticking point is the most strenuous movement of a repetition, and it occurs at some point in the shortening phase (e.g., biceps curl midway point upwards)
  - Instruct clients to **exhale through the sticking point during muscle shortening** and to **inhale during the less stressful lengthening phase** of the repetition.

Exercise Technique Fundamentals
- **Breathing Considerations** (McGill version)
  - Spine stability must be maintained
  - A wide range of muscles are involved in spine stability, depending on the task
    - The transverse abdominis is NOT the key muscle
  - Balance in forces produced by multiple muscles is critical for spine stability
  - Activation of all 3 muscle layers in needed for “abdominal bracing” ("superstiffness")
Exercise Technique Fundamentals

- Should athletes breathe during a particular phase of the exertion? (McGill version pg 51, 146)
  - Exhaling upon the exertion when lifting a weight will not transfer to the athletic situation in a way that will ensure sufficient spine stability
  - Spine stabilization requires that lung ventilation become independent of exertion
  - The spine must be stabilized by co-contraction of the abdominal wall, regardless of whether the individual is inhaling or exhaling
  - You must train to breath independently of the exertion, maintaining spine stability throughout (Lab exercise)

Exercise Technique Fundamentals

- Breathing Considerations (NSCA version)
  - Valsalva maneuver (forcible exhalation against a closed airway)
    - For experienced and well-resistance-trained athletes performing structural exercises
    - Structural exercise:
      - Loading vertebral column: e.g. back squat
      - Stresses lower back: e.g. bent over row, shoulder press
    - Will assist in maintaining proper vertebral alignment and support

Exercise Technique Fundamentals

- Should athletes breathe during a particular phase of the exertion? (McGill version pg 146)
  - Exception to the need to breath independent of exertion:
    - Single maximum effort (e.g., weight lifting maximum) requires supreme spine stiffness a breath hold at high volume
    - Only elite lifters and sprinters do this.

Exercise Technique Fundamentals

- Breathing Considerations (NSCA version)
  - Valsalva maneuver
    - Involves expiring against a closed glottis, which, when combined with contracting the abdomen and rib cage muscles, creates rigid compartments in the lower torso and the upper torso
    - Helps to establish the “flat-back” and erect upper torso position in many exercises
    - Performed through the “sticking point”, 1-2 secs
    - NOT for people with CV, respiratory, or orthopedic disorders
**Exercise Technique Fundamentals**

- **Weight Belts (NSCA text)**
  - For when performing ground based structural exercises that place stress on the lower back and during sets that involve **near-maximal or maximal loads**.
  - Not needed for exercises that do not stress the lower back (e.g., lat pull down) or for those that do stress the lower back but involve loads below near-max.
  - SO… Most people do not need weight belts

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**Exercise Technique Fundamentals**

- **Weight Belts (McGill text)**
  - Not recommended for healthy people in routine work or exercise
  - Recommended for extreme athletic lifting to allow elite athlete to lift more weight
  - SO… non-elite lifters do not need weight belts

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**Spotting Free Weight Exercises**

- Use a spotter for free weight exercises that involve a load:
  - moving over the head
  - positioned on the back
  - on the front of the shoulders
  - passing over the face

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**Spotting Free Weight Exercises**

- For barbell exercises…
  - Spotting Overhead Exercises and Those With the Bar on the Back or Front Shoulders
    - should be performed inside a power rack with the crossbars in place at an appropriate height
Spotting Free Weight Exercises

- Spotting Overhead Exercises and Those With the Bar on the Back or Front Shoulders
  - Out-of-the-rack exercises (e.g., forward step lunge or step-up) with heavy weights can result in serious injury.
  - These exercises should be executed only by well-trained & skilled clients and spotted by experienced professionals.
  - Do these inside a rack with crossbars if possible

Spotting Over-the-Face Exercises

- Because of the bar’s curved trajectory in some exercises (e.g., lying triceps extension, barbell pullover), the spotter will use an alternated grip to pick up the bar and return it to the floor but a supinated grip to spot the bar.

Spotting Over-the-Face Exercises… e.g. Flat Dumbbell Fly. Where should spotter place his hands when spotting dumbbells?
Spotting Free Weight Exercises

- Spotting Over-the-Head Exercises… Dumbbells
- Comments on technique at right?

Spotting Free Weight Exercises

- Do Not Spot Power Exercises (e.g., Power Clean)

Communication Between Athlete and Spotter, set a technique before the lift
- Use of a Liftoff (does spotter help?)
- Amount and Timing of Spotting Assistance (coordination between 2 spotters)

Spotting Free Weight Exercises

- Number of Spotters
  - Determined by load, lift, and experience and ability of athlete and spotters (e.g., heavy vs light bench press)

Other safety issues

- Use revolving sleeves for power exercises
- Sufficient space above and around, including for falling weight and people
- For standing lift from rack:
  - Lift off rack and step BACK to start (when fresh)
  - Step FORWARD to return bar to rack (when tired)
Other safety issues

- Use collars to secure free weight plates
- Fully insert pin in machine stacks (use only pins manufactured by that company for that machine design)

Exercise Technique Considerations – resistance training on an unstable surface

- Training on an unstable surface is advocated by some as a way to make the resistance training lift more challenging

- Training on an unstable surface is NOT advocated by some
  - Resistance training on unstable surfaces:
    - Does not always result in greater muscle activation, compared to training same exercise on stable surface
    - Reduces force and velocity in squat exercises
      - Source: 3 article summaries on 416 web site on unstable surface resistance training
  - Strength and Power Hour podcast 09-06-28, Erik Helland, NBA Strength & Conditioning Coach, and Juan Carlos Santana, Elite trainer, views.