Grades and dosages

- Two systems of grading dosages (or rate of application) and their application in the range of available motion have been popularized.

- **Non-Thrust Oscillation Techniques**
- The oscillations may be performed using physiological (osteokinematic) motions or joint-play (arthrokinematic) techniques.

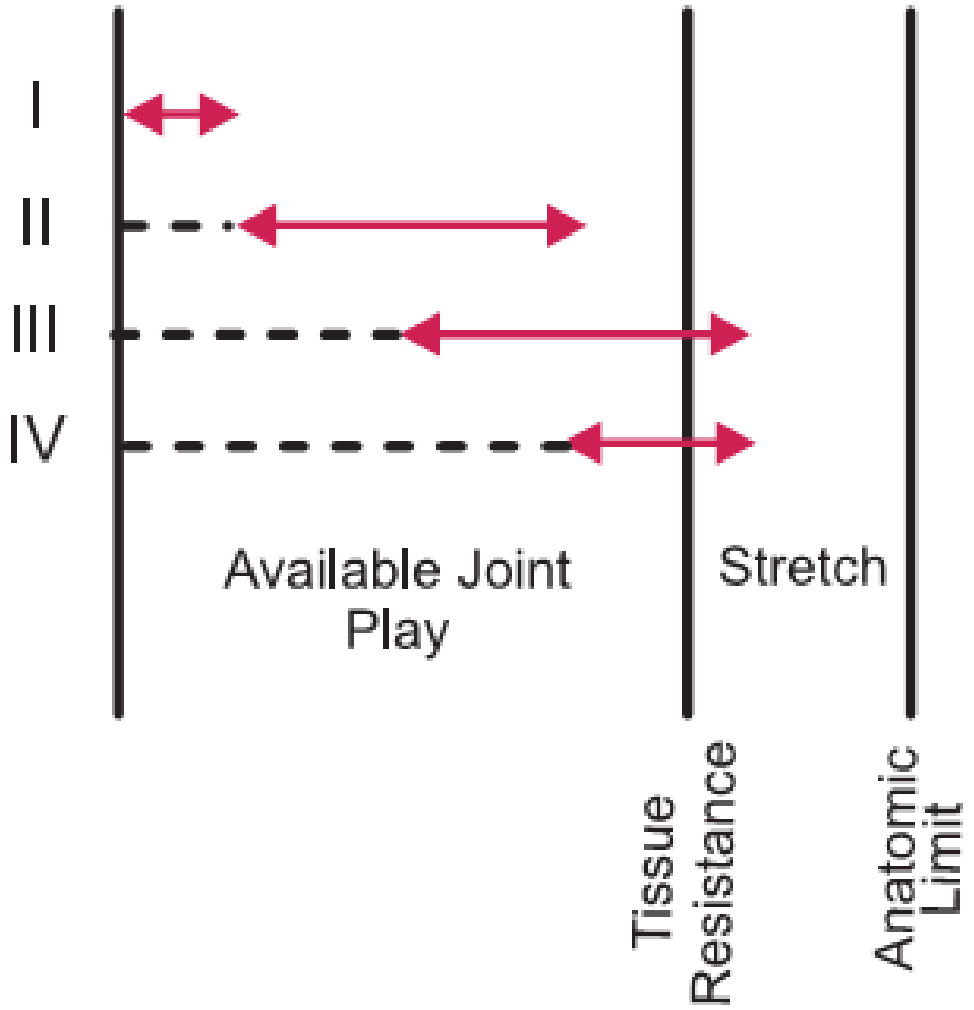

FIGURE 5.9 Representation of oscillation techniques. *(Adapted from Maitland.[11])*

Dosage and Rate of Application

- ***Grade I.*** *Small-amplitude rhythmic oscillations are performed at the beginning of the range. They are usually rapid oscillations, like manual vibrations.*
- ***Grade II.*** *Large-amplitude rhythmic oscillations are performed within the range, not reaching the limit. They are usually performed* ***at 2 or 3 per second for 1 to 2 minutes.***
- ***Grade III.*** *Large-amplitude rhythmic oscillations are performed up to the limit of the available motion and are stressed into the tissue resistance. They are usually performed* ***at 2 or 3 per second for 1 to 2 minutes.***
- ***Grade IV.*** *Small-amplitude rhythmic oscillations are performed at the limit of the available motion and stressed into* the tissue resistance. They are usually rapid oscillations, like manual vibrations.

- **Indications**
- **Grades I and II** are primarily used for treating joints limited by **pain or muscle guarding**. The oscillations may have an inhibitory effect on the perception of painful stimuli by repetitively stimulating mechanoreceptors that block nociceptive pathways at the spinal cord or brain stem levels.
- These nonstretch motions help move synovial fluid to improve nutrition to the cartilage.
- **Grades III and IV** are primarily used as stretching maneuvers.
- Vary the speed of oscillations for different effects, such as low amplitude and high speed, to inhibit pain or slow speed to relax muscle guarding.

Non-Thrust Sustained Joint-Play Techniques

- This grading system describes only joint-play techniques that separate (distract) or glide/translate (slide) the joint surfaces.

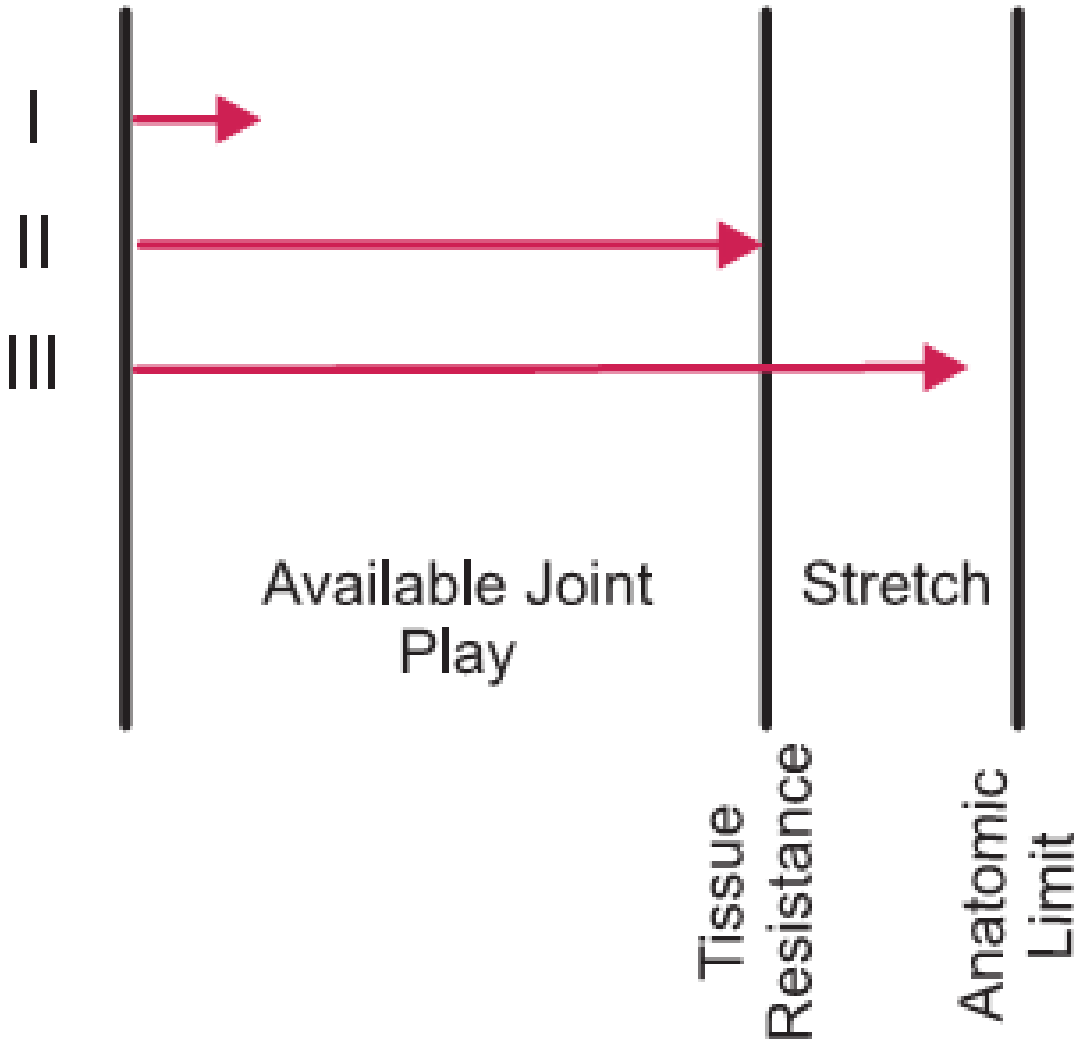

FIGURE 5.10 Representation of sustained joint-play techniques. *(Adapted from Kaltenborn.[15])*

- **Dosages and Rate of Application**
- As indicated by the name, rate of application is slow and sustained for several seconds followed by partial relaxation and then repeated depending on the indications.
- ***Grade I (loosen).*** *Small-amplitude distraction is applied when no stress is placed on the capsule. It equalizes cohesive forces, muscle tension, and atmospheric pressure acting on the joint.*
- ***Grade II (tighten).*** *Enough distraction or glide is applied to tighten the tissues around the joint. Kaltenborn* called this "taking up the slack."
- ***Grade III (stretch).*** *A distraction or glide is applied with an amplitude large enough to place stretch on the joint capsule and surrounding periarticular structures.*

- **Indications**
- Grade I distraction is used with all gliding motions and may be used for relief of pain. Apply intermittent distraction **for 7 to 10 seconds** with a few seconds of rest in between for several cycles. Note the response and either repeat or discontinue.
- Grade II distraction is used for the initial treatment to determine the sensitivity of the joint. Once the joint reaction is known, the treatment dosage is increased or decreased accordingly.
- Gentle grade II distraction applied intermittently may be used to inhibit pain. Grade II glides may be used to maintain joint play when ROM is not allowed.
- Grade III distractions or glides are used to stretch the joint structures and thus increase joint play. For restricted joints, apply a minimum of a 6-second stretch force followed by partial release (to grade I or II), then repeat with slow, intermittent stretches at 3- to 4-second intervals.