



Methods of Stretching

BALLISTIC STRETCHING

- Involves using momentum or speed to stretch a muscle group.
- Small bouncing movements are applied at the extreme end of range.

Methods of Stretching

STATIC STRETCHING

- Achieved by slowly moving to position towards the end of range.
- Static position is held
- Feeling of mild tension should be felt - not pain.

Methods of Stretching

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF)

- Hold-Relax (HR)
- Contract-Relax (CR)
- Contract-Relax-Agonist-Contract (CRAC)

Passive versus Active

- **Passive** - individual being stretched does not contribute to the stretch.
- **Active** - stretching accomplished by individual alone

Passive versus Active

- **Passive-Active** - begins passively with athlete attempting to maintain stretch.
- **Active-Passive** - move to EoR then partner assists.

Ballistic Stretching

Arguments for:

- equal to static stretching
- get dynamic flexibility
- useful in preparation
- more interesting

Argument against:

- problems with tissue adaptation & stretch reflex
- may cause injury
- spindles are sensitive to rate of stretch
- may evoke stretch reflex > contraction

Static Stretching

Arguments for:

- rate of stretch is slow
- causes less soreness
- may relieve muscle soreness
- ↓ emg readings
- mechanical changes in MTU can occur

Arguments against:

- few arguments against
- may be performed at the expense of ballistic stretching
- should use a blend of ballistic and static

P.N.F. Stretching

Arguments for:

- largest ↑ in RoM
- Golgi tendon evoked → relaxation
- increases in strength
- ↑ endurance & circulation
- ↑ muscle relaxation

Arguments against:

- Partner poorly trained or skilled
- may be painful
- ↑ tension is ↑ risk of injury
- valsalva phenomenon may occur
- **Don't hold your breath!**



Or are they all the same?

What Response is Required?

- Basic method of maintaining and developing flexibility

STATIC STRETCHING

- perform during the warm-up and cool down
- ↑ RoM and ↓ soreness

What Response is Required?

- Developing dynamic flexibility

BALLISTIC STRETCHING

- Preparation for explosive activities
- preceded by a slow easy jog and then static stretching

What About PNF Stretching?

- Greatest increases in RoM come through PNF stretching.
- Need 2 people to carry out effectively
- Poorly trained individuals may cause more harm than good
- Time consuming for 1 PT to stretch the whole team

Guidelines on Stretching

- No internationally agreed guidelines
- No knowledge of the most effective application of each stretching method
- No agreement on the length of time a stretch should be held for.

Guidelines on Stretching

- Range between 10 secs to 120 secs.
- Suggested range of between 10-15 seconds.
- PNF contraction should be held for 6 secs.

How Long Does It Last?

- Depends on the method and technique used.
- Suggestion of 3 hours with a small decline after 6 hours.
- Other authors suggest effects last 48 hours.
- During a day long competition, athletes should check extensibility regularly.

How Many Times Per Week?

- Depends on method and technique used.

PNF

- 3 times per week to increase RoM
- 1 time per week to keep RoM

How Many Times Per Week?

Static

- every day to increase RoM
- every 2nd day to maintain RoM

Training and
Therapeutic Exercise

As many ways to train as
colours in the rainbow!!

Basic Principles of Training

- Overload
- Specificity
- Variation
- Recovery
- Rest between sets

Overload

- To increase strength muscle must be overloaded
- Sufficient stress is put on the body to cause exertion
- Achieved by \uparrow reps, \uparrow sets, \uparrow load, change type of contraction, \uparrow speed of movement, altering rest interval.
- Must select safe appropriate protocols

Specificity

- Specific Adaptations to Imposed Demands (SAID) - body's response to exercise.
- Strength gains are specific to the type of exercise carried out.

Specificity

- Combinations of contraction types causes greater increases than single type.
- Use Repetition Maximum (RM)
- Specific strength gains for specific sports

Variation

- Training stimulus should be varied.
- Low loads/high reps in one session followed by high loads/low reps the next.
- Led to the concept of 'Periodization'
- Alterations in load and reps to optimise strength gains

Periodization

- Selye's general adaptation syndrome
 - Phase 1 - shock and soreness
 - Phase 2 - adaptation to the stimulus - increased performance
- Once adaptation occurs, performance will decrease if stimulus is not varied.

Recovery

- Adequate recovery is essential between exercise sessions.
- Should be 48-72 hours between sessions on the same muscle groups.

Rest Between Sets

- Length of rest periods should be determined by the aims of the strengthening session.
- Max strength gains require long rest periods between max contractions.

Rest Between Sets

- Increases in aerobic endurance only require short rest periods.
- Remember aerobic sessions involve high reps at low resistance.

Components of Fitness

- Aerobic Capacity
- Anaerobic Capacity
 - Power
 - Speed
 - Strength
 - Flexibility

Aerobic Capacity - Endurance

- **Long Steady Distance (LSD)**
 - 30 min - 60 min, 1/2 pace - jog
- **Threshold Runs**
 - 20 - 30 min, 3/4 pace

Aerobic Capacity - Endurance

- **Long Intervals**
 - 5-10 min, 3/4 pace, 3 min rec, 3-6 reps
- **VO₂ Max Runs**
 - 12 min or 3600m, as fast as possible

Aerobic Capacity - Endurance

- **Short Intervals**
 - 3 min max pace, 3-5 min rec, 4-6 reps
- **Fartlek Runs**

Anaerobic Capacity - Speed Endurance

- **Long Intervals**
 - 60-120 secs, 90%-max, 2-3 min rec, 4-6 reps.
- **Short Intervals**
 - 30-60secs, max, 20sec - 3 min rec, 6-12 reps
- **Multiple Sprints**
 - 8-30 sec, max, 20 secs - 3 min rec, 6-40 reps

Power Training

- Resistance Training
- Plyometrics
- Complex Training
- Specific Resistance Exercises

Speed Training

- Neuromuscular Training
- Technical drills
- Agility, footwork drills
- Plyometrics

Strength Training

- Progressive Resistance Training
- 90-95% 1RM load
- 3-5 min recovery
- 110-130% 1RM with eccentric exercise
- Large muscle groups worked

Any Questions?