

PLYOMETRIC TRAINING

Introduction and Fundamentals.





INTRO

- HISTORY:
- Developed in the 1950's and 1960's in Russia, (“Shock Training”).
- Progressed to “Plyometrics” , by American Fred Wilt.
- Widely used and researched in many sports codes in terms of training methods.



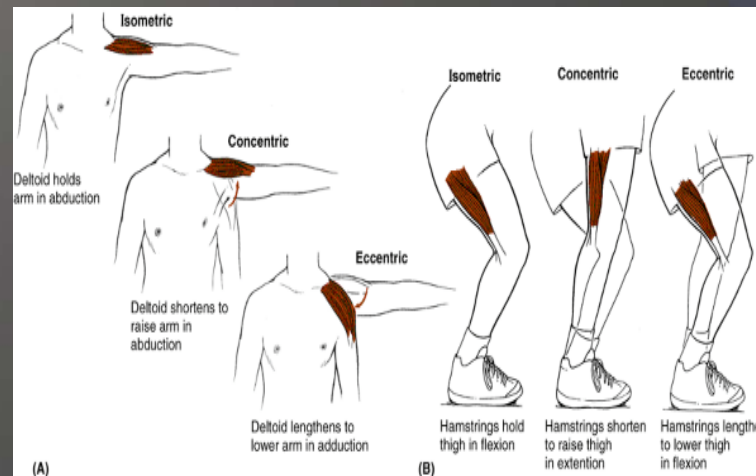
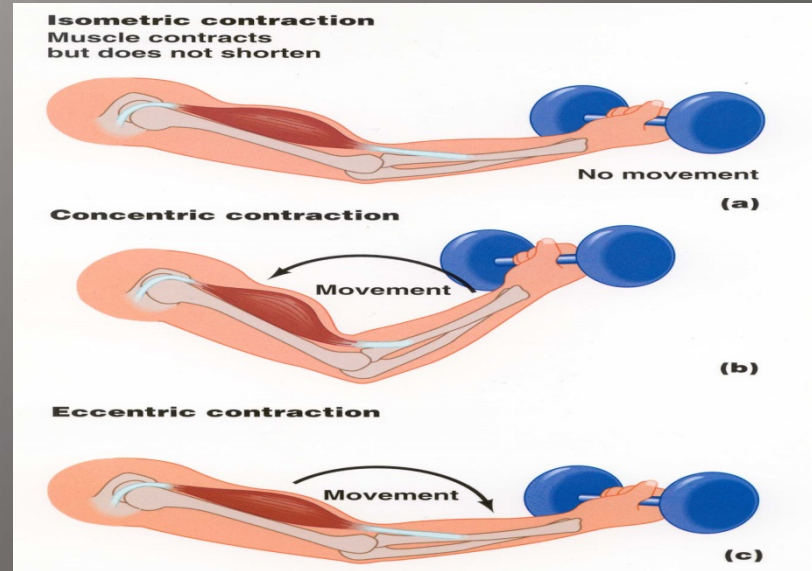
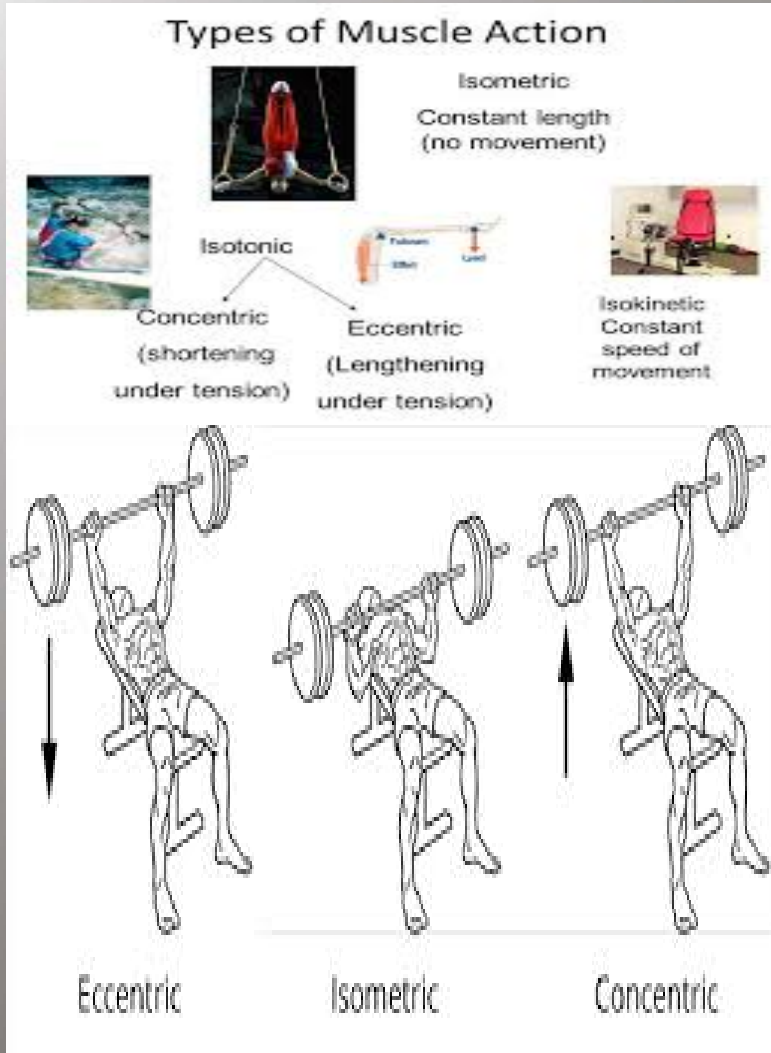
INTRO



- GENERAL MUSCULAR MOVEMENTS:
- Isotonic, Isometric & Isokinetic
- Isotonic:
 - Length change of the muscle
 - Concentric muscle action: Shorten
 - Eccentric Muscle action: Lengthen

INTRO

• GENERAL MUSCULAR MOVEMENTS



WHAT

Mechanics of plyometrics

1. Eccentric “stretching” of the muscle,
 2. is rapidly terminated by a powerful isometric contraction, thus initiating a stretch reflex, where elastic energy is stored.
 3. Stored energy increases force in the subsequent concentric action.
- **Stretch-shortening cycle (SSC),**
 - SSC combines mechanical and neurophysiological mechanisms .
 - Plyometrics is a means to develop stretch shortening cycle ability.



WHY

- **Strong Associations with improvements in:**
- Muscle strength
- Muscle power
- Bone strength
- Balance
- Agility
- Speed
- Resistance to injury
- Sports performance
- Outlook on physical activity
- 4 weeks to see improvement



WHY

- Can be used in conjunction with other training to develop explosive quick movements.
- Enhanced neuromuscular coordination.
- Increase the rate of stretching and shortening of muscle so that the stored elastic energy transfers more rapidly to the next explosive movement.



FYI

RESISTANCE VS PLYOMETRIC TRAINING

- $F = ma$.
- RESISTANCE TRAINING:
INCREASE MASS, HIGHER INERTIA
- PLYOMETRIC TRAINING:
INCREASE IN ACCELERATION AND LOWER INERTIA

THERE FOR TARGETING HIGH LEVELS OF CNS
STIMULATION AND NEUROMUSCULAR PROCESSES



WHERE

- PLYOMETRIC FOCUSED SESSIONS
- WARM-UPS:
 - Neuromuscular Stimulation
 - Means of “switching on”
 - Potentiation
- COMBINED/COMPLEX TRAINING REGIMES:
 - More experienced athletes
 - ie. Resistance training combined with plyometrics
 - Program design is **NB**: to achieve greatest benefit.



WHEN

- Age ?
- Sport ?
- Season ?
- Periodisation Plan?



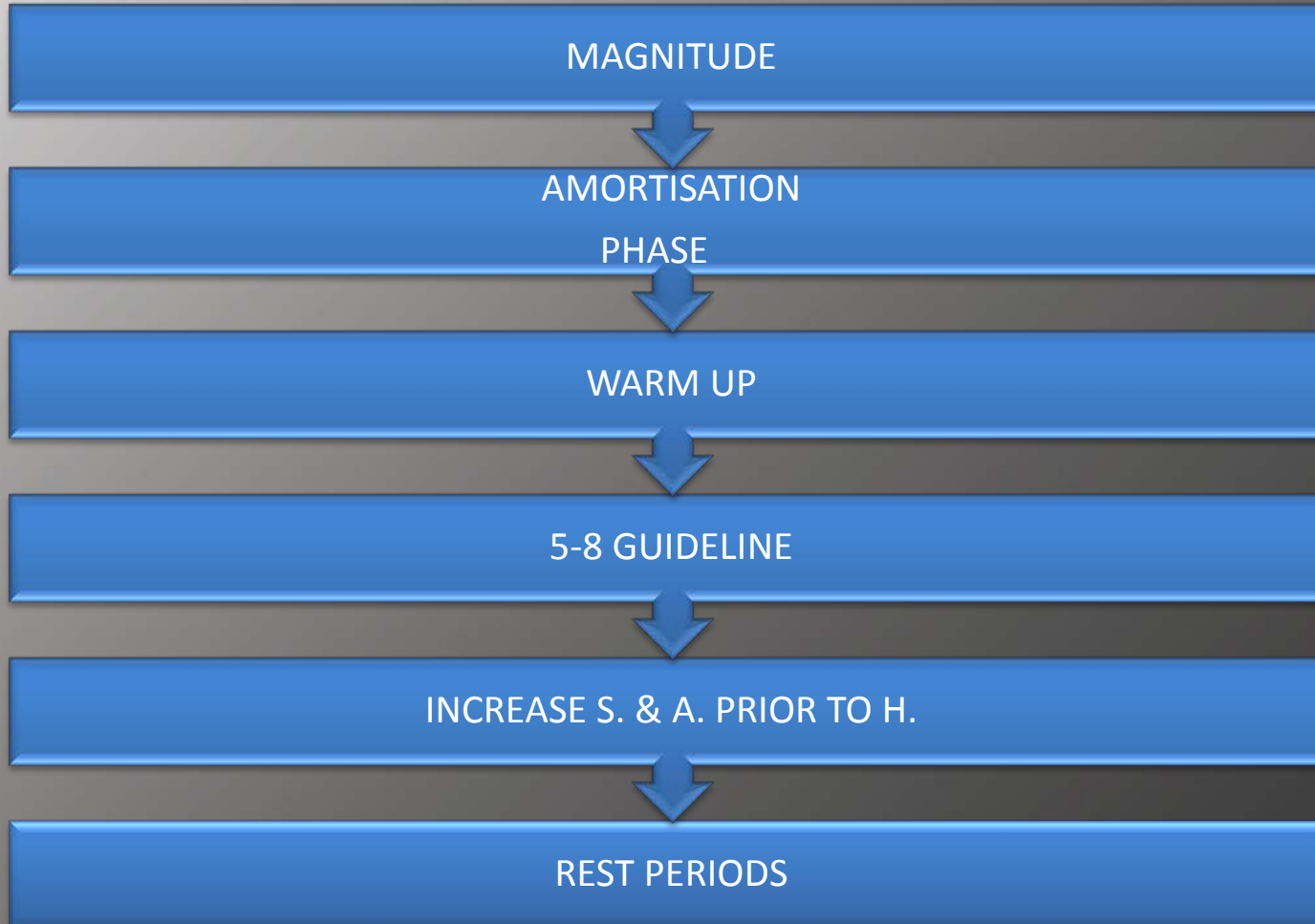
PROGRAM DESIGN

- MODE
- INTENSITY
- FREQUENCY
- RECOVERY
- VOLUME
- PROGRAM LENGTH
- PROGRESSION



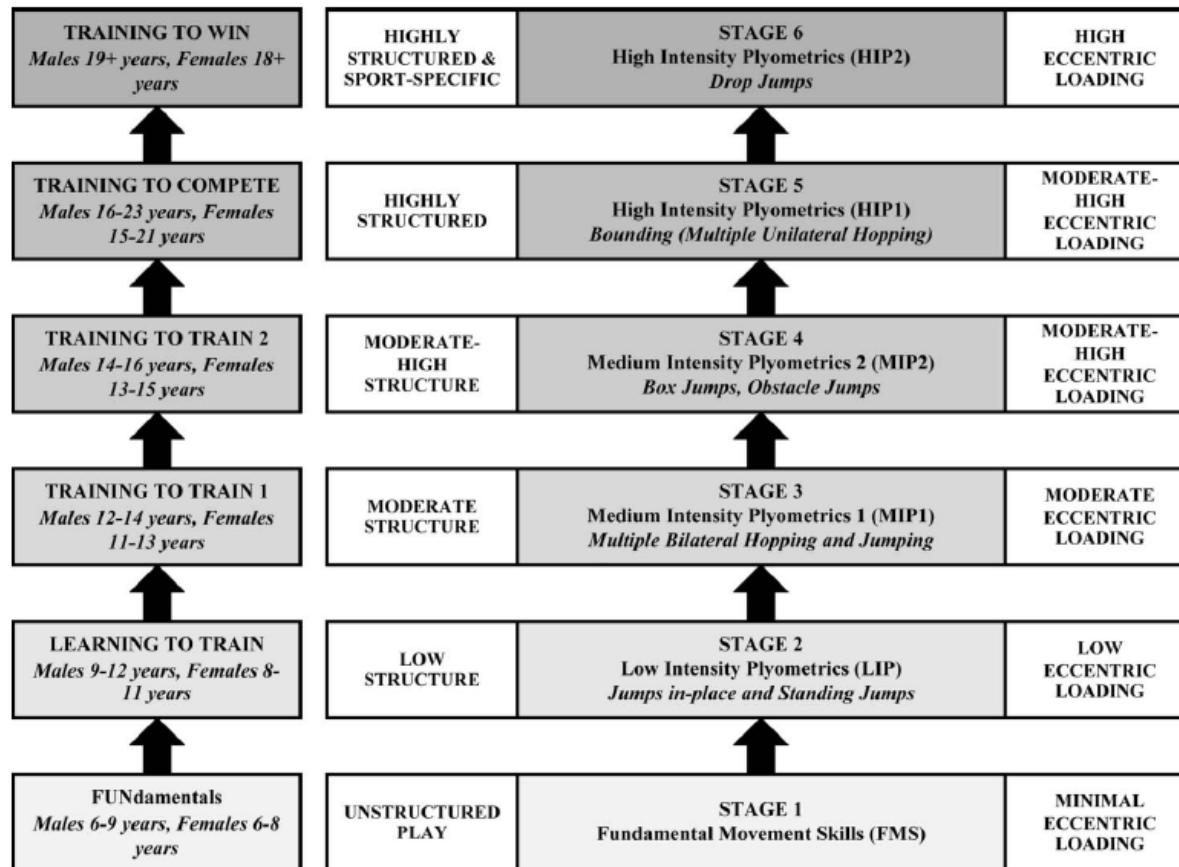
HOW

- Factors to take into consideration when implementing plyometrics.



CONSIDERATIONS

Plyometric Progression Model



CONSIDERATIONS

Tests to establish if an athlete can move to intermediate - advanced plyometrics:

- Fully back squat 1.5 times their own body weight
- Bench press 1RM should be at least 1.0 – 1.5 times the body weight
- Perform five clap push-ups in a row.
- Perform 5 reps @60% in 5 seconds
- Balance – stand on 1 leg for 30 sec without falling



CONSIDERATIONS

Key Points when doing plyometrics

- Technique, Technique, Technique!!
- Posture and Control
- Contact points (hands, feet etc.)
- Gradual Progression
- Changeover from Eccentric to Concentric Muscle Movement
- Rate/ Speed of execution
- Be Critical



DISCUSSION TOPICS

- CAN WE USE/IMPLEMENT PT IN WRESTLING? AND WHY?
- SCHEDULE AND SEASON
- HOW CAN WE IMPLEMENT IT IN OUR TRAINING?
- PROGRAM DESIGN: WHERE, WHEN, HOW MUCH ETC.?
- PRACTICALITY



Conclusion

- Increased neuromuscular stimulation
- Great method of rapid force development
- Quality vs. quantity rule
- Innovation and Simplicity
- “Not the be all and end all”
 - Is an effective training method but not should not be done without adequate strength etc. training



References

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Thank You

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