LEARNING OBJECTIVES

+ Identify and list the primary components and proposed benefits of the traditional warm-up

+ Describe and contrast the benefits of dynamic versus static stretching within a warm-up

+ Define movement prep and list the five primary components

+ Identify and design effective movement prep programming relative to individual differences and session demand
What do we think of when we hear warm-up?

Animals Warm-Up...
Humans Warm-Up...

Warming-Up is Central in Sport...
WARM-UP: DEFINED

GOAL:

To optimize performance while decreasing risk of injury during practice and competition
Traditional Approach to Warming-Up

TRADITIONALLY DEFINED

- Low intensity aerobic activity
- Static stretching of specific muscles
- General skill rehearsal

(Young & Behm, JSC, 2002)
**PROPOSED BENEFITS**

- Increase flexibility and decrease muscle stiffness *(Injury Prevention)*
- Increase body and muscle temperature *(Injury Prevention)*
- Increase muscular post-activation potentiation *(Performance Enhancement)*

(Bishop, Sport Med, 2003)

**Does the traditional approach adequately prepare athletes for practice & competition?**
Is there a benefit to including light aerobic activity as a part of the warm-up?

YES

(Bishop, Sport Med, 2003)

Does acute static stretching negatively affect strength and power?

Static stretching <30s has no negative effect on performance

Static stretching >60s negatively affects performance

MAYBE

(Kay & Blazevich, MSSE, 2012)
Does static stretching reduce risk of injury in athletic populations?  

**NO**  
(Small et al., RSM, 2008)

Does dynamic stretching improve performance?  

**YES**  
(Behm & Chaouachi, EJAP, 2011)

**YES**  

**YES**  

**YES**
Should specific activation exercises be included in warm-ups?

YES

(Faigenbaum et al., JSCR, 2005; Young and Behm, SMPF, 2003)

WHAT HAS BEEN MISSING?

- Movement Specificity (General vs. Specific)
- Movement Direction (Linear vs. Multidirectional)
- Movement Coordination (Static vs. Dynamic)
- Movement Velocity (Slow vs. Fast)
- Movement Force (Low Force vs. High Force)
WHAT IS NEEDED?

1. List the 3 benefits of the traditional warm-up

2. In a few sentences discuss the influence of static stretching on performance and injury prevention within the context of a warm-up

3. In a few sentences discuss what has been missing from the traditional warm-up

CHECK FOR LEARNING

01
RE-DEFINING WARM-UP

+ “Warm-up” specifically emphasizes the role of heating up the body and muscles prior to training

+ This term does not adequately capture what needs to happen prior to training and competition

+ MOVEMENT PREPARATION has been proposed as an alternative to the term “Warm-Up”
DEFINING MOVEMENT PREPARATION

An integrated approach to prepare the athlete physically and mentally for the demands of training and competition through a progressive and specific preparation period.
01 GENERAL MOVEMENT

- Considerations
  - Movement

- Emphasis
  - Increase Temperature

- Equipment
  - N/A

02 HIP ACTIVATION

- Considerations
  - Movement
  - Direction
  - Difficulty

- Emphasis
  - Activation

- Equipment
  - Minibands
02 HIP ACTIVATION (Movement)

STRAIGHT LEG   BENT LEG

02 HIP ACTIVATION (Direction)

LINEAR   LATERAL
02 HIP ACTIVATION (DIFFICULTY)

SINGLE BAND

DOUBLE BAND

03 DYNAMIC STRETCH

✦ Considerations
  - Movement
  - Direction
  - Difficulty

✦ Emphasis
  - Mobility/Activation

✦ Equipment
  - N/A
03 DYNAMIC STRETCH (Move-Shoulder)

- STANDING Ts
- STANDING Ws

03 DYNAMIC STRETCH (Move-Hip/Ankle)

- BACKWARD LUNGE
- INVERTED HAMSTRING (RDL)
03 DYNAMIC STRETCH (Direction-Linear)

KNEE HUG  WALKING QUAD STRETCH

03 DYNAMIC STRETCH (Direction-Lateral)

LATERAL SQUAT  LATERAL LUNGE
03 DYNAMIC STRETCH (DIRECTION-ROTATION)

LEG CRADLE

DROP LUNGE

04 MOVEMENT INTEGRATION

✦ Considerations
  - Movement
  - Direction
  - Difficulty

✦ Emphasis
  - Specificity
  - Activation

✦ Equipment
  - N/A
04 MOVEMENT INTEGRATION (Movement)

MARCH

SKIP

04 MOVEMENT INTEGRATION (Direction)

LINEAR MARCH

LATERAL MARCH
05 NEURAL ACTIVATION

- Considerations
  - Movement
  - Direction
  - Difficulty

- Emphasis
  - Specificity
  - Activation

- Equipment
  - Hurdles
  - Ladders
  - Dots/Lines

05 NEURAL ACTIVATION (Direction)

LINEAR

LATERAL
05 NEURAL ACTIVATION (DIFFICULTY)

3-HURDLE + STABILITY  3-HURDLE CONTINUOUS

CHECK FOR LEARNING

+ List the 5 components of Movement Prep

+ List 3 programming considerations for exercise selection within the components of Movement Prep
CONSIDERATIONS: MOVEMENT VOLUME

- **Movement Prep:** Design session volume based on the capacity and specific needs of the athlete

  - **Low Intensity Session:**
    - Time: 10-15min
    - Athlete: Low capacity
  
  - **High Intensity Session:**
    - Time: 20-30min
    - Athlete: High capacity
## MOVEMENT PREP PROGRAMMING

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MOVEMENTS</th>
<th>VOLUME (SET/REP)</th>
</tr>
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<tbody>
<tr>
<td>HIP ACTIVATION</td>
<td>2-4 MOVEMENT</td>
<td>1-2 SETS/ 10-15 REPS EACH</td>
</tr>
<tr>
<td>DYNAMIC STRETCHING</td>
<td>4-8 MOVEMENT</td>
<td>1-2 SETS/ 4-6 REPS EACH</td>
</tr>
<tr>
<td>MOVEMENT INTEGRATION</td>
<td>4-6 MOVEMENT</td>
<td>1-2 SETS/ 10-15YDS</td>
</tr>
<tr>
<td>NEURAL ACTIVATION</td>
<td>4-6 MOVEMENT</td>
<td>1-2 SETS/ 5-15S</td>
</tr>
</tbody>
</table>

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## CONSIDERATIONS: Movement Selection

**Movement Prep:** Design session based on dominant movements and directions that the athlete will be exposed to in training and competition

- **LINEAR**
- **MULTIDIRECTIONAL**
### MOVEMENT PREP PROGRAMMING

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>LINEAR</th>
<th>MULTIDIRECTIONAL</th>
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<tbody>
<tr>
<td>HIP ACTIVATION</td>
<td>LINEAR MINIBAND</td>
<td>MULTI-MINIBAND</td>
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<tr>
<td>DYNAMIC STRETCHING</td>
<td>ANTENIOR HIP/THIGH POSTERIOR HIP/THIGH</td>
<td>TOTAL HIP LATERAL/MEDIAL HIP</td>
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<td>MOVEMENT INTEGRATION</td>
<td>LINEAR MARCH LINEAR SKIP</td>
<td>LATERAL MARCH LATERAL/ROT SKIP</td>
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<tr>
<td>NEURAL ACTIVATION</td>
<td>LINEAR RAPID RESPONSE</td>
<td>LATERAL/ROT RAPID RESPONSE</td>
</tr>
</tbody>
</table>

**EXAMPLE: MULTI- EMPHASIS**

**HIP ACTIVATION**
- Lateral Straight Leg Miniband Walks
- Lateral Bent Leg Miniband Walks
- Base Position Internal Rotations

**DYNAMIC STRETCHING**
- Backward Lunge
- Lateral Lunge
- Inverted Hamstring
- Drop Lunge
- World’s Greatest Stretch + Rotation

**MOVEMENT INTEGRATION**
- Lateral March
- Lateral Skip
- Crossover Skip

**NEURAL ACTIVATION**
- Base Position Lateral Shifts
- Base Position Pogo w/ Cut
- Base Position Rotations
GUIDELINES

- Movement Specificity (General to Specific)
- Movement Direction (Linear to Multidirectional)
- Movement Coordination (2-Leg to 1-Leg)
- Movement Velocity (Slow to Fast)
- Movement Force (Low Force to High Force)

CHECK FOR LEARNING

Create a Movement Prep session for an intermediate athlete preparing for a linear acceleration movement skill session (Note: Provide as much detail as possible on total time, volume, and movement selection. Reflect on your ability to support why you chose each movement.)
THE BIG FIVE

- General Movement
- Hip Activation
- Dynamic Stretch
- Movement Integration
- Neural Activation
REVERSE ENGINEER

- Program design should be based on dominant demands of primary movement skill or practice session while taking into consideration the level of the individual.

TRANSFER

- Movement Prep not only helps improve performance acutely, but also has long-term implications on performance when compared to the traditional “warm-up”.

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APPENDIX

APPENDIX