

STRENGTH PROGRAM DESIGN FOR THE RUNNING ATHLETE

**By Carrie Lane, Sport
Performance Coach**

**Authentic Performance
Center**

Denver, CO



WHY

WHAT

HOW

**TO IMPLEMENT INTO A
STRENGTH TRAINING
PROGRAMS FOR
RUNNERS**



MY PERSPECTIVE

Distance runner →

Distance coach →

Thrower → throws coach →

S and C course instructor →

**Speed/power coach and
rehab for endurance athletes**



DEFINITION OF “STRENGTH TRAINING”

**More like
“Speed/Power/Strength”
Training**

**Not JUST in the weight room.
Includes hurdle mobility,
plyometrics, throwing, bodyweight
work, and traditional “weight
training” activities.**



WHY STRENGTH TRAIN?

**Skill
reinforcement**

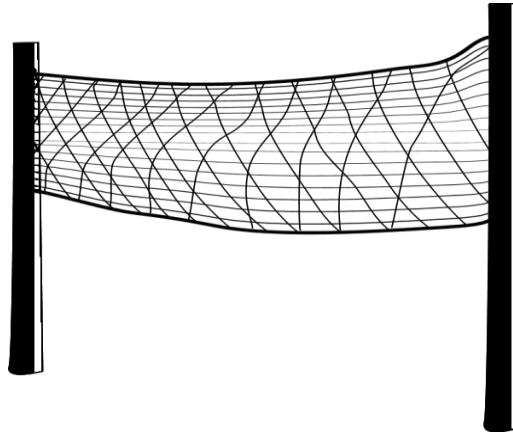
**Muscular
balance**

**Recovery/
Adaptation**

“Neural” day

Running Economy

Force Development



Tensegrity

“General” day

Hormone Response

Glycogen Depletion

WHY STRENGTH TRAIN?

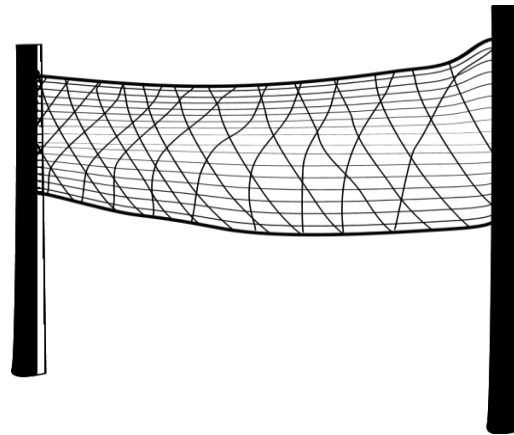
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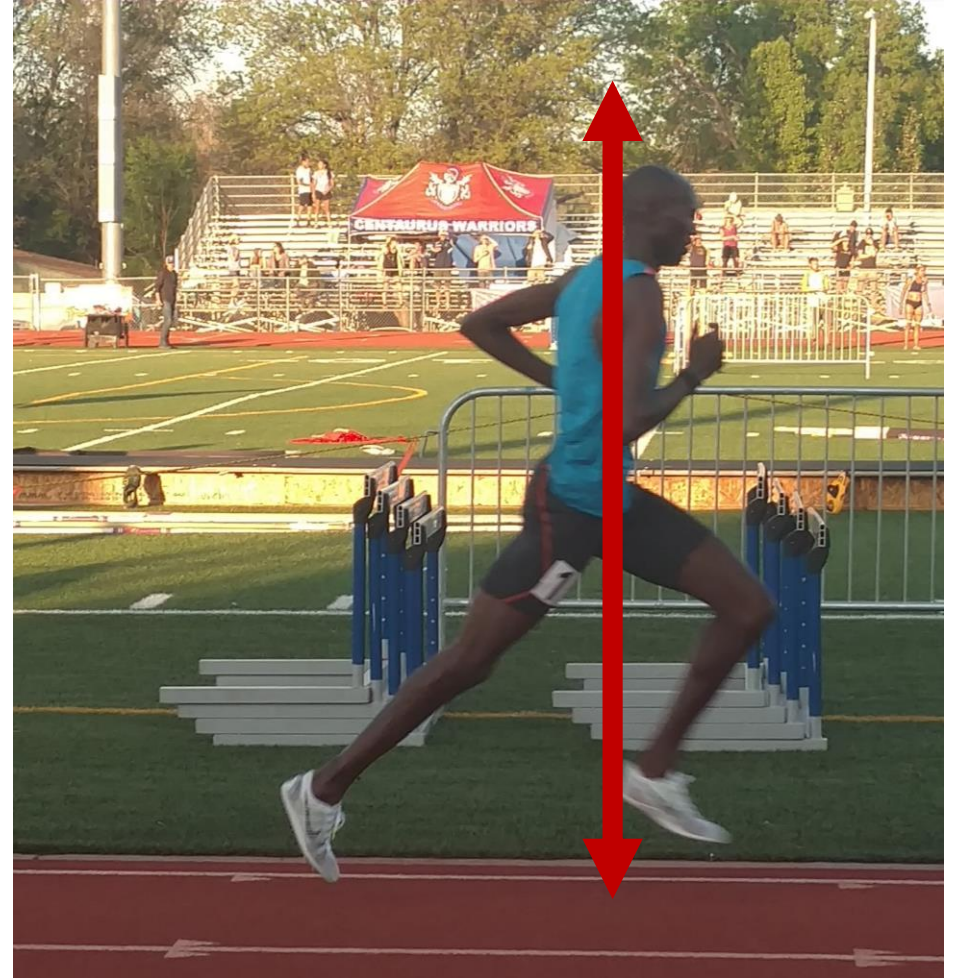
Running Economy

Force Development



Tensegrity

WHY: THE SKILL OF VERTICAL FORCE PRODUCTION





RUNNING ECONOMY



VERTICAL FORCE PRODUCTION



COORDINATION



POSTURE

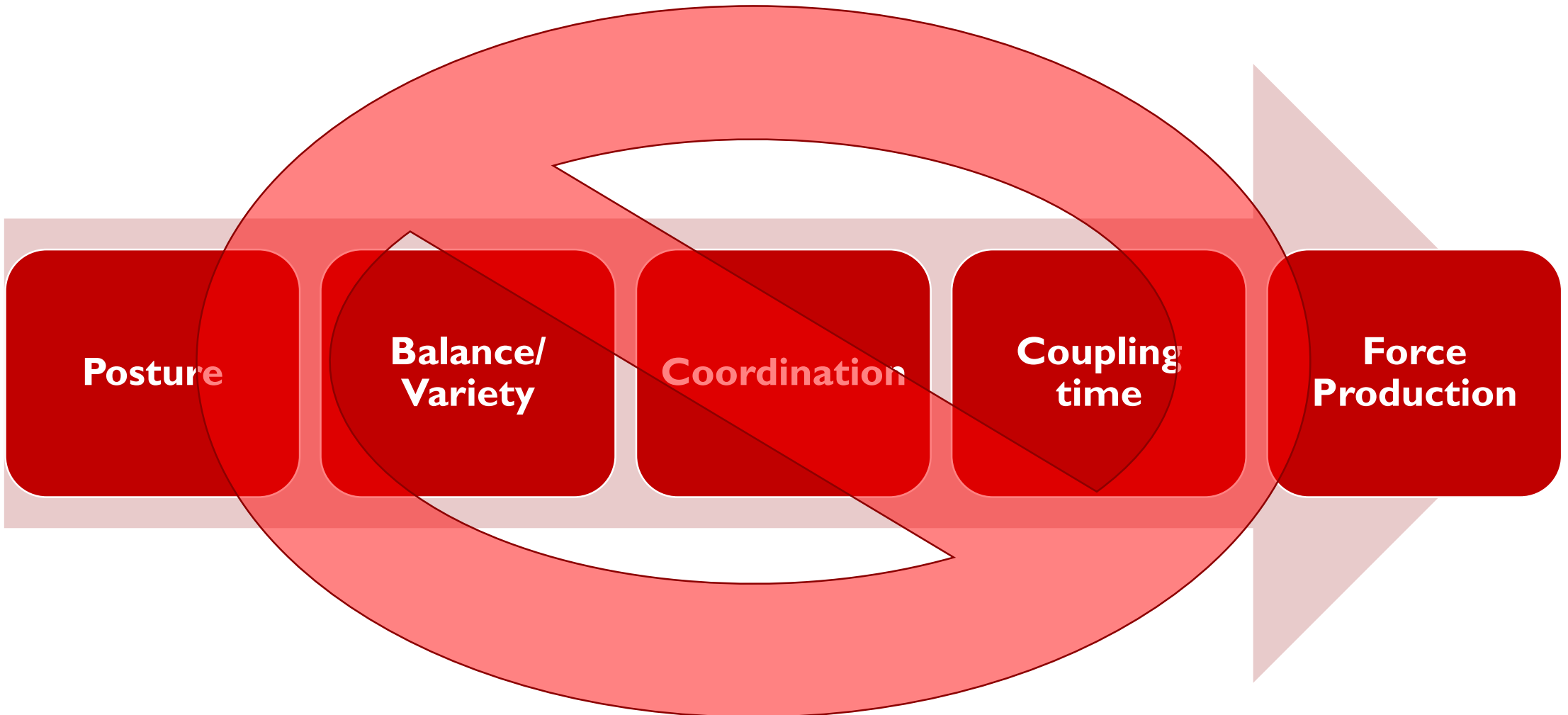


**COUPLING
TIME**

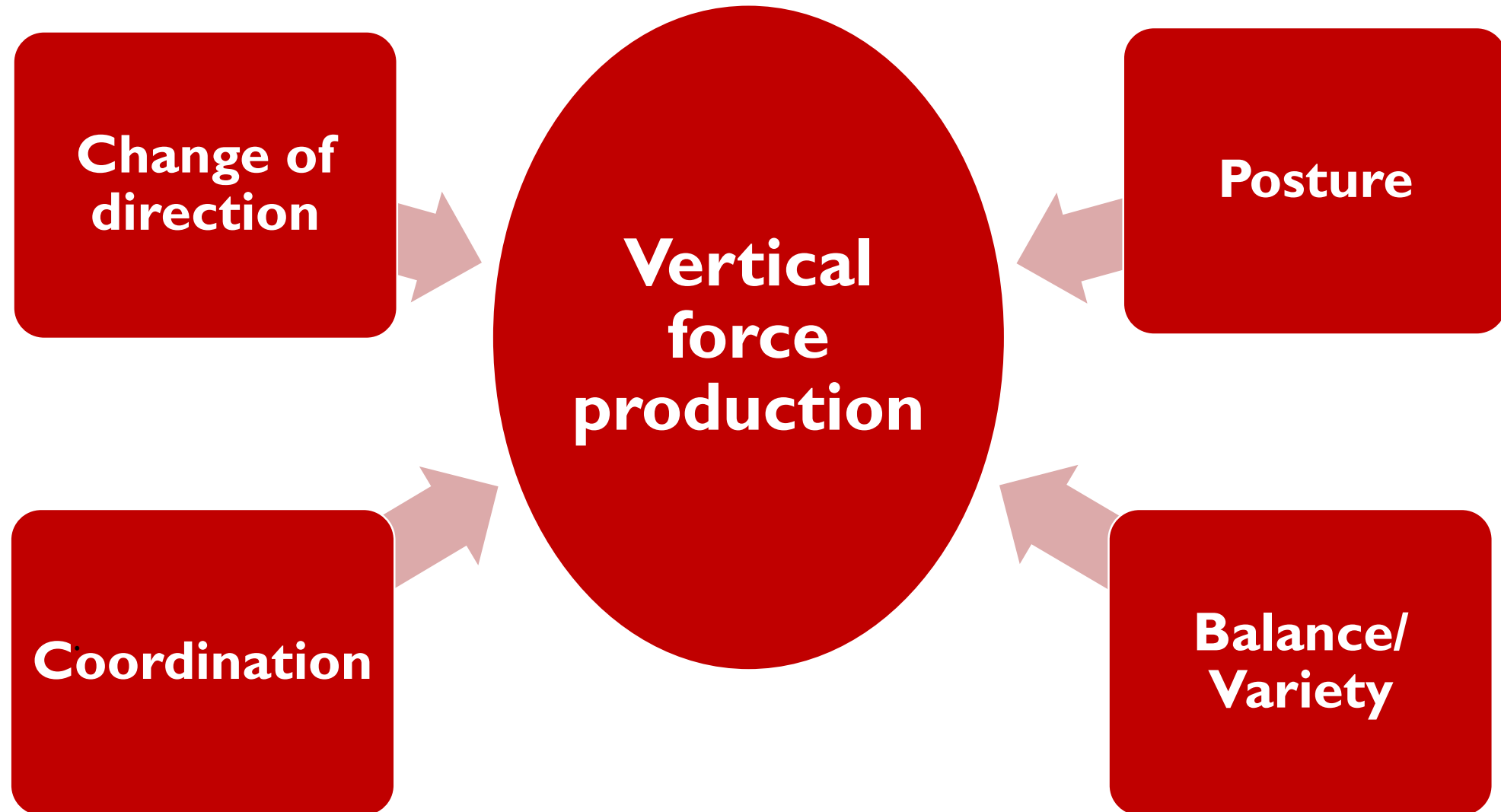


**BALANCE/
MOBILITY**

WHAT: WHEN TEACHING FORCE PRODUCTION SKILLS



WHAT: WHEN TEACHING FORCE PRODUCTION SKILLS



WHAT: ACTIVITIES TO TRAIN FORCE PRODUCTION SKILLS

- ✓ Posture
- ✓ Coupling time
- ✓ Coordination
- ✓ Balance/ Mobility
- ✓ Modify for injuries
- ✓ Transfer skills to racing



REVIEW: WHY STRENGTH TRAIN?

**Skill
reinforcement**

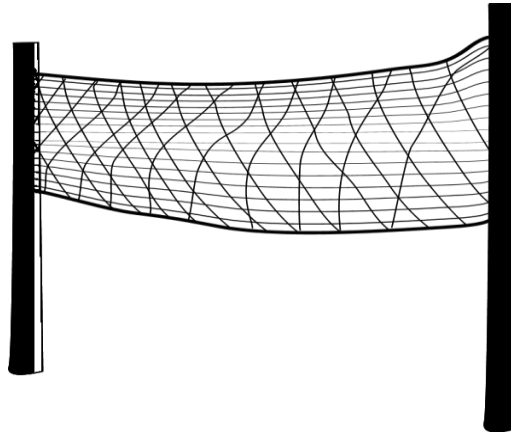
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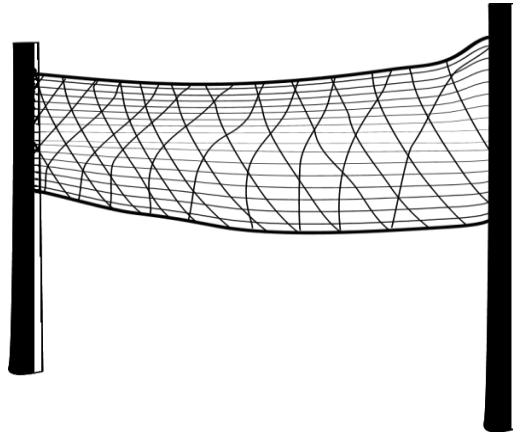
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Hormone Response

Glycogen Depletion

REVIEW: WHY STRENGTH TRAIN?

**Muscular
balance**



Tensegrity

**Recovery/
Adaptation**

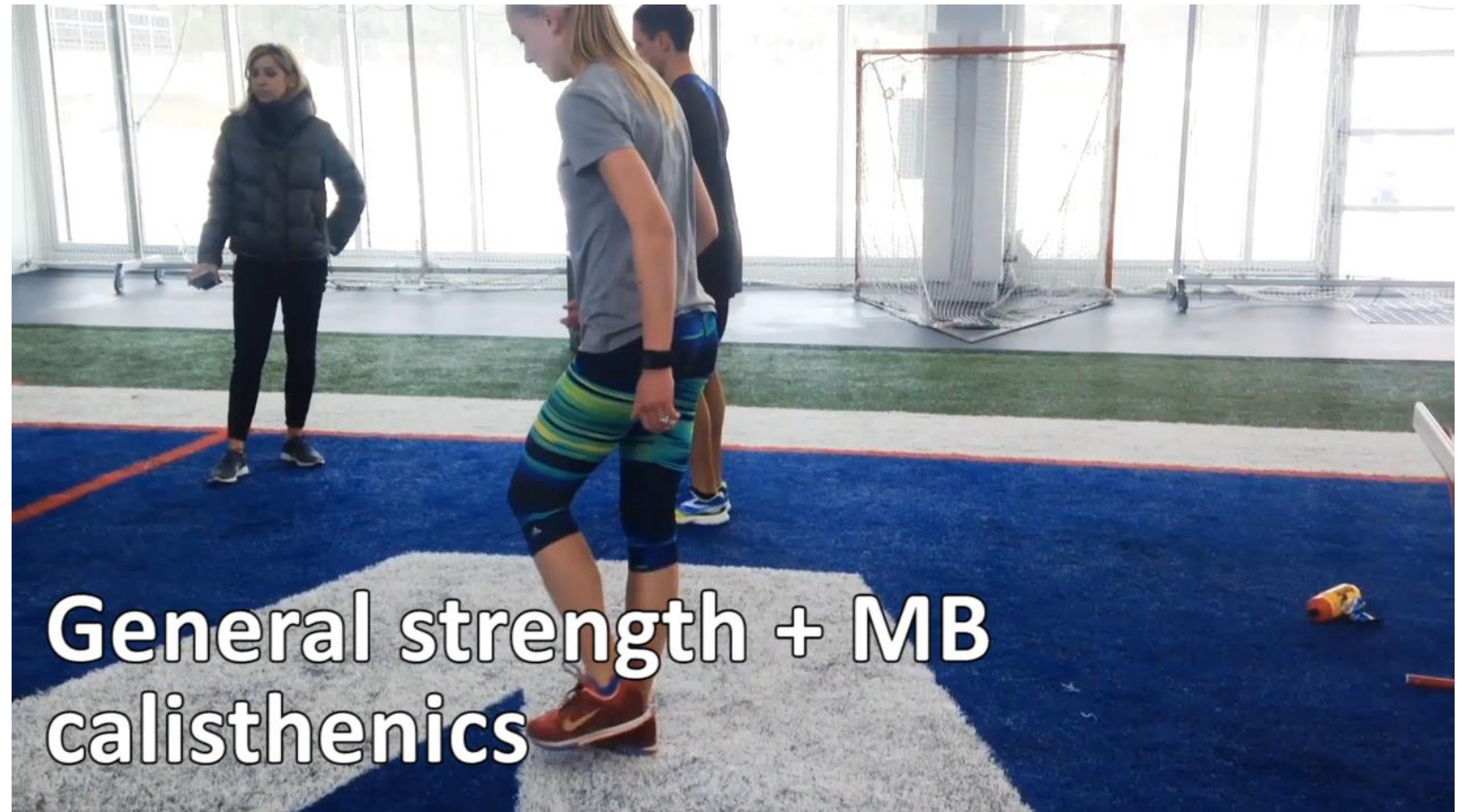
“General” day

Hormone Response

Glycogen Depletion

WHAT: ACTIVITIES TO ACCELERATE RECOVERY

- ☑ Exercise selection
- ☑ Move with intent
- ☑ Common theme
- ☑ Modify for injuries



HOW: ORGANIZING STRENGTH TRAINING (SAMPLE)

	Mon	Tues	Wed	Thur	Fri
THEME	Aerobic Threshold GENERAL	Anaerobic Threshold GENERAL	Aerobic GENERAL	Alactic NEURAL	Anaerobic/ AT pace GENERAL
WARMUP	Walking hurdle mobility	Lateral and backward sprint dev drills	Dynamic stretches	Sprint dev drills + runouts	Skipping hurdle mobility
WORKOUT	40-70 min run at 65% of VO2	2 x 20 min at 80% of VO2	Recovery Run	10 x 40 mtrs with 1-2 min rest	600-500-400- 300-200 with equal rest
STRENGTH TRAINING	General Strength & Core Stability Circuits	Bodybuilding Circuit		Multi jumps, Multi throws, Olympics, Statics	Med ball catch-toss circuit

HOW: ORGANIZING STRENGTH TRAINING

**Step 1: What is the warmup and
cooldown?**

**Opportunity for light
training of key strength
concepts**

Hurdle mobility

- ☒ Posture
- ☒ Limb stiffness (advanced)
- ☒ Vert force development
- ☒ Gen strength, balance, coordination

Sprint drills

- ☒ Posture
- ☒ Limb stiffness (advanced)
- ☒ Vert force development
- ☒ Gen strength, balance, coordination

HOW: ORGANIZING STRENGTH TRAINING

- ☑ **Posture**
- ☑ **Coordination**
- ☑ **Variety of movement**
- ☑ **Vertical force production**
- ☑ **Modify for injuries**



HOW: ORGANIZING STRENGTH TRAINING

Step 2: What is the workout today?

**Match the running and
strength themes**



Short intervals or speed development “NEURAL” ACTIVITIES

- ☑ Multi-jumps
- ☑ Multi throws
- ☑ Olympic and/or static lifts

Long intervals or threshold “GENERAL” ACTIVITIES

- ☑ Circuits- MB, MB Catch-toss
- ☑ Circuits- weight room (BB)

Recovery run “GENERAL” ACTIVITIES

- ☑ Circuits- BW, MB, Core
- ☑ Circuits- weight room (BB)

REVIEW: NEURAL ACTIVITIES

- ✓ Posture
- ✓ Coupling time
- ✓ Coordination
- ✓ Balance/ Mobility
- ✓ Modify for injuries
- ✓ Transfer skills to racing



PROTOCOL FOR NEURAL ACTIVITIES

- **Complete or near complete recovery after each repetition. NOT CIRCUIT-STYLE (EXCEPTION: IN-PLACE JUMP CIRCUIT)**
- **High power output on each repetition**
- **Technical breakdown determines your repetition range and complexity of activity**

SAMPLE WORKOUT FOR NEURAL ACTIVITIES

SAMPLE NEURAL WORKOUT (BEG/INT HS ATHL):

1. IN-PLACE JUMP CIRCUIT: 12 EXERCISES, 15 SEC EACH, 30 SEC REST. 9 MINUTES TOTAL CIRCUIT TIME
2. BACKWARD OVERHEAD THROWS X 6
3. FORWARD UNDERHAND THROWS X 6
4. HAMMER THROW RIGHT X 6
5. HAMMER THROW LEFT X 6

SAMPLE NEURAL WORKOUT (INT/ADV HS ATHL):

1. R-L-R-L-LAND BOUNDS X 5 REPS
2. DB JUMPS 4 SETS OF 5 JUMPS FOR HEIGHT. 15% OF BW
3. SPLIT SQUAT 2 SETS OF 5 SQUATS PER LEG
4. SKIPS FOR HEIGHT 2 SETS OF X 6 TAKEOFFS

HOW: ORGANIZING STRENGTH TRAINING

Step 2: What is the workout today?

**Match the running and
strength themes**



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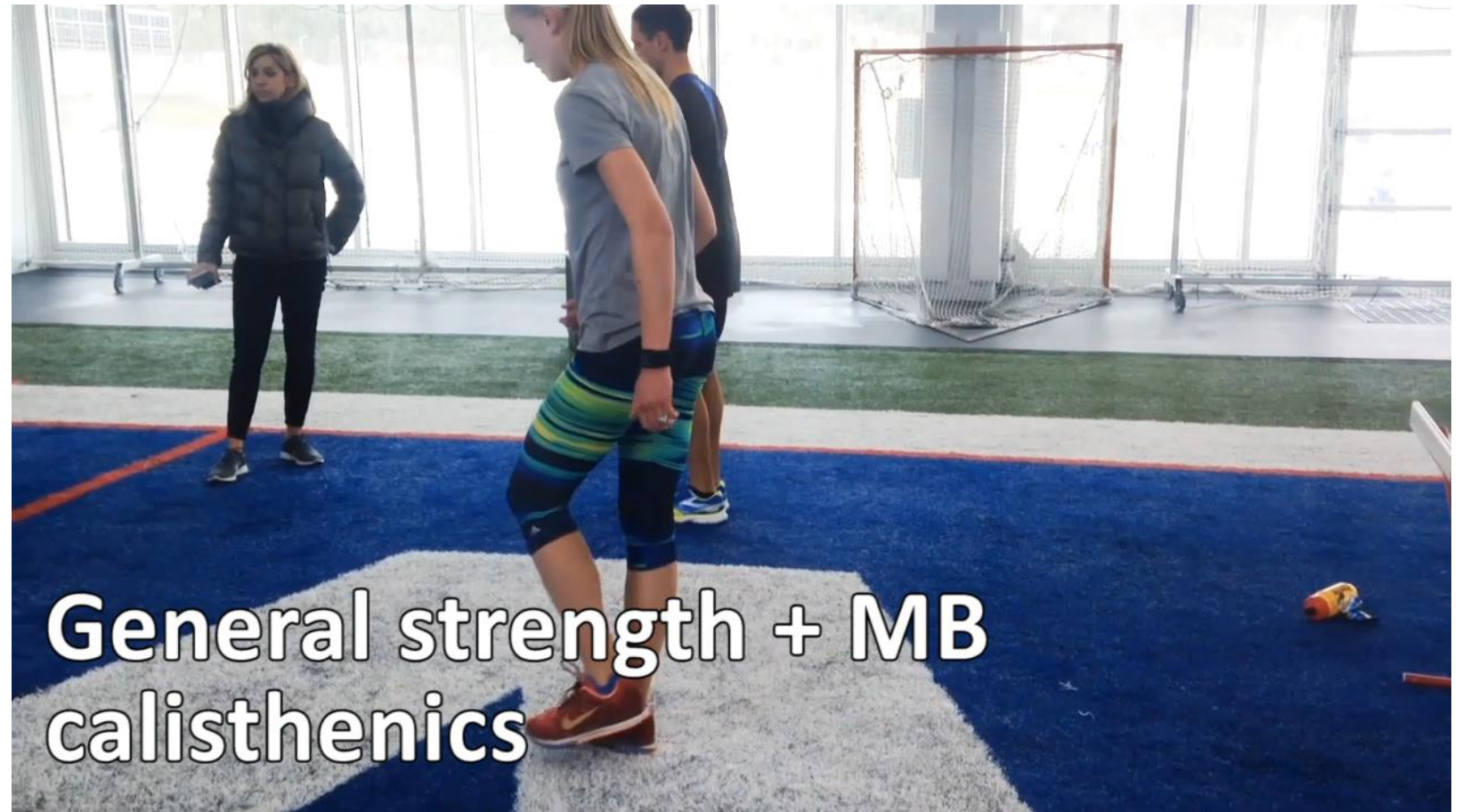
- ☑ Circuits- MB, MB Catch-toss
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Recovery run “GENERAL” ACTIVITIES

- ☑ Circuits- BW, MB, Core
- ☑ Circuits- weight room (BB)

REVIEW: GENERAL ACTIVITIES (BW AND MB)

- ☑ Exercise selection
- ☑ Move with intent
- ☑ Common theme
- ☑ Modify for injuries



PROTOCOL FOR GENERAL ACTIVITIES

- **Work: rest ratio is 1:1 or 2:1**
- **15-40 second work bouts**
- **8-12 minutes long**

- **Can add short sprints to increase intensity**
- **Mild lactate buildup aids recovery and provides aerobic work in the background**
- **Can substitute for aerobic work with injured athlete**
- **Cumulative work provides healthy blood chemistry for healing process**
- **Endocrine responses help with over-trained athletes or weight loss efforts**

SAMPLE GENERAL CIRCUITS

SAMPLE BODYWEIGHT CIRCUIT:

PERFORM EACH EXERCISE FOR 30 SEC. TAKE 15 SEC REST. PROCEED TO NEXT EXERCISE. 8 MIN CIRCUIT

1. PRISONER SQUAT
2. DECLINE PUSHUPS (FEET ON BLEACHERS),
3. V-UPS
4. LATERAL LUNGES R
5. LATERAL LUNGES L
6. YOGIS
7. LUNGE-RETURN ALTERNATE R-L
8. INCLINE PUSHUPS (HANDS ON BLEACHERS)
9. SUPINE R/L HEEL TAPS
10. MOUNTAIN CLIMBERS

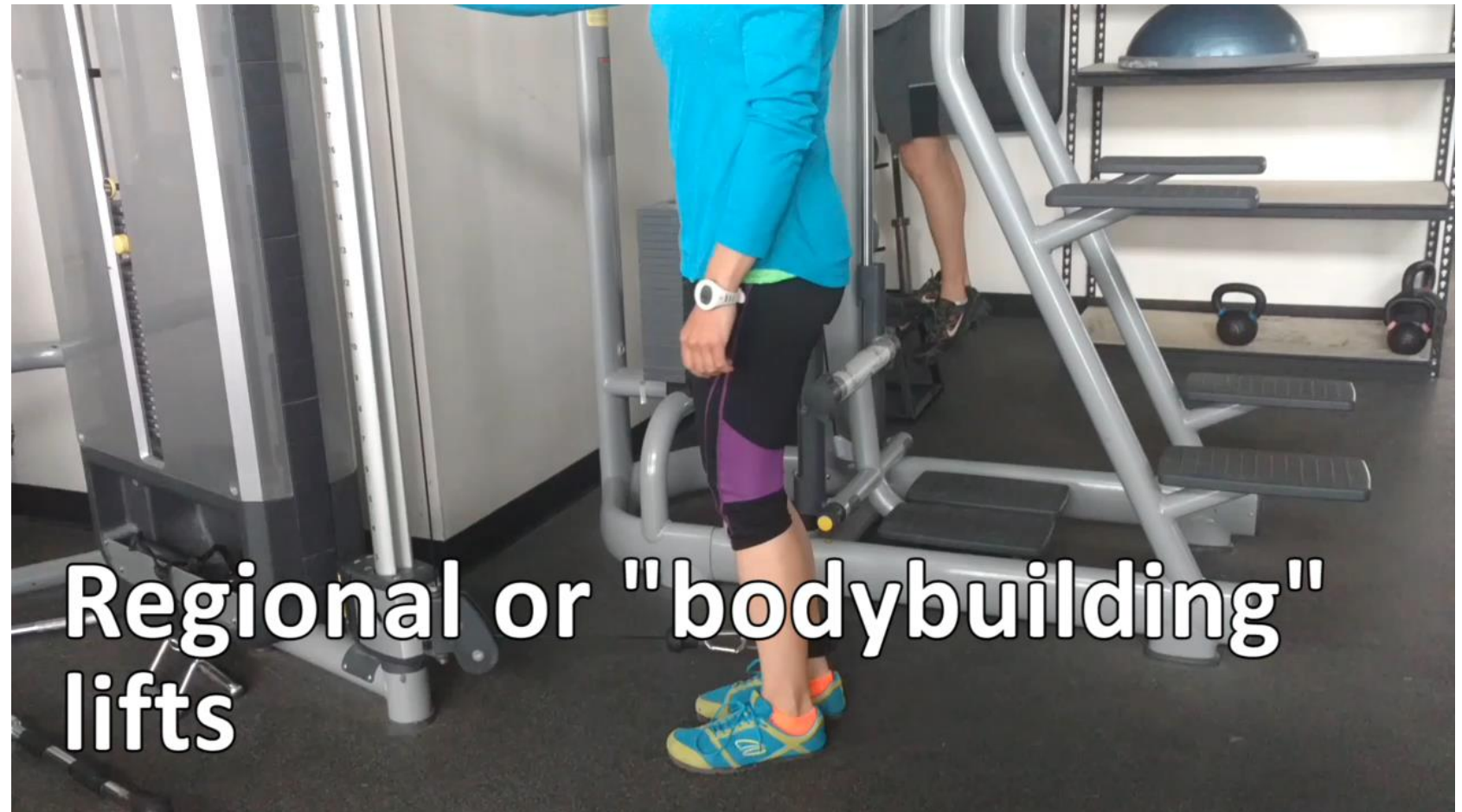
SAMPLE PARTNER MED BALL CIRCUIT:

PERFORM EACH EXERCISE FOR 10 REPS. TAKE 15 SEC REST. PROCEED TO NEXT EXERCISE. APPROX 8 MIN CIRCUIT

1. KNEELING OVERHEAD PASS
2. STANDING SCOOP PASS R
3. STANDING SCOOP PASS L
4. ROTATIONAL CHEST PASS R
5. ROTATIONAL CHEST PASS L
6. SLAMDOWNS WITH JUMP
7. ROTATIONAL SLAMDOWNS R
8. ROTATIONAL SLAMDOWNS L
9. TRICEP THROWS

GENERAL ACTIVITIES (WEIGHT ROOM)

- ☑ Exercise selection
- ☑ Move with intent
- ☑ Common theme
- ☑ Modify for injuries



**Regional or "bodybuilding"
lifts**

PROTOCOL FOR GENERAL “BODYBUILDING” CIRCUITS

- **2 sets of 10-12 exercises, 10 reps each**
- **60-90 seconds rest after each exercise**
- **Effort level ~ 75% (scrunched forehead)**
- **Effort, total sets, and rest time produce hormone response**
- **Further glycogen depletion after threshold-type workout**
- **Good for hs or big groups. Partners and stations work well**
- **Can also do very simply with minimal equipment (wt plate).**
- **Trains muscular endurance**
- **Helps with over-trained athletes**

SAMPLE BODYBUILDING CIRCUIT

PERFORM EACH EXERCISE x 10 REPS AT APPROX
75% EFFORT.

TAKE 60 SECONDS REST BEFORE PROGRESSING
TO NEXT EXERCISE.

REPEAT ENTIRE CIRCUIT ONE TIME

- 1 Lat pull down
- 2 Hamstring curl
- 3 Hanging knee ups
- 4 DB or BB upright row
- 5 Leg extension
- 6 Weighted back hyper with twist R-L
- 7 Tricep extension
- 8 Windmills
- 9 Single leg RDL R
- 10 Single leg RDL L

HOW: ORGANIZING STRENGTH TRAINING MAINTAIN A “MENU” OF CIRCUITS

GENERAL STRENGTH

EVEREST (Calisthenics, Rotational)

- 1 Prisoner squat
- 2 Decline Pushups (ft on bleacher)
- 3 V-ups
- 4 Xover/Lateral Lunges
- 5 Tricep Dips (on bleacher)
- 6 Yogis/Kneeling tip backs
- 7 Alternating Lunge-Return
- 8 Incline Pushups (Hands on bleacher)
- 9 Supine P/L heel taps
- 10 Mountain climbers

AMA DABLAM (Calisthenics, Rotational)

- 1 Split squat R (no DB)
- 2 Split squat L (no DB)
- 3 Reverse crunch
- 4 Suitcases
- 5 SL crab position hip lift R
- 6 SL crab position hip lift L
- 7 Mountain climbers wide
- 8 Supermans
- 9 Clap pushups
- 10 V-ups

MAKALU (Calisthenics, bunched)

- 1 Bkwd lunge walk (note easy or hard version)
- 2 SL mountain climber R
- 3 SL mountain climber L
- 4 L-over (no MB)
- 5 Rocket jumps
- 6 Supine hip lifts
- 7 Hip dips R (w or w/o leg elevated)
- 8 Hip dips L (w or w/o leg elevated)
- 9 Bear crawls backward
- 10 Bear crawls forward (you know you love it)
- 11 Stretch loop pac-mans R
- 12 Stretch loop pac-mans L

CORE AND CORE STABILITY

MERU (Core Stability)

- 1 Elbow Hip dip R
- 2 Elbow Hip dip L
- 3 Prone Trail leg R
- 4 Prone Trail leg L
- 5 Hand Side Plank Abduction R leg
- 6 Hand Side Plank Abduction L leg
- 7 My hammy fans
- 8 Fire hydrant R
- 9 Fire hydrant L
- 10 Hand Side Plank Adduction R leg
- 11 Hand Side Plank Adduction L leg
- 12 Supine plank marching alt R-L

ANNAPURNA (Specialized Calisthenics)

- 1 Supermans
- 2 Kneeling bows w/ rounded back
- 3 Supine hip lifts
- 4 Supermans alt limbs
- 5 Glute bridge
- 6 Supine toe touch alt R-L
- 7 Squirms
- 8 Prone crunch alt shoulder
- 9 Straight leg glute bridge R
- 10 Straight leg glute bridge L
- 11 Supine scissors

CAMP 3 (Specialized Calisthenics, barefoot)

- 1 Forward lunge walks on toes
- 2 Backward lunge walks on toes
- 3 Lateral monster walks with bungee R
- 4 Lateral monster walks with bungee L
- 5 Sumo position heel lifts
- 6 Standing towel grabs R
- 7 Standing towel grabs L
- 8 Lateral low walks R
- 9 Lateral low walks L
- 10 Backward 3-way heel walks
- 11 Backward 3-way toe walks

BODYBUILDING

MOUNT BLANC

- 1 Standing dumbbell press
- 2 Bulgarian squat R
- 3 Bulgarian squat L
- 4 Dumbbell row R
- 5 Dumbbell row L
- 6 Standing side crunch R
- 7 Standing side crunch L
- 8 Weighted back hyper
- 9 Plate pull-over
- 10 Weighted sit ups with feet anchored

MATTERHORN

- 1 Lat pull down
- 2 Hamstring curl
- 3 Hanging knee ups
- 4 DB or BB upright row
- 5 Leg extension
- 6 Weighted back hyper with twist R-L
- 7 Tricep extension
- 8 Windmills
- 9 Single leg RDL R
- 10 Single leg RDL L

JUNGFRAU

- 1 Lat pull down behind neck
- 2 Hanging knee ups
- 3 BB upright row
- 4 Triple jumper hangs
- 5 Kneeling cable cross R
- 6 Kneeling cable cross L
- 7 Tricep extension
- 8 Windmills
- 9 RDL (DL)

MEDICINE BALL

RAINIER (Calisthenics)

- 1 L-over
- 2 Backward lunge-return
- 3 V-ups alt R-L
- 4 Seated taps
- 5 Russian twists
- 6 Seated tricep extension
- 7 Standing Fig 8 pass R
- 8 Standing Fig 8 pass L
- 9 Split jumps MB OH or chest
- 10 Squat to press
- 11 Kneeling bow flat back
- 12 Rotational slamdowns R
- 13 Rotational slamdowns L

SHASTA (Catch-toss)

- 1 Standing scoop pass R
- 2 Standing scoop pass L
- 3 Pike passes
- 4 Standing OH pass
- 5 Behind-the-back flicks
- 6 Superman throws
- 7 Seated lateral pass R
- 8 Seated lateral pass L
- 9 Seated medial pass R
- 10 Seated medial pass L
- 11 Russian twist legs elevated R
- 12 Russian twist legs elevated L
- 13 MB reach and hike

MOOSE TOOTH (Calisthenics, light plyos)

- 1 Kneeling OH pass
- 2 Standing scoop pass R
- 3 Standing scoop pass L
- 4 Rotational chest pass R
- 5 Rotational chest pass L
- 6 Slamdowns (jump optional)
- 7 Rotational slamdowns R (jump optional)
- 8 Rotational slamdowns L (jump optional)
- 9 Tricep throws

HOW: ORGANIZING STRENGTH TRAINING

Step 3: Troubleshoot

Theme matching is most important

The weight room is too small for my team

We don't have access to our weight room

We have to lift in the mornings

I don't design my athlete's weight work

We have to lift on the same days each week

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THANK YOU!

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