Six Steps to Success: A Complete Approach to Functional Sports Training

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Philosophy

Our mission is “to build a foundation, prevent injuries, and improve performance.”

How do you get there?
Start with the Olympic Development Teams and work through the pipeline educating athletes, parents, and especially coaches.

Ultimate Teamwork

Strength Coach
Athlete
ATC/DC
Coach
MD/DO
Nutritionist
USA Water Polo Model

10 USA Water Polo Teams (Men's and Women's Cadet, Youth, Junior, Senior A & B) along with the Olympic Development Program and Splashball Program follow the same model for sport performance and injury prevention.

All programs will have the same foundation based on Six Steps for Success.

6 Steps of a Functional Foundation

1. Functional evaluation
2. Core strength
3. Dynamic and Static stretching
4. Balance and proprioception
5. Eccentric training
6. Multi-planar movements and strength training exercises

#1 Functional Evaluation

- Why? It personalizes the programs for each person and identifies tendencies for a sport, work place, etc.
- Performed to identify hypertonic muscles and hypotonic muscles with dynamic movement patterns, static posture, and active range of motion for joints.
- There are many types of functional evaluations—USA Water Polo ODP uses combination of NASM-PES, mentor Dr. Joe LaCaze and Dr. Vladimir Janda functional evaluation approach. We also believe in the joint-by-joint approach by Grey Cook and Mark Boyle.
- No need to reinvent the wheel. However, each one of us takes the philosophy of a founding father and add our own flare make it our own.

10/20/2011
Tested 200 USA Water Polo Athletes

- Documented static observation of posture
- Listed any present or pre-existing injuries and hand dominance
- Measured internal and external rotation of shoulders and hips to identify ROM
- Performed Movement Patterns:
  - Full Overhead Squat
  - Modified Push-up
  - Side-Lying Hip Abduction
What We Found…

- Common tendencies in water polo players
  - Pelvis chain weakness, especially glute max
  - Upper Crossed Syndrome with breathing and TMJ issues
    - Tight psoas; shoulder capsule of dominant shoulder and bilateral scapula winging/flaring
  - Extreme forward head carriage
  - Lower Crossed Syndrome
    - Hypertonic external obliques and limited internal rotation of the hip on the non-dominant side
    - Hypertonic rectus femoris and paresis of dominant arm
    - On the side of the dominant hand, AS of pelvic and hypertonic posterior shoulder capsule
    - Limited internal hip rotation on the non-dominant side and limited external hip rotation on the dominant side
  - Overall… altered firing patterns because of muscle weakness
    - Rhomboids, middle trapezius, lower trapezius, gluteus medius, gluteus maximus, serratus anterior, deep neck flexors, and inner abdominals.

The Janda Approach

Common Injuries

- Rotator cuff strain
- Labral tear/FAI in hip
- Lumbar sprain/strain
- Groin strain
- Patellofemoral Pain Syndrome
- Concussion
- Cervical Spain/Strain
- Sports hernia/rectus abdominis strain
- Shoulder impingement
- IT Band Syndrome
Functional Evaluation + Your program

- Take the information from your evaluation and begin the program modification.
- Prescribe exercises and stretches that will isolate and eliminate the problem(s) identified in your evaluation.
- Tissue work, CMT and modalities of choice (ICT Tape, Therabands, InterliSkin shirts, PRM, PEMF) can also be used in the process. If you are working with a sport team, discuss your findings with the medical team so that it can be incorporated across the board.
- Coach: Focus on engaging core in sport-specific drills, work on the basic fundamental of each position, incorporate breathing techniques.
- Nutritionist: Discuss hydration, weight loss or weight gain, proper nutritional advice for performance goals and recovery.
- Strength Coach: Add in certain areas to strengthen and/or lengthen based on functional evaluations and position-specific needs.

#2 Core Strength

- One complex unit involving the abdominal wall, pelvis, low back, hips, and inserting muscles of the spine.
- Take the information from the functional evaluation to determine areas of special focus.
- Teach core bracing before moving into core exercises.
- Core should be engaged at ALL TIMES, especially during sport-specific movement.
- Use muscles of the trunk strength to generate force.
- The concept of “Total Chain Movement”.
- Activate muscles of inhalation and expiration without holding breath.
- Fatigue of core leads to changes in biomechanics which lead to injury.

Core Strengthening

- Two Systems:
  - Stabilization System
    - Transversus abdominis
    - Internal oblique
    - Hip external rotators
    - Lumbar multifidus
    - Pelvic floor muscles
    - Diaphragm
  - Movement System
    - Latissimus dorsi
    - External Oblique
    - Erector spinae
    - Biceps
    - Hamstrings
    - Hip adductors
    - Glutes
Example of a core water polo routine...

- Superman with palms up
- Butterfly Toe Touches: Middle, Right and Left
- Hip Ups
- Side-to-side Reaches
- Crunches
- Crunch and hold to the middle

Rotex Series: 4 x 30 sec on hypertonic external oblique side; 2 x 30 sec opposite hip

#3 Stretching

- Flexibility is important because the loss of flexibility overall or in a specific joint can result in reduction of movement efficiency and may increase risk of injury during activity (Wenos and Konin 2004)
- To avoid deficits in flexibility, it is important to incorporate stretching as a key element in an athlete’s program for injury prevention and sport performance
- Cook and Boyle’s joint-by-joint approach
- The two types of stretches that are commonly used for water polo are: static and dynamic stretching

Dynamic vs. Static Stretching

**Dynamic**
- Target each joint through full range of motion
- Challenges flexibility while stressing ROM
- Sport specific movements
- 10-12 reps of each exercise (or 25 yards)
- Approx 12-15 exercises
- Increase heart rate
- Build into more explosive movements.
- Before competition
- May be an abbreviated version of practice routine

**Static**
- Hold muscle at lengthened position for 30-90 sec, rest 2-10 sec
- 2-3 sets
- Reduces performance of powerful activities up to one hour after stretching (McNeal and Sands, 2001)
- Perform after practice or competition; mornings and before bed
Dynamic Warm Up Tips

- Do some type of warm-up before dynamic stretching (cardio, jumping rope, or jogging)
- Can either be performed on the pool deck, in the pool, or in an area that is open. The length of movement can vary (usually 25 yards).
- Actively move body part(s) throughout entire range of motion to end range
- All the muscles should work together with core engaged
- Do NOT stretch into pain
- Movements are a controlled pattern with core always engaged

#4 Balance and Proprioception

- Three planes of motion
  - Frontal
  - Sagittal
  - Transverse
- Stable surface before unstable surface
- Progression in training is key
- Challenge the patient/athlete in ways their normal activities would not challenge them
- Sport-specific training is VERY important
- Example: Water polo athletes do not compete on stable surfaces, so unstable surface training must be incorporated in all three planes

Balance & Proprioception Exercise Examples

- Exercised
  - Stork Stand, 3 x 10 seconds
  - Stork Stand with head flex/extended, 2 x 10 seconds
  - Stork Stand with head rotation, 2 x 10 seconds
  - Stork Stand with lateral head bending, 2 x 10 seconds
  - Shoulder ABC’s at 90 degrees abduction, 2 x 1 ABC’s
  - Single leg throwing in the mirror, 2 x 10 times
  - Track starts in the mirror, 2 x 10 times
- Key points:
  - Perform balance on each leg or arm
  - Start with 10 seconds balance and then increase time.
  - Can advance to unstable surface (foam, trampoline, or dynadisk)
  - Progress from head movement to body movement
  - Progress from eyes open to eyes closed
#5 Eccentric Training

- Eccentric Muscle Contraction
  - Muscle contraction while an external force causes the muscle to lengthen
  - The mechanism of many musculotendinous injuries
- Often left out of resistance training
  - Muscles fatigue
- Repetitive eccentric contractions in competition
  - Fatigue leads to changes in biomechanics which lead to injury
- Teach proper technique
  - Jumping-Landing
  - Tandem Tubing

Eccentric Training

- Jump Rope
  - Great warm-up
  - Concentric and eccentric contractions
  - Increase blood flow to entire body
  - ACL Injury Prevention
  - Proprioception
  - Strength
- Tandem Tubing
  - Performed with partner
  - Muscular endurance of shoulders and core
  - Constant tension in tubing is required
  - Focuses on concentric and eccentric muscle contractions
Eccentric Training

Tandem Tubing

- Dynamic warm-up
- Pre-practice
  - 1-2 sets
  - 15-30 sec
- Pre-competition
  - 1-2 sets
  - 10-15 sec
- Strength and Endurance Training
- 1-2 sets
- 10-15 sec

Strength and Endurance Training

- 2-3x / week

#6 Multi-planar movements and strength training exercises

- Incorporate Steps 1-5, especially the functional evaluation feedback
- Limitless exercises that can be preformed with body weight and then progress with weight and/or resistance
- Coupled exercises that incorporate isometric holds and also include explosive power
- First develop body balance and then move into sport specific explosive movements that are performed at game speed

Example #1:

- Small Arm Circles @ 90 degree shoulder abduction, 25 each direction (squeeze shoulder blades together)
- Wrist curls, 20 seconds
- Punches, 20 seconds

- Big Arm Circles @ 90 degree shoulder abduction, 25 each direction (squeeze shoulder blades together)
- Rows, 20 seconds
- Throwing motion, 20 seconds

- Internal Rotation, 20 seconds
- External Rotation, 15 seconds

** Make sure to perform all exercises bilaterally
Transitioning into Multi-Planar Movements

- Break down the proper squatting technique and proper push up technique before adding multi-planar movements
- Squatting: Utilize a mirror to develop proper symmetry
  - Engage the intrinsic muscles of the feet
  - Engage the core in pelvic neutral with proper posture (shoulder blades down and in)
- Push the hips back before bending knees for a controlled decent
  - Descend without knees over toes to lower below 90 degrees with lower leg control and balance
- Depending on the age and experience with strength training, prescription will vary
  - Younger athletes and less experienced patients start with body weight exercises and move to more advanced movements with weight

Multi-planar movements and strength training exercises

- Challenge the patient/athlete in new ways
  - Creative dynamic Warm Up
  - Increase resistance and velocity
  - Add unstable surface
  - Single leg balance
  - Incorporate multiple planes within one exercise
  - Concentric and eccentric contractions
- If you are working with a team strength coach, two minds can be better than one
  - Present your findings from the medical perspective and work to develop the best possible sport-specific routine for optimal performance and injury rehab and prevention

USA Water Polo Strength & Conditioning Workouts
USA Jr. Team 12 Week Progression

**Week 1-4**

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<tr>
<th>Day 1</th>
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<tr>
<td>Exercise Sets/Reps</td>
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<tr>
<td>Full Squat w/out weight</td>
<td>3x8</td>
<td>RDL</td>
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<td>Lateral Lunge</td>
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<td>Supine Pullover</td>
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<td>Forward Monster Walks</td>
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<td>DB Bench</td>
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<td>Standing Cable Row</td>
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<td>Mule Kicks</td>
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<td>Tricep Push ups</td>
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<td>T's &amp; Y's on Ball</td>
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<td>DB Row</td>
<td>3x8</td>
<td>Plank Series: 60 sec per side</td>
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<td>Prone Pank</td>
<td>3x30</td>
<td>Back Extensions</td>
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**Weeks 5-8**

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<td>Squat w/ Band to Push Press</td>
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<td>Bulgarian Split Squat</td>
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<td>Static Squat to Squat Jump</td>
<td>3x:20 SS, 10 J</td>
<td>Monster Walk</td>
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<td>RDL</td>
<td>3x8</td>
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<td>Single Arm Cable Row</td>
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<td>Lat Pulldowns</td>
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<td>Tricep Push ups</td>
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<td>Combo mule and kick back</td>
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**Week 9-12**

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<td>Ball Walk out with push up</td>
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<td>Rotating Plank</td>
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<td>DB Back Ext w/ T's, I's, Y's</td>
<td>3x5</td>
<td>Bridge with Figure 4</td>
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10/20/2011

When and how often should I do my routines?

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Personal Recommendations

- Pro Muscle Release – percussion therapy modality
- Rotex
- KT Tape
- Intelliskin
- Pulse Electro Magnetic Field Therapy

Tying it Together

- As an ATC, DC or dual credential who is in charge of a sports team, it is important to be open and versatile in your job.
- Unique treatments can apply to all professions but Chiropractic is especially unique because it can incorporate soft tissue, physical therapy and manipulation.
- We have the best of all worlds, and the athletes LOVE it!!!
Any Questions???

References

References continued…
References continued...


