Tactical Athletes: Physical Therapists Working with Firefighters, Law Enforcement & Military

Introduction

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- U.S. Army Veteran

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- U.S. Army Veteran

SIG Chair:
Rich Westrick
Vice Chair:
Chuck Rainey

www.spts.org
Disclosures

- **Kyle Sela**
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  - Co-owner, Back-to-the-Box, LLC

- **Tyler Christiansen**
  - National Strength & Conditioning Association (NSCA)

- **Jacob Morrow, MAJ Westrick, MAJ Suttles**, No relevant financial relationships

Learning Objectives

1. Describe the incidence and prevalence of injuries in tactical athlete populations.
2. Understand the physical demands of tactical athletes – similarities and differences between “traditional” athletes.
3. Understand the impact of musculoskeletal conditions on lost duty time in the tactical athlete population.
4. Appreciate the unique rehabilitation considerations for firefighters, law enforcement, and military tactical athletes.
5. Understand the benefit of working relationships with TSAC professionals.

Who is the “Tactical Athlete”?

Who is the “Tactical Athlete”?
Who is the “Tactical Athlete”?

A professional in an occupation involving planning and maneuvering to accomplish a purpose; who, as with the professional athlete, is obligated to maintain a certain level of Operational Physical Fitness in order to fulfill that purpose, AND who must maintain that level of fitness as a term of employment.

General Physical Preparedness (GPP) & fitness requirements
- Technical and Tactical Skills (T/TS)
- Strenuous Physical & Mental requirements

Tactical Athletes!
Why are “Tactical Athletes” important?

“Here It’s Not A Game”
“Here It’s Not A Game”

Who Ya Gonna Call?

>650,000 911 calls per day

150,560 “Boots on the Ground”
Military in Foreign Countries

as of October 2015
OUSD Defense Manpower Data Center

50,000 U.S. Army Soldiers Can’t Deploy

>87% musculoskeletal injury
Malish, MilMed, 2014
Musculoskeletal Injury Burden

>63% Lost duty time due to musculoskeletal injury  
**Rand 2011**

Musculoskeletal Injury Burden

>51% Lost duty time due to musculoskeletal injury  
**Jahnke 2013**

Tactical Physical Demands & Musculoskeletal Injury

- Manageable
- Excessive  
**S. Dye '05**

The ‘envelope’ changes following MSKI

Pre-injury

Post-injury
Enhanced Tactical Athlete
Physical Health and Readiness

Understanding the Population

Screening for MSKI Risk

Tactical Athlete A

Tactical Athlete B

The ‘envelope’ is not the same for all Athletes

Tactical Athletes:
Physical Therapists Working with Firefighters, Law Enforcement & Military

Enhanced Tactical Athlete
Physical Health and Readiness

Rehabilitation

Tactical Strength & Conditioning

Enhanced Tactical Athlete Readiness

MSKI Decision Aids/Tools

Screening for MSKI Risk
Physical Therapists Working with Military Tactical Athletes

CSM 2016
MAJ Sean T. Suttles PT, DPT, OCS, CSCS

Agenda
• Introduction
• Disclosures
• Epidemiology
• Financial Burden
• Injury Details
• Tactical Athlete Defined
• Why the Term Fits
• Who is The Military Tactical Athlete?
• Why the Term is Problematic
• Sports Medicine Model

Introduction
• 27yrs TIS; 17 enlisted; 10 officer
• 15yrs Green Beret
• 17yrs airborne status
• Staff PT in Lg Med Cen OP PT clinic
• Stryker BCT PT
• Special Forces PT
• Sports Medicine Fellow NFL (NY Giants)
Disclosures

• The Author is an employee of the federal gov’t and the views and opinions expressed in this presentation are those of the author and do not reflect the views or official policies of the Dept. of the Army, The Dept. of Defense, or the U.S. Government.

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Epidemiology

• Takehome:
  • MSK Injury is third leading cause of:
    — Total Medical Encounters
    — Hospital Bed Stays
    — Lost Duty Time
  • #1 cause of NBI evacuations from OIF/OEF:
    — Sports/PT related MSK Injury

Financial Burden

• Takehome:
  — $548 million annually in direct medical costs
  — MSK injury is #1/primary injury type associated with VA disability payouts – BILLIONS
Injury Details

• Most Common MOI's for MSK Injuries:
  - Physical Training (Individual), 19.79%
  - Gradual Onset, 13.63%
  - Physical Training (Unit), 11.54%
  - Insidious Onset, 9.04%
  - Training - Airborne Operations, 8.43%
  - Recreational Sports, 6.45%
  - Training - Schools, 5.14%
  - Other, 4.64%
  - Training - Field Exercise, 3.63%
  - Unknown, 3.43%
  - Combat - Non-Battle Injury, 2.75%
  - Non-Military Activity, 2.63%
  - Combatives, 2.35%
  - Physical Training (THOR3), 2.30%
  - Combat - Battle Injury, 2.02%
  - MVA, 1.68%
  - Training - Fastrope, 0.55%

Running, 76%
Sports, 9%
PT (other), 12%
Road Marching, 3%

• Occupations – Amaroso, 1997
  - The men in MOS 11B (Infantrymen) have the highest hospitalization rates for both acute injuries and musculoskeletal conditions.

• For women, the highest rate of musculoskeletal hospitalizations was among Light Wheeled Vehicle Mechanics, MOS 63B.

• Detailed occupation-specific physical demand analysis beyond the scope of this 20 min talk.

Total Injuries Treated (18 series vs. all others; n=543)

- 18 series (49.64%) 51%
- All others (50.36%) 49%

Total Individuals Treated (18 series vs. all others; n=470)

- 18 series (50.64%) 51%
- All others (49.36%) 49%

Tac
cal Athlete Defined

• Tactical defined:
  - of, relating to, or used for a specific plan that is created to achieve a particular goal in war, politics, etc. (Webster’s)
  - relating to actions occurring at the battlefront to gain a military end

• Athlete defined:
  - a person who is trained or skilled in exercises, sports, or games requiring physical strength, agility, or stamina (Webster)
Tactical Athlete Defined

- What is a Tactical Athlete?
  - Any professional in an occupation involving planning and maneuvering to accomplish a purpose; who, as with the professional athlete, is obligated to maintain a certain level of Operational Physical Fitness in order to fulfill that purpose, AND who must maintain that level of fitness as a term of employment.

Tactical Athlete Defined

- Tactical Athlete
  - Key term:
    - Operational Physical Fitness
      - (strength, power, agility, & stamina to operate successfully within a given occupational paradigm)
    - Occupational tasks + Physical Fitness required for maneuvering vs. Occupational tasks alone

Why the Term Fits

- Justification for use of the term, “Military Tactical Athlete”:
  - Majority of MSK injuries experienced by military service members are related to participation in sports, recreation, and physical training
  - Military members as a whole are at substantially increased risk for MSK injuries commonly seen in sports athletes and managed in sports medicine clinics compared to general population.

(Cameron, 2014)

Why the Term Fits

- Further justification for use of the term, “Military Tactical Athlete”:
  - Army physical readiness is the ability to meet the physical demands of any combat or duty situation, accomplish the mission and still have a reserve of strength. (FM 25-101, Training the Force, Battle-Focused Training)
Why the Term Fits

- Further justification for the use of the term, “Military Tactical Athlete”:
  - “Military leaders have always recognized that the effectiveness of fighting men depends to a large degree upon their physical condition. War places a great premium upon the strength, stamina, agility, and coordination of the soldier because victory and his life are so often dependent upon them. To march long distances with full pack, weapons, and ammunition through rugged country and to fight effectively upon arriving at the area of combat; to drive fast-moving tanks and motor vehicles over rough terrain; to make assaults and to run and crawl for long distances, to jump into and out of foxholes, craters, and trenches, and over obstacles; to lift and carry heavy objects; to keep going for many hours without sleep or rest – all these activities of warfare and many others require superbly conditioned troops.” (FM 21-20, Physical Training, January 1946)

Who is the Military Tactical Athlete?

- Special Operations (closest resemblance to elite athlete):
  - Recruited from top 2% of military
  - Special vetting
    - Higher APFT requirements at entrance level
    - Higher marksmanship requirements
    - Higher intelligence requirements (minimum ASVAB GT score 110)
    - Greater psychological hardiness (Bartone)
    - Greater self efficacy (Bartone)
    - Embedded multi-d performance/medical staff (RAND, Sutliff, Goss)

Who is the Military Tactical Athlete?

- Navy:
  - Seals
  - SBU’s
- Airforce:
  - Pararescue (PJ’s)
  - Combat Controller (CCT)
- Marines:
  - Recon
- Army:
  - Delta
  - Special Forces
  - Rangers
  - Special Operation Aviation Regiment (SOAR)
  - Special Warfare Center and School (SWCS)
Who is the Military Tactical Athlete?

- **US Army Special Operations Command (USASOC) Combined Aggregate:**
  - Mean age:
    - Overall (SOF, Ranger, SOAR, SWCS combined): 31.1
    - 18 series (Special Forces): 33.7
    - Non 18 series assigned to USASOC units: 29.9
  - Mean yrs TIS: 6.6
  - Mean yrs time in SOF: 3.7

Who is the Military Tactical Athlete?

- **Conventional Military**
  - More difficult to define than in SOF
  - Active Duty All Branches (Cameron, 2014)
    - 1.4 million AD; enlisted:officer 5:1
    - 50% of enlisted ≤ 25y/o
    - 70% ≤ 30y/o
    - 85.5% male

(Cameron, 2014)
Why the Term is Problematic

- No professional coaches in the ranks
  - Those who run PRT lack education or expertise
    - Everyone thinks they’re an expert on adult fitness
    - Shake and bake training (MFT)
    - SME’s (see one, do one, teach one)

- PRT has to be performed as a group
  - No time or personnel to conduct personalized assessments or develop individualized exercise progressions

Why the Term is Problematic

- Two key factors that significantly impact HPO as IP:
  - No season
    - Periodization is an impossible pipe dream (OPTEMPO)
    - Training monotony
    - No off season
  - Exposure to physical demand
    - Intermittent
    - Unpredictable

Sports Medicine Model

- Sports medicine model of care:
  - Often biased toward early as possible surgery vs. focus on early rehab
    - Favors rapid return to physical performance (return to play) over longterm functional outcomes
  - Rehab conducted one-on-one
  - Rehab includes in house:
    - Rehab to performance bridging
    - “Return to play”/”Prepare to play” performance progression utilizing sport specific tasks, loads, volumes, and settings
Sports Medicine Model

- Sports medicine model of care cont’d:
  - Training room (career sparing) operations
    - Daily management of chronic conditions
    - Immediate and daily management for minor injuries not requiring an appointment with a provider
    - Walk-in availability of recovery procedures
      » Ice & compression
      » Contrast tubs
      » Foam rolling
      » Compression (e.g. Normatec pants)
      » Soft tissue mobs/manual stretching
      » Heat packs

Military model of Orthopedic Care

- Typical ankle sprain case
  - Report to sick call and sit for several hours while ankle balloons up
  - Provided limited duty profile and NSAIDs w/o f/u care planned
    - Worse case: soldier is seen by an unskilled provider who immobilizes them
    - Soldier receives no rehab for a month and doesn’t get better

Military model of Orthopedic Care

- Provider finally refers soldier to PT
  - Soldier waits another 2-4 week to be evaluated
  - Soldier now chronically stiff and painful
  - Soldier receives HEP due to accessibility issues or receives biw therex in clin
  - Soldier fails to progress after 6wks and is discharged; referred back to PCM for permanent profile
  - If lucky the PT orders imaging to r/o fracture or ligamentous injury

Military model of Orthopedic Care

- If there are imaging findings soldier receives routine referral to ortho or podiatry
  - After waiting 2-4 weeks Soldier is screened by ortho service PA
  - Soldier waits another 2-4 weeks to consult with surgeon
  - Soldier receives surgery for ligamentous rupture one month later (Soldier is now 2-4 months post original injury)
Treatment & Prevention for Military Tactical Athletes

- Occupation/“Sport-specific” rehabilitation focus (Infantry, Armor, Support, etc)
  - Regardless of their specialty the process is the same
  - You always treat the impairments you find and try as best as you can to keep your processes within the context the patient works in

“Finishing Rehab”
- Restoring function and returning to pre-injury level of capability is likely not enough for prevention of subsequent injury (Wilk JOSPT 14)

Determining “Return to Duty”
- Understanding physical demands
- Running
- Combatives, hand-to-hand/MMA
Summary

• Athlete is an assumption in many cases
  – We have to decide who in our population are the “Tactical Athletes” and who are not
  – Many MOS's have lower physical demands and can tolerate limited physical capability
  – Permanent limited duty profiling will bar combat arms MOS soldiers from continuing to serve
  – Care on all fronts should be prioritized to combat arms soldiers for that reason
• As many visits generated by non-athletic, non-combat arms soldiers as combat arms soldiers

Questions?

Summary

• Sports medicine model a must in order to properly care for tactical athletes as if they are athletes
  – Training room setting w/daily recovery and “career sparing” treatments necessary
  – Full return to play rehab workups necessary
  – Streamlined/prioritized access to surgical consults a must
• Without these we are simply providing outpatient orthopedic care to our soldiers the same way we would for anybody else
Objectives

- Who is the tactical firefighter
- What do they do
- What challenges do they face
- How and why do they get hurt
- How do they return to duty
- Tactics to stay fit to fight

Who are Firefighters

- 1.2 million
- 30,052 US Departments
  - 31% (345,600) Career
  - 69% (786,150) Volunteer
- 73% of career firefighter work in areas with population >25,000

Demographics

- Male 95%
- Female 5%
- White 82%
- African American 8%
- Hispanic 10%
- Other 3%

Age

- 16-19 (3%)
- 20-29 (21%)
- 30-39 (28%)
- 40-49 (26%)
- 50-59 (16%)
- 60 and over (6%)
What We Do

- Medical Aid 68%
- Hazardous Material 1%
- Other 14%
- Other Hazards 2%
- False Alarms 7%
- Fire 4%
- Mutual Aid 4%

Other?

Occupational Challenges

- Positional challenges
- Turnouts
- Self contained breathing apparatus (SCBA)
- Environmental conditions

Physical Challenges

Turnouts – Coat, Pants, Helmet, Boots, Hood

- Average 30lbs
- Tools average 5-10lbs
- Withstands 500°F
- Modified movement patterns
- Now carry tools, hose, and ladders
Physical Challenges

Self Contained Breathing Apparatus
• Average 35lbs
• Positive pressure
• Increases ventilation rate, O2 consumption, and heart rate
• Reduces tidal volume

External Factors/Loads

• Throwing ladders - 42 - 127lbs distributed over 14'-20'

External Factors/Loads

• Charged hose line
  • 100' of 1.75" hose
  • 12.5 gallons of water
  • 104lbs
• Nozzle Reaction force
  • 30-95lbs

External Factors/Loads

• Tools and equipment aloft
• Rescues
• Search and evac
Physiologic Stresses
Cardiovascular and Thermal Strain

• Core body temperature increases 2.5°F in 20 min
• With sustained work to over 102°F
• Profuse sweating
• Prolonged periods of near maximum heart rate

Physiologic Stresses
Cardiovascular and Thermal Strain

• Stroke volume decreases
• High blood pressure that rapidly drops with cessation of work
• Decrease plasma volume (15% in 20 min)
• Hemoconcentration causes changes in blood electrolytes and platelet aggregability

Clinical Effects

• Lee et al, 2013
• Increased VO2 30%
• Rapid increase in HR
• Increased RPE
• Time to fatigue was 50%

Internal Risk Factors

You are most likely seeing this...
Internal Risk Factors

• 50% between age 30-50
• BMI – 80% overweight or obese
• CDC fitness recommendations <75%
• Monochromatic meal plans

Injuries

• 65,350 in 2014
• 45% on fireground
• 19% Non-fire Emergency
• 18% Other on-duty
• 12% Training
• 5% Responding or returning

Fireground Injuries

“Sprains and Strains”

• Lumbar spine
• Lower extremity
• Shoulder
• Poplin et al, 2014 76% from lifting

Over 50% from strain, overexertion, slips, and falls
Modifiable Risk

- Butler et al. 2011
  - 108 recruits over 4 years
  - Max performance test and FMS
  - FMS <14
  - Sit and reach

Popin et al. 2015

- 799 career firefighters over 4 years
- Hip/back flexibility
- Grip strength
- Body fat %
- Resting HR

Rehab Considerations

- Don’t put the cart before the horse, keeps rehab simple
- Follow foundational principles

Sport Specific Rehab

- Develop core strength
- Teach proper movement
- Use fire equipment
- Use weighted vests or turnouts appropriately
- Have functional testing measures
Return to Duty

- Stair test
- Hose pull
- Dummy Drag
- Ladder Throw

Fire Fitness Programs

- Football team in one player
- Consider all needs
  - Cardiovascular
  - Power
  - Muscular endurance
  - Consider proper timing

Entry Level Tests

- Candidate Physical Ability Test
- Biddle
- Pack Test

*There are no standards for career testing

Movement Patterns

- FMS
- SFMA
- “Power Positions”
- Economy of motion
Workout Routines

- Recreational
- Cardio
- Meathead
- Cross-fit
- Circuit-training

Workout Routines

- Abel et al. 2011 - Circuit Training
- Peterson et al. 2008 - Undulating training
- Rhea et al. 2004 - Non-linear training
- Jahnke et al. 2015 - High-intensity training (HIT)

Fireground specific functional outcomes

Other Considerations

- Workouts must be tailored to the individual
- Cardiovascular needs
- Strength and Power needs
- Beware of “Interference Phenomenon”

References


References

Physical Therapists working with Tactical Athletes: Law Enforcement Officers

Kyle M. Sela, PT, DPT, SCS, OCS
Combined Sections Meeting
February 19th, 2016
Anaheim, CA

Objectives
1. Introduce the law enforcement tactical athletes.
2. Review common injuries, and injury rates in law enforcement tactical athletes.
3. Describe the unique physical and psychological demands required of law enforcement tactical athletes.
4. Understand sport-specific rehabilitation concerns for law enforcement tactical athletes.

Disclosures
• Co-founder/Owner of Movement Guides, Inc.
  • www.movementguides.com

Background Information
• Who is the law enforcement officer (LEO)?
  • Definition: personnel who carry firearm and badge, full arrest powers, paid by government from specific funds
  • Employers: City, County, State and Federal Agencies
  • Types of positions: Patrol officers, Investigative, Special Assignments, Administrative
  • Enter the profession through some type of training “academy”

• Numbers (Reeves 2015):
  • 477,000 sworn officers at local levels in 2013
  • 12.8% were female
  • NPC has the largest force
  • Washington DC has most officers per 10K residents
LEO: A Dangerous Profession

• Line of duty dangers in 2014 (FBI.gov):
  • Deaths:
    ▪ 51 feloniously
    ▪ 45 line of duty accident
  • Officers assaulted: 48,315
  • 28% resulting in injuries
  • 9 assaults per 100
  • Mortality Rate for Patrol Officers (Teisman 2002):
    ▪ 18 per 100,000 workers
    ▪ 3.5 per 100,000 is national average
  • 7% of occupational deaths were heart attack
  • LOD may have higher rates of CV disease

Injury Data

• Incidence of non-fatal injury and illness 2014:
  ▪ New injury reported: 10.6 per 100 officers
  ▪ 2800 injuries resulting in 24,000 lost days of work in 2008 (Zachary, 2008)
  ▪ MSK Injury Incidence in the last year (Nabeel 2007)
    ▪ Back pain: 49%
    ▪ Chronic pain: 26%
    ▪ Acute injuries other than back pain: 20%

Classification of the LEO

<table>
<thead>
<tr>
<th>Patrol Officers</th>
<th>Investigative Administration</th>
<th>Special Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest number of officers</td>
<td>Detective Leadership Roles</td>
<td>SWAT leadership</td>
</tr>
<tr>
<td>Lowest exercise frequency</td>
<td>Highest percentage of obesity</td>
<td>Lowest self reported fitness level</td>
</tr>
<tr>
<td>Highest intensity of exercise</td>
<td>Highest activity scale</td>
<td></td>
</tr>
</tbody>
</table>

• Association with fitness and health (Nabeel 2007)
  ▪ BMI >35% = 3 x more likely to report back pain
  ▪ Exercise ≥ 4x/week = 73% less likely to report back pain
  ▪ “Fair” and “Poor” general health = 8x more likely to report chronic pain

Specific Considerations when treating LEO

• In-Vehicle Operations
  ▪ Injuries are more repetitive/overuse in nature
  ▪ Roughly 50% of work day (McKinnon 2011)
  ▪ Occupational driving
    ▪ Cumulative stress
    ▪ Vibration
    ▪ Highly repetitive
    ▪ Poor ergonomic work station
      ▪ Mobile Data Terminal
        ▪ 13% of time in vehicle (McKinnon 2012)
        ▪ Consistent long durations of typing in rotation
        ▪ Seat breakdown
          ▪ Roughly 5 degrees of tilt towards drivers door
Specific Considerations when treating LEO

**Out of Vehicle Operations**
- Injuries are more traumatic or acute in nature
  - Average of 4 pursuits per year (Kaminski 2007)
  - Foot Pursuits (Kaminski 2013)
    - 31% result in injury to officer
    - 43% less serious – contusion, sprain
    - 3% more serious – fracture, laceration, bite
  - 42% resulted in suspect assaulting officer
- Level of force used:
  - 72% "soft hand tactics"
  - 28% "hard hand tactics"
- Duration of pursuit and resistance: 30-120 seconds (Hays 2009)

**Uniform Considerations**
- Duty Belt
- Body Armor/Tactical Vest
- Wear of vest associated with earlier onset to 1st time low back pain (Burton 1996)

**Mental Health**
- Shift work
- Stress to young families
- Higher injury incidence and injury duration (Voas et al. 2013)
- Sleep disturbances
- Highly stressful situations
- Public perception
- Poor coping strategies?
  - Cultivates coping through “excess”

**Cardiovascular Disease in LEO**
- Increased rate of CVD in LEO is reported (Zimmerman 2012)
- Known risks for CVD include:
  - Obesity
  - Sedentary lifestyle/occupation
  - Sudden physical stress
  - Psychological stress
  - Shift work
  - Noise/Alarm Exposure
Case Study

• 38 yo male LEO with 4 months of lower back pain

Specific Treatment Recommendations

• Teach and develop lumbo-pelvic stability and neutral spine awareness
• Specifically evaluate and address thoracic mobility with focus on rotation
• Review strategies for “active” sitting
• Establish safe and efficient patterns and strategies during fundamental tasks
• Identify specific mobility limitations, motor control issues and true weaknesses to allow safe and efficient movement
• Educate on training principles:
  • Develop both aerobic and anaerobic capacity
  • Resistance training: Strength vs Power vs Muscular Endurance
• Encourage workup and continued monitoring for cardiovascular disease

Master Teaching the Basics

• Establish safe and efficient patterns and strategies during fundamental tasks
  • Hinge
  • Squat
  • Lunge
  • Push
  • Pull
  • Carry
  • Jump
  • Laid
  • Cut
  • Run
  • Breathe
• Take advantage of your time as a movement expert in a 1 on 1 setting
• Prepare your tactical athlete to show up ready to train

Strength and Conditioning of LEO

• Needs Analysis and Program Design for Police Officers – Matthew Rhea, PhD, CSCS*D (Strength & Conditioning Journal 2015)
  • “At some point, any officer may face physical dangers or demands that require incredible feats of physical performance”
  ● READ THIS ARTICLE!!
Summary

- A career in law enforcement is dangerous
- Work-related injury is common
- Rehabilitate to meet the demands of both:
  - In-vehicle operations
  - Out-of-vehicle operations
- Cardiovascular disease needs to be considered
- PT’s can aid in physical training by establishing patterns and strategies
- Lack of high quality evidence to best understand, train, and treat this deserving population
- Huge opportunity for research

References

The Strength Coach and Physical Therapist
Tyler Christiansen, CSCS,*D, TSAC-F,*D, RSCC*D
Tactical Strength and Conditioning Program Manager
National Strength and Conditioning Association

Objectives
- Introduce the unique physical demands required of tactical athletes
- Describe the role of the strength coaches for tactical athletes
- Sport Specific conditioning concerns for tactical athletes
- Review tactical athlete programs for tactical athletes

What is the Tactical “Athlete”
- Sheepdog Theory
  - Sheep
  - Wolves
  - Sheepdog
- A dedicated servant of his or her country and/or community.

http://www.zengardner.com/author/freefall/

Are All Tactical Athletes in Fact “Athletes”?
- Wellness
- Fitness
- Performance

Programming more corrective in nature
Programming less corrective in nature

Sitting is the New Smoking
- Fitness & Lifestyle Survey for Royal Canadian Mounted Police (7)
  - 73% (76.3%) report sitting more than 5 hours per day at work
  - 31% (33.2%) report sitting more than 5 hours per day on days off

Lemelin, Syl. NSCA National Conference 2015
Activity on a Police 10 Hour Shift (1)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Average Minutes/shift</th>
<th>Average hours/shift</th>
<th>HR ranges</th>
<th>%max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td>373</td>
<td>6 hrs 13 mins</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td>138</td>
<td>2 hrs 18 mins</td>
<td>30-40%</td>
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<tr>
<td>Walking</td>
<td>94</td>
<td>1 hr 34 mins</td>
<td>50-60%</td>
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<tr>
<td>Lifting/Carrying</td>
<td>10</td>
<td>10 mins</td>
<td>70-100%</td>
<td></td>
</tr>
<tr>
<td>Pulling/Pushing</td>
<td>7</td>
<td>7 mins</td>
<td>70-100%</td>
<td></td>
</tr>
<tr>
<td>Running</td>
<td>6</td>
<td>6 mins</td>
<td>70-100%</td>
<td></td>
</tr>
</tbody>
</table>


Strength

• Strength is the ability to produce force (2)
  - Squat over 2x bodyweight (bw) is associated with higher power outputs (4).
  - Example: 90kg Athlete Squats 180kg = Relative lower body strength of 2x bw
    - Add 20kg to bw for protective equipment (110kg):
    - Relative Strength 1.63 x bw

Newton’s Laws

• 1st: At rest unless compelled to change by forces
• 2nd: There is an inverse relationship between mass and acceleration

Other Considerations

• Atypical schedule
• Stress and recovery
• Reactive job (shots fired)
• S&C is only a fraction of their job
  – Not like professional athlete
• Typical age between 18-60 years old
  – Age 16-19 (3%), Age 20-29 (20%), Age 30-39 (27%), Age 40-49 (25%), Age 50-59 (17%), Age 60 and over (7%) (6)
The Role of the S&C Coach
- Certified and educated SME on exercise and movement
- Educator
  - Dictator vs Educator
- Friend
  - They won’t care how much you know until they know how much you care
  - Leads to referrals to other professionals

Communicate with other Professionals
- Integration:
  - APTA: Physical Therapy
  - NATA: Prehab and Pre-Performance
  - NSCA: Performance and Fitness
  - If the system is broken we can have a higher risk of re-injury

Cross Discipline Communication
- Roles are defined as a team
- Leave “ego” at the door
  - Know your lane of expertise
- Use the same language
- Cross training for staff
- Track communication and training
- Tactical athlete education

“Sport Specific” Concerns
- Interpreting Needs Analysis
  - Specificity of training is warranted in the tactical field; however, too much specialization in something such as CQB may hinder the tactical operator in executing other job tasks as an officer
  - Some “specific” exercises are great to relate back to job and may be “fun” to use in ESD
  - WE ARE NOT Tactical Skill specialists
- Develop a well balanced program

Does this make sense?

What is Tactical Strength and Conditioning?
Correctives and Warm-Up

- Important aspect that is often neglected
  - Focus and Intent
- Collaborative effort with ATC and DPT
- Daily (grind) corrective checklist
  - 23 to 1 Rule

### Daily Corrective Options

<table>
<thead>
<tr>
<th>Corrective</th>
<th>M</th>
<th>T</th>
<th>W</th>
<th>F</th>
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**Thank You!**

- APTA and members
  - Rick Westrick
  - Jason Mitchler
  - Virginia Dulla
  - Heather Lopez
  - Dana Terrell

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**References**