



Psychosocial Determinants of Health in Recreational, Tactical, and Competitive Athletes: Implications for Physical Therapists

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Session Objectives

Upon completion of this session, attendees will:

- Apply population health frameworks to physical therapy practice involving recreational, tactical, and competitive athletes
- Discuss the relevance of the Pain Worlds sociological construct to care-seeking in athletes
- Understand potential psychological or social factors that contribute to neuromusculoskeletal injury and influence care-seeking in athletes.
- Be able to develop mitigating strategies for perceived or actual barriers to care in athletes following neuromusculoskeletal injury.
- Comprehend best practices for improving healthcare access and delivery to recreational, tactical, and competitive athletes.
- Discern the role of the physical therapist in mitigating impairment and enhancing function in athletes across the lifespan.





Psychosocial Health Determinants and Risks: Outside Influences on Team Dynamics



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@sunsoopeningband

What Is Health?



"A state of **complete** physical, mental, and social well-being."

• World Health Organization, 1948



"A state of complete physical, mental, and social well-being, and **not simply the absence of disease or infirmity.**"

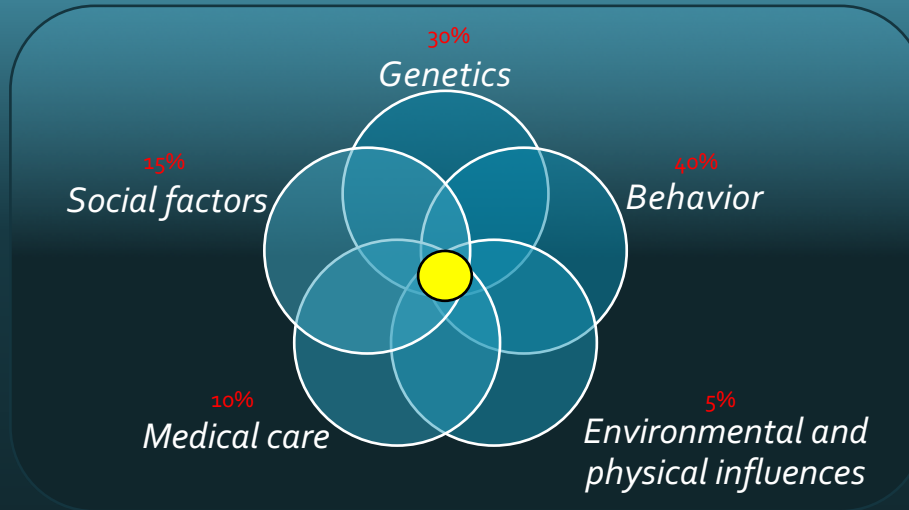
• World Health Organization, 2005



"A **state of equilibrium** that an individual has established within her/himself and between her/himself and the social and physical environment"

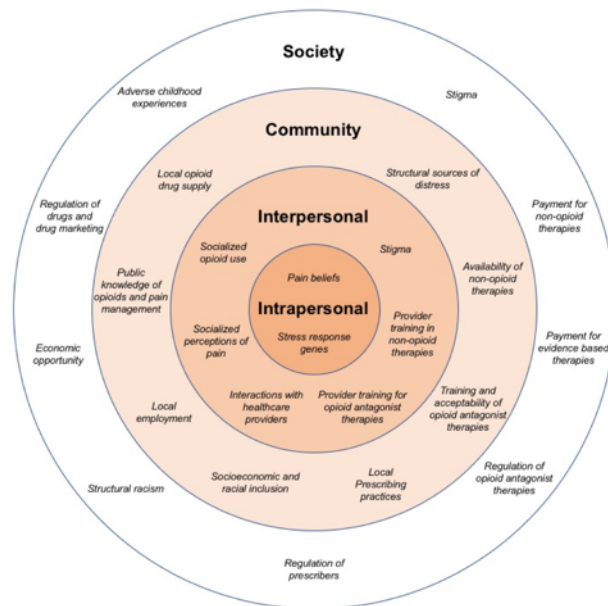
• Sartorius, 2006 – Croatian Med J

Determinants of Health, United States CDC

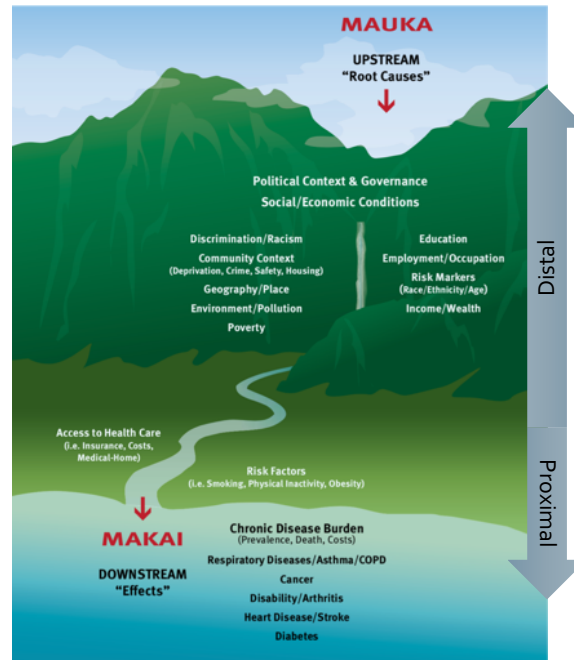


<https://www.cdc.gov/nchstp/socialdeterminants/faq.html>
Schroeder et al 2007 - JAMA

Social Ecological Model Sets a Context for the Determinants of Health



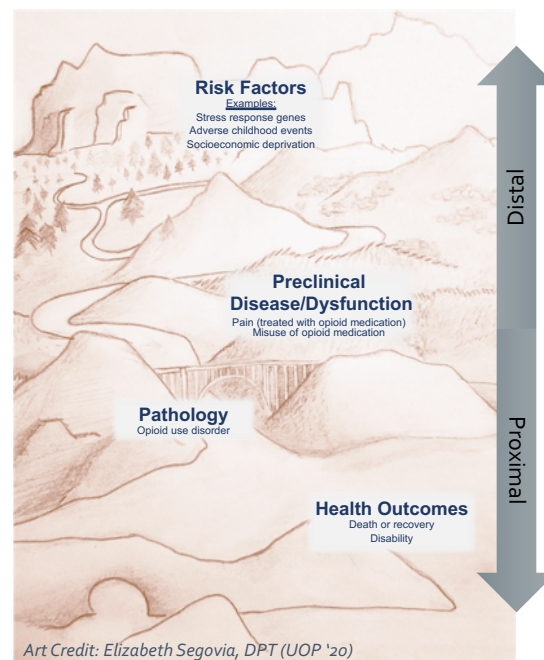
Health as a “Stream”



Hawaii Department of Public Health, 2011



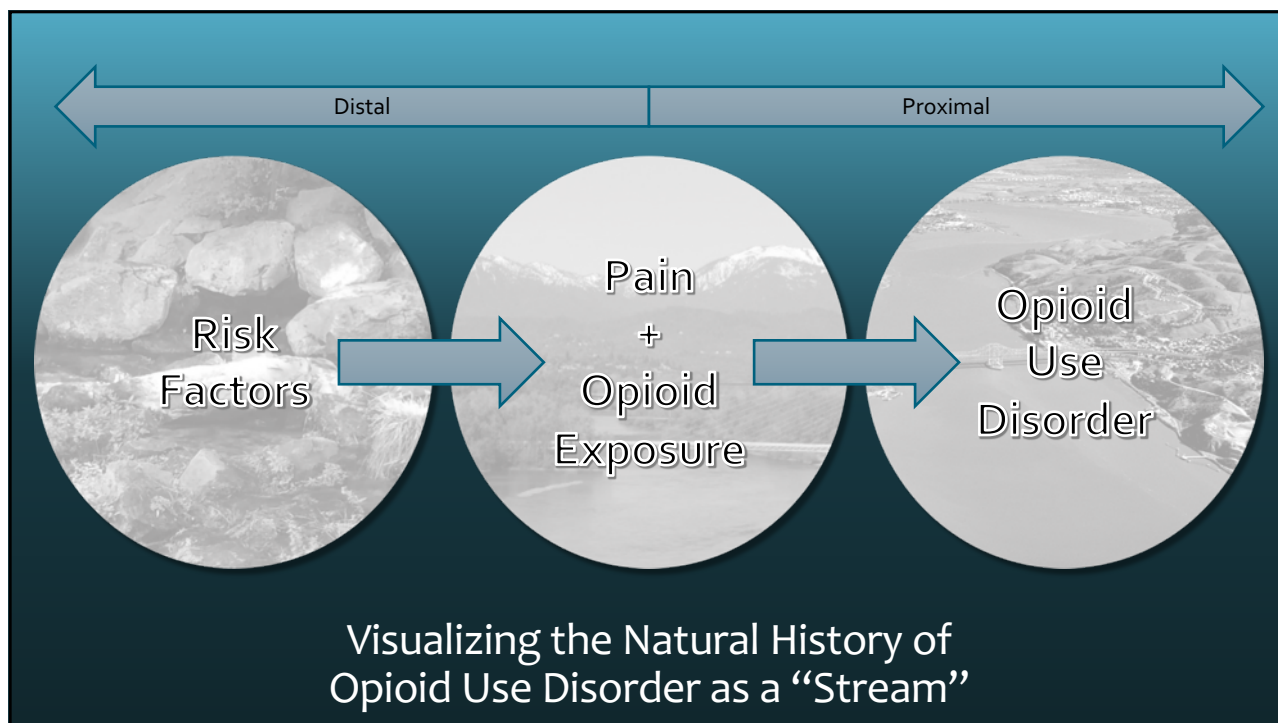
Example of Health as a “Stream”



Art Credit: Elizabeth Segovia, DPT (UOP '20)

Davenport et al 2020 – PTJ

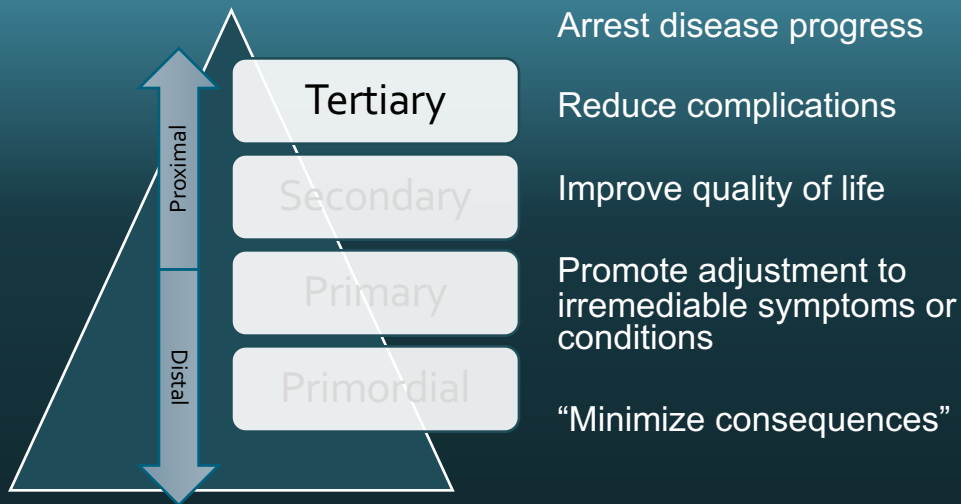




Health Is the
Sum of the
Actions of All
Causal "Streams"

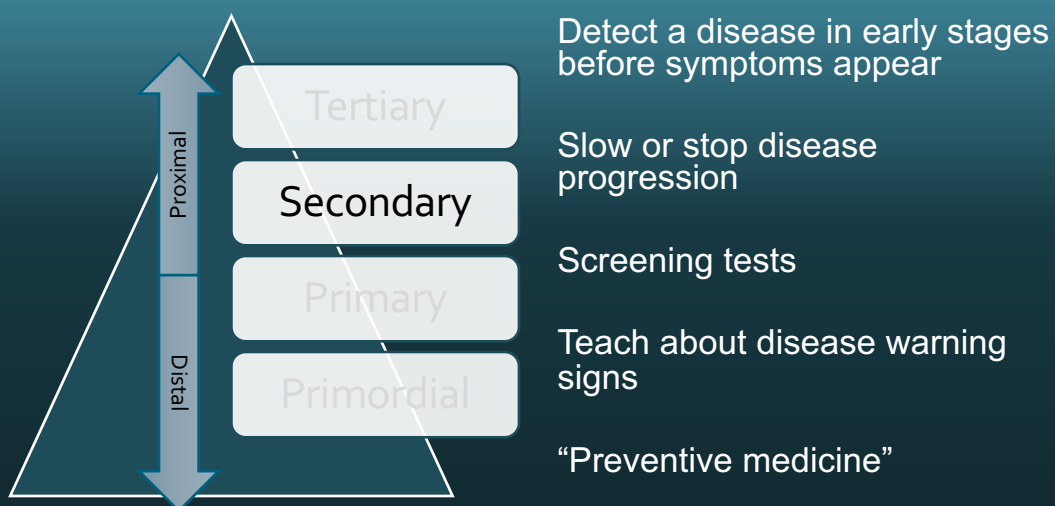


Levels of Prevention: The Disease Prevention Model



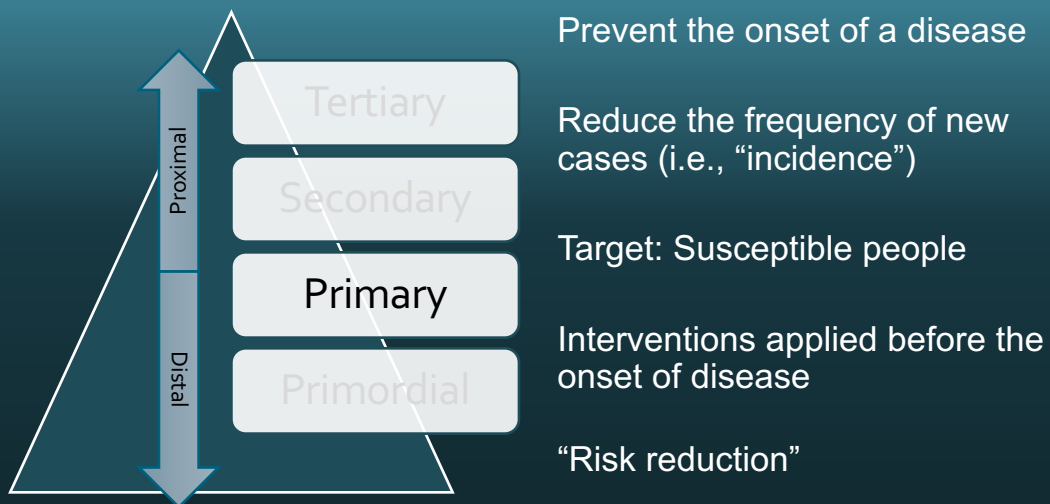
https://www.med.uottawa.ca/sim/data/Prevention_e.htm

Levels of Prevention: The Disease Prevention Model



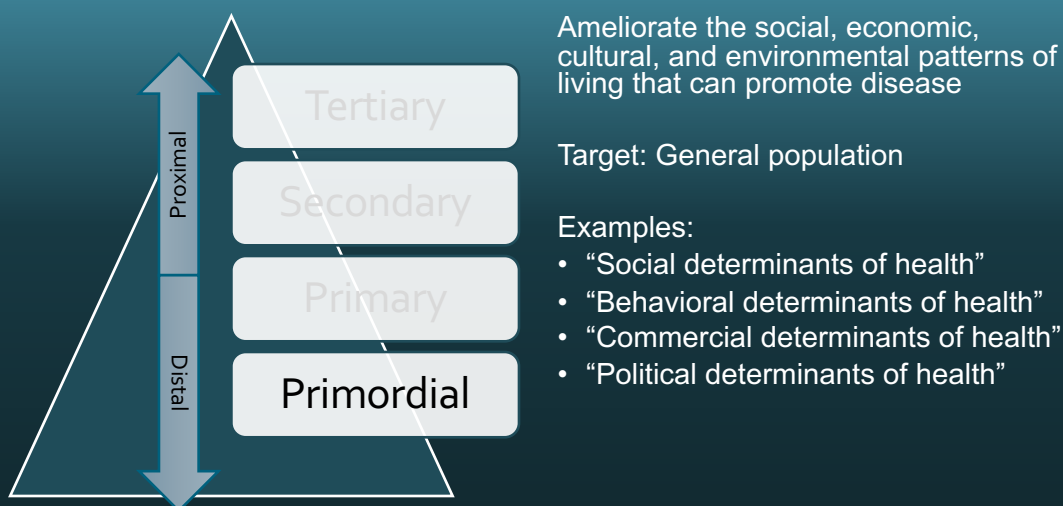
https://www.med.uottawa.ca/sim/data/Prevention_e.htm

Levels of Prevention: The Disease Prevention Model



https://www.med.uottawa.ca/sim/data/Prevention_e.htm

Levels of Prevention: The Disease Prevention Model



https://www.med.uottawa.ca/sim/data/Prevention_e.htm

Prevention

To reduce the frequency of a health condition

To slow or stop the progression of a disease process

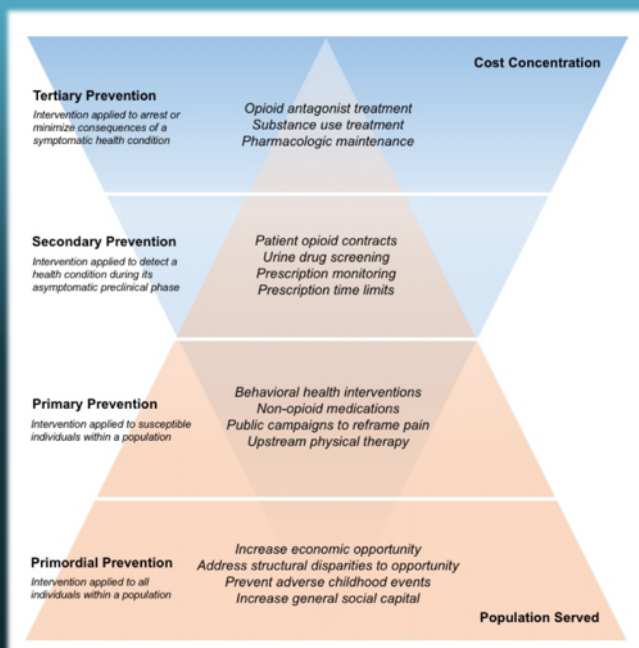
To improve quality of life in a person with a disease process



Health Promotion

“Process of enabling people to increase control over, and to improve, their health. It moves beyond a focus on individual behavior towards a wide range of social and environmental interventions.”

http://www.who.int/topics/health_promotion/en/



Effects of “Getting Upstream”

- Increases the number of people who can benefit from an intervention
- Reduces the relative cost per person served (although the absolute costs of service still may be very high)

Davenport *et al* 2020 – PTJ

Thinking Outside the Team: Social Determinants of Health

- Conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes
- Informs the Healthy People 2030 Agenda:
 - Health Care Access and Quality
 - Education Access and Quality
 - Social and Community Context
 - Economic Stability
 - Neighborhood and Built Environment

<https://www.cdc.gov/socialdeterminants/about.html>



How We Describe Differences: What's in a Name?

Health/medical disparity

- Inequality based on age, social rank, or condition
- Used commonly within the United States
- Purported to avoid ethical judgments

Health/medical inequality

- Status of being unequal
- Moderately connotes social injustice
- Often used synonymously with disparity outside the United States

Health/medical inequity

- Status of being unequal
- Strongly connotes social injustice and ethical failure
- More frequently used outside the United States

Carter-Pokras & Baquet 2002 – Public Health Reports



Sources of Health Differences

Socioeconomic factors

- Wealth
- Education
- Occupation

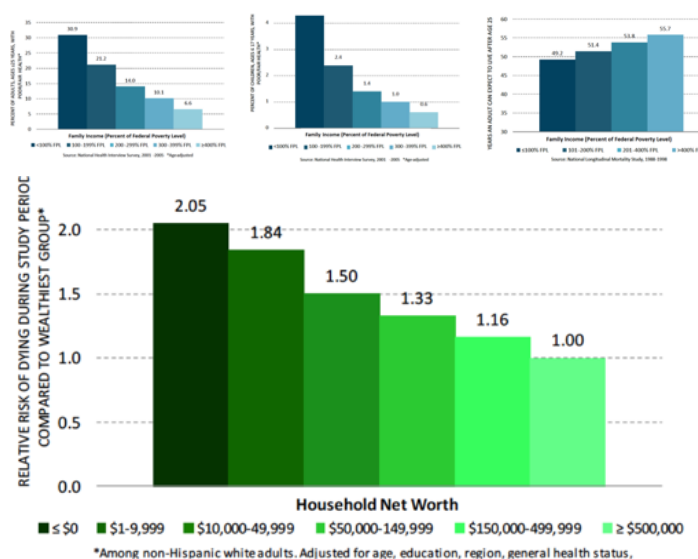
Social identity

- Race
- Ethnicity
- Culture
- Gender
- Sex
- Sexual orientation



General Effects of Wealth and Income on Health

- As income and wealth increase, the frequency of the following health outcomes decrease:
 - Percentage of adults with poor/fair self-rated health
 - Percentage of children with poor/fair self-rated health
 - Premature mortality
- And life expectancy after age 25 increases.



How Do Wealth and Income Affect Health?

- Economic assets necessary to acquire goods and services
- Used to pursue a healthful lifestyle and also to purchase health products and services
- Avoids psychosocial distress associated with limited access to goods, services, and transportation

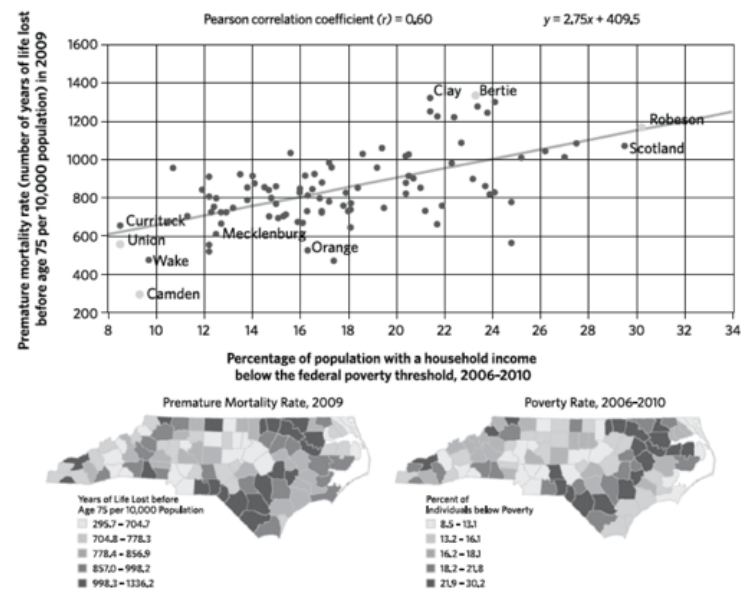


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General Effects of Wealth and Income on Health

As the share of population with household income below the federal poverty line increases, the proportion of premature mortality also increases

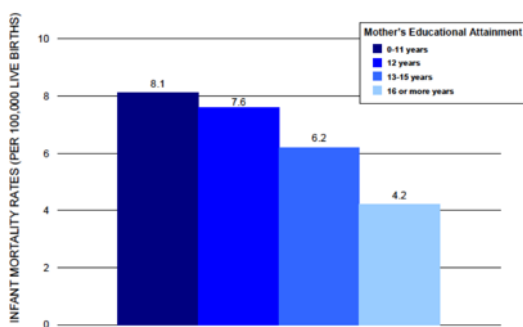
FIGURE 2.
Relationship of Premature Mortality to Poverty in North Carolina Counties



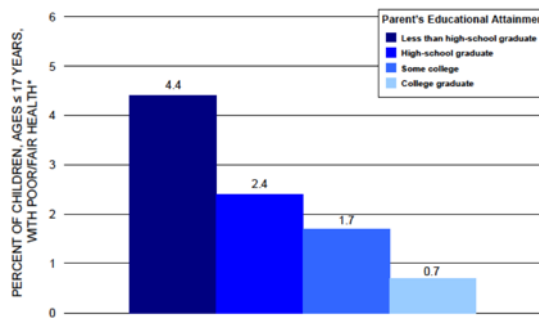
Mansfield & Novik 2012 – North Carolina Medical Journal

APTA

“More Parental Education, Better Children’s Health”

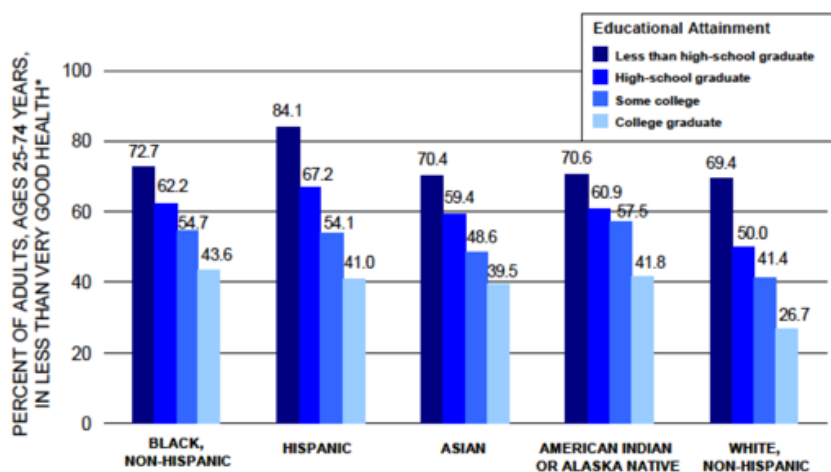


Source: Matthews TJ, MacDorman MF. Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Dataset. National Vital Statistics Reports, vol 55 no 15. Hyattsville, MD: National Center for Health Statistics, 2007.



Source: National Health Interview Survey, 2001-2005.
† Based on parental assessment and measured as poor, fair, good, very good or excellent.
* Age-adjusted.

Robert Wood Johnson Foundation 2011 – Issue Brief #5: Exploring the Social Determinants of Health



Source: Behavioral Risk Factor Surveillance System Survey Data, 2005-2007.
† Based on self-report and measured as poor, fair, good, very good or excellent.
* Age-adjusted.

The General Effects of Education on Health are Maintained by Race

- Higher educational attainment is associated with higher proportion of adults in very good self-rated health
- The effects of education are greatest for white college graduates

Robert Wood Johnson Foundation 2011 – Issue Brief #5: Exploring the Social Determinants of Health



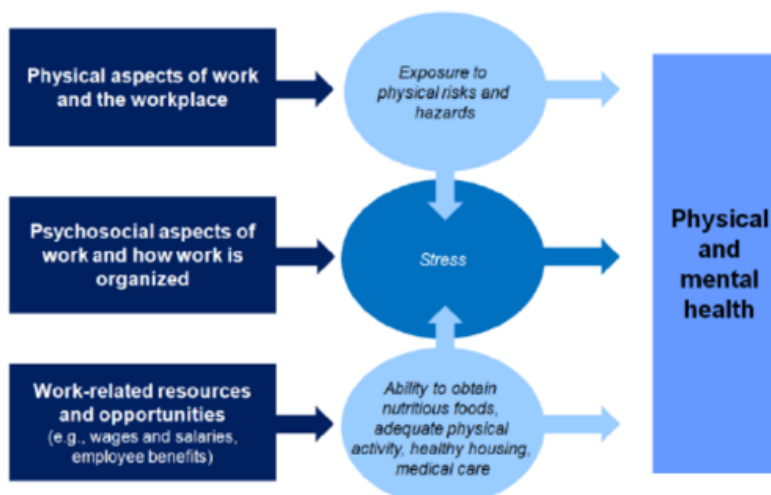
Occupation and Sport



- Half of waking hours may be spent at work in the United States
- Wealth, social status, and social support networks may be derived from sport or workplace
- Health exposures may occur that are unique to specific sports or workplaces



General Effects of Work and Sport on Health

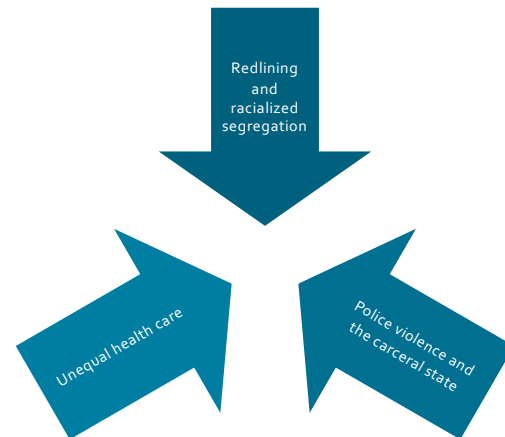


Robert Wood Johnson Foundation 2011 Issue Brief #9: Exploring the Social Determinants of Health



Race and Health

- Personal racism
 - Individually held beliefs that may be public or private
- Structural racism
 - “Baked in” to laws, policies, rules, norms, customs, and practices
 - May be specifically sanctioned or quietly facilitated
- Population-level and individual-level health consequences



Bailey et al 2020 - New England Journal of Medicine



Gender Definitions

Sex

- Anatomical and physiological expression of “male” and “female”
- Hormones, gonads, external genitalia
- May be “male,” “female,” or “intersex”
- Not “sexual identity”

Gender

- Social expression of “maleness” and “femaleness”
- Indicates by ways of dressing, communicating, and perhaps social roles
- May or may not be congruent with anatomical and physiological sex
- May be “female,” “male,” or “genderqueer”/“non-binary”



RESEARCH ARTICLE

Quantifying the collective influence of social determinants of health using conditional and cluster modeling

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What About Evidence From Physical Therapy?

MODELING THE COLLECTIVE INFLUENCE OF SOCIAL DETERMINANTS OF HEALTH

WHAT IS ALREADY KNOWN?

- Individual social determinants of health (SDH) influence musculoskeletal disorder outcomes
- SDH variables do not routinely exist singularly

STUDY GROUP

A cohort of **8977** individuals who received a primary lumbar spine surgery

SDH of interest included race/ethnicity, educational attainment, employment status, insurance payer, and gender

RESULTS

We built a clustered subgroup model with 4 distinct subgroups of SDH variables

- Older, white, male and older, white, female patients were not more or less likely to have successful outcomes
- Younger, white, higher socioeconomic status (YWH) patients were more likely to have successful outcomes
- Younger, minority, lower socioeconomic status (YML) patients were less likely to have successful outcomes

SDH Group

Outcome	YWH cluster	YML cluster
Satisfaction	86	63
Leg Pain	87	62
Disability	85	62
Back pain	86	63
Quality of Life	85	64

CONCLUSION

- Viewing patients' social factors collectively enhances clinicians' abilities to predict outcomes
- Interventions to reduce the disparities observed, such as integrating social needs screening and referral, are warranted

APTA

What About Evidence Related to Sport?

- Access to healthcare may be related to sport participation
 - Disparities in medical staff based on socioeconomic characteristics of schools and teams
- Almost 20% of college students are food-insecure
 - Increased risk with racial minority status, lived off-campus, received a Pell grant, reported a parental education of high school or less, and did not participate in a meal plan
- Increased likelihood of injury in athletes in urban settings, who are white and have a high body mass index, and had higher weekly sport participation

Pryor 2014 – *J Athl Train*, Rose et al 2008 – *Med Sci Sport Exerc*, El Zein et al 2019 – *BMC Public Health*

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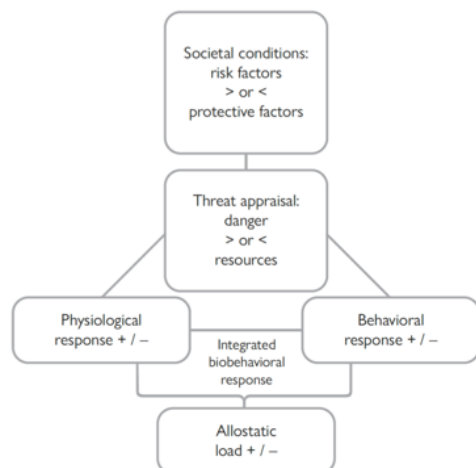
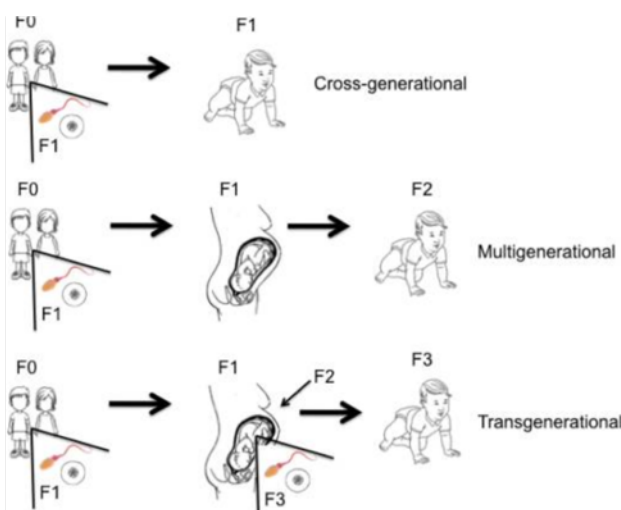


FIGURE 4.2: SOCIETAL CONDITIONS AND THREAT APPRAISAL INFLUENCE ALLOSTATIC LOAD

Are These Social Determinants Really...Social?

In a systematic review (40 included studies), psychosocial stress was associated with CVD risks such as vascular pathology (hypertension, blood pressure fluctuation, and carotid artery plaque), as well as metabolic factors such as abnormal blood glucose, dyslipidemia, and elevated cardiac enzymes

An et al 2016 – Biological Research in Nursing;
Figure from DeVoght & Davenport (2021) in Erb & Schmid Integrative Rehabilitative Practice



Are These Social Determinants Really...Social?

- Observational studies suggest the potential for intergenerational transmission of changes in brain structure and function related to preconception distress
- Cumulative effects of transgenerational SDOH may be important!

Scorza et al 2019 – J Child Psychol Psychiatry



HEALTH AFFAIRS BLOG

RELATED TOPICS:
SOCIAL DETERMINANTS OF HEALTH | ACCESS TO CARE | COSTS AND SPENDING | SYSTEMS OF CARE

Meeting Individual Social Needs Falls Short Of Addressing Social Determinants Of Health

Brian C. Castrucci, John Auerbach

- Social determinants are population-level
- Social risks are individual-level
- “Social risks” are “social needs”
- Meeting individual level social needs is not sufficient by itself to address social determinants
- Midstream and upstream preventive efforts are required



Social Determinants- Social Risks- “Social Needs”



FIGURE. Key domains associated with the social determinants of health. Abbreviation: SE, socioeconomic.

Rethorn et al 2020 - JOSTPT



Selected Social Needs Assessment Tools

- PRAPARE
- Accountable Health Communities
- American Academy of Family Practice



Protocol for Responding to and Assessing Patient's Assets, Risks, and Experiences (PRAPARE)

Category	Question	Text
Personal Characteristics	1	Are you Hispanic or Latino?
	2	Which race(s) are you? Check all that apply.
	3	At any point in the past 2 years, has seasonal or migrant farm work been your or your family's main source of income?
	4	Have you been discharged from the armed forces of the United States?
	5	What language are you most comfortable speaking?
Family & Home	6	How many family members, including yourself, do you currently live with?
	7	What is your housing situation today?
	8	Are you worried about losing your housing?
	9	What address do you live at?
Money & Resources	10	What is the highest level of school that you have finished?
	11	What is your current work situation?
	12	What is your main insurance?
	13	During the past year, what was the total combined income for you and your family members you live with?
	14	In the past year, have you or any family members you live with been unable to get any of the following when it was really needed? Check all that apply.
Social & Emotional Health	15	Has lack of transportation kept you from medical appointments, meetings, work, or from getting things needed for daily living? Check all that apply.
	16	How often do you see or talk to people that you care about and feel close to?
	17	Stress is when someone feels tense, nervous, anxious, or can't sleep at night because their mind is troubled. How stressed are you?
Optional	18	In the past year, have you spent more than 2 nights in a row in a jail, prison, detention center, or juvenile correction facility?
	19	Are you a refugee?
	20	Do you feel physically and emotionally safe where you currently live?
	21	In the past year, have you been afraid of your partner or ex-partner?

https://www.nachc.org/wp-content/uploads/2020/08/NACHC_PRAPARE_ALL-Updated-8.24.20.pdf



Characteristics of the PRAPARE Tool

- Characterizes sociodemographic characteristics for identification of risk groups
 - Income
 - Race
 - Gender
 - Social isolation
 - Physical safety
 - Intimate partner/family violence
 - Incarceration history
- Optimized for electronic health records



Accountable Health Communities

**Box 1 | Accountable Health Communities
Core Health-Related Social Needs Screening Questions**

Underlined answer options indicate positive responses for the associated health-related social need. A value greater than 10 when the numerical values for answers to questions 7-10 are summed indicates a positive screen for interpersonal safety.

Housing Instability

1. What is your housing situation today?

☐ I do not have housing. I am staying with others, in a hotel, in a shelter, living outside on the street, on a porch, in a car, abandoned building, bus, or train station, or in a prison.

☐ I have housing today, but I am worried about losing housing in the future.

☐ I have housing.

2. Think about the place you live. Do you have problems with any of the following? (check all that apply)

☐ Bug infestation

☐ Mold

☐ Lead paint or pipes

☐ Inadequate heat

☐ Cuts or holes not sealing

☐ No or not working smoke detectors

☐ Water leaks

☐ None of the above

Food Insecurity

3. Within the past 12 months, you worried that your food would run out before you got money to buy more.

☐ Often true

☐ Sometimes true

☐ Never true

4. Within the past 12 months, the food you bought just didn't last and you didn't have money to get more.

☐ Often true

☐ Sometimes true

☐ Never true

Transportation Needs

5. In the past 12 months, has lack of transportation kept you from medical appointments, meetings, work or from getting things needed for daily living? (Check all that apply)

☐ Yes, it has kept me from medical appointments or getting medications

☐ Yes, it has kept me from non-medical meetings, appointments, work, or getting things that I need

☐ No

Utility Needs

6. In the past 12 months has the electric, gas, oil, or water company threatened to shut off services in your home?

☐ Yes.

☐ No.

☐ Already shut off.

Interpersonal Safety

7. How often does anyone, including family, physically hurt you?

☐ Never (1)

☐ Rarely (2)

☐ Sometimes (3)

☐ Fairly often (4)

☐ Frequently (5)

8. How often does anyone, including family, insult or talk down to you?

☐ Never (1)

☐ Rarely (2)

☐ Sometimes (3)

☐ Fairly often (4)

☐ Frequently (5)

9. How often does anyone, including family, threaten you with harm?

☐ Never (1)

☐ Rarely (2)

☐ Sometimes (3)

☐ Fairly often (4)

☐ Frequently (5)

10. How often does anyone, including family, scream or curse at you?

☐ Never (1)

☐ Rarely (2)

☐ Sometimes (3)

☐ Fairly often (4)

☐ Frequently (5)

SOURCE: The above-noted health-related social need screening items are used with permission from their respective owners.

- Screening questions recommended by panels of experts in each area of health-related social need
- 10 items, scored individually
- Core Health-related Social Needs
 - Housing instability
 - Food insecurity
 - Transportation needs
 - Utility needs
 - Interpersonal safety

<https://nam.edu/standardized-screening-for-health-related-social-needs-in-clinical-settings-the-accountable-health-communities-screening-tool/>



American Academy of Family Practice



Social Needs Screening Tool

PROVIDER FORM (short version)

Undeclared answer options indicate a positive response for a social need for the housing, food, transportation, and utility categories.

HOUSING

1. What is your housing situation today?
 - ☐ I do not have housing (I am sleeping with others, in a hotel, in a shelter, living outside on the street, in a tent, in a car, abandoned building, bus, or train station, or in a park)
 - ☐ I have housing, but I am worried about losing housing in the future
 - ☐ I have housing
2. Think about the place you live. Do you have problems with any of the following? (check all that apply)
 - ☐ Bug infestation
 - ☐ Mold
 - ☐ Lead paint or pipes
 - ☐ Inadequate heat
 - ☐ Open up about not working
 - ☐ No or not working smoke detectors
 - ☐ Water leaks
 - ☐ None of the above

FOOD

3. Within the past 12 months, you worried that your food would not last before you got money to buy more?
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true
4. Within the past 12 months, the food you bought just didn't last and you didn't have money to get more?
 - ☐ Often true
 - ☐ Sometimes true
 - ☐ Never true

TRANSPORTATION

5. In the past 12 months, has lack of transportation kept you from medical appointments, meetings, work or from getting things needed for daily living? (check all that apply)
 - ☐ Yes, it has kept me from medical appointments or getting medications
 - ☐ Yes, it has kept me from medical appointments or getting medications, work, or getting things that I need
 - ☐ No

UTILITIES

6. In the past 12 months has the electric, gas, oil, or water company threatened to shut off services in your home?
 - ☐ Yes
 - ☐ No
 - ☐ Almost shut off

A value greater than 10 when the numerical values for answers to the following questions are summed indicates a positive screen for personal safety.

PERSONAL SAFETY

7. How often does anyone, including family, physically hurt you?
 - ☐ Never (2)
 - ☐ Rarely (2)
 - ☐ Sometimes (2)
 - ☐ Fairly often (2)
 - ☐ Frequently (2)
8. How often does anyone, including family, insult or talk down to you?
 - ☐ Never (2)
 - ☐ Rarely (2)
 - ☐ Sometimes (2)
 - ☐ Fairly often (2)
 - ☐ Frequently (2)

9. How often does anyone, including family threaten you with harm?
 - ☐ Never (2)
 - ☐ Rarely (2)
 - ☐ Sometimes (2)
 - ☐ Fairly often (2)
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10. How often does anyone, including family, scream or curse at you?
 - ☐ Never (2)
 - ☐ Rarely (2)
 - ☐ Sometimes (2)
 - ☐ Fairly often (2)
 - ☐ Frequently (2)

Sum of questions 7-10: _____

Greater than 10 equals positive screen for personal safety.

ASSESSMENT

11. Would you like help with any of these needs?
 - ☐ Yes
 - ☐ No

Questions 7-10 are repeated with permission from the National Academy of Medicine, courtesy of the National Academies Press, Washington, D.C.

REFERENCES

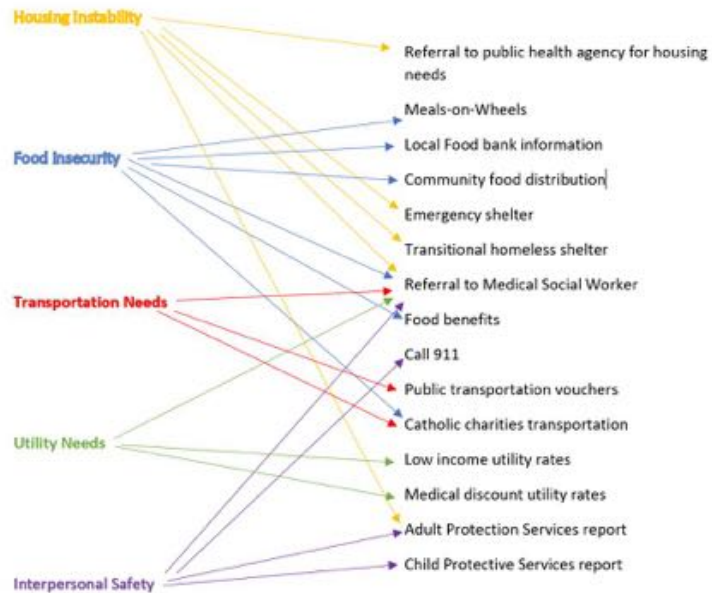
1. Gillman A, Hargrett-Keil N, Anderson R, and Wiley D. National Academy of Medicine. Development of screening for health-related social needs in clinical settings: the accountable health communities screening tool. National Academies Press, Washington, D.C. <https://www.nationalacademies.org/handbook/screening-for-health-related-social-needs-in-clinical-settings.pdf>. Accessed November 16, 2020.



https://www.aafp.org/dam/AAFP/documents/patient_care/everyone_project/provider-short-print.pdf



What To Do With An Affirmative Response



Rabena-Amen 2020 – SDOH Toolkit
<https://www.homehealthsection.org/e-documents>



Action Items



At the patient level

- Be alert to clinical flags
- Ask patients about social challenges in a sensitive and caring way
- Find out about benefits and support services, and help patients access them



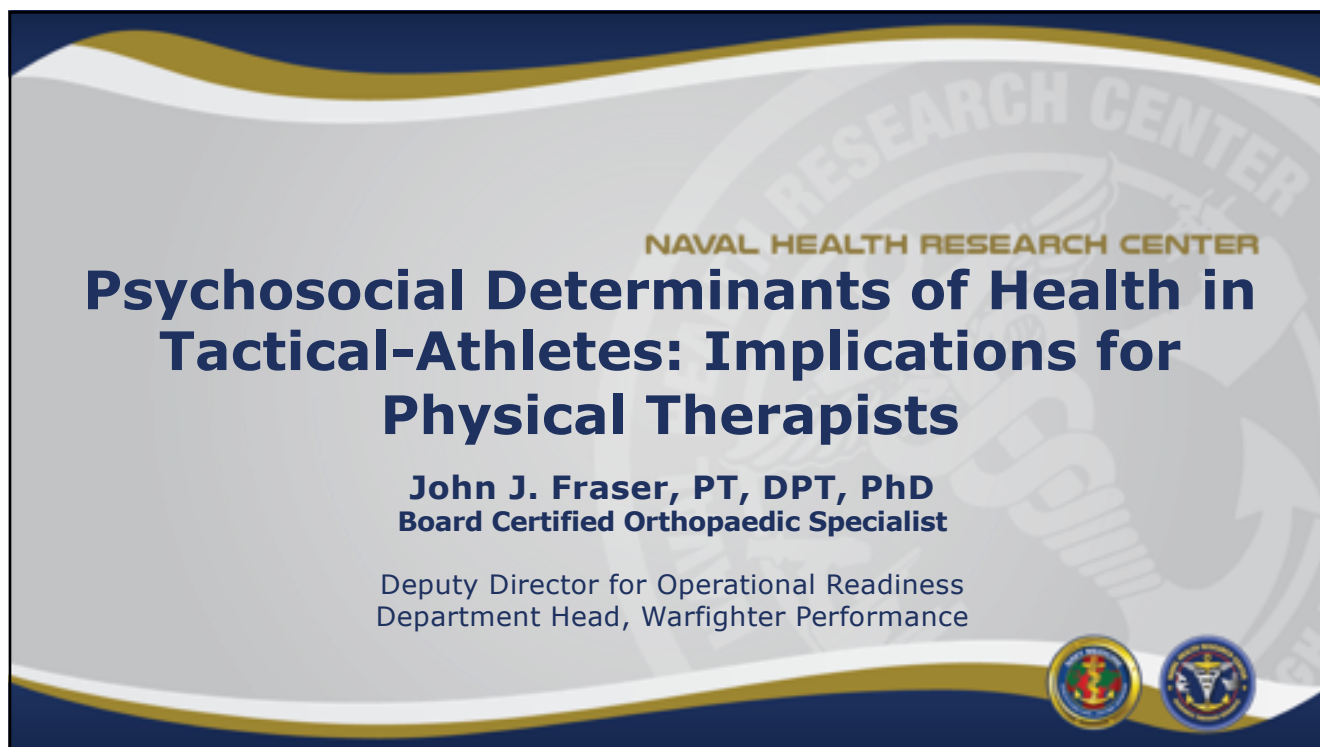
At the practice level

- Offer culturally safe services
- Use patient navigators where possible
- Ensure that care is accessible to those most in need
- Use clinical decision aids, practice guidelines in day-to-day practice



At the community level

- Partner with local organizations and public health
- Get involved in community needs assessments and health planning
- Advocate for more supportive environments for health
- Use clinical experience and research evidence to advocate for social change



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Cardiopulmonary Physical Therapy Journal

Official Journal of the Cardiovascular & Pulmonary Section
American Physical Therapy Association



CLINICAL PERSPECTIVE



Physical Therapy as a Force Multiplier: Population Health Perspectives to Address Short-Term Readiness and Long-Term Health of Military Service Members

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Neuromusculoskeletal Injuries in the Military

- Leading cause of treatment- seeking and disability across all military services
(Armed Forces Health Surveillance Branch 2017)
- 1.6M servicemembers reported a NMSK injury between 2008 and 2017 (Stahlman 2018)

Musculoskeletal injury top threat to Airmen readiness, lethality:
Interventions support fitness improvement plan

duids
DISTRIBUTION STATEMENT: A



Photo By Estella Holmes | Airmen participating in group fitness exercise. [read more](#)



Neuromusculoskeletal Hazards and Risk Influenced by Geopolitics and Military Mission Requirements

Examples:

- Force shaping requirements (selection bias dependent on requirement for growth or downsizing, recruitment pool composition, recruitment pool willingness to serve)
- Recruitment and Occupation Training (type, volume, environment)
- Operational Training (type, volume, environment, equipment)
- Mission Execution (task requirements, unit composition, resources, equipment, environment, enemy tactics, number of deployments)

Personal Risk Factors

Examples:

- Adiposity as a result of pre-accession physical activity and diet
- Increased exposure to hazards of Infantry during field exercises in preparation for deployment
- Inclusion of females in previously closed military occupations

Preclinical Disease & Impairment

Examples:

- Osseous cortical stress changes in the tibia
- Diminished ankle dorsiflexion joint motion
- Degenerative calcaneal tendon changes

Health Conditions & Symptoms


Examples:

- Pain during running with a tibial stress fracture
- Impaired neuromotor control of the ankle-foot following lateral ankle sprain
- Diminished strength in ankle plantarflexion resulting from calcaneal tendinosis

Health Outcomes

- Short-term or long-term activity limitation and participation restriction
- Recovery
- Death

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Neuromusculoskeletal Hazards and Risk Influenced by Geopolitics and Military Mission Requirements

Examples:

- Force shaping requirements (selection bias dependent on requirement for growth or downsizing, recruitment pool composition, recruitment pool willingness to serve)
- Recruitment and Occupation Training (type, volume, environment)
- Operational Training (type, volume, environment, equipment)
- Mission Execution (task requirements, unit composition, resources, equipment, environment, enemy tactics, number of deployments)

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71% of young people are ineligible for the military – and most careers, too

Kim Strong York Daily Record
Published 1:49 p.m. ET May 14, 2019 | Updated 6:19 p.m. ET May 14, 2019




Photo by Cpl. Tatum Vayavananda Photo by Master Sgt. Michel Sauret



Personal Risk Factors

Examples:

- Adiposity as a result of pre-accession physical activity and diet
- Increased exposure to hazards of Infantry during field exercises in preparation for deployment
- Inclusion of females in previously closed military occupations

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Photo by Chief Warrant Officer Paul Mancuso

Pentagon Says More Than Half Of The US Military Is Overweight

Geoffrey Ingersoll Apr 29, 2013, 12:57 PM

BUSINESS INSIDER

A health report from the Pentagon contains some troubling statistics, and suggests more than half all U.S. troops are clinically overweight.



Photo by Spc. Justin English

WE ARE THE MIGHTY Obesity severely impacting military mission readiness



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Preclinical Disease & Impairment

Examples:

- Osseous cortical stress changes in the tibia
- Diminished ankle dorsiflexion joint motion
- Degenerative calcaneal tendon changes

Health Conditions & Symptoms

Examples:

- Pain during running with a tibial stress fracture
- Impaired neuromotor control of the ankle-foot following lateral ankle sprain
- Diminished strength in ankle plantarflexion resulting from calcaneal tendinosis

Health Outcomes

- Short-term or long-term activity limitation and participation restriction
- Recovery
- Death

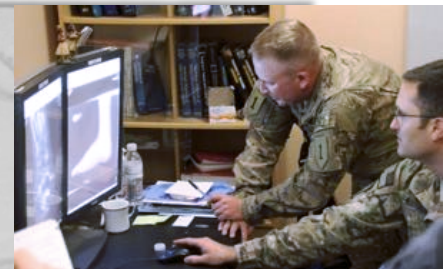


Photo by LCDR Jesse Ehrenfeld



Photo by Staff Sgt. Wallace Bonner





Determinants of Care-seeking in the Military

NMSKI are ubiquitous during initial training, 64% unreported (Smith 2016)

Proof of Concept Project 2010 (Fraser 2020)

- Assessment of Deployed Navy PT with the Fleet Marine Force
- Needs Assessment Conducted of Infantry (n=315) & Aviation (n=221) Marines
 - **51.1% with a previous NMSK injury**
 - **36.7% with current NMSK injury** for which they did not seek care from a medical professional



Photo by CDR John J. Fraser



Photo by GySgt James Frank/24th MEU/Released

Reasons for Military Non-Care Seeking

- **Perceived Injury severity:**

- self-limiting or not substantial enough to require tx (Taber 2015)



<https://bit.ly/3nsvXAB>



Culture that values grit & resilience

(Fraser 2020)

Stoicism

- Prioritizing needs of the mission over self
- Pain equates to hard work
- Fear of
 - being grounded or pulled from patrol
 - perception of weakness



<https://amzn.to/3mxm2b1>

Knowledge, beliefs, attitudes, and priorities



Tx Accessibility & Perceived Quality

- Geographic & administrative barriers to care (Fraser 2020)
- Medical mistrust and communication issues with clinicians (Taber 2015)
- “Medical would be of little or no help” (Fraser 2020)



<https://bit.ly/3rBNTLx>



Psychosocial determinants likely affect long-term health related quality of life

Lateral ankle sprains (LAS): one of the most common injuries in the military

- Perception of “it’s just an ankle sprain” is pervasive

Assuming civilian-derived evidence is generalizable to the military

- 7% with LAS and private insurance receive PT care within 30 days after injury, 11% receive PT care at all (Feger 2015, 2017)
- 40% will progress to chronic ankle instability (CAI) (Doherty 2016)



Photo by Jose Rodriguez



Sequela of Chronic Ankle Instability

- Non care-seeking plausibly contributes to long-term sequela
- Pain post-injury (van Rijn 2008)
 - 1 year: 5%-33%
 - 3 years: 5%-25%
- ↓ physical activity vs healthy controls
 - Lifelong ↓ in animal models (Hiller 2012, Hubbard-Turner 2015a,b)



<https://wb.md/3rcb5jl>

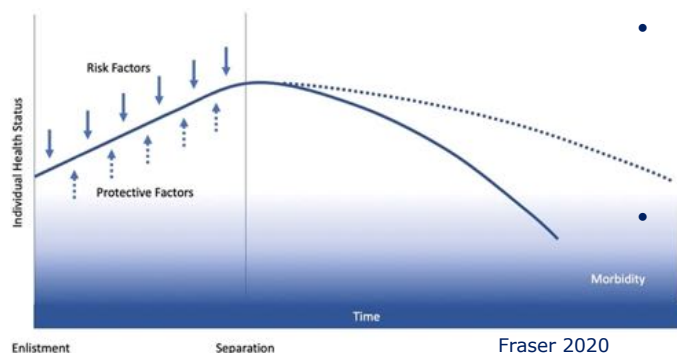


Long Term Sequela of CAI

- Posttraumatic OA is a consequence of LAS & CAI (Delco 2017)
 - also associated with ↓ physical activity & participation restriction (Hiller 2019, Hubert 1994)
 - salient contributor to CV disease (Williams 2018)



Life Course Wellness population health framework



- PTs have a role in injury prevention & mitigation
 - Our ability to effect change is dependent on the buy-in from our stakeholders
 - Influenced by psychosocial factors
- Mission requirements take priority
 - While readiness is required for mission execution, near and long-term priorities may be competing
- The enemy gets a vote



Recommendations

- Intertwining prevention & performance programs
- Providing care close to where servicemembers work, sleep, or eat
- Building trust through relationships and demonstration of competence/effects



Changing Culture Pertaining to Injury & Treatment

- Education regarding condition, treatment, and expected outcomes
- Joint goal-setting
- Measurement & communication of progress
- Measuring & mediating psychological readiness for return to sport/duty
- Marketing prevention/early treatment as a "force multiplier" for optimizing readiness and warfighter performance



Healthcare Delivery

- Inclusion of the military PT organic with operational units
 - Important to be integral in the organizational culture
- Military Sports Medicine is a Team Sport
 - Military PTs, as part of a collegial team comprised of Sports Med Physicians, ATs, Psychologists, S&C Coaches, and other specialists, leverages esoteric skillsets of each profession and strengthens the team as a whole



Questions




@NavyPT



https://bit.ly/NHRC_OpReadiness



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Psychosocial Factors That Influence Injury Risk, Care-Seeking, and Return to Sport in Adolescent Athletes

Dr. Jenna Sawdon-Bea, PT, PhD
Associate Professor / Program Chair
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Aim 1

- Understand the Intrinsic & Extrinsic Risk Factors for Injury in Adolescent Athletes

Aim 2

- Explain the Psychosocial factors influencing rehab

Aim 3

- Outline what psychosocial readiness to return to sport is and how the sports medicine team can influence an optimal return to sport



- In the United States, more than **38 million** children and adolescents participate in organized sports each year
- An estimated **12 million student-athletes** between the ages of 5 and 22 years sustain a sport-related injury annually (Post et al., 2020)
- Estimated **20 million** lost days of school (Post et al., 2020)
- Lower extremity injuries account for over sixty percent of the overall injury burden in sport, and 60% of these are **ankle** and **knee** injuries (Emery and Tyreman, 2009)

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- The number of young athletes is continually increasing as is the number of acute and over use injuries
- For many, the only access to healthcare system is through **SPORT**



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Risk Factors

Characteristics and behaviors of athletes and characteristics of sports and the environment that are associated with some measure of risk of injury

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AGE: Adolescents **over 13** years at **greater risk** of injury than younger children (Emery, 2003)

GENDER: Boys sustain twice as many injuries as girls

GENDER: Injuries of the **ACL** are up to 6-10 times more common in women (Bram, 2020)

GENDER: Higher incidence **concussion** in females (Khodaei, 2017)

Muscle Imbalance: Quad dominance linked to ruptures of the ACL (Hewett, 2005)

Muscle Imbalance: Shoulder IR/ER imbalances linked to shoulder pain (Cools, 2015)

Body Composition: Excessive weight can predispose an athlete to stress injuries

Body Composition: Females with lower BMI had a higher risk of injury and took longer to heal from their injuries (Jamieson et al., 2017)

Anatomy/Biomechanics: Increased knee abduction angles, higher knee abduction moments and greater impact forces during standardized landing tasks are related to ACL injuries (Hewett, 2005)

Fitness Level: Well-developed aerobic fitness might protect youth athletes from future injury or illness (Watson, 2017 & Carter 2011)

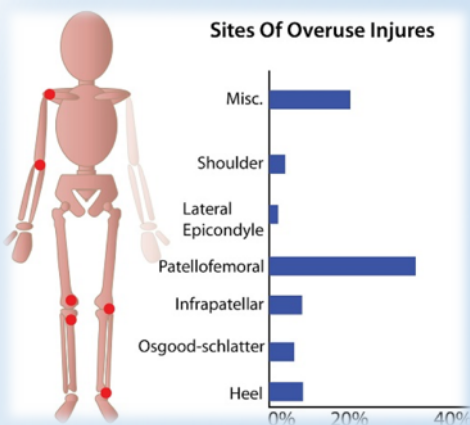
Prior Injury: Previous injury is the strongest predictor for the development of future injuries

Prior Injury: Injury risk was 3 times greater in youth football players with 2 or more prior injuries (Kucera, 2005)

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Overuse



The Risk of Overuse Injuries

OVERUSE INJURIES CAN BE CAUSED BY
training errors, improper technique, excessive sports training, inadequate rest, muscle weakness and imbalances and early specialization.

COMMON OVERUSE INJURIES ARE
general stress, inflammation and swelling.

LONG-TERM CONSEQUENCES INCLUDE
loss of playing time, reduced function and psychological inhibition.

SYMPTOMS OF OVERUSE INJURIES
tend to be gradual, resulting in athletes going undiagnosed and untreated for longer periods of time.

INJURIES TO THE GROWTH PLATE CAN RESULT
from repeated microtrauma, which is accumulating in the muscle fibers and connective tissues.

STRESS FRACTURES
occur when shock that can't be absorbed from fatigued muscles is transferred to the bone.

OVERUSE INJURIES ARE MORE FREQUENT IN
• Running • Baseball • Softball • Cross country • Track and field • Other low-contact sports

APPROXIMATELY 50%
of all sports-related injuries for pediatric athletes—those ages 6 to 17 and adolescents ages 18 to 19—are due to overuse.

WOMEN'S SPORTS, INCLUDING
Field hockey • Soccer • Cross country • Softball

HAVE THE MOST OVERUSE INJURIES

PREVENTING OVERUSE INJURIES

- Avoid specialization and repetitive sport activity at a young age. Athletes who participate in a variety of sports tend to have fewer injuries and play longer.
- Limit training to one sport to no more than five days a week with at least one day off from any organized physical activity.
- Take time off from one sport for two to three months each year to allow physical injuries to heal, the body to recover and for the athlete to focus on strength training and conditioning. This is also a psychological break that can help the athlete avoid burnout and overtraining syndrome.
- Pediatric athletes should only play one overhead throwing sport at a time and should avoid playing the same sport year-round. Participation in multiple sports throughout the year provides a wider range of skills as well as rest from repetitive, single-sport activities.
- Although there aren't injury thresholds for specific sports or age ranges, data suggest limiting vigorous physical activity to 16 to 20 hours a week for pediatric athletes.
- Conduct a pre-participation physical exam on an annual basis to detect the threatening conditions as well as factors that may predispose the athlete to overuse injuries.

Source: National Athletic Training Association, Journal of Athletic Training, American Academy of Pediatrics. Images are courtesy of the National Athletic Training Association.

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To Reduce Overuse

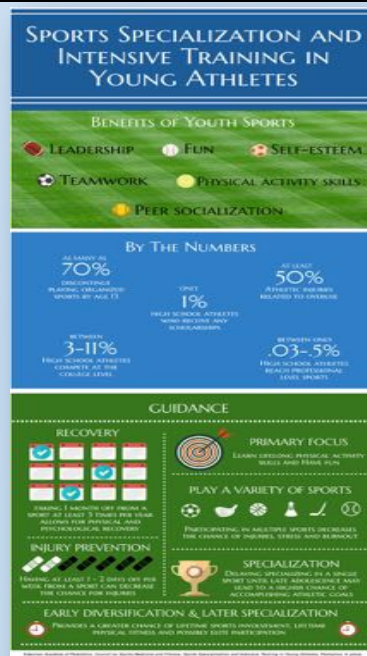
#1 - DO NOT SPECIALIZE EARLY!

#2 – Limit competition in a single sport to no more than 8 months per year

#3 – Take 1-2 days off per week

PEDIATRICS

Joel S. Brenner, and COUNCIL ON SPORTS
MEDICINE AND FITNESS Pediatrics
2016;138:e20162148



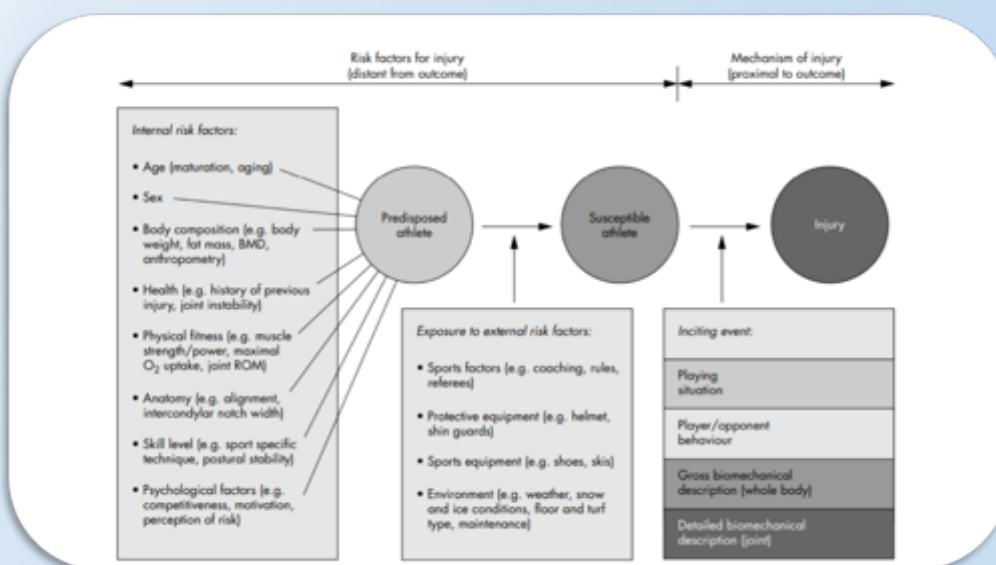
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Returning to Sport



- Reported return to competitive sport rates may be as low as **55-60%**, whereas return to **performance rates** may be as low as 17-22% following sports injuries that are common to football (Ishøi et al., 2018, Ardern Taylor, Feller & Webster, 2014b; Harris et al., 2013)



From: Ardern, Clare L., et al. "2016 Consensus statement on return to sport from the First World Congress in Sports Physical Therapy, Bern." *British journal of sports medicine* 50.14 (2016): 853-864.

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The prime focus of research on sports injury has been on **physical factors**

This is despite our understanding that when an athlete sustains an injury it has **psychosocial** as well as physical impacts

Psychosocial factors have been suggested as prognostic influences on the outcomes of rehabilitation

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Psychosocial Factors

Social factors on a player's mind or behavior, and to the interrelation of behavioral and social factors

Return to sport process takes place in a **social environment** involving many different people (e.g., injury practitioners, technical coaches, family, friends, team-mates)

extrinsic (i.e., social support, social environment) and **intrinsic** factors (i.e., emotion, cognition, behavioral characteristics)

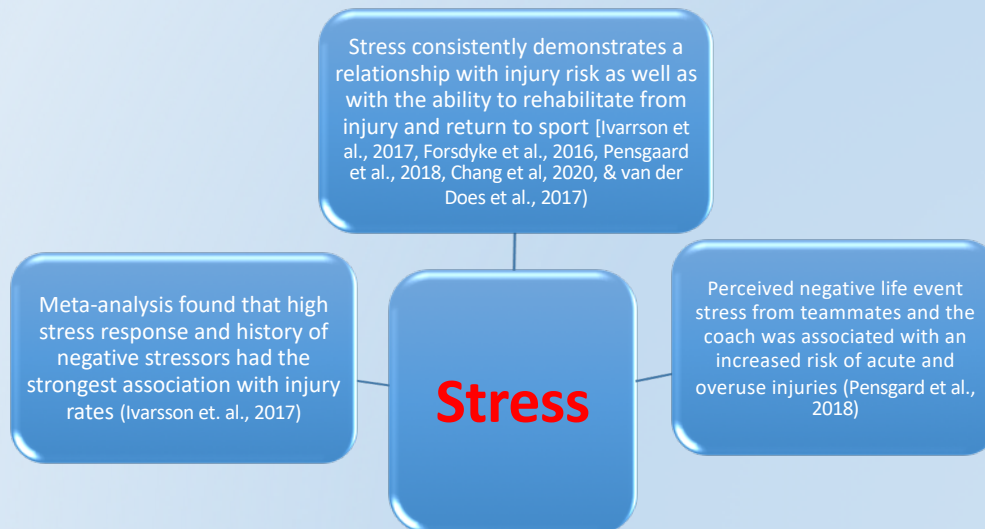
The **net effect** of these intrinsic and extrinsic psychosocial factors in response to the experience of injury, rehabilitation and return to sport that may be prognostic factors of return to sport outcomes

(Martikainen, Bartley & Lahelma, 2002, Nilsson & Kristenson, 2010, & Forsdyke, 2020)

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Psychological and Sociocultural factors as potential *risk factors* for injury



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“Playing Hurt” Culture – Dangerous for Adolescents

- Sociological evidence indicates that sports participation operates in a “cultural context that **glorifies risk** and **normalizes pain, injuries and playing hurt.**” (Nixon, 1994)
- “Pain is part of the game” and athletes are expected to play through it
 - Reinforced by coaches, fans, medical personnel
- Perceptions of direct social pressure to play hurt

Willingness to Compete Hurt (Mayer, Jochen, et al. 2018):

- 1138 elite adolescent athletes (14-18years old):
 - **42.1%** would not rest while taking pain meds
 - 16.4% would not perceive it legitimate to rest with a fever-cold
 - **43.8%** had high willingness to compete despite joint pain

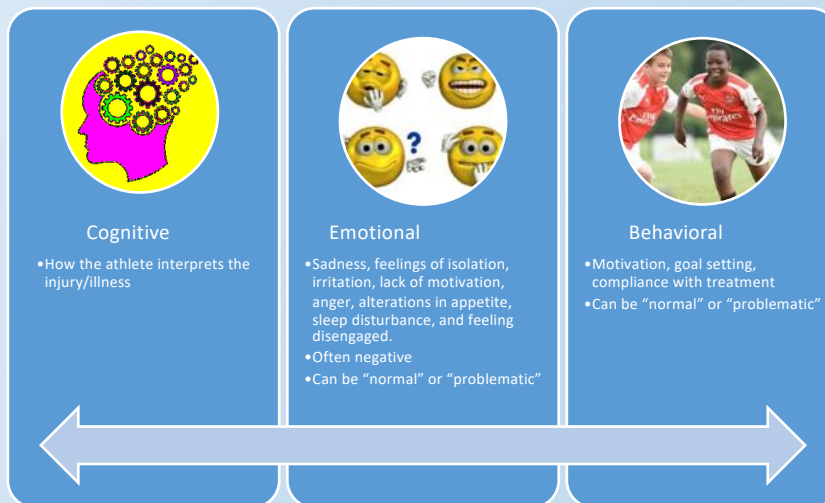


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Three Athlete Responses to Injury/Rehab

(Forsdyke, et al., 2016)



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Examples of Problematic Cognitive Responses

(Chang et. al., 2020, Forsdyke et al., 2016)



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“Readiness” to Return to Sport

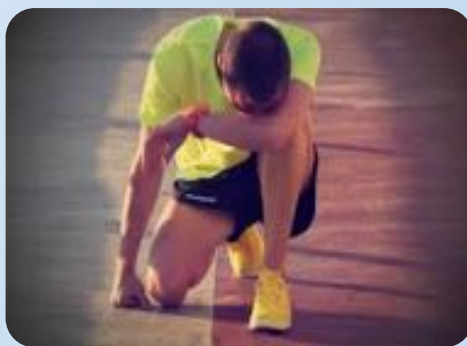
- Subdivided into physical, psychological and psychosocial
- **Physical readiness** generally assessed with a battery of open and closed chain skills/assessments

A player's physical readiness is seldom comprehensively evaluated, with only **23%** of players meeting full physical discharge criteria prior to return to sport (Webster & Hewitt, 2019)

Being unable to meet such criteria is related to a **four-fold** increase in the risk of re-injury upon return to sport (Kyritsis, Landreau, Miladi & Witvrouw, 2016)

When an Athlete is Not Ready to Return to Sport?

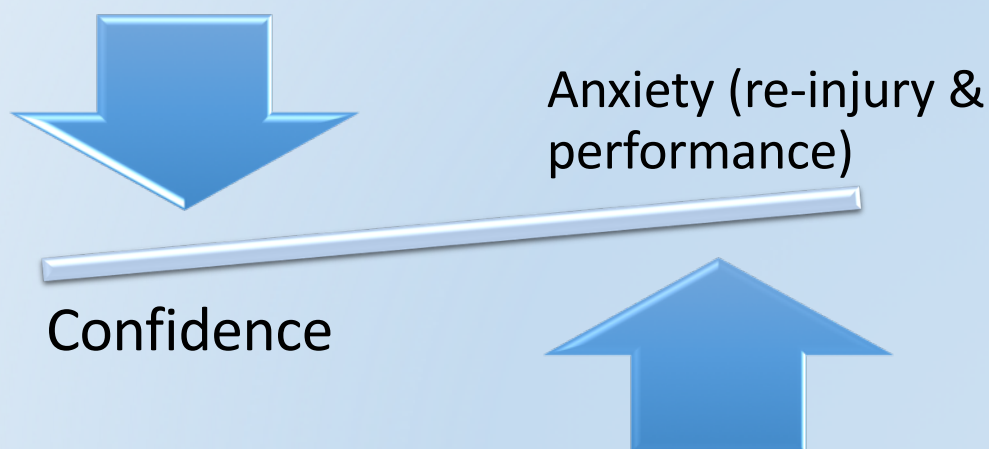
Reduced functional task performance
(Zarzycki et al, 2018)



Increased risk of re-injury
(McPherson et al, 2019)

Less Likely to return to pre-injury sport or pre-injury sport performance (Kitaguchi et al., 2019, Arden et al., 2014)

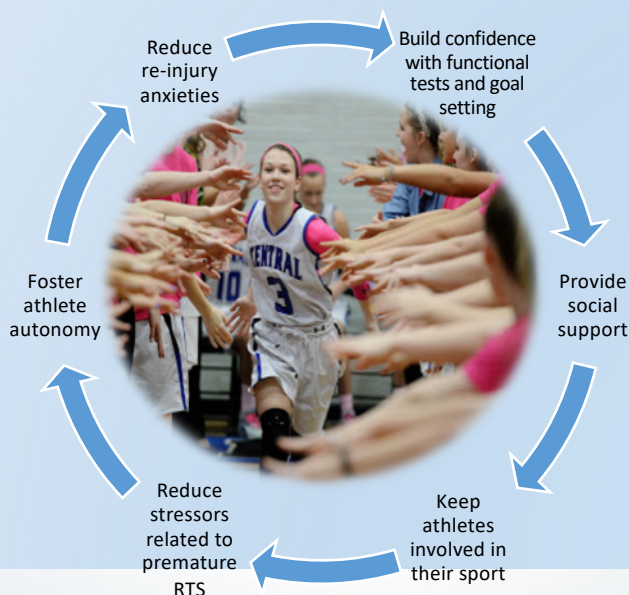
Psychological Readiness to RTS (Forsdyke et al., 2016 & 2020)



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Psychological Readiness (Chang et al., 2020, Podlog et al, 2015. Forsdyke 2020)



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Example: Prior Hamstring Strain & RTS



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Psychosocial + Physical Factors

Cohort study of players with ACL injury requiring reconstruction, psychosocial factors were associated more significantly than functional outcomes (i.e., limb symmetry from hop tests) with a return to pre-injury sport

ALSO
Elevated levels of **fear of movement** were associated with a 17% reduction in return to pre-injury sport (Baez, Hoch & Hoch, 2020)

When directly compared to physical factors (e.g., limb function, strength, joint laxity), psychosocial factors (e.g., **fear of re-injury, self-efficacy**) appear to be equally or more important (Ardem, Taylor, Feller & Webster, 2012b; Kitaguchi et al., 2019; Kvist, Ek, Sporrstedt & Good, 2005).

Psychosocial factors were the sole significant predictor contributing to a **performance** following ACL injury (Webster et al., 2019)

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- **3** key elements that practitioners can consider when monitoring psychological readiness to RTS in preparation for RTS decision-making (Forsdyke et al., 2017)

1. Use tools to monitor injured athletes

2. Use working knowledge of the athlete

3. Adopt an interdisciplinary, shared decision-making approach

Tools to Assist with Assessing Psychological Readiness/Anxiety

- **Re-Injury Anxiety Inventory (RIAI):** <http://www.sciencedirect.com/science/article/pii/S1466853X09000996>
- **Tampa Scale of Kinesiophobia (TSK):** <http://www.ncbi.nlm.nih.gov/pubmed/16962238>;
- **Injury-Psychological Readiness to Return to Sport Questionnaire (I-PRRS):** <http://natajournals.org/doi/pdf/10.4085/1062-6050-44.2.185>;
- **Knee Self-Efficacy Scale (KSES):** <http://onlinelibrary.wiley.com/doi/10.1111/j.1600-0838.2005.00472.x/abstract>;
- **ACL-Return to Sport after Injury Inventory (ACL-RSI):** <http://www.sciencedirect.com/science/article/pii/S1466853X07000971>.



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Conclusions



- In addition to physical factors, there is evidence that indicates that psychosocial factors are associated with a range of sports injury rehabilitation outcomes
- Athletes should only return to sport when they are physically and psychologically ready
- Practitioners need to recognize that an injured athlete's thoughts, feelings, and actions are related to the outcome of rehabilitation
- For injured players, interventions should be focused on enhancing perceptions of social support, reducing injury stress and anxiety, restoring self confidence and promoting psychological wellbeing

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Thank You

Where bold begins.

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