



# HUMAN PERFORMANCE AND NUTRITION RESEARCH INSTITUTE

*DRIVEN BY SCIENCE. POWERED BY HUMANS.*



ATHLETICS

STUDENTS

BRAND

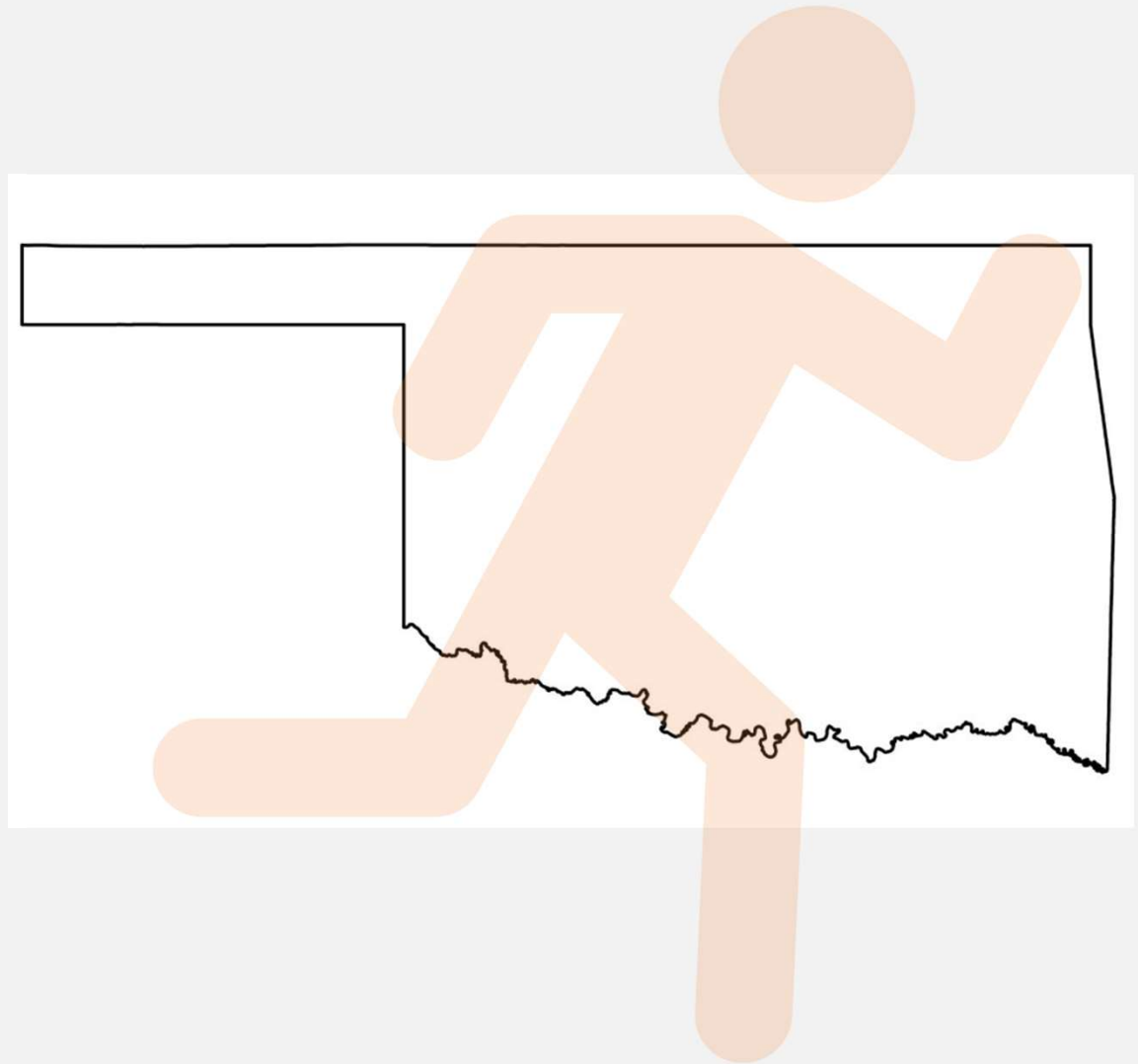


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HEALTH  
STATUS

DISEASE  
BURDEN

EXTENSION  
RESOURCES



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Coaching  
Pedagogy

Sport & Exercise  
Science

Strength &  
Conditioning



Nutrition  
Education

Nutrient  
Management

Body  
Composition &  
Energy Balance



Health  
Management

Injury  
Prevention

Rehabilitation



Mental Skills

Psychology &  
Psychobiology

Life Skills



Cognitive  
Neuroscience

Sensorimotor  
Skill

Neurophysiology



Multi-Omics &  
Bioinformatics

Endocrinology

Biotechnology



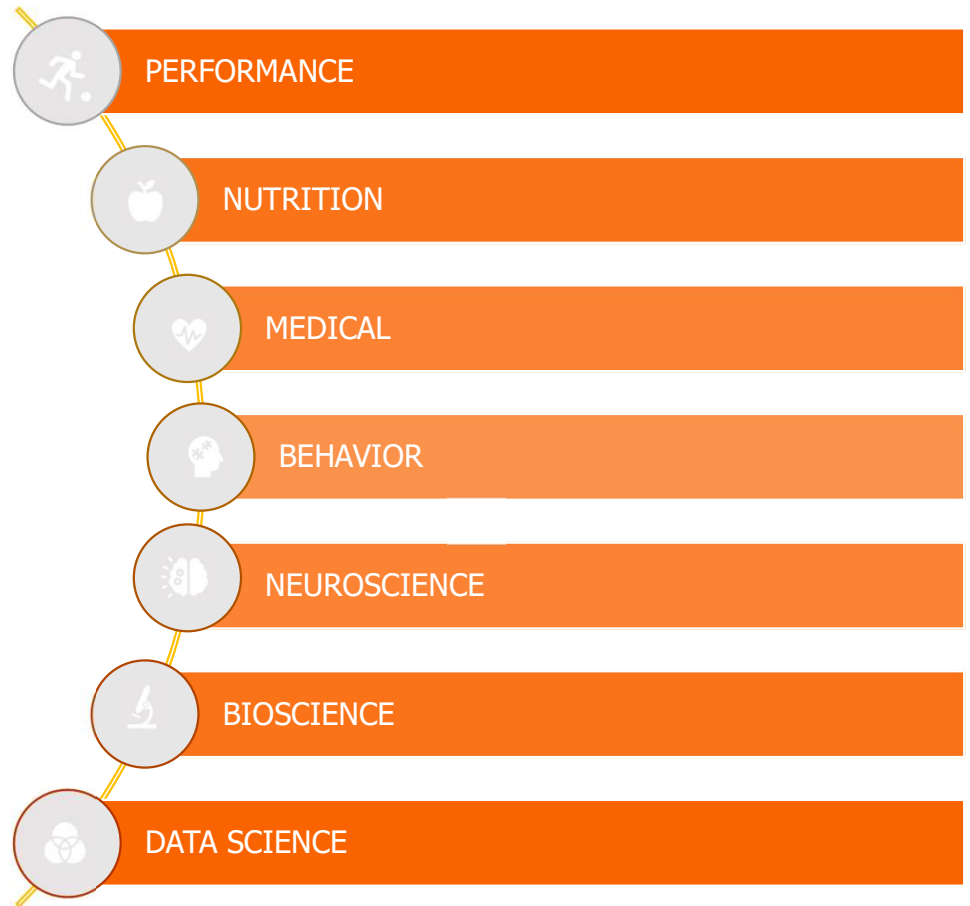
Artificial  
Intelligence

Data  
Management

Health  
Informatics



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# OPPORTUNITY



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ATHLETICS



HEALTH



ACADEMICS



BURDEN



BRAND



RESOURCES

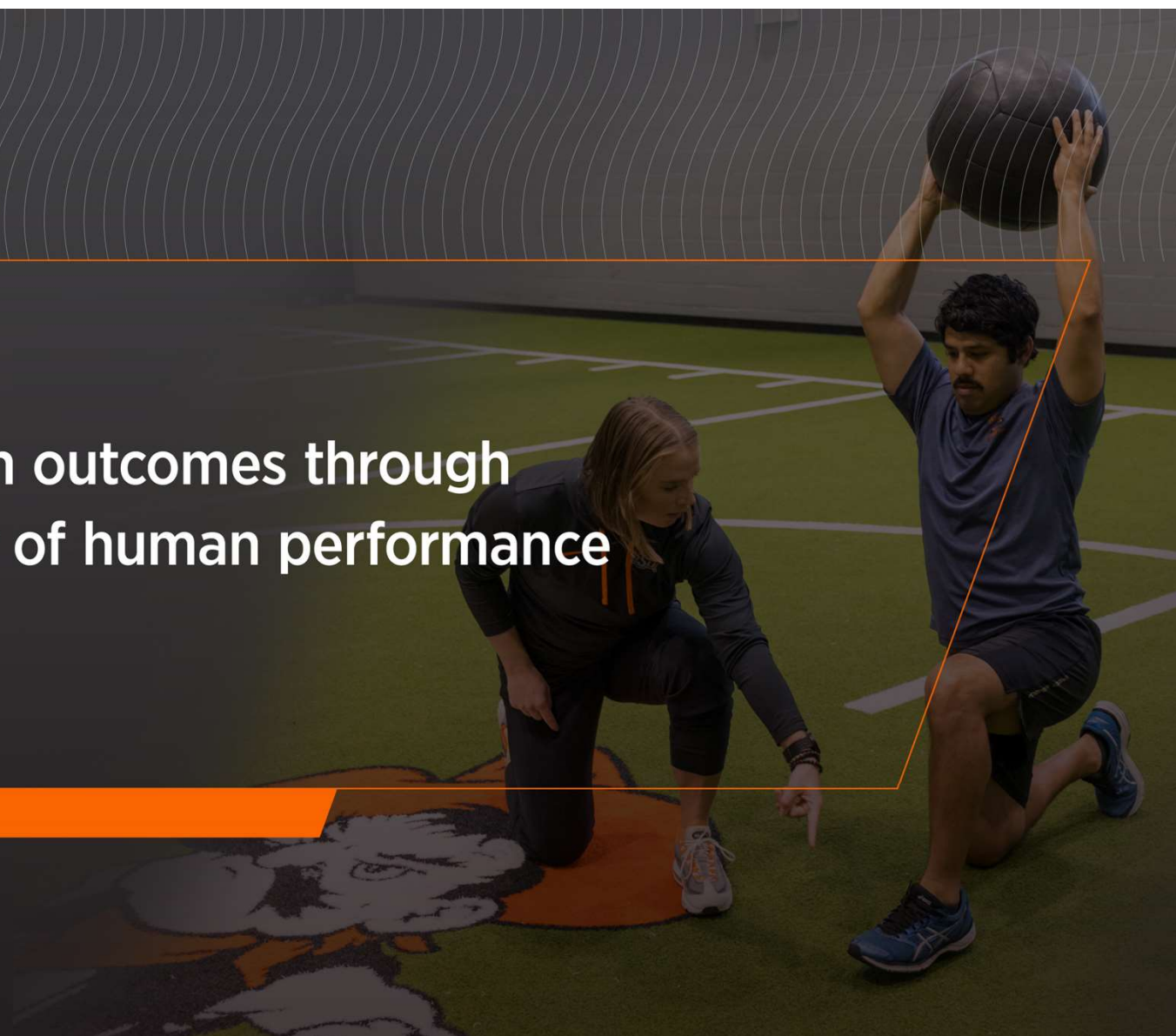
**RESEARCH / TEACHING / EXTENSION**

# VISION

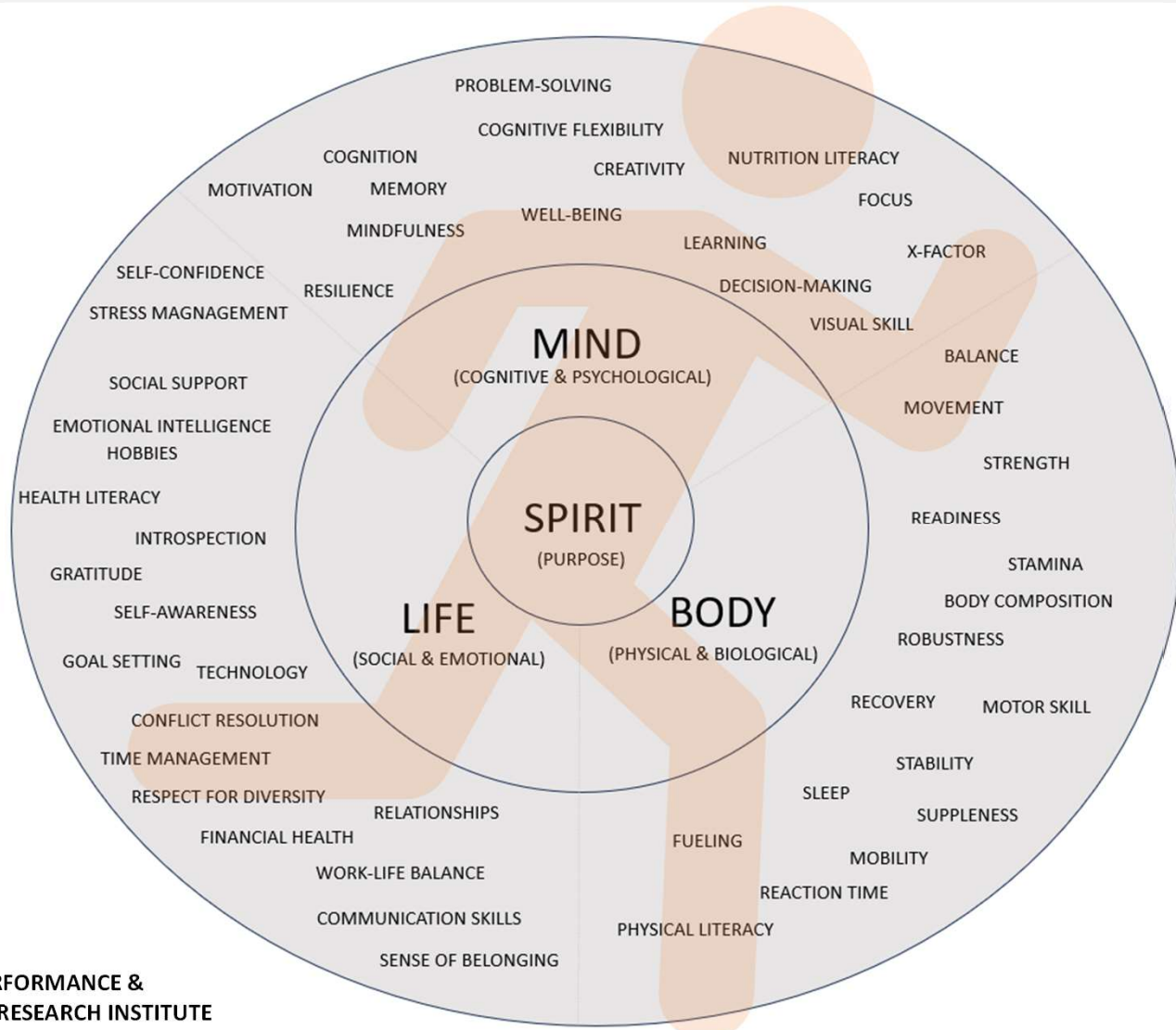
To transform health outcomes through  
the scientific study of human performance



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**HUMAN PERFORMANCE &  
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**CONTROLLABLE FACTORS**  
(Shared Areas of Opportunity)

**PERFORMANCE IMPACT**

**HEALTH IMPACT**

Bioenergetics, Endurance, Recovery, Inflammation	<b>ENDOCRINE SENSITIVITY</b>	Insulin Resistance, Inflammation, Energy Balance, DM-II
Exercise Capacity, Recovery, Injury Risk, Endurance	<b>BLOOD PRESSURE</b>	CV Risk, Renal Function, Inflammation Cognition, Vision
Recovery, Glycogen Sparing, Endurance Performance	<b>LIPID PROFILE</b>	CV Risk, Insulin Resistance, Pancreatitis, Liver Function
Athleticism, Mental Health, Body Comp, Recovery	<b>PHYSICAL ACTIVITY</b>	Disease, Mental Health, Body Comp, MSK Health
Power/Strength, Endurance, Injury Risk	<b>BODY COMPOSITION / ANTHROPOMETRICS</b>	CV Risk, Cancer Risk, MSK Health, Sleep, Diabetes Risk
Bioenergetics, Injury Risk, Recovery, Body Comp, Fueling	<b>NUTRITION BEHAVIOR</b>	Body Comp, Mental Health, Disease Risk, Food Choices
Power, Endurance, Injury Risk, Recovery	<b>NEUROMUSCULOSKELETAL FUNCTION</b>	Disease, Fall Risk, Body Comp, Mental, Quality of Life
Motivation, Focus, Sleep, Injury Risk, Body Composition	<b>STRESS</b>	CV Risk, Mental Health, Cognition, Immunity, Digestion
Performance, Mental Health, Ethics/Legal	<b>READINESS</b>	Inflammation, Body Comp, Hormone Balance, Stress
Athleticism, Injury Risk, Performance, Cognition, Recovery	<b>EXERCISE / TRAINING</b>	Insulin Sensitivity, Stress, Body Comp, Inflammation
Fueling, Sleep, Recovery, Injury, Adaptability	<b>RESILIENCY</b>	Food Choices, Exercise Habits, Support Seeking
Recovery, Mental Health, Reaction, Endurance, Injury Risk	<b>NEUROPHYSIOLOGICAL RECOVERY</b>	Sleep, Insulin Resistance, Endocrine Fxn, Inflammation
Energy, Fatigue, Injury, Recovery, Infection/Sickness	<b>INFLAMMATION</b>	Insulin Resistance, Dyslipidemia, Obesity, CV Risk
Visual Acuity, Decision-Making, Depression, Injury Risk	<b>TRAUMATIC BRAIN INJURY</b>	ANS Dysfunction, Inflammation, Obesity, Insulin, Lipids
Pain, Absenteeism, Performance Decrements, Depression	<b>MUSCULOSKELETAL INJURY</b>	Physical Inactivity, Weight Gain, Stress, Joint Disease
Injury Risk, Health Behavior, Training Effects, Safety	<b>PHYSICAL, NUTRITION, &amp; HEALTH LITERACY</b>	Physical Inactivity, Lifestyle, Health Knowledge Psychological Stress

# HPNRI SOLUTION



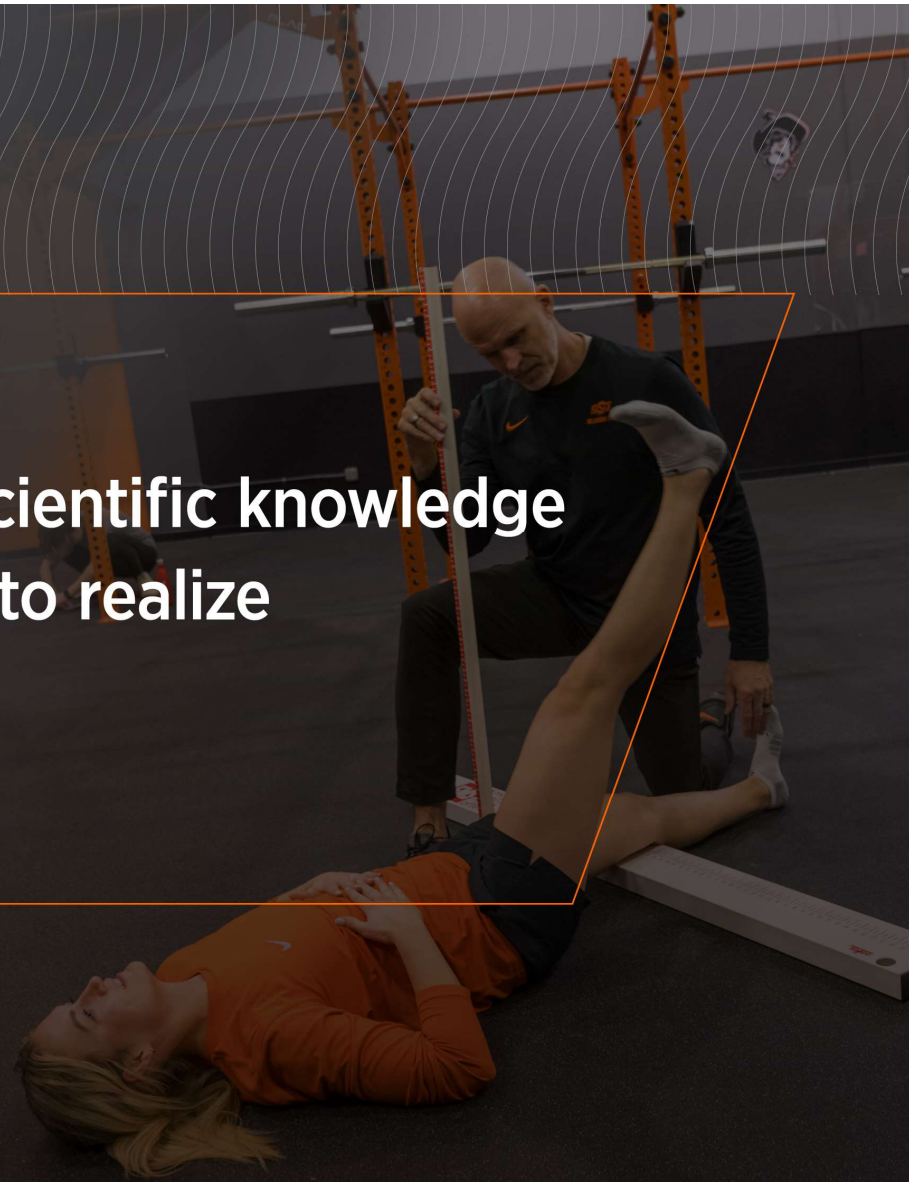
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# MISSION

To discover, develop and deliver scientific knowledge to empower people of all abilities to realize their optimal performance



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Health transformed through performance science.

## DISCOVER

Innovative and applied solutions in human optimization that impacts both STATE health and performance.

### Imperative 1:

Create Transdisciplinary Human Performance and Nutrition Research **Collaborations** and **Capabilities**

### Imperative 2:

Secure External Research **Grants** and Programmatic **Funding** for Human Performance and Nutrition Discovery

### Imperative 3:

Produce Innovative **Applied Research** in Human Performance and Nutrition

## DEVELOP

A next generation of providers and performers equipped and inspired to impact STATE health and performance.

### Imperative 4:

Provide Applied Science and Transdisciplinary Research **Experiences** in Human Performance and Nutrition

### Imperative 5:

Establish **Professional Development** Programs Focusing on Human Performance and Nutrition

### Imperative 6:

Facilitate Networking and Industry **Connections** in Human Performance and Nutrition

## DELIVER

Impactful resources that empower individuals, groups, and communities for optimizing STATE health and performance.

### Imperative 7:

Forge Synergistic **Community Impact Partnerships** in Human Performance and Nutrition

### Imperative 8:

Develop and Implement Community **Education Programs** in Human Performance and Nutrition

### Imperative 9:

**Translate and Disseminate** New Knowledge and Innovative Solutions in Human Performance and Nutrition



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# HPNRI FUNCTION



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## INPUTS



## DATA

- PERFORMANCE
- READINESS
- HEALTH
- WORKLOAD
- COGNITIVE
- RECOVERY
- BEHAVIORAL
- NUTRITION

AMS

HPNRI

## OUTPUTS

OSU  
DEPARTMENTS

A&M  
CAMPUSES

DATA  
LAKE



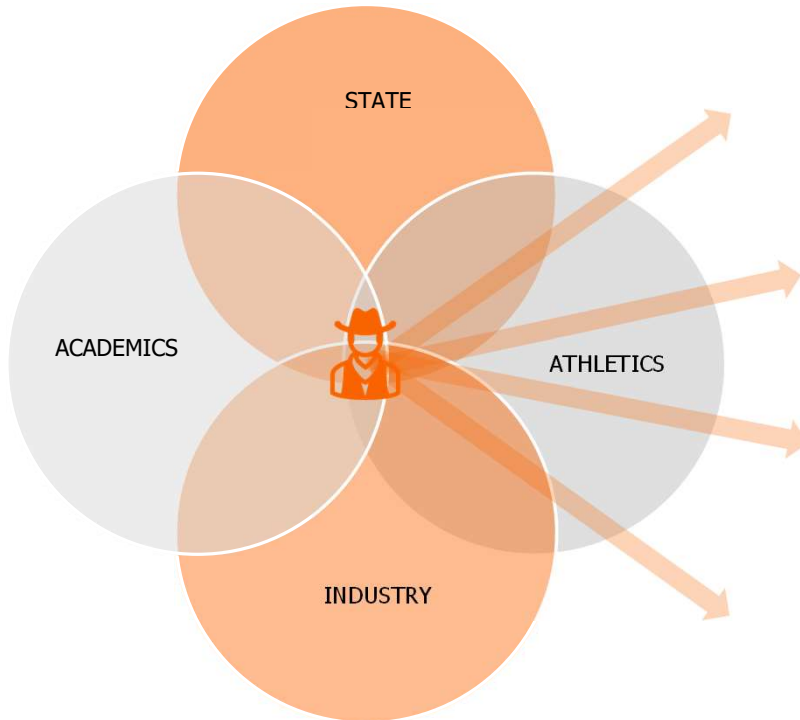
INDUSTRY  
PARTNERS

GOVERNMENT  
AGENCIES

# HPNRI OPPORTUNITY INTERSECTION



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**HYDRATION**

- Status & Management
- Dietary Intake Effects
- Weight Loss Effects

**LEAN BODY MASS**

- Development & Maintenance
- Relationship to Inflammation
- Nutritional Optimization

**DIGITAL HEALTH**

- AI-Enabled Therapeutics
- Population Specificity
- Wearable Technologies

**RETURN-TO-PERFORM**

- Protocols & Timelines
- Readiness Criteria & Benchmarks
- Neurocognitive Factors

**METABOLIC FITNESS**

- COVID Long-Term Effects
- Transfer Effects (CRF, Injury)
- Signatures & Benchmarks

**THE FEMALE ATHLETE**

- Cycle-Based Load Management
- Menstrual Cycle Nutrition
- Injury Risk Management

**PROTEIN**

- Source Quality & Quantity
- Age- & Sex-Specific Intakes
- Intake Timing Optimization

**RESILIENCY**

- Psychometrics
- Talent/Risk ID
- Development Programming

**PHYSICAL LITERACY**

- P.E. Curriculum Effectiveness
- Community Program Support
- Physical Educator Training

**SUGAR CONSUMPTION**

- Insulin Sensitivity Development
- Glucose Management & Monitoring
- Intake Modification Strategy

**SLEEP & RECOVERY**

- Customized Regeneration
- Sleep Optimization
- Recovery Nutrition

**INJURY PREVENTION**

- Risk Factor Management
- Personalized Load Prescriptions
- Cognitive Load Factors

**HEALTH BEHAVIOR**

- Technology in Change Strategy
- Intervention Effectiveness
- Health Behavior Transition

**ANTIOXIDANTS**

- Endogenous Production Of
- Oxidative Stress Recovery
- Exogenous Supplementation

**PRECISION NUTRITION**

- Dietary Responsiveness
- "Food as Medicine"
- Prescriptive Nutrigenomics

**TRAUMATIC BRAIN INJURY**

- Rehabilitation & Readiness
- Risk Factor Management
- Mental Health Effects





# HPNRI SYMPOSIUM OUTCOMES



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**TRANSDISCIPLINARY COLLABORATION**

**SPECIAL INTEREST GROUP FORMATION**

**EXPLORING INTEREST AND RESOURCES**

**PILOT RESEARCH PROJECT FOCUS AREAS**

**NEXT SYMPOSIUM – APRIL 18<sup>TH</sup>**



# HPNRI FOCUS AREAS



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## PHYSICAL LITERACY

Empower a holistic and lifelong relationship with movement and physical activity.

## READINESS

Optimize performance recovery, preparation, and robustness for sport and life.

## HUMAN HORSEPOWER

Generate sustained energy, critical power, and productive work.

## RESILIENCE

Respond, adapt, and bounce-back from challenges and adversity.

## PRECISION NUTRITION

Personalize nutrition to unique needs, preferences, and genetic factors, tailored for optimum performance.

## DIGITAL HEALTH

Create new and leveraging existing technologies to optimize performance and maximize the human healthspan.

## PRIORITY POPULATIONS

Understand, adjust, and innovate for the unique opportunities to optimize performance in female, tactical, and youth athletes.



College Of Education & Human Sciences



Athletic Department



Student Affairs



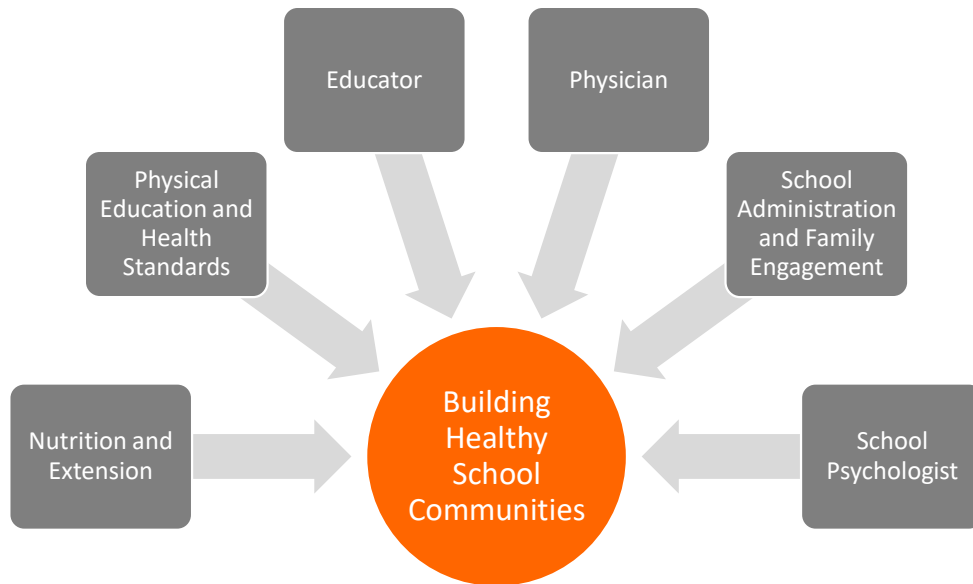
College Of Arts & Sciences



College Of Engineering, Architecture, & Technology



College Of Education & Human Sciences



**“ALL TEACH, ALL LEARN”  
VIRTUAL PLATFORM**

**3 HPNRI ECHO LINES - TSET FUNDED**

**ATHLETIC TRAINING - SPORTS MEDICINE**

**PEDIATRIC OBESITY**

**BUILDING HEALTHY SCHOOL COMMUNITIES**

## Athletic Training – Sports Medicine Project ECHO Report Launch Date May 24, 2023



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This ECHO line supports trainers, sports medicine providers, and healthcare workers supplying expert knowledge and advancements in best-practice in identification, reduction, and treatment of sports-related injuries to keep student athletes active, healthy, and hasten their return to play once injured.

### Project ECHO HUB Team Members:

- Dr. Aric Warren, PhD, LAT, ATC, CSCS, CES, TSAC-F
- Dr. Jason Moore, DO, DPT, MHA
- Dan Newman, MS, LAT, ATC
- Kevin Andrews, HA, LPC, MHA
- Gena Wollenberg, PhD, RD, CSSD, LD
- Lance Walker, PT, MS, CSCS

Number of Sessions Held: 7

### Attendance

Individual attendees: 151

Total attendance: 349

Average attendance: 49.9 per session

Attendee involved: 151 individuals attending combined total of 349 times

Organizations attending: 97

Schools represented: 17 OK K-12 schools

College or University: 13 OK Higher Ed institutions

Continuing Medical Education:

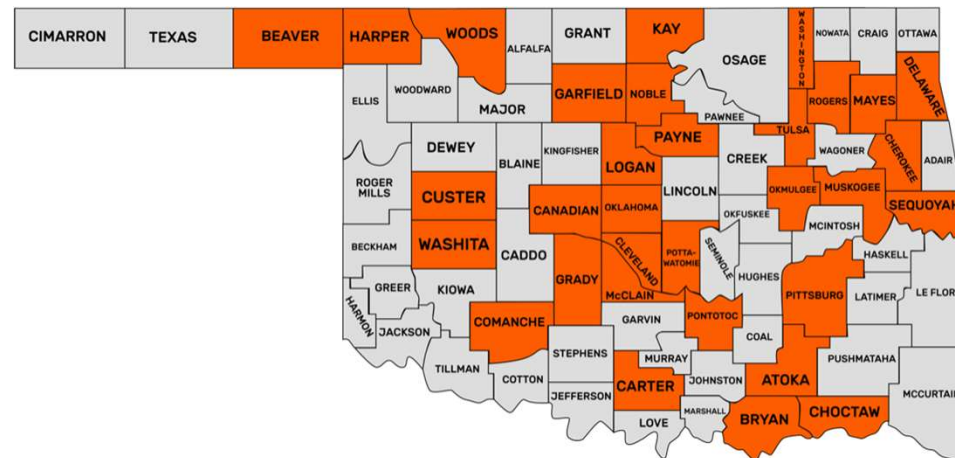
130 CME/CEU credits awarded

### Coverage:

33 of 77 Oklahoma counties reached

10 Other States: Kansas, Missouri, Maryland, Texas, Ohio, Florida, Kentucky, Pennsylvania, Hawaii, Nevada

2 Countries: US and Canada



## Pediatric Obesity Project ECHO Report Since May 1, 2023



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The Pediatric Obesity ECHO line is an established Medicine ECHO providing best practices and evidence-based care for children and families struggling with obesity to medical providers, nurses, medical assistants, nutritionists, dietitians, psychologists, behavioral health providers, supervisors and administrators, social workers, case managers.

The current Pediatric Obesity Medicine ECHO line is transforming into a new hybrid Medicine and Education line focusing on school health provider inclusion in April 2024. HPNRI Pediatric Obesity ECHO is working with OSDE and OSDH to extend outreach to school health professionals providing information, education, and support in the prevention and treatment of obesity. We predict expanded growth of this line and its reach in 2024. At present, the line extends into the counties listed below.

### Project ECHO HUB Team Members:

- Dr. Colony Fugate, DO, FACOP
- Dr. Kelly Murray, PharmD, BCACP
- Dr. Ginger Welch, PhD
- Dr. Kerry Morgan, PhD, MCHES
- Dr. Courtney Abernathy, MMSc, PA-C
- Dr. Ashlea Braun, PhD, RD

Number of Sessions Held: 12

### Attendance

Individual attendees 82

Total attendance 143

Organizations attending:

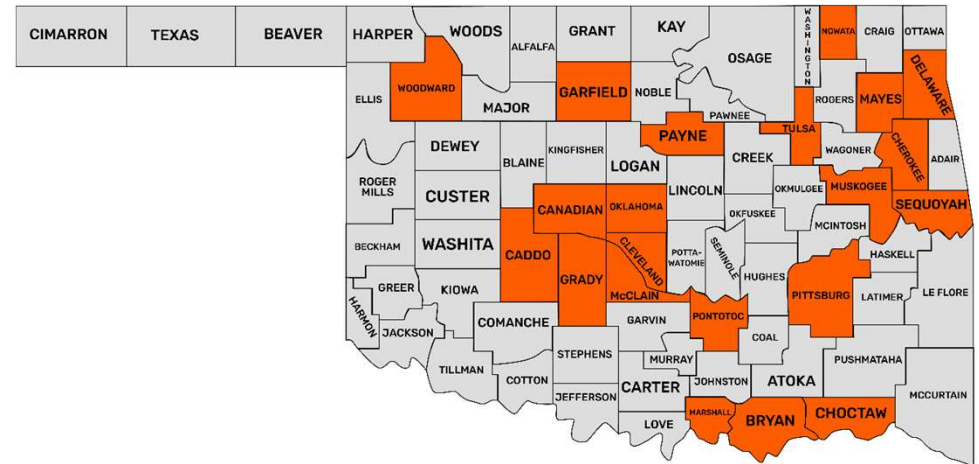
Continuing Medical Education: 49

130 CME/CEU credits awarded

Coverage:

21 Counties in this time frame

4 other States



## Building Healthy School Communities ECHO Launching January 2024



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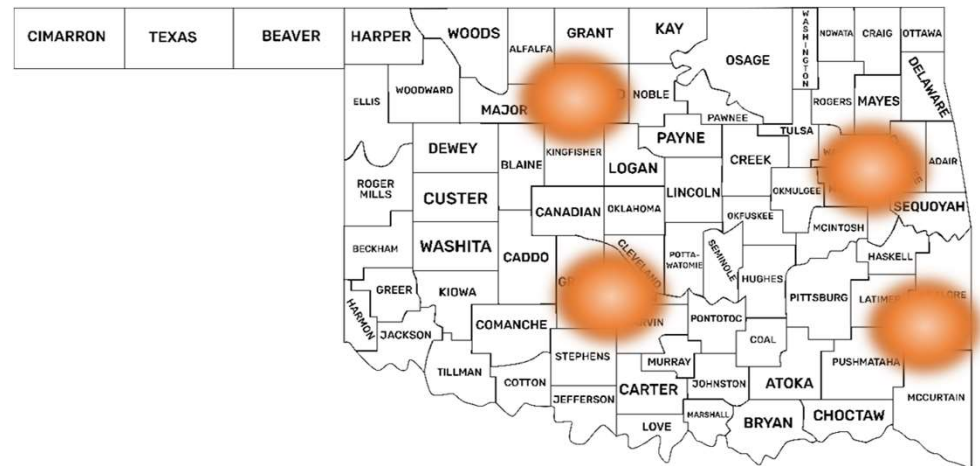
In collaboration with OSU Extension, OSDE, OSDH and OAPHERD the Building Healthy School Communities ECHO line will empower Oklahoma schools to improve **physical activity** and healthy nutritional behavior in targeted K-12 school communities across the state.

This line will partner with school districts to provide a transdisciplinary framework of resources that supports **physical and health literacy** in school communities with the goal of making an impact on health behaviors. HPNRI will combine transdisciplinary experts from OSU academics, extension, research, and medicine as well as **experts in Oklahoma State Physical and Health Education Standards** to develop and deliver best practices to participants.

### Project ECHO HUB Team Members:

- Team Lead: Dr. Deana Hildebrand – OSU Professor in Nutritional Sciences and Extension **Community Health** Program Lead
- Shana Classen – OK State Director for Health **Physical Education**
- Dr. Kathy Curry – OSU Professor of **Educational Leadership**, Former Secretary of Education
- Dr. Christopher McNeil – OSU Post Graduate ER Resident and former collegiate athlete
- Sarah Ehrlich – **Elementary P.E. Teacher** – Stillwater Public Schools
- Dr. Kacey Gilbert – Asst Professor **Teaching, Learning and Educational Sciences**

*These ECHO lines were made possible through collaborative efforts between Oklahoma State University Center for Health Sciences, OSU Athletic Training, and the new Human Performance & Nutrition Research Institute, as well as with generous funding from the Tobacco Settlement Endowment Trust (TSET).*



# HPNRI - AMPLIFYING OUR REACH



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LEGISLATIVE PRESENTATIONS

INSIDE OSU PODCAST



STATE MAGAZINE

SWEATFEST SPONSORSHIP

BMX ANNOUNCEMENT

SOCIAL MEDIA



HPNRI DONOR NEWSLETTER

## In the Media

The Journal Record

[OSU wrestlers visit teen in rehab after adolescent stroke](#)

KFAQ The Blitz

[Morning Blitz discusses concussions with OSU-CHS](#)

KFOR

[OSU using virtual health extension to teach best practice health care for student-athletes](#)

KTUL Channel 8

[OSU launches new Sports Medicine ECHO](#)



# BOONE PICKENS HUMAN PERFORMANCE INNOVATION COMPLEX





# HPNRI IMPACT



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## OKLAHOMA STATE UNIVERSITY

### ATHLETICS

- Performance Science Support
- Recruiting & Retention
- Talent Development

### STUDENTS

- Professional Development
- Workforce Preparedness
- Recruitment & Retention

### BRAND

- Interdisciplinary Discovery
- Strategic Partnerships
- Broaden Research Reach

## STATE OF OKLAHOMA

### HEALTH STATUS

- Childhood Obesity
- Metabolic Syndrome
- Diet & Physical Activity

### DISEASE BURDEN

- Human Productivity
- Workforce Capacity
- Health Care Costs

### EXTENSION RESOURCES

- Targeted Research
- Content Creation
- Expanded Clinical Outreach



RESEARCH & INNOVATION



TEACHING & INSPIRATION



EXTENSION & AMPLIFICATION



# HPNRI TIMELINE



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2023

## LAUNCH & INITIATE

- ECHO & transdisciplinary team-of-teams
- Affiliates, alliances, advisors, & partnerships
- Targeted research projects
- Mentorships & symposia
- Facility planning & fundraising

2024

## BUILD & IMPLEMENT

- Facility & athlete services
- Performance data management system
- Expand ECHO & Telemedicine services
- Develop partnerships & sponsored research
- State reporting

2026

## IMPACT & SUSTAIN

- Complete facility
- Integrated data management ecosystem
- Oklahoma health outcome measures
- Grow & diversify funding
- Implement contracted services

2028

## EXPLORE & EXPAND

- Optimize current/create new products & services
- Expand partnerships
- Focus on future potential
- Generate new earned income streams



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