

IOPN

Institute of Performance Nutrition

Diploma in Performance Nutrition

Course Overview

(v:4.11.19)



IOPN

Diploma in Performance Nutrition

#sciencetopractice

A course designed to bridge the gap between science and practice in sport and exercise nutrition.

Mission statement: "To provide our students with the highest quality, relevant evidence-based education and support, to help them achieve unparalleled success in their studies and ultimately in their professional practice."

Welcome

With 25 years of professional experience working with teams and organisations such as:



Dr Laurent Bannock

DProf, MSc, CSCS, RNutr, SENr

“ The Diploma in Performance Nutrition was built from the work of my doctoral thesis and continued pursuit of bridging the gap between science and practice.

Our mission is to decrease this gap by providing our students with cutting-edge evidence-based sport and exercise nutrition science that is distilled in a manner that's practically relevant to support professional practice.

”

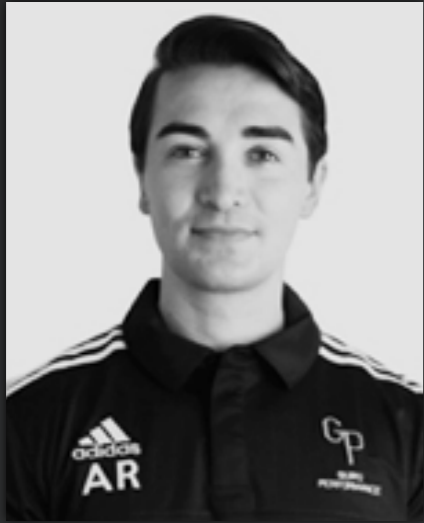
FIFA WORLD CUP
RUSSIA 2018



London Irish™



The Team



Alex Ritson

MSc, SENr (Grad)



Mark Hearnis

BSc, MSc, PhD(c), SENr

The IOPN team are highly qualified, experienced practitioner's and researchers in the field of sport and exercise nutrition. They are also graduates of the Diploma in Performance Nutrition. This is a key strength to the program delivery and support provided to our students.



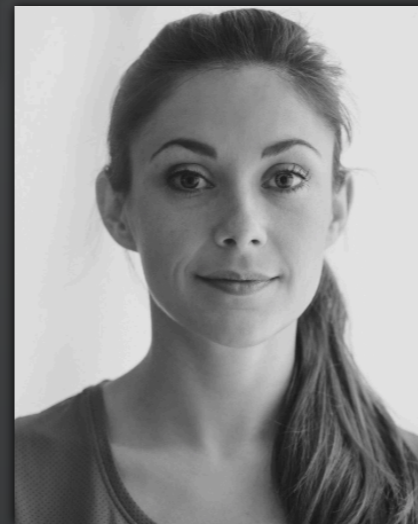
Rianne Costello

BSc, MSc, PhD(c), SENr (Grad), AFHEA



Dr Sally Waterworth

PhD



Jasmine Campbell

BSc, MSc, DProf(c), SENr



Stephen Smith

BSc, MSc, PhD(c), SENr (Grad)

Diploma in Performance Nutrition Roadmap

Module 1: Sports Nutrition: the fundamentals (part 1)

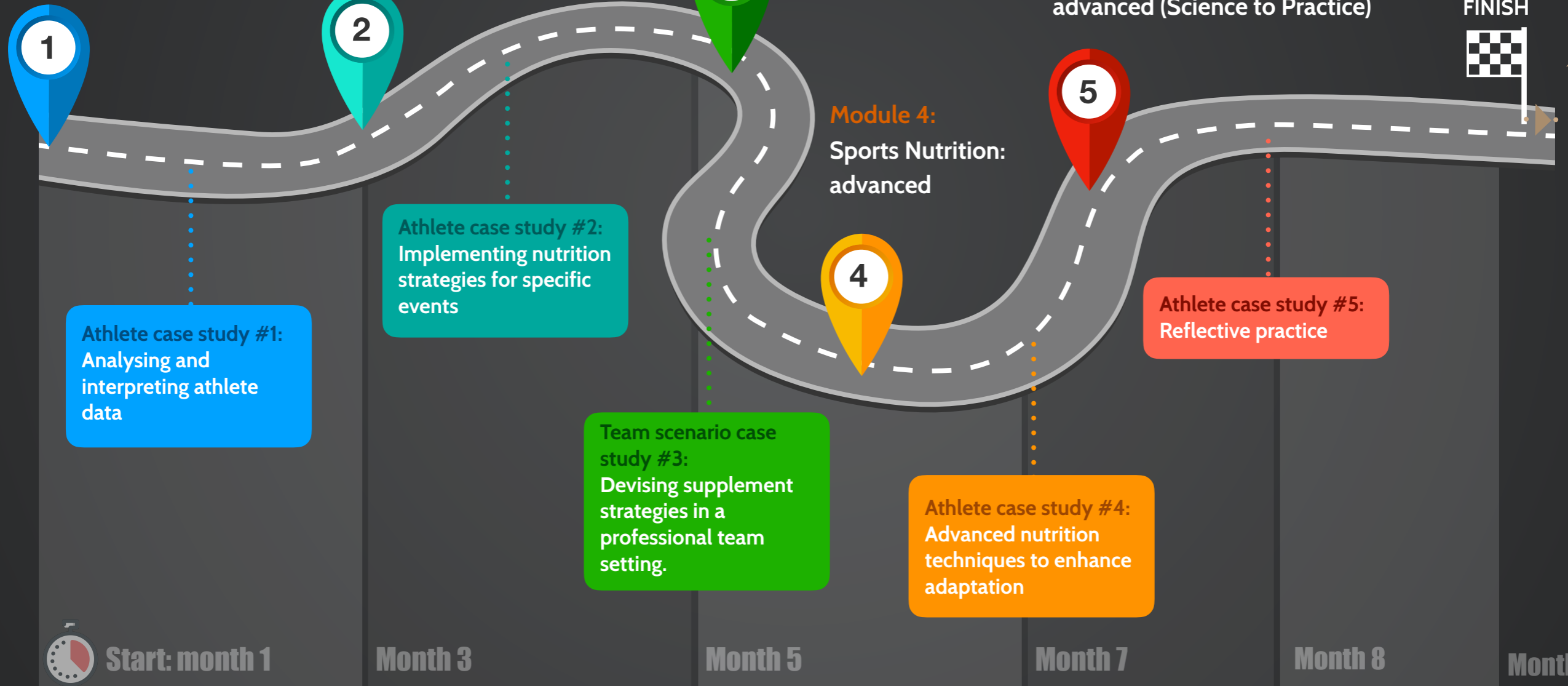
Module 2: Sports Nutrition: the fundamentals (part 2)

Module 3: Sports Nutrition: the fundamentals (part 3)

Module 5: Sports Nutrition: advanced (Science to Practice)

Module 4: Sports Nutrition: advanced

FINISH



Key Achievements:

- Diploma in Performance Nutrition
- Practice relevant knowledge*
- BDA, SENr, ACSM, and BASES CPD/CEU/CEC accredited*
- CISSN certification (optional)*
- Access to MSc in Sports Nutrition*

*See website for further details

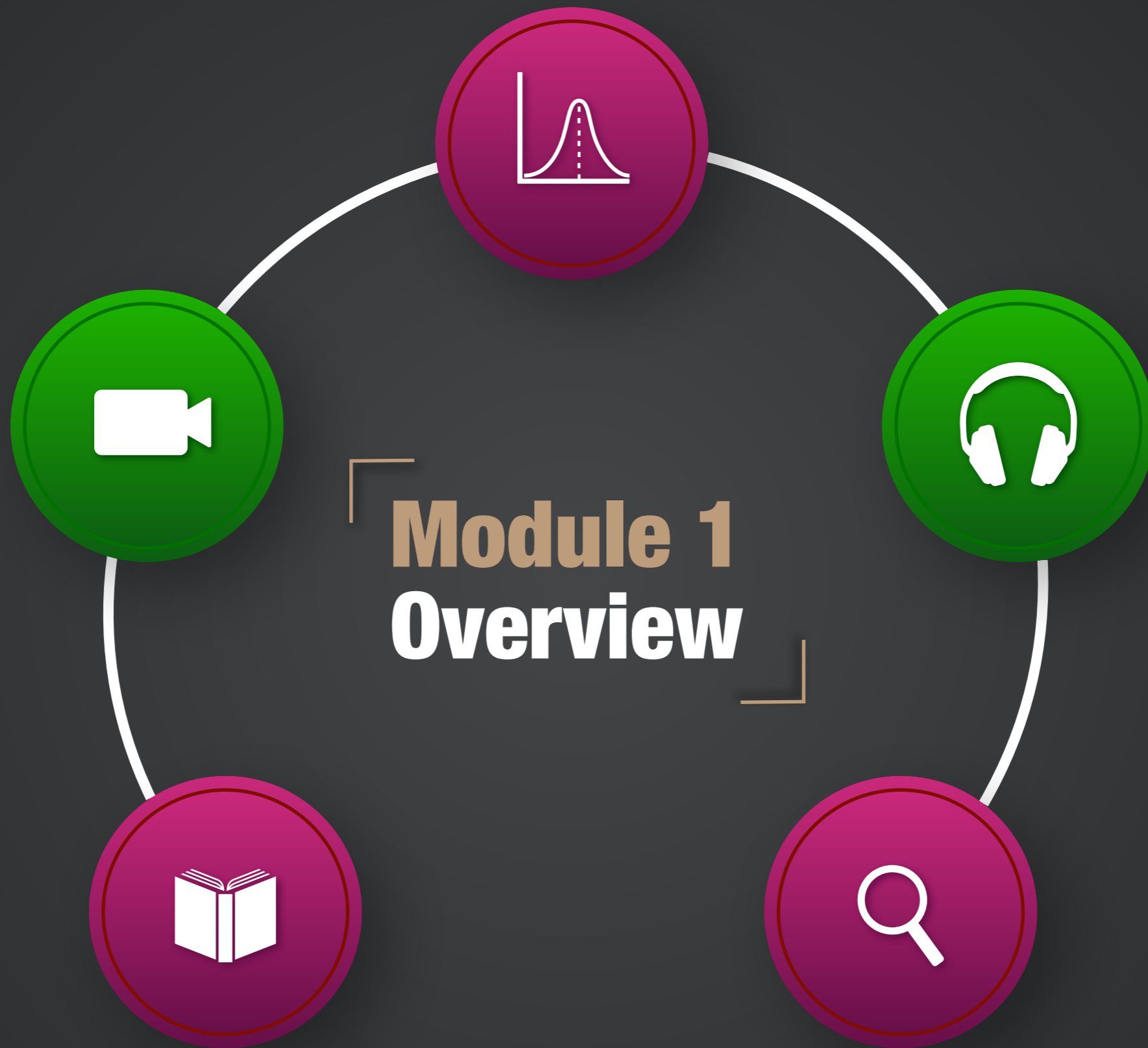
Athlete case study #1:
Analysing and interpreting athlete data

Athlete case study #2:
Implementing nutrition strategies for specific events

Team scenario case study #3:
Devising supplement strategies in a professional team setting.

Athlete case study #4:
Advanced nutrition techniques to enhance adaptation

Athlete case study #5:
Reflective practice



Sports Nutrition: The fundamentals (part 1)

Assessing energy intake
and expenditure

Metabolic regulation
during exercise

Skeletal muscle
structure and function

Nutrients and
recommended
intakes

The research on
healthy eating

Energy sources for
muscle and exercise
metabolism

Energy transfer





Module 1 lecturers

Your lecturers

Our course is delivered by the IOPN team and an impressive selection of guest experts who are typically world leading researchers and practitioners in the field of Sports and Exercise Nutrition.



Dr James Morton

Professor of Exercise
Metabolism and Nutrition

Liverpool John Moores University,
Team Sky



Dr Craig Sale

Professor of
Human Physiology

Nottingham Trent University



Dr Kirsty Elliot-Sale

Associate Professor of
Female Physiology

Nottingham Trent University



Dr Dylan Thompson

Professor of
Human Physiology

University of Bath



Dr Graeme Close

Professor of
Human Physiology

Liverpool John Moores University,
Everton FC & England Rugby



Dr Scott Robinson

Doctorate in Exercise
Metabolism and Nutrition

Private Practice

Learning targets

All reading material and questions finished (estimated time per day ~45 minutes, five days per week)

Hand over written case study for grading



All lecture videos finished and case study finalised (estimated time per day ~45 minutes, five days per week)

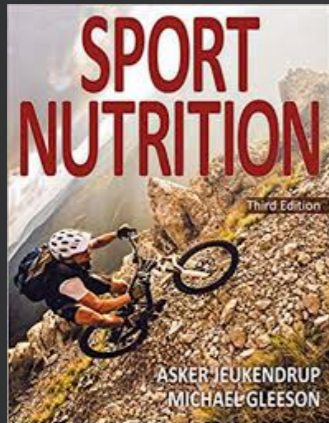
Move on to Module 2!



Module 1: Textbook topics

Text book: Sports Nutrition 3rd Edition (Human Kinetics)

- > Nutrients and Recommended intakes
- > Healthy Eating
- > Fuel Sources for Muscle and Exercise Metabolism
- > Energy
- > Key Concepts in Biological Chemistry Relevant to Sport Nutrition



Text book: Biochemistry for Sport and Exercise Metabolism (Wiley-Blackwell)

- > Energy Sources for Muscular Activity
- > Skeletal Muscle Structure and Function
- > Biochemical concepts



Module 1: Lecture videos

- **Performance Nutrition – An Introduction to the Art and Science of Sports and Exercise Nutrition** – Dr Laurent Bannock
- **Energy Systems: What, When & How?** – Prof James Morton
- **Protecting cellular ATP**– Prof Craig Sale
- **Exercise Metabolism 101: What We Need to Know and What Others Should Know** – Dr Scott Robinson
- **Exercise Metabolism- Endurance Exercise** – Prof Graeme Close
- **Exercise Intensity: Why does fat metabolism decline?** – Prof James Morton
- **Skeletal Muscle: Structure, Construction & Plasticity** – Prof James Morton
- **Limiting factors to maximal oxygen uptake: a heart or muscle problem?** – Prof James Morton
- **Nutrition & Fatigue** – Prof James Morton
- **Metabolic Regulation: Nutritional Effects** – Prof James Morton
- **Nutrition for fat and energy balance** – Prof James Morton
- **Assessing Energy Intake and Expenditure in Athletes: Perhaps not quite as simple as it sounds?** – Prof Graeme Close
- **How to get your fat fit - the impact of exercise on adipose tissue** – Prof Dylan Thompson
- **Exercise and non-physical activity thermogenesis** – Prof Dylan Thompson
- **RED-S (in males)** – Prof James Morton
- **Nutritional considerations for Eumenorrhic athletes** – Dr Kirsty Elliot Sale

Key topics addressed

Nutrients and Recommended Intakes

You will learn about the different classes of nutrients, their chemical properties, their basis for recommended intakes, how to track and assess food intake and diet composition.

Essential (indispensable) nutrients

Amino Acids

Histidine	Lysine	Threonine
Isoleucine	Methionine	Tryptophan
Leucine	Phenylalanine	Valine

Fatty Acids

α -Linolenic	Linoleic
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Minerals

Calcium	Magnesium	Potassium
Chloride	Phosphorus	Sodium

Trace minerals

Chromium	Iron	Selenium
Copper	Manganese	Zinc
Iodine	Molybdenum	

Ultratrace elements

Arsenic	Cobalt	Silicon
Boron	Nickel	Vanadium

Vitamins and choline (which is an essential vitamin-like nutrient)

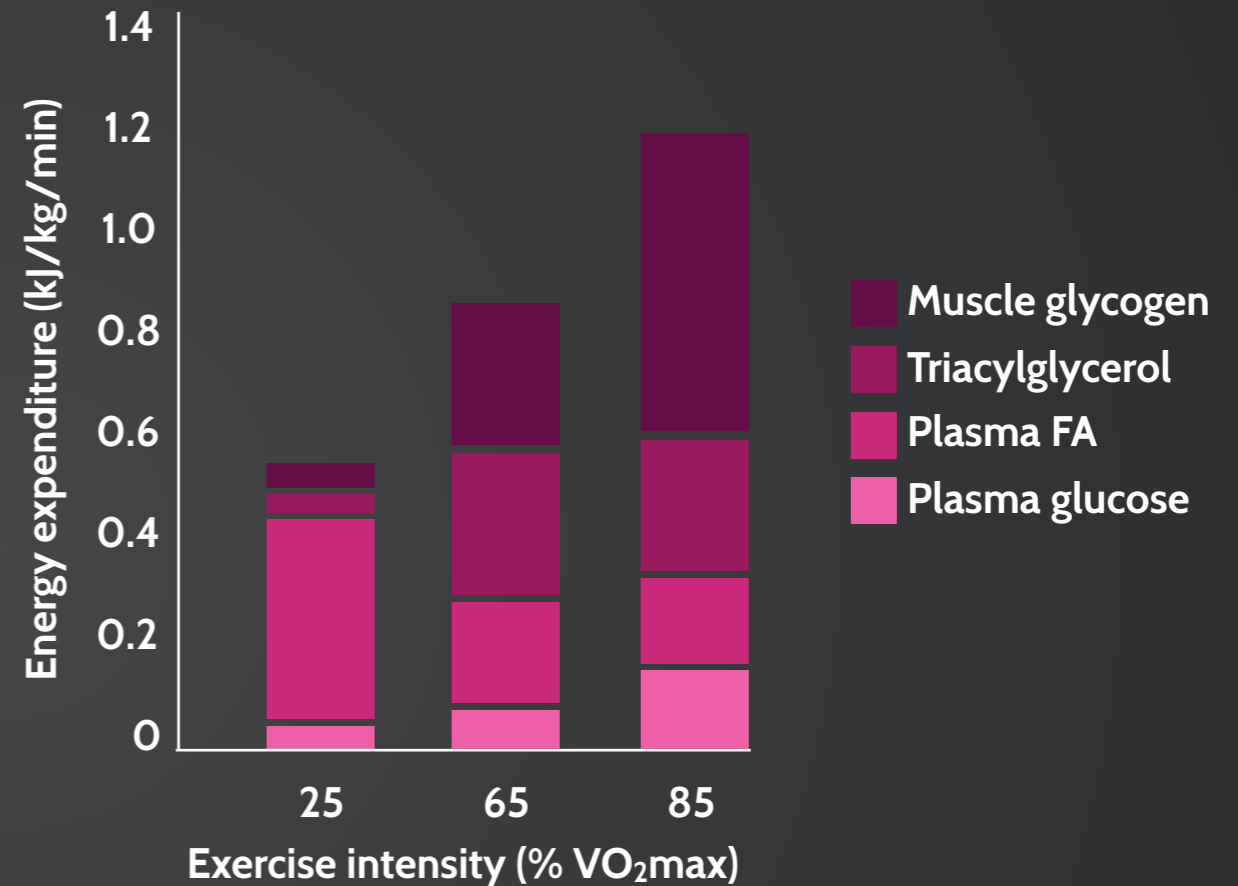
Biotin	Riboflavin	Vitamin C (ascorbic acid)
Choline	Thiamin	Vitamin D
Folic acid	Vitamin A	Vitamin E
Naicin	Vitamin B ₆ (pyridoxine)	Vitamin K
Pantothenic acid	Vitamin B ₁₂ (cobalamin)	

Water

From Jeukendrup and Glesson, *Sports Nutrition 3rd Edition* (2018)

Energy sources of Muscular Activity

You will learn about the structure of skeletal muscle, the processes of muscle contraction and how various metabolic pathways provide fuel for muscle contraction during exercise.



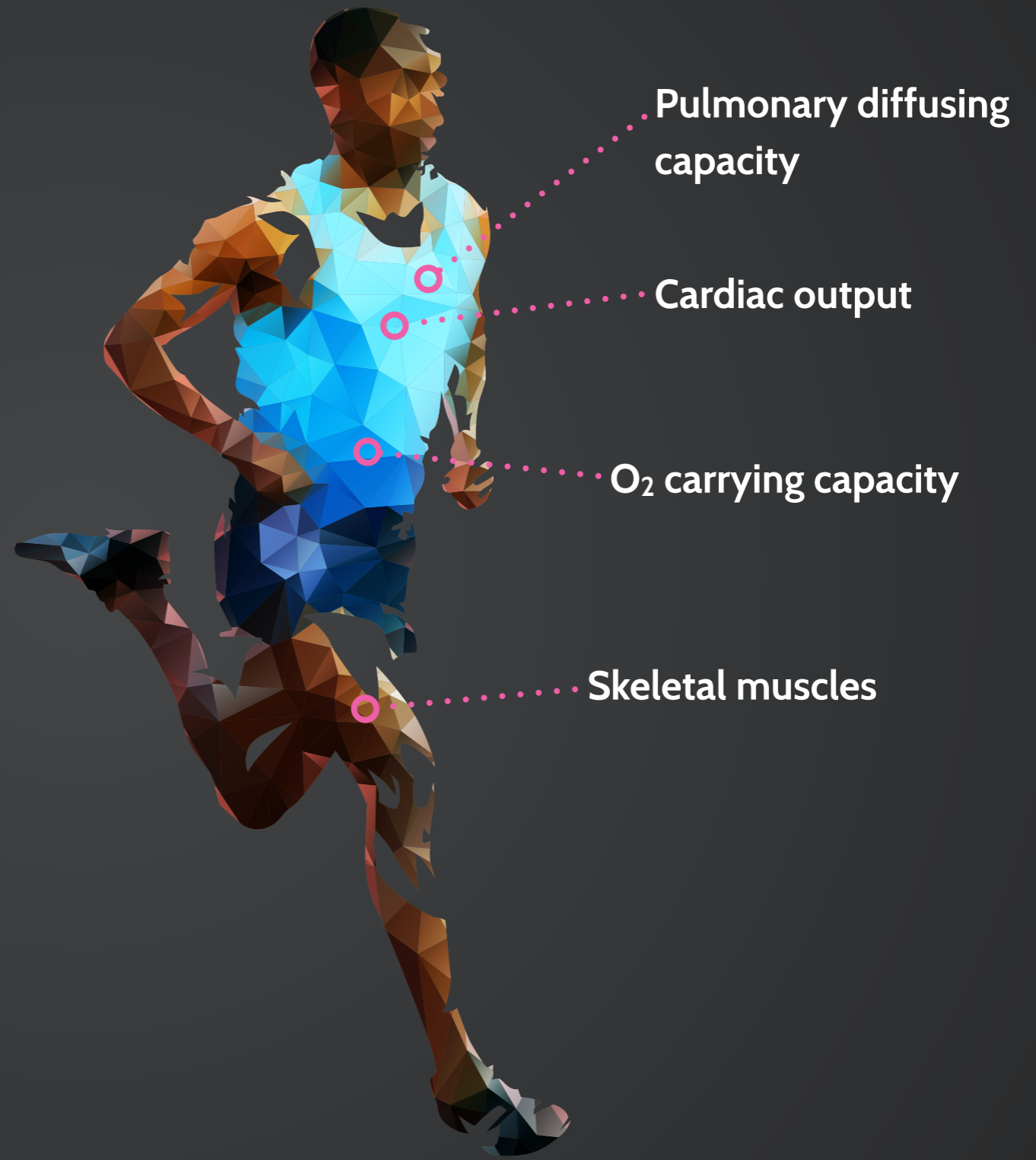
The contributions of different fuel sources to energy expenditure at three different exercise intensities

Based on Romijn et al. (1995)

Key topics addressed

Limiting factors for maximal oxygen uptake

You will learn about the history and current evidence for what the limiting factors are for enhanced aerobic performance.

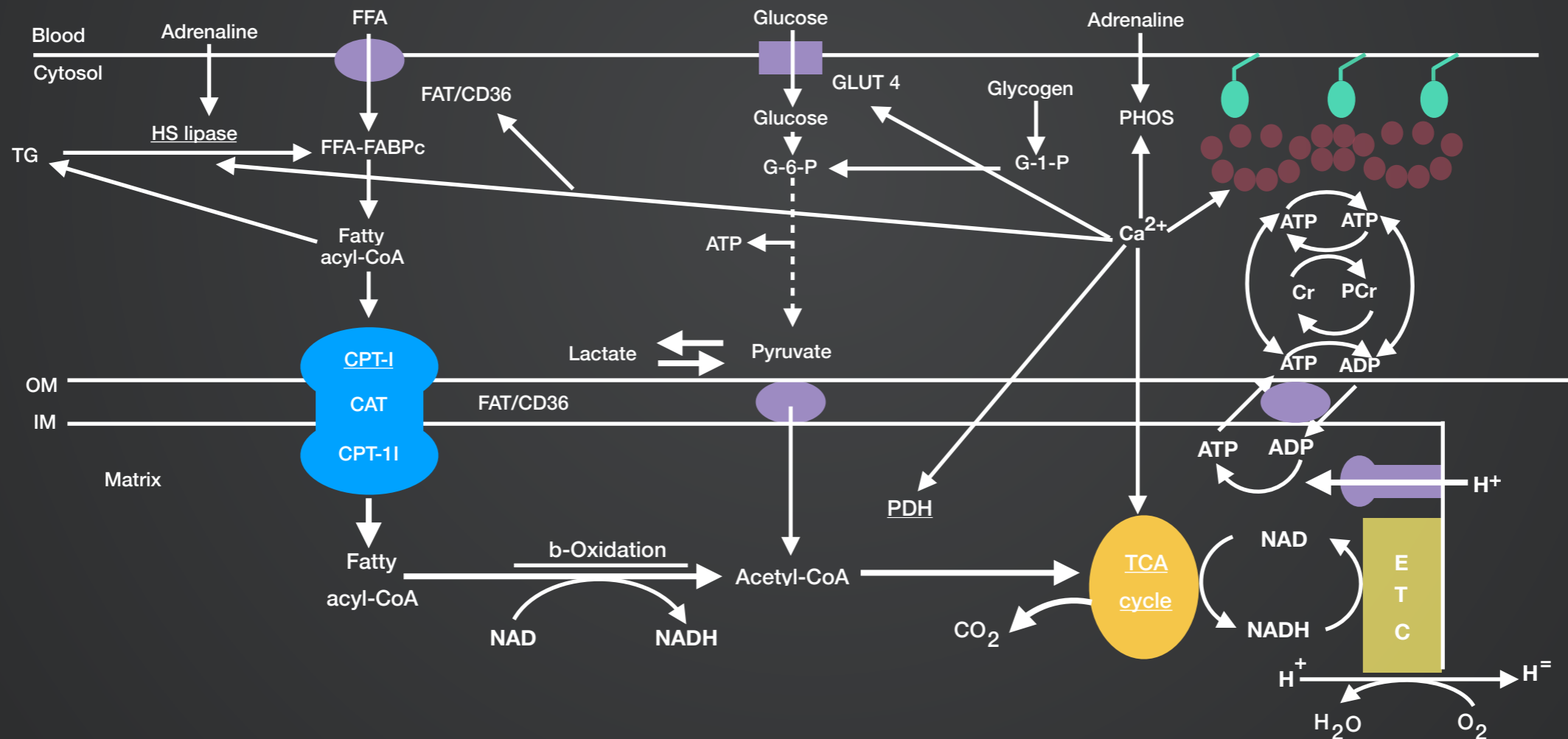


Based on Bassett and Howley (2000)

Key topics addressed

Metabolic regulation

You will be introduced to how specific enzymes and hormones influence metabolic pathways that provide energy to exercising muscle

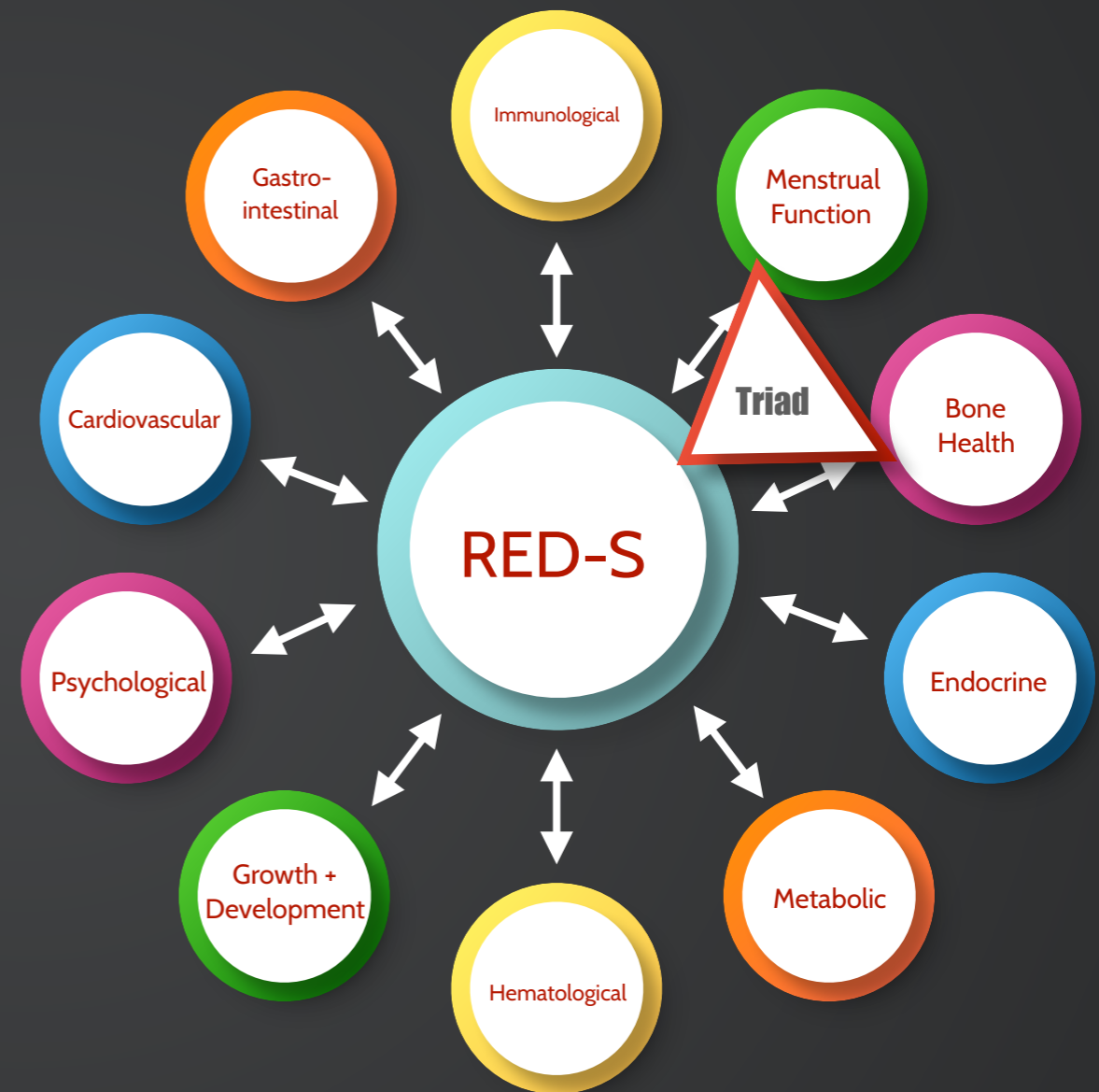


From MacLaren & Morton, *Biochemistry for sport and exercise metabolism* (2012)

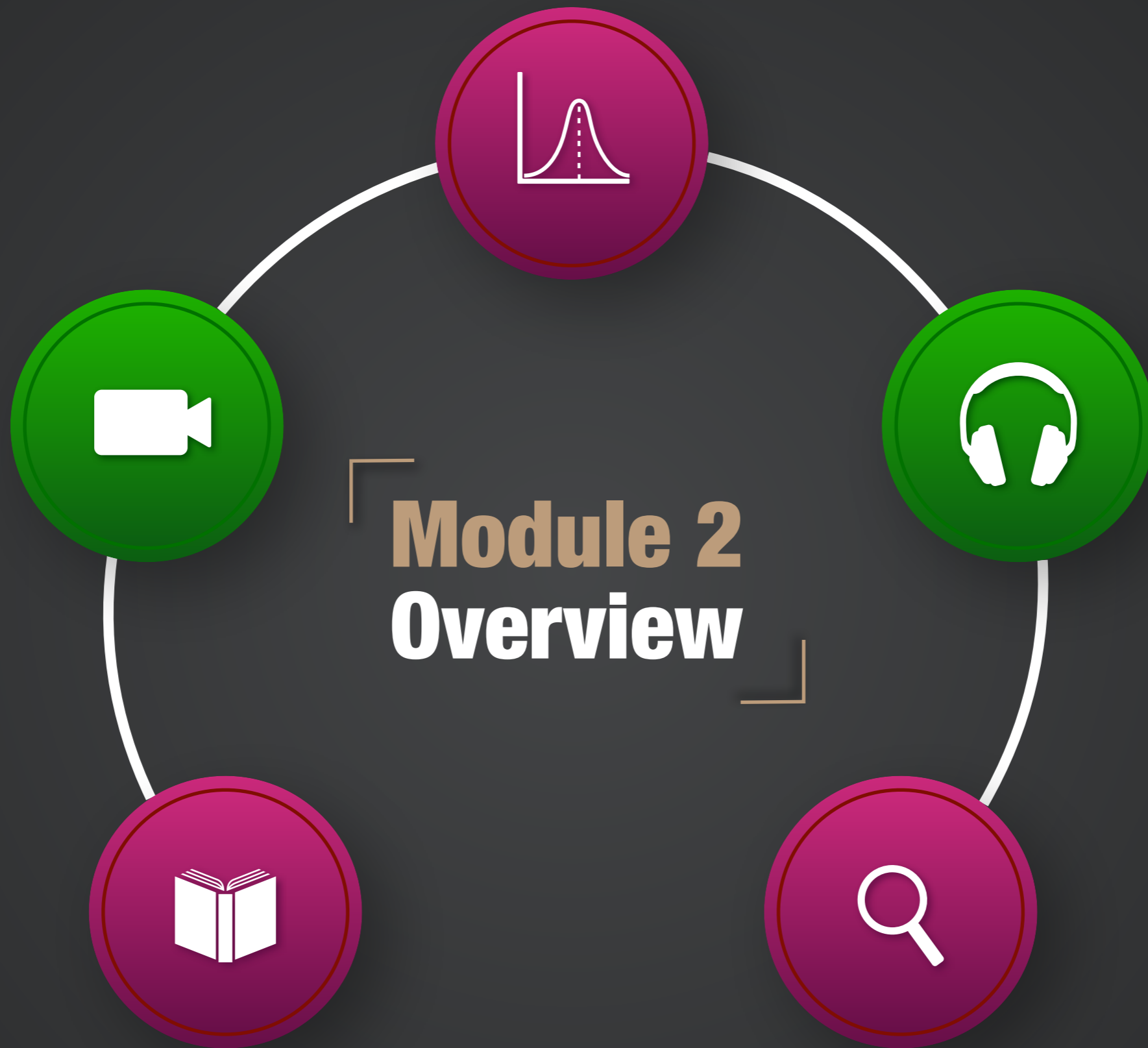
Key topics addressed

Relative energy deficiency in sport (RED-S)

You will learn about energy availability and the concept 'Relative Energy Deficiency in Sport' (RED-S) and how this impacts health and sports performance.



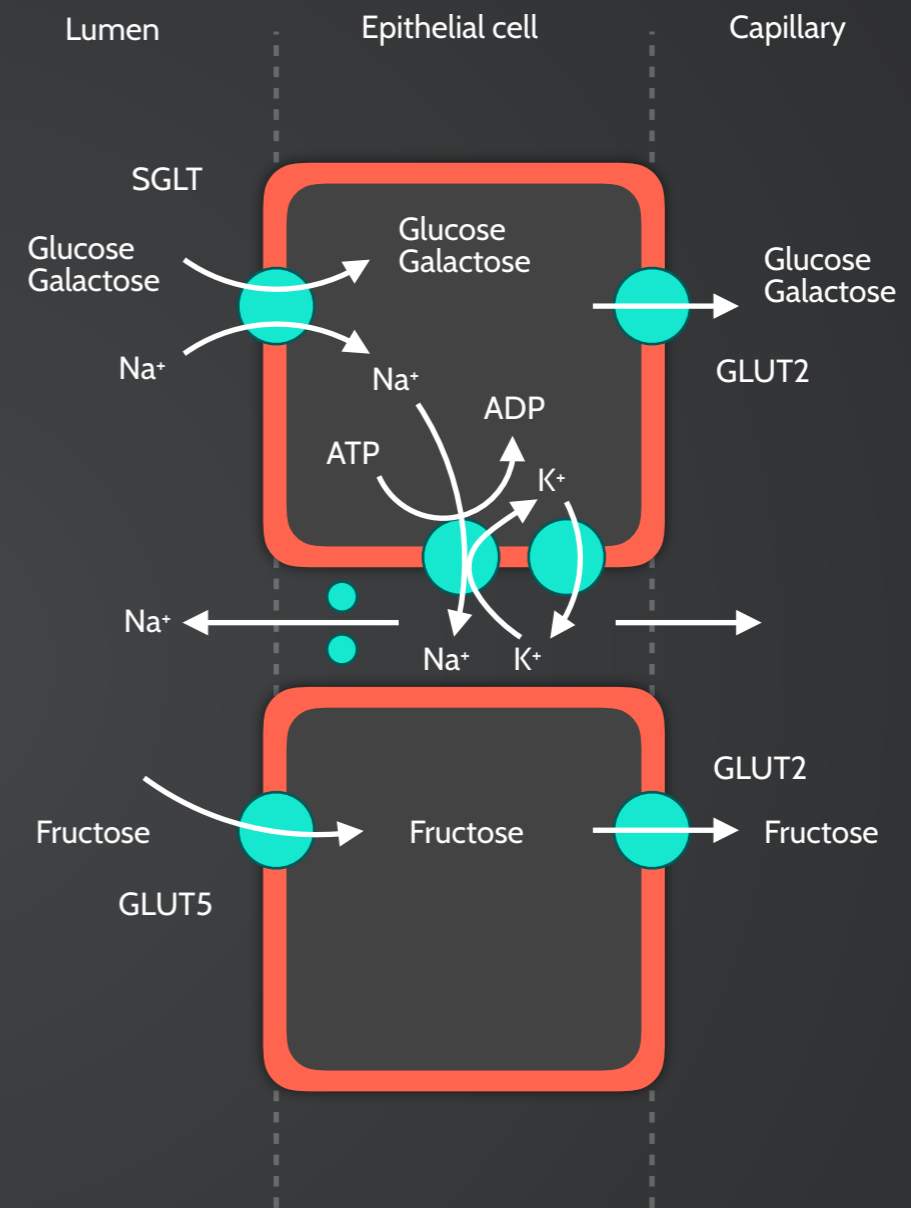
Based on Mountjoy et al. (2014)



Key topics addressed

Gastric Emptying, Digestion and Absorption

You will learn about the digestion and absorption processes of carbohydrate, fats and proteins and how exercise influences gastric emptying and absorption.



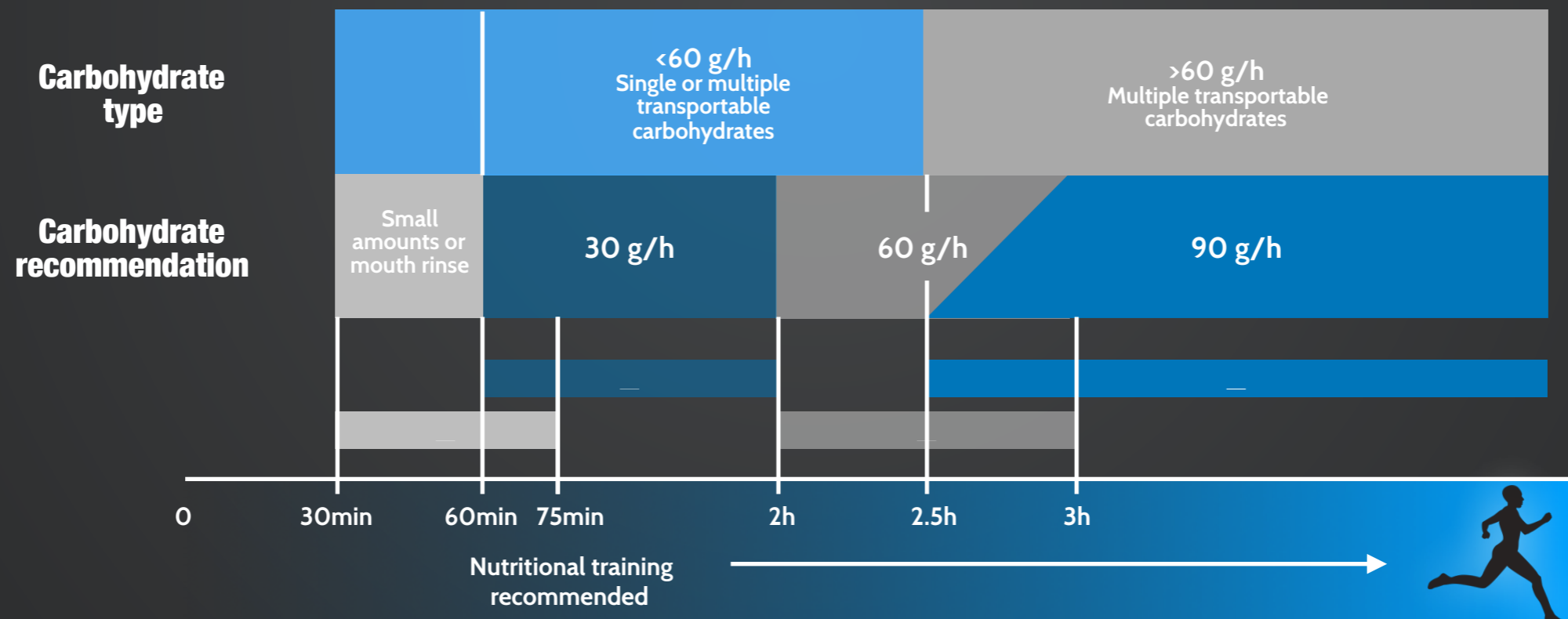
Absorption of carbohydrate

From Jeukendrup and Glesson, *Sports Nutrition 3rd Edition*

Key topics addressed

Carbohydrates - Pathways, Regulation & Requirements

You will learn about the main biochemical pathways within carbohydrate metabolism, the factors that determine its regulation and requirements for a variety of sports-specific events.

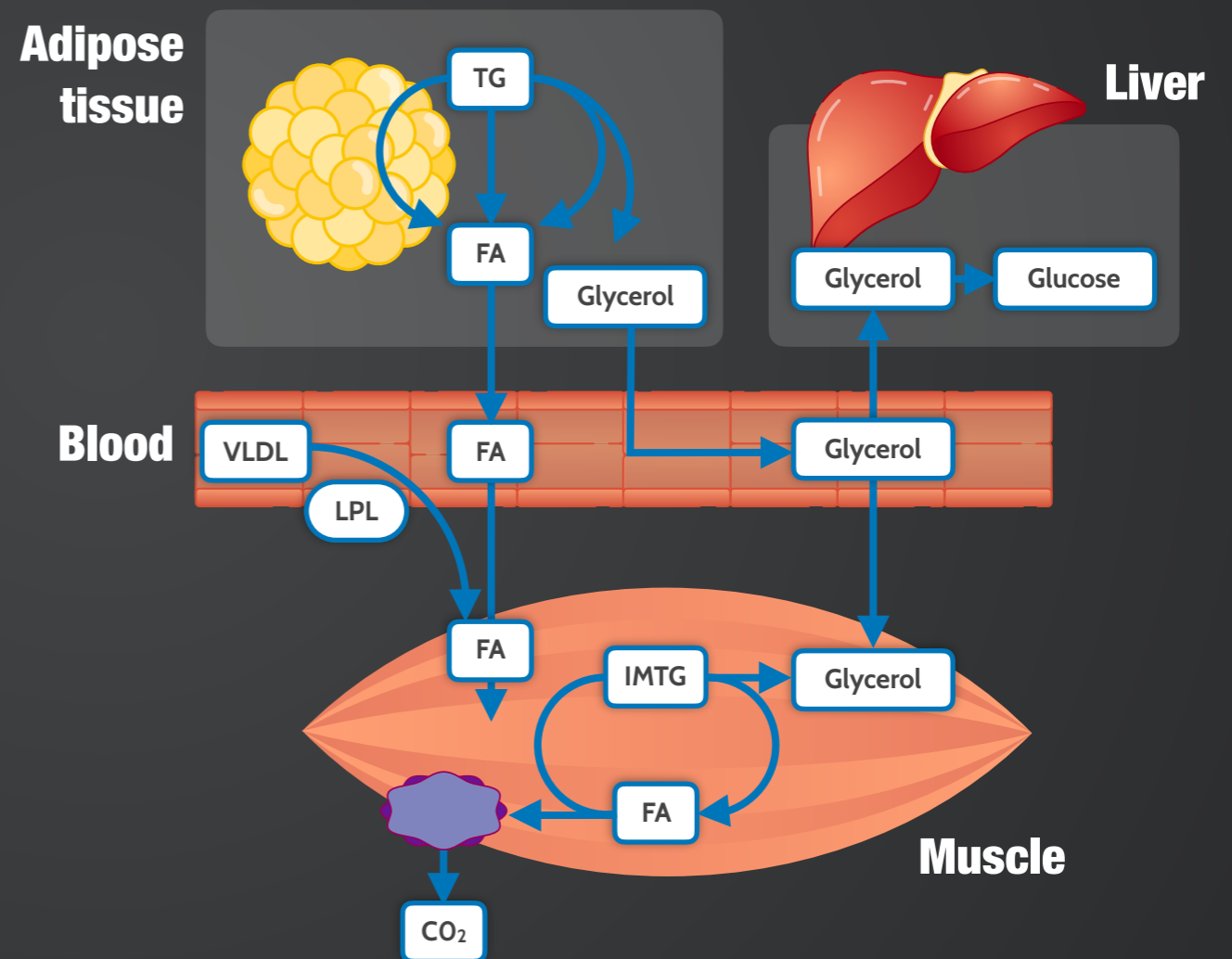


From Jeukendrup and Gleeson, *Sports Nutrition 3rd Edition*

Key topics addressed

Fats - Pathways, Metabolism, & Regulation

You will learn about the main biochemical pathways within fat metabolism, the key factors that influence its regulation, and the metabolic and performance effects of short and long-term high fat diets.

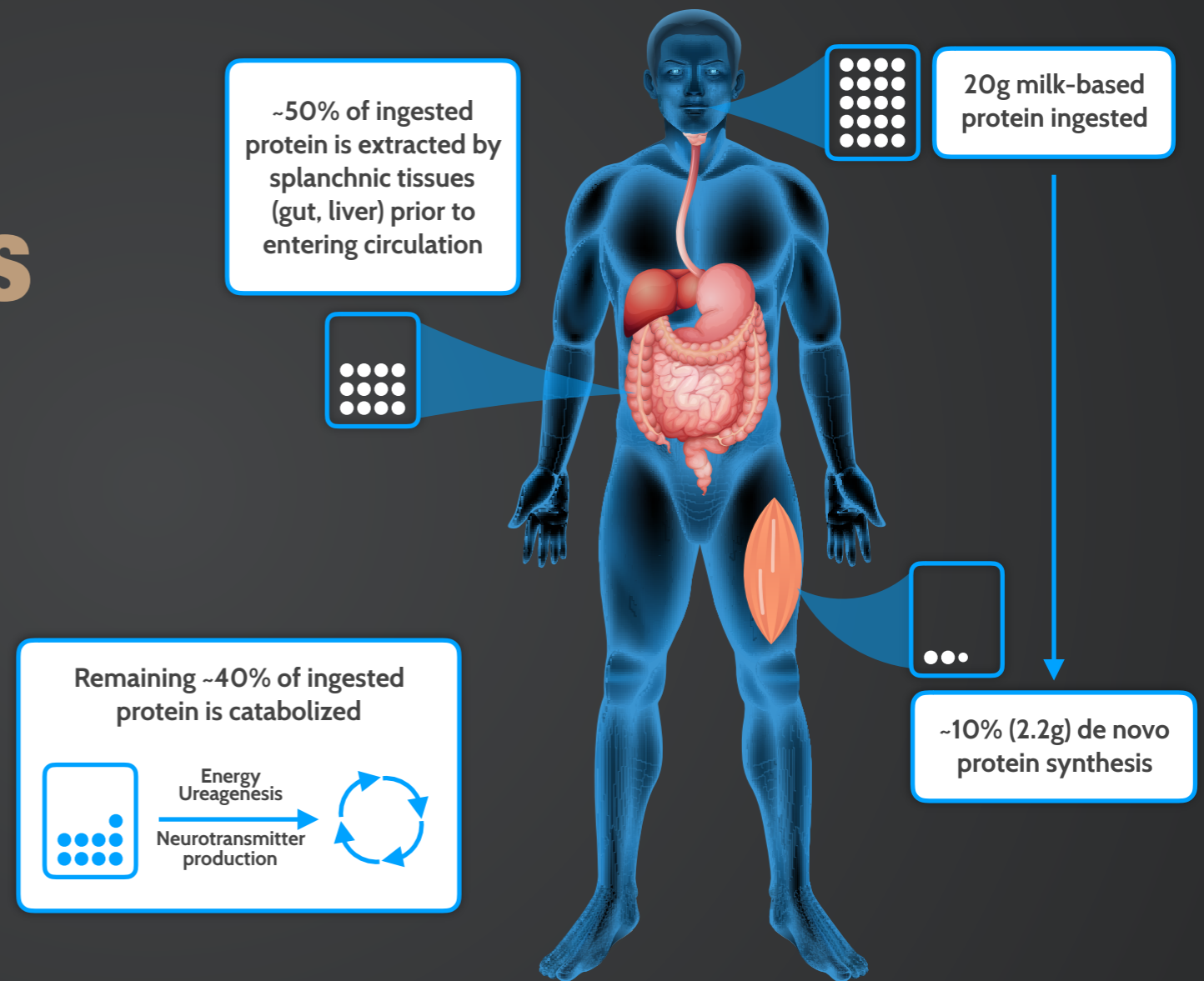


From Jeukendrup and Glesson, *Sports Nutrition 3rd Edition*

Key topics addressed

Protein & Amino Acids- Metabolism, Regulation & Recommendations

You will learn about protein and amino acid metabolism, and how training, feeding, timing, and the composition of protein-rich meals impact protein balance.

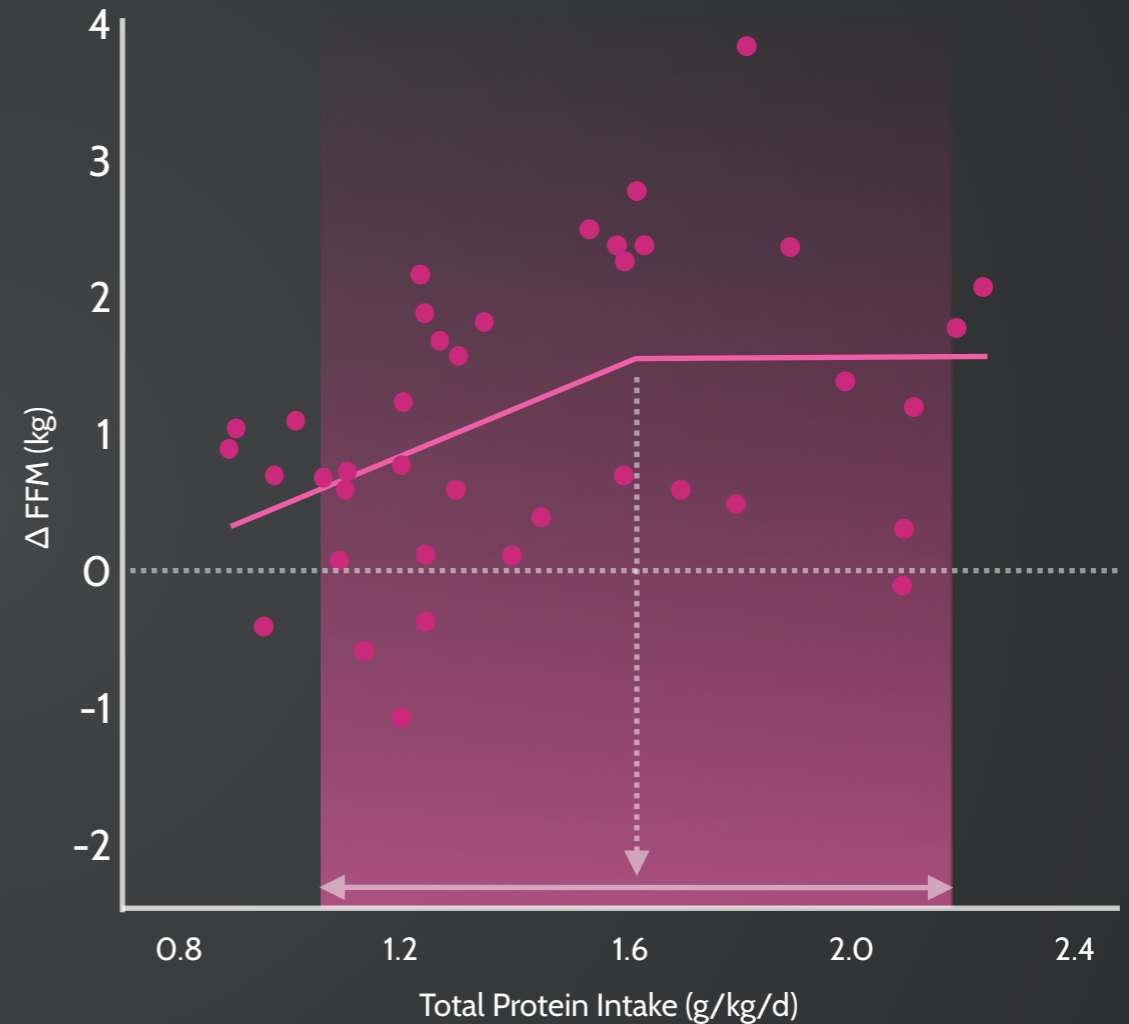


Based on Stokes et al. (2018)

Key topics addressed

Protein - Recommendations for Strength and Endurance Athletes

You will learn about current protein guidelines for strength and endurance athletes.

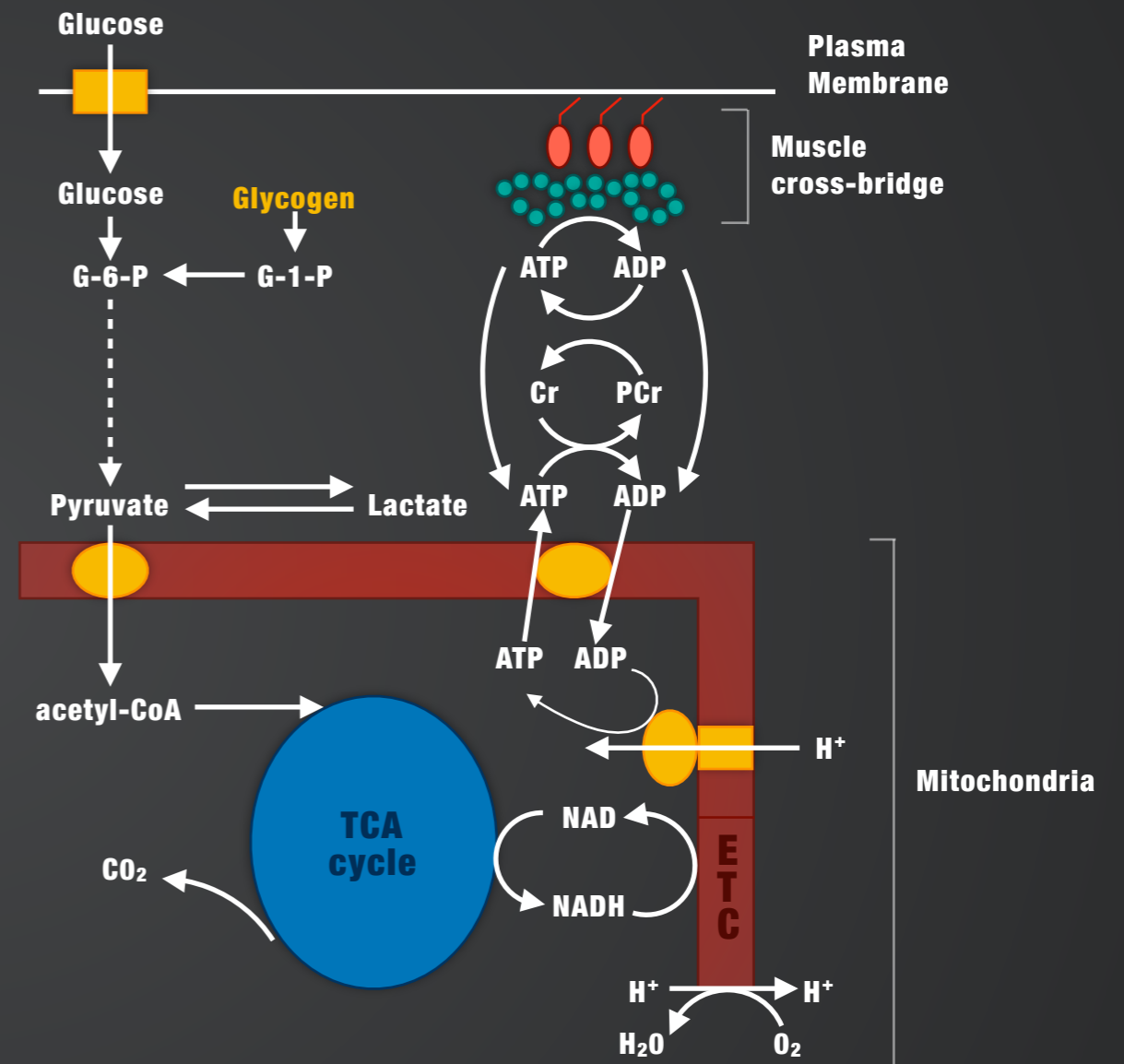


Based on Morton et al. (2018)

Key topics addressed

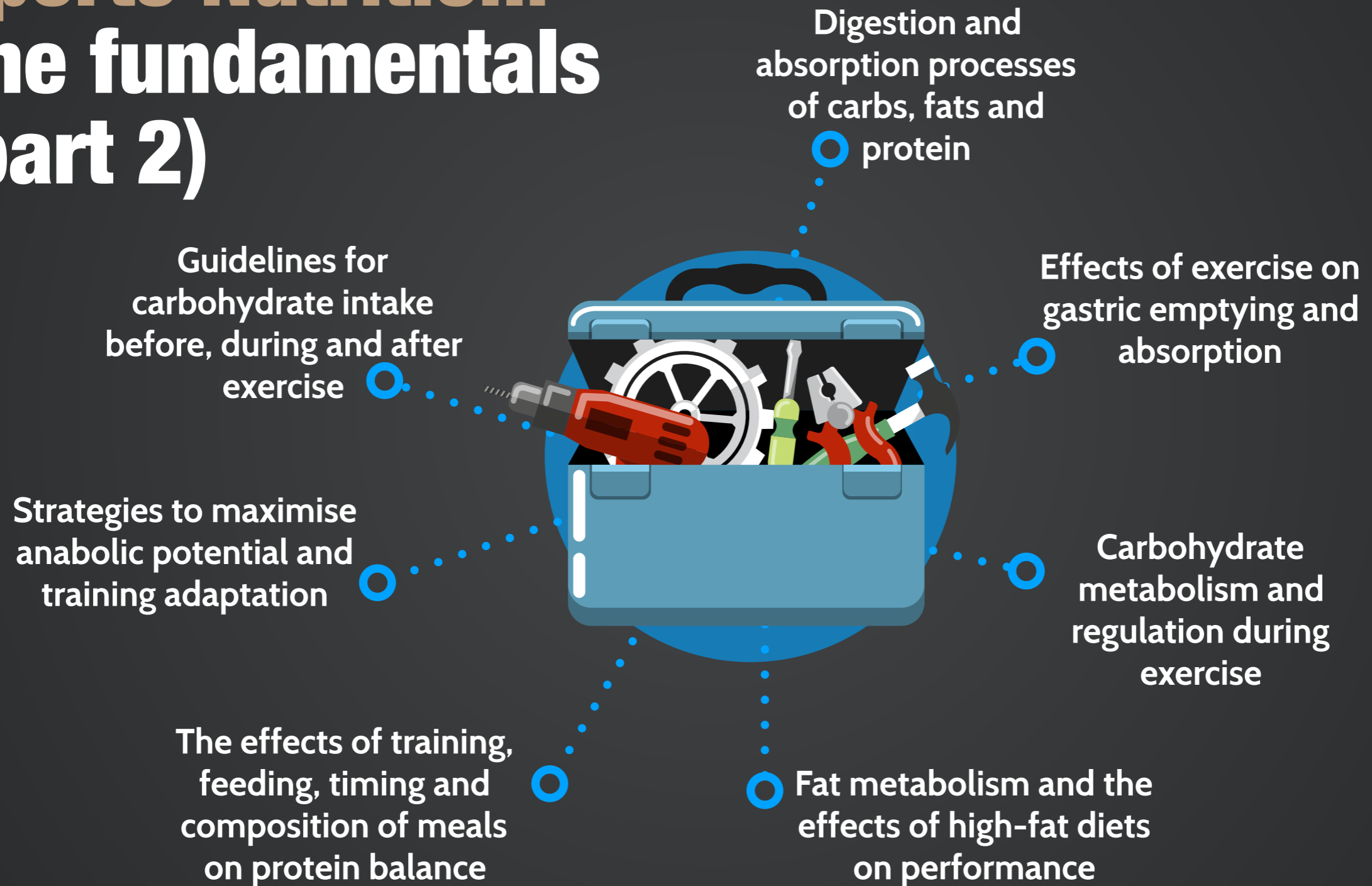
Muscle & Liver Glycogen - Regulation during exercise

You will learn about the regulation of muscle and liver glycogen during exercise.



From MacLaren & Morton, *Biochemistry for sport and exercise metabolism* (2012)

Sports Nutrition: The fundamentals (part 2)

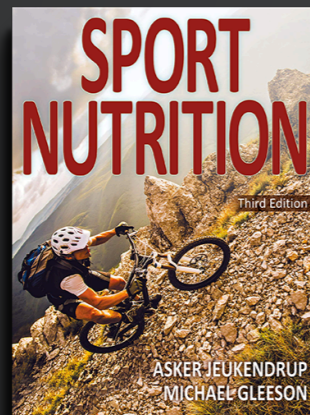
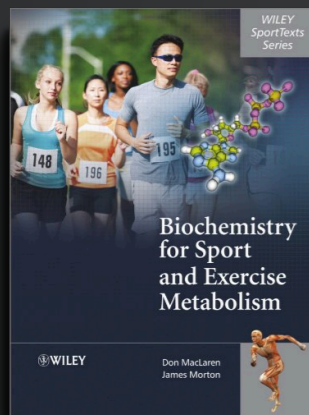




Module 2: Textbook topics

Text book: Sports Nutrition 3rd Edition (Human Kinetics)

- > Gastric Emptying, Digestion, and Absorption
- > Carbohydrate
- > Fat
- > Protein and Amino Acids



Text book: Biochemistry for Sport and Exercise Metabolism (Wiley-Blackwell)

- > Proteins
- > Carbohydrates
- > Lipids



Module 2: Lecture videos

- **Fuelling Exercise Part 1** – Prof Craig Sale
- **Fuelling Exercise Part 2** – Prof Craig Sale
- **Carbohydrate metabolism and supplementation** – Prof James Betts
- **The Wondrous Properties of Carbohydrates**– Prof James Morton
- **Glycogen Re-Synthesis: From Biochemistry to Practical Application** – Prof James Morton
- **Glycogen Metabolism - Cause of Fatigue and/or training regulator?** – Prof James Morton
- **Role of Protein Supplementation in Augmenting Gains in Muscle Mass**– Prof Stuart Phillips
- **Protein Requirements versus Recommendations for Athletes** – Prof Kevin Tipton
- **Beyond Muscle Hypertrophy: Protein Nutrition in Endurance Athletes**– Dr Leigh Breen
- **The Muscle Anabolic Potential of Leucine** – Dr Leigh Breen
- **Dietary Protein and Bone: Zero or Hero?** – Prof Craig Sale
- **Fat Oxidation during Exercise** – Dr Scott Robinson
- **IMTG in Exercise and Health** – Dr Scott Robinson
- **Exercise and the GI System**– Dr Gethin Evans
- **The Athlete's Gut**– Stephen Smith PHD (c)

Module 2 lecturers

Your lecturers

Our course is delivered by the IOPN team and an impressive selection of guest experts who are typically world leading researchers and practitioners in the field of Sports and Exercise Nutrition.



Dr Craig Sale

Professor of
Human Physiology
Nottingham Trent University



Dr James Morton

Professor of Exercise
Metabolism and Nutrition
Liverpool John Moores University,
Team Sky



Dr Leigh Breen

Senior Lecturer in Exercise
Physiology and Metabolism
University of Birmingham



Dr Stuart Phillips

Professor in Kinesiology
McMaster University



Dr Gethin Evans

Principal Lecturer in
Healthcare Science
Manchester Metropolitan University



Dr Kevin Tipton

Professor of Sport, Health
and Exercise Science
University of Durham

Learning targets

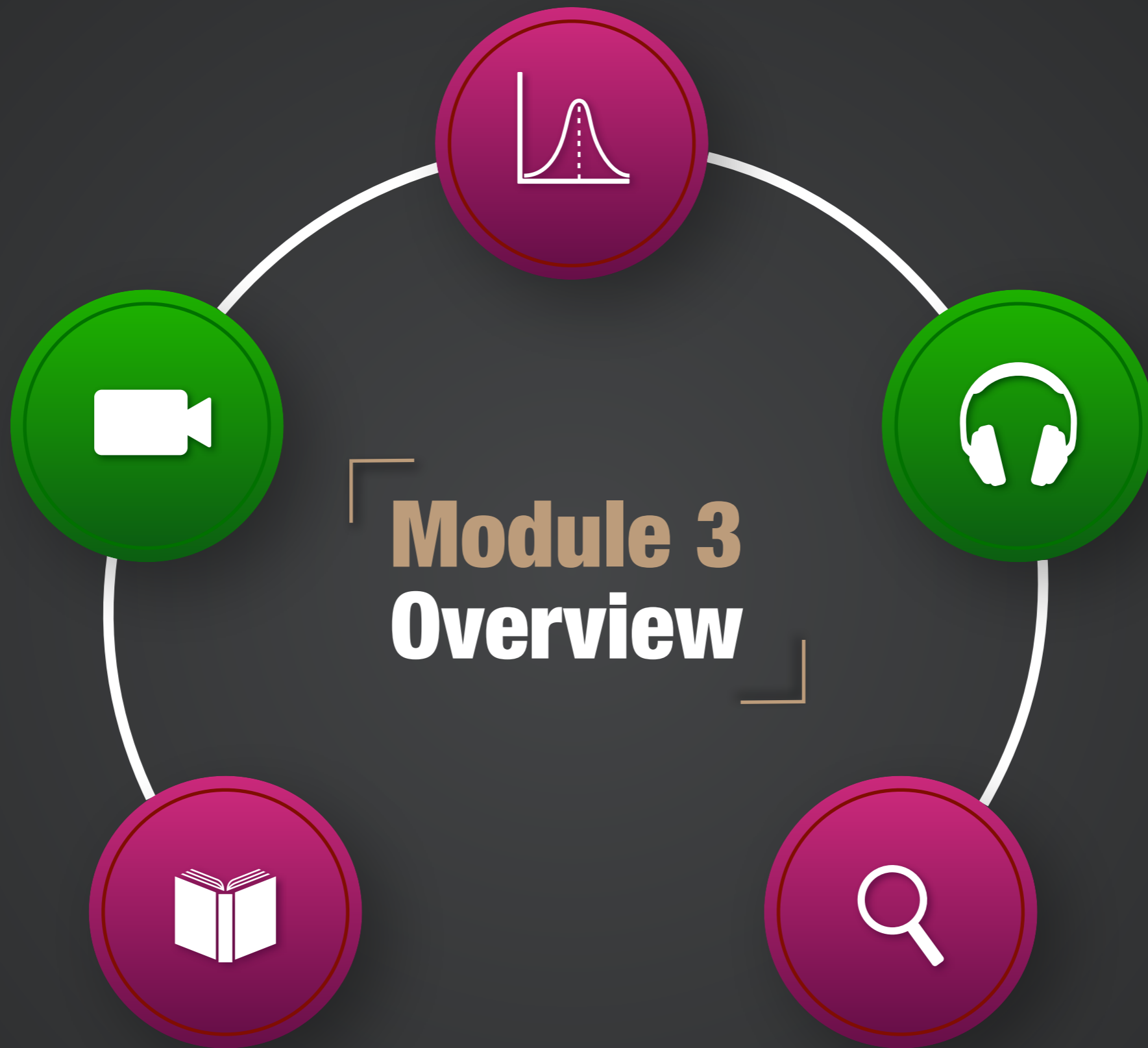
All reading material and questions finished (estimated time per day ~45 minutes, five days per week)

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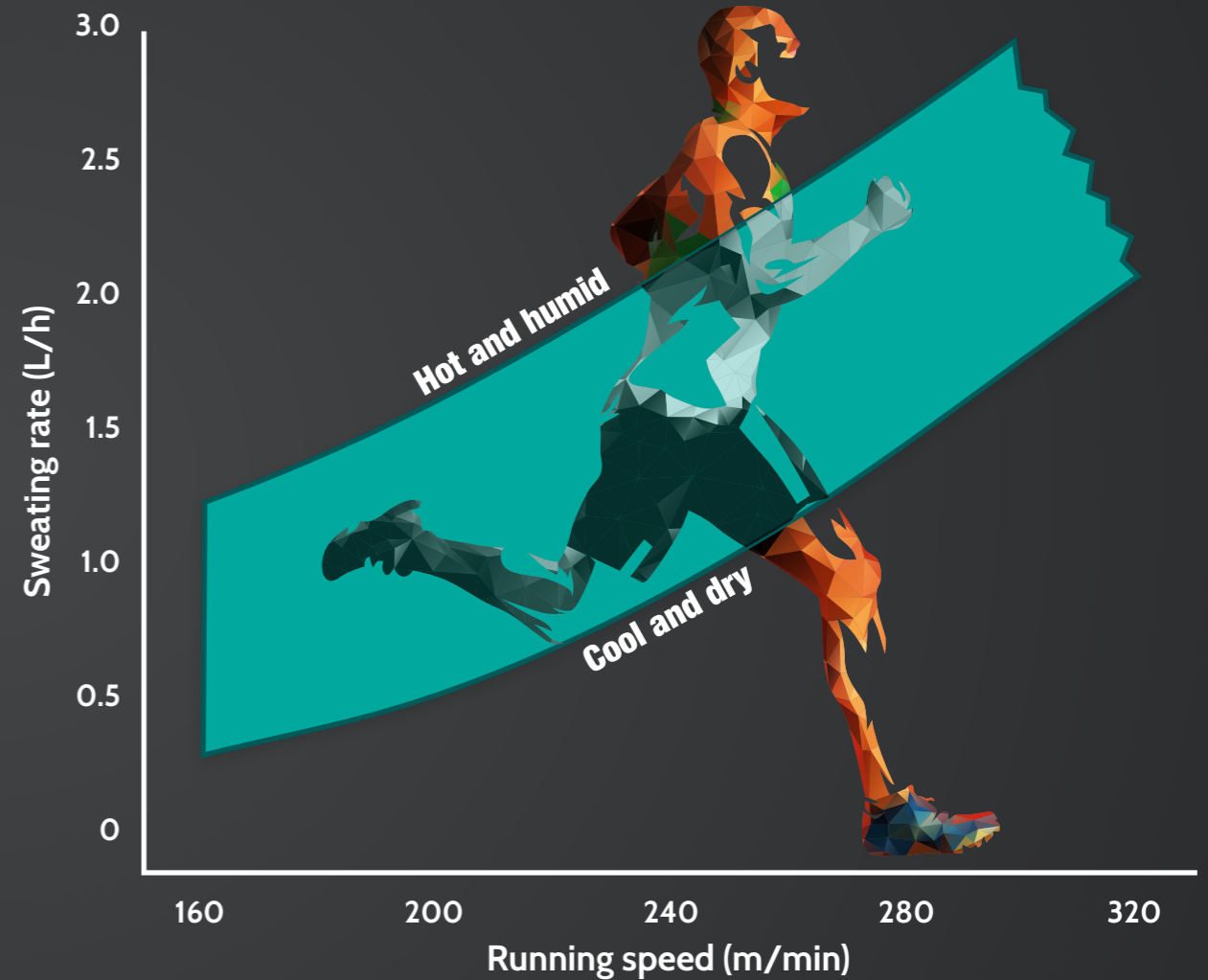
Move on to Module 3!



Key topics addressed

Water Requirements, and Fluid Balance

You will learn about the effects of dehydration on exercise performance, and intake strategies to ensure the environmental and sport-specific fluid requirements of an athlete are met.

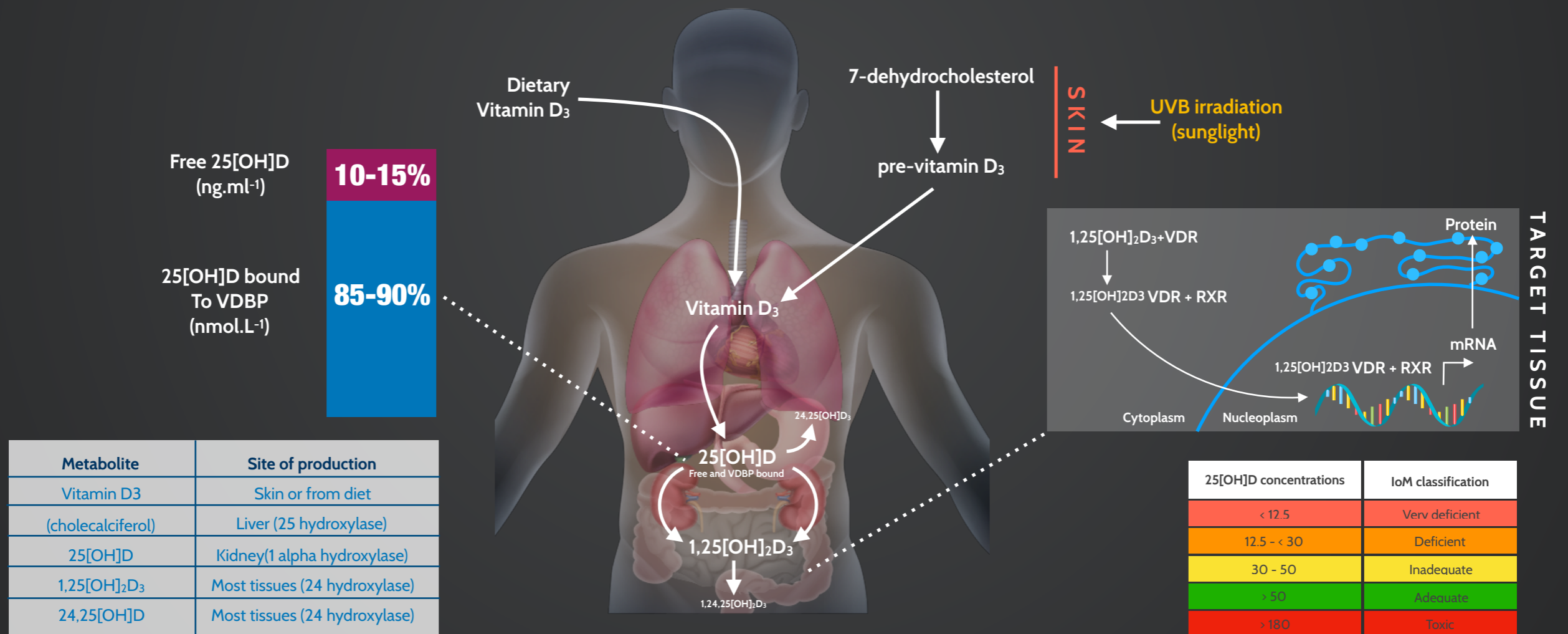


From Evans et al. (2017)

Key topics addressed

Vitamins and Minerals

You will learn about the vitamins and minerals required to maintain health, the roles of micronutrients on growth and tissue repair, and the effects of exercise on micronutrient requirements and athletes susceptible to deficiency.



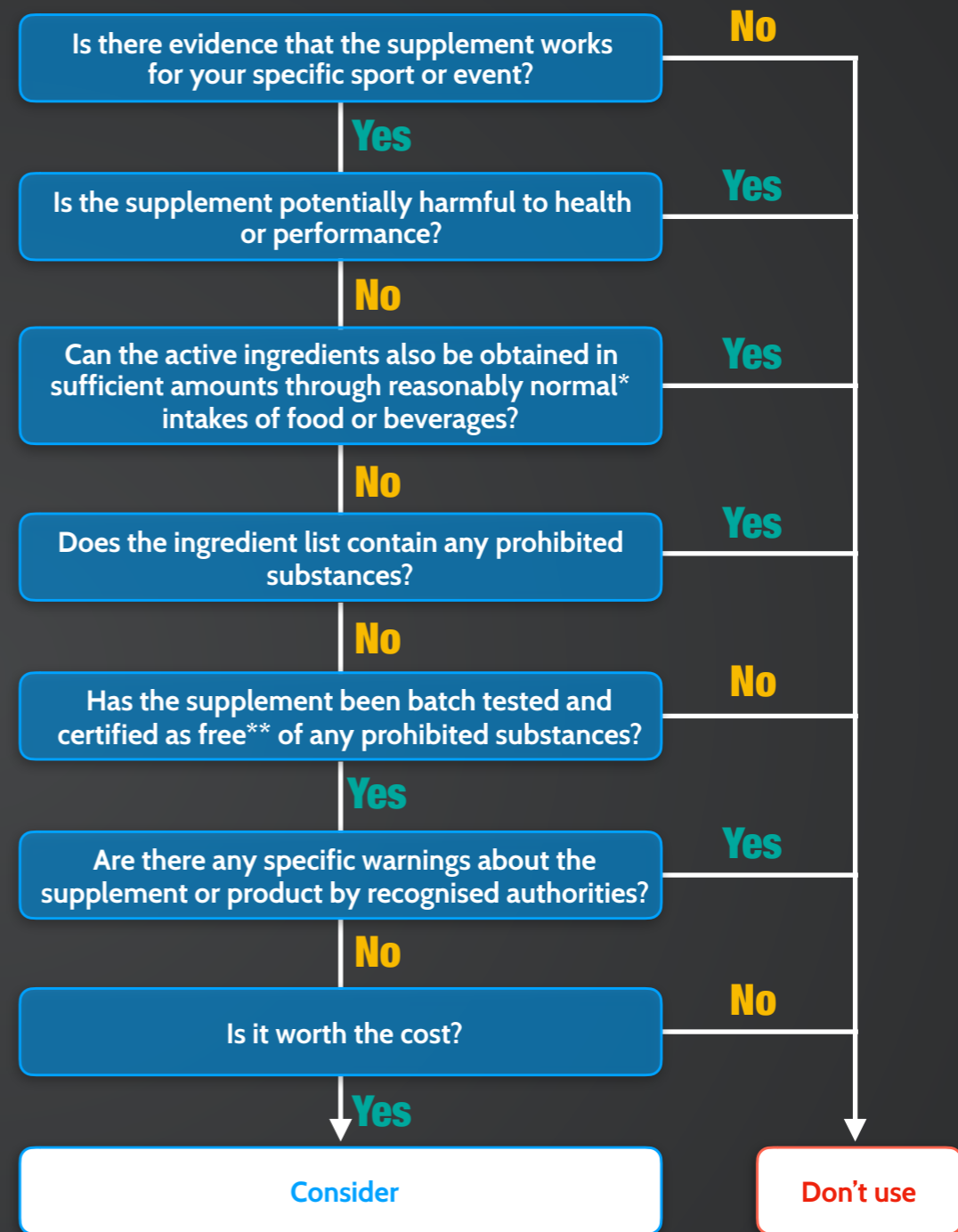
From Owens, Allison and Close (2018)

Key topics addressed

Nutrition Supplements

You will learn about the practical relevance of research findings on sports supplements, which supplements have ergogenic potential and what policies and procedures need to be implemented to adhere to the requirements of UK Anti Doping (UKAD).

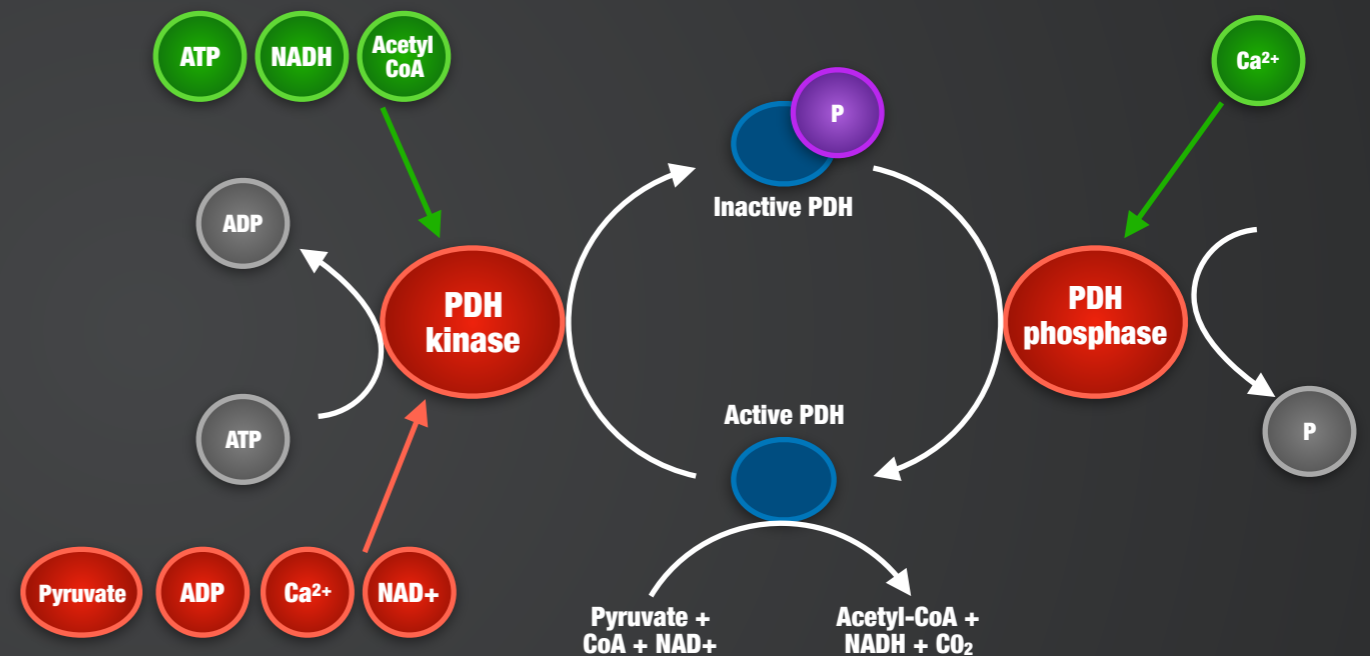
Becoming a UKAD advisor is a mandatory requirement to pass Module 3



From Jeukendrup and Gleeson, *Sports Nutrition 3rd Edition*

Metabolic Regulation: The Principles

You will learn about key hormones that regulate metabolic events in the cell, and important enzymes involved in metabolism which via their activation or inactivation influence fuel use in the exercising muscle.

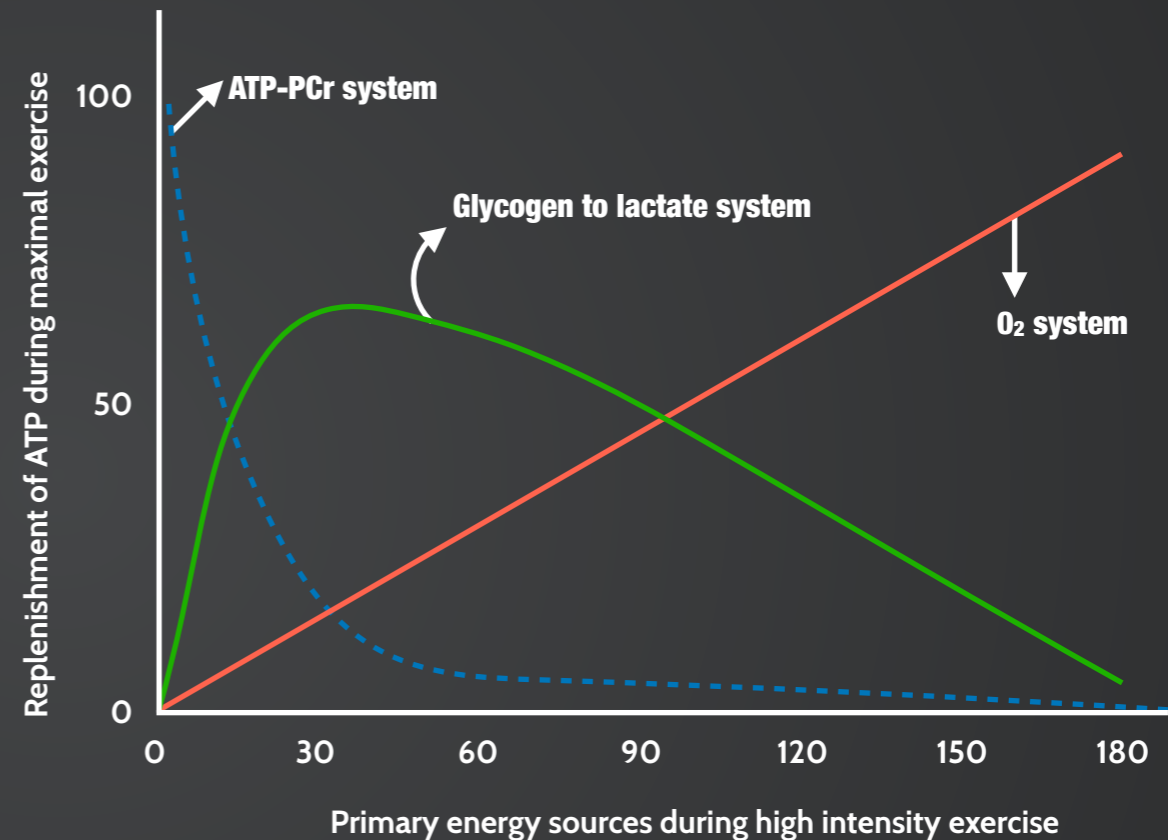


From MacLaren & Morton, *Biochemistry for sport and exercise metabolism* (2012)

Key topics addressed

High Intensity Exercise

You will learn about the main regulators of metabolism during high intensity exercise and potential ergogenic aids that influence high intensity exercise performance.

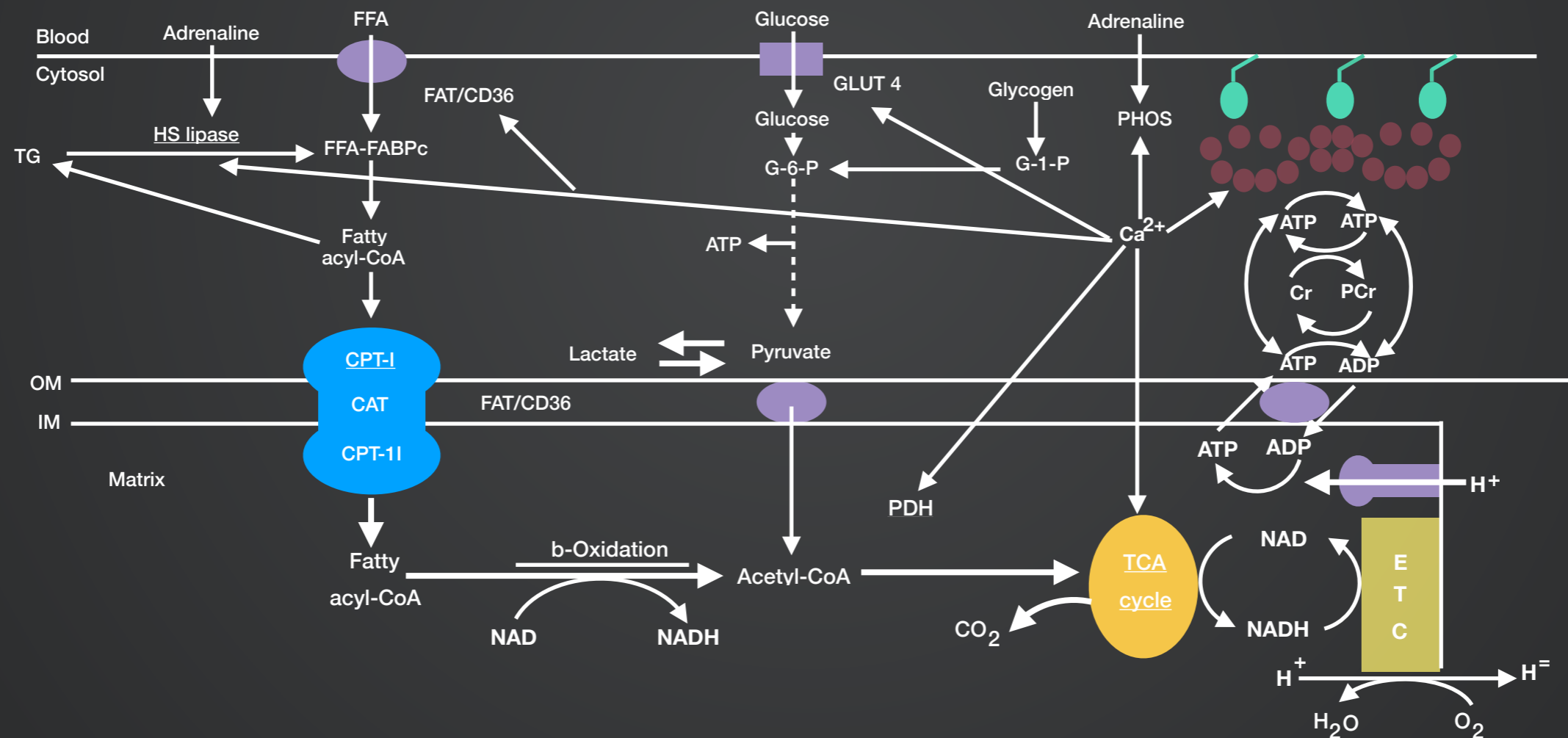


From MacLaren & Morton, *Biochemistry for sport and exercise metabolism* (2012)

Key topics addressed

Endurance Exercise

You will learn about the influence of energy production during endurance exercise, how exercise intensity, duration, nutrient availability and training status influence fuel use, and the potential metabolic causes of fatigue.



From MacLaren & Morton, *Biochemistry for sport and exercise metabolism* (2012)

Key topics addressed

High-Intensity Intermittent Exercise

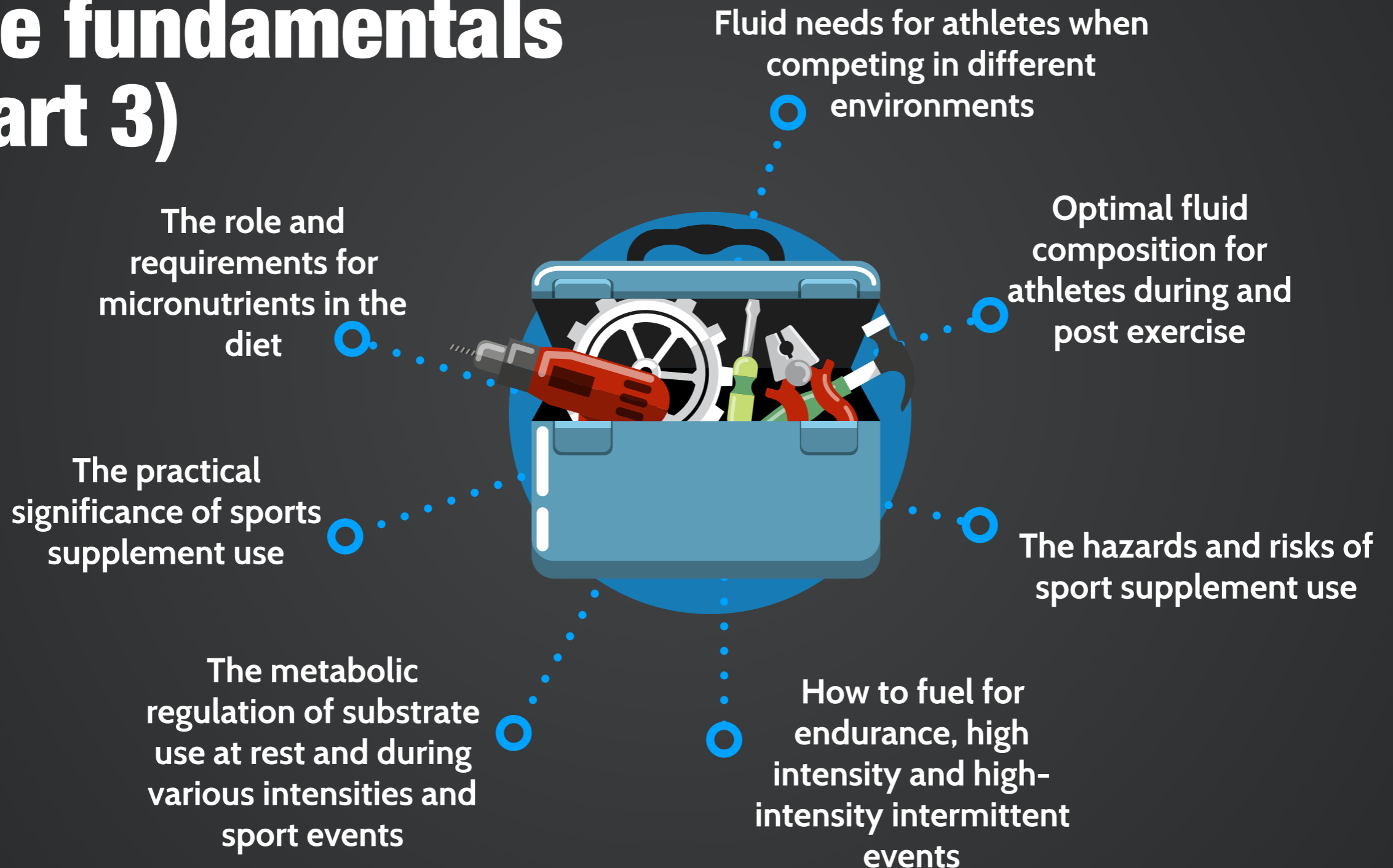
You will learn about the key reactions and regulators that determine fuel use during intermittent exercise, the impact of nutrition on substrate use and performance, and potential causes of fatigue during intermittent exercise.

	Normal carbohydrate	Low carbohydrate
Number of players	5	4
Muscle glycogen before the game	100%	50%
Muscle glycogen at half time	40%	7%
Muscle glycogen at end of match	10%	0%
Distance covered in 1st half	6,100m	5,600m
Distance covered 2nd half	5,900m	4,100m
Percent walking	27	50
Percent sprinting	24	15

Changes in muscle glycogen and distance covered during a football match
(adapted from Saltin, 1973)



Sports Nutrition: The fundamentals (part 3)

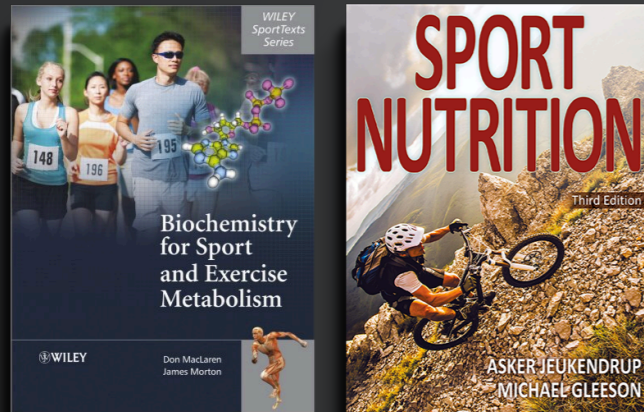




Module 3: Textbook topics

Text book: Sports Nutrition 3rd Edition (Human Kinetics)

- > Water requirements and fluid balance
- > Vitamins and Minerals
- > Nutrition and Supplements



Text book: Biochemistry for Sport and Exercise Metabolism (Wiley-Blackwell)

- > Principles of metabolic regulation
- > High-intensity exercise
- > Endurance exercise
- > High intensity intermittent exercise



Module 3: Lecture videos

- **Fluid Balance and Exercise** – Dr Gethin Evans
- **Optimising Post-Exercise Hydration** – Dr Lewis James
- **Dehydration and Exercise Performance** – Dr Lewis James
- **Shedding Some Light on Vitamin D**– Dr Daniel Owens
- **Molecular Action of Fatty Acids in Skeletal Muscle**– Dr Leigh Breen
- **To Supplement or Not to Supplement?** – Dr Craig Sale
- **An Update on Buffering Agents for Sports Performance**– Dr Craig Sale
- **Creatine**– Dr Craig Sale
- **Caffeine**– Dr Craig Sale
- **Dietary Nitrate & Exercise Performance** – Prof Andy Jones
- **An Introduction To Cell Signalling**– Dr Lee Hamilton
- **Metabolic Regulation in Sport & Exercise** – Dr Scott Robinson
- **Metabolic Regulation in High Intensity Exercise** – Dr Scott Robinson
- **Metabolic Regulation in High-Intensity Intermittent Exercise**– Prof James Morton
- **Carbohydrates for endurance exercise: how do they work and what is the best source?**–Dr Javier Gonzalez
- **Concurrent Training: Nutritional Strategies**–Prof James Morton

Module 3 lecturers

Your lecturers

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Dr Craig Sale

Professor of
Human Physiology
Nottingham Trent University



Dr Lewis James

Senior Lecturer in Nutrition
Loughborough University



Dr James Morton

Professor of Exercise
Metabolism and Nutrition
Liverpool John Moores University,
Team Sky



Dr Javier Gonzalez

Senior Lecturer in Human
Physiology
University of Bath



Dr Andrew Jones

Professor of Applied
Physiology
University of Exeter



Dr Leigh Breen

Senior Lecturer in Exercise
Physiology and Metabolism
University of Birmingham

Learning targets

All reading material and questions finished (estimated time per day ~45 minutes, five days per week)

Hand over written case study for grading



All lecture videos finished and case study finalised (estimated time per day ~45 minutes, five days per week)

Move on to Module 4!

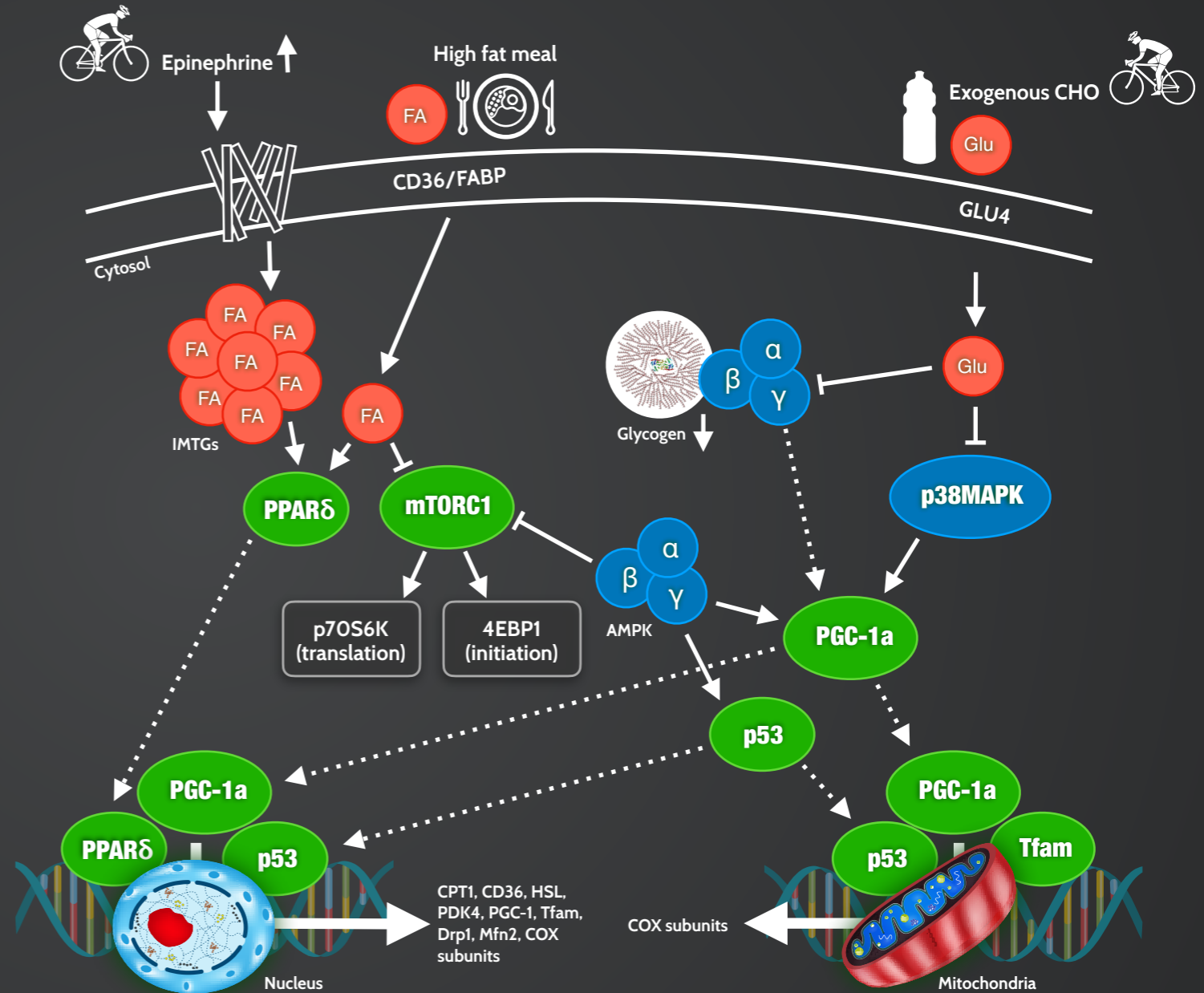


Key topics addressed

Nutrition and Training Adaptation

Big structures, tiny machines

You will learn about the outstanding plasticity of skeletal muscle, and the key factors that influence its adaptation to exercise and nutrition

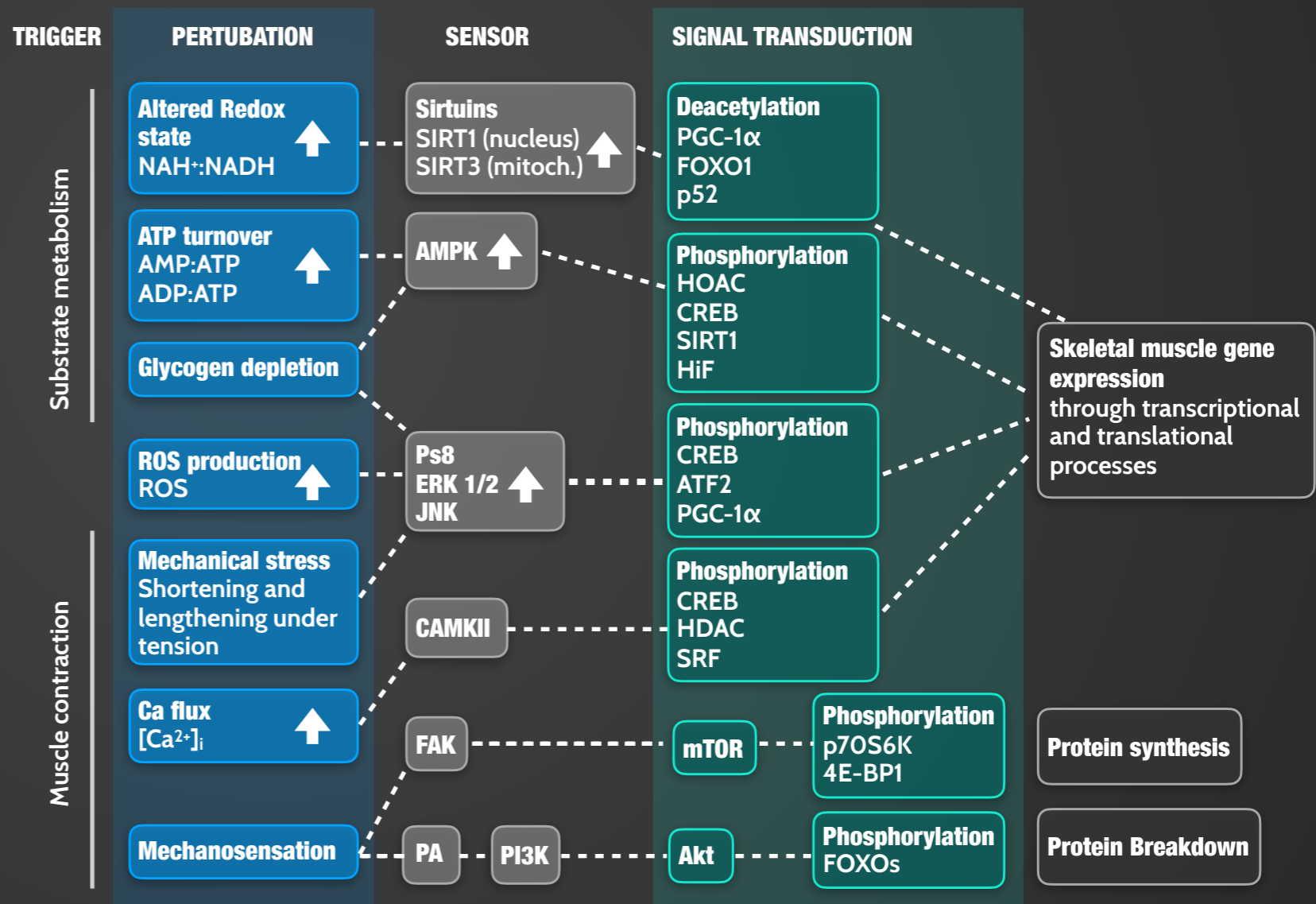


Adapted from Impey et al. (2018)

Key topics addressed

Mechanical, Metabolic and Molecular Regulators of Training Adaptation

You will learn about the metabolic triggers and key molecular signals that mediate the adaptations of the muscle to exercise.

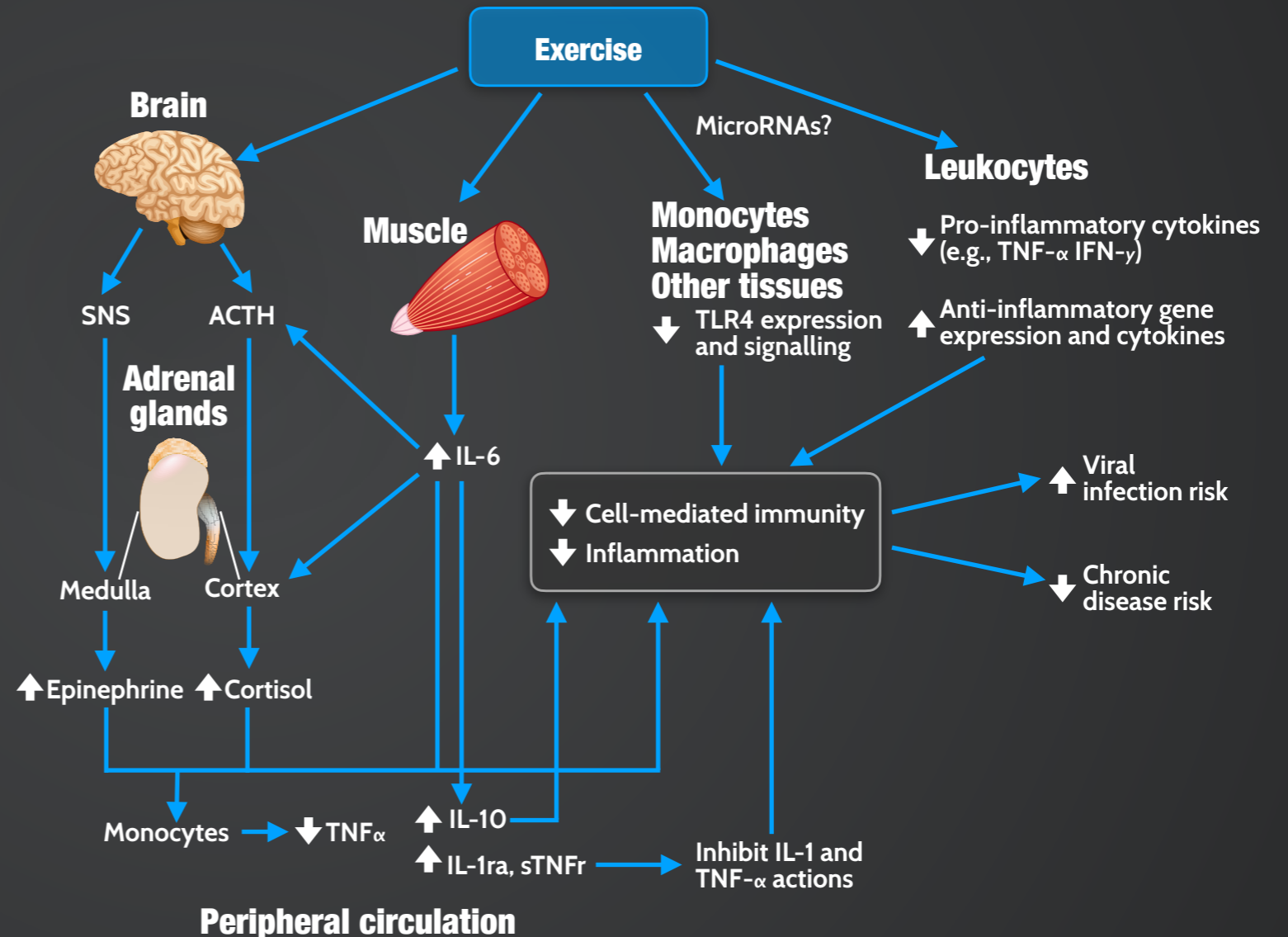


Adapted from Egan and Zierath (2013)

Key topics addressed

Nutrition and Immune Function in Athletes

You will learn about common illnesses and allergies experienced by athletes and nutrition strategies that positively influence immune function



From Jeukendrup and Gleeson, *Sports Nutrition 3rd Edition* (2018)

Key topics addressed

Body Composition

You will learn about the different methods for estimating body composition and their strengths and limitations in research and professional practice.

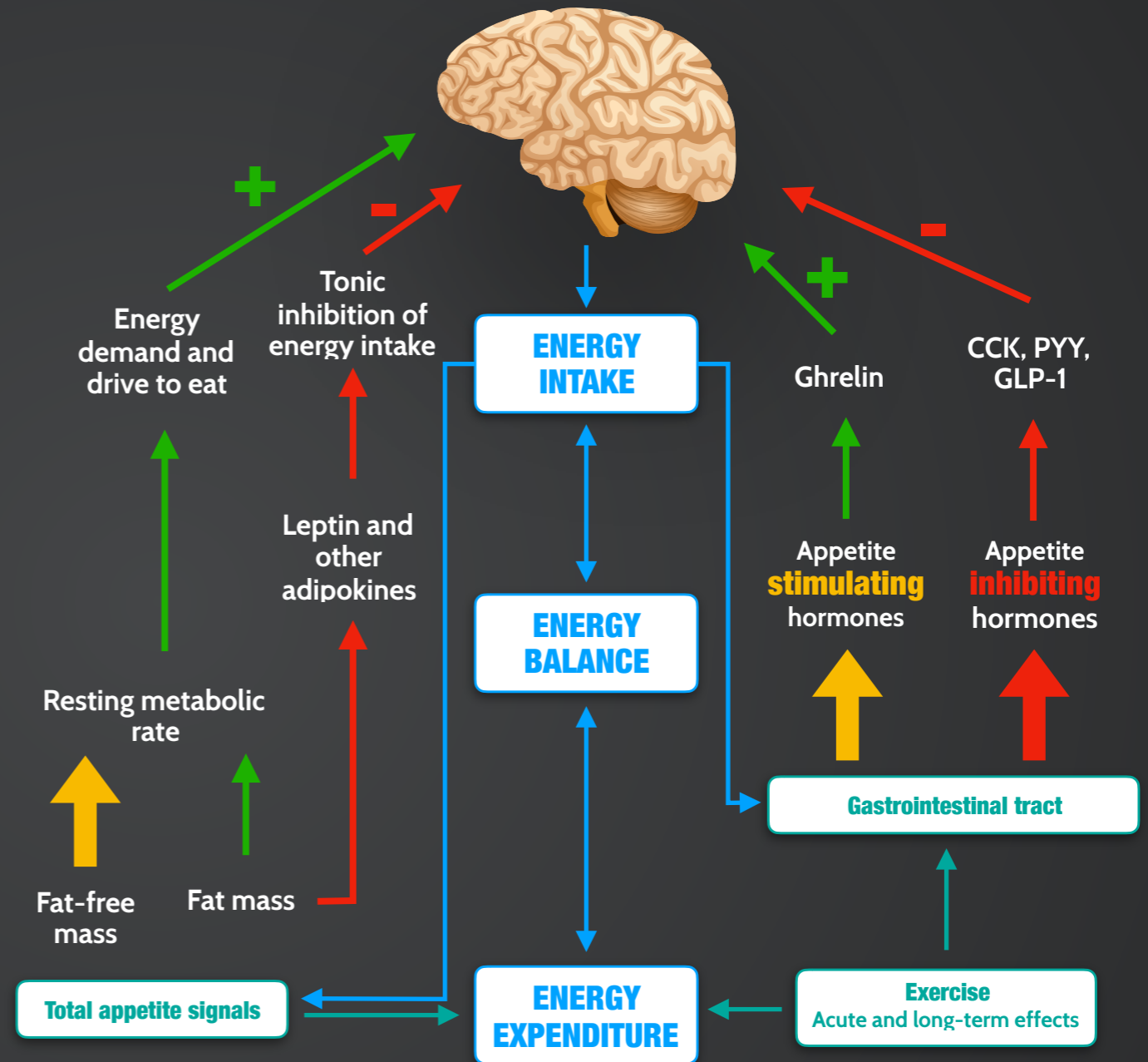
Method	Description
Anthropometry	Measurements of body height, body weight, and body segment girths to predict body fat
Densitometry	Underwater weighing based on Archimedes' principle to estimate lean body mass and fat mass
Skinfold thickness	Measurement of subcutaneous fat with a calliper that gives an estimation of lean body mass and fat mass
Bioelectrical impedance analysis (BIA)	Measurement of resistance to an electrical current to estimate total-body water, lean body mass and fat mass
Dual-energy X-ray absorptiometry (DXA or DEXA)	X-ray scan at two intensities to measure total-body water, lean body mass, fat mass and bone-mineral density
Computed tomography (CT)	Computer-assisted X-ray scan to image body tissues and measure bone mass
Quantitative magnetic resonance imaging	Similar to CT but uses electromagnetic rather than ionising radiation to image body tissues and organs
Air displacement plethysmography (Bod Pod)	Measurement of air displacement to estimate lean body mass and fat mass

From Jeukendrup and Glesson, *Sports Nutrition 3rd Edition (2018)*

Key topics addressed

Bodyweight Regulation

You will learn about effective, safe weight loss strategies for athletes, hormonal regulators of appetite and the influence of exercise on bodyweight regulation.



Adapted from Blundell et al. (2015)

Key topics addressed

Eating Disorders and Energy Availability

You will learn about the prevalence of eating disorders in athletes and the association with certain sport events; signs of disordered eating in athletes, and the physiological and performance consequences of low energy availability.

Type of sport	<i>n</i>	Eating disorder present (%) and 95% CI
Aesthetic	64	34 (24-43)
Weight-dependent	41	27 (13-39)
Endurance	119	21 (14-28)
Technical	98	14 (8-20)
Ball games	183	11 (6-15)
Power	17	6 (5-11)
Non-athletes	522	5 (3-7)

Data are shown as mean percentage of individuals with an eating disorder in each sport type and the 95% CI.

Data from Sundgot-Borgen (2000)

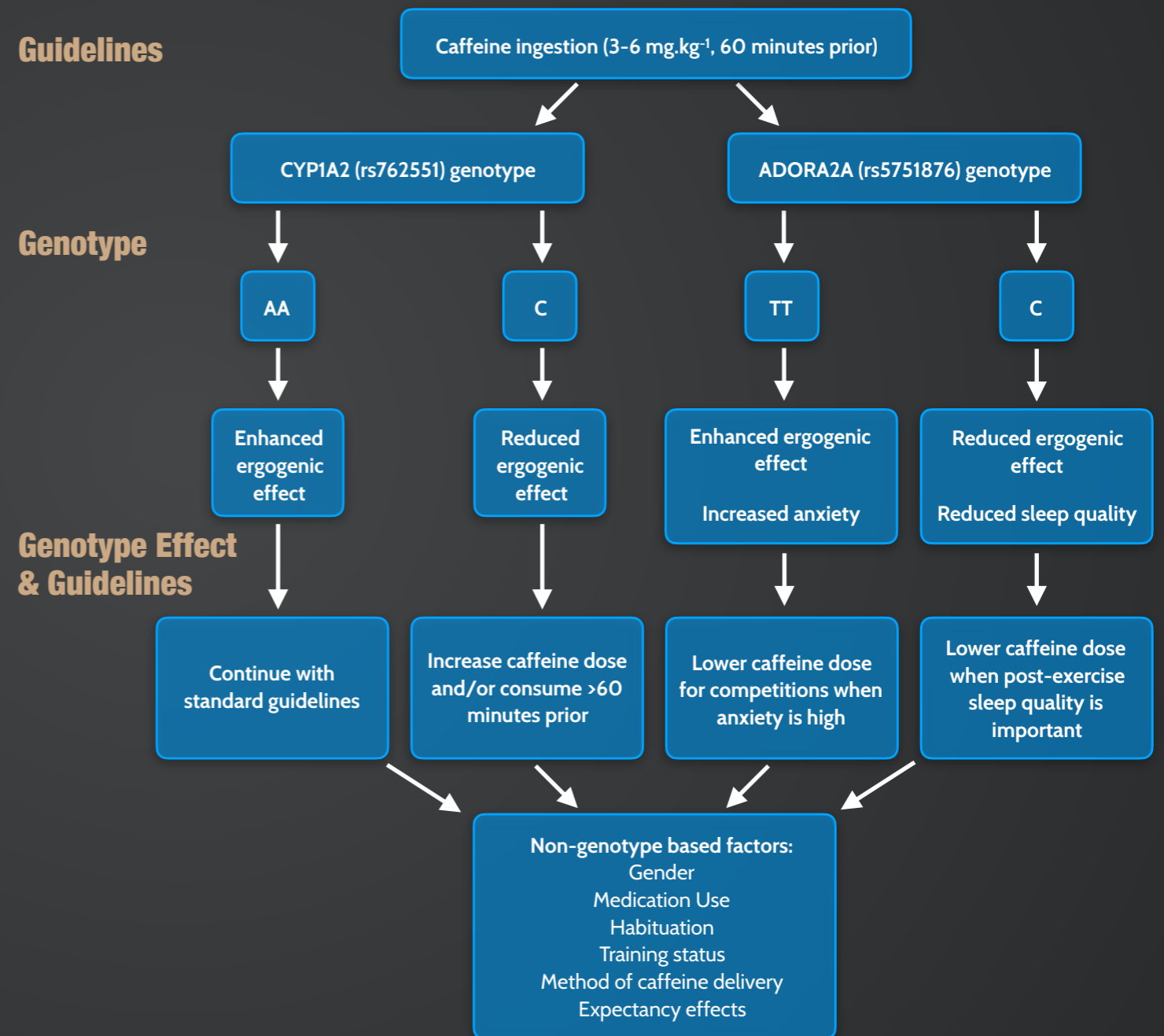
Key topics addressed

Nutrigenomics in sport

You will learn about our current understanding of nutrigenomics in sport and its application in professional practice



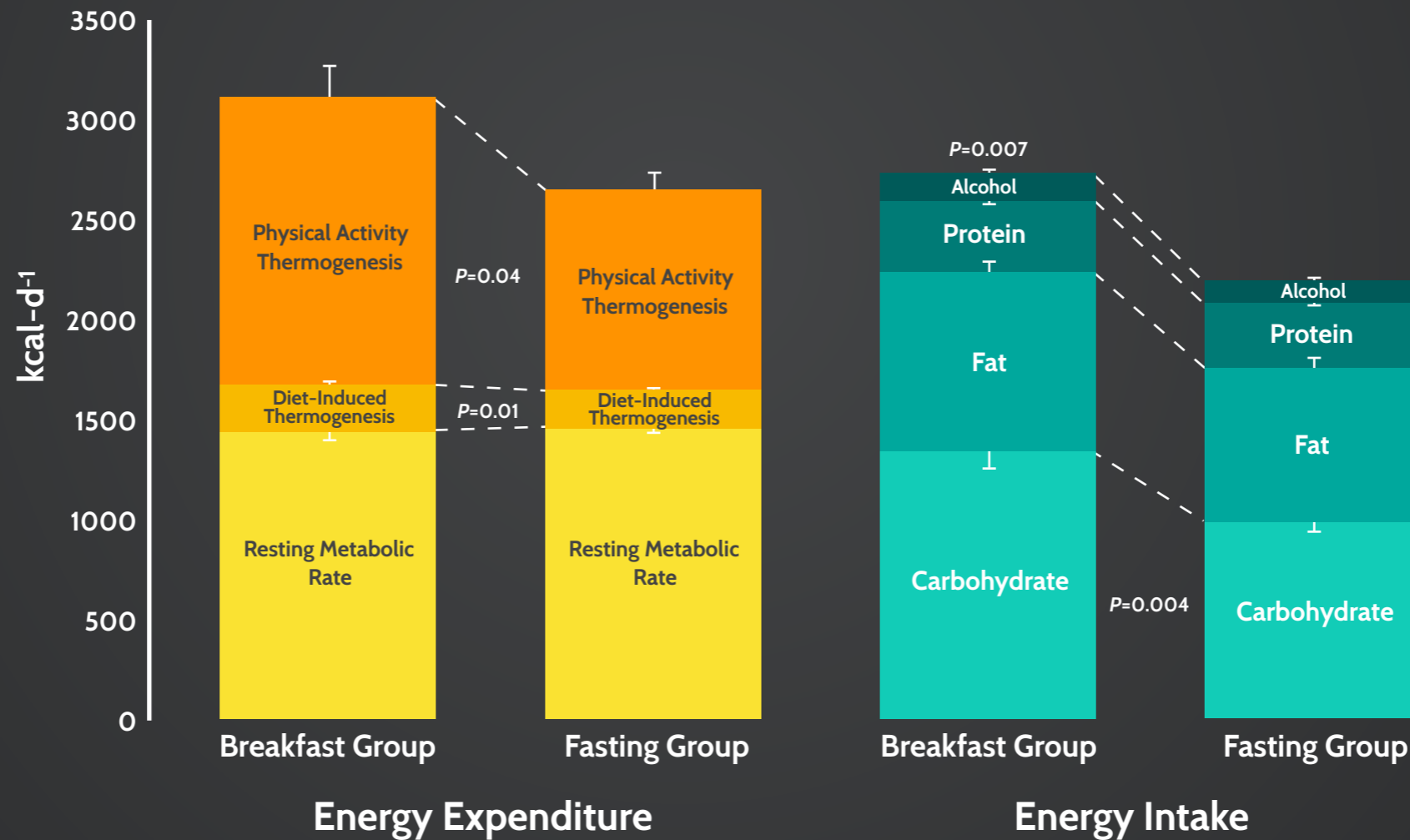
Genetic and non-genetic factors influencing caffeine ingestion decisions



Adapted from Pickering & Kiely (2016)

Diets and Metabolism

You will learn about how different dietary approaches influence energy expenditure, energy intake and bodyweight.

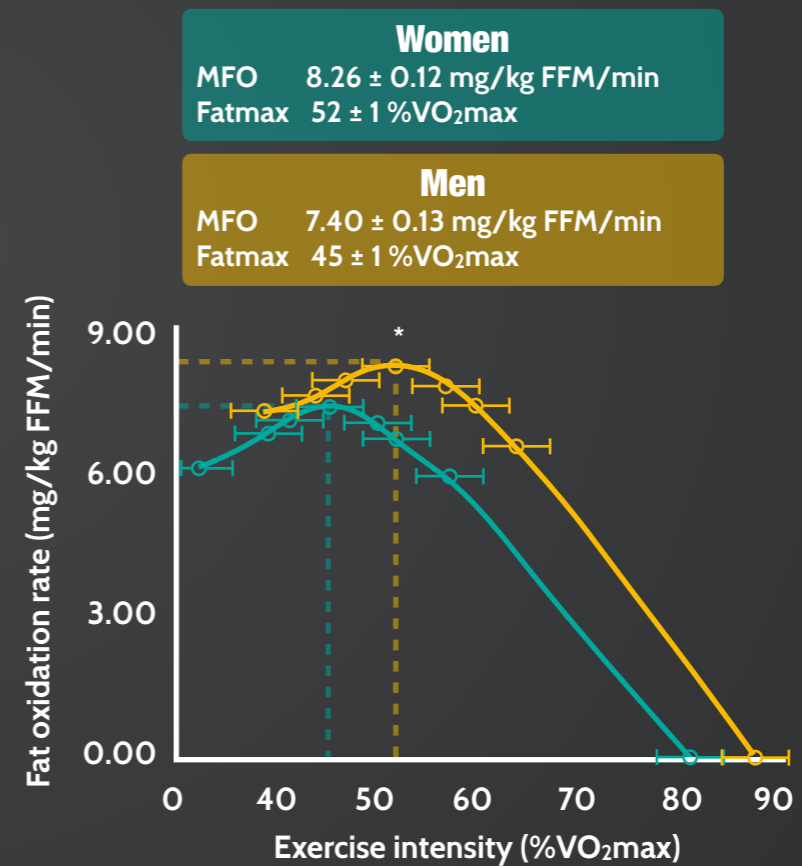
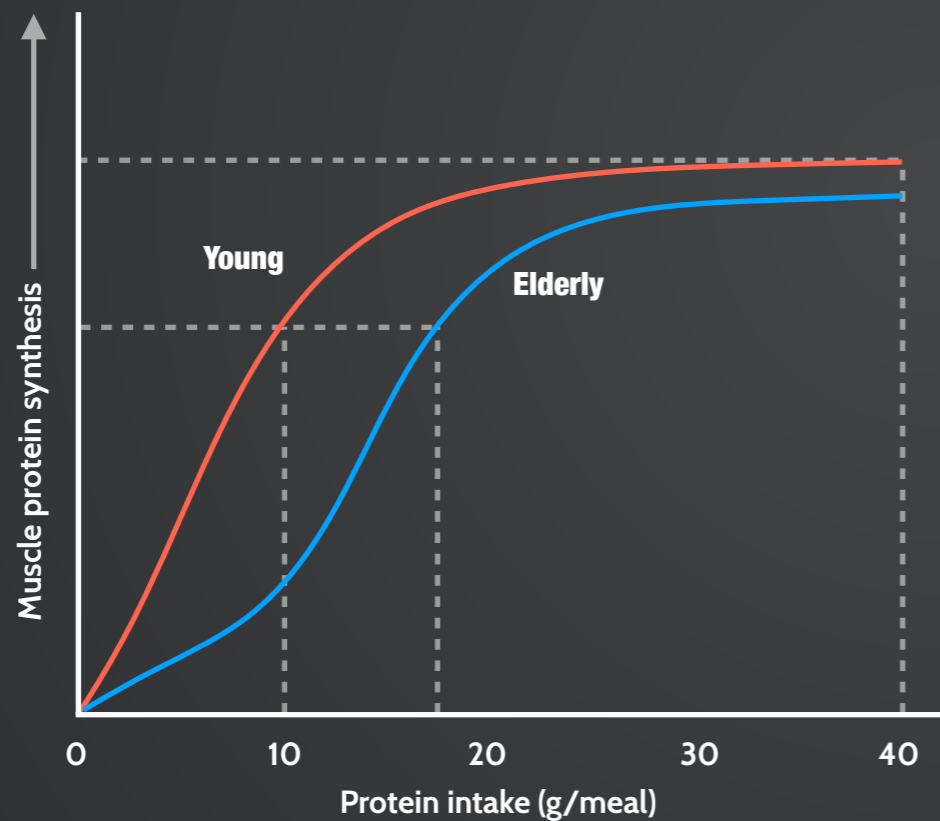


Data from Betts et al. (2014)

Key topics addressed

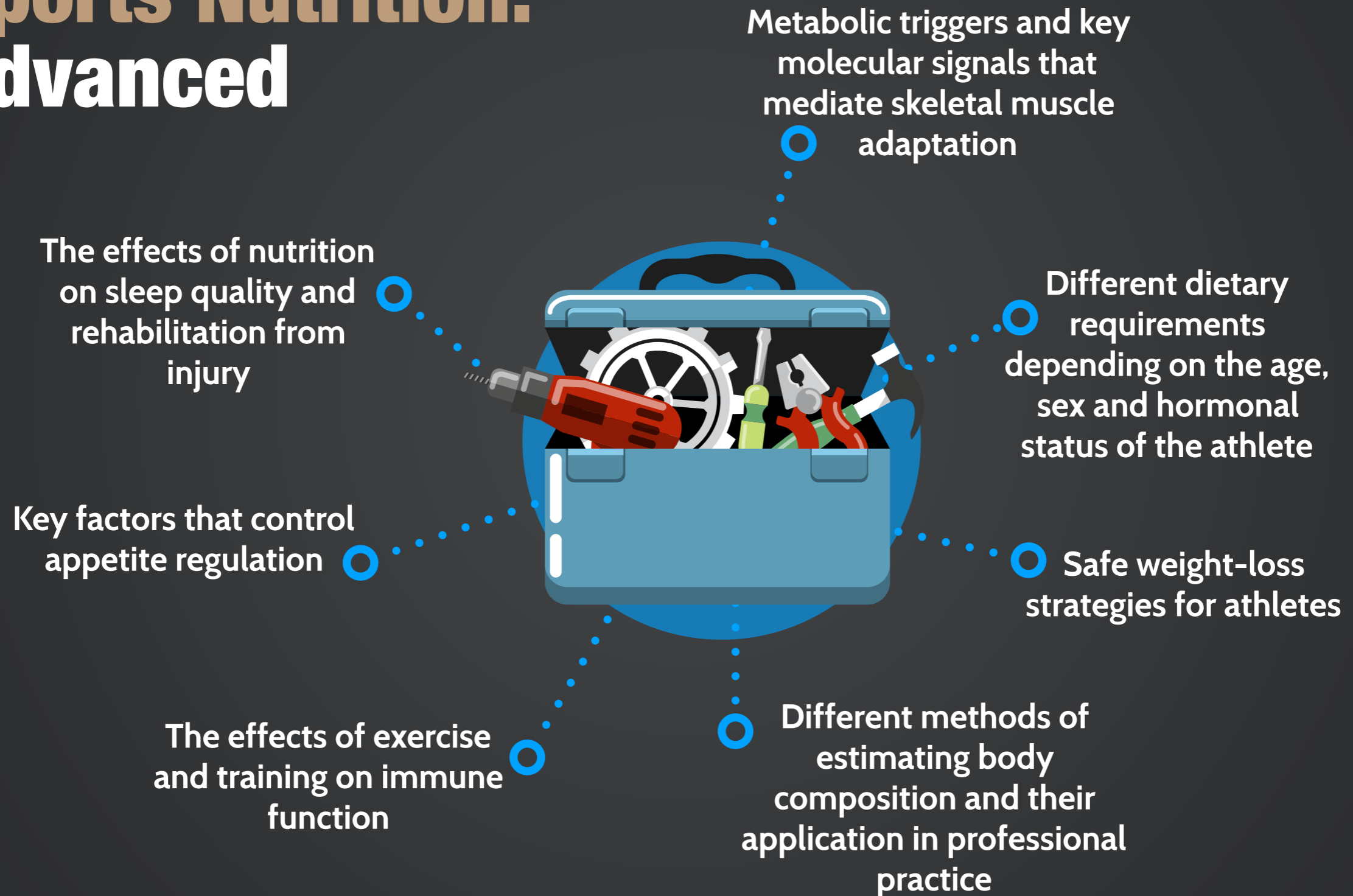
Personalised Nutrition

You will learn about different dietary requirements depending on age, sex and hormonal status of the athlete



From Jeukendrup and Gleeson, *Sports Nutrition 3rd Edition* (2018)

Sports Nutrition: Advanced

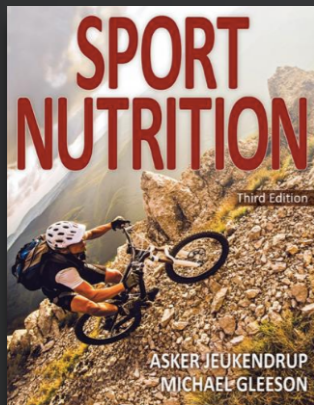




Module 4: Textbook topics

Text book: Sports Nutrition 3rd Edition (Human Kinetics)

- > Nutrition and Training Adaptations
- > Nutrition and Immune Function in Athletes
- > Body Composition
- > Weight Management
- > Eating Disorders in Athletes
- > Personalized Nutrition



Module 4: Lecture videos

- **Nutrient Sensing & Exercise Adaptations** - Dr Lee Hamilton
- **Training Adaptations: Effects on Substrate Utilisation** - Prof James Morton
- **Nutritional Strategies To Optimise Recovery - The Balance Between Recovery & Adaptation** - Prof Graeme Close
- **PGC-1 Alpha: A master Regulator of Endurance Training Adaptation?** - Prof James Morton
- **Nutrition Periodisation**- Prof James Morton
- **Free Radicals & Exercise: Has the Poacher Turned Game Keeper** - Prof Graeme Close
- **Exercise, Immunity and Infection Risk in Athletes**- Dr Glen Davison
- **Immunology and Nutrition**- Dr Glen Davison
- **Nutrition & Immune Function: Can We Do Anything To Offset The Winter Sniffles?**- Prof Graeme Close
- **Gut Hormones & Regulation of Appetite** - Dr Gethin Evans
- **Nutritional Strategies to Influence Appetite**- Dr Javier Gonzalez
- **Breakfast for athletes: advisable, inappropriate or irrelevant?** -Dr Javier Gonzalez
- **Protein and Muscle During Weight Loss** - Prof Kevin Tipton
- **Exercise Nutrition For Older Adults**- Dr Leigh Breen
- **Exercise, Nutrition and Ageing - Time to Run for Your Life?**-Dr Graeme Close
- **Nutritional Considerations for Hormonal Contraceptive Use (Athletes)**-Dr Kirsty Elliot-Sale

Module 4 lecturers

Your lecturers

Our course is delivered by the IOPN team and an impressive selection of guest experts who are typically world leading researchers and practitioners in the field of Sports and Exercise Nutrition.



Dr Kirsty Elliott-Sale
Associate Professor of
Female Physiology
Nottingham Trent University



Dr Graeme Close
Professor of
Human Physiology
Liverpool John Moores University,
Everton FC & England Rugby



Dr James Morton
Professor of Exercise
Metabolism and Nutrition
Liverpool John Moores University,
Team Sky



Dr Javier Gonzalez
Senior Lecturer in Human
Physiology
University of Bath



Dr Glen Davison
Director of Graduate Studies
and Reader
University of Kent



Dr Leigh Breen
Senior Lecturer in Exercise
Physiology and Metabolism
University of Birmingham

Learning targets

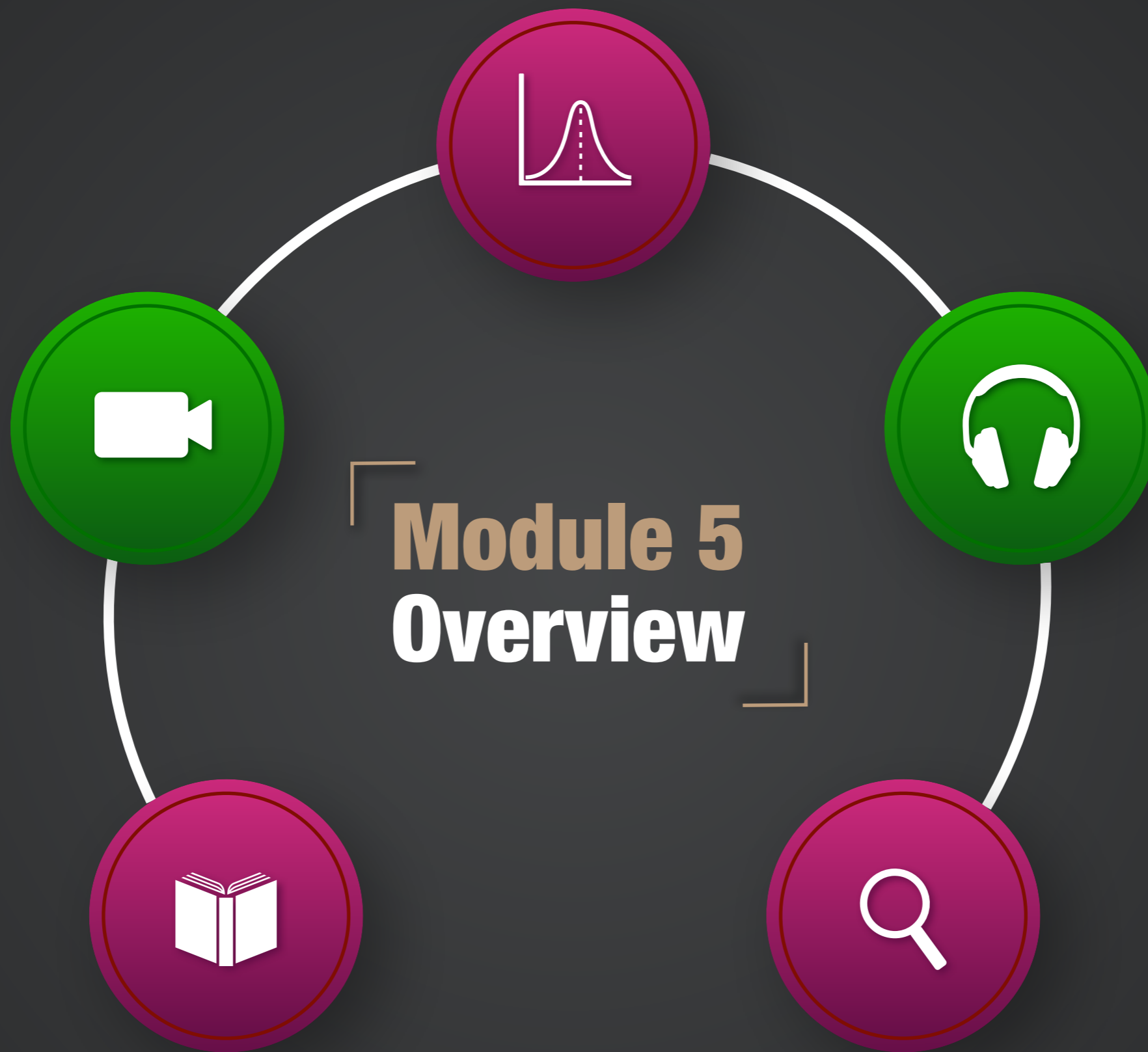
All reading material and questions finished (estimated time per day ~45 minutes, five days per week)

Hand over written case study for grading



All lecture videos finished and case study finalised (estimated time per day ~45 minutes, five days per week)

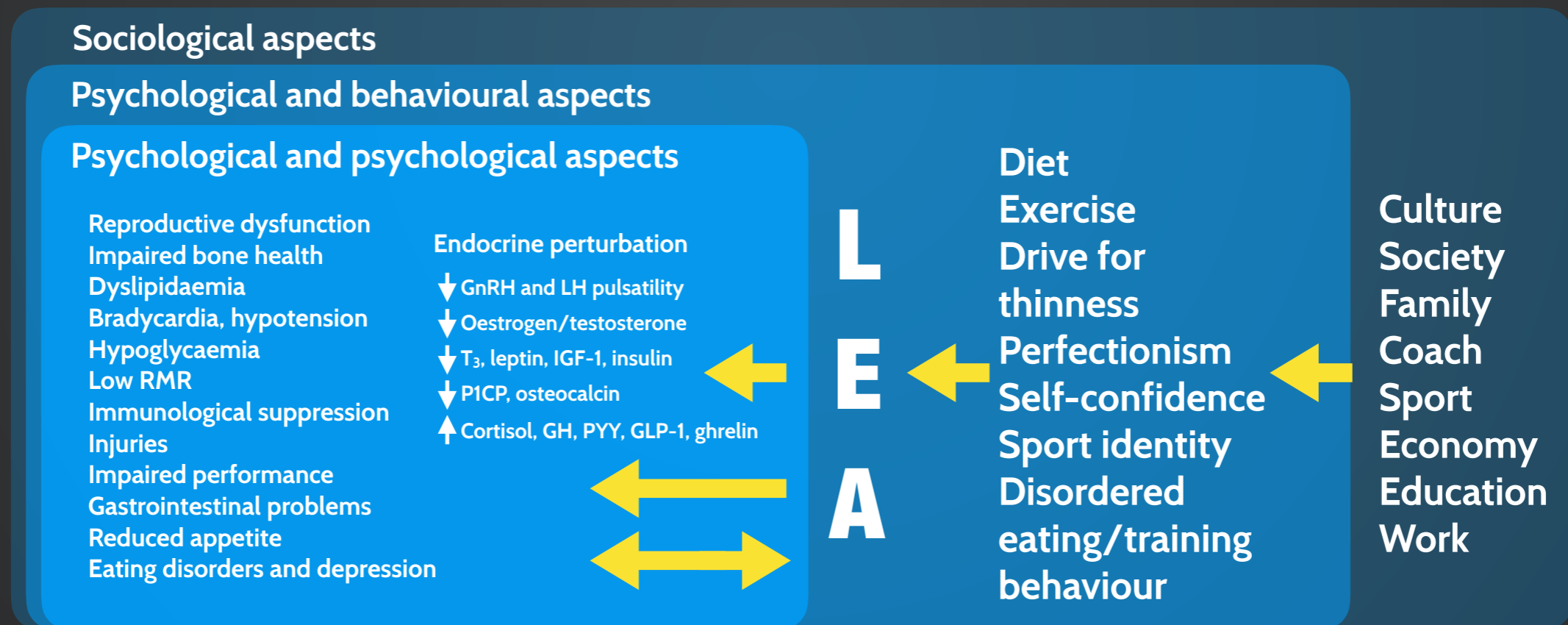
Move on to Module 5!



Key topics addressed

Energy availability and weight management

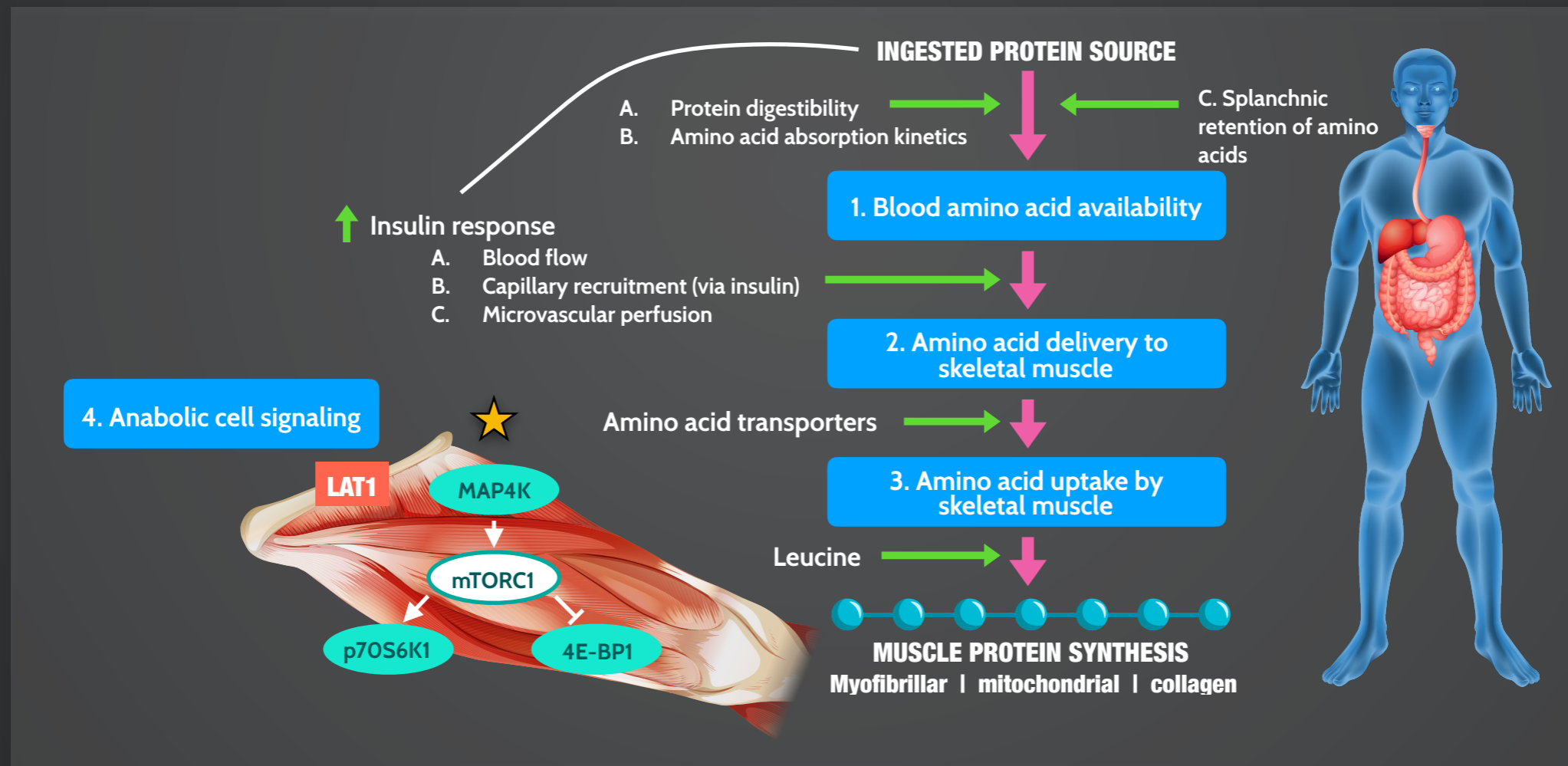
You will learn about the health and performance repercussions of low energy availability, limitations for its accurate measurement and key considerations during a weight management program.



Adapted from Melin et al. (2019)

Protein and amino acids (revisited)

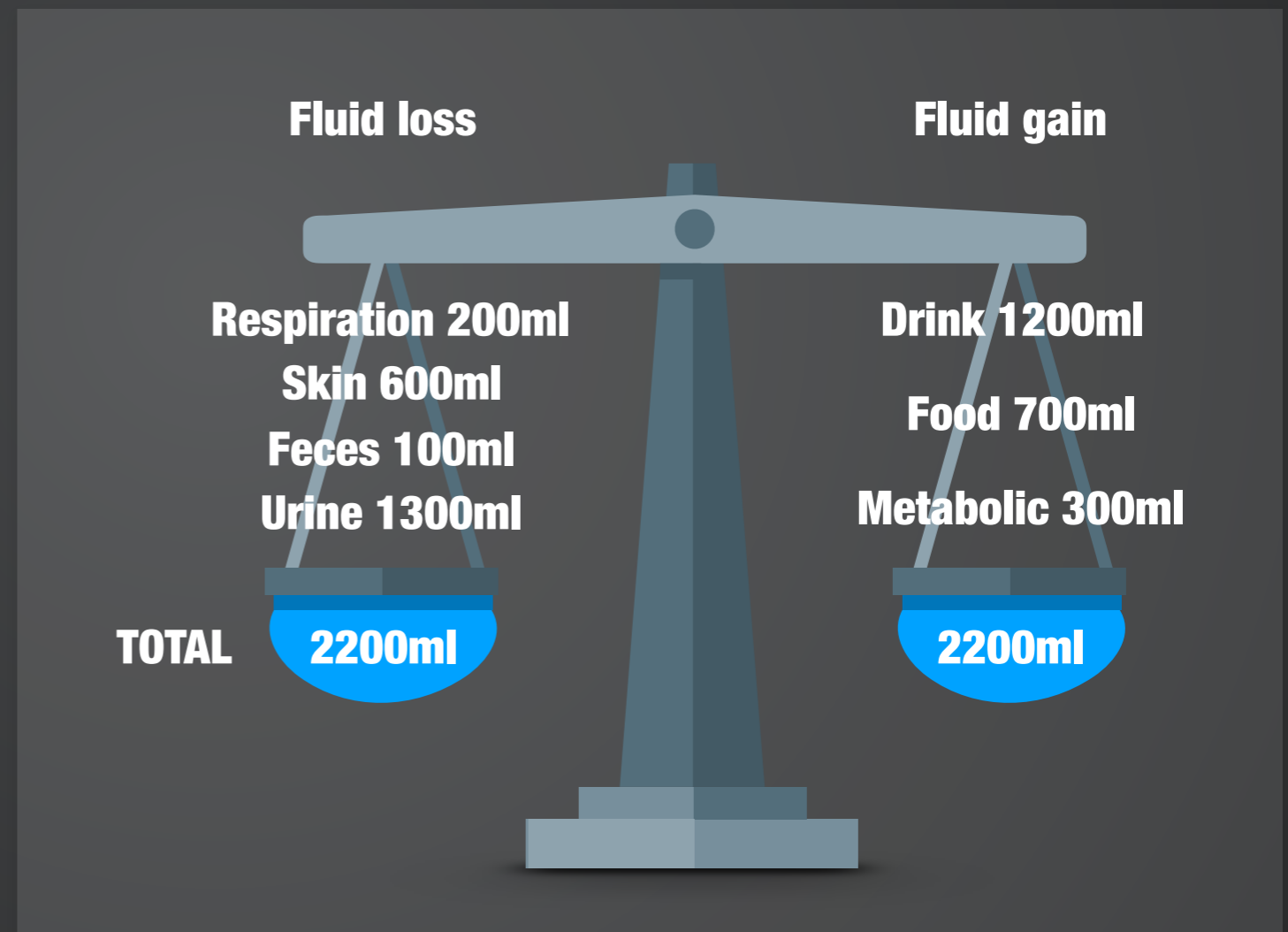
A review of protein and amino acids; you will revisit the impact of protein nutrition and exercise on muscle protein synthesis rates and the adaptation to myofibrillar, mitochondrial and collagen proteins.



Adapted from presentation by Dr Oliver Witard (2018)

Water and fluid requirements (revisited)

A review of fluid balance; you will revisit fluid needs of athletes during rest, training and competition and examine the impact of alterations in fluid balance on health and performance.



From Jeukendrup and Gleeson, *Sports Nutrition 3rd Edition* (2018)

Key topics addressed

Advanced physiological testing

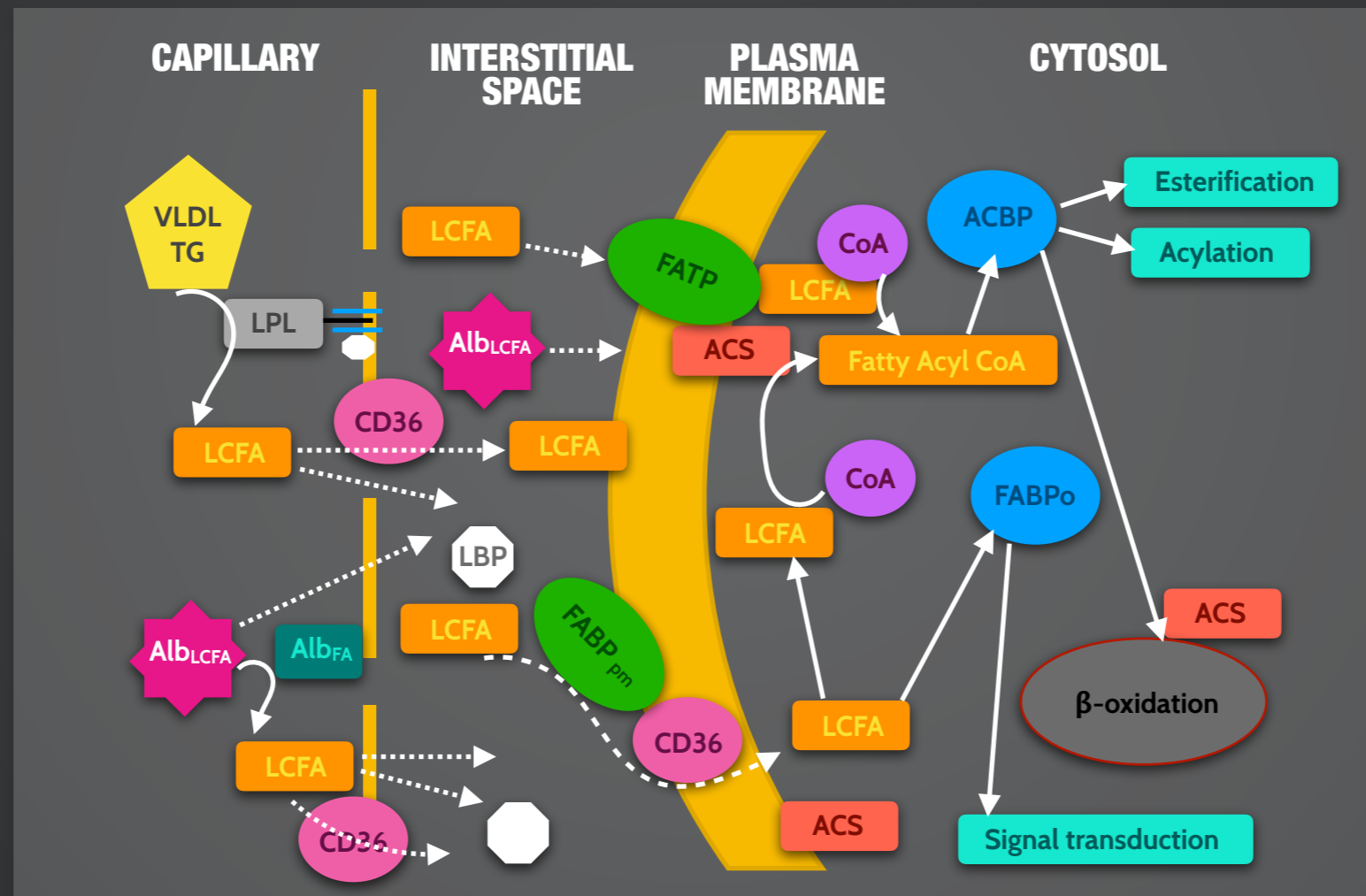
Insights into the field; you will learn about advanced physiological assessment methods used on elite athletes in the field and how they inform professional practice



Key topics addressed

Lipids (revisited)

A review of lipids; you will revisit biochemistry, metabolism and examine the role of fat in exercise performance

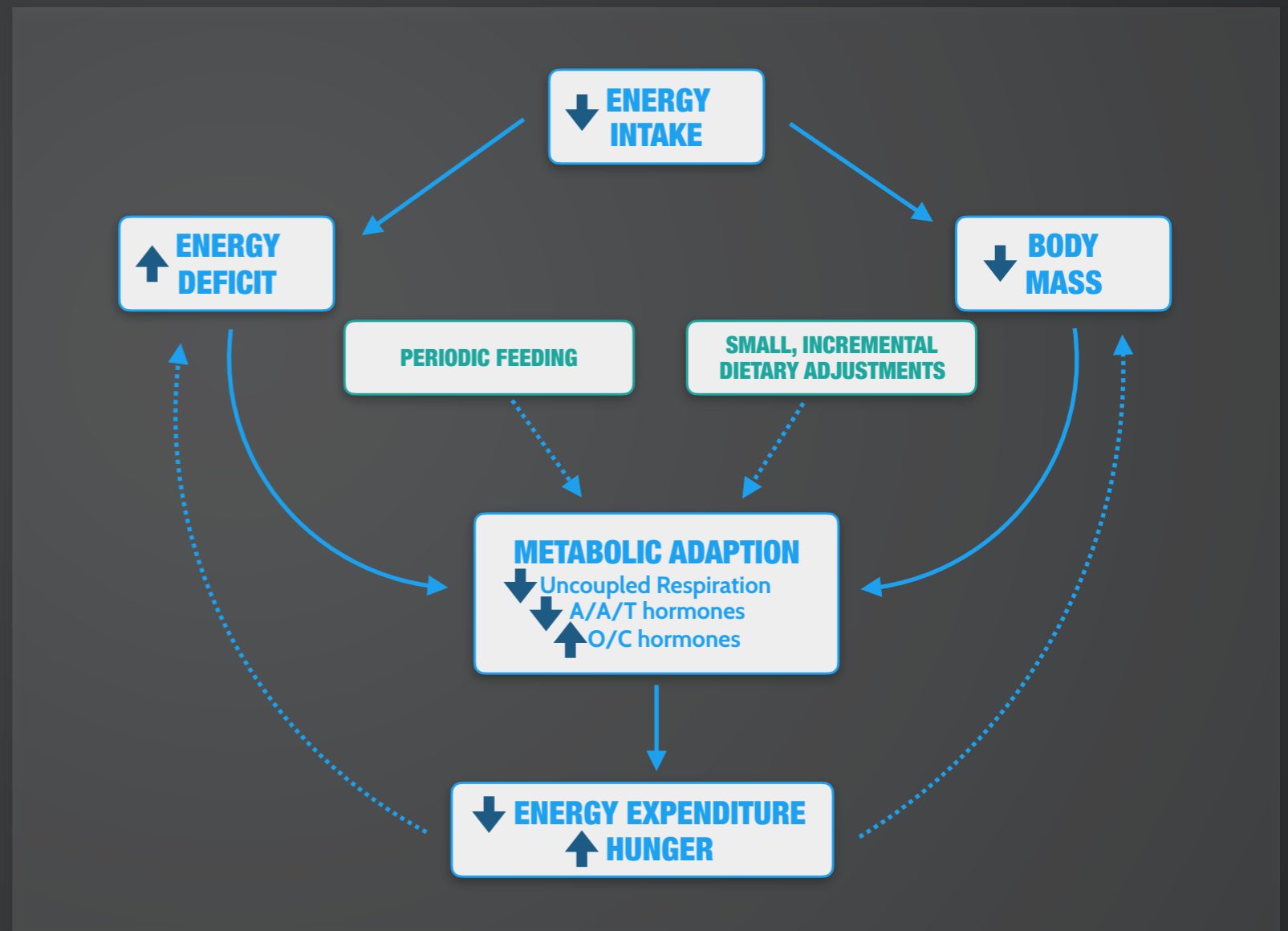


From McLaren and Morton (2012). *Biochemistry for Sport and Exercise Metabolism*.

Key topics addressed

Diets, body composition and metabolic adaptation

You will learn about the impact of different diet types on body composition, adaptive mechanisms that attenuate weight-loss and dietary strategies for effective weight management



From Trexler et al. (2014)

Key topics addressed

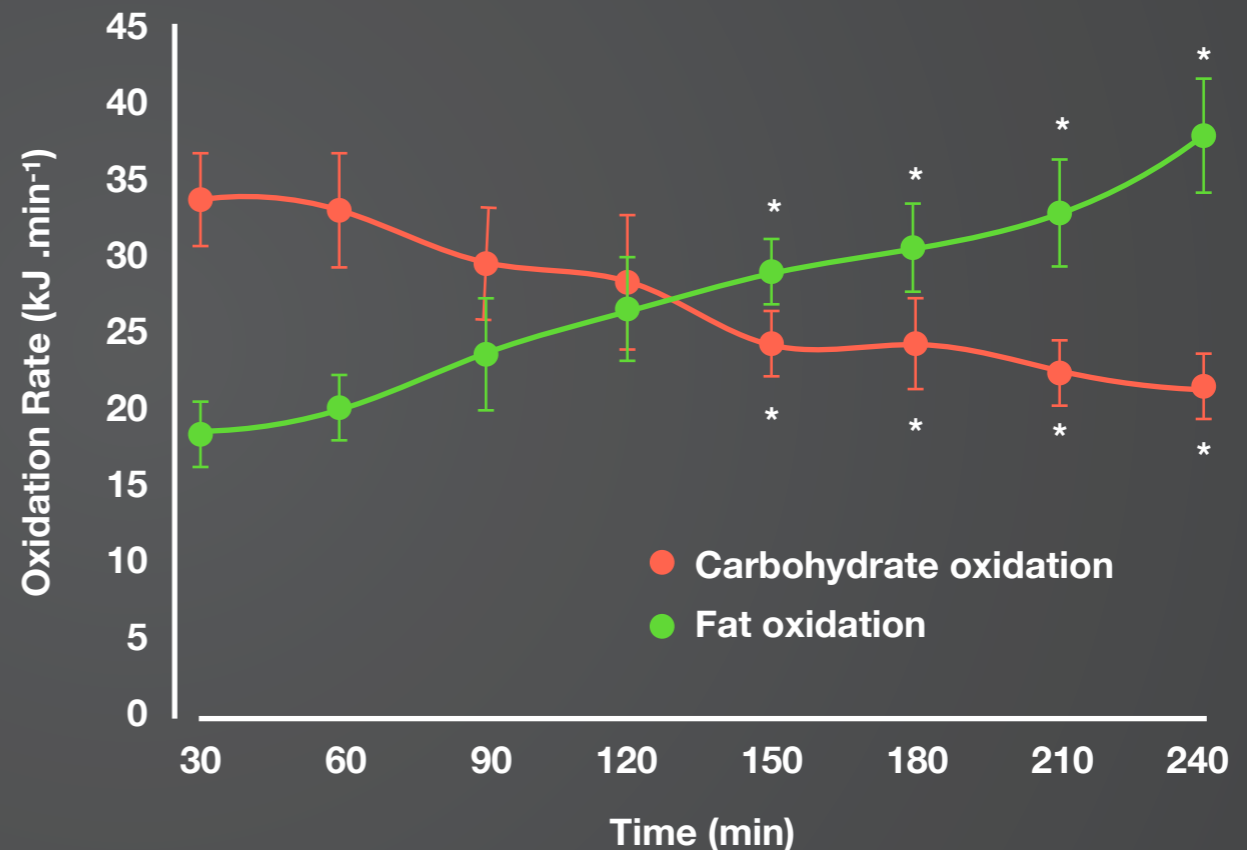
Nutrition for high performance athletes

Insights into the field; you will learn about the day-to-day challenges and solutions of maintaining an athlete's health and performance in endurance sports and during travel.



Fuel Use for the muscle and exercise metabolism (revisited)

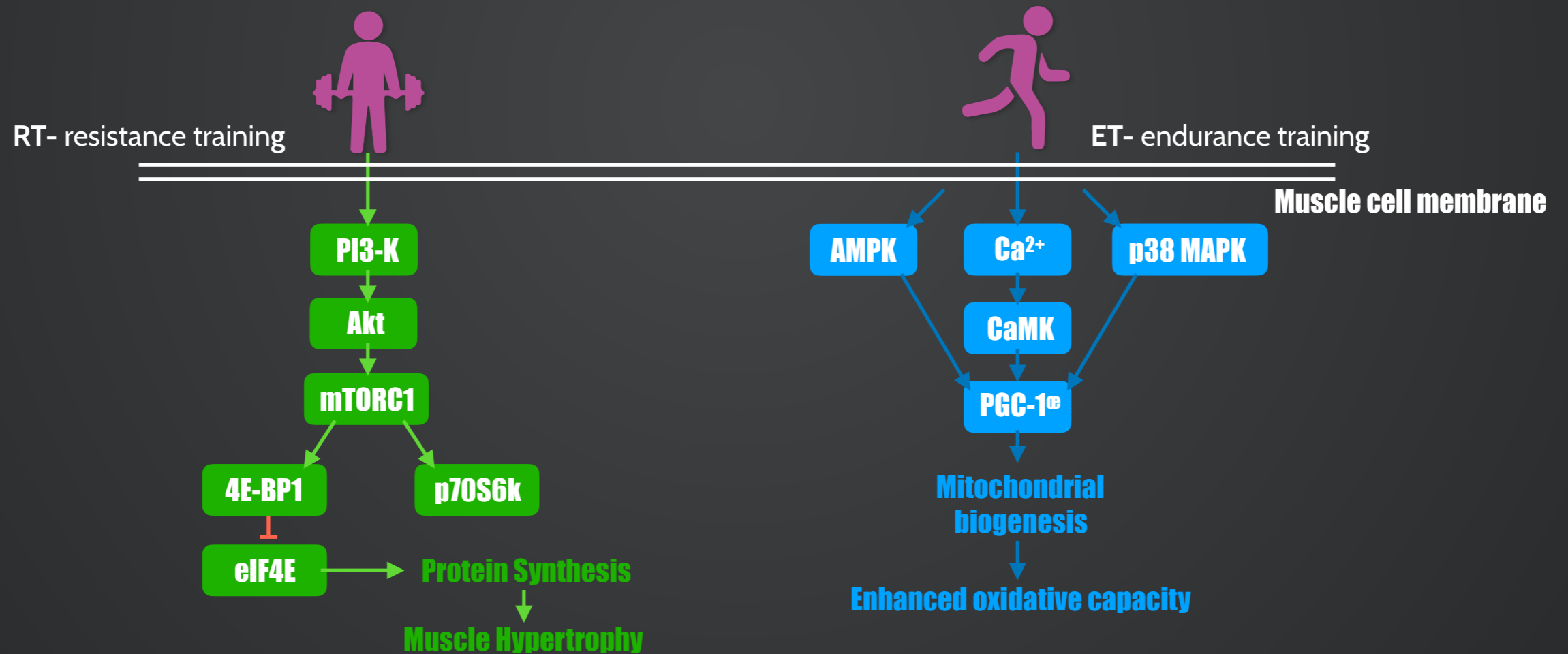
A review of exercise metabolism; you will revisit metabolic regulation, fuel selection and substrate use as well as exploring some of the concepts behind nutritional periodisation.



From McLaren and Morton (2012). *Biochemistry for Sport and Exercise Metabolism*.

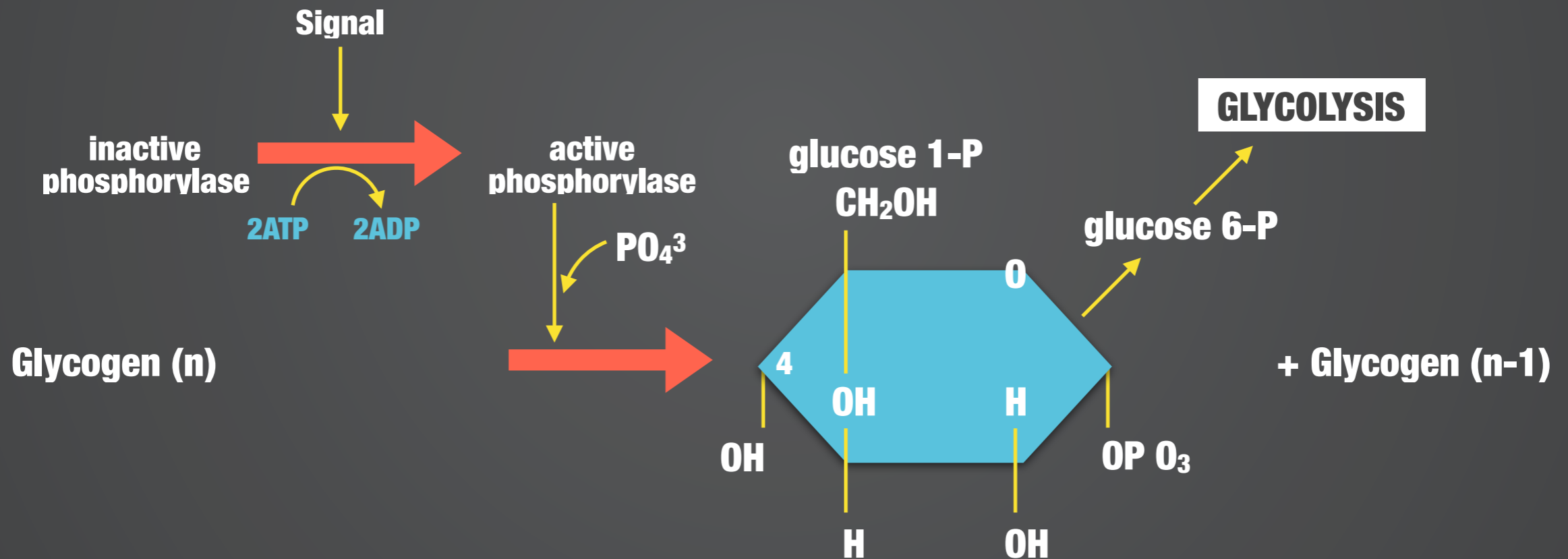
Training Adaptation (revisited)

A review of training adaptation; you will revisit the outstanding plasticity of skeletal muscle, the key proteins that influence distinct skeletal muscle phenotype changes and the nutritional interventions that potentiate this response.



Carbohydrates (revisited)

A review of carbohydrates; you will revisit biochemistry, metabolism and examine the role of carbohydrates in exercise performance and recovery



From McLaren and Morton (2012). *Biochemistry for Sport and Exercise Metabolism*.

Key topics addressed

Match-Day team sport nutrition considerations

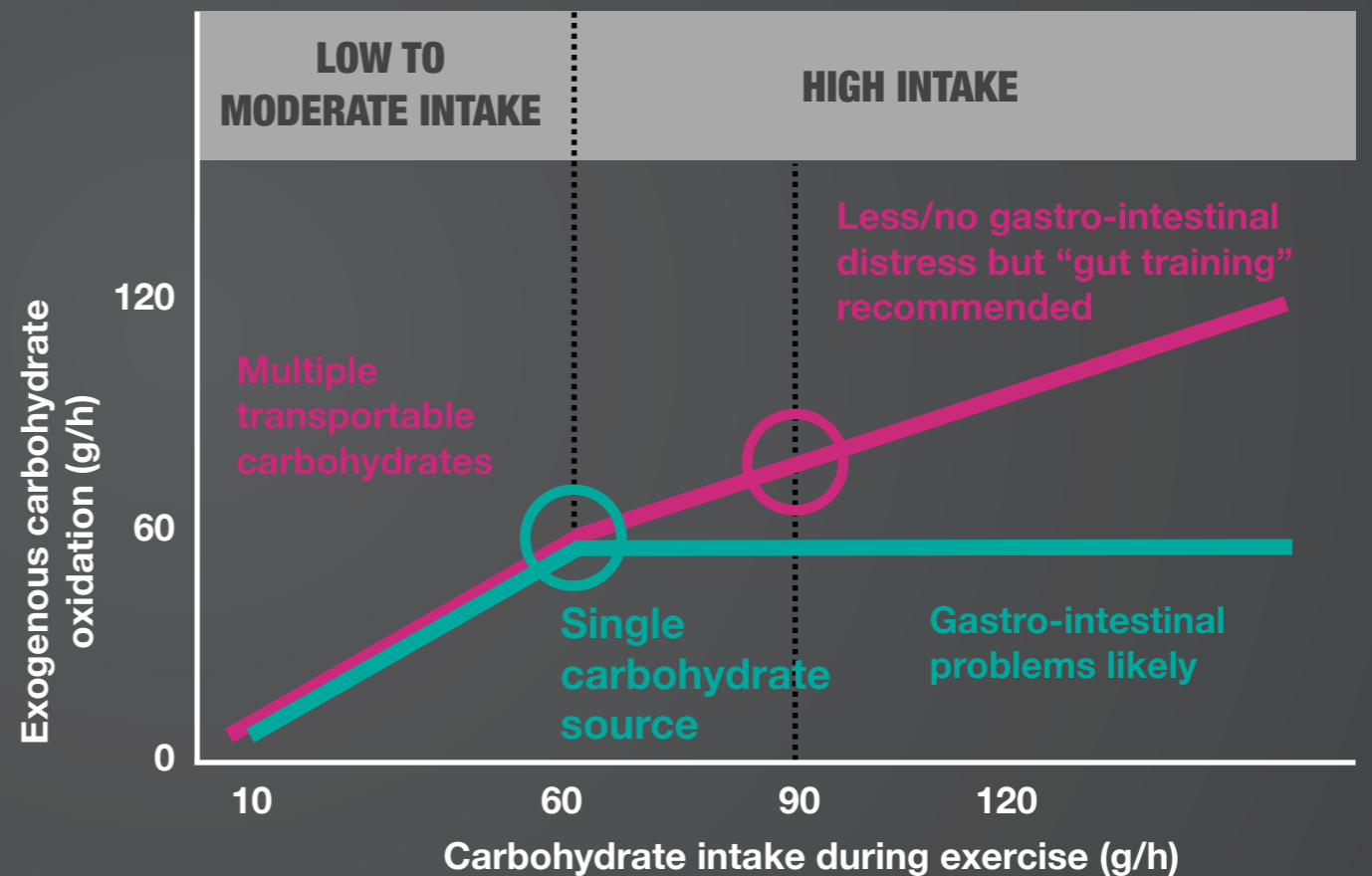
You will learn about the latest nutrition strategies for preparing for competition, moderating fatigue and maintaining performance on match-day in team-sports.



Key topics addressed

Gastric Emptying, digestion, and absorption (revisited)

A review of gastric emptying; you will revisit the underlying mechanisms of nutrient absorption within the gastrointestinal tract, factors affecting gastric emptying and strategies to optimise the athlete's gut.

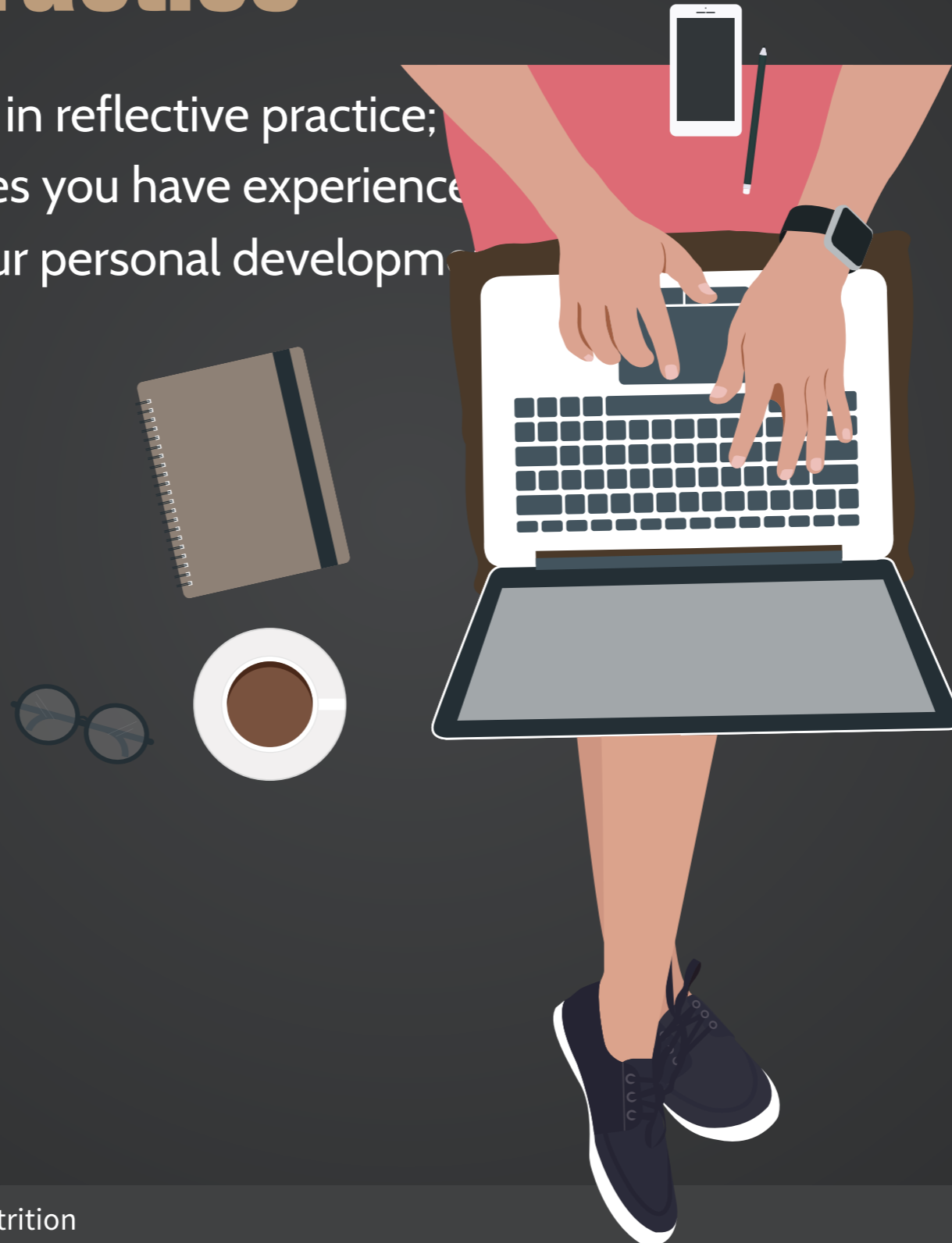


Extracted from: *Training the Gut for Athletes*. Jeukendrup (2017)

Key topics addressed

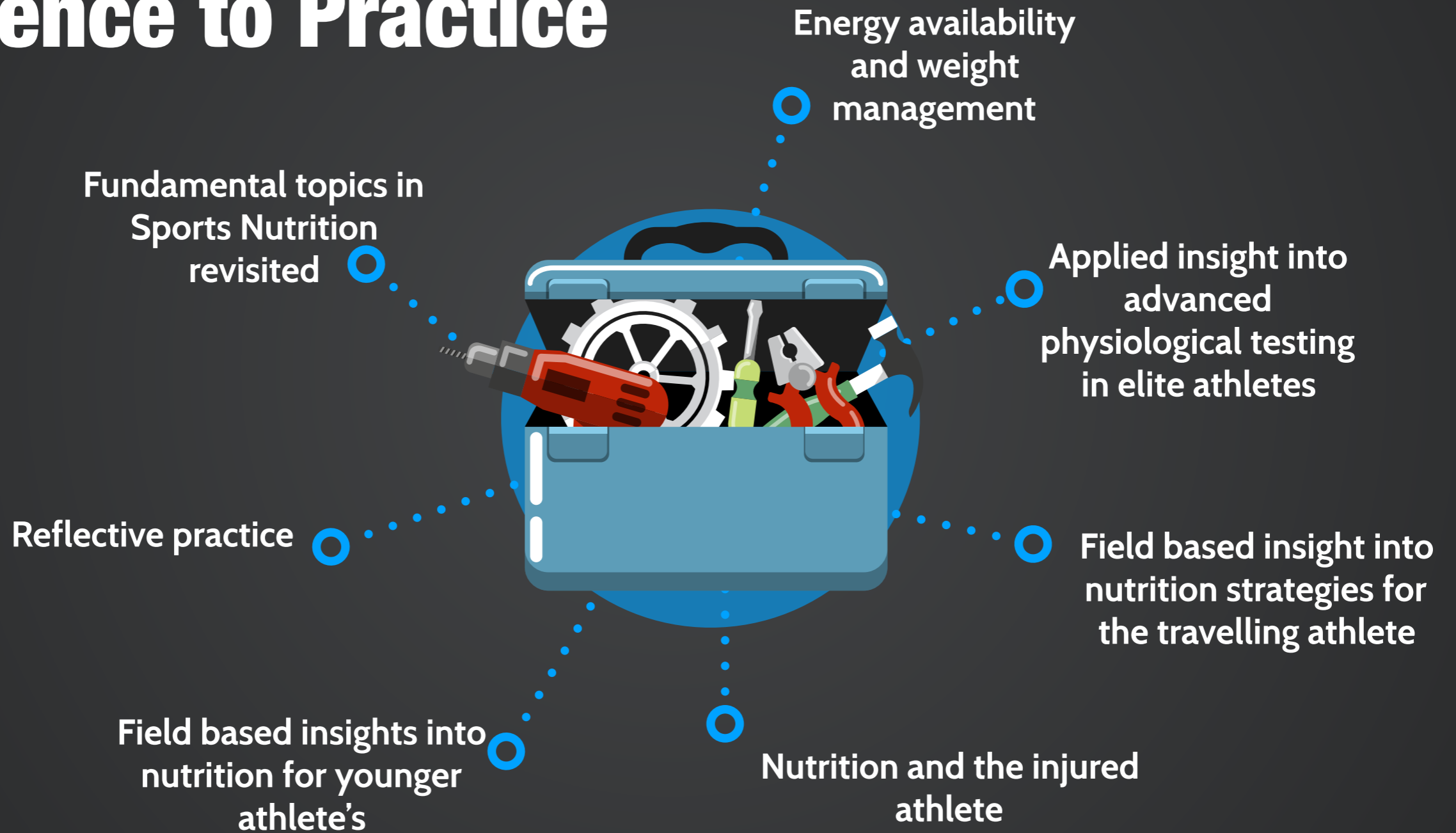
Reflective practice

You will learn and engage in reflective practice; reflecting on the challenges you have experienced the Diploma as well as your personal development learning.



Key topics addressed

Sports Nutrition: Science to Practice





Module 5: Textbook topics

Key journal papers assigned to the following topics:

- > Fuel use for the muscle and exercise metabolism
- > Gastric emptying, digestion and absorption
- > Carbohydrates
- > Protein and amino acids
- > Lipids
- > Water and fluid requirements
- > Nutrition and training adaptation
- > Nutrition supplements
- > Energy availability
- > Weight management



Module 5: Lecture videos

- **Nutrition for High Performance Athletes** – Dr Sophie Killer
- **Football Nutrition** – Prof James Morton
- **Match-Day Team Sport Nutrition Considerations** – Dr Mark Russell
- **Advanced Physiological Testing in Professional Boxing** – Dr Scott Robinson
- **From Science to Practise: Applying Sound Performance Nutrition Support in Elite Sport**– Dr Mayor Ranchordas
- **Sports Nutrition & Rugby - From Benchtop to Pitchside**– Prof Graeme Close
- **Half Time in Team Sports: An Opportunity to Influence Subsequent Performance?**– Dr Mark Russell
- **From the lab to the road: testing to inform practice and endurance performance**– Matthew Furber PhD
- **Nutrition For Jockeys (Latest Research & Applications)**– Prof Graeme Close
- **Nutrition & Injury Rehabilitation** – Prof James Morton
- **Educating the Future Elite: Reflections from International Youth Rugby**– Dr Daniel Owens
- **Understanding the response to training and competition: implications for athlete performance and health** –Dr Craig Twist
- **Reflective Practice for Sports Nutritionists**– Prof James Morton

Module 5 lecturers

Your lecturers

Our course is delivered by the IOPN team and an impressive selection of guest experts who are typically world leading researchers and practitioners in the field of Sports and Exercise Nutrition.



Dr Sophie Killer

Lead Performance
Nutritionist for British
Athletics



Dr Graeme Close

Professor of
Human Physiology
Liverpool John Moores University,
Everton FC & England Rugby



Dr James Morton

Professor of Exercise
Metabolism and Nutrition
Liverpool John Moores University,
Team Sky



Dr Mayor Ranchordas

Reader in Nutrition and Exercise
Metabolism
Sheffield Hallam University



Dr Scott Robinson

Doctorate in Exercise
Metabolism and Nutrition
Guru Performance Institute,
Private Practice



Dr Daniel Owens

Lecturer in Cellular and
Molecular Sport and Exercise
Science
Liverpool John Moores University,

Learning targets

All reading material and questions finished (estimated time per day ~45 minutes, five days per week)

Hand over written case study for grading



All lecture videos finished and case study finalised (estimated timer per day ~45 minutes, five days per week)

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Performance
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