CISSN STUDY GUIDE

Please read the last 10 years of ISSN Position Papers – https://www.tandfonline.com/journals/rssn20/collections/issn-position-stands

Category:

Diet

- Know the comparison of different hypo-energetic diets on performance and body composition (lean mass)
    - Higher protein/lower carbohydrate vs. lower protein/higher carbohydrate
    - Low-carbohydrate vs. low-fat diet
- Understand what piscatorial style of eating is
- Kale contains what that protect the eyes from macular degeneration?
- Ketogenic diet:
    - Know what it is and how macronutrients are weighed in the diet
    - Understand the primary reason for the changes in body mass and body composition
    - Know the effects of ketogenic diet on strength performance
    - What are the adaptive responses?
- Vegan diet:
    - What is it?
    - The effects on enhancing athletic performance
- Vitamin C: different sources
- Vitamin D: different sources
- Saturated fatty acids: different sources
- Know the benefits of milk consumption for everyone
- Understand non-exercising scenarios on meal frequency impact on weight loss and body composition
- Comparing ketogenic diet with a high-carbohydrate, low fat diet (protein and calories are equal), what does the research say about loss of fat mass between the two?
- High protein diet (>2.2 g per kg daily) according to RCTs:
    - Know effects on exercise
    - Know effects on body composition
    - Know effects on health (bone mineral density, kidney, etc.)
    - Know effects during hypocaloric periods
- Plant-based diets are high in which nutrients?
- Know the effects of a low-carbohydrate diet on different physical activities and body composition (short-duration, long high intensity, etc)
- Exercise-trained men and women that carry the risk alleles for the FTO SNPs (rs1421085, rs17817449 and rs9939609) compared to those at normal risk:
    - Know what the data shows after a 4-week period of energy restriction while consuming a high protein diet
- Know the effects of weight loss on caloric restriction vs caloric restriction + resistance training
- Know common sources of food for fats, protein, carbohydrates

- Know the acceptable macronutrient distribution ranges (ADMR) for fats, carbohydrates, and proteins
- Carnivore diet: what is it?
- Know the effects of a high-carbohydrate diet (8-12 g/kg/day) on maximizing glycogen stores
- What are the blood values of ketone bodies commonly seen in nutritional ketosis?
- Know the criteria used to classify a low-carbohydrate diet
- Know the fats found in wild-caught fatty fish that are shown to provide health benefits
- Understand the effects of intermittent fasting on body composition

Metabolism:

- Know when the ATP-PCr, fast glycolysis (aka lactic acid), and aerobic energy system is being utilized as the primary energy system during exercise, sport, etc.
- Carbohydrates:
    - Usage during exercise
    - Kcal per gram
    - Know dietary guidelines for Americans
    - Role carbohydrates have for ATP synthesis and protein-sparing
    - Know the predominant carbohydrate source as exercise intensity increases: what and where is it stored?
    - Know the four categories of carbohydrates: monosaccharides, disaccharides, oligosaccharides, and polysaccharides
- Fats:
    - Usage during exercise
    - Kcal per gram
    - Know dietary guidelines for Americans
- Protein:
    - Usage during exercise
    - Kcal per gram
    - Know dietary guidelines for Americans
    - Non-essential and essential amino acids
- What is the rate of glucose and fructose absorption from the small intestine?
- Which macronutrient is recognized as being the most satiating?
- Know the different strategies for rapid restoration of glycogen post-exercise for recovery
- Know the role lactate plays during exercise
- Understand the aerobic training adaptations on enhancing fat oxidation during exercise
- Understand how and why blood glucose is maintained during exercise
- Know the physiological responses to a high-carbohydrate meal
- Endurance athletes vs bodybuilders on carbohydrate necessities
- Know different theories for non-insulin mediated glucose transport upregulation from intense muscle contraction
- Know these terms and the metabolic pathway: deamination, glycolysis, gluconeogenesis, glucogenesis, lipolysis, and protein synthesis
- Know the metabolic pathway for glucose absorption

- Know TDEE and its different components
- Know the role of the trace mineral chromium on insulin function
- Understand the metabolic pathway of amino acid being converted into ATP
- Understand RMR and what substrates are being utilized the most in different heart rate ranges

Physiology:

- Understand the factors that reduce rates of MPS as well as elevate MPS (muscle protein synthesis).
- The effects of testosterone in healthy adult males (i.e., lean body mass, fat mass, strength, etc.). See the classic 1996 paper in NEJM by Dr. Bhasin.
- Know study results are typically reported as group means (averages). Subjects' responses are a mix of results that fall above and below the mean, thus it is important to view study results as guidelines subject to adjustment according to individual response.
- Know the effects of aerobic training at altitude and performance advantages
- Know the different limiting factors in maximal oxygen uptake and *primary limiting factor* in the majority of individuals
- Know major adaptations in skeletal muscle from regular aerobic training
- Phosphatidylserine has been shown to reduce levels of _____ during times of stressful activity or encounters.
- Know Principle of Specificity
- What is the most significant pH buffer in the blood?
- Know the different contributions to prolonged cessation of the menstrual cycle
- What does the fluid lost through sweating fluid come from?
- Know the characteristics of cardiac muscle cells
- Know carnosine's role primary muscle-buffering substances in skeletal muscle
- Elite endurance athletes vs non-endurance athletes on total daily energy expenditure (TDEE)
- Know the physiological adaptations to chronic endurance (aerobic) training
- Know the effects of thermoregulation with both males and females
- Know the physiological adaptations to chronic heavy resistance training
- Know the skeletal muscle adaptations to chronic heavy resistance training
- Understand the skeletal muscle adaptations to resistance training with untrained individuals
- Know the comparison of resting metabolic rate with different athletes
- Know and compare the different methods for assessing body composition
- What are good indicators of aerobic performance?
- Accumulation to exercising in the heat occurs within how many days of heat exposure.
- RER: what is it and what are the components?
- Why is cholesterol important for good health?
- Understand how massages play a role in recovery
- What is the primary fate of lactate?
- Know the role of blood lactate in untrained individuals
- Know the differences between skeletal muscle fibers and the nomenclature.

    - I, IIA, IIX
    - SO, FOG, FG
    - Dark vs White meat
- What are the components of the female triad?
- Know the effects on body composition with increased skeletal muscle glycogen storage
- What are the different substrate sources of fuel used by the nervous system?
- Know the different components of stroke volume
- Understand how the bicarbonate system plays a role in the body during high intensity exercise
- Understand how pre-exercise dehydration affects the body
- Understand the role calcium plays in the body
- Understand what mechanistic target of rapamycin (mTOR)
- Understand Henneman's size principle of motor unit recruitment
- Understand the role of myosin heavy chain in skeletal muscle fibers (i.e., muscle fiber type).

Supplements:

- Define ergogenic
- Know what effective ergogenic aids are
- Creatine:
    - Ergogenic effects
    - Dosage recommendations
    - Effective nutritional hyper-hydration strategy
    - How is it synthesized?
    - Where is it stored in the body?
    - Know the different sources and which ones are better
    - Timing of peak levels in plasma after congestion
    - Know what the data says on the effects of high levels of supplementation (0.3-0.8 g/kg/day)
    - Know the effects in a hot humid environment
    - Know he minimum daily dosage to maintain elevated creatine levels after achieving creatine loading
    - Know the effects of supplementation on traumatic brain injuries
    - Know the benefits of creatine monohydrate vs. creatine ethyl ester supplementation
- Beta-alanine:
    - Know the effects of supplementation on exercise performance
    - Know daily dosage recommendations for benefits
    - Know what kind of exercise beta-alanine supplementation benefits
    - Know supplementation benefits on neuromuscular fatigue and tactical performance
- Bicarbonate loading as sodium bicarbonate during high intensity exercise: know ergogenic benefits of pre-exercise loading
- Know the most consumed ergogenic aid

- Vitamin D: know different sources
- Nitrate: different ways to consume
- Know the differences between different types of proteins
- What post workout beverage is beneficial for hydration *and* enhances recovery?
- Protein:
    - Recommendations of daily dosage
    - Know what occurs if 5.5 times the recommended daily allowance was consumed (~ 4.4 g/kg/)
    - Know TEF; what does it mean? It is also called DIT.
    - Know the effects of a high protein diet on bone mineral density
    - Know the effects of high consumption on kidneys
    - Know the benefits of supplementation for exercise
    - Know the effects of post-exercise ingestion (immediately-post to 2 hours post) and pre-exercise ingestion
    - Understand the main role of protein
    - Know what amino acid is most effective in stimulating muscle protein synthesis
- Know the effects of D-ribose supplementation on DOMS
- Know the carbohydrate ergogenic effects with events greater than 2 hours in duration and events lasting 90-120 minutes (about 2 hours)
- Caffeine:
    - Dosage recommendation
    - Pre-workout consumption benefits (both endurance and resistance training)
    - Know the effects of consumption on metabolic rate
    - Know what other supplements have similar effects
    - Know the enzyme responsible for metabolizing caffeine
    - Know the benefits in relation to mood state, ratings of perceived exertion, and perception of muscle pain
- Know what the most effective ergogenic aids are
- BCAA supplementation:
    - Dosage recommendation
    - Benefits of supplementation for exercise performance
    - Understand what it is mainly for
    - Know effects of supplementation on DOMS
- Glutamine supplementation
    - Know dosage recommendations
    - Know exercise and health benefits on muscle damage
- Fish oil supplementation:
    - Know dosage recommendations
    - Know exercise and health benefits
- Know the difference between the types of research studies and which one is ideal for evaluating performance-enhancement benefits of an exogenous supplement
- EAAs: dosages in both free form and as a protein bolus for muscle protein synthesis
- What supplement is known for enhancing pH buffering capacity of skeletal muscles?
- Beetroot juice:
    - Know dosage recommendations

    - Know supplementation effects on exercise performance
    - What ingredient is it rich in?
    - What ingredient is found in sugar beets known to improve muscular endurance?
- Glycerol:
    - Know dosage recommendations
    - Know benefits with endurance training
- Beta-Hydroxy beta-methylbutyrate (HMB)
    - mechanism of action
    - the population/individual that would benefit the most from supplementation
- What kind of events would benefit from drinking a carbohydrate-containing beverage?
- Probiotics:
    - Understand the benefits of supplementation
    - Understand the minimal effective dose and method of administration
- Conjugated linoleic acid:
    - Know dosage recommendations
    - Know exercise and health benefits
- Tart jerry juice: know exercise and health benefits on muscle damage
- Understand the physiological effects of a consuming a high-fructose beverage before exercise
- Know the benefits of bitter orange (citrus aurantium) and the primary ingredient
- Know the benefits and dosage recommendation of citrulline

Summary list of Supplements to Know

Know the recommended dosages/prescription, mechanism of action, intended effects, side effects, and contraindications for the following:

- Arginine
- Alpha-Ketoglutarate
- Astaxanthin
- Beta-Alanine
- Betaine
- Bicarbonate
- Branch chain amino acids
- Caffeine
- Carnitine
- Carnosine
- Chondroitan
- Cinnamon extract
- Citrulline
- Creatine
- D-Ribose

- Echinacea
- Ephedra
- Essential amino acids
- Fish oil/Omegas
- Fucoxanthin
- Glutamine
- Glucosamine
- Glycerol
- Green tea extract
- Guarana
- HMB (beta-hydroxy-beta-methylbutyrate)
- Leucine
- Lysine
- Methionine
- N-acetylcysteine
- Nitrates (Beetroot)
- Protein
    - Whey
    - Casein
    - Soy
    - Other Plant Based proteins
- Spirulina
- Synephrine
- Tart cherry
- Taurine
- Valine
- Vanadyl sulfate
- Vitamin D
    - Other vitamins