

Science of Appetite Course Agenda

Course Times: 8:30 AM - 3:30 PM

Lunch: 11:30 AM - 12:20 PM

APPETITE: THE BRAIN-BODY CONNECTION - understanding the signals that make us want to eat

- Peripheral regulators: gut hormones (Ghrelin, GLP-1, CCK, PYY, etc.), fat cell hormones (Leptin, adiponectin), pancreatic hormones (eg. insulin – the “feast” hormone).
- Central regulators: hypothalamic regulators (NPY, Melanocortin system, CART), reward chemicals (opioids, endocannabinoids), dopaminergic and serotonergic systems.

DYSREGULATION OF APPETITE –a leading cause of morbidity and mortality worldwide

- Obesity epidemic- is it the cause of, or the result of appetite dysregulation?
 - Role of insulin and leptin resistance in re-wiring neural circuits that control appetite.
 - The pleasure principle – do the obese have weaker reward circuitry?
 - The problem of weight regain. Consequences of appetite dysregulation: diabetes, cardiometabolic disease, fatty liver, certain cancers, cognitive dysfunction, PCOS, infertility.
- Thyroid dysfunction (hypothyroidism) and appetite changes - cause of or result of obesity?
- Age-related changes in appetite and food intake (“anorexia of aging”).
- Psychiatric disorders and Eating disorders – the neurobiology of Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorder, Addictive behaviors, Alcoholism and appetite.

FACTORS THAT INFLUENCE APPETITE

- Genetics – how do genes drive our appetite? Genetic abnormalities linked to runaway appetite: clues from Prader-Willi syndrome, MC4R pathway, leptin gene and FTO gene. Are humans hard-wired to overeating times of abundance?
- Prenatal exposures – intrauterine exposures that cause rewiring of central appetite regulatory networks before birth.
- Diet – availability, portions, variety, palatability. How can we self-regulate in a food-rich environment?
 - Role of refined carbohydrates (killer carbs?), soft drinks, artificial sweeteners?
 - Does a poor quality diet damage appetite-regulating cells in the brain?
- Pharmacologic –anti-depressants and appetite, anti-psychotics and weight gain.
- Others – Stress, sleep deprivation, shift work, caffeine, alcohol, nicotine, alterations in estrogen and testosterone.

INTERVENTIONS TO REGULATE OR CURB APPETITE

- Dietary Intervention - Can we switch off our appetites by manipulating our diets?
 - Can a healthier diet reset our reward circuitry and reduce cravings?
 - Role of fiber, glycemic load, healthy fats, energy density.
 - Antioxidants for weight control? Popular diets and appetite. Liquid meal replacements and satiety.
 - Modified foods designed to suppress appetite – coming to your supermarkets soon?
 - The way to eat: hunger management techniques.
 - Prevention and management of obesity in children.
- Exercise Strategies - effect of intensity, duration and timing of exercise on appetite (influence on appetite regulating chemicals).
 - Exercise and stress. Exercise and sleep quality.
- Pharmaceutical therapy - prescription drug therapies to outsmart hunger signals.
 - Approaches on the horizon (ghrelin antagonists, leptin therapy, endocannabinoids).
 - Herbal and dietary supplements – weight loss or hoopla? (eg. Hoodia, Chromium picolinate).
 - Pharmacological management of anti-psychotic-induced weight gain.
- Surgical and alterative approaches: bariatric surgery and appetite hormones.
 - Gastric electric STIMULATION AND appetite. Deep brain stimulation as a promising therapeutic option.