



Defense Health Agency (DHA) Clinical Communities Speaker Series

OCT 2022 CCSS: Military Health Care: Innovative Health Care Delivery for a Ready Medical Force

S04: The Impact and Value of Tracking Visceral Adipose Tissue as an Important Biomarker in Service Members by MRI and CT

Resource List

Harvard University Medical School published research on a [New Obesity Tool](#) (2021) that proposes use of energy expending brown fat cells towards potential new therapeutic options for obesity. Specifically, the authors point to smooth muscle cells expressing the Trpv1 (temperature-sensitive ion channel transient receptor potential cation subfamily V member 1) receptor and identify them as a novel source of energy-burning brown fat cells (adipocytes). This should translate into increased overall energy expenditure, and ultimately, researchers hope, reduced weight. Funding for the study was provided by the National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, and American Diabetes Association.

The Centers for Disease Control and Prevention (CDC) has a [Nutritional Biomarkers Branch](#) (2021) that conducts research, develops methods, and analyzes essential nutrients, nonessential nutrients and bioactive dietary compounds that are responsible for changes in health status. For many of these essential nutrients and dietary compounds, the Branch produces population-based exposure levels segmented by age, sex, and race or ethnicity. The details of this research are available in the CDC's National Report on Selected Biochemical Indicators of Diet and Nutrition, which is a series of publications that provide ongoing assessment of the U.S. population's nutrition status by measuring blood and urine concentrations of biochemical indicators.

The PLoS Medicine journal article, [Adipose Tissue Biomarkers and Type II Diabetes Incidence in Normoglycemic Participants in the MESArthritis Ancillary Study](#) (2021), investigates the associations between computed tomography (CT) derived biomarkers for adipose tissue and Type II diabetes (T2D) incidence in normoglycemic adults. Given the central role of skeletal muscles in glucose homeostasis, deposition of adipose depots beneath the fascia of muscles (versus subcutaneous adipose tissue [SAT]) may precede insulin resistance and T2D incidence. This study concludes that there is an association between intermuscular adipose tissue at baseline and T2D incidence over the follow-up and suggests the potential role of intermuscular adipose deposits in the pathophysiology of T2D.

The U.S. Food and Drug Administration (FDA) has an [About Biomarkers and Qualification](#) (2021) webpage that details how biomarkers are used to improve the drug development process. Biomarkers are a defined characteristic that is measured as an indicator of normal biological processes, pathogenic processes, or responses to an exposure or intervention, including therapeutic interventions. Molecular, histologic, radiographic, or physiologic characteristics are types of biomarkers. Qualified biomarkers have the potential to provide valuable information that may reduce uncertainty in regulatory decisions during drug development. The qualification process is collaborative, where the Biomarker Qualification Program works with the requestor(s) in guiding biomarker development.



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References

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Pishgar, F., Shabani, M., Quinaglia, A C Silva, et al. (2021). Adipose Tissue Biomarkers and Type 2 Diabetes

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