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Meeting Report

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9th International Conference on Obesity and Chronic Diseases (ICOCD-2025) Highlights: Integrating Multidisciplinary Advances in Obesity and Metabolic Health

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The International Conference on Obesity and Chronic Diseases (ICOCD-2025) brought together an international community of clinicians, basic scientists, surgeons, and behavioral researchers to address obesity as a complex, lifelong condition shaped by metabolic, psychological, social, and environmental forces. Across keynote lectures and scientific presentations, a consistent message emerged: effective obesity prevention and treatment require multidisciplinary, life-course–oriented strategies that extend beyond weight loss to encompass metabolic resilience, mental well-being, microbiome integrity, circadian biology, and sustained behavioral change.

Early metabolic risk and prevention were highlighted through work focusing on gestational diabetes and reproductive health. Women with a history of gestational diabetes mellitus were shown to face a substantially elevated risk for future type 2 diabetes, yet this vulnerability also represents a critical window for prevention. Evidence from lifestyle intervention studies demonstrated that improvements in physical activity, dietary patterns, and modest weight reduction in young adulthood led to significant and durable reductions in diabetes incidence [1]. These findings reinforce the importance of integrating structured lifestyle programs into postpartum care pathways. Complementary reproductive health data further underscored obesity's systemic impact, as excessive body mass index (BMI) gain during pregnancy was associated with increased urinary tract infection risk in primigravidae, emphasizing the need for coordinated metabolic monitoring and prevention across clinical disciplines [2].

The long-term management of obesity was examined through both surgical and non-surgical perspectives. Bariatric surgery remains among the most effective interventions for severe obesity; however, outcomes extend well beyond weight reduction alone. Gender-based analyses revealed that while men and women achieved comparable BMI loss, quality-of-life outcomes differed by procedure. Men demonstrated higher bariatric analysis and reporting outcome system scores following one anastomosis gastric bypass and adjustable gastric banding, whereas no gender differences were observed after sleeve gastrectomy [3]. These findings suggest that psychosocial, physiological, and possibly hormonal factors may modify perceived benefit and recovery, reinforcing the need for gender-sensitive patient selection and counseling. Long-term cohort data further demonstrated sustained weight loss, improvement in metabolic syndrome components, and reduced reliance on antihypertensive and hypoglycemic medications years after Roux-en-Y gastric bypass, while also identifying predictors of weight regain, such as age and preoperative BMI [4, 5].

Several keynote presentations emphasized that weight loss and weight-loss maintenance represent biologically distinct states. While weight reduction

is driven by negative energy balance, long-term maintenance is challenged by persistent metabolic adaptations that favor weight regain. These include reductions in energy expenditure, heightened appetite, and enduring alterations in leptin and thyroid hormones signaling [6, 7]. Importantly, phenotypic and genotypic predictors of successful weight loss differ from those predicting maintenance, reframing obesity as a chronic condition requiring ongoing, individualized treatment rather than time-limited intervention. This conceptual distinction has important implications for the design of long-term obesity care and precision medicine approaches.

Circadian biology and meal timing emerged as influential regulators of metabolic and neurological health. Disruption of circadian rhythms was linked to obesity-associated cardiometabolic dysfunction, muscle impairment, neuroinflammation, and cognitive decline. Experimental and translational findings demonstrated that time-restricted feeding restores circadian alignment, normalizes lipid metabolism, and reduces inflammation in both peripheral tissues and the brain [8]. Notably, time-restricted feeding mitigated apolipoprotein E–related neuronal lipid accumulation by regulating fatty acid and triglyceride synthesis pathways, including diacylglycerol O-acyltransferase 2, highlighting a potential mechanism linking obesity, aging, and neurodegenerative risk.

The gut microbiome was repeatedly identified as a central mediator linking diet, metabolism, and systemic disease. Dietary protein source, particularly soy protein with varying isoflavone content, significantly altered fecal microbial composition in obese animal models over both short- and long-term exposure. While alpha diversity remained relatively stable, beta diversity and the relative abundance of key genera associated with metabolic health and inflammation were strongly influenced by both obesity status and dietary intervention [9]. These findings support the concept that targeted dietary strategies can modulate gut microbiota and potentially attenuate obesity-associated non-alcoholic fatty liver disease. Broader conceptual frameworks further emphasized the evolutionary importance of early-life microbial transmission, gut–brain communication, and immune development in shaping long-term metabolic health [10].

Psychological and behavioral dimensions of obesity were strongly represented throughout the conference. Surveys of psychiatric professionals revealed substantial gaps in obesity-related diagnostic knowledge but also a strong willingness to engage in multidisciplinary care teams, highlighting psychiatry's underutilized role in comprehensive obesity management [11]. Among adolescents, body weight misperception emerged as a powerful driver of restrictive dieting behaviors, fasting, supplement use, and psychological distress, even in individuals without clinical overweight. Parental and peer support were identified as protective factors, while sociocultural pressures amplified risk, underscoring the need for early, integrated mental health and obesity prevention strategies [12].

Innovative behavioral and neurocognitive approaches further expanded therapeutic possibilities. Family-based behavioral treatment for pediatric obesity demonstrated clinically meaningful and sustained BMI reductions across follow-up periods extending to ten years, with approximately half of participants achieving long-term obesity reversal [13, 14]. These findings reaffirm the value of early, family-centered interventions targeting both children and parents. Emerging adjunctive strategies, including transcranial direct current stimulation combined with hypocaloric diets, showed modest but significant weight loss benefits [15, 16], while smartphone-based interventions addressing eating addiction as a displacement behavior illustrated the potential of technology to redirect maladaptive coping strategies toward healthier alternatives, particularly among youth [17].

At the molecular and physiological level, new therapeutic targets were identified. Research on bilirubin highlighted its dual antioxidant and regulatory roles in cardiovascular and metabolic disease, with lower serum concentrations associated with poorer outcomes in ischemic heart disease [18]. In parallel, investigations into transient receptor potential cation channel subfamily M member 7 kinase revealed its essential function in preserving pancreatic islet cell mass, hormonal secretion, and glucose homeostasis under metabolic stress, identifying a potential target for preserving metabolic resilience in obesity and type 2 diabetes [19].

In summary, ICOCD-2025 reinforced the understanding of obesity as a multisystem, lifelong condition shaped by genetics, metabolism, circadian biology, microbiota, psychology, and social context. Across keynote lectures and scientific contributions, the conference emphasized that sustainable progress in obesity care depends on multidisciplinary collaboration integrating medical, dental, surgical, behavioral, psychiatric, microbiome, and preventive strategies. By highlighting both therapeutic advances and persistent knowledge gaps, ICOCD-2025 set a forward-looking agenda for innovation in integrated obesity and metabolic health care worldwide.

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