

# A Novel Gut-Orchestrated Exercise Theory on Obesity and Cancer Prevention

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## Abstract

A novel gastrointestinal tract (gut) mediated exercise theory was developed to explain how highly disciplined physical activity can help prevent obesity and cancer. The gut serves the modern human body as another brain. The gut microbiota plays crucial regulatory roles in determining the health of the gut itself and entire body. Adequate exercise has been recommended to increase energy expenditure and reduce fat deposition, especially visceral adiposity. This article presents a gut-brain axis related theory based upon which with adequately intense and regular physical activity, the gut does assimilate foods and nutrients more effectively. Thus, the amount and flow of excreta are optimized. As such, the excretion of unhealthy compounds such as cholesterol, fatty acids, and to some extent starch increase. As a result, hepatic load of nutrients decrease. Consequently, the entire body tissues experience a relief in the time-consuming and energy-burning process of metabolite turnover and detoxification. Therefore, regular intense exercise does not only reduce unhealthy nutrient deposition, it can also decrease appetite and nutrient intake. This theory should permit innovative research to formulate new gut-centered public recommendations regarding the importance of adequate regular exercise to help prevent obesity and cancer and associated metabolic complexities.

**Key words:** gut; exercise; obesity; excretion; intake; cancer

## Opinion Presentation

Cancer, obesity and their related metabolic complexities immensely reduce human life quality worldwide. Traditionally, adequate exercise has been recommended to increase energy turnover and expenditure [1-3]. In addition, the significance of exercise regularity and adequate exercise intensity has been highlighted [4,5]. Since the gastrointestinal tract (gut) is named as the second brain of the human body, an opinion is presented in the current article to explain why and how adequate, regular, and intense physical activity (e.g., running, climbing, hiking, mountaineering) comes to play a crucial role in controlling appetite, optimizing gut motility and function, reducing unhealthy metabolite absorption and deposition, and preventing obesity and cancer. Depressed individuals with lack of regular exercise would have suppressed gut motility and would be prone to obesity.

Because of such an exercise physiology, gut health and its microbiota well-being are promoted towards optimized hepatic metabolism and health. As another consequence, the liver and kidneys will work well and healthily towards effective detoxification. With adequate exercise, the gut motility and functioning improve. As a result, the digesta retention time along the gastrointestinal tract decreases. Consequently, the gut environment becomes healthier and more competitive in timely excretion

of the unassimilated food components. In other words, adequate and regular physical activity optimizes the excretion of undigested or partly-digested food components, and thus, reduces the extra assimilation and absorption of cholesterol, fatty acids, starch, and glucose. This cascade acts to optimize splanchnic tissue metabolism and health towards reduced fat deposition both viscerally and peripherally. Moreover, it is expected that the likelihood of the gut related disorders and issues such as cancer in splanchnic organs would decrease remarkably [6,7].

Furthermore, satiety signals would work properly and appetite would be controlled efficaciously with adequate, intense, and regular physical activity. As a result, less nutrients would be consumed. The lowered energy intake alongside the increased/optimized digesta excretion will work in an orchestrated fashion to reduce nutrient retention in the body in form of unhealthy adipose tissue. Recently, possible associations of obesity with the gastrointestinal motility disorders have been noted [8,9], requiring more future research for mechanistic elucidations. As implied above, the gut-brain axis should possess a determining role in the pathophysiology of gut motility disorders and their relation to obesity [9]. Last but not least, it is the gut that ultimately determines the degree of success and response to dietary strategies in exercise related obesity and cancer prevention programs.

## Conclusion and Implication

A novel theory was presented in this opinion article based on which the gastrointestinal tract (gut) regulates and determines how adequately intense and timely efficient and regular physical activity helps to prevent obesity and cancer. Increased gut motility and improved gut microbiota health and integrity play major roles in optimizing food components assimilation and nutrient absorption along the gut. As a result of the optimized digesta and excreta flow, hepatic function and health would also improve. Consequently, the total splanchnic tissue wellbeing improves and the likelihood of disorders and cancers in different organs and parts of these tissues would be reduced. To summarize, the gut is a central orchestrator in preventing obesity through systematic and disciplined physical activity. Future research and public education programs on obesity prevention should emphasize such central and mediatory gut functions and roles.

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