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Editorial

Optimizing intrinsic capacity to prevent frailty and sarcopenia in old age

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With aging we begin to experience some forms of functional decline. Geriatric syndromes such as frailty and sarcopenia are associated with physical function loss in old age. Frailty is a physiological state of increased vulnerability to stressors[1] and Sarcopenia is the accelerated loss of skeletal muscle mass and functions with aging[1]. These syndromes are associated with a myriad of negative outcomes such as hospitalization, disability, or death and greatly impact the quality of life in older adults[1]. Consequently, it is of greatest importance to geriatricians and aging researchers to prevent these conditions in order to reduce the burden of disability and dependency in old age and contribute to healthy aging. Healthy aging is the process of maintaining functional ability that enables well-being in old age[2]. This notion of healthy aging stresses the need to reorient our healthcare models from disease to a function-centered approach, as the traditional model of healthcare based on treating a single disease at a time (mostly applicable to a younger population) may not be able to fulfill the heterogeneous care needs of older adults.

Identifying strategies to maintain functional ability in old age is a topic of highest priority in geriatrics research. Interventions to prevent frailty and sarcopenia are still experimental and largely based on exercise and nutritional supplementation[3-6]. At this stage, we are still far away from implementing these intervention strategies at the community level. Moreover, it might be already too late to intervene for many older people when they experience apparent signs of functional decline (e.g., severe limitation in activities of daily living). But, if we can routinely monitor the trajectory of our functions, we may be able to intervene in time, to avoid several geriatric syndromes.

The concept of "Intrinsic Capacity" was introduced by the World Health Organization (WHO)[2]. Intrinsic capacity (IC) has been defined as the composite of all physical and mental abilities of an individual[7,8]. The decline in IC may be observed throughout life (although more likely to be evident from mid-life), unlike frailty or sarcopenia which are mostly distinct in the later stage of life. Thus, optimizing one's IC from the earlier stage of life could result in a better functional ability in older age[2]. The Integrated Care for Older People (ICOPE) care model proposed by the WHO centers around the concept of IC, which provides a clinical basis for the optimization of functional decline in older people[8]. ICOPE proposes a person-centered and community-based integrated care plan to maintain IC[8].

IC incorporates five major domains: locomotor, sensory (hearing and vision), vitality, psychology, and cognition[7], and measures to screen and assess these domains have been specified in the ICOPE guideline[8] (Figure 1). These five domains have been suggested to interact with each other and the environment one inhabits, resulting in corresponding functional ability. It should also be noted that the domains incorporated in the IC construct are very closely related to the construct of frailty phenotype[9] and also sarcopenia which has some overlap with the frailty construct. IC represents the underlying physiological reserve throughout the life course, while frailty is the accumulated deficits during aging, distinct at the later part of life[9]. In other words, if we can maintain good locomotor capacity and maintain suitable nutritional status and physical strength in the early and mid-stage of life, we may be able to retain a robust musculoskeletal system in the later stage of life, which means there is a lower likelihood of frailty and sarcopenia (Figure 1). Preventing frailty and poor muscle function as a consequence of good lifestyle behavior, better nutritional status, or cognitive function[3,4,6,10,11] suggest that these geriatric syndromes are controllable or preventable. As such, strengthening the domains of IC may be crucial. For example, using hearing aids, reading glasses, or performing cataract surgery where needed may strengthen sensory function. But unfortunately,

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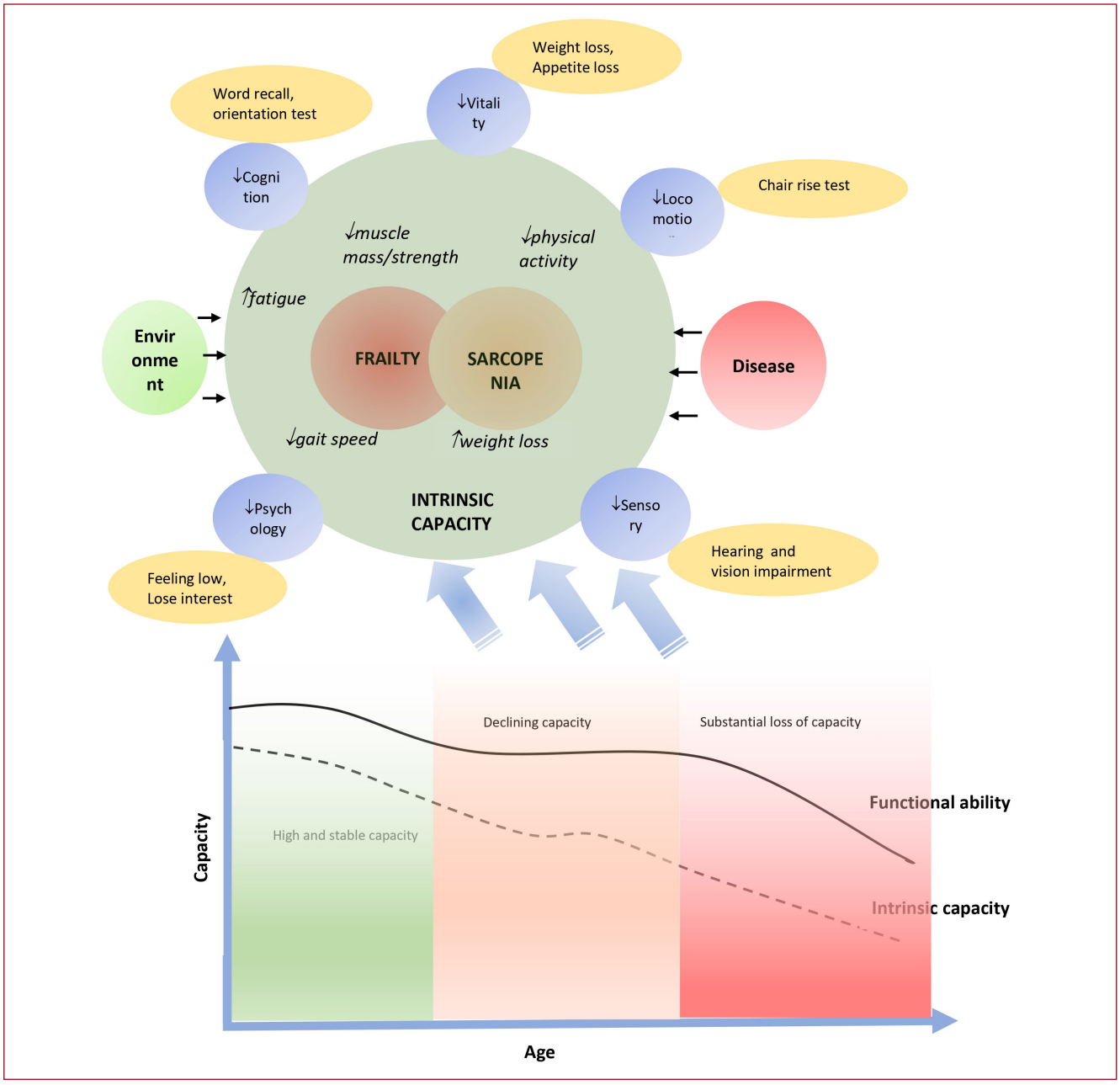

Figure 1. Decline in intrinsic capacity may precede frailty and sarcopenia. Conversely maintaining intrinsic capacity could ameliorate the geriatric syndromes.

many chronic diseases are not as preventable. Healthy aging despite chronic disease and multimorbidity could be achieved by minimizing geriatric syndromes, maintaining good nutrition and exercise, access to appropriate healthcare, and supportive social and physical environments.

Screening of IC requires minimum resources and can be readily performed worldwide, irrespective of healthcare advancement[7]. General healthcare workers without any formal geriatric education may be able to assess IC with minimal training. In fact, older adults may be able to self-assess their IC using mobile apps and could get specialized care once they experience a decline in any one of the domains[12]. Thus, providing a sense of empowerment among older people, challenging the ageist stereotype that labels them as dependent/burdensome". More importantly, opposite to the traditional concepts centered on functional deficits such as frailty or disability, IC represents a new paradigm that accentuates on promoting the positive health

attributes of older people[7]. The construct of IC is based on the longitudinal assessment of health trajectories whereas frailty or activities of daily living are generally estimated at the later stage of life. In addition, IC might be able to capture the health status of an individual better than these traditional concepts as it involves multiple physiological domains, thus providing a more holistic picture of the individual's health. Intervention strategies based on longitudinal observation data may be more personalized and effective than those based on a single observation.

The concept of IC proposed by the WHO holds great potential in improving the health status of older people globally. Routine screening for decline in IC may enable us to identify high-risk individuals for functional decline. Accordingly, this novel concept of IC provides an intervenable target for geriatricians/clinicians for preventing geriatric syndromes, such as frailty and sarcopenia, and mitigating their deleterious outcomes. Pilot projects in various socio-economic settings are needed to confirm the feasibility and adaptability of the recommended strategies within their existing healthcare infrastructure and resource. Clear recommendations for the operationalization of IC may be needed from the WHO to avoid ambiguities. "Keeping it simple" is the key to attracting stakeholders worldwide in raising awareness to optimize IC, hence, preventing several geriatric conditions down the road.

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