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Study: 80% of Singapore Elderly at Risk of Malnutrition Have Low Muscle Mass, but Nutrition Intervention Can Improve Physical Function and Health

PHASE TWO OF SHIELD STUDY BY CHANGI GENERAL HOSPITAL, SINGHEALTH POLYCLINICS AND ABBOTT EVALUATES THE EFFECTS OF NUTRITIONAL INTERVENTION ON HEALTH OUTCOMES

- High prevalence of low muscle mass among 4 in 5 older adults in Singapore at risk of malnutrition, which may impact overall health and immune function.
- Community-dwelling older adults who received individualised dietary counselling and consumed oral nutritional supplements (ONS) found significant improvement in nutritional status, physical function and health.

SINGAPORE, 15 January 2021 – New Phase Two findings from the SHIELD study by Changi General Hospital (CGH), SingHealth Polyclinics (SHP), and Abbott – which aims to **strengthen health in the elderly** through nutrition – revealed that improved nutritional intake reduced the risk of malnutrition by almost three-fold and promoted better health.

The double-blind clinical study of 811 participants, aged 65 and up, recently published in *Clinical Nutrition*, examined the effects of consuming oral nutritional supplements along with individualised dietary counselling to enhance health outcomes of older adults living in the community who are at risk of malnutrition.ⁱ

When compared to the control group who received individualised dietary counselling and a placebo supplement over six months, the group of 405 participants who received individualised dietary counselling and consumed two servings of a specialized oral nutritional supplement containing beta-hydroxy-beta-methyl-butyrate (HMB)* each day showed:

- Improvements in overall health outcomes without hospital admission or readmission, with at least 5% weight gain
- Three times lower risk of malnutritionⁱⁱ
- Improved vitamin D status ⁱⁱⁱ
- Enhanced physical function, specifically increased leg strength^{iv} and improved handgrip strength^v

MALNUTRITION LEADS TO LOW MUSCLE MASS AND HEALTH IMPLICATIONS

Malnutrition affects a third of older adults, a population that is expected to grow rapidly in Asia^{vi} - with 1 in 3 older adults in Singapore at risk for malnutrition,^{vii} and more than 35% of older adults admitted to a local hospital found to be malnourished^{viii}.

Malnutrition occurs when the body does not get the nutrients it needs and affects both underweight and overweight individuals. Malnutrition often goes undiagnosed as it is not assessed regularly during visits to the doctor.

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In addition, every 1-year increase in age after 65 is associated with a 13% higher odds of having low muscle mass, even in older adults with normal nutritional status^{ix}. With the onset of aging, older adults require up to 30% more protein in their diet to maintain the same muscle mass as a young person in their twenties^x. Thus, maintaining a healthy nutritional status to avoid becoming malnourished requires sustained effort through a balanced diet and exercise.

"At CGH we have a longstanding dedication to patient-centric care and research, and over the years, we have observed a large number of older adults admitted to the hospital with associated symptoms of malnutrition," said Adjunct Associate Professor Samuel Chew, senior consultant, geriatric medicine, Changi General Hospital, and principal investigator of the study. "Protein needs increase with age, and muscle protein synthesis can be more effective with the addition of regular and moderate exercise. Given Singapore's aging population and the results from this SHIELD study, CGH will work to reverse the effects of malnutrition by developing interventions in collaboration with our partners, so our older Singaporeans can continue to live healthy and active lives at home and in the community."

EXERCISE AND PROTEIN INTAKE ARE KEY TO MAINTAINING MUSCLE MASS

Muscle mass is an important indicator of health in older adults. Low muscle mass is associated with adverse health outcomes and slower recovery rates in older adults. Building up muscle mass through diet and exercise can help older adults to retain their mobility, strength, energy levels, and independence as they age.

A lack of protein may result in loss of muscle mass, leaving older adults more vulnerable to age-related symptoms such as frailty, sarcopenia, infections, and more. A high-protein, well-balanced diet plays an essential role in ensuring that the recommended daily intake of nutrients is met. Ingredients such as lean meat, fish, poultry, eggs, tofu, beans, and pulses, as well as cheese and other dairy products, are rich sources of protein. Older adults with chewing and swallowing difficulties, or experiencing a loss of appetite, and those who are at risk of malnutrition may be prescribed texture-modified diets or oral nutrition supplements during their dietary counselling to support proper dietary intake.

"Nutrition is fundamental for people to live well, particularly for older adults to maintain their strength and support their immune health, prevent disease and aid their illness recovery," said Low Yen Ling, PhD, divisional vice president, scientific and medical affairs at Abbott and co-author of the study. "That's why Abbott has been researching the impact of nutrition in adults for more than 45 years. The latest clinical research on aging confirms that with the right nutritional intervention and dietary guidance, older adults – even those at risk of malnutrition - can improve their nutritional status, mobility and strength, and help them lead fuller lives, into their golden years."

"The findings of this study highlight the importance of early intervention, even for older adults living independently in the community," said Tan Ngiap Chuan, associate professor, family physician and director of research at SingHealth Polyclinics, and vice-chair of research at SingHealth-Duke NUS Family Medicine Academic clinical programme. "Screening the nutritional status of the older persons in primary care is pivotal to their muscle health, making a big difference in their quality of life at the end of the day."

About the SHIELD Study

SHIELD is a large-scale prospective, randomized, double-blind, placebo-controlled two-part study conducted by Changi General Hospital (CGH), SingHealth Polyclinics (SHP), and Abbott, that investigates the effects of nutrition management and the impact of oral nutritional supplements in the clinical, nutritional and functional outcomes of community-dwelling older adults, aged 65 and above in Singapore.

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In part two of the study, it assessed 811 older persons, aged 65 years and above who were at risk of malnutrition. Conducted at the Nutritional Health of the Elderly Reference Centre (NHERC) that was set up in partnership between CGH and Abbott in 2017, the participants were provided with dietary counselling during the study. In addition, approximately half of the group, comprising 405 individuals were given 2 glasses of a specialized oral nutritional supplement containing HMB, whereas the other group (406) received placebo supplement.

The first phase of the study, which was published in *PLOS One* in October 2019, showed that 1 in 5 Singaporeans age 65 and up, with normal nutritional status, will potentially be at risk for sarcopenia or low muscle strength. Starting in 2017 and funded by the Singapore Economic Development Board, CGH and Abbott, the SHIELD study evaluates the association between nutrition and health outcomes, establishing nutrition standards for a rapidly aging population in Asia and developing community engagement efforts and localized solutions to empower and enable independent-living older adults within the community.

About Changi General Hospital

Changi General Hospital (CGH) is an academic medical institution with over 1,000 beds serving a community of more than 1 million people in eastern Singapore. With a wide range of medical specialties and services, it is helmed by an experienced and skilled team of healthcare professionals who consistently deliver positive health outcomes and care for patients.

About SingHealth Polyclinics

SingHealth Polyclinics (SHP) practises Family Medicine, providing seamless, patient-centred treatment and preventive healthcare that is affordable and accessible to all through its network of eight polyclinics. SingHealth Polyclinics is a member of Singapore Health Services (SingHealth) – an Academic Medical Centre offering over 40 clinical specialties through a network of acute hospitals, national specialty centres, community hospitals and polyclinics.

About Abbott

Abbott is a global healthcare leader that helps people live more fully at all stages of life. Our portfolio of life-changing technologies spans the spectrum of healthcare, with leading businesses and products in diagnostics, medical devices, nutritional and branded generic medicines. Our 107,000 colleagues serve people in more than 160 countries.

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ⁱ Chew STH, et al. *Clinical Nutrition*. 2020. E-pub ahead of print

ⁱⁱ Assessed based on Malnutrition Universal Screening Tool (MUST) risk

ⁱⁱⁱ At days 90 and 180

^{iv} At Day 90 (both genders)

^v At Day 180 (females only)

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^{vii} Wei, K., Nyunt, M. S. Z., et. al. (2017). Frailty and malnutrition *Journal of the AMDA*, 18(12), 1019-1028.

^{viii} Lim, Yen Peng (2010). Malnutrition and clinical outcomes in elderly. PhD thesis, Queensland University of Technology.

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^x Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE, Phillips S, Sieber C, Stehle P, Teta D, Visvanathan R, Volpi E, Boirie Y. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc*. 2013 Aug;14(8):542-59. doi: 10.1016/j.jamda.2013.05.021. Epub 2013 Jul 16. PMID: 23867520; Moore DR, Churchward-Venne TA, Witard O, Breen L, Burd NA, Tipton KD, Phillips SM. Protein ingestion to stimulate myofibrillar protein synthesis requires greater relative protein intakes in healthy older versus younger men. *J Gerontol A Biol Sci Med Sci*. 2015 Jan;70(1):57-62. doi: 10.1093/gerona/glu103. Epub 2014 Jul 23. PMID: 25056502.

^x Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE, Phillips S, Sieber C, Stehle P, Teta D, Visvanathan R, Volpi E, Boirie Y. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc*. 2013 Aug;14(8):542-59. doi: 10.1016/j.jamda.2013.05.021. Epub 2013 Jul 16. PMID: 23867520; Moore DR, Churchward-Venne TA, Witard O, Breen L, Burd NA, Tipton KD, Phillips SM. Protein ingestion to stimulate myofibrillar protein synthesis requires greater relative protein intakes in healthy older versus younger men. *J Gerontol A Biol Sci Med Sci*. 2015 Jan;70(1):57-62. doi: 10.1093/gerona/glu103. Epub 2014 Jul 23. PMID: 25056502.

*Due to the design of the study, it is not possible to ascribe the results of the trial to a single ingredient or nutrient, but only to the intervention product as a whole.