

Project **MUSCLE-UP**

Enhancing detection of possible sarcopenia and delivery of targeted physiotherapy interventions among hospitalized older adults - a Quality Improvement (QI) initiative

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**Background**

- Sarcopenia is an age-related progressive skeletal muscle disorder that involves loss of muscle mass plus loss of muscle strength and/or reduced physical performance.
- Affects 9.9% to 40.4% of older people<sup>1</sup> with links to several cardiometabolic risk factors (notably diabetes mellitus, hypertension and hyperlipidaemia)<sup>2</sup> and increased risk of physical limitations at 4 years, slowness at 7 years and 10-year mortality.<sup>3</sup>
- Amongst community-dwelling prefrail or frail older persons with sarcopenia, exercise intervention led to improvement in fall risk scores.<sup>4</sup>

**Impetus**

- In our institution, there is no standardised workflow to diagnose patients with sarcopenia or possible sarcopenia. Targeted interventions are thus not delivered.
- Fish-bone analysis (Figure 1) and Pareto chart were used to identify reasons behind low detection of sarcopenia.
- A multi-disciplinary QI team, including physiotherapists and doctors, was formed to address this.

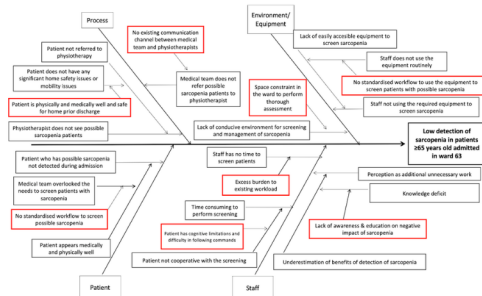


Figure 1: Fishbone analysis to elucidate causes behind low detection rates of sarcopenia

**Developing Solutions**

Tree diagram and prioritization matrix (Figure 2) were utilized to identify top 3 solutions which were most effective, feasible and sustainable

- In-person introduction and regular engagement through Tigertext chat group
- Combined Tigertext chat group involving all stakeholders.
- Identification of efficient screening tools for sarcopenia.

Approach to Address Root Cause	Specific Solutions	Effectiveness	Feasibility	Sustainability	Total Score
Improve awareness of negative impact of sarcopenia and screening	Introduce at department meetings	3	4	2	9
	Lecture on Sarcopenia/screening tools	2	4	2	8
	AKO Room Poster	2	5	3	10
	Prevention Introduction 1 Chat Group	6	5	6	17
Establish communication channel between medical team and PTs to highlight cases	Identifying "Possible Sarcopenia" in GPCS	2	5	4	11
	Combined chat group with PT, MD, etc	4	5	4	13
	Organizing multidisciplinary meetings	3	2	3	8
Optimal Sarcopenia screening with engineering team efficiency	SARC-F + Handgrip strength	4	2	2	8
	SARC-F alone	2	5	4	11
	SPPB-CaF	1	5	5	11
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Figure 2: Tree diagram and prioritization matrix for solutions identified

**Mission Statement**

- To reduce the time to detection of possible sarcopenia and receive targeted rehabilitation for patients aged more than 65 in Ward 63 (an acute geriatric ward) from 3 days to 1 working day within 6 months.
- A target of > 25 patients was set and key exclusion criteria defined.<sup>5</sup>
- Targeted rehabilitation defined by 3 main physiotherapy (PT) interventions: balance, gait training, strength training.
- Other measures collected included:
  - Physical performance outcome using Short Physical Performance Battery (SPPB) (before commencing rehabilitation and prior to discharge)
  - SARC-CalF scores.

**Process & Results**

- 2 PDSA cycles were implemented.



- Development of workflow with inclusion & exclusion criteria defined.
- Increased awareness of sarcopenia through publicity at department meeting and in-person education.
- Implementation of trial screening for 12 patients & PT notes reviewed to assess baseline interventions/time to referral.
- Promulgation of workflow (Figure 3) for referral and rehabilitation structure
- Core group with junior doctors and PTs created to highlight and monitor selected patients as well as continued publicity regarding chosen sarcopenia screening tool.

- 26 patients were enrolled.
- 13 (50%) were admitted for falls.
- Significant improvement in:
  - Time to PT review from baseline of 2.16 days to 1.38 days.
  - Increase in number of interventions delivered per patient from 1.08 interventions to 2.23 interventions.
- All 26 SARC-CalF scores were collected. (mean score 14.6)
- 14/26 (53.6%) had SPPB scores measured.

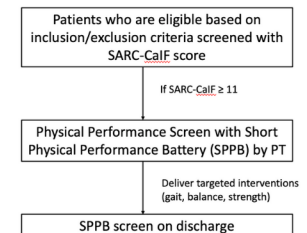


Figure 3: Workflow for screening patients

**Moving forward**

- Sarcopenia is prevalent and recognition, as well as assessment, should be incorporated as core curriculum for junior doctors and allied health professionals.
- Doctor education and SARC-CalF screen are simple and practical tools that can be utilised
- Development into a research project to further validate its utility in providing targeted PT interventions to suitable frail elders and to assess long term outcomes of these interventions.

**References**

<sup>1</sup> Mayhew AJ, Amog K, Phillips S, et al. The prevalence of sarcopenia in community-dwelling older adults, an exploration of differences between studies and within definitions: a systematic review and meta-analysis. *Age Ageing*. 2019;48(1):48-56.  
<sup>2</sup> Fielding RA, Vellas B, Evans WJ, et al. Sarcopenia: An undiagnosed condition in older adults. Current consensus definition: Prevalence, etiology, and consequences. International Working Group on Sarcopenia. *J Am Med Dir Assoc* 2011;12:249e256.  
<sup>3</sup> Woo J, Leung J, Morley JE. Defining sarcopenia in terms of incident adverse outcomes. *J Am Med Dir Assoc* 2015;16:247e252.  
<sup>4</sup> Lu Y, Niti M, Yap KB, et al. Assessment of Sarcopenia Among Community-Dwelling At-Risk Frail Adults Aged 65 Years and Older Who Received Multidomain Lifestyle Interventions: A Secondary Analysis of a Randomized Clinical Trial. *JAMA Netw Open*. 2019 Oct 2;2(10):e1913346.  
<sup>5</sup> Exclusion criteria included inability to answer SARC-F (deaf, mute, poor vision – caregivers are allowed to answer on behalf of patient), inability to measure calf circumference, medically unstable (hemodynamic instability, acutely delirious/drop in GCS/obtundation, post-operative), oxygen requirement > 2L, clinical frailty scale (CFS) more than 6, metastatic cancer, on renal replacement therapy (RRT).