

## Gym Tonic

### Recreation<sup>1</sup>

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Walking is an important pastime and mode of transport for older adults. Through walking, older adults can access amenities, improve their health and interact with their community. However, walking can become increasingly challenging as we age. For 90-year-old Mdm Than, the walk from her house to Bishan Community Club (Bishan CC) is an integral part of her daily activity. During her journey, she must rest twice on the way to her destination.

After six months of Gym Tonic, she has improved her walking endurance and is able to walk further now. She only needs to rest once for the same journey.

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<sup>1</sup> This is an evolving database. We will be adding more examples and cases over time.



Photo 1: Gym Tonic @ Bishan CC<sup>2</sup>, designed by Formwerkz Architects

This story is part of the increasing evidence that frailty can be reversed through early intervention (See Box 1). This webpost note introduces Gym Tonic, a pre-emptive approach recently implemented in Singapore to combat frailty beyond the current dose-response or reactionary approach.

### Box 1: Definition of Frailty

Frailty is a distinct clinical condition wherein the individual has low reserves and is highly vulnerable to both internal and external stressors. Individuals suffering from frailty exhibit signs of weakness, slowness, exhaustion and loss of muscle mass.

Source: Chen, C. Y., Gan, P., & How, C. H. (2018). Approach to frailty in the elderly in primary care and the community. *Singapore Medical Journal*. 59(5), 240.

<sup>2</sup> All photos taken by the author and Dr Rashed Bhuyan, with permission from Gym Tonic Bishan CC unless otherwise stated.

## What is Gym Tonic<sup>3</sup>?

Initiated in 2014, Gym Tonic is an evidence-based strength training programme for seniors conceived by the Lien Foundation, in collaboration with health technology company PulseSync and Finnish research partner Kokkola University Consortium Chydenius, University of Jyväskylä. Originally deployed in nursing homes and senior care centres, Gym Tonic has been set up within the community following positive reception among the community. There are 29 Gym Tonics in various locations around Singapore, co-located with community clubs, senior activity centres, senior care centres, among others, serving an estimated 4200 active users. The Lien Foundation plans to scale up to 50 sites in the next few years.

Through structured and supervised training, Gym Tonic is designed to help older adults aged 55 years and above to regain their physical strength and extend their functional life years.

Gym Tonic uses age-friendly machines imported from Finland. Each Gym Tonic centre comes equipped with a set of six pneumatic exercise machines.

<sup>3</sup> We thank Mr. Gabriel Lim, Lien Foundation; Mr. Khoo Kar Tiong & Mr. Siew Heng Quah, Gym Tonic Management Committee; Mr. Joseph Chan & Mr. Yuan Hui Looi, Gym Tonic Wellness Coach; PulseSync Pte Ltd; Formwerkz Architects; and volunteers & participants of Bishan Community Club for their valuable insights and information on Gym Tonic at Bishan Community Club.

While commercial gyms usually have weights in kilograms, which might prove too challenging for older adults, pneumatic technology allows older adults to scale their training to finer calibration e.g. in 100gm intervals. In addition, the machines target core muscles (leg, abdomen, chest, abduction, shoulder and upper body) that are essential for daily living activities.



Photo 2: Senior-friendly Pneumatic Machines

One of the unique features of Gym Tonic is the IT software, which captures exercise data from these machines. The participants' exercise data and assessment records are then used to prescribe their exercise load and monitored by on-site trainers on a regular basis. The aggregated assessment and exercise data is also constantly analysed in the background to better understand older people's behaviour and other factors which allow the programme to be fine-tuned

to drive better results, higher utilisation and operations efficiency.

Each Gym Tonic centre is jointly funded by Lien Foundation and the implementing site. Lien Foundation funds the machines, implementation of the IT system, training for the therapists and maintenance while the implementing site takes care of the manpower and operating costs as well as any renovation that might be needed.

### *Structured Training*

A typical Gym Tonic programme consists of 4 main stages:

- 1) Pre-assessment & measurement;
- 2) Exercise & intervention;
- 3) Post-assessment;
- 4) Maintenance & re-assessment.

Gym Tonic offers flexible schedules and pricing options. For example, participants could sign up for a 12-week exercise package including a pre and post assessment for S\$150-S\$240 per month.

At the start of the programme, participants are assessed on their baseline fitness using WELMED assessment protocol<sup>4</sup> which is jointly developed with the University of Jyväskylä, Finland. The software analyses participants' baseline

<sup>4</sup> WELMED is a health concept that integrates measurement technology with physical activity to provide evidence-based information. For more information visit: <https://www.chydenius.fi/en/health-sciences/welmed>.

assessment data based on age, gender among other factors. These results are presented in scores and charts to allow trainers to better understand participants' fitness and frailty levels and prescribe the appropriate starting exercise load for individuals (See Box 2). The baseline fitness level is shared with the participants to allow them to better understand their condition and identify areas for improvement.

### Box 2: Assessment of Frailty

Gym Tonic assesses frailty based on a set of five criteria from the Fried Frailty phenotype. These include unintentional weight loss, weakness, exhaustion, slow walking speed and low physical activity. Participants with none of these symptoms are 'robust'; one or two is categorised as 'pre-frail' and three or more is considered 'frail'.

Source: Lien Foundation. (2017). Gym Tonic Press Release. Singapore: Lien Foundation.

Following the assessment, participants undergo 12 weeks of strength training with two sessions per week. Each session spans 30-40 minutes of structured training under the guidance of a qualified trainer. Upon completion of 12 weeks of structured training, post-assessment of participants' health and physical condition is conducted. The pre and post assessment allows participants to review their performance.

At the end of the 12-week structured training, participants are encouraged

to continue onto a maintenance programme for a further 12 weeks. Participants that choose to leave the programme at the end of the 12 weeks will be encouraged to continue an active lifestyle on their own and are reminded to return to the programme again should they feel weak or frail.

### *Efficacy of Gym Tonic*

*"The frail elderly is often caught in the vicious cycle of inactivity where, because they are afraid of falling, they don't try to exercise and this in turn makes them weaker to the point of being bed-bound," - Mr Andrew Yeo, Peacehaven Nursing Home Exercise Therapist<sup>5</sup>*

No miracle cure is claimed.

*"We don't claim that their leg pain or shoulder pain will get better. We tell them that by doing this, they'll become stronger," - Looi Yuan Hui, Gym Tonic Wellness Coach<sup>6</sup>. Where excessive pain is experienced, he added, "we encourage them to visit a doctor".*

A Lien Foundation 2017 participant evaluation study found that close to half of the 396 older respondents in

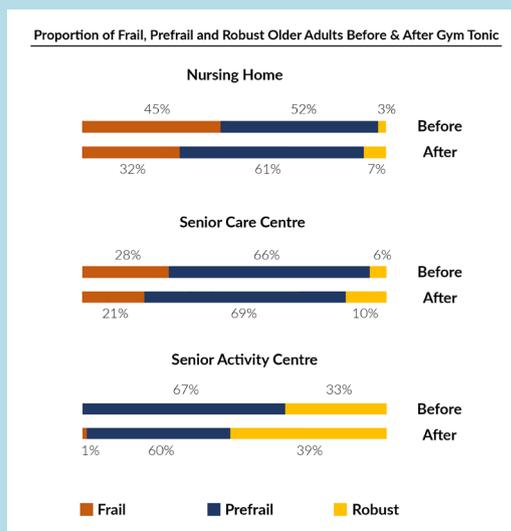
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<sup>5</sup> Elder-friendly gym machines for active ageing. *The Straits Times*. Retrieved from: <https://www.straitstimes.com/singapore/health/elder-friendly-gym-machines-for-active-ageing>. Accessed on 20th March 2019.

<sup>6</sup> Lien Foundation. (2017). Gym Tonic Press Release. Singapore: Lien Foundation. Retrieved from [http://www.lienfoundation.org/sites/default/files/GT\\_Presser\\_12Dec2017\\_Combined.pdf](http://www.lienfoundation.org/sites/default/files/GT_Presser_12Dec2017_Combined.pdf). Accessed 22nd February 2019.

nursing homes and senior care centres who exercised on Gym Tonic machines reversed their frailty or pre-frailty to pre-frail and robust status respectively (See Box 3).

### Box 3: Lien Foundation 2017 Study Results



Source: Lien Foundation. (2017). Gym Tonic Findings. Singapore: Lien Foundation.

A more recent study of 183 Gym Tonic members at Bishan CC found that 70% experienced improvement in their walking speed, 76% had improvement in their Sit to Stand Speed and 88% improved their lower body muscle strength.

Other benefits include stronger grip strength and better scores on physical tests, which assessed daily functioning. Research in Jyväskylä University, Finland, has shown that strength and balance training can reduce falls by as much as half with knock-on effects on healthcare costs. These outcomes are encouraging in view of the prevalence of frailty in Singapore (Box 4).



Photo 3: Warm Up and Cool Down Exercises

### Box 4: Prevalence of Frailty in Singapore

Inactivity and frailty are prevalent issues in Singaporean society. According to the National Health Survey in 2010, 54.1% of Singaporeans do not exercise and one in four aged 40 or above has at least one chronic disease.

In addition, results from the Singapore Longitudinal Ageing Studies showed that approximately half of older adults aged 55 years and above in Singapore are frail. The study also reported that physically frail older adults are 2 to 10 times more likely to become functionally disabled on daily living activities, get hospitalised or die earlier than their robust counterparts. Coupled with rapid population ageing, this has severe implications on the disability and disease burden of Singaporean society.

Source: Nyunt, M. S. Z., Soh, C. Y., Gao, Q., Gwee, X., Ling, A. S., Lim, W. S., ... & Ng, T.

P. (2017). Characterisation of physical frailty and associated physical and functional impairments in mild cognitive impairment. *Frontiers in Medicine*. 4, 230; Ministry of Health (MOH). (2010). National Health Survey 2010 Singapore. Singapore: MOH.

## What makes Gym Tonic Special?

Gym Tonic offers a holistic approach to active ageing. The idea is not only about allowing older adults to stay fit through exercise, nutrition and lifestyle but more fundamentally, to help them regain their self-confidence, life's purpose and passion.

Gym Tonic is context specific and dynamic. Different community sites explore different ways to integrate Gym Tonic with their community and social activities like community gardening, physical games, handicraft making, music playing, self-organised seasonal/goal attainment celebrations, etc. For example, Bishan CC holds graduation events to celebrate each cohort's programme completion and each participant receives a simplified report card of their achievements and improvements. Other sites in senior activity centres, for example, have implemented ideas such as a rewards-based system that allows participants to accumulate points and redeem them for household essential goods.



Photo 4: National Day Potluck (Photo Credits: Gym Tonic Bishan CC)

Each visit to Gym Tonic provides the older person with opportunities for physical activity as well as social interaction and cognitive stimulation, motivating each other to exercise regularly. Over time, networks form between fellow participants and these networks can become powerful drivers for lifestyle change and deterrents to social isolation. Some participants even return as volunteers to support the programme.

At Bishan CC, the club-like environment helps strengthen self-motivation amongst similarly aged peers. Common objectives highlighted by Gym Tonic participants include losing weight (especially for ladies), walking independently to the marketplace or taking public transport, and being able to travel. Key outcomes observed are better sleep quality, improvement in incontinence, better mood/physical wellbeing (especially for participants in nursing homes). Aside from self-motivation, Gym Tonic trainers play a critical role in guiding and encouraging older people to progress in their training.



Photo 5: Community Node for Social Interaction

Gym Tonic is designed to offer a fuss-free, age-friendly exercise experience for older adults using technology. This is accomplished through an intuitive and user-friendly machine interface. The older adult only needs to tap their radio frequency identification (RFID) smart card on the exercise machine and the machine proceeds to adjust itself according to previously customised user settings.

*'The machines improve the image of ageing and give them back their dignity. Instead of having improvised exercises or improvised equipment, now they are getting almost the real stuff, like in gyms such as California Fitness.'* -Sister Geraldine Tan, St Joseph's Home<sup>7</sup>

From a perspective of practical significance, having an easy-to-use interface is important as some older

<sup>7</sup> Lien Foundation spending over \$2m on gym machines for seniors. *The Straits Times*. Retrieved from: <https://www.straitstimes.com/singapore/health/lien-foundation-spending-over-2m-on-gym-machines-for-seniors>. Accessed on 20th March 2019.

adults may not take to new technologies easily. Through Gym Tonic, older adults are helped to understand that technology can be a helping tool rather than an obstacle. They can view the results of their exercise routine as it occurs.

Aside from lowering the barriers to exercise and changing behaviour, Gym Tonic is designed to reverse the common perception of gyms being an exclusive lifestyle option that is oriented towards young people. Its exercise machines can be calibrated to set finer increments of weight loading, which is suited to the needs of older adults and they are made to feel at home and welcomed in the place. Gym Tonic offers a demonstration of inclusiveness, which is often inconspicuous in initiatives that aim to be age-friendly.



Photo 6: Age-Friendly Gym

The idea of an age-friendly gym prompts us to ponder about the latent opportunities to motivate the older population to work out and keep them active within their communities. A deeper understanding of the continuum of outdoor physical activity

spaces would be helpful for this purpose. This presents a potential area for future research.

## Conclusion

*“Gym Tonic has shown that physical decline can be reversed with strength training. With timely intervention, we can reduce the loss of functions experienced by seniors and lessen the growing strain on long-term care resources. Strength training must be integral to the prevention, treatment, and rehabilitation strategies for the care of our seniors. Many of those on Gym Tonic have shared how they feel rejuvenated in their strength and spirits, like our oldest participant, a 97-year old lady from Care Corner. They are proof that it’s never too late to start.” – Mr Lee Poh Wah, CEO of Lien Foundation<sup>8</sup>*

Gym Tonic manifests this philosophy by considering older adults’ needs, making previously inaccessible lifestyle options accessible to older adults and encouraging them to regain strength and reverse decline through strength-training exercises. This is all achieved under the guidance of trainers in a community setting. Even though aches and pains may not all go away, many have reported improvements after attending Gym Tonic - older adults are not only fitter (stronger muscle strength, higher mobility and flexibility) but more

importantly, they feel empowered in their lifestyle options. The latter plays a huge role in their self-confidence, social connections, autonomy and dignity.

Gym Tonic has gained growing acceptance among the community. Against expanding demand, the Lien Foundation is currently exploring plans to set up Gym Tonic at more community sites and possibly to explore collaboration opportunities with faith-based organisations.

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<sup>8</sup> Lien Foundation. (2017). Gym Tonic Press Release. Singapore: Lien Foundation. Retrieved from [http://www.lienfoundation.org/sites/default/files/GT\\_Presser\\_12Dec2017\\_Combined.pdf](http://www.lienfoundation.org/sites/default/files/GT_Presser_12Dec2017_Combined.pdf). Accessed 22nd February 2019.