

Department of
GERIATRIC MEDICINE

Muscle Health for Staying Active and Robust!



What is Sarcopenia?

Sarcopenia refers to a progressive, age-related decrease in our muscle health, in terms of both muscle mass and strength.

How Do I Know if I have Sarcopenia?

We may experience:

- Inability to carry out daily activities
- Difficulty climbing stairs, carrying daily items or getting up from a chair
- Tiredness or slowness in our walking



What Causes Sarcopenia?

Factors that can worsen sarcopenia include:

- Low physical activity
- Poor dietary intake, especially protein
- Chronic conditions like diabetes, osteoarthritis, heart, lung, kidney or liver disease
- Certain types of medications



What Happens if I Have Sarcopenia?

Sarcopenia can lead to **frailty**, a state where our body is less able to overcome health-related stresses.

It also puts us at risk of **falls, disability, hospitalisations** and **need for long term care**.

What is Sarcopenic Obesity?

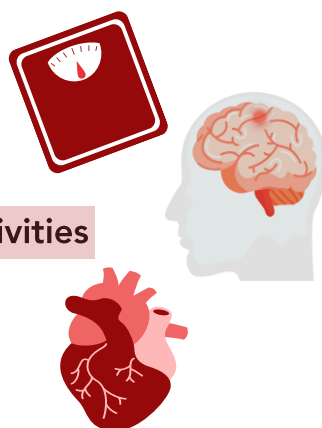
As we age, our body fat increases while muscle mass decreases. **Sarcopenia obesity** occurs when we not only lose both muscle mass and strength, but also have excess, unhealthy body fat gain, especially around our waist.

What Happens if I Have Sarcopenic Obesity?

Sarcopenic obesity leads to more serious health consequences/conditions compared to sarcopenia or obesity alone.

These include:

- Falls
- Reduced mobility
- Difficulty/Inability to manage daily activities
- Higher risk for heart disease & stroke
- Reduced psychological well-being
- Lower quality of life



What Causes Sarcopenic Obesity?

Other than ageing, factors that can cause sarcopenic obesity are:

- Low physical activity
- Poor diet quality
- Hormonal changes
- Chronic conditions like diabetes

My Health Goals

Our muscles are as important as our heart and lungs in helping us move around and stay independent so we can do what we enjoy even as we approach our golden years.

What is most important to me now?

Why is this goal important to me?

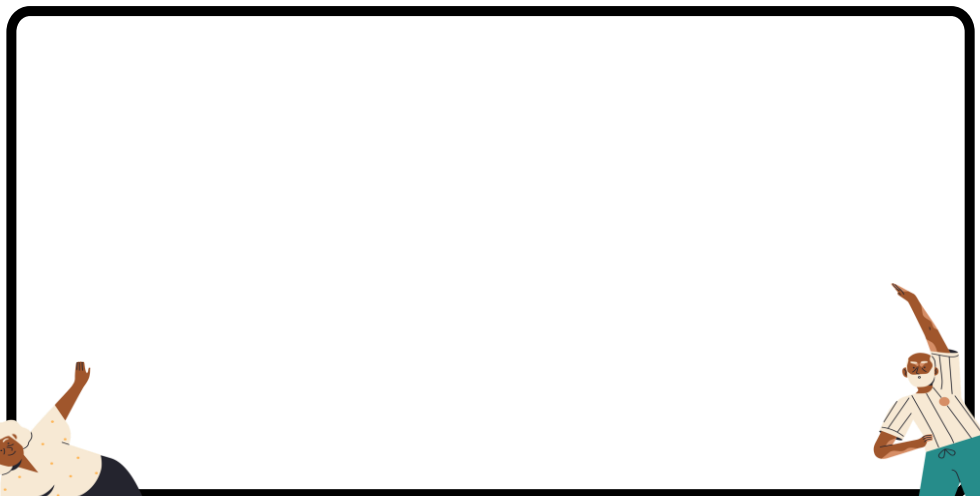


My Health Goals

Which part of my lifestyle should I change if I want to achieve my goals?



What do I need to do to achieve my goals?



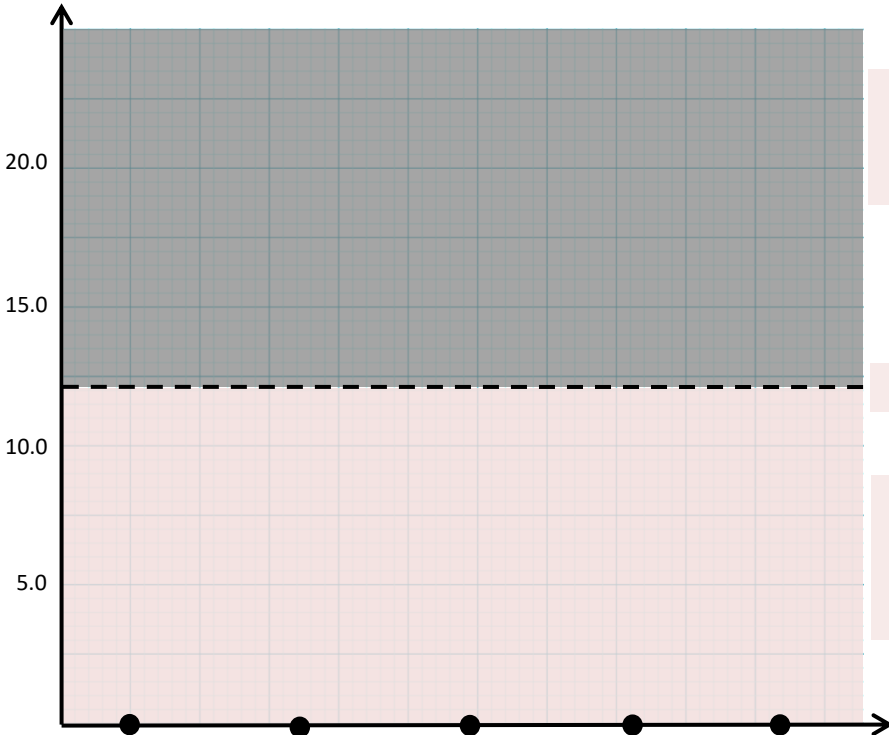
Tracking My Progress

5x Chair-stands

The 5x chair-stand test measures my leg strength and power, and how well I can do daily activities including climbing stairs getting up from a chair.



Time (s)



With time and targeted exercise, you will get faster!

Almost there!

Your effort is paying off! Let's maintain or continue to improve!

	1 st visit	Week __	Month __	Month __	Month __
Date					
Score					

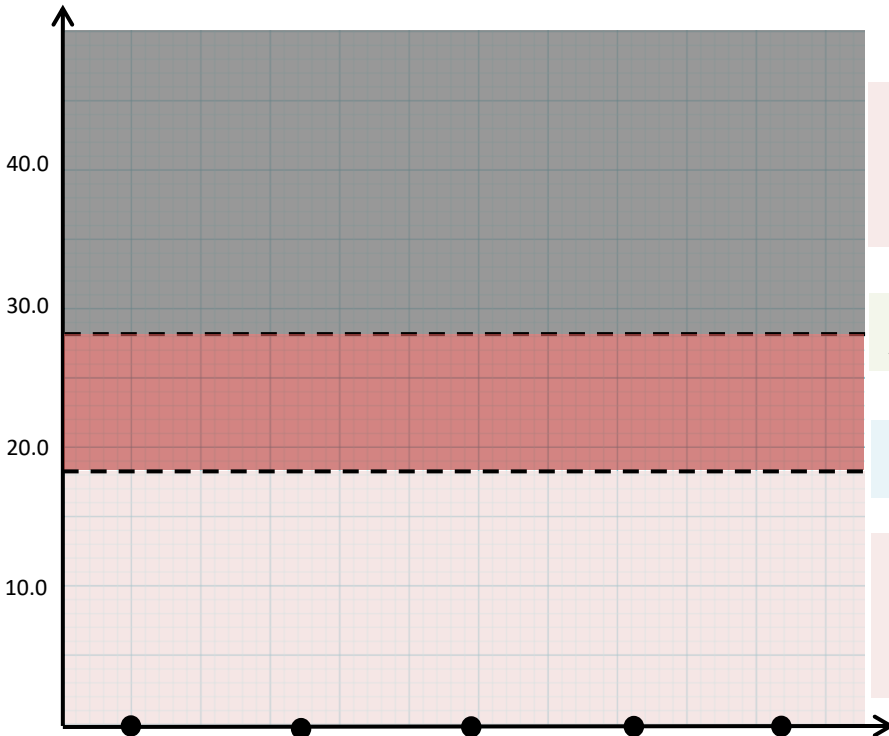
Tracking My Progress

Hand Grip Strength

The hand grip strength measures my muscle strength too. Being stronger means I can continue grocery shopping, gardening by myself, or caring for my grandchildren!



Strength (kg)



Your effort is paying off!
Let's maintain or continue to improve!

Men:
Aim for >28 kg

Women:
Aim for >18 kg

With time and targeted exercise, you will get stronger!

	1 st visit	Week __	Month __	Month __	Month __
Date					
Score					

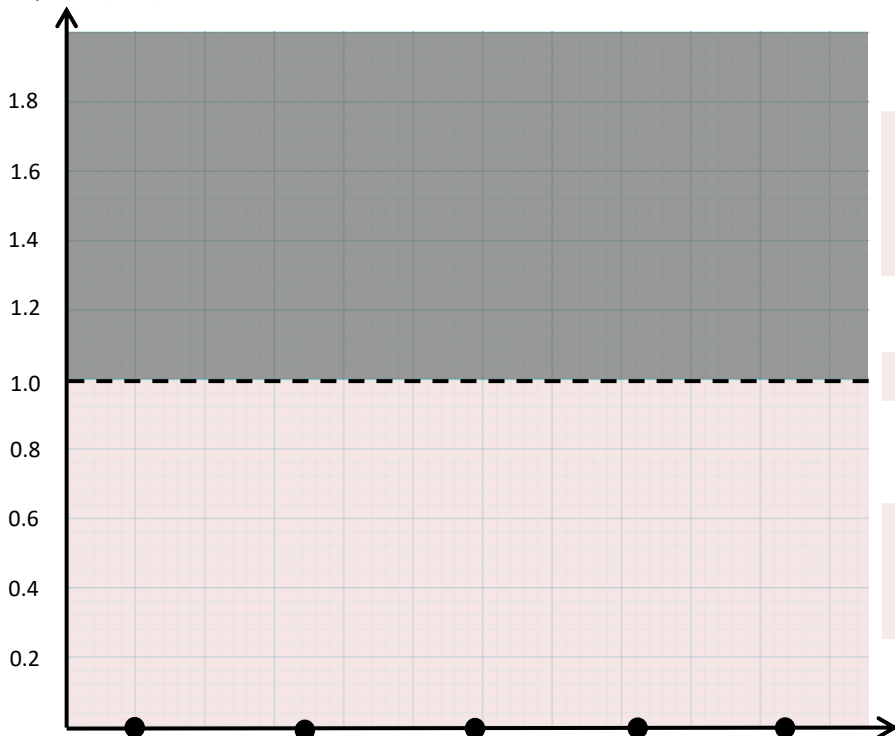
Tracking My Progress

Gait Speed

The gait speed is a measure of my walking ability. A faster speed means I can cross the road easily without rushing!



Speed (m/s)



Your effort is paying off!
Let's maintain or continue to improve!

Almost there!

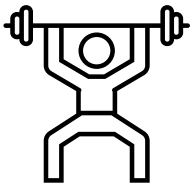
With time and targeted exercise, you will get faster!

	1 st visit	Week __	Month __	Month __	Month __
Date					
Score					

Exercise

To combat sarcopenia and sarcopenia obesity, we need to start exercising & become more active!

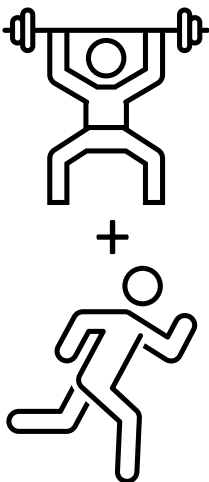
Sarcopenia



Resistance exercise helps us to:

- Get stronger
- Reverse muscle loss
- Move better

Sarcopenic Obesity



Resistance & aerobic exercise helps us to:

- Get stronger
- Reverse muscle loss
- Move better
- Improve heart health
- Reduce fat tissue
- Improve blood flow

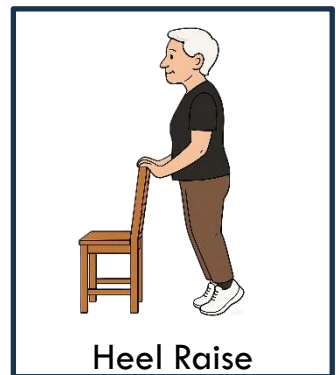
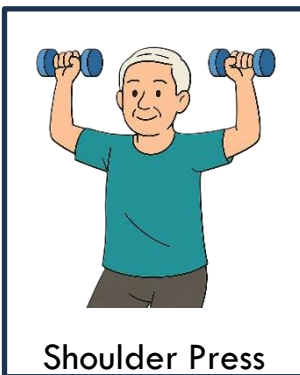
Resistance Exercise

These are exercises where our muscles work against weight (e.g. water bottle, weight machine, dumbbell, elastic band, body weight) to build muscle strength.

How Do We Start Resistance Exercise?

- 3 sets of 8-12 repetitions for each exercise
- At least two days per week (alternate days)
- Target all body parts, including arms & legs
- Start with lighter weights
- Gradually increase as we get stronger!

Examples of Resistance Exercise



All images created by ChatGPT

Aerobic Exercise

These are exercises that increase our heart rate and breathing while improving our stamina.

How Do We Start Aerobic Exercise?

- Start with lower intensity & shorter duration (e.g. 10 minutes)
- Aim towards 150 minutes of moderate intensity activity per week
- Use “talk test” to determine intensity



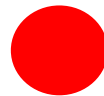
Light

Can talk in full sentences and sing



Moderate

Can talk in phrases or short sentences but cannot sing



Vigorous

Have difficulty talking

Examples of Aerobic Exercise

Brisk Walking

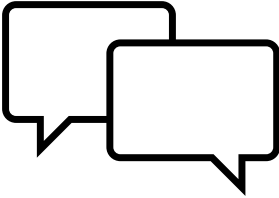


Stationary Cycling

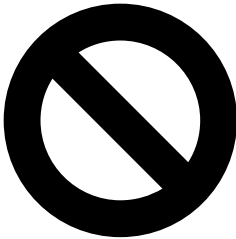


All images created by ChatGPT

How Do We Exercise Safely?



Speak to a healthcare provider before starting a new exercise program.



Stop exercising and get help if there is chest pain or tightness, severe shortness of breath or dizziness.



Progress exercises gradually. Start with light intensity and progress when ready.



Do exercises under supervision, or with a caregiver's help if our mobility is reduced.

Stay Active and Keep Fit!

Besides doing regular exercise, it is also important to stay physically active in our daily life.

We can try to move more by:



Taking the stairs instead of the escalator or lift



Getting off the bus a few stops earlier and walking the rest of the way



Standing up and moving around every 30–60 minutes after sitting for a long time

Taking short walks around the house or corridor after meals

Community Exercise Programmes

Are there any exercise programmes near our neighbourhood that we can join?

Gymtonic



<https://for.sg/gymtonic>

Resistance training using gym equipment

CALM Programme



<https://for.sg/calm-programme>

Learn resistance band-based exercises to combat muscle loss

MOVE IT Resources by Health Promotion Board



<https://for.sg/move-it>

Various kinds of exercise programs & guides

Home Therapy/ Day Rehabilitation Services



<https://for.sg/home-therapy-day-rehab>

Therapy sessions to help seniors improve their function

My Exercise Calendar

Exercise	Date					

My Exercise Calendar

Exercise	Date					

My Exercise Calendar

Exercise	Date					

Adequate Protein Intake

Adequate protein intake is essential for **tissue repair, better immunity, recovery, and maintaining muscle to reduce falls and fractures.**

Each star ★ represents one serving of protein. **You are recommended to consume ____ protein stars a day.** If you have kidney disease, please speak to your dietitian for individualised recommendations.

Choose **high-quality protein** (indicated by *) as they contain a higher amount of essential amino acids required to build muscles.



1/3 palm size of meat (30g cooked = 40g raw)



2 tablespoons minced meat / canned fish*



1 whole egg*



2 egg whites*



4 medium prawns*



1/2 block of silken tofu*



1 block tau kwa*



1/2 cup of beans



3 tablespoons of lentils



200ml milk or 4 tablespoons milk powder*



1 small tub of yoghurt*



200ml soymilk or 4 tablespoons soymilk powder*



2 slices of cheese*



3 tablespoons of seeds



1 handful of nuts



2 tablespoons of peanut butter

Adequate Protein Intake

Tips to Include More Protein in Our Diet:

- ✓ Add extra egg, tofu, tau kwa, braised peanuts or beans in meals
- ✓ Replace water with milk or soymilk
- ✓ Add milk or soymilk to coffee, tea or malted beverages
- ✓ Enjoy yogurt or soybean curd as snack
- ✓ Add cheese, peanut butter, egg, canned tuna in water, low sodium canned sardines to bread
- ✓ Take protein-rich foods **within 1 hour after exercising** to stimulate muscles building

If you have kidney disease, you may need to limit your protein intake. Please speak to a dietitian for individualised recommendations.

How Can I Improve My Intake If...

I Experience Changes in Taste:

- ✓ Add herbs, spices and condiments to enhance flavours of foods
- ✓ Add citrus foods like lemon or lime to foods and beverages to stimulate your appetite
- ✓ Serve food warm to bring out the aroma
- ✓ Review medications that may affect taste



I Have Difficulty Chewing or Swallowing:

- ✓ Choose softer foods and moisten foods with gravy
- ✓ See a dentist for denture fitting or if there are issues with your dentures
- ✓ Speak to your speech therapist on advice for suitable food texture and drinks consistency to ease chewing and swallowing
- ✓ Refer to advice from 'Oral Frailty Exercises for Healthy Living' handout
- ✓ Speak to your occupational therapist for advice on specialised utensils that can help with feeding



How Can I Improve My Intake If...

I Have Less Interest in Food:

- ✓ Have your meals and snacks at regular timings
- ✓ Try a variety of foods with different flavours, smells, colours and textures, as this may increase your interest in foods
- ✓ Make mealtimes more enjoyable (e.g. eat your meals using brightly coloured kitchenware or utensils) to improve the appeal of foods
- ✓ Have your favourite foods at any time of the day

I Have No Appetite:

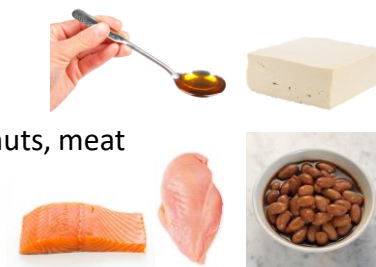
- ✓ **Have small, frequent meals**
- ✓ Eat more when your appetite is the best (e.g. some people have better appetite in the morning)
- ✓ **Increase your physical activity** as advised by your physiotherapist. This may stimulate your appetite (e.g. taking a walk 1 hour before meals can make you hungry)
- ✓ **Prioritise protein sources first, followed by carbohydrates** (e.g. rice, noodle, porridge, bread, chapati), and lastly vegetables and fruits. Vegetables and fruits are high in fibre (can make you feel full sooner) and low in calories and protein
- ✓ Avoid drinking fluids for an hour before meal, during meals and at least 20 minutes after eating, as fluids can make you feel full

What is Food Fortification?

Food fortification **increases nutrient content** in foods **without increasing portion sizes**. Some examples are listed below:

Porridge, Rice or Noodles

- ✓ Add sesame oil, shallot oil or olive oil
- ✓ Add fish, meat, tofu, egg, braised peanuts, meat floss
- ✓ Add sweet potato or potato



Bread

- ✓ Spread thick layer of soft margarine, peanut butter, jam* or kaya*
- ✓ Add cheese, egg or canned tuna/sardines



Oats

- ✓ Add milk, soymilk, honey*, egg, peanut butter, dried fruits*

Coffee, Tea or Malted Drinks

- ✓ Add milk or soymilk
- ✓ Add ice cream*, honey* or sugar* to make milk shake



** These foods may not be suitable for patients with diabetes*

High Calorie Snacks

Local Desserts*

- ✓ Bean curd, sesame paste, yam paste, tau suan, bubur cha cha, pulut hitam, green bean soup



Savoury Snacks

- ✓ Curry puff, steamed bao, dim sum, you tiao, Chinese kueh, vadai, nuts, keropok



Sweet Snacks*

- ✓ Yogurt, ice cream, biscuits with cream fillings, cake, jelly, chocolate, laddu, Nonya kueh, goreng pisang, putu piring



** These foods may not be suitable for patients with diabetes*

Nourishing Drinks

Choose nourishing drinks instead of water, plain coffee or plain tea that have little nutrition.

Examples of nourishing drinks are:

- ✓ Full cream milk
- ✓ Soymilk, oat milk, almond milk, rice milk
- ✓ Yogurt drink*
- ✓ Malted drinks (e.g. Milo, Horlicks)*
- ✓ 3-in-1 cereal or drinks*
- ✓ Honey water*
- ✓ Fruit juice*
- ✓ Sweetened beverages* such as packet drinks, chrysanthemum tea or barley drink
- ✓ Cream soup



** These drinks may not be suitable for patients with diabetes*

What is Oral Frailty?

Oral health refers to the healthy function of our teeth, tongue, lip, throat muscles, salivary glands and other structures within our mouth.

Oral frailty refers to a decline in the function of our teeth, muscles and other parts of our mouth, affecting our speaking, chewing, swallowing and eating abilities.

How Do I Know if I Have Oral Frailty?

We may experience:

- Pain and/or difficulties chewing foods
- Preference for softer foods
- Coughing/choking/throat clearing when eating/drinking
- Difficulties speaking clearly
- Mouth dryness

What Causes Oral Frailty?

Other than age, factors that can cause oral frailty include:

- Lack of teeth or ill-fitting dentures
- Conditions like stroke, Parkinson's disease
- Certain types of medications



What happens if I have oral frailty?

Oral frailty can affect our **diet quality** and **nutritional status**, increasing the risk of **sarcopenia** and **physical frailty**. It can also reduce our **quality of life**.



What Can I Do To Maintain My Oral Health?

Keep Our Teeth & Gums Healthy to Chew & Eat Well!



Brush teeth
twice daily

Brush our
tongue daily

Floss
daily

Drink enough
water

Reduce sugar
intake

Avoid
smoking

Visit the Dentist
every six months



How Should I Floss My Teeth?

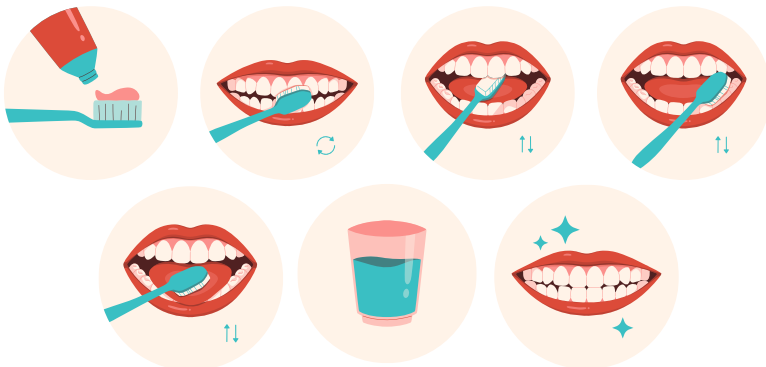
1. Floss to remove dirt between teeth
2. Wind about 45cm of floss around your middle fingers
3. Hold floss taut using your thumbs and index fingers
4. Gently slide floss between two teeth
5. Curve floss into “C” shape at the base of each tooth
6. Gently slide floss up & down against each tooth surface
7. Use a clean section of floss for each tooth



What Can I Do To Maintain My Oral Health?

How Should I Brush My Teeth?

1. Use a soft toothbrush with small & round-tipped bristles
2. Apply pea-sized amount of fluoride-based toothpaste
3. Hold toothbrush 45 degrees to the gums
4. Brush the outer, inner and chewing surfaces of your teeth gently using short, circular or vertical movements for at least two minutes
5. Brush gums and roof of mouth
6. Brush tongue using a tongue cleaner or toothbrush from back to front
7. Spit excess toothpaste; avoid rinsing immediately
8. Replace toothbrush every three months





What Can I Do To Maintain My Oral Health?

How Should I Care For My Dentures?

- Rinse after every meal
- Brush with soft toothbrush dipped in diluted dishwashing liquid
(Toothpaste will scratch the dentures)
- Remove dentures before sleeping
- Soak in denture-cleaning solution overnight

How Can Dentists Help?

Lack of natural teeth is a common reason for difficulty in eating. Dentists can replace missing teeth with dentures, dental bridges or implants.

They can also advise how to manage ill-fitting or loose dentures.

What Can I Do if I Have Swallowing or Speaking Difficulties?

Doctors can perform an assessment for related medical conditions and advise on the appropriate treatment options.

Speech Therapists can advise on strategies for safe eating and teach exercises to improve our swallowing and communication.

What Can I Do if I Have Mouth Dryness?

Doctors can review our medications.

Drinking enough water, avoiding caffeine/sugar can reduce dryness.

Alcohol-free mouth-washes can also help with dry mouth.



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Medication Use in Sarcopenia

Older adults tend to have multiple medical conditions and may need to take many medications. These can include prescribed medications, over-the-counter (OTC) medications (to treat minor conditions), and supplements.

Generally, older adults are more prone to adverse effects from medications due to age-related changes in the body. Frail older adults are even more prone to developing side effects.

The side effects of some medications may contribute to an increased risk of developing sarcopenia. Certain medications can also contribute to a greater risk of falls, especially in frail older adults with sarcopenia.

Hence, it is important to manage your own medications and ask your doctor or pharmacist to review them whenever it is necessary!

Medications and Their Impact on Sarcopenia

The side effects of some medications may contribute to the development of sarcopenia or increase the risk of falls in an older adult with sarcopenia.

Side Effect & Consequence

Change/Disturbance, loss of appetite, dry mouth, nausea, vomiting

*Food seems less tasty
→ Eat less
→ Poor nutrition
→ Weight loss*

Muscle weakness, muscle soreness, muscle wasting

*Affect balance and gait
→ Increase risk of falls*

Drowsiness, giddiness

Increase risk of falls

Examples

- Iron supplements
- Metformin (blood sugar pill)
- Zopiclone (sleeping pill)
- Behavioural control medicines
- Certain antibiotics
- Certain chemotherapy

- Cholesterol lowering medications (statins)
- Certain chemotherapy
- Steroids

- Cough syrups
- Flu medications
- Certain painkillers
- Sleeping pills

How Can I Manage The Side-Effects?

Taste change, taste disturbance

- Rinse your mouth with baking soda solution before meals to get rid of the altered taste.
- Change your food choices to mask the taste change. Avoid spicy or heavily processed foods.
- Maintain oral hygiene by brushing your teeth and rinsing your mouth (if on dentures).
- Quit smoking! It can alter your taste perception.

Dry mouth

- Suck on some ice chips.
- Drink more water (if you can).
- Consider artificial saliva products or oral moisturizing gels to moisten the mouth.

Nausea, vomiting

- Take your medication after food.
- Avoid spicy or high-fat foods.
- Take small frequent meals.

Drowsiness, giddiness

- Sit or lie down to rest.
- Avoid alcohol, it can make you more tired!
- Ask your doctor for non-drowsy alternatives.

If you develop any side effects from your medications, you can always **discuss with your doctor to change to an alternative medication** (if possible)!

Role of Vitamin D in Reducing Risk of Sarcopenia

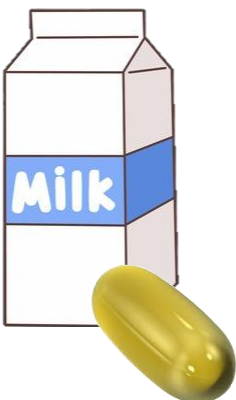
What are the effects of low vitamin D level?

Low vitamin D level ($<20\text{-}30\text{ ug/L}$) is common in older adults due to age-related changes and reduced sunlight exposure.

Prolonged low vitamin D levels contribute to muscle weakness, and reduced muscle mass and strength. This relates to poorer physical performance, and higher risk of falls and fractures.



What are the recommendations for older adults with low vitamin D level?



Older adults should consume at least 800 to 1000 IU (international units) of dietary vitamin D daily to prevent deficiency and insufficiency.

In older adults with low vitamin D levels, oral vitamin D supplementation is beneficial to improve muscle strength and reduce the risk of falls and fractures.

Take Charge of Your Medications!

It Will Help You To...



Make informed
decisions
about
your health



Be aware of side
effects and know
when to seek
help



Prevent
confusion and
medication
errors

Regular review of your medications by your doctor or pharmacist can help to reduce unnecessary medication use and undesirable side effects.

This can help minimise the impact of medications on developing sarcopenia and risk of falls in older adults with sarcopenia!

What Can I Do To Manage My Medications?

1. Keep track of the medications you are taking

- Take a photo of your medications and store it in your phone for easy access.
- Log in to HealthHub to access your personal medication list.
- Alternatively, create your own medication list using the template behind!
- Your list should include all prescription medications, OTC (non-prescription) medications, traditional medications and supplements.
- Ensure the following medication information is present in your list:

Medication name

Dosage instruction (dose, medication strength, frequency)

Reason you are taking it

Place you obtained from

- The list should be updated regularly and bring it to all appointments.

2. Ask questions about your medications

- Ask your doctor or pharmacist about your medications to find out more!
- Visit the HealthHub medication A-Z (<https://www.healthhub.sg/a-z>) webpage to understand more about your medications. You can look up on the useful patient information leaflets on the medications you are taking.
- Engage in the 'Know Your Meds Series' on the Ministry of Health website. You can learn basic skills to manage your medications through videos and bite-sized information. Scan the QR code on the right to access these resources.



<https://for.sg/managing-medication>

Use This Template To Create Your Own Medication List!

Name: _____ Updated On: _____

ID No.: _____

Medical Conditions	Drug / Food Allergy

Medications/ Supplements

No.	Medication Name & Strength	How to Take	Used For	Obtained From

Centre of Geriatric Medicine

TTSH Annex 2, Level B1

Contact:

6357 7000 (Central Hotline)



Scan the QR Code with your smart
phone to access the information online
or visit

<https://for.sg/ttsh-health-library>

This booklet was developed in collaboration with the Departments of
Physiotherapy, Nutrition & Dietetics, Speech Therapy, Nursing, and Pharmacy.

Was this information helpful?
Please feel free to email us if you
have any feedback regarding what
you have just read at
patienteducation@ttsh.com.sg



Tan Tock Seng
HOSPITAL
National Healthcare Group

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