DESIGN GUIDELINES FOR THERAPEUTIC GARDENS IN SINGAPORE
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The Therapeutic Garden @ HortPark is the prototype for the network of therapeutic gardens in Singapore. Developed based on best practices and evidence-based design principles relating to therapy for improving mental well-being, it provides respite for visitors of all ages and incorporates design elements and user-friendly features to meet the needs of the elderly, including those with conditions such as dementia. Since its launch in May 2016, there has been a growing interest to incorporate such therapeutic environments outside of park settings.

This guide puts together the basic characteristics of therapeutic gardens and aims to be a useful resource for the design of future therapeutic landscapes in Singapore, particularly for the elderly and people with dementia.
The practice of creating green spaces that promote well-being dates back to ancient times, where people sought to arrange their surroundings in ways that would enhance their quality of life. There are a number of schools of thought on landscape aesthetics. These include the Prospect-Refuge Theory (Appleton, 1975), the Savanna Hypothesis (Orians & Heerwagen, 1986 and 1992) as well the more recent Biophilia Hypothesis (Wilson, 1984 and 1993) – which have served as an inspiration to many design practitioners worldwide. These designers have applied this understanding of humans’ innate attraction to nature to biophilic design principles defined for the built environment.

Taking this concept a step further, natural environments can be specifically designed to bring about optimal restorative benefits for users. Therapeutic gardens fulfill this purpose. They are often intended to meet the needs of a specific population, through a multi-disciplinary collaborative design process helmed by a team of professionals.

In our recent research study with the National University Health System, we found that elderly participants who took part in a horticultural therapy programme experienced improvements in several aspects of their mental health. There were also improvements in a number of biological markers, suggesting that the participants’ interaction with nature reaped biological benefits, such as reducing inflammation and depression. The outcomes are both positive and promising, and we have since launched the first Therapeutic Garden @ HortPark in May 2016.

We are heartened by the interest and support of our working associates, including colleagues from the healthcare sector, in our initiative on therapeutic gardens. In this publication, we share best design practices on therapeutic gardens for Singapore. It introduces design guidelines that incorporate principles from the Attention Restoration Theory (Kaplan & Kaplan, 1989) and Stress Reduction Theory (Ulrich, 1991), to restore users’ ability to pay attention and experience a more rapid relief from stress. We invite you along in our endeavour to nurture the connection between people and nature – creating a healthier population as a result.

Kenneth Er
Chief Executive Officer
National Parks Board

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PART 1

INTRODUCTION, THEORIES & RESEARCH
Therapeutic gardens are outdoor gardens specifically designed based on evidence to meet the physical, psychological and social needs of the people using the gardens.

**What are Therapeutic Gardens?**

**Human Connection to Nature**
The body of research literature demonstrating the wide range of benefits arising from human interactions with nature is extensive and growing. Green space provides an attractive venue for physical activity, and contributes to physical health as a result. Through bio-physiological mechanisms, it also enhances our mental well-being.

One particularly beneficial activity is horticultural therapy. It is defined as the use of prescribed nature-related activities to aid recovery from mental or physical ailments. Study findings have shown benefits such as the reduction of chronic pain, improvement in attention, lessening of stress, and reduction of falls. Similarly, therapeutic gardens, located within built environments and designed specifically for a target group of patients, are now increasingly being recognised as an important aid in healthcare. They support and enhance the impact of horticultural therapy for users. In view of these benefits, the design of healthcare facilities and policies globally has begun to incorporate access to therapeutic gardens.
Understanding Benefits at Population Level
A number of theories have been presented to explain the widespread attraction to and appreciation of natural environments, the Biophilia Hypothesis being a significant one.

Biophilia was first defined by Erich Fromm as “the passionate love of life and all that is alive” in his book *The Anatomy of Human Destructiveness* (1973). The term was later used by American biologist Edward O. Wilson in his work *Biophilia* (1984), which proposed that the tendency of humans to focus on and to affiliate with nature and other life-forms has, in part, a genetic basis.

Overall, the concept of biophilia implies that we hold a biological need for connection with nature on physical, mental, and social levels. Hence, integrating natural environments into our urban setting will affect our personal well-being, productivity, and societal relationships in a positive way.

Understanding Benefits at Individual Level
Complementing population level theories are “restoration and recovery” theories (described in the following sections) that explain the psycho-physiological mechanisms through which natural environments manifest their physical and mental benefits on individuals.

Reference
Kaplan and Kaplan explain in the Attention Restoration Theory (ART)\(^1\) that a person has several states of attention including directed attention and effortless attention. Directed attention requires effort and is used when concentrating on specific tasks, such as working on the computer. As the capacity of the brain to focus on a specific stimulus or task is limited, prolonged usage of directed attention causes direct attention fatigue, and results in ineffectiveness and human error.

Restoration from directed attention fatigue can be derived from the use of effortless attention when a person is in a natural environment. Gardens, in particular, provide an opportunity for people to rest since they do not have to exercise directed attention.

ART proposes that exposure to the natural environment encourages more effortless brain function, thereby allowing it to recover and replenish its directed attention capacity.
In S. Kaplan’s earlier work, he explains the following landscape characteristics being intuitively meaningful.

A) Coherence
Provide a setting that is orderly and organised into clear areas so that people can easily understand and make sense of a place.

B) Complexity
Provide a rich setting with many opportunities for sensory engagement. For example, a garden can have a clear layout but be rich with trees, shrubs, flowers, places to sit, and paths to wander.

C) Legibility
Create a distinct setting that has one or more memorable components – something that helps someone remember the place and also allows them to navigate easily through the space.

D) Mystery
Scenes high in mystery are characterised by continuity; there is a connection between what is seen and what is anticipated. For example, a view partially obscured by foliage tempts one to follow the path, “just a little farther”, thus engaging the visitor and drawing him or her forward.

References
STRESS REDUCTION THEORY

Roger Ulrich used the Stress Reduction Theory (1991) to explain emotional and physiological reactions to natural spaces. Being in an unthreatening natural environment or viewing natural elements (such as vegetation) activates a positive affective response, resulting in a decrease in stress in individuals, which involves reduced levels of negatively toned feelings and reductions in elevated physiological conditions (such as heart rate and blood pressure).
Based on the theory, there are four areas of consideration that can guide the design of therapeutic gardens:

**A) Sense of control**
Enable users to get to and into the garden easily (garden should be visible from a main entry or other gathering/waiting area). The garden should have a variety of different types of spaces for users to choose from.

**B) Social support**
Locate and configure seating for a variety of opportunities for interaction. Conducive seating will allow users to gather and spend time together, building social connections.

**C) Physical movement and exercise**
Provide more structured opportunities for exercise as well as interaction with the gardens.

**D) Positive natural distraction**
Provide as many opportunities to engage with nature as possible. This includes plants, water, and wildlife.

**Reference**
Recognising the positive role that greenery plays in improving people’s health, the National Parks Board (NParks) and the National University Health System embarked on the first study in ASEAN (Association of South East Asian Nations) countries to evaluate the efficacy of horticultural therapy in promoting mental health and cognitive functioning of our elderly in 2015. This is especially relevant in the context of the proven benefits of horticultural therapy on the elderly population and our rapidly ageing population with increasing numbers of elderly with dementia.

In the study, 69 elderly participants were randomly assigned to receive horticultural therapy in the treatment group, or to be waitlisted in the control group. The horticultural therapy programme for the treatment group comprised outdoor gardening, indoor horticultural activities, and park visits. The sessions took place weekly for 12 weeks, and then monthly for three months.

The mental health of participants in both groups was assessed through self-reports of depressive and anxiety symptomatology, social connectedness, and psychological well-being as well as tests on immunological markers. The participants were examined at three points in time: at the start (to establish a baseline); three months post-intervention (after therapy started); and six months post-intervention.
The findings revealed that horticultural therapy improved participants’ scores for life satisfaction, memory, and psychological well-being. In particular, this improvement was significant for positive relations (social connectedness and trusting relationships).

Through biomarkers assessment, it was found that the levels of the cytokines, interleukins IL-1β and IL-6, in the horticultural therapy group were significantly reduced compared to those of the control group. IL-1β and IL-6 are pro-inflammatory proteins involved in the activation of inflammatory responses, which lead to both physical and psychological deterioration.

These positive findings support our plan to develop specially designed therapeutic gardens that are infused with nature to stimulate the senses and also incorporate features that facilitate gardening and nature engagement. Inclusive in nature, they cater to users with different capabilities, including the elderly and those with mobility concerns. As gardening offers an enjoyable experience while increasing physical activity levels at the same time, we anticipate therapeutic gardens to become more popular amongst the elderly.

Beyond the elderly, all visitors to therapeutic gardens in our public parks will be able to experience benefits as these gardens are designed to bring about restorative effects to our mental well-being.
CASE STUDY: THERAPEUTIC GARDEN @ HORT PARK
Project Summary
The first therapeutic garden in Singapore, this site is distinguished by its exceptional landscape quality and design functionality.

In its Activities Zone, where horticultural activities take place, elements like trees with ample shade, moveable and raised planter beds, wide walkways, and easily accessible water sources help to enhance the gardening experience. These features allow users with different physical abilities to carry out typical gardening tasks like watering, weeding and harvesting without straining or overexerting themselves.

A Restorative Zone complements the Activities Zone: it is a space designed with appropriate rest points like pavilions and benches scattered across the garden, serving as varied vantage points to its intensive and fascinating landscape.
At the start of the project, feedback was obtained from the psychological health department of the National University Health System. The Alzheimer’s Disease Association was also consulted as the Therapeutic Garden was intended to benefit the elderly. Their input was considered and incorporated in the design.
SITE SELECTION

A) Vicinity
It is located near a building known as the Hands-on House at HortPark, which has amenities such as toilets, wash areas and drinking fountains.

B) Shade
A site with shady trees was selected. In addition, the project was implemented without removing any existing trees. A shady area provides comfort to participants when programmes are being carried out.

C) Terrain
The site selected has a gentle slope of an approximate gradient of 1:20 running along its length. To create a level space, a timber deck was introduced.

D) Borrowed landscape
The surrounding landscape/scenic view in HortPark enhances the landscape experience in the garden.
A) Simple, clear layout
The circulation path adopts a simple looped pattern without confusing dead ends. The area is enclosed with planting beds, providing safety and separation without the use of a fence.
B) Zoning
i. Activities Zone – includes space for group activities such as horticultural therapy and exercise equipment

ii. Restorative Zone – includes space for strolling and seating

The Therapeutic Garden @ HortPark is made up of two zones, the Activities Zone and the Restorative Zone

Entrance to the Restorative Zone

MICROCLIMATE

A) Ambient temperature
With the provision of shade by trees and shelter, the ambient temperature of the site is expected to never exceed 32 degrees Celsius.

B) Air ventilation
The absence of walls and other enclosing structures allows for natural ventilation and wind to pass through the site.

C) Shade and shadow
The mature trees in the site provide shade and contribute towards the comfort of users. Considerations were made to avoid long streaky shadows.
GARDEN STRUCTURES

A) Shelter
An existing gazebo was retained to provide an area for respite and self-contemplation. New benches were built into the shelter to provide seating for up to 15 people. Views of the garden from inside the shelter were carefully curated and maintained to promote calmness and peacefulness.
B) Trellis
A new trellis was built in the activities area to provide shade for users participating in planting activities. Mobile planters were incorporated into the trellis area to ensure that the plants receive enough sunlight. If needed, the mobile planters may be moved aside, to create additional space for group activities.
AMENITIES

A) Benches
Benches are located strategically throughout the garden to make the most of scenic views. These benches were designed with armrests to assist the elderly with getting up. The shape of the bench and its materials are carefully selected to ensure they are safe and easily usable by the elderly.

B) Toilets, drinking fountains and vending machines
Toilets, drinking fountains and vending machines can be found in close proximity to the garden, at the Hands-on House. The access between the garden and these facilities was designed to be barrier free. The Hands-on House also provides shelter in the event of wet weather.
E) Seats at the Activities Zone
The railings along the timber deck are fitted with seats to optimise space. These seats allow caregivers to rest while activities are going on. Mature trees provide shade for the seating areas.

C) Planting racks
Planting racks are provided in the activities area for participants of the programmes to display their completed projects. These racks were designed to be at a height for easy access to anyone in a wheelchair.

D) Work bench
Work benches for the activities were designed to be at a height that is accessible for users on wheelchairs. Materials were selected with safety of the participants and durability in mind.
The Therapeutic Horticulture Programme at HortPark uses plants and plant-related activities to improve the well-being of individuals through active or passive involvement.

The programme aims to:
• provide an enriching experience with nature
• promote social interaction and physical activity
• stimulate the senses through interaction with nature
• enhance physical and mental well-being
• promote interest in plants and gardening

Participants and volunteers enjoying gardening activities from the therapeutic horticulture programme
The programme outline is as follows:

<table>
<thead>
<tr>
<th>Duration</th>
<th>Location</th>
<th>Activities</th>
<th>Summary of Steps</th>
</tr>
</thead>
</table>
| 10 min   | Hands-on House | Introduction | 1. Arrival of participants  
           |          |             | 2. Ice-breaking session  
           |          |             | 3. Simple stretching activity |
| 15 min   | Therapeutic Garden @ HortPark Restorative Zone | Contact with Nature | 4. Guided tour of Therapeutic Garden @ HortPark, highlighting the different zones of the garden. Participants will get to know the plants and be encouraged to smell, touch and feel the plants, stimulating their brain and senses |
| 10 min   | Therapeutic Garden @ HortPark Restorative Zone | Rest | 5. The tour will end at the Gazebo where the group will rest and enjoy the scenery  
          |          |             | 6. Sharing session can be conducted during this time to encourage interaction among participants |
| 45 min   | Therapeutic Garden @ HortPark Restorative Zone | Therapeutic Garden Activities | 7. Participants will be guided to carry out the programme activities |
| 10 min   | Hands-on House | Reflection | 8. Participants return to Hands-on House to refresh, reflect on their activities and end with a sing-along session |

### Therapeutic Garden Activities

<table>
<thead>
<tr>
<th>Summary of Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gardening</td>
</tr>
</tbody>
</table>
| • Propagation of edible plants  
| • Growing of edible sprouts  
| • Maintenance (Pruning/watering/weeding) |
| 2. Art & Floral Appreciation |
| • Leaf printing  
| • Pebble or pot design  
| • Floral Arrangement |
| 3. Exercise & Music Reminisce |
| • Simple stretching with music |
In a piece that appeared in the *Journal of Art and Design* (2012), M.S. Erickson offers design considerations to apply to every component of all therapeutic gardens:

**A) Safety, security and privacy**
Outdoor spaces, in particular those within healthcare facilities, serve people who may be vulnerable in one way or another. All aspects of the outdoor space must ensure users’ physical and emotional safety and security.

**B) Accessibility**
Ensuring safe and comfortable use for all people regardless of age or ability is essential. The design should adhere to Universal Design (UD) principles as much as possible.

**C) Physical and emotional comfort**
The overall goal is to create an environment in which people feel cared for and nurtured. When people are physically and emotionally comfortable, they tend to stay in a garden longer and benefit more from the experience. The design should provide safe and comfortable places to walk and sit as well as create opportunities for social connection.

**D) Positive distraction**
Elements in the garden should, as much as possible, distract users from stress. The purpose of the garden should be to provide a place of natural beauty to let users get away, both physically and emotionally, from interior environments that may be alien, stressful, threatening, or intimidating.
E) Engagement with nature
Research has shown that connection to nature, especially in healthcare settings, is one of the most effective forms of positive distraction. Planting, natural materials and sounds, and the presence of water are some examples of positive natural distractions.

F) Maintenance and sustainability
All therapeutic gardens have to be properly maintained to function as safe, useful and enjoyable spaces for their target users. Damaged garden elements such as paving or seats can compromise users’ safety. Also, plants that are not properly maintained may affect the mood of users and create a negative experience towards the garden.

As much as possible, garden design should be ecologically sustainable by using recycled materials, tapping on green infrastructure for stormwater management, and choosing plants that require low maintenance.

References
FRAMEWORK FOR DESIGNING THERAPEUTIC GARDENS

PLANNING

SITE SELECTION

VISUAL COMMUNICATION & SIGNAGE

LAYOUT

PLANTING & COMPOSITION

GARDEN STRUCTURES
A) **Involve** all stakeholders in the planning and design process, including users, caregivers and healthcare staff, to ensure their needs and concerns are considered. Multiple perspectives help to maximise the value of the garden

B) **Identify** users’ cultural backgrounds, age groups, and extent of their illnesses (e.g. stage of dementia disease) to better design for their needs

C) **Consider** programming in tandem with the planning, design and development of the garden

---

**Reference**

1. *Multiple perspectives must be considered in healthcare facility and garden master planning to maximise the value of the garden for patients and staff alike.*

SITE SELECTION

A) Accessibility
i. It is recommended that vehicular drop-off access be as close to the site as possible to avoid making elderly users walk long distances

ii. It is recommended that, in the case of rooftop gardens, Universal Design (UD) elements such as lifts are included to ensure accessibility for all users

B) Vicinity
It is recommended that the site be located near amenities like toilets, wash areas, or drinking fountains to ensure users have easy access

C) Terrain
It is recommended that the site be relatively flat to facilitate ease of movement for users

D) Noise
It is recommended that the site be situated away from roads and amenities such as basketball courts and playgrounds to minimise disturbance to the users

E) Shade
Adequate shade is recommended on the site to provide respite for users from the sun

F) Borrowed landscape
Choose a site with existing landscape or scenic views to enhance the landscape experience in the garden

G) Good ventilation
The site should have good airflow and be located away from the exhaust flow of building air vents
A) Simple, clear layout
i. It is recommended that the circulation path be easily navigable and identifiable from the entrance

ii. The general circulation path should be a simple looped pattern or a figure-of-8 pattern, without dead ends

B) Zoning
i. Active zone – includes space for group activities such as horticultural therapy, as well as exercise equipment

ii. Passive zone – includes space for strolling and seating

C) Boundaries
Provide a boundary with shrubs to soften the sight of fences or walls and create a secure space without having a sense of being enclosed

D) Visibility
i. It is recommended that caregivers be given a clear view of all parts of the garden from all vantage points

ii. The garden should not have any blind spots which might hide users from their caregivers

References
1. Shade is critical as Alzheimer’s patients have difficulty recognising that they are too hot and may not take the precaution to wear a hat or put on sunblock.

2. Ensure garden design is legible for dementia patients; people with dementia, who have problems with spatial orientation and memory impairments, are most likely to become disorientated at decision points such as junctions and corners.
**GARDEN STRUCTURES**

**A) Garden entrance**

i. **Engage the senses**  
Include design features that engage a user’s senses\(^1\) (hearing, touch, sight, smell and taste)

ii. **Provide contrast**  
Create a distinct colour contrast between the circulation path and plants, furniture, and other garden structures for easy wayfinding\(^2\)

iii. **Evoke memories**  
Provide features to evoke the memory of users, such as plants with familiar smells\(^3\)

iv. **Incorporate views**  
Allow for views out to a wider landscape for a sense of belonging to a broader community\(^4\)

**B) Wheelchair accessibility**

All areas and appropriate structures within the garden should be accessible by wheelchairs

**C) Amenities**

Provide an abundance of attractive and well maintained destination points and facilities:

i. Create pockets of interest throughout the garden

ii. Cluster together interesting elements such as garden ornaments and colourful plants, to capture users’ attention

iii. Include choices for seating and gathering spaces

iv. Provide for semi-private spaces for 2 to 3 people as well as larger interactive spaces to accommodate groups of 8 to 10 people
D) Shade + Shadow
Shadows cast on site by garden structures should be monolithic rather than slatted to avoid causing agitation for dementia participants. If possible, provide maximum shade using plants.

**Monolithic shadows cast by solid buildings**

**Slatted shadows cast by trellises**

References

1. **Sensory stimulations help reduce declines in cognition and function in dementia patients.**

2. **Patients with Alzheimer’s disease are significantly weaker in detecting colour contrast.**

3. **Dementia patients tend to retain large amounts of memories and familiar smells and sounds can be used to stimulate positive sensory experiences into therapeutic programmes to bring about positive outcomes.**


5. **Alzheimer’s patients exhibit a phenomenon known as sundowning, displaying increased agitation in the late afternoon. One suggestion to reduce this problem is to avoid slatted shadows as it is thought that the casting of long shadows in the late afternoon contributes to this problem.**
AMENITIES

A) Garden entrance
Entrance into the garden should be distinct to make it easy for users to identify the start and end point.

B) Secondary access
i. Provide a secondary entry to enable maintenance staff to enter, or users to leave in an emergency.

ii. Secondary entry needs to be subtly located or designed to be less visually obvious.

C) Signage
Install signage for informative and interactive purposes.

D) Sculptures
Install features or landmarks in the garden. They can be located near to the entrance as a focal point.

E) Storage area
Provide storage area for tools and materials to support horticultural activities.

F) Watering point
Provide a watering source to support horticultural activities.
G) Planter

i. Provide raised planters at varying heights for users to interact with plants. They can be used for horticultural therapy or general ease of viewing.

ii. Plants in planters should be within reach of all users.

Reference

1. Surroundings that make it easy for users to familiarise themselves help them to recognise the environment and feel at home.

### H) Paving

i. Minimum width of 1.2m for wheelchair access

### Pavement widths

<table>
<thead>
<tr>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9~1.1m</td>
<td>One wheelchair</td>
</tr>
<tr>
<td>1.2~1.5m</td>
<td>One wheelchair + one person</td>
</tr>
<tr>
<td>1.8~2.0m</td>
<td>Two wheelchairs</td>
</tr>
</tbody>
</table>

Pavement widths

ii. Simple and consistent finishes

iii. Level with good traction to prevent slipping when wet

iv. Glare-free with consistent, light colour

v. Avoid gaps in-between paving (except for expansion joints)

vi. Provide edging on either side to support wayfinding and define the edge of the path
Types of paving to be used and avoided

References

1. Users with Alzheimer’s Disease may start to forget how to perform basic motor acts so they tend to shuffle as they move along. Gaps between paving may cause them to trip and fall.

2. Users with Alzheimer’s Disease tend to have problems identifying edges and contrast.
I) Seating

i. Armrests with a minimum width of 0.1m should be provided to support movement while sitting down or getting up

ii. Provide a minimum of one bench every 5m along the path. This not only allows users to rest frequently, but also provides a visual cue to encourage them to walk further\(^1\)

iii. Provide a variety of seating options in spaces that cater to different needs; from benches for small groups of people in semiprivate spaces to a mix of seating options in public settings

iv. Provide appropriate type of seats in gathering spaces to suit target users’ needs

v. Provide seating at right angles or opposite each other and close together to allow social interaction\(^2\)

vi. Provide a variety of seating options

vii. Provide a hard surface setback with a minimum width of 0.6m between paving and seat

viii. Provide colour contrast between seating and hard surface setback

ix. Do not introduce benches with slumped backs

x. Provide room for a wheelchair next to seats to allow both wheelchair users and non-wheelchair users to gather


References
J) **Shelter**

i. Provide a shelter large enough to accommodate groups of 10 to 12 people

ii. Provide a smaller shelter to accommodate smaller groups

iii. Include a minimum of one electrical socket for activity use in each shelter

iv. Provide access for users with wheelchairs

---

![Recommended shelter dimension for 10 to 12 people](image-url)
K) Hand rails

i. Hand rails should be provided intermittently along the pathway to support users and help them to balance themselves while moving through the gardens.

ii. If possible, provide hand rails at various heights

Reference

A good visual communication and signage design helps to convey information effectively, enhancing the users’ visiting experience.

This can be achieved with the effective application of graphic elements, such as images, layout, colours, typography, signage scale and placement, with specific considerations of the needs for the elderly and/or users suffering from cognitive conditions such as dementia.

Generally park users can be categorised into three common groups – A, B and C – depending on the user’s health:

**A**
User can move about independently.

**B**
User has declined mobility, dependent and/or has mild health conditions.

**C**
User has a severe cognitive condition such as dementia.
Signage can be installed at the entrance, within, or outside the therapeutic garden to provide direction, educational information and/or advisory messages for different users:

<table>
<thead>
<tr>
<th>Sign type</th>
<th>User A</th>
<th>User B</th>
<th>User C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directional marker</strong></td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td><em>(Placed outside therapeutic garden)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Directional marker</strong></td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td><strong>Interpretive sign to provide educational information</strong> <em>(If required)</em></td>
<td>✔️</td>
<td>✔️</td>
<td>—</td>
</tr>
<tr>
<td><strong>Advisory sign</strong> <em>(If required)</em></td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
DIRECTIONAL MARKER

An effective directional marker helps to inform, direct and identify a space. It leads and informs users that they have reached their intended destination.

A) Placement and design of sign
i. Be visible from far and remains unobstructed

ii. Use colours that provide differentiation from the immediate surrounding to draw the user’s attention

iii. Placed at decision-making points or junctions for clearer orientation of the space around

iv. The distance between each sign should be less than 50m (subject to the extent of the line of sight)

v. Placed perpendicularly to pedestrian flow

vi. Information such as distance and direction should be sequentially linked to surrounding signs

vii. Information such as ‘exit’, ‘toilet’ and ‘shelter’ are important to users and should be clearly displayed on the sign

viii. Use bigger font to help older users read easily from afar. The suggested minimum font height is 20mm

Information stated in this section is referenced from the following publications:
Directional marker should be placed at decision-making points or junctions for clearer orientation of the space around.

It should be visible from afar and remains unobstructed.

An example of a directional marker with suggested clearance perimeter for the information displayed.
INTERPRETIVE SIGN

It is more comfortable to tilt the head down to read, especially for older users. For a sign with more content such as an interpretive sign, it is recommended that information is placed below the natural eye level.

In addition, a sturdy and level pedestal for wheelchair users allows them to get closer to the sign and read the content more easily.

B) Clarity of layout and content

i. Layout should be clear of clutter for the user to read, navigate and digest the content easily

ii. Ensure contrast to distinguish foreground from background elements

iii. Use a light coloured background instead of white to help the user read comfortably

iv. Keep the content simple, short and easily digested with minimal need to rely on memory

v. Use prominent headers or sub-headers

vi. Use sharp images and ensure copyrights are sought or to seek valid permission before use

vii. Use bigger font to help older users read easily. The suggested minimum font height is 5mm

viii. Avoid using all capital letters (other than for the header)
50DESIGN GUIDELINES FOR THERAPEUTIC GARDENS IN SINGAPORE

An example of an interpretive sign with an uncluttered layout and clear foreground elements

Therapeutic Garden
An outdoor garden specifically designed based on evidence to meet the needs of...

THERAPEUTIC GARDEN
AN OUTDOOR GARDEN SPECIFICALLY DESIGNED BASED ON EVIDENCE TO MEET THE NEEDS OF...

Avoid using all capital letters for body text.

An example of an interpretive sign with suggested heights
OTHER CONSIDERATIONS

C) Illumination
i. A well-illuminated sign helps the user read easily in a dim (night) environment

ii. The illumination level on the sign-face should not be significantly higher or lower than the ambient light around the sign

iii. For a non-illuminated sign, consider placing it next to an existing light source, e.g. park light, to enhance legibility at night

iv. Distance between light source and sign should be carefully planned to avoid undesirable highlights and shadows cast on sign-face

D) Finishing
Use non-reflective or anti-glare material/finishes on the sign-face as some users may be sensitive to glare or bright surfaces

E) Pictogram/Icon
Use pictograms or icons that are recognisable and easily understood

Examples of common and recognisable pictograms/icons

Information stated in this section is referenced from the following publications:
**F) Font**

Use sans serif font for better differentiation. Avoid using serif and exotic fonts or fonts with thin lines as they are harder to distinguish under bright/dark conditions.

Serif and sans serif fonts

Futura

ABCDEFghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
1234567890

An example of a sans serif font
A) Mature trees
Existing mature trees provide shade, and a symbolic sense of longevity, continuity, and character for the overall garden.

B) Sensory attributes
Diverse characteristics and features used in the selection of plants for a therapeutic garden include:

i. Colour
Warm colours like red, yellow and orange stimulate the mind and excite the senses while cool colours such as blue and purple create a calming experience.

ii. Texture
Plants with interesting leaf textures can be used to surprise and fascinate visitors through their sense of touch. These plants should be located within reach of all visitors, including those using wheelchair.

iii. Smell
The scent of plants may evoke memories by engaging visitors’ sense of smell. Fragrance can be immediate through the perfume of flowers or released through rubbing/crushing of leaves.

iv. Auditory
The gentle rustling of leaves such as from grasses and trees or a gurgling water feature can create a serene and peaceful environment.
v. **Fauna attracting plants**
   Opportunities should be created for visitors to observe and appreciate wildlife like butterflies and birds.

vi. **Edibles**
   Plants that are used for cooking i.e. herbs and spices, fruits and vegetables can also engage users through a sense of familiarity and the associated comfort that food brings.

vii. **Local cultural memory**
   Plants encountered in childhood or daily life can evoke memories and bring back a sense of nostalgia to the visitors. These could include culturally significant, edible, or wayside plants.

C) **Plants to use with caution**
   i. Poisonous sap (ingestion)
   ii. Irritating hairs/surface oils (contact)
   iii. Thorns/spikes/prickles (contact)
   iv. Plants with associations with undesirable fauna

D) **Contrast in composition**
   Plant species with contrasting colours, leaf texture, and size can create captivating visual texture in a garden.

E) **Plant labels**
   Plant identification labels and interactive educational signage will provide interesting information to visitors.
The following are some examples of plants that can be featured in therapeutic gardens for their different characteristics.

The list of plants is not exhaustive, and serves only as examples which can be used. Plants with similar characteristics can also be introduced into the gardens.

Plant selection should be made foremost on site suitability based primarily on soil, water and light conditions.

For more information on plant choices, growing conditions and unique plant characteristics, please visit florafaunaweb.nparks.gov.sg.
### Key Symbols:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Water Symbol]</td>
<td>Prefers lots of water</td>
</tr>
<tr>
<td>![Water Symbol]</td>
<td>Prefers moderate water</td>
</tr>
<tr>
<td>![Water Symbol]</td>
<td>Prefers little water</td>
</tr>
<tr>
<td>![Sun Symbol]</td>
<td>Prefers full sun</td>
</tr>
<tr>
<td>![Sun Symbol]</td>
<td>Prefers semi-shade</td>
</tr>
<tr>
<td>![Sun Symbol]</td>
<td>Prefers full shade</td>
</tr>
<tr>
<td>![Tree Symbol]</td>
<td>Tree</td>
</tr>
<tr>
<td>![Creeper Symbol]</td>
<td>Climber &amp; Creeper</td>
</tr>
<tr>
<td>![Bonsai Symbol]</td>
<td>Bonsai</td>
</tr>
<tr>
<td>![Aquatic Symbol]</td>
<td>Aquatic plant</td>
</tr>
<tr>
<td>![Fragrant Symbol]</td>
<td>Fragrant plant</td>
</tr>
<tr>
<td>![Native Symbol]</td>
<td>Native to Singapore</td>
</tr>
<tr>
<td>![Bird Symbol]</td>
<td>Bird-attracting plant</td>
</tr>
<tr>
<td>![Host Symbol]</td>
<td>Host plant</td>
</tr>
<tr>
<td>![Nectar Symbol]</td>
<td>Nectar plant</td>
</tr>
</tbody>
</table>
EXAMPLES OF PLANTS FOR COLOUR

- **Arundo dona** ‘Versicolour’
  (Variegated Giant Reed)

- **Graptophyllum pictum** ‘Tricolour’

- **Bridelia ovata** (variegated)

- **Aglonema cultivars**

- **Cyathula prostrata**
  (Purple Hookweed)

- **Syngonium cultivars**

- **Hibiscus rosa-sinensis** ‘Cooperi’
  (Checkered Hibiscus)

- **Planchonella obovata**
  (Sea Gutta)

- **Ipomoea batatas** ‘Margarita’
  (Margarita Sweet Potato Vine)
**Fragrance scale:**
1 (fragrant up close or when crushed)
2 (fragrant from afar but faint)
3 (very fragrant from afar and can become overpowering)
EXAMPLES OF PLANTS FOR TEXTURE

- **Pennisetum x advena**
  - **‘Rubrum’**
  - (Red Fountain Grass)

- **Leucophyllum frutescens**
  - (Barometer Bush)

- **Dalbergia latifolia**
  - (Black Rosewood)

- **Ficus villosa**
  - (Villous Fig)

- **Argyreia nervosa**
  - (Elephant Climber)

- **Licuala grandis**
  - (Ruffled Fan Palm)

- **Conocarpus erectus**
  - **var. sericeus**
  - (Silver Buttonwood)

- **Calathea cultivars**

- **Pellionia repens**
  - (Rainbow Vine)
* Fragrance scale:
1 (fragrant up close or when crushed)
2 (fragrant from afar but faint)
3 (very fragrant from afar and can become overpowering)
EXAMPLES OF FRAGRANT PLANTS

1. **Aloysia virgata**  
   (Sweet Almond Verbena)

2. **Pleiocarpa mutica**  
   (Kanwene)

3. **Uvaria grandiflora**  
   (Red Hot Poker)

4. **Vallaris glabra**  
   (Bread Flower)

5. **Gardenia mutabilis**  
   (Thai Gardenia)

6. **Cananga odorata var. fruticosa**  
   (Dwarf Ylang Ylang)

7. **Gardenia jasminoides**  
   (Cape Jasmine)

8. **Ocimum basilicum**  
   (Basil)

9. **Magnolia figo**  
   (Banana Shrub)
DESIGN GUIDELINES FOR THERAPEUTIC GARDENS IN SINGAPORE

*C Fragrance scale:
1 (fragrant up close or when crushed)
2 (fragrant from afar but faint)
3 (very fragrant from afar and can become overpowering)
EXAMPLES OF PLANTS FOR ATTRACTING FAUNA

- *Cheilocostus speciosus* (Crepe Ginger)
- *Callerya reticulata* (Evergreen Wisteria)
- *Aristolochia acuminata* (Dutchman’s Pipe)
- *Asclepias curassavica* ‘Silky Yellow’ (Milkweed)
- *Rhodomyrtus tomentosa* (Rose Myrtle)
- *Cratoxylum cochinchinense* (Kayu Arang)
- *Etlingera elatior* (Torch Ginger)
- *Calotropis gigantea* (Giant Milkweed)
- *Aegkeia sericea* (Silky Aegkeia)
- *Etlingera elatio* (Torch Ginger)
- *Cratoxylum cochinchnense* (Kayu Arang)
- *Rhodomyrtus tomentosa* (Rose Myrtle)
* Fragrance scale:
1 (fragrant up close or when crushed)
2 (fragrant from afar but faint)
3 (very fragrant from afar and can become overpowering)
EXAMPLES OF EDIBLE PLANTS

- **Annona squamosa** (Custard Apple)
- **Averrhoa bilimbi** (Belimbing)
- **Centella asiatica** (Indian Pennywort)
- **Platostoma palustre** (Chin Chow)
- **Coffea arabica** (Arabica Coffee)
- **Lansium domensticum** (Langsat)
- **Leptospermum madidum ssp. sativum** (Weeping Tea-Tree)
- **Kaempferia galanga** (Sand Ginger)
- **Basella alba ‘Rubra’** (Red Ceylon Spinach)
Tagetes lucida (Sweetscented Marigold)
Persicaria hydropiper (Laksa Leaf)
Gnetum gnemon (Belinjau)
Piper nigrum (Common Pepper)
Clitoria ternatea (Butterfly Pea)

*Fragrance scale:*
1 (fragrant up close or when crushed)
2 (fragrant from afar but faint)
3 (very fragrant from afar and can become overpowering)
EXAMPLES OF PLANTS ASSOCIATED WITH LOCAL CULTURAL MEMORY

**Psidium guajava**
(Guava)
* Kampung home garden

**Adenanthera pavonina**
(Saga)
* Seeds are a symbol of love

**Tamarindus indica**
(Tamarind)
* Kampung home garden

**Carica papaya**
(Papaya)
* Kampung home garden

**Nephelium ramboutan-ake**
(Pulasan)
* Kampung home garden

**Hymenocallis speciosa**
(Spider Lily)
* Habitat of fighting spiders

**Manihot esculenta**
(Tapioca)
* Kampung home garden

**Artocarpus heterophyllus**
(Jackfruit)
* Kampung home garden

**Syzygium aqueum**
(Jambu Ayer)
* Kampung home garden
**Punica granatum** (Pomegranate)  
* Symbol of good luck in Chinese culture

**Manilkara zapota** (Chiku)  
* Kampung home garden

**Ipomoea batatas** (Sweet Potato)  
* Kampung home garden & commonly used in local cuisine

**Impatiens balsamina** (Balsam)  
* Kampung home garden

**Azadirachta indica** (Neem Tree)  
* Significance in Hinduism

**Manilkara zapota** (Chiku)  
* Kampung home garden

**Pandanus amaryllifolius** (Pandan)  
* Kampung home garden & commonly used in local cuisine
TYPES OF SOCIAL AND THERAPEUTIC HORTICULTURE PROGRAMMES
Group programme led by gardening leaders with the aim to promote mental and physical well-being through active and passive enjoyment of gardens.
Social Horticulture Programmes (SHP) are broad-based horticulture engagement programmes which aim to improve participants’ well-being through horticulture activities in a social setting. They are suitable for a group of people with a wide range of abilities and can be enjoyed with or without a facilitator.

A) Objective of designing a SHP
Promote greater physical and mental well-being through social participation of plant-based activities. The objective is for participants to feel better about themselves at the end of each session.

B) Understanding SHP design process
i. Target profile
Understanding the desires, conditions and behaviour of the participants of SHP will help gardening leaders design purposeful and sustainable programmes and leverage available gardening resources.

ii. Objective
The purpose of the programme must be clear; usually, SHP aims to promote physical and mental well-being.
C) Output
A compilation of activities and steps designed for targeted groups or individuals

i. Session list (choices of activities and notes for trainers)

ii. Individual activity plan (detailed steps of the activity and tips to achieve the aims)

D) Review
Engage participants to gather feedback on their enjoyment level and feelings after the programme, and areas for improvements for continuity.

EXAMPLE OF SHP DESIGN FLOW

1. CLIENTS’ PROFILE
   Elderly who are keen to participate in social and nature-based activities

2. AIM
   To promote mental and physical well-being of elderly residents

3. OUTPUT
   Improved sense of mental and physical well-being

4. REVIEW
   Gather feedback on enjoyment level and areas for improvement
TYPES OF SOCIAL AND THERAPEUTIC HORTICULTURE PROGRAMMES
Long-term programme with assessable group goals conducted by trained persons; continuous sessions that use plants and plant-based activities.
Therapeutic Horticulture Programmes (THP) are long-term programmes that utilise plant-related activities to achieve group goals. The sessions are linked and build on previous sessions. Programme design and assessments are done in consultation with a trained person (individual trained in Horticultural Therapy); assessments may be designed into the plan and usually occur before, during and after the THP.

**Objective of designing a THP**

i. **Mental well-being**
   Promote greater awareness of present moment of being in the garden and stimulate mental activity through spontaneous learning of plants and plant-based activities.

ii. **Emotional well-being**
   Uplift mood through sensory experiences and self expression during interaction with other participants and the environment.

iii. **Physical well-being**
   Improve muscular strength and motor skills through medium and low intensity exercises in the form of gardening activities and movement in the garden.
EXAMPLE OF THP DESIGN FLOW

1. **CLIENTS’ PROFILE**
   Elderly with mild cognitive impairment who live alone in a HDB flat, physically abled

2. **AIM**
   To enhance quality of life for elderly persons who have mild cognitive impairment and are living in isolation by building social connections and promoting physical exercise

3. **OUTCOMES**
   - Increase mental stimulation
   - Encourage positive social and environmental connection
   - Stimulate memory
   - Promote mindfulness
   - Promote medium and low intensity exercise

4. **OUTPUT**
   End products of respective session such as potted seedlings or photos from park visit

5. **ASSESSMENT**
   Combination of suitable quantitative and qualitative assessment tools that measures the outcomes before, during and after THP

6. **REVIEW**
   Evaluate current programme effectiveness based on result of assessment and modify programme accordingly
TYPES OF SOCIAL AND THERAPEUTIC HORTICULTURE PROGRAMMES
Individualised treatment programme with clinical assessments, goals, and documentation guided by trained therapists that focuses on the outcome rather than the output.
Horticultural Therapy Programmes (HTP) are individualised treatment plans with prescribed horticultural activities administered by trained therapists to achieve clinically documented goals. It adopts a person-centred approach that emphasises the outcome over the output, adapts the environment, and modifies the task to increase participation in the prescribed horticultural activities to reach the goals. HTP is usually practised in healthcare institutions and long-term care centres.

**Objective of designing a HTP**

i. **Cognitive well-being**
   Improve or maintain cognitive abilities through horticultural activities that practice concentration, memory, conceptual thinking and other cognitive domains.

ii. **Emotional well-being**
   Improve one’s ability to manage stress, anger, fear and other feelings through horticultural activities that promote awareness and self expression that progresses in a productive manner towards better emotional states.

iii. **Social well-being**
   Improve the ability to relate and connect positively with others through horticultural activities in social settings that foster better communication and understanding of people and reduce incidences of isolation.

iv. **Physical well-being**
   Increase specific muscle strength and endurance through medium and low intensity exercises in the form of horticultural activities. Improve gross and fine motor skills to increase independence in activities of daily living.
EXAMPLE OF HTP DESIGN FLOW

1. **CLIENTS’ PROFILE**
   An elderly person who is trying to improve grip and fine motor skill after a mild stroke, has no speech problem and is living with family.

2. **AIM**
   To improve independence in movement and motor function coordination through horticultural activities.

3. **OUTCOMES**
   - Improved mental health
   - Promote mindfulness
   - Improve fine motor skills
   - Increase grip strength

4. **OUTPUT**
   End products of respective session such as potted seedlings or photos from park visit.

5. **ASSESSMENT**
   Validated and reliable assessment tools that measure individual’s specific and relevant outcomes before, during and after HTP.

6. **OUTCOME EVALUATION**
   Statistically evaluate the results to determine the results of intervention and refine the treatment to increase effectiveness.

7. **REVIEW**
   Engage client and family members to gather feedback on experience and enjoyment so as to improve future sessions.
ANNEX A: SCHEDULE DESIGN OF SOCIAL HORTICULTURAL PROGRAMME

Example of an activities list with 8 individual activities
<table>
<thead>
<tr>
<th>S/N</th>
<th>Programme</th>
<th>Aim</th>
<th>Notes to facilitator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction to sensory experience in the garden</td>
<td></td>
<td><strong>Ensure safety:</strong> Promote physical and mental well-being</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Visually assess participants who may be unwell for activity and may need to rest or require more assistance</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Vegetable pot creation</td>
<td></td>
<td><strong>Encourage interaction:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Use verbal cues like: “What is your favourite…”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“How would you…”</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Indoor garden creation</td>
<td></td>
<td><strong>Increase physical exercise:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Promote physical activity by gardening or walking and exploring sensory features in the garden</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Exercise in garden</td>
<td></td>
<td><strong>Promote awareness:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prompt participants about the activity of the day and direct them to areas of interest in the garden</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Vegetable cooking session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Fruit and vegetable press painting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Pressed flower card creation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Herb propagation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANNEX A1: 

SHP ACTIVITY PLAN DESIGN

Example of activity 1: 
Introduction to sensory experience in the garden
Aims

Encourage interaction:
Use verbal cues such as:
• “Did you smell…”
• “What do you think this can be used for?”
• “What does this feel like?”

Increase physical exercise:
Promote movement in the garden that will allow bending, extension of arms and legs to experience certain sensory stimulants

Promote awareness:
Prompt participants to quietly listen at times to increase awareness of their environment

Steps (50 mins):
Introduce the use of five senses, lead participants through the garden and allow time for individual exploration within garden. Seek participants’ opinion on additional uses for their senses in nature or the garden beyond the examples listed below:

<table>
<thead>
<tr>
<th>Senses</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Sight</td>
<td>To assess the plant condition, soil colour and appreciate the beauty of nature etc.</td>
</tr>
<tr>
<td>b. Smell</td>
<td>To assess scent from the plant parts (e.g. leaf, flowers) to appreciate change in seasons</td>
</tr>
<tr>
<td>c. Hear</td>
<td>To appreciate sound of nature and warn us of danger</td>
</tr>
<tr>
<td>d. Taste</td>
<td>To allow for enjoyment of eating besides filling our body energy needs</td>
</tr>
<tr>
<td>e. Touch</td>
<td>To assess the soil condition, fruit ripeness and appreciate natural texture</td>
</tr>
</tbody>
</table>

Reflection (5 mins):
Ask how participants feel about the session and what their favourite part of the activity is. Activity ends.
ANNEX A2:
SHP ACTIVITY PLAN DESIGN

Example of activity 7: Pressed flower card creation
Aims

**Encourage interaction:**
Use verbal cues such as:
- “What could you use the pressed flower card for?”
- “How do you think pressed flowers are prepared?”

**Increase physical exercise:**
Encourage walking around the garden to find possible materials for plant pressing.

**Promote awareness:**
Prompt participants to explore their creative side of themselves in the design of the card and increase their focus in the activity.

Steps (50 mins):
Items needed: Toothpicks, glue, pre-pressed plant parts, A5 card, laminating pouch, laminator and scissors

a. Toothpicks are used to dab glue to apply on plant parts for pasting on the A5 card.

b. Participants are free to explore their creativity and discuss with others in the process of designing the card.

c. Participants then laminate the completed card and trim the excess and corners.

Reflection (5 mins):
Ask how participants feel about the session and what their favourite part of the activity is. Activity ends.
ANNEX B:
SCHEDULE DESIGN OF THERAPEUTIC HORTICULTURAL PROGRAMME

Example of 8-week sequential programme
<table>
<thead>
<tr>
<th>S/N</th>
<th>Programme</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction to sensory experience in the garden</td>
<td>• Encourage positive connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>2.</td>
<td>Sowing of vegetable seedlings</td>
<td>• Encourage positive social connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td>3.</td>
<td>Vegetable maintenance and sowing of herb seeds</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>4.</td>
<td>Vegetable and herb maintenance</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Encourage positive social connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td>5.</td>
<td>Vegetable and herb maintenance</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote mindfulness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>6.</td>
<td>Harvest and cook</td>
<td>• Encourage positive social connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td>7.</td>
<td>Pressed flower card</td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote mindfulness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td>8.</td>
<td>Propagating herbs by cuttings</td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote mindfulness</td>
</tr>
</tbody>
</table>
ANNEX B:
SCHEDULE DESIGN OF THP

Example of 8-week sequential programme
Notes to facilitators

a. Ensure safety:
Visually assess participants who may be unwell for activity, need to rest, or require more assistance.

b. Increase mental stimulation:
Use verbal cues like: “What do you think…,” “How would you…,” “When is the suitable…”

c. Encourage positive connection:
Promote buddy assistance to complete task and use leading questions to promote positive connection with activity and group.

d. Stimulate memory:
Provide session recap emphasising learning points, encourage association of plants with past experiences, and support descriptive expression.

e. Promote Mindfulness:
Emphasise engagement and attention to detail in the activity; invite participants to reflect and share their thoughts and feeling about the day’s session.

f. Promote medium and low intensity exercise:
Encourage exploration of garden sensory features and active involvement in gardening activities such as hoeing, digging and lifting.

g. Promote fine motor skills:
Emphasise the control of finger grip strength and stability in activity.
ANNEX B1: THP SESSION PLAN DESIGN

Example of session 2: Sowing of vegetable seedlings

Outcomes:

**Encourage positive social connection:**
Promote buddy assistance to complete task and prompt participants to share their thoughts on food related to *cai xin* vegetable.

**Promote fine motor skills:**
Guide participants to pick up seedlings delicately and plant with care; this emphasises on control of finger grip strength and keeping steady hands.

**Increase mental stimulation:**
Use verbal cues during the session to encourage thinking and conversation:
“How long do you think it takes to grow for harvest?”
“What do you think we will use the netting for?”
[Netting is needed to protect crops from pests such as birds and insects from eating the plants and removes the need to use pesticides.]
“Why are there plugs at the base and side of the pot?”

[Side plug – Overflow hole to drain excess water collected if the plug at the base is secured
Base plug – Reservoir creation by securing the plug or to remove during the rainy season for drainage]

Steps (50 mins):
Items needed: cai xin seedlings, stakes, soil, gloves, netting, pot, scissors, soil and file clips. 2–3 persons to share a square pot for this seedling session

a. Remove the drainage plug at the side of pot and fill pot ¾ full with potting soil.

b. Plant 10 seedlings per pot, evenly distributed, using a finger to create a small hole (half finger depth) sufficient to insert the seedling.

c. Lightly pat around the root collar to secure the seedling position and water 1 litre of water.

d. Insert four stakes at each corner of the pot.

e. Wrap the netting around the stakes, cover top and sides to form a net house over the pot and cut the excess, secure netting with file clip on each side of the pots.

Note: Each pot is only labelled with the plant name and date it was planted to encourage community spirit of sharing and caring for all the plants regardless of who planted it.

Reflection (5 mins):
Ask how participants feel about the session and what their favourite part of the activity is. Activity ends.
ANNEX B2:

THP INDIVIDUAL SESSION DESIGN

Example of session 8: Propagating herbs by cutting

Outcomes:

**Promote fine motor skills:**
Guide participants to use scissors in the comfortable way to cut the basil stem for cuttings; emphasis on control of finger grip strength and keeping steady hands.

**Promote mindfulness:**
Use verbal cues during the session to encourage focus in execution: “cutting below the node will increase success rate of propagation..”

**Stimulate memory:**
“Do you remember what we used the netting for in vegetable planting?”
[Netting is needed to protect crops from pests such as birds and insects from eating the plants and removes the need to use pesticides.]
“Do you recall why are there plugs at the base and side of the pot?”
[Side plug – Overflow hole to drain excess water from the side, if the plug at the base is secured
Base plug – Reservoir creation by securing the plug or removed during the rainy season for drainage]

Steps (50 mins):
Items needed: pre-planted basil from previous session, potting mix, gloves, stakes, netting, file clips, scissors, square pots. 2 – 3 persons to share a square pot for this propagation session

a. Remove side plug and fill pot ¾ full with potting mix.

b. Choose three basil stems that have a minimum of four nodes. Cut between the 2nd and 3rd node from the top.

c. Create a hole approximately half index finger depth and insert the cutting.

d. Secure the cutting by patting down the soil around the cutting lightly.

e. Water 500 ml of water and install stakes and netting the same way as for the vegetable pot.

f. Cover the netting and place it in a cool area away from direct sun.

Note: The pots are only labelled with the plant name and date it was planted to encourage community spirit of sharing and caring for all the plants regardless of who planted it.

Reflection (5 mins):
Ask how participants feel about the session and what their favourite part of the activity is. Activity ends.
ANNEX C:
SCHEDULE DESIGN OF HORTICULTURAL THERAPY PROGRAMME

Example of 8-week sequential programme
<table>
<thead>
<tr>
<th>S/N</th>
<th>Programme</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction to sensory experience in the garden</td>
<td>• Encourage positive social and environmental connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote medium and low intensity exercise</td>
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<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>2.</td>
<td>Sowing of vegetable seedlings</td>
<td>• Encourage positive social and environmental connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td>3.</td>
<td>Visit to therapeutic garden and light vegetable</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td>maintenance</td>
<td>• Promote fine motor skills</td>
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<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>4.</td>
<td>Vegetable maintenance and sowing of herb seeds</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Encourage positive social and environmental connection</td>
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<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
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<tr>
<td>5.</td>
<td>Visit to therapeutic garden and edible maintenance</td>
<td>• Promote medium and low intensity exercise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote mindfulness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td>6.</td>
<td>Harvest and cook</td>
<td>• Encourage positive social and environmental connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote medium and low intensity exercise</td>
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<tr>
<td></td>
<td></td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td>7.</td>
<td>Visit to therapeutic garden</td>
<td>• Increase mental stimulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote mindfulness</td>
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<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
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<tr>
<td>8.</td>
<td>Propagating herbs by cuttings</td>
<td>• Stimulate memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promote fine motor skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Encourage positive social and environmental connection</td>
</tr>
</tbody>
</table>
ANNEX C:
SCHEDULE DESIGN
OF HORTICULTURAL
THERAPY
PROGRAMME

Example of 8-week sequential programme

Adaptation notes for facilitators

a. Encourage positive social and environmental connection:
   - Allow client to internalise the instruction and take his/her time to respond. The client could be going through this in a group setting but should be given personal space to perform the tasks independently monitored and guided by facilitator.
   - If the client has difficulty reaching the sensory stimulants such as fragrant or textured plant parts, it could be brought within the client’s range of movement.
   - Allow client to move through garden at his/her own pace to build confidence in the control of movements. Maintenance can be done with dining spoons and fork to rebuild confidence for the use of cutlery.
b. Promote fine motor skills:
- Client can use a funnel to increase space consistency of distributing seeds in the pot. Facilitator can hold on to the funnel while the client deposits the seed. The option to replace gardening tool with dining fork and spoon to loosen soil and pick up weeds should be available.

- Facilitator can provide a long cutting for the participant to trim into shorter lengths with a blade. Allow client to insert the cutting into any area in the pot to build confidence.

- Support client in his/her process of harvesting, cleaning and cooking. Allow space and time for him/her to do it at his/her own pace. Give suggestions to decrease difficulty and adjust equipment access for easier completion of task. The use of cutlery is a revision to the constant use of gardening tools in maintenance to help build fine motor skills.

- Move pot within client’s range of movement. Allow client to use metal spoon or fingers to facilitate the process of sowing seedlings when necessary. Allow client to try at his/her own pace.

c. Increase mental stimulation:
- Client can identify his/her favourite part of garden where he/she wants to spend more time exploring the area. Utilise full range of tasks in maintenance and allow participant to do so independently.

- Repeated visits will build familiarity in the client’s mind. Therefore suggest areas or exercises which will extend his reach, grip and other physical coordination.

- Provide opportunity for independence through loosening and weeding of the vegetable and herb pot. Be open to client’s alternative suggestion.
Example of session 4: Vegetable maintenance and sowing of herb seeds

**Outcomes:**

**Promote fine motor skills:**
Guide client on how to pick up seeds using fingers or spoon and either put it into soil direct or with help of funnel; this emphasises on control and stability of fingers. When inserting the seeds, funnel can be used to improve accuracy of sowing and encourage them to use both hands.

**Promote medium and low intensity exercise:**
Allow client time to complete the task as it require lifting, bending and walking during the process.
**Increase mental stimulation:**
Use verbal cues during the session to encourage thinking and conversation:

“How long do you think it takes for the seed to germinate?”

“What other ways can basil be propagated?”

Give client time to respond and opportunities to suggest his/her way of doing things. Allow modification to the steps below where appropriate.

**Steps (50 mins):**
Items needed: basil seeds, stakes, soil, gloves, netting, rectangle pot, trowel, file clips and funnel

- **a.** Remove the drainage plug at the side of pot and fill pot ¾ full of potting soil.

- **b.** Create five holes and three seeds per hole in evenly spaced fashion, using a finger to create a small hole (half finger depth) sufficient to insert each seed. Funnel can be used to increase accuracy of sowing.

- **c.** Cover back the holes with surrounding soil and water 500 ml of water.

- **d.** Wrap the netting around the stakes, cover top and sides to form a net house over the pot and cut the excess, and secure netting with file clip on each side of the pot.

Note: The pot is labelled with the client’s name, plant name and date it was planted to encourage mindfulness and mental stimulation.

**Reflection (5 mins):**
Ask how client feels about the session and what their favourite part of the activity is. Activity ends.
ANNEX C2:

HTP INDIVIDUAL SESSION DESIGN

Example of session 5: Propagating herbs by cuttings

Outcomes:

**Promote fine motor skills:**
Guide client to use scissors/blade in the comfortable way to cut the basil stem for cuttings; this emphasises on control of finger grip strength, and coordination between the holding and cutting hand. Facilitator can provide a long cutting for the client to trim into shorter lengths with a blade. Allow client to insert the cutting into any area in the pot to build confidence.

**Stimulate memory:**
Use verbal cues during the session to encourage recollection of similar actions in earlier sessions.

“Have you done such cuttings in the past?”
**Encourage positive environmental and social connection:**
Allow client to internalise the instruction and take his/her time to respond. The client could be going through this in a group setting but should be given personal space to perform the tasks independently monitored and guided by facilitator.

**Steps (50 min):**
Items needed: pre-planted basil from previous session, potting mix, gloves, stakes, netting, file clips, scissors, square pot

- **a.** Remove side plug and fill pot with ¾ potting mix.
- **b.** Choose three basil stems that have a minimum of four nodes. Cut between the 2nd and 3rd node from the top.
- **c.** Create a hole with approximately the depth of half an index finger and insert the cutting.
- **d.** Secure the cutting by patting down the soil around the cutting lightly.
- **e.** Water 500 ml of water and install stakes and netting the same way as for the herb pot.
- **f.** Cover the netting and place it in a cool area away from direct sun.

Note: The pot is labelled with the client’s name, plant name and date it was planted to encourage mindfulness and mental stimulation.

**Reflection (5 min):**
Ask how client feels about the session and what their favourite part of the activity is. Activity ends.
ANNEX D:
FURTHER READING

American Horticultural Therapy Association
www.ahta.org


Legacy Health Therapeutic Garden programme
www.legacyhealth.org/gardens.

http://www.youtube.com/watch?v=DyQnTX1zkMM.


ANNEX D:
FURTHER READING


Nature Sacred Initiative
www.naturesacred.org


DESIGN GUIDELINES FOR THERAPEUTIC GARDENS IN SINGAPORE


Therapeutic Landscapes Network
www.therapeuticlandscapesnetwork.org


University of Illinois at Urbana-Champaign, Landscape and Human Health Laboratory. http://lhhl.illinois.edu/adhd.htm.


