



The Connection Between Landscapes and Health





Landscapes and gardens play a huge role in human health and wellbeing! There is strong evidence that real or simulated views of nature can produce positive feelings reducing anxiety, anger, or other negative emotions. Many green spaces scenes function as pleasant distractions that may block stressful thoughts and promote healing.





Green spaces boost oxygen production, remove atmospheric pollutants and green house gases, help with temperature regulation and reduce energy costs in our buildings. They also provide green infrastructure for outdoor exercise, relaxation, recreation and sport.

The incredible grounds at Sunnybrook Health Sciences Centre serve as an extension to the important and lifesaving work happening within the walls of the hospital. Every day, patients, their families and staff use the green space around the hospital as a place of escape, reflection, enjoyment and healing.

landscape ontario.com
 *Green for Life!*





HEALING & HEALTHCARE

Because of the relationship people have with nature, green spaces also have an important impact on our social, spiritual and physical health, including:

- A. Studies have found exposure to landscapes offers hospitalized patients benefits like:
 - 1) Improved sleep and better pain management
 - 2) A reduction in post-operative stays (Ulrich, R. S. ,1984). Patients with exposure to green space had shorter post-surgery stays, better emotional well-being, and fewer minor complications such as persistent nausea or headache.
 - 3) Enhanced psychological wellbeing within minutes of exposure for patients suffering from major depressive disorder (Berman et al., 2012), and can be a source of vitality and personal happiness.



- B. Green spaces enhance overall air quality, as pollution and dust can deplete oxygen from the air we breathe. Without sufficient oxygen, our bodies can experience exhaustion, fatigue, depression, muscle aches, respiratory difficulty and memory problems. An average home lawn of 2,500 sq. ft. of grass can produce enough oxygen for a family of four to breathe daily!
- C. Taking advantage of being outdoors can often encourage physical activity, which is critical to maintaining a healthy body weight throughout life. Knowing that obesity and sedentary lifestyles have become an epidemic in our society, encouraging outdoor activity can help address these problems.

SELF-CARE

Caregivers within the healthcare environment, where the primary focus is on caring for others, are prime candidates for employing wellness initiatives.

Compassion fatigue can result from the stress of caring for others. It is important for healthcare providers and caregivers not to forget to take care of themselves while providing quality healthcare to others. Exposure to nature can be one approach in minimizing the risk of fatigue, exhaustion and illness

Mary Kate Hoffmann, LCSW with Methodist Community Counseling Program reiterates that, “Not only does compassion fatigue negatively affect the sufferer, but it also impacts our ability to care for effectively others.”

At Sunnybrook, our self-care initiatives include different modalities of treatment – of which the landscapes or green space have been recognized and appreciated as being an integral contributor. Outdoor avenues established for staff to work self-care into their schedule. Our landscape and green spaces have the natural potential to address all three components of self-care: physical mobility, emotional relaxation, and spiritual care.



- Taking a nature walk and maintaining an active lifestyle can help boost the immune system, increasing endorphins (the “happy” hormone) and decreasing stress.
- Outdoor spaces can encourage creative social settings for group interactions (Inter-Professional Collaboration)

Due to the overwhelming benefits of nature, Sunnybrook Health Sciences Centre encourages staff to enjoy its greenspaces which are maintained by ecologically responsible land care practices.







CREATING A SUSTAINABLE LANDSCAPE WITH HEALING POTENTIAL TO ENGAGE PEOPLE IN A CREATIVE WAY

Key Steps:

- A. Choose the right plants for the existing growing conditions on the property. Use of evergreens in winter climates also contributes to energy savings because they create windbreaks. Reductions in wind speed can reduce the infiltration of cold air into buildings by up to 50%, giving potential heating savings of 10-12% per year.
- B. Use of serotonin (mood-influencing neurotransmitters) mimicking plants, while respecting the fragrance sensitivity of our users. Gardening is medicine that makes us happier!
- C. Strive to have our landscape carbon-neutral, by introducing 'minimal maintenance' plantings in our landscapes as well as non-fossil fuel maintenance equipment.
- D. Adapt a zero "yard waste" off-site removal by composting, mulching, grass cycling and recycling all vegetative material on-site.
- E. Create seamless transitions from indoor to outdoor environments to encourage the use of the green spaces that "hug" our buildings.
- F. Design elements that promote activities, such as outdoor exercises and nature walks.
- G. Promote a pollinator-friendly environment (bees & butterflies) and edible landscaping.
- H. Promote multi-storey planting to encourage greater biodiversity, tolerance to adverse conditions and the promotion of beneficial organisms. When diverse species are planted, garden plants are better able to withstand attacks from both insects and disease.



- I. Apply compost and other organic matter to landscapes, including lawns. This improves drought resistance due to greater water-holding capacity, improves nutrients availability and promotes sustainable biodiversity. By feeding the microbes with organic matter they in turn feed the plants. Fertilizers are applied in a way that promotes biodiversity by not interfering with the microorganism population.
- J. Mulch beds whenever possible and recycle nutrients by mulching grass clippings and leaves. No vegetative waste is taken away!
- K. Damage caused by the ice storm to organically grown trees and shrubs provided a supply of Ramial chipped wood mulch. All fallen and structurally compromised trees are chipped and reused on-site as either compost or mulch.

“The impact of a healthy tree canopy, colorful gardens and lush green landscapes on human health has long been known, but not well quantified, until now” – Mark Cullen (Ottawa Citizen, Jan. 2016).



DID YOU KNOW:

- Stress Relief – Gardening can help reduce the level of stress hormone Cortisol
- Bacteria – Soil contains a natural antidepressant that can make us happier
- Immunity Booster – Direct exposure to soil and plants can help boost your immune system
- Brain Health – One study revealed that daily gardening can **REDUCE RISK OF DEMENTIA BY 36%**

Source: organiclesson.com



TYPES OF GARDENS AT SUNNYBROOK

The gardens at Sunnybrook are designed to stimulate all senses by providing fully accessible active and passive garden spaces. These spaces are specifically designed to meet the physical, psychological, social and spiritual needs of our patients as well as their caregivers, family members, friends and visitors. They give an opportunity to enjoy nature, and experience the unique restorative and preventative healing it provides.

Specifically designed for:

- Sensory Interest - fragrance, texture, sight, sound, and taste. For example, using plants that engage all the senses for aromatherapy. Certain scents can give rise to different emotions, such as:

Lavender which provides a scent that can stabilize the mood, promoting a sense of calmness and wellbeing when a person is feeling stressed.

Rosemary prefers the sun to cooler climates. It is good for mental alertness. It's been shown to have positive effects on performance and mood. Rosemary has also demonstrated the ability to reduce cortisol levels. This means that rosemary aromatherapy can be a good choice for de-stressing during the day when there is still work to be done.

Peppermint aromatherapy has been found to increase memory and alertness, which can provide a great pick-me-up for tired and busy people, stressed students, and the overworked.

- Quiet private sitting areas provide a variety of spaces to accommodate different activities and levels of privacy.
- Functionality is imperative to ensure the space is accessible for everyone.
- Simplicity is essential in designing healing gardens to keep the space easy to understand. Many people using healing gardens are dealing with stress, therefore it is important that the space not have too much “going on” to add any additional stress.

Our landscapes are designed to bring a greater quality of life to anyone using our facilities. They provide self-care to staff, and preventative and restorative healing to patients, visitors and staff.





HEALING GARDENS

Throughout history, gardens have been used to aid in the healing process and can be found in a variety of settings, including hospitals, and other related healthcare and residential environments. These were often part of hospitals prior to the mid-twentieth century and are regaining popularity now.

The gardens' purpose is to support generalized healing by helping patients to become relaxed, therefore enhancing the healing processes. Healing gardens produce a soothing and healing environment for patients, which fosters stress recovery by evoking positive feelings (blocking or reducing stressful thoughts), and reducing negative emotions. The goal of a healing garden is to make people feel safe, less stressed, more comfortable and even invigorated. Patient outcomes such as pain, sleep, stress, depression, length of stay, social support and overall patient satisfaction tends to improve. *Staff outcomes*, such as injuries, stress, work effectiveness and overall satisfaction, have also been proven to be affected positively.



THERAPEUTIC GARDENS

They are designed to conform to the medical model. Just as one can ask if a medication has relieved pain or cured an infection, in a therapeutic garden, one should be able to ask if walking in the garden has improved strength and balance, for example.

“Therapeutic” implies treatment or a remedy with the expectation of a positive measurable outcome.

The Butterfly Garden

Butterflies aren’t just beautiful creatures. They’re an important part of every eco-system because they pollinate much of our harvests and serve as an indicator of the environment’s health.

Because butterflies are relatively weak fliers, our conservatory garden is placed in a non-windy location. The area chosen provides a sheltered area that will protect our garden and make it easier for butterflies to explore. This area is also sunny, which is essential for the butterfly garden.

Large rocks, exposed soil and even pavement is present to provide warmth to these cold-blooded pollinators.

Butterflies may be attracted to the garden by a large patch of bright flowers, but they will linger longer if there are also areas that provide shelter, water, sun and a diverse group of plants that imitate the way plants grow in the wild.



Edible Gardens

Regarding nature/landscaping, there is another area Sunnybrook has embraced: nutrition through edible landscaping. It's a concept that is gaining popularity globally given current demand to secure sustainable food sources. This approach to landscaping involves growing edible plants (perennials and annuals) like veggies, herbs and flowers in the existing flower gardens to perform multiple functions:

1. Provide **Food** which can be donated to food banks or consumed. Foods such as Kale, onion, carrot, asparagus, Garlic, etc. are grown, while still providing sensory Interest.
2. Provide **Aromatherapy** (sensory interest); "flavor" or fragrance which is a vital component to any healing and therapeutic garden. - Many herbs have attractive flowers and fragrant foliage. Pineapple sage, bee balm and lavender to name a few. We are currently using some of the above plants in the healing and Nurses gardens.
3. Ornamental **Appearance** such as peppers which come in a variety of colors and shapes, making them exceptional choices for flower borders and beds. Mint, Thyme and Oregano can be used as ground covers in certain gardens also. Again, all in this group can be harvested and sent "fresh" to a food bank of choice.

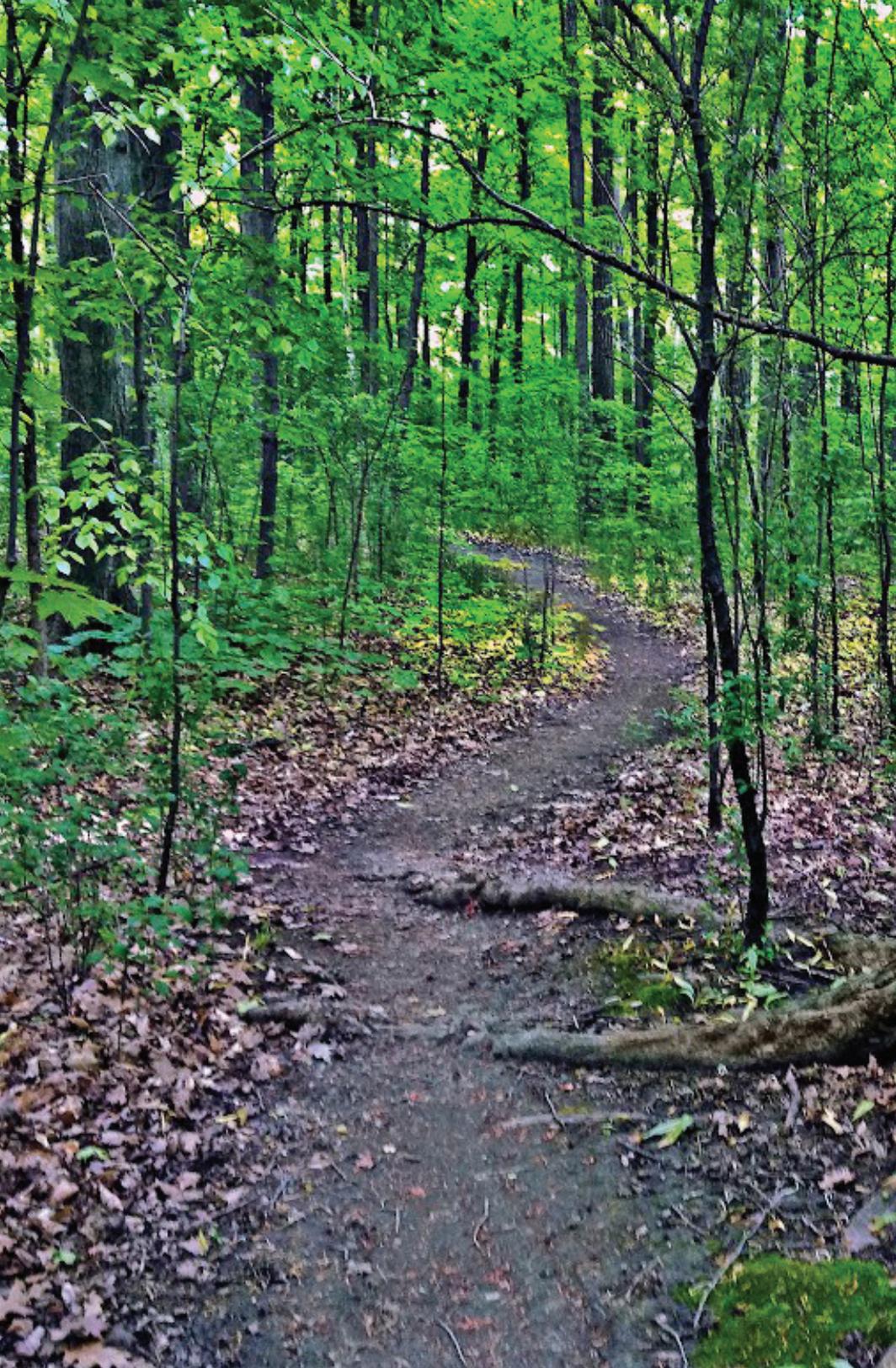


In addition to the above benefits, mixing vegetables and herbs with our traditional horticultural plants can increase garden yields and flower production. The flowers increase nectar production, attracting more beneficial insects that protect edible plants and pollinators that increase flower production. For example, planting certain plants deter insect infestation on other plants.

1. Marigolds deter insects attacking tomato plants, preventing snail damages
2. Petunias planted with beans repel bean beetles
3. Onions deters aphid attack on plants such as roses – great addition in the Sunnybrook Rose bed at the Churchill monument, and other beds with roses.

This approach also accentuate the importance of “community planting” which we are currently doing, rather than traditional ‘formalized’ commercial planting of a bed filled with a single plant variety. We are promoting multi-storey planting to encourage greater biodiversity, tolerance to adverse conditions and the promotion of beneficial organisms.







BONUS RESOURCES

Allergies in the Landscape

For allergy sufferers, the onset of Spring is usually associated with the plant allergens, such as pollen and moulds.

1. Spring (April - May) = Pollen from trees. Primary pollen producing trees in Canada: Oak – (worst pollen producer), Maples, Willow, Pine, Ash, Birch
2. Late Spring – midsummer (June – July) = Grasses
3. Late Summer – Early Fall (Aug – Oct) = Weeds such as ragweed

Pollen from trees, grass and weeds are usually spread by wind while pollen from many flowers are usually spread by insects such as bees, butterflies and birds, which are not usually a factor for allergy sufferers.

“Twenty-five years ago, only 10% of the US population suffered from allergy. Today the official figure is 38% and rising. Second, deaths from asthma, long ago almost unknown, are now becoming common. About 7,000 people are expected to die in the US in the year 2,000 from complications due to asthma.

Lawns are pollen trappers. Of the over 1,000 types of grass, only a few produce pollen. Unfortunately, those few include our common Kentucky blue, rye, and Bermuda grass. Grasses such as tall fescue usually only release pollen when tall (more than 10”). This is the primary grass type used in Sunnybrook’s lawns.

At Sunnybrook:

1. Where possible, the female of the plant species are planted as the male plants produce pollens. The Grounds team avoids plants, trees and shrubs that are labelled as “fruitless” or “seedless” because they are usually male, and seek out pollen-free plants. They may be messier than males, but they do not produce pollen.



2. Low allergen gardens - using OPALS* table (Appendix I) are planted.
3. Lawns are mowed regularly to prevent seed head production.
4. Planting of wind pollinated plants are avoided. Plants that are pollinated by birds, bees and butterflies are promoted.
5. Many times, allergies from lawn mowing are triggered by the release of previously trapped pollens into the air by the lawn mower. The Grounds team avoids mowing on hot, dry and windy days and bags and composts when possible.

***OPALS** is an acronym for Ogren Plant Allergy Scale. It is an allergy rating system for plants that measures the potential of a plant to cause allergic reactions in humans.

Companion Gardens

Why are chives in the Sunnybrook Rose beds? “Companion plants assist in the growth of others by attracting beneficial insects, repelling pests, or providing nutrients, shade, or support” - Wikipedia.

This relationship between plants and insects is the safest and most natural way to garden organically.

Plant:

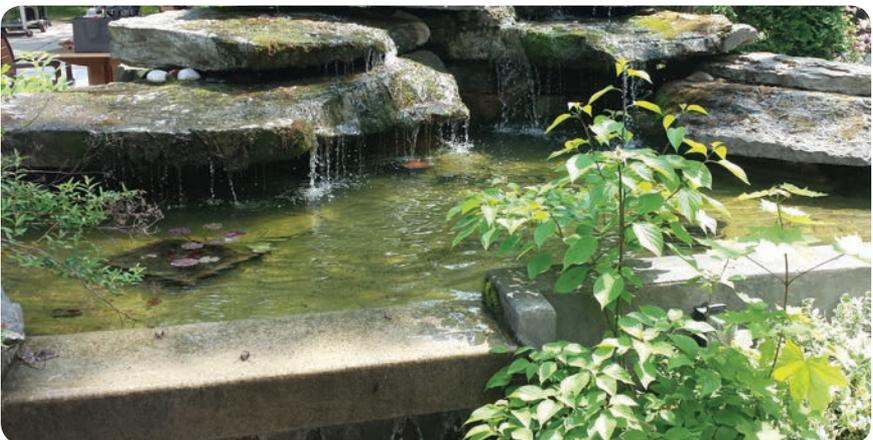
- Marigolds help repel aphids and a host of other pests, including nematodes
- Peppermint repels ants, white cabbage moths, aphids and flea beetles
- Garlic discourages aphids, fleas, Japanese beetles and spider mites
- Perennial chives repel aphids and spider mites, and resist the disease Blackspot on roses

- Basil repels flies and mosquitoes
- Sage repels carrot flies, cabbage moths and slugs (Artemisia or Wormwood)

Certain plants attract predatory insects that will feed on harmful undesirable ones. For example, Perennial Yarrow attracts ladybugs that consume masses of aphids.

Companion plants:

- Cabbage, celery, dill, onions and potatoes are good companion plants. Avoid planting strawberries, tomatoes, and pole bean.
- Carrots, lettuce, radish, onions and tomatoes are friends. Dill isn't, so plant it at the other end of the garden.
- Corn prefers to be near pumpkins, peas, beans, cucumbers and potatoes. Keep tomatoes away.
- Tomatoes, carrots, onions and parsley are good companion plants. Basil improves growth, yield and flavour. Keep cabbage and cauliflower away from them.



APPENDIX I

OPALS

OPALS™ (Ogren Plant Allergy Scale) measures the allergy potential of all garden and landscape plants.

Opal Rating	Guideline ^[5]
1-3	Very low potential to cause allergies
4-6	Moderate potential to cause allergies, exacerbated by overuse of the same plant throughout a garden
7-8	High potential to cause allergies, advise to plant as little as possible
9-10	Extremely high potential to cause allergies, should be replaced with less allergenic species

Usage

Within Canada: The OPALS allergy scale was used in the Canadian Urban Allergy Audit, which was conducted in 2012



APPENDIX II

COMPANION GARDENING

Vegetable	Companions	Antagonists	Insight
Asparagus	Basil, Coriander, Dill, Parsley, Carrots, Tomatoes, Marigolds	Garlic, Potatoes, Onions	Marigolds, Parsley, Tomato protect from asparagus beetles
Beans	Beets, Brassicas, Carrot, Cabbage, Cauliflower, Cucumber, Celery, Chards, Corn, Eggplant, Peas, Potatoes	Alliums (chives, garlic, leeks, onions), Peppers, Tomatoes For Broad Beans: Fennel	Corn is a natural trellis, and provides shelter for beans. Beans provide nitrogen to soil.
Broccoli	Basil, Bush Beans, Chamomile, Cucumber, Dill, Garlic, Lettuce, Marigold, Mint, Onion, Potato, Radish, Rosemary, Sage, Thyme, Tomato	Grapes, Mustard, Oregano, Strawberry, Tomato	Rosemary repels cabbage fly. Dill attracts wasps for pest control.
Cabbage	Beets, Bush Beans, Celery, Chamomile, Dill, Mint, Onion, Potato, Oregano, Rosemary, Sage	Beans (Pole and Runner), Mustards, Peppers, Strawberry, Tomato	Celery, onion and herbs keep pests away. Rosemary repels cabbage fly.



Vegetable	Companions	Antagonists	Insight
Carrots	Beans (Bush and Pole), Garlic, Lettuce, Onion, Parsley, Peas, Rosemary, Tomato	Dill, Parsnip	Beans provide nitrogen in soil which carrots need. Onion, parsley and rosemary repel the carrot fly
Cauliflower	Beans, Celery, Oregano, Peas, Tomato	Strawberries	Beans provide the soil with nitrogen, which cauliflower needs.
Corn	Beans, Cucumbers, Marjoram, Parsnip, Peas, Potatoes, Pumpkin, Squash, Zucchini	Tomato	Tomato worm and corn earworm like both plants. Beans and peas supply nitrogen.
Cucumber	Beans, Celery, Corn, Dill, Lettuce, Peas, Radish	Potato, Sage, strong aromatic herbs, Tomato	Cucumbers grow poorly around potatoes and sage.
Lettuce	Beans, Beets, Carrots, Corn, Marigold, Onions, Peas, Radish, Strawberries	Parsley	Mints repel slugs (which feed on lettuce).



Vegetable	Companions	Antagonists	Insight
Marigold	Brassicas (broccoli, etc), Cucurbits (cucumber, etc), Peppers, Tomato, and most other plants	-	It is said that you can plant Marigolds throughout the garden, as they repel insects and root-attacking nematodes (worm-like organisms). Be aware they may bother allergy sufferers.
Onions	Beets, Cabbabe, Carrots, Lettuce, Marjoram, Rosemary, Savory, Strawberry, Tomato	Beans, Peas	Repels aphids, the carrot fly, and other pests.
Potato	Beans, Cabbage, Corn, Eggplant, Horseradish, Marjoram, Parsnip	Celery, Cucumber, Pumpkin, Rosemary, Strawberries, Tomato	Cucumber, tomato and raspberry attract harmful pests to potatoes. Horseradish increases disease resistance.
Sage	Beans, Cabbage, Carrots, Peas, Rosemary, Strawberries	-	Repels cabbage fly, some bean parasites.

Vegetable	Companions	Antagonists	Insight
Spinach	Beans, Lettuce, Peas, Strawberries	-	Natural shade is provided by beans and peas, for spinach.
Squash	Fruit trees, strawberries	-	Similar companion traits to pumpkin.
Strawberries	Borage, Bush Beans, Caraway	Broccoli, Cabbages	The herb, Borage, is likely the strongest companion.
Tomatoes	Alliums, Asparagus, Basil, Borage, Broccoli, Carrots, Cauliflower, Celery, Marigold, Peppers	Brassicas, Beets, Corn, Dill, Fennel, Peas, Potatoes, Rosemary	Growing basil about 10 inches from tomatoes increases the yield of the tomato plants.





RESOURCES

The American Institute of Architects:
www.aia.org, especially *Guidelines for Design and Construction of Health Care Facilities*

The Center for Health Design:
www.healthdesign.org, especially *The Role of the Physical Environment in the Hospital of the 21st Century*

INTERNET CITATION:

- <http://www.slideshare.net/pd81xz/zq35b>
- <http://www.landscapeontario.com/the-social-benefits-of-green-spaces>
- <http://www.footprintnetwork.org/en/index.php/GFN/>
- <http://www.sustland.umn.edu>
- http://www.eoearth.org/article/Environmental_effects_of_urban_trees_and_vegetation
- <http://www.ctahr.hawaii.edu/hih/human.asp>
- <http://aggie-horticulture.tamu.edu/syllabi/432/article3.html>
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- http://depts.washington.edu/hhwb/Thm_Healing.html
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- <https://www.terrabinbrightgreen.com/reports/the-economics-of-biophilia/>
- <http://www.vegetablegardeninglife.com/companion-planting-charts.html>



- http://www.sheridannurseries.com/garden_tips/general_gardening/companion_planting
- <http://www.mindful.ca/programs-training/mbsrp/>
- <http://sunnybrook.ca/content/?page=mindfulness-meditation-stress-therapy>
- <http://www.thekimfoundation.org/blog/2015/07/28/understanding-the-importance-of-self-care/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3974630/>
- <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/08/09/18/improving-health-and-wellness-through-access-to-nature>
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- <http://www.rosalindcreasy.com/edible-landscaping-basics/>
- <http://www.ediblewildfood.com/blog/2013/08/edible-wild-food-can-help-stave-off-hunger/>
- <http://ca-en.naturespath.com/about/movements/gardens-for-good>
- <http://justfood.ca/ottawa-food-action-plan/edible-landscaping-in-the-city-of-ottawa/>
- <http://www.cbc.ca/news/canada/nova-scotia/halifax-hospitals-replacing-flower-beds-with-vegetables-1.3073677>
- <http://grist.org/article/food-smart-city-governments-grow-produce-for-the-people/full/>
- https://sunnynet.ca/data/1/rec_docs/17770_The_Link_Between_Landscapes_and_Health.pdf
- http://grounds-mag.com/mag/grounds_maintenance_landscaping_thats_nothing/
- <http://www.allergyfree-gardening.com/opals.html>
- http://file.marketwire.com/release/PolleNation_Report.pdf
- <http://www.safegardening.org/2016-11-07-22-12-16/opals.html>
- <http://www.veteransgardeningguide.com/>
- http://file.marketwire.com/release/PolleNation_Report.pdf
- <http://www.greenlegacyguernsey.org.uk/9.html>

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NOTES





OUR LANDSCAPE:
AN INCLUSIVE APPROACH TO HEALTH & SELF-CARE

