



With the help of the PHS Philadelphia LandCare program, neighbors of this once trash-strewn vacant lot in West Philadelphia created a vital green space that connects them to nature and each other. (Learn more about it on page 16.)

PHOTO BY ROB CARDILLO

STUDIES SHOW THAT
SPENDING TIME IN GREEN
SPACES IS A PRESCRIPTION
FOR BETTER HEALTH.

NATURE'S *therapy*

by SARI HARRAR

“THE CONNECTIONS BETWEEN NATURE AND HEALTH are as old as time,” says Eugenia South, MD, an assistant professor of emergency medicine and the faculty director of the Urban Health Lab of the University of Pennsylvania’s Perelman School of Medicine. “As David wrote in Psalm 23 of the Old Testament: ‘He makes me lie down in green pastures; He leads me beside quiet waters. He restores my soul.’ In *The Canon of Medicine*, completed in 1025, the Persian and Muslim physician-scholar Avicenna extols the virtues of fresh air for human health, in particular that air found in forests and near trees. In some ways, science is really catching up to what humans have known instinctively forever.”

Ten years ago, South and her colleagues at Penn put Mother Nature to the test. Could turning rubbish-strewn vacant lots into green spaces, they wondered, boost a neighborhood’s mental health? “Admittedly, I was a skeptic at first,” South says. “But scientific research—including my own—slowly shifted my thinking.”

South partnered with PHS Philadelphia LandCare on a headline-grabbing study that first appeared in the July 20, 2018, issue of *JAMA Network Open*, published by the American Medical Association. The researchers surveyed 342 Philadelphia residents living near 541 vacant lots. The lots were sorted into three different groups according to their condition. Those in the first group were left as they were, usually full of trash. The lots in the second group were cleared of trash, and those in the third were cleaned up and converted by PHS into green spaces with grass, wooden fencing, and regular maintenance.



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—Eugenia South, MD

The study found that neighborhood residents living near the “cleaned and greened” lots experienced a 41 percent decrease in feeling depressed, and a 50 percent decrease in feeling worthless, compared with those living near the lots where trash remained. The greening treatment had an even greater effect on the most impoverished residents in the study, who demonstrated a nearly 70 percent reduction in feeling depressed.

As this and many other surveys show, connecting with nature’s healing power—in your garden, a neighborhood park, a wild forest, or simply near a leafy tree or a patch of emerald-green grass—is more important than ever. Eight in ten Americans polled by the Pew Research Center in July reported that they were spending time outdoors daily or weekly to cope with the stress of the COVID-19 pandemic. After pandemic shutdowns began in March, 41 percent of Americans in a Harris Poll survey said that they took daily walks for the same reason. Residents of the Philadelphia area flocked in record numbers to parks in Pennsylvania, New Jersey, and Delaware this summer and fall as an alternative to shuttered malls, movie theaters, and restaurants.

As we revel in nature, South and other researchers are documenting that green spaces have big benefits for our moods, minds, and bodies. Physicians are even starting to use this research in a new field called nature therapy by writing “green prescriptions” for their patients. At the same time, PHS is extending the healing power of green spaces in projects such



as the Azalea Garden at the Art Museum and the gardens at Logan Circle, the Philadelphia Navy Yard, and the Subaru headquarters in Camden. “One of our primary goals with green spaces is to make them accessible to all, says Andrew Bunting, PHS vice president of public horticulture. “Many of our gardens are used daily by tourists and also by local residents, including the homeless.”

Hundreds of studies have demonstrated the beneficial effects of getting outdoors, but many adults in highly developed countries like the United States still spend 90 percent of their time indoors, missing out on the healing power of “biophilia”—our hardwired links to the natural world.

“Getting outside helps us relax, connect with ourselves and others, and get some physical activity,” says Jeremy Mennis, PhD, a professor at Temple University studying the effects of urban green space on stress levels in teenagers. “The idea that you can get mental respite from being in nature has a very long history—

Stress levels and even premature deaths may be reduced in neighborhoods with trees, like this block of Quince Street in Philadelphia.

just look at the development of Central Park in New York City or Fairmount Park in Philadelphia in the mid-19th century, or the mountain retreats of wealthy people 100 years ago. Today parking lots are packed at state parks and forests across Pennsylvania. I see more people out walking in my neighborhood. People are turning to nature because they need it. What’s exciting and new is the way science is now studying these interactions.”

RESEARCH REPORTS

Less stress now for a lifetime of better health. In another study by South, 12 Philadelphia residents wore heart rate trackers as they walked past “cleaned and greened” vacant lots, “ungreened” lots, and down streets where they couldn’t see a vacant lot at all. The study found that the average heart rate of the participants dropped by nearly three beats per minute when they were in view of the grassy, cleaned-up lots and increased by ten beats per minute as they strolled past the trash-strewn lots. The researchers say exposure to greenery may bolster people—especially those living in stressful urban environments—against increases in stress that can boost inflammation, harm the heart, and raise blood sugar levels. Other research finds another deep, physiological connection between nature and less stress: lower levels of the stress hormone cortisol.

A break from anxiety for teens. In a 2018 study, Mennis found that teens’ stress levels dropped when they visited urban green spaces near their homes in Richmond, Virginia—even when stress at home was high. For the study, 179 13- and 14-year-old girls and boys answered surveys on their smartphones about how they were feeling, giving the researchers permission to note their locations when making these comments. In a current study, Mennis is looking at how teenagers’ stress levels line up with the amount of greenery they can actually see. “Using technology, we’re learning more and more about how nature can relieve stress,” he says.



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—Jeremy Mennis, PhD

Renewed mental focus and less burnout. Mental and emotional fatigue were reduced when people had more exposure to greenery at home or on the job, according to studies made in Oakland, California, and Portland, Oregon (cited in a 2019 report from PHS and the group Nature Sacred). Greenery can also improve emotional resilience: Walking in natural areas reduced rumination—worryful thinking patterns that can increase risk of depression—among participants in a 2015 Stanford University study. Brain scans made as part of the study revealed why: Time in nature quieted activity in the subgenual prefrontal cortex, an area of the brain that is believed to fuel ruminating.

A burst of happiness. A 2017 study from National Taiwan University found that the moods of older adults who took unhurried woodland walks—a Japanese practice called forest bathing, or *shinrin-yoku*, which involves soaking up the forest experience with all of your senses—shifted from tense, anxious, tired, and depressed to vigorous and upbeat. Korean researchers speculate that trees shower the forest air with a microscopic spray of plant oils that may reduce inflammation and bolster brain health.



The Riverfront Greenway at the Philadelphia Navy Yard and its four-season gardens tended by PHS provide local residents and employees working nearby with safe green spaces for relaxation and outdoor exercise.

PHOTOS BY ROB CARDILLO (QUINCE STREET, NAVY YARD) AND COURTESY OF EUGENIA SOUTH AND TEMPLE UNIVERSITY (PORTRAITS)

“BRINGING PEOPLE TOGETHER IN THIS AGE OF ISOLATION IS ONE IMPORTANT WAY NATURE CAN IMPROVE OUR PHYSICAL HEALTH.”

—Michelle Kondo



A longevity boost. Increasing the amount of green space in a city may affect mortality itself, suggests a study in the April 2020 issue of the journal *The Lancet*. Researchers estimated that enlarging Philadelphia’s tree canopy by 30 percent could prevent 403 premature deaths annually and that just a 5 percent increase could forestall 302 such deaths each year. Increases in the canopy would make neighborhoods cooler, reduce stress levels, and allow people to be more physically active and socially connected, all of which would tend to decrease crime and gun violence. “Stress reduction is just one potential pathway to longer lives,” says the lead study author, Michelle Kondo, PhD, a social scientist at the U.S. Forest Service’s Northern Research Station, based in Philadelphia. “Another possible connection between green spaces and longevity is the fact that we tend to relate to one another better when we’re around trees or in nature. Bringing people together in this age of isolation is one important way nature can improve our physical health.”

Many more health benefits. Living on a block with more greenery was associated with lower levels of heart failure, coronary heart disease, heart attacks, and irregular heartbeats in a 2019 University of Miami study of nearly 250,000 older adults. Risk of type 2 diabetes was about 10 percent lower for Australians in greener neighborhoods, according to a 2014 study from the University of Western Sydney. Pregnant women in Portland, Oregon, living near areas covered by a larger tree canopy were less likely to deliver low-birth-weight babies, found a 2011 study from the U.S. Forest Service and Drexel University. Finally, more time outdoors was associated with a 7 to 41 percent lower prevalence of overweight among preteens, and just living in a greener neighborhood reduced obesity risk by 17 percent for women, in studies from Australia’s Deakin University (published in 2008) and University of Western Sydney (2014).



City dwellers and visitors can experience nature’s healing power in the PHS-maintained Azalea Garden, which is adjacent to the Philadelphia Museum of Art.

Black city neighborhoods in an attempt to measure how time in nature might reduce or prevent postpartum depression, a condition that affects about one in eight new mothers in the United States, according to CDC research.

“It’s not easy getting organized to go outside with a new baby, but I’d say all of the mothers enjoyed it,” ScottLorde says. “And everyone did it their own way—walking, or sitting on a bench to read or listen to music. One mom was even inspired to start a garden for her children and neighbors.”

Getting outdoors is especially significant for ScottLorde. After the birth of her third child, neighborhood walks helped heal a birth-related injury as well as her own postpartum depression. “Feeling the cold air on my face and observing the trees and animals in my neighborhood helped me feel like myself again,”

she says. And during the past nine months of the pandemic, she has turned to the natural world more than ever, leading virtual and live wellness walks.

“All of my work intersects with nature,” says ScottLorde. “As an African American person, I know the value of spending time in nature. It’s a refuge. We need time to decompress, to sit in beauty and stillness. It’s a release from the stresses and systemic inequities we experience. It’s even more true for mothers, because we’re conditioned to sacrifice our wellness for our families. I want women and my own children to know there can be a balance. We can build joy, peace, and rest into our days.”

Her lessons seem to be taking root. Her two oldest children, whose school classrooms met online in the fall, asked for breaks from screen time to play outside or go for a hike. “They like to remind me that I need to get outside too,” she says. “They say, ‘Mom, it’s okay to take a rest. Did you get outside and get some sun on your face?’”

“Nature is essential for sustaining your life so you can fulfill your purpose.” 🌿

Sari Harrar, a Bucks County resident, is a frequent contributor to GROW magazine. Visit PHSonline.org to see many ways you can join PHS in the effort to increase access to green spaces in our region.

GREEN PRESCRIPTIONS

In the Philadelphia area, physicians are beginning to prescribe time in nature for a variety of ailments. In a recent pilot study, pediatricians serving the city’s Cobbs Creek and Roxborough neighborhoods used a website, NaturePHL, to identify family-friendly playgrounds and green spaces. A collaboration between Children’s Hospital of Philadelphia, the Schuylkill Center for Environmental Education, Philadelphia Parks and Recreation, and the U.S. Forest Service, NaturePHL was linked to doctors’ electronic medical record systems so they could prescribe patients outdoor activities in specific nearby places.

South adds that access to green space should be part of the conversation about reducing health inequities caused by systemic racism. Some neighborhoods have more access than others, and each patient’s individual abilities also need to be considered when making such prescriptions, she says. She recommends using community health workers as “nature navigators” to help people get outdoors in suitable ways.

Lee ScottLorde, a wellness coach and member of the Philadelphia Department of Public Health’s Health Justice Leadership Team, served as a “peer nature coach”—helping new mothers plan practical ways to enjoy some outside time with their new babies—for a recent study done by South. Called Nurtured in Nature, the study enrolled 36 women from predominantly



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—Lee ScottLorde

PHOTOS BY ROB CARDILLO (AZALEA GARDEN), NICOLE SEAHORN (SCOTTLORDE) AND COURTESY OF MICHELLE KONDO