Nature Therapy: An Essential Prescription for Health

John La Puma, MD, FACP

John La Puma, MD, FACP, is a board-certified internist, organic farmer, and author who pioneers cutting-edge topics in medicine today. Known for his work in culinary medicine, here Dr. La Puma emphasizes the importance of nature and nature therapy in medicine. Dr. La Puma believes that clinicians should be actively writing prescriptions for patients who suffer from a nature deficit. In this article, Dr. La Puma talks about the growing field of nature therapy, important resources for clinicians, and how to prescribe such therapy to patients.

Q: How convinced are you that nature therapy is essential for improved well-being in our patients?

John La Puma: I believe that within a generation, nature therapy will establish its place along with nutrition and exercise as a lifestyle intervention that has both immediate and long-term health benefits. As clinicians, we are well aware that people can suffer from negative health consequences related to nature such as conditions caused by air and water pollution. However, being in and interacting with nature can also have significant positive health effects.

There is a long list of ways that nature therapy is beneficial to health. For example, studies have shown that compared to walking in urban settings, walking in forest or park settings has been linked to improved short-term memory, concentration, cortisol levels, natural killer cell number and activity, heart rate, and blood pressure. Improved postoperative recovery, birth outcomes, and pain control have also been reported. Studies of community gardening have shown reduction in glycosylated hemoglobin in people with diabetes with no intervention other than growing vegetables. Gardeners have been shown to be less likely to develop dementia than non-gardeners.

Many forces today are converging to give rise to the field of nature therapy or green medicine, including the personal,

social, environmental, and financial consequences of the disconnection from nature that many people feel. The causes of this disconnection are complex and partly related to climate change and its accelerated pace. Climate changes health. Extreme weather worsens disease, food insecurity and food quality directly, and air, water, and shelter quality and adequacy indirectly. Many people stay indoors nearly 22 hours a day and have little familiarity with nature and, worse, are fearful of it and do not know how to adapt to it.

The disconnection from nature many of us experience is also related to our obsession with personal technology. Addictive mobile technology has people walking across city streets with their faces glued to their phones and looking at screens for 11 hours daily on average (U.S. adults). On average, children younger than eight years old look at screens for 48 minutes per day, tweens nearly five hours, and teens nearly seven hours. Work and productivity are often prioritized over recreation and family, never mind sleep and well-being.

If we were better connected personally to our place in the natural world and realized that the dual forces of global warming and overwork were separating us from our natural position as part of nature instead of apart from it, we would be less likely to stand by and watch its plunder as it and we are threatened.

I believe that Nature Deficit Disorder (NDD), as defined by journalist and visionary Richard Louv in his book *Last Child in the Woods: Saving our Children from Nature Deficit Disorder*,¹ is a true clinical problem and not just a social or behavioral one in both children and adults. The causes of NDD include increasing urbanization without greening and digital distraction. Those at greatest risk are people who work inside constantly, especially in urban centers, and who are tethered to their devices and are relatively sedentary. NDD has many associated clinical conditions such as obesity, cardiovascular illness, attention-deficit disorder, generalized anxiety disorder, myopia, and burnout syndrome.

Q: What does nature therapy as a field in medicine ultimately include? Is it more than just getting outside regularly?

John La Puma: Nature therapy is a new evidence-based field in medicine defined as the prescriptive, evidence-based use of natural settings and nature-based interventions. Its

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mission is to prevent and improve signs, symptoms, clinical conditions, and well-being, and its vision is to be readily available to every family, regardless of proximity to blue or green space. The existing research in nature therapy/green medicine is in somewhat disparate fields such as horticulture, interior design, architecture, forestry, wildlife management, auditory and color science, and herbal and botanical medicine. Nature therapy is also much more advanced in countries other than the United States. The United Kingdom, Australia, Japan, Korea, and much of northern and central Europe have traditions in the field, and some of the research out of these countries has not yet been translated.

Nature therapy has at least 11 different subdisciplines that include:

- Adventure therapy
- Animal-assisted (pet) therapy
- Blue care
- Care farms
- Ecotherapy
- Forest bathing
- Green exercise
- Nature meditation/guided visualization
- Nutrition (herbal, botanical, floral)
- Therapeutic horticulture/horticultural therapy/gardening
- Wilderness immersion

The number of clinicians practicing green medicine/nature therapy is unknown. However, increasing numbers of clinicians are actively prescribing nature therapy to their patients. Occupational and recreational therapists often guide their patients to therapeutic horticulture, pet therapy, and care farms; physicians in emergency medicine and other specialties often lead wilderness, green exercise, forest, and adventure groups; and psychologists and psychotherapists sometimes take additional training and practice as ecotherapists.

Q: How did you personally become interested in the field of nature therapy?

John La Puma: When I told my clinician friends that I was rehabilitating an old nursery and converting it into an urban teaching orchard and farm, they in turn told me about the beauty of getting lost in their own rose garden, building a pizza oven outdoors, or about their vacation to the ocean or mountains where they sail, snorkel, hike, or ski. Gradually, it dawned on me that my friends were going outside to feel better and reset their stress levels and personal health, and so was I.

I fell in love with the process of creating a certified organic farm and participating in regenerative agriculture so much that I went back to school and received a permaculture design certificate and also became a certified California naturalist. I began to learn to keep bees and dogs, manage water, foster fungal ecosystems, and plant and grow

vegetables and fruit-bearing trees. Interestingly, having and caring for houseplants can offer some of the same benefits as caring for plants outside, and houseplants can improve the microbiome of the built environment and individual respiratory and cognitive conditions. Being in contact with living plants and animals inside can be useful as well as fun.

I began to use time spent on the farm as a preventive and therapeutic tool, much like we do in clinical medicine with patients. When I learned that this type of work and that being outside improved blood pressure, cortisol, anxiety, mood, and focus, and that plants and water were being used by corporate institutions worldwide to enhance worker creativity and productivity and improve learning, I knew that I needed to bring some of what I had learned to medicine and medical practice.

Q: When should clinicians think about prescribing nature therapy to their patients, and which medical conditions in particular may benefit from such therapy? How might they write a prescription for nature therapy?

John La Puma: There are a wide variety of people with medical conditions who would benefit from nature therapy. Five conditions that specifically have been shown to benefit from time spent outside include attention-deficit/hyperactivity disorder (ADHD), anxiety, insomnia, hypertension, and myopia. The research continues to emerge in this area, showing benefits for physical, emotional, mental, and spiritual well-being.

But the most important point that I want to drive home to other clinicians is that they should think about prescribing nature therapy whenever they identify a nature deficit. My two question assessment for patients is: “Have you been outside yet today?” and “Have you been outside in nature in the last week to walk, hike, play with a pet, listen to birds, garden, or have a picnic?” If the person answers “no” to both questions, then they need a prescription for nature therapy.

To write a prescription, clinicians should be as specific as we are with prescription medication. Prescribe a specific exercise or activity in a specific place/location on specific days of the week for a specific duration, and whether alone or with others. The prescription should include health goals and might read like this: “Walk in Lincoln Park for 20 minutes with your phone off with a walking buddy six days per week. Write down your blood pressure, pulse, mood, and/or stress level five minutes before and after the walk.” Clinicians can write similar prescriptions for forest bathing and home gardening.

I often write a prescription for a five-minute immersion in a park or other natural spot, and ask people to cycle through their senses, starting with sound first, and giving them specific exercises for each sense. This helps to reset their attention and helps them focus not on the list of things they have to do or current demands, but instead on their immediate surroundings. People invariably feel better after such a session.

For clinicians who want to learn more about nature therapy, there are many available resources. To name a few, Frumkin

et al. recently summarized a research agenda and evidence-based health benefits for nature therapy.² Britton et al. recently published a rigorous, systematic review of blue-space interventions and suggested more topics for research in this area.³ I also published an open-access 20-page white paper defining the different subspecialties in nature therapy and ways that people can interact with nature, which can be accessed online at <https://drjlp.com/members>. This may be a good place to start, and I also included links to additional resources in the paper.

The Children and Nature Network has a research library of about 600 abstracts currently, with links to the full article for most (www.childrenandnature.org/research-library/). Topics include ADHD, anxiety, autism, behavior, learning problems, ophthalmologic disorders, and barriers to nature engagement. The Walk with a Doc Website (walkwithadoc.org) is well-established and helps clinicians and their communities get outside. The International Nature and Forest Therapy Alliance (INFTA) organization is authoritative about forest bathing (<http://infata.net/>).

Q: Please share a few cutting-edge research findings about the benefits of spending regular time in nature.

John La Puma: There are three areas of research that I would like to mention, including exercise, nature views, and myopia in children. When it comes to exercise, clinicians have a special tool to use and that is talking about exercise and location with their patients. It turns out that the location of exercise can be important for optimizing health. Exercising in nature—in sight of and preferably near water or greenery—is more effective and therapeutic and less expensive than exercising indoors without nature in sight. A recent Stanford study of nature therapy showed significantly reduced rumination after a 90-minute walk in nature compared to a 90-minute walk through an urban environment.⁴ In this same study, people who strolled through nature for 30 minutes a day reported a decrease in negative thinking. On magnetic resonance imaging results, the nature walkers showed lower activity in an area of the brain linked to risk for mental illness compared to urban walkers. Another study showed that participants in a forest walking group had higher energy levels and lower levels of interleukin-6 and tumor necrosis factor compared to an urban exercising group.⁵

Next is the importance of having a view of nature, even if it is a poster. Adults in the United States spend the majority of their time indoors. Hospitalized patients spend all of their time indoors. A pioneering study by psychologist Roger Ulrich showed that among 23 matched postoperative participants, those with a view of nature from their bed needed fewer analgesics and had fewer complications and shorter hospital stays compared to those whose view was a brick wall.⁶

A pilot program created by my colleagues and me has also included using virtual reality (VR) nature scenes of the beach, underwater scenes, and sky scenes with children who are receiving flu shots. In our program, patients in the VR group used a free app (Aquarium VR) for approximately 30 seconds

in total before and during vaccination. Children using VR reported 48% less pain than controls. Parents' perception of their child's pain in the VR group was 45% less than that of parents of controls. Health-care staff reported VR children had 74.7% less pain than controls. We believe nature views are not simply a distraction from pain, but instead engage parasympathetic and biophilic impulses that may have application in other acute and chronic pain conditions. Our program has expanded since the pilot concluded, and we now use nature VR in routine pediatric vaccination.

Another area of interesting research shows that time spent outside improves myopia in children. An epidemic of increased screen time has been linked to increased myopia in school-age children. One study that included 693 children in 16 different schools showed that 11 hours of 1000 lux exposure or more reversed myopia.⁷ Both myopic shift and axial elongation were significantly reduced and a risk of rapid myopia progression dropped by more than 50%. To prevent myopia, both spending time outdoors without devices and also spending screen time in both bright and dim light should be considered, as should unstructured outdoor free play in a natural environment.

These are just a few areas of important research occurring in the field. Happily, a number of world-class organizations, including the World Health Organization, the Burroughs Wellcome Fund, and the National Institutes of Health have begun to fund research to establish whether nature therapy can positively and measurably impact specific health conditions as well as well-being. While research about nature therapy is currently largely epidemiological, observational, and retrospective, it is moving quickly toward randomized double-blind controlled trials. It can be argued that this is not the only or most valid research method for the field. However, having such trials will help gain acceptability for it in more mainstream medical and payer channels.

Q: Do you have any final advice for clinicians who also probably don't spend enough time outdoors?

John La Puma: Walk the talk, literally, for five minutes daily if it's a new habit. The strongest predictor for patient behavior change is their physician's behavior. Physicians who exercise will counsel their patients about it more than those who don't exercise, and the same is true for those who eat healthfully or meditate and so on. Practicing healthy behaviors ourselves leads to greater counseling of others in this area.

If a clinician schedules the time to go for a walk, he or she can mention it to patients all day long and ask them if they will do the same. Putting up the right posters of nature scenes in the office—instead of abstract art or bare walls—will likely lower patient anxiety, blood pressure, and pulse rate. Houseplants can clean petroleum products from the air, and NASA has ranked the top plants for that purpose.⁸ If you buy air-cleaning plants for the office (and yes, they may be inefficient, but for now, NASA data about them are the best we have), you can talk about them. I've found those indoor plants to be nearly indestructible.

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Lastly, deliberate nature exposure improves productivity, focus, and creativity. Yet, many people work long hours in offices in pursuit of these ends, despite the absence of data showing that productivity, focus, and creativity are improved with long hours. Nature might be offered as a way to optimize the day of a busy inside-only clinician: take five minutes daily outside, cycle through the senses (sound, smell, sight, touch, and—if it's safe—taste). It's easy to stay indoors and passively absorb media. However, nature, including interacting with plants, animals, and water, can help us improve our own health and well-being and pay it forward to our patients and colleagues.

References

1. Louv R. Last Child in the Woods: Saving our Children from Nature Deficit Disorder. Chapel Hill, NC: Algonquin Books of Chapel Hill, 2008.
2. Frumkin H, Bratman GN, Breslow SJ, et al. Nature contact and human health: A research agenda. *Environ Health Perspect* 2017;125:075001.
3. Britton E, Kindermann G, Domegan C, et al. Blue care: A systematic review of blue space interventions for health and wellbeing. *Health Promot Int* 2018;103:1–20.
4. Bratman GN, Hamilton JP, Hahn KS, et al. Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proc Natl Acad Sci U S A* 2015;112:8567–8572.
5. Mao GX, Lan XG, Cao YB, et al. Effects of short-term forest bathing on human health in a broad-leaved evergreen forest in Zhejiang Province, China. *Biomed Environ Sci* 2012;25:317–324.
6. Ulrich RS. View through a window may influence recovery from surgery. *Science* 1984;224:420–421.
7. Wu PC, Chen CT, Lin KK, et al. Myopia prevention and outdoor light intensity in a school-based cluster randomized trial. *Ophthalmology* 2018;125:1239–1250.
8. Wolverson, BC, Johnson A, Bounds K. Interior landscape plants for indoor pollution abatement. National Aeronautics and Space Administration (NASA). Online document at: <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19930073077.pdf> Accessed January 30, 2019.

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