THE 'GREEN' PEDIATRIC OFFICE

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FIGURE 1

INTRODUCTION

Medicine in the 21st century…what a marvelous, though sometimes overwhelming, time to be in the practice of pediatrics! Technology has become both our boon and our bane: more tools to help our patients, yet daily increases in the slope of our ongoing learning curves. Such rapid change has us struggling toward a techno-future without a clear overview of how to combine all the pieces of this giant techno-puzzle.

One area of medical care provision that is often more piecemeal than complete picture is the design and construction of the physical spaces where care is delivered. While some advanced design technology is slowly moving into the offices of private physicians, it is rarely implemented with an overall plan that takes into account its full impact on the health care we are attempting to provide.

Further, technology is not limited to electronics. Advances from many diverse fields can have a major impact in optimizing the delivery of health care, but only when all are utilized with a sense of the interplay and interconnectedness of their roles.

No, we're not speaking of whooshing Star Trek *doors, or tricorders that diagnose patients with the wave of a hand. Rather, new tools, concepts, and practices available today can be used to enhance the delivery of pediatric care using cutting-edge technology combined with the practical application of current knowledge from many fields of study.*

It is with these thoughts in mind that we begin an ongoing dialogue on the importance of design, materials, and operations in the "green" pediatric office by Lawrence D. Rosen, MD.

-GREGG M. ALEXANDER, DO

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Ecologically sustainable medicine; it *has* been done

Many of us are increasingly aware of how the environment can have an adverse impact on our children's health. Increasing rates in asthma and other atopic disorders, certain types of cancer, obesity, and neurodevelopmental disorders have all been linked to the environment.[1-11]

This growing body of evidence is driving hospitals and private offices to adopt ecologically sustainable medicine (ESM).[12] But what exactly is ecologically sustainable medicine? The Teleosis Institute defines ESM as "an approach to health and wellness that focuses on sustainable, cost-effective health care and preventative self-care education."[13] ESM is also protective of human and environmental health.

New Jersey's Hackensack University Medical Center (HUMC) is home to one of the world's first ecologically sustainable children's hospitals. By using energy-efficient and environmentally friendly building and cleaning materials, healing space design, and waste minimization and recycling, HUMC demonstrates that health care facilities can themselves be models of health and wellness.

Using the lessons learned from working at HUMC, I opened a new "green" primary care pediatric office in northern New Jersey. The three key "green" concepts we considered were design, materials, and operations.

DESIGN

The environment in which we practice should be a model of health and healing, incorporating natural features, openness, and light when possible.[14-16]

At our center, families are greeted at an open reception desk (FIGURE 1), and waiting rooms are divided in sick and well spaces. The clinical space flow is circular in nature, revolving around a centralized, open nursing station, and leading to seven exam rooms. Five of the exam rooms have large windows, allowing in as much natural light as possible (FIGURE 2). Private consultation offices in the rear of the space are efficiently located near the business office. A large, multipurpose space functions as staff lounge, meeting room, and yoga studio.

The entire space is ADA (American with Disabilities Act)-compliant including reception space and bathrooms, which is crucial for practices working with children with special health care needs.

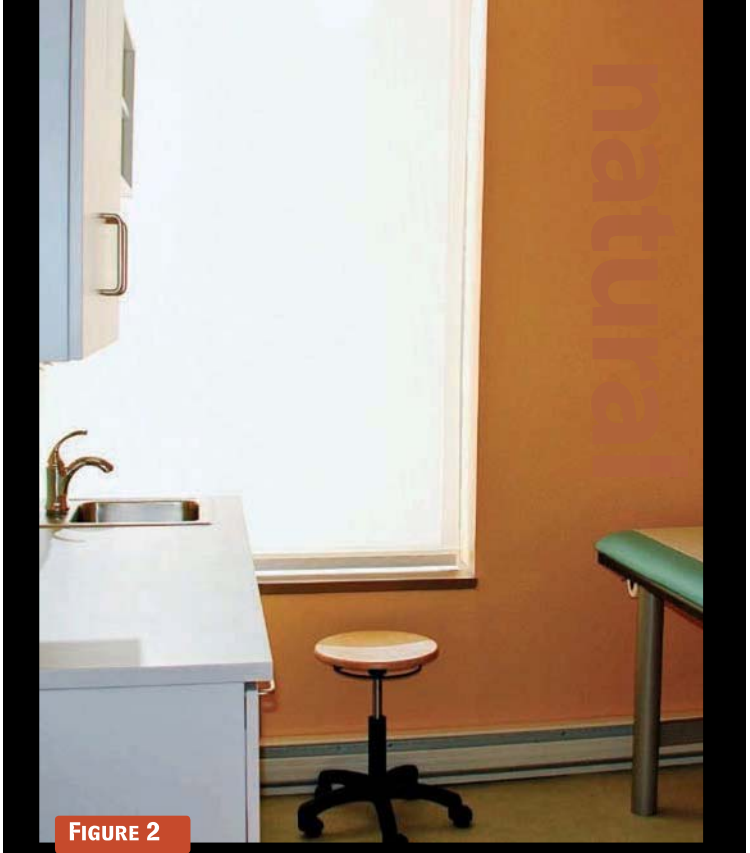

FIGURE 2

Large windows allow in as much natural light as possible.

IMAGES COURTESY OF DR. ROSEN

MATERIALS

Green building materials used to be quite a bit more expensive than conventional materials. This has changed significantly, since demand has increased and suppliers have realized larger markets for their materials. Today it is possible to build an office using ecologically sustainable principles for only 3% to 5% more. In the long run, based on energy savings and tax incentives, one will likely save money. The US Green Building Council (GBC) provides information about green building materials and certification programs such as LEED. According to the GBC, "LEED is an internationally recognized certification system that measures how well a building or community performs across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts."[17]

What makes a product environmentally safe or appropriate has to do with both the raw materials and process utilized during manufacture. For example, wood used for furniture, cabinetry, flooring, or doors should ideally be made of rapidly renewable resources like Forest Stewardship Council (FSC)-certified wood.

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Additionally, how a product is finished matters. Wood, for example, can be stained and sealed using nontoxic products. Typical wood stains and sealants contain potentially toxic chemicals, such as volatile organic compounds (VOCs) like formaldehyde. These VOCs can continually "offgas" or leach into the air, emitting toxins. The GBC and other certifying bodies such as "Green Seal"[18] review alternatives that contain no or low VOCs.

Point Taken

Insulation typically contains formaldehyde. One safer option is cotton, made from recycled blue jeans.

Certain manufacturers are certified by third-party organizations for their environmental practices—Greenguard Environmental Institute, an industry-independent, non-profit organization, is one example. Look for these labels as you research solutions for your practice. Also, a growing number of online and brick-and-mortar retailers serve as one-stop shops for green resources. Of course, there are a number of infrastructure considerations that may be out of a practice's control. For example, insulation typically contains formaldehyde. But safer options exist, such as cotton (from recycled blue jeans). Alternative power sources for heating, ventilating, and air-conditioning (HVAC) include solar or wind/water power, but these may not be practical.

Surface materials and furnishings are much more feasible to consider, and this is where I chose to focus my resources. Ceiling tiles, which usually contain fiberglass, a respiratory irritant, can be made of recycled mineral content. Inexpensive flooring options exist, such as a natural linoleum product made of entirely renewable resources and extraordinarily easy to clean. There are several products certified by the International Organization for Standardization, under the ISO 14001 standard.[19]

Carpets are best avoided in clinical areas due to staining, mold, and infectious organism trapping. But in an administrative/consultation room area, one might consider recyclable carpeting like those by a company that practices the regenerative "cradle-to-cradle" process used by green design firms. Cradle-to-Cradle design, pioneered by William McDonough and Michael Braungart, refers to products and services that are "designed based on patterns found in nature, eliminating the concept of waste entirely and creating an abundance that is healthy and sustaining."[20]

Alternatives for cabinetry exist both in terms of core materials and surface coverings. Surface laminates exist with low volatile organic compound/nonformaldehyde properties. Exam tables can be made with synthetic non-PVC leathers to minimize toxic off-gassing of VOCs. One manufacturer was able to make both infant and standard tables for pediatricians using these safer surfacing products. Paints are widely available in low or non-VOC versions; most large commercially produced eco paints still had some VOC content. I was able to find a company that had non-VOC versions: they produced absolutely no smell as the painters were coating the walls.

Bringing the natural world inside was made possible through several design elements. The window treatments

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FIGURE 3

Chairs constructed of mostly recyclable components.

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we chose allowed us to use an eco-friendly material that allows natural light in even when the shades are down. We built in a divider between sick and well waiting rooms utilizing an eco resin containing hundreds of embedded river rocks. The eco resin contains high levels of recycled content, rapidly renewable and sustainably harvested materials, and is Greenguard-certified for indoor air quality.[21]

In terms of furniture, we worked with a company committed to environmentally sound design and manufacturing processes. Many of the task chairs, for example, are constructed mostly of recyclable components **(FIGURE 3)**. Even the bookcase, while brown in color, is green in spirit. The bookcase/storage rack is both functional and retro-looking, and is made of FSC-certified wood.

OPERATIONS

Finally, we thought carefully about the environmental impact of our daily operations, aiming to "reduce, reuse, and recycle" whenever possible. Recycling bins for staff and patients are in use, and we have implemented a virtually paperless practice management/EMR system. We use green cleaning supplies. The materials used in these cleaning products not only are better for air quality but are equally effective germ-killers as standard hospital cleaners. Green pharmacy initiatives include collecting unused patient medications for proper disposal.

One small step for man... and medicine

Green medicine is not only trendy, it is becoming increasingly more affordable for medical practices to adopt. Not every office will adopt all of the strategies I have outlined above. Yet it is possible to start with just two or three changes, and build from there. It is no longer a luxury but a necessity to consider the impact our health care practices have on the environment and, in turn, on children's health. CP

For more information

One excellent starting point for pediatricians interested in learning more about environmental medicine is the American Academy of Pediatrics' "*Green Book*," officially titled, "*Pediatric Environmental Health*."[12]

The AAP's Section on Complementary and Integrative Medicine is yet another valuable resource.

http://www.aap.org/sections/CHIM

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