

Mémoire pour le CHUM
F. Hanley
Inf., MSc
18 décembre 2006

Ce mémoire exprime mon souhait de voir la construction du nouvel hôpital selon les principes des édifices verts. Comme infirmière et enseignante, je suis très consciente de l'importance de l'environnement physique sur les patients et sur le personnel de l'hôpital. Je crois aussi dans l'importance d'ériger des hôpitaux efficaces et bien intégrés dans la communauté.

Des guides comme le protocole « LEED » ou le « Green Guide for Health Care » définissent ces orientations d'avant-garde, qui ne sont pas encore respectées dans la plupart des institutions de santé. Il y a néanmoins de plus en plus d'ingénieurs, d'architectes et de professionnels de la santé qui voient la nécessité de construire ce type d'hôpitaux pour protéger la santé de la population, accélérer la guérison des patients et satisfaire les besoins du personnel.

Je suggère plusieurs principes de construction verte qui peuvent être envisagés pour le CHUM, et qui englobent par exemple les matériaux, l'équipement, le respect des 4 « R » (réutiliser, recycler, réduire et repenser), la consommation d'énergie, la nourriture et l'accessibilité par le transport en commun.

Memoire for CHUM
F. Hanley
Inf., MScN
18th December 2006

As a nursing teacher preparing student nurses for the profession I am very concerned about the type of hospitals we are designing for the future. On a daily basis I am confronted with the dichotomy between what I know to be best practice in health promotion, and prevention and what I see is occurring in our existing hospitals and health care institutions.

I am by no means an expert, but as a paediatric nursing instructor, a member of the Nurses Working Group of Health Care Without Harm, and a participant at the Clean Med Conference in Seattle 2006. I have been inspired by the possibilities of how hospitals can be designed with the goal of creating environments for sustainability and for healing.

I teach my students about the effects of environmental toxins on children's health, the exquisite vulnerability of children to these toxins, the importance of the precautionary principle, and the principle of health promotion and yet when they go to their hospital placements they see a total disregard of all four environmental principles: reduce, reuse, recycle and reduce.

I am joining my voice to that of increasing numbers of nursing organisations who are urging their members to work to protect the environment and reduce hazards to our patients. We are a profession that prides itself on advocating for the health of our patients, of teaching them about health promotion and disease prevention, of concerning ourselves with the whole person within their community. We cannot continue to plead ignorance about our implication in activities that are causing harm to our patients and the community at large. We want to have a concordance between our practice and our institutions. We wish to have health care institutions that do not put a lie to their mission of healing, but contribute in every way to the physical, spiritual and mental health of their staff and their patients. I would like to see a humanised community of healing.

The basis of our practice is of non-malficence, to do no harm, and yet the hospitals and health care institutions within which we practice are not designed according to this principle. We are involved on a daily basis in activities which are harmful to our patients and to the population in general. While nurses are working so hard to care for patients we are inadvertently causing harm by increasing air, water, soil and food pollution, as well as contributing to global warming (ANA/ANF 2002, Hancock 2001).

In what way is this harm done?: the Problem

Through the massive waste of energy and materials, the culture of single use and disposability that has taken hold, by the toxins contained in the equipment we use for medical interventions for our patients, the materials used in the buildings themselves which contribute to poor indoor air quality, the pesticides used in and around the buildings, and in the products by which we keep our

institutions clean. While we send our patients outside to smoke, we pollute the inside air of the hospital with toxic off gases and chemicals

Nor is the food we serve to our patients is exempt from blame, often pre-packaged instant or frozen, pre-cut food products without taste and with questionable nutritional value. This in a city where we pride ourselves on the quality of our restaurants, and our appreciation of good food, and yet when we look at what is served on our patients' trays we understand why they close the lid and turn their heads.

Waste:

It is well known that the health care industry makes up about 10% of Canada's GDP (CNA 1995, Hancock 2001). It not only uses a massive amount of resources, but produces a significant amount of solid and air born waste, and contributes substantially to contamination of our air, soil, water and food (Hancock 2001).

Health Canada estimates that the care and treatment of the average hospital patient can produce about 5.5 kg of waste each day including disposable plastics, dressings, bedding, and pathogenic remains (Environment Canada 2002).

The types of wastes produced by hospitals include clean general waste, as well as biomedical, chemical, liquid, radioactive, pharmaceutical, and miscellaneous waste (Hancock 2001). Nearly $\frac{3}{4}$ of hospital waste is non-hazardous, with only a small amount that could not be recycled or sent to a landfill. However in many hospitals and health care facilities all of the waste is incinerated either on or off-site. Despite this, few Canadian hospitals have anti-pollution systems, and most still do not respect the norms for waste management (Hancock 2001). Hospital incinerators are significant sources of mercury, lead, dioxin and other air pollutants which also find their way into our water, soil and food.

When I take my students to the hospital everything goes in the garbage, from paper, IV sets, sterile water bottles, plastic kidney dishes to SaO₂ probes and food containers. Excess medications are often poured down the sink, or inadvertently flushed down the drain as they are measured out. The only recycling facilities that exist are in some of the office areas. The cafeteria provides plastic utensils, cardboard cups, plastic and foam food containers, and those exasperating small cream containers. I often wonder how many tons of waste are created from the hospital cafeterias alone. What are the consequences of encouraging use of these containers which most likely contain bisphenol-A, an oestrogen imitator which tends to leach out of these containers and get absorbed by the human body?

Another issue of concern is the disposal of electronics equipment. Many substances found in this equipment have been linked to health effects including cancer, birth defects and hormone disruption. When the equipment is not

properly disposed of the problem is compounded by the release of toxins such as heavy metals into the air and water (HCWH 2006).

Chemicals:

Hospitals are important producers and users of chemicals for various applications, either as components of the medical equipment that is used, or as disinfecting or sterilising agents. Dioxin and mercury are just 2 of the many harmful chemicals produced in important quantities by hospitals. Dioxin is a known carcinogen, possibly the most potent known human carcinogen (Hancock 2001, Environment Canada 2002). The origins of Dioxin lie in the manufacture and disposal of PVC plastics, IV bags and lines for example, and other plastic and chlorine based material.

The US Environmental Protection Association concluded that medical waste incinerators are the 3rd largest source of Dioxin contamination in the United States (Environment Canada 2002).

IV and other plastic materials also contain DEHP phthalate which has been linked to fertility problems in males. PVC based plastics containing phthalates continue to be used despite a 2002 Health Canada Advisory to use alternate materials.

Mercury is a neurotoxin, with a cascade of health effects. Despite large scale elimination of mercury from such objects as thermometers, it still remains in much equipment such as sphygmomanometers, fluorescent lights, lab chemicals, and cleaners. Incineration and improper disposal of mercury containing devices allow mercury to be transported by air to lakes where it is transformed into methylmercury. All our fish advisories to pregnant women sound hollow when we continue to be an important source of mercury pollution.

Materials:

Indoor air pollution is being recognised as a growing problem in health care institutions for staff and patients. This is caused by the surprisingly wide variety of other toxic chemicals and materials used in health care institutions such as pesticides, bromated flame retardants, VOCs such as naphthalene & formaldehyde, and cleaning products combined with a lack of ventilation and air exchange. A recent report from Health Care Without Harm found serious cause for concern about the type of materials used and found in health care institutions that can cause or trigger asthma. These include latex and biological allergens; disinfectants, sterilants and cleaners; and formaldehyde, found in chemically-treated fabrics, carpets, pressed wood and other products. They also found other chemicals which they deemed to be of special concern for nurses including some disinfectants and sterilising agents.

Energy Use:

Health Care Institutions contribute to air pollution and global warming by wasteful energy practices. They are insatiable consumers of resources. For example, in 2002, a Vancouver physician estimated the ecological footprint of the Lions Gate Hospital in North Vancouver to be 739 times its actual size (Sibbald, B. CMAJ •

February 5, 2002; 166 (3).Hospitals are 24 hour institutions, using heat, light, air conditioning and electricity. Few provide any incentives to employees about energy conservation, use alternative energy sources, or increase efficiency in their institutions. I am not sure that the CHUM as it exists now does so either.

Design:

Engineers and architects are now realising the importance of design on patient outcomes and staff health and satisfaction. Traditionally health care institutions have not used the beauty and the healing that comes from the natural environment. There has been little recognition of the succour that each of us feel from our contact with nature. Nor are hospitals traditionally supportive of the caregivers, often being cramped, inconvenient, non-social, and dependent on artificial sources of light. There is little attention to the idea of community or of humanity in the functional design that is traditional to health care.

With the change of paradigm to an ecological one, the patient is seen as at the centre of care, and the importance of a natural healing environment crucial to the patient's progress and to staff health and satisfaction.

Use of natural daylight and other architectural design choices have been shown to increase both of these. Well-designed hospitals have a significant influence on the performance of nurses in their work and have a positive impact on their recruitment and retention. The research also shows that nurses are acutely aware of the role that hospital design plays in their everyday work and, consequently, want a greater say in shaping their working environment. A 2005 study carried out in Britain overwhelmingly concluded that nurses felt they should be included in consultations for hospital design, and that hospital design is crucial to nurses' retention and performance. Factors for them such as access to public transport, and family friendly facilities were important factors in recruiting and retaining nurses.

(The role of hospital design in the recruitment, retention and performance of NHS nurses in England 2005) <http://www.healthyhospitals.org.uk/diagnosis/diagnosis.html>

Recommendations.

The Green Guide to Health Care (<http://www.gghc.org/>) describes 3 ways in which building design and practices protect health. These include protecting the health of building occupants, protecting the health of the community, protecting the health of the global community and natural resources.

The Green Guide has been developed by green healthcare industry leaders as a 'toolkit of best practices' in order to create 'high performance healing environments'. (<http://www.gghc.org/about.cfm>).

I believe that the re-design and rebuilding of the CHUM offers a prime opportunity for respecting these best practices. The Green Guide to Health Care sets out in meticulous detail the steps for hospital construction according to sustainable design principles, whether it be a new or re-built hospital. The ground work is already done, and the evidence is clear as to what can be built and why. Green hospitals make economic sense, increase staff and patient satisfaction,

promote healing, and contribute to the community. This guide enables hospitals and health care workers to respect their commitment to do no harm.

The guide goes beyond the LEED principles in incorporating every element of design from reducing water and energy use, suggesting alternatives to hazardous materials, using natural plantings, recuperation of storm and waste water and incorporation of public transport access, bicycle paths and storage areas into the design. The Green Guide offers savings in energy consumption, in material usage, and in waste management.

The CleanMed conference in April this year in Seattle offered the opportunity to hear from hospitals who had re-designed their hospitals to follow green building design. For example Tom Badrick of Legacy Health System in Portland Oregon, spoke about the Waste Management changes that were made to their facility, turning their recycling and waste management facilities into a money making venture. They recycle paper and fibre, scrap metal, pallets, yard debris, electronics, plastics, blue sterile wrap, and anything else possible. Their 12,000 foot warehouse employs challenged workers to sort recyclables, and they have organised community projects such as thermometer exchanges, and community drop off of recyclables. On top of these benefits the hospital made money by their recycling. Mr Badrick estimated that they saved \$233,000 on the waste that did not go into the garbage.

Candic Thompson of the Mercy Health System, a 240 bed facility described the major changes they made in their food delivery system, changing from the traditional paper menu from which the patient chooses the day before, to a room service delivery system where the patient orders from a restaurant style menu. The cleanable menu is kept in a folder at the bedside, and the patient orders by phone to the room service representative. With this new service, they increased patient satisfaction from 40% to 90%, saved approximately 500 lb of paper a year, and reduced food wastage because the patient orders what they want when they want it. All trays have reusable dinner ware, and patient can put recyclables such as newspapers on their tray for collection. Their hospital kitchen was refitted with Energy star appliances, hand-free sinks, and 100% recycled non-bleached napkins.

Health care institutions such as the Spaulding Rehabilitation Hospital in Boston recognised their primary mission of care as being linked to sustainability. The Rocky Mountain Institute and the HCWH Summit gave hospital administrators the incentive to build a green hospital. The CEO, Judith Waterston realised that this would help their patients to recover their health more quickly, and also help to recruit and retain staff. It would also help them to become leaders in the rehabilitation field and the health care community. As Mrs. Watson said, not to be green would be very short-sighted. When we are seeing so much innovative building design in Montreal for commercial and residential sites we should be also leading the way in health care design.

There are plenty of inspirational stories across the US and the UK from which we can take lessons. My vision of the CHUM and of the MUHC would therefore include:

- aspects of design for public transport and bicycle accessibility, bicycle storage areas, and bike paths
- incentives for public transport and car sharing for employees
- recycling throughout the hospital with warehouse construction for processing of a wide variety of materials
- medical devices that are without phthalates, pvc, heavy metals, bisphenol A, or other known toxins
- use of recycled paper products without chlorine bleach
- cleaning products that do not contain toxic chemicals
- environmental purchasing with standards for specific items and supplies
- use of multiple use instruments and material where possible with autoclave and other energy saving and efficient sterilisation facilities
- flexible design that can be adapted to the needs of a variety of patients
- natural daylight access for patients and staff where possible
- natural ventilation when possible
- nurse designed units for improved patient care, including de-centralised nursing stations where nurses can be closer to their patients, using digital technology
<http://www.managedhealthcareexecutive.com/mhe/article/articleDetail.jsp?id=376836&pageID=2>
- food facilities based principles of healthy food, locally grown, pesticide and hormone free, organic if possible, incorporating farmer's market and gardens.
- Use of fair trade products where possible, such as tea and coffee
- Use of re-usable crockery throughout the hospital, drastically reduced dependence on disposables
- A hospital garden designed to grow herbs for the kitchen, and flowers which could be sold in the hospital to be re-invested in more flowers.
- Green roofs, or if this was not found to be feasible, then natural plantings and garden areas around the site using storm water for irrigation which would be accessible or visible to patients and families
- Grey water use for toilet flushing
- Reduced noise and devices to create awareness of noise in hospitals,
- Non-toxic building materials, following the principles set out by Lent & Stensland:
 - No materials that contribute to the formation of Persistent Organic Pollutants (POPs)
 - No materials that contain or emit highly hazardous chemicals
 - Sustainably sourced biobased or recycled and recyclable materials
 - No materials manufactured with highly hazardous chemicals
 (Lent, T., Stensland, J. Nov 2006: H2E Green Building Teleconference Series: Making the Case for Healthy Interior Materials).
 - Use of fast growing sustainable building materials such as bamboo, and bio-plastics from corn.
- A hospital open to the public for public outreach and information

There are already existing Health Centres constructed or adapted in accordance with these principles: Hackensack University Medical Centre, New Jersey; Legacy Salmon Creek Hospital Vancouver Washington, Kaiser Permanente, Modesto CA.

As Lucia Athens asked at the Clean Med Conference in Seattle “How can we persist in building hospitals with substances that cause cancer, hypospadias, deplete wildlife, pollute the air and the soil, and continue to use chemicals that we do not know the effect of?” Without a vision we will not advance, and without taking risks we will achieve nothing. I hope for visionaries and risk-takers who can create our new hospital centres that will abide by the precautionary principle, that cause no harm to anyone, or anything, that promote healing, a sense of community, of sanctuary, of humanised care and real health promotion.