

# DO NO HARM?

## HEALTH CARE AND THE ENVIRONMENT

'Do no harm' is the decree exhorted of all health professionals when they first begin practice. But does this, or should this, include doing no harm to the environment? Environmental advocates argue it should, but is this the reality? **Fiona Armstrong** reports.

Illustration by Nerissa Douglas



As the highest per capita producers of greenhouse gases in the world, Australians have good reason to be concerned about environmental health. Australians produce the equivalent of 27.2 tonnes of carbon dioxide per person each year.<sup>1</sup>

We also produce over a tonne of garbage per person annually, placing huge burdens on the capacity of landfill. But while domestic waste is the focus of enthusiastic recycling and waste management schemes, industry practice is lagging behind, placing environmental and human health at risk.

And as every nurse knows, the volume and nature of waste produced in health care is both huge and toxic.

## Health effects of environmental change

There is now clear evidence of the negative health effects resulting from changes to the global environmental landscape.

Uncensored burning of fossil fuels, an increasing reliance on vehicle transport, the loss of many of the world's carbon sinks through deforestation, and the accompanying effects of global warming is having a dramatic effect on the health of the world's population.

Recent studies from the USA suggest air pollution is affecting foetal growth, and may even be causing DNA damage in unborn children.<sup>2</sup> A report from the UK has linked an increase in brain diseases (such as Alzheimer's and Parkinson's) to environmental factors such as car pollutants, and toxic chemicals like agricultural pesticides.<sup>3</sup>

The World Health Organisation (WHO) claims over three million children die every year, mainly in the developing world, from diseases related to their environments.<sup>4</sup>

Populations of frogs, considered by scientists to be the world's 'canaries in the coalmine' for their role as nature's best indicator of environmental health, are dying en masse.<sup>5</sup>

The clearing of native forests, urban sprawl and the erosion of biodiversity in north America have been identified as contributing to the spread of infectious diseases such as Lyme disease.<sup>6</sup>

And if the human costs aren't shocking enough, consider the economics: a recent report from the Australian Bureau of Transport and Regional Services estimated the health cost of pollution in our cities was around \$3.5 billion per year.<sup>7</sup>

## Nurses as environmental advocates

This should concern nurses because they are 'the watchdogs of the health services', according to USA nurse and environmental educator, Dr Barbara Sattler.

Sattler is director of the environmental health education center at the University of Maryland

School of Nursing, in Baltimore, USA, and co-leader of the Nurses Working Group of Health Care Without Harm (HCWH), a coalition of over 420 organisations across 52 countries seeking to reduce the impact of health care on human health and the environment.

Sattler says while it's true hospitals are supposed to be places of healing, as producers of large volumes of toxic waste and environments where dangerous chemicals are tools of trade, hospitals are actively damaging public health.

As the most numerous group of health professionals in hospitals, Sattler says nurses are well positioned to advocate for, and lead change on environmental health.

'Nurses are very often the first line of defence in the health professional world. We are also the ones who our patients trust the most to help interpret health risks and recommend steps that we can take to be as healthy as possible.

'Increasingly the scientific literature is finding culpability among environmental contaminants with regard to human health risks. If we, as nurses, do not integrate this science into our practice, we will miss many of the potential aetiologies for our patients' complaints, and miss the opportunity for primary prevention.'

## Mercury, PVC and dioxins

According to Sattler, the International Council of Nurses (ICN) and the American Nurses Association (ANA), the biggest risks posed by hospitals come from health care products containing PVC and mercury, and poor waste disposal practices such as incineration (which creates dioxin, a known carcinogen).

Mercury is present in many health care products, not just the old-fashioned thermometers, but in sphygmomanometers, dilation and feeding tubes, batteries, fluorescent lamps and laboratory chemicals.

If humans are exposed to mercury, it can act as a powerful neurotoxin which can affect the brain, spinal cord, kidneys and liver. So when mercury products break, or are disposed of into medical or municipal incinerators or landfill, the mercury vapour which is released can disperse over huge areas of land or leak into groundwater.<sup>8</sup>

Mercury is then changed by microorganisms into methyl mercury, which is easily absorbed by animals and fish. According to the USA Centers for Disease Control and Prevention (CDC), up to one in ten women in the USA already carry enough mercury in their blood to pose a threat to an unborn foetus.<sup>9</sup>

The threat to our food chain from these emissions is no longer imagined: both the USA Environmental Protection Agency (US EPA) and Food Standards Australia are advising pregnant women to avoid eating specific types of fish due to

environmental mercury contamination.<sup>10</sup> While figures are not yet available in Australia, USA hospitals are estimated to contribute 4-5% of the total mercury load into wastewater,<sup>11</sup> with the US EPA ranking the health care sector as the fourth largest source of mercury air emissions in the country.<sup>12</sup>

## What's the alternative?

There are safer alternatives to mercury, according to RN Charlotte Brody, co-founder and executive director of Health Care Without Harm.

Brody and her colleagues have been responsible for spearheading an initiative known as *Hospitals for a Healthy Environment*. This partnership between hospitals, nursing organisations, and the US EPA, aims to replace mercury products in health care by encouraging safer, cost-effective alternatives to mercury products.

So far 1,400 hospitals across the USA have joined the program, which hopes to eliminate mercury from the health care waste stream by 2005.

USA governments have also begun to take the matter seriously, with many states passing legislation banning the manufacture, sale, and distribution of mercury-containing devices.

## Plastic products

Plastic products containing the chemical DEHP, or phthalates, and widely used in health care, also pose a health risk.

Used to make plastic more pliable in products such as IV and feeding tubes, DEHP is present in around 25% of medical products. Evidence suggests prolonged use can facilitate the leaking of this chemical into the bloodstream of recipients, causing developmental problems and hormonal disorders.

It also points to 'downstream' dangers, such as dioxin, a known carcinogen that is produced when PVC products are disposed of into medical or municipal incinerators.

Concern about the use of products containing phthalates has been formally acknowledged internationally since 2002, when the US FDA and Health Canada issued warnings about their use in populations known to be at risk, and urged their substitution for people receiving prolonged IV or enteral feeding, neonates, infants, and pregnant women.

## The precautionary principle

This precautionary approach to products affecting environmental health, now endorsed by many international governments, advocates a 'better to be safe than sorry' approach to activities that raise threats of harm to the environment or human health.

It is this principle which is driving the HCWH initiative, says RN Charlotte Brody.

'It's really important to challenge the thinking that what we cannot prove, we ignore. Where there is a potential for harm, and safer alternatives exist, it makes good sense to err on the side of safety,' Brody said.

'This is especially important in societies like the USA, where the health of corporations matters more than the health of the planet, and where industry keeps raising the bar for how much proof you need before you take action.'

Recognition of the risk of phthalates is just beginning to dawn in Australia, with the Therapeutic Goods Administration (TGA) recently calling for information on the use of phthalates in medical devices. Sattler and Brody both say, under the precautionary principle, there is no question the products should be substituted.

## Dioxin danger

Other factors implicating hospitals and health care in damage to environmental and human health are both the sheer volume of waste and the pollutant dioxin, produced from the incineration of waste.<sup>13</sup>

Dioxin is created when waste containing chlorine (used in the production of paper, and present in huge quantities in hospitals), PVC, or carbon, such as that contained in Australia's medical waste stream, is burned.

Despite a requirement for hospitals to report to the National Pollutant Inventory (NPI) on emissions (such as dioxin), current limits on the both the nature and the level of reportable emissions mean the data is of limited value in assessing the impact of the health care industry on the environment and on human health.

One report from the NPI, a division of Environment Australia, suggests 'little data exists on emissions from Australian incinerator facilities' but indicates USA derived data is suitable for use as a basis for characterising emissions from incinerator facilities in Australia.<sup>14</sup>

Another NPI report suggests there has been a 543% increase in the amount of mercury emissions to land, air and water since 2001-2002.<sup>15</sup> While it seems likely that increased reporting may be responsible for this leap, the general lack of data on medical waste means Australia is still a long way from being able to accurately estimate the impact of health care on the environment.

The Australian Government Department of Environment and Heritage recently conducted a review of studies of dioxin emissions in Australia, and concluded that while exposure to dioxins in Australia was low compared to other industrialised nations, it recommended 'all reasonable steps' be taken to 'further reduce human exposure, by reducing and eliminating significant sources' of dioxin generation.<sup>16</sup>

## Waste reduction

Clinical waste expert and former nurse Trevor Thornton estimates the total volume of waste generated in the Australian health care sector is over 130 thousand tonnes each year, and says this could, and must, be substantially reduced. But he is also quick to point to the paucity of data.

'Hospitals don't appear to know what they're throwing out. They don't know how much they are generating, they don't know what it costs them, and they don't know if they are compliant with regulations,' Thornton said.

And because they are not accurately measuring their waste, Thornton says hospitals are also underestimating what it is costing them.

'Hospitals look at invoices for disposal of general waste and clinical waste to make up a figure for waste management. But they tend to leave out sharps containers, garbage bags, staff costs, administrative costs, work cover premiums etc. So they may think they're spending \$50,000, when it is actually costing them \$200,000.'

'Also, if they are not accurately measuring their waste, there is no way of ascertaining if their performance on waste management is getting better or worse.'

## Waste to be accredited

Complying with waste management regulation is about to get more serious however, with waste management recently becoming a mandatory accreditation requirement for Australian hospitals.

Thornton says this means hospitals now seeking accreditation with the Australian Council on Healthcare Standards (ACHS) will have to make sure they are compliant with all legislation and codes of practice.

The Australian and New Zealand Clinical Waste Management Industry Group (ANZCWMG) recently reviewed their code of practice for the health care industry for the disposal of clinical waste, and this

will form the standard for clinical waste management for Australian hospital accreditation.

'They have to make sure they know what is in their waste stream – this means doing waste management audits, and making sure all their systems are correct,' Thornton said.

'Nurses need to know that these codes exist, so they can ensure their management is addressing these issues, and providing the appropriate resources to do so.'

## 'Know before you throw'

Charlotte Brody from Health Care Without Harm says nurses need to understand what waste is potentially hazardous, and what is not, as well as what can be recycled.

'The same confusion that leads a nurse to throw a juice can or office paper into the [infectious waste] bag can also result in the nurse forgetting to separate potentially hazardous items.

'Thoughtful placement of garbage – a "know before you throw" attitude – not only reduces the amount of waste, but lowers costs, and improves proper segregation and disposal of hazardous waste,' Brody said.

## Do you mean me?

Barbara Sattler says all nurses have a responsibility to act, to advocate for change, to dispose of waste responsibly, and to influence environmentally responsible purchasing, so as to minimise the damage of health care on the health of the population.

'Nurses must find their collective voice on these issues,' Sattler says.

'In the USA, approximately 1 in every 100 Americans is a registered nurse. I bet similar proportions exist in Australia. We have never harnessed the power of our collective voice. Once we do, I think we will have discovered how we can best effect change.

'It does not mean that we all must become experts on every issue. But it does mean we must develop expertise among ourselves and heed this expertise as we develop and initiate policy and practice changes.

'These changes can be within our own institutions, within our own communities, and within our local, state and national governments, as well as internationally with organisations such as the ICN.'

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## Making a start

Waste management programs are one way hospitals can reduce their impact on the environment. One such program at Cairns Base Hospital is reaping the benefits of waste segregation, with savings of more than \$23,000 in the first few months.

The project aims to reduce clinical waste within the hospital by up to 30% as well as cut costs by correctly disposing of waste, and so far, the benefits are stacking up.

Environmental manager Nick Hill-Murray said it cost \$1.56 per kilo (or \$1,500 per tonne) to dispose of clinical waste, and just seven cents a kilo (or \$68 per tonne) to dispose of general waste, so making sure staff disposed of waste correctly had the potential to create huge economic savings.

In Victoria, the Alfred Hospital has been working on various projects to make the hospital more environmentally friendly. A recent project known as 'Dollar Wise – Patient Wise' aims to achieve savings by encouraging staff to be more conscious of the use of consumables in their area and to identify areas for reduction.

Environmental officer, Mr Bob Dowal, said segregating and recycling were the keys to a successful hospital waste management program, adding that the hospital hoped to achieve \$70,000 reduction in waste costs for the 04/05 financial year.

St John of God Healthcare (SJOG) in WA introduced an environmental management system in 2002 to reduce energy, water and waste. Supported by the Curtin University Centre of Excellence in Cleaner Production, the SJOG Subiaco campus has reduced their overall and clinical waste volumes through separation and is reducing disposable products through environmentally responsible purchasing.

Environmental officer at Subiaco, Mae Mallows, said simple things, like compacting cardboard could also dramatically reduce volumes of waste and increase recycling – purchasing a compactor has increased cardboard recycling by over 100%.

Ms Mallows said staff education was critical to the success of waste

management programs, as well as giving people 'ownership' by having an environmental representative in every department and every ward.

'We run clinical waste training programs in each ward and study days for people on night duty. These help to educate staff about the importance of separating waste — what goes in, and what doesn't.'

SJOG Murdoch campus (also in WA) has instituted energy efficient technologies and recycling schemes, with a large proportion of kitchen waste diverted from landfill to a worm farm onsite.

Environmental management coordinator Jade Carlton said the hospital was recycling cardboard, plastics, paper, glass, steel and aluminium, as well as toner cartridges from printers and photocopiers, and was beginning to implement environmentally responsible purchasing policies, such as using 50% recycled paper.

'We have substantially reduced our clinical waste through staff training, and hope to reduce it further,' Ms Carlton said.

Even regional health care is getting in on the act. Health care providers at Stawell, Ballarat and Bendigo in Victoria have each conducted environmental audits finding staggering amounts of waste, much of it general waste discarded into the infectious waste stream, and a large proportion of it recyclable.

Bendigo Health Care Group (BHCG) found 27,000kg of infectious waste was being disposed of per year, but only 49% of it was actually infectious (37% was general waste and 12% was recyclable.)

Stawell Regional Health estimated four tonnes of their waste going to landfill each year was recyclable. And Ballarat Health Services reduced their total waste by 74,000kg in one year, by directing organic waste to a worm farm and increasing the amount of recycling.

Manager of environmental services at Ballarat, Don Colbert, reiterated Ms Mallow's view that the involvement of the entire staff is critical: 'It's not just environmental services who are responsible for waste management, it's everybody.'

## Help! Resources for nurses

**Healthcare Without Harm** provides tools for nurses:

<http://www.noharm.org/tools/nurses>

**Hospitals for Healthy Environment** provides tools for hospitals and health care systems to help minimise the volumes of waste generated and the use of toxic chemicals: <http://www.h2e-online.org/index.cfm>

**EnviRN** supports nurses seeking scientific information on environmental health and nursing <http://envirn.umaryland.edu/>

The **Sustainable Hospitals Project** assists the health care industry to select

safer products and work practices while maintaining quality patient care and containing costs: <http://www.sustainablehospitals.org/HTMLSrc/Project.html>

The **Australian and New Zealand Clinical Waste Management Industry Group** code of practice for the health care industry for the disposal of clinical waste is available at <http://www.wmaa.asn.au>

The **Centre of Excellence for Cleaner Production** at Curtin University in WA helps promote cleaner production technologies and eco-efficiency: <http://www.cleanerproduction.curtin.edu.au/about-cecp.htm>

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