Invited Editorial

Making change in haemodialysis units for a sustainable future

Anthony Perkins & Rosemary Simmonds

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Many of us are beginning to acknowledge that climate change is one of, if not the biggest, threat to health this century. It appears that we may have only a small window of opportunity to act. If we start now to make sustainable changes to our health care practices, we may be able to make some difference to our planet's long-term health.

Non-renewable resources in Australia have come under increasing pressure in recent years. Agar (2010) recommends that we take a far more responsible attitude to water recycling and resource management. He proposes that all new and existing haemodialysis services, regardless of region, should develop plans to incorporate some sort of water-saving initiative and/or a renewable energy source.

Haemodialysis is one of the most resource-greedy and carbon-producing treatments in health care. We consume vast amounts of water and power and create large volumes of waste. This practice is not sustainable for a healthy future. Many of us have attempted to make changes and in this paper we have provided some insights into our experience.

Water

In our medium-sized service alone, Barwon Health, Victoria, prior to 2007, >100,000 L/week of potable water was rejected to the drain. This water is of a quality suitable for drinking and meets the standards as defined by the WHO and EPA (WHO 2008) (EPA 2009). However, local government and water boards assess reject water as "grey-water" making it legally undrinkable. It is, therefore, up to us as health professionals to develop more innovative ways in which to use this valuable resource.

Some simple do-it-yourself (DIY) plumbing enables units to collect this water and utilise it in other service areas. Reverse osmosis (RO) reject water can provide autoclave steam for instrument sterilisation, ward toilet flushing, janitor stations and garden maintenance. Satellite centre reject water can be transported to community sporting fields, schools and aged-care gardens. People at home on haemodialysis can collect and reuse RO reject water for use in home domestic utilities, gardens and animal watering. For very minimal financial investment and some DIY plumbing we can dramatically lessen the environmental impact on a finite resource.

Power

As with water needs, the electrical power requirements of dialysis centres are also enormous. With solar exposure of approximately six hours per day, the potential to apply solar-powering to haemodialysis is unquestionable. The Barwon Health home haemodialysis training unit has embarked on a solar power-assisted haemodialysis project. A solar array was installed in July 2010 and to date has produced enough solar energy to power about 80% of the requirements for four haemodialysis machines and portable RO units. Though the short-term costs of setting up a solar array may be expensive (approximately $16,200 for a 24m² array) the longer term savings and carbon footprint reductions are undeniable. A solar array has an operational life of approximately 30 years, income-generation with the national electricity grid via a grid-share and reimbursement arrangements can predict a potential revenue stream back to the dialysis service in the third decade of the solar array's lifespan (Energy Matters 2011). Again, the installation of suitable solar array for home haemodialysis patients would also make a significant reduction in our overall carbon impact and help alleviate overall costs for people dialysing at home. Solar power seems a logical choice as an alternative power source for dialysis services after all we are a 'sunburnt' country.

Waste

A single haemodialysis session produces about 2.5 kg of solid clinical waste, of which approximately 38% is plastic. This amounts to an estimated 390 kg per year per in-centre haemodialysis patient, which is increased further with home haemodialysis up to 650 kg of waste per year, dependent on frequency. Peritoneal dialysis is also waste-productive, with approximately 617 kg of waste produced per year (Centre for Sustainable Healthcare, 2008). None of these estimates include the significant amounts of packaging waste.

Recycling of packaging waste is something we could easily improve upon and is a very easy practice to institute within a dialysis unit. Most health care networks have a waste recycling programme and it is easy to collect spent dialysate containers and cardboard packaging for the recycling bin. It all starts here.

Unfortunately most of the waste produced by dialysis services is incinerated. This practice not only costs a significant amount, but leaves a heavy carbon footprint. However, an innovative and greener option to dispose of waste is available. Autoclave steam sterilisation devices like the STERISHRED 250®, that are able to treat all types of infectious waste and sharps are now available in some countries. All thin-walled metal parts such as scalpel blades, syringes, glass, dialysis materials and plastic material, gloves, paper and cloth and, of course, liquids and other infectious materials are sterilised and shredded in preparation for disposal. This product can then be sent to land fill, which, although not optimal,

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does leave a softer carbon footprint than incineration (STERISHRED 250®, 2011). More sophisticated ways of using recycled plastic are also being trialled around the world; for example, it has been used in road surfacing projects in India.

Dialysis services can no longer ignore the non-medical aspects of their programmes and need to think green by planning, trialling, implementing and embracing 'green dialysis' resource management practices. We need to follow the lead of our UK counterparts who have set up a green nephrology programme, including a fellowship, regular summits and innovative research for all things 'green' in kidney care. For now we can focus on water conservation, alternative power sources and waste management, which will make a significant dent in the carbon footprint left by dialysis services. We as nurses have the power to start the 'green wheel of change' rolling. Changes to practice that reflect smart resource and waste management could see us living healthier lives and enjoying 'greener' health care that is fit to care for ourselves in the future.

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