



## LITERATURE REVIEW

# Achieving cost and carbon savings in neonatal practice: A review of the literature on sustainable waste management

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### KEYWORDS

Waste;  
Sustainability;  
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**Abstract** Sustainable waste management in neonatal and high dependency care areas has not been given sufficient priority or consideration according to literature. As a consequence research is lacking in identifying waste that may be recyclable or reduced, generating income that could be reinvested in patient care. The key aim of this paper is to explore and report on the systematic review of the literature, which discloses waste management practice within neonatal and high dependency care areas, which may identify waste with subsequent environmental impacts. Exclusion criteria, inclusion criteria and search by terms methodologies were used to carry the systematic review essential for the study. The research findings suggest that there is little published material on waste management within neonatology or other high dependency and resource dependent clinical areas. This lack of published material could be seen as an indication that this is a relatively unexplored area of clinical practice that provides an opportunity for further empirical research and development of interventions within highly resource dependent areas such as

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neonatal intensive care that are intended to reduce waste costs and carbon emissions whilst promoting a sustainable reduce, re-use, recycle philosophy within healthcare waste management.

## Introduction

The importance of wisely using and conserving scarce and costly resources within healthcare has been well reported in the literature (Richardson et al., 2009; Nichols, 2014) as has the need for healthcare organisations such as the National Health Service (NHS) to reduce their waste and their subsequent environmental impact on society (Manzi et al., 2014). The NHS in the United Kingdom (UK) has been reported to have had a carbon footprint of approximately 21 million tonnes of CO<sub>2</sub>e in 2011/12 and has been tasked with significantly reducing this carbon footprint by 2020 (NHS Sustainable Development Unit, 2012). A significant element of this carbon footprint is generated by transport and management of waste.

In addition to environmental costs, the financial costs of healthcare waste management must also be considered. The Royal College of Nursing (RCN) (2011) in their investigation of waste management found that organisations participating in their study during 2009–10 produced waste costing approximately £65,500,000. The RCN go on to claim that a 20% reduction in infectious waste could produce a yearly saving of around £8,840,000 in waste management processing costs. More broadly, the Academy of Medical Royal Colleges (AOMRC) (2014) has argued that avoiding waste and promoting value in healthcare is associated with quality of care. This is arguably particularly pertinent for clinical areas that are highly dependent on scarce, specialist resources and at times when resources are constrained (AOMRC, 2014). In the face of increasing constraints on funds and resources, which may have a particular impact on high dependency, high resource consuming areas such as intensive care, waste must be reduced and available resources used wisely (AOMRC, 2014; Nichols, 2014). However, there is evidence within the literature that reducing waste generated in clinical care has not been given sufficient priority or consideration (AOMRC, 2014). Furthermore, evidence also suggests that significant proportions of waste generated within high dependency areas may be recyclable thus potentially generating income that could be reinvested in patient care. In addition, it has been argued that research into the reduction and management of waste in high

dependency areas such as intensive care and neonatal intensive care is lacking (McGain et al., 2009).

This evidence indicates the need for some further investigation of the management of waste within high dependency and resource dependent areas such as neonatal intensive care. This paper reports on a systematic review of the literature with the intention of investigating waste management within healthcare with an initial specific focus upon neonatology, as this area has been identified as being especially dependent on the availability of resources and technology and may consequently generate significant amounts of waste with subsequent environmental impacts (Nichols, 2013, 2014).

## Methods

A systematic review of the literature was carried out with an initial aim of identifying contemporary and recently published empirical research or policy documents within neonatology relating to clinical waste. Appropriate databases (Table 1) were searched (January 2015) to identify relevant research published in English.

### Inclusion criteria

Inclusion criteria were that the article title, abstract and body of original research papers, policy documents, professional body/organisation documents, published and unpublished (grey literature) appeared to be relevant to the research topic. Papers must have been published or if “grey literature” produced after the year 2000, in English.

### Exclusion criteria

Letters, newspaper articles, opinion pieces and non-academic documents were excluded.

### Search terms

An initial search was carried out using the search terms: “clinical waste” OR “health\* waste” AND neonatology OR paediatric intensive care. In this

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