

PERFORMANCE AUDIT

Waste management in Scottish hospitals

Executive summary

Introduction

The effective management of hospital waste is essential for the health and safety of patients, staff and the general public. The safe storage, transportation, treatment and disposal of hospital waste are important in ensuring that environmental standards are met, while the standards themselves continue to be raised by government at both the UK and European levels. These increasing standards have resulted in major changes in the way hospital waste is treated. Twenty years ago most hospital waste was disposed of by the NHS in hospital incinerators. Now very few trusts dispose of their own waste; the vast majority of waste is treated and disposed of by contractors.

Hospital waste can be considered in two broad categories, domestic waste and clinical waste. Domestic waste is, as the name implies, made up of the same types of items found in waste from any household. Clinical waste consists of waste not deemed safe for disposal along with domestic waste. There are different types of clinical waste and different classifications which determine how the waste should be treated. For example, blood-stained bandages are not treated as domestic waste, but are in a different category of clinical waste from, say, low level radioactive waste which results from some treatments.

Assuring safety

Safety issues fall into a number of groups. These include safe working of clinical and nursing staff, proper segregation of clinical waste, and the movement and storage of waste by porters. In addition to these internal safety matters there are issues surrounding the transportation, treatment and disposal of clinical waste. Although normally undertaken by a contractor, trust management retains a responsibility for these aspects of waste management.

To achieve high standards of safety trusts need to provide appropriate training for all staff in contact with clinical waste, and ensure staff and contractors are aware of and comply with waste standards. Trusts need to monitor both staff and contractor performance to ensure compliance.

Our study found that in general safety standards are high, although there were occasional examples of poor practice in regard to training and staff compliance with safety standards. The standard of monitoring of uplift and disposal varied significantly between trusts. Without good monitoring it is hard to see how a trust can fully discharge its 'duty of care'.

Cost savings

The disposal of hospital waste costs about £8 million a year. Clinical waste costs about £300 per tonne more to dispose of than domestic waste. There is however variation in the cost of disposing of both clinical and domestic waste and therefore the difference in cost between clinical and domestic waste varies amongst trusts. Clinical waste accounts for about 75% of total waste disposal costs. Achieving significant savings in the costs of waste management will require a reduction in the costs associated with clinical waste.

This could be achieved in two ways:

- by reducing the unit cost of disposal
- by reducing the volume of clinical waste produced.

The unit cost depends on the contract price that has been negotiated with the contractor. Glasgow trusts have jointly negotiated a contract which runs until 2005, and a consortium comprising most of the other trusts has recently negotiated a ten year contract which is expected to reduce clinical waste disposal costs. Given the long term nature of these contracts our study looked at the second aspect of cost ie, the amount of waste classified as clinical waste. There are two possible ways in which the amount of clinical waste might be reduced:

- better segregation of domestic waste from clinical waste
- reclassification of some clinical waste as domestic waste.

Segregation

In areas such as wards where both clinical and domestic waste are produced it is vital for safety reasons that clinical waste is not mixed with domestic waste. It is also important for cost control reasons that domestic waste is not mixed in with clinical waste and disposed of in a much more expensive way than is necessary.

Acute hospitals generate more clinical waste (on average) than non-acute hospitals, but even within this group there is a greater than three-fold variation in the amount of clinical waste produced for each staffed bed. And there is no apparent relationship between size or type (eg, teaching/non-teaching, with or without maternity services) of trust and waste produced per staffed bed.

We found two trusts where in wards there was no segregation of domestic waste from clinical waste; instead all waste was classified as clinical waste and disposed of expensively. The reason given for this approach was that in the past the trusts had incidents where clinical waste had been wrongly disposed of as domestic waste. While this is clearly a serious safety failure, we do not believe the solution is simply to dispose of all domestic waste as clinical waste.

The other segregation issue identified by the study was poor segregation of waste by staff in a number of trusts that did have a segregation policy. We estimate that about £1million could be saved if all trusts achieved the standard of segregation achieved by the best. If segregation of domestic waste from clinical waste is to be improved, then all trusts must have appropriate policies and ensure that staff are trained in the importance of separating out domestic waste.

Reclassification

Clinical waste includes 'sanpro' waste, ie, items used for the disposal of urine, faeces and other bodily secretions and excretions but which do not contain identifiable human tissue and blood. The term sanpro is a description and not a classification; these waste products may be classified as domestic or clinical depending on their origin. Sanpro waste generated in nursing and residential homes is treated as domestic waste but treated as clinical waste in hospitals.

Current guidance from the Scottish Environment Protection Agency (SEPA) and the Health and Safety Executive states that, if risk assessment identifies an infection risk during handling and final disposal processes, then all such waste shall be treated as clinical waste.

If a formal risk assessment demonstrates that there is no infection risk from sanpro, then such waste need not be classified as clinical waste and may be disposed of safely in other ways. Most sanpro waste is produced by primary care trusts and most of this plus much of that produced at acute trusts is likely to be risk free. We estimate that over £1million could be saved if sanpro was reclassified. We therefore recommend that a number of pilot formal risk assessments be undertaken at primary care trusts to establish whether sanpro waste from certain hospitals or types of patient could be treated as domestic waste.

Management information and monitoring

Information and monitoring are required for environmental, safety and cost reasons. There is also a need for information which permits comparison over time and with other trusts.

The duty of care imposes a responsibility on trusts for clinical waste right through to its final disposal. They therefore need to know the amounts uplifted and the amounts properly disposed of are the same. To ensure the trust is charged for the correct amount of clinical waste the trust needs to know the weight of the clinical waste uplifted by the contractor. In addition there is a need to monitor safety issues (for example needle stick injuries).

Our study found there was considerable variation amongst trusts, in the information gathered and the monitoring use made of this information. We recommend that the basic information highlighted on page 18 of the report covering amounts of waste and costs along with specific safety monitoring should be the basis for trusts' waste information and monitoring systems.

Many of the recommendations in this report can be implemented by trusts individually. However, some require joint working, such as the piloting of sanpro risk assessment and benchmarking. We recommend that the Clinical Waste Steering Group and the Property Environment Forum Executive should provide the coordination required. Both these groups are already undertaking good work on a multi-trust basis.

The purpose of this report is to identify significant waste management issues and to act as a baseline report against which the performance of the NHS in Scotland and individual trusts can be measured. It is our intention to carry out a follow-up audit in about 18 months time to establish what action has been taken and what improvements have been achieved.

1 Introduction

Good waste management and environmental practice is a matter for the whole of the NHS in Scotland. Everyone has responsibility not only for patient and staff safety but also for making a contribution towards a better environment for the entire community.

Government policy, for both economic and environmental reasons, is to encourage all organisations to reduce the amount of waste produced, to promote re-use wherever possible, and to maximise the benefits of recycling. All NHS trusts and other NHS in Scotland bodies can play a part in achieving these aims.

Generally, waste which is produced in a healthcare setting falls into two main categories: clinical waste and domestic waste. Clinical waste (defined by *'The Controlled Waste Regulations' 1992*) refers to those wastes that arise from diagnosis and treatment, and from the immediate care of patients. There are special requirements for the disposal of clinical waste, arising from both health and safety legislation and environmental protection regulations. Individual trusts are required to undertake local risk assessments and to put in place policies for the safe disposal of their clinical waste.

As well as posing health and safety risks, clinical waste is expensive to dispose of. Estimates indicate that the NHS in Scotland generates more than 15,000 tonnes of clinical waste each year. As disposal costs, including packaging, transporting, treatment and final disposal, average over £400 per tonne, the annual NHSiS bill for clinical waste lies between £6 million and £7 million. Waste is generated in most parts of a hospital but wards are by far the single biggest producers of both domestic and clinical waste.

The volume per head of population of waste classified as clinical waste is higher in Scotland (and elsewhere in the UK) than in some other countries in Europe¹. The NHS in Scotland Property and Environment Forum Executive strongly recommends that trusts should review their management of clinical waste establishing and monitoring robust procedures for segregation. The overall aim is to ensure that only waste which requires specialist treatment and disposal is classified as clinical waste, and thereby substantially to reduce the costs involved. This aim should be achieved within the overriding requirement that all waste is disposed of safely.

Waste management in the NHSiS has undergone many major changes. Ten years ago, most clinical waste was disposed of relatively inexpensively at 150 or so incinerators located on hospital sites in Scotland. Changing legislation and tighter environmental controls has meant that most incinerators have had to close, since it was not economical for most trusts to bring incinerators up to the

¹ Scottish Hospital Technical Note 3 (SHTN3), *'Management and Disposal of Clinical Waste'*, compiled by the NHS in Scotland Property and Environment Forum Executive.

required standards. A major factor was the abolition of crown immunity and the loss of protection previously afforded to hospitals from prosecution under environmental regulations.

In 1997 new, higher environmental standards were introduced, which could not be met by a number of the remaining waste disposal facilities, and alternative methods of disposal had to be established. Trust chief executives set up a Clinical Waste Services Review Group (now the Clinical Waste Steering Group) which was successful in agreeing a clinical waste disposal contract for 22 trusts (out of 28) and two islands health boards in Scotland. The contract is based around a heat disinfection process, recognised as one of the most environmentally acceptable methods of disposal, and is expected to save more than £6 million over ten years.

The trusts in Greater Glasgow have a separate arrangement. They have worked collaboratively since 1995 and are halfway through a contract which also ensures that waste is handled in an environmentally sound manner. The two main contracts are good examples of trust collaboration, and it is the Steering Group's intention to build on existing expertise to create a base for further work on waste management issues.

The Clinical Waste Steering Group includes representatives from the Property and Environment Forum Executive, which is a recognised centre of expertise within the NHS and has developed key documents including:

- *'Scottish Hospital Technical Note 3'* (Management and disposal of clinical waste with definitions and guidance on all healthcare waste issues)
- Greencode (a computerised management system for trusts covering environmental awareness).

It is important for the NHS to keep waste management under review, since the requirements of legislation continue to develop; for example, from 1 January 2002 trusts will have to replace bags with rigid packing for infectious waste transported by road which is likely to increase further the cost of disposing of clinical waste.

The aims of this study were to:

- investigate whether waste is being handled safely and effectively in accordance with the regulations
- investigate whether waste is properly segregated, recycled wherever possible, and disposed of economically
- identify and promulgate good practice
- identify scope for potential savings.

The study was carried out in consultation with the Clinical Waste Steering Group, and this report is based on the findings of local audit investigations at 21 trusts (out of 47) during 1998/99. It also makes use of clinical waste data in respect of all trusts for 1998/99 collected by the Property and Environment Forum Executive.

This report will act as a baseline report against which the performance of the NHS in Scotland and individual trusts can be measured. It is our intention to carry out a follow-up audit in about 18 months time to establish what action has been taken and what improvements have been achieved.

2 Safety, training and environmental issues

This section concentrates on the safety, environmental and training issues that arise in dealing with clinical waste. The main safety and environmental requirements are summarised below.

Policies and practice

The management and disposal of clinical waste (as defined by *'The Controlled Waste Regulations' 1992*) is regulated under the Environmental Protection Act 1990 and related legislation. From April 1996, SEPA has been responsible for the enforcement of all relevant legislation. Legislation requirements include the fulfilment of a 'duty of care' which requires all those in the chain of production, transport, treatment and disposal of clinical waste to take reasonable measures to ensure that the waste is managed and disposed of properly. The waste producer's 'duty of care' extends to final disposal.

Scottish Executive policy, as expressed in an NHSiS context in NHS MEL (1999)61, states that trusts should adopt best practice arrangements for the segregation and safe and economic handling of clinical waste. Staff should be motivated and trained to segregate waste properly, in order to ensure that the quantity requiring specialist treatment is minimised, and the amount available for recycling is increased. A key message is that good environmental practice is a matter for all NHS employees, which should be seen as a desirable challenge rather than a burdensome imposition.

The fundamental principles of good waste management require trusts to:

- ensure that clinical waste is properly and efficiently segregated, stored, transported and disposed of
- provide appropriate information, instruction, training and supervision to ensure the implementation of waste management systems
- minimise the production and environmental impact of waste by reviewing materials used and practices employed
- safeguard against the uncontrolled release or spillage of waste
- regularly review all activities to ensure compliance with environmental and health and safety legislation.

Detailed good practice is included in the *'Model Waste Disposal Operational Policy'* document (produced by the Clinical Waste Steering Group for incorporation in a revision to *'Scottish Hospital Technical Note 3'*) and therefore not set out in this report.

All staff have a responsibility to ensure that waste enters the correct disposal stream. They therefore need to be aware that any misuse of the system could lead to an increase in the hazards and risks associated with clinical waste. If such

misuse constitutes a breach of the 'duty of care', it may result in legal action including prosecution. It is therefore vital that trust management have:

- safe systems that offer demonstrable value for money with minimal environmental impact
- robust procedures and monitoring/reporting arrangements for ensuring that waste management policies are adhered to
- contingency plans for ensuring prompt and effective action when things go wrong.

As part of this study local auditors reviewed the procedures in place at 21 trusts (out of 47). In the vast majority of cases good safety procedures were in place and were followed. There were, however, areas where improvements could be made, and in two cases there was evidence that trusts did not dispose of clinical waste in full compliance with the 'duty of care' regulations (Exhibit 1).

Exhibit 1: Examples of poor disposal

At one trust auditors found that waste management policy and procedures did not define 'duty of care' requirements and it was unclear who, if anyone, had responsibility for monitoring adherence to procedures. More specifically, some drivers and domestic staff had received no information, and in some cases no training, on the duties relating to the disposal of clinical waste. During a site visit to one of the trust's large hospitals the auditor noted examples of:

- insecure bins, near to ward areas, with unhindered patient/public access
- bins showing signs of spilled clinical waste which had not been cleaned for some time.

At a second trust the auditor found cases of the trust receiving waste from a neighbouring trust without any formal transfer agreement. This had apparently occurred because the trusts used the same portering contractor. While the waste was subsequently disposed of properly, there had been a breakdown in control. This breakdown in control raises legal and safety issues; because the waste content was unknown and there had been a break in controls between origin and final disposal, the trust could not demonstrate it had met its duty of care. It also means that the trust was incurring disposal costs for waste originating elsewhere.

Other examples of poor practice observed during our study include:

- poor procedures for tagging waste bags, and poor compliance with written procedures
- staff faced with segregation problems at two trusts, where it was reported that black bags had been unavailable
- contrary to trust policy, some waste-carrying vehicles did not carry 'spillage kits'
- storage areas not secured and lacking wash down facilities
- rubbish in hospital corridors
- inadequate domestic waste uplifts.

However, most trusts have in place good procedures that are followed by staff; the failures above are exceptions. They have been reported to local trust management, and action plans have been agreed to prevent recurrences. These will be followed up by local auditors.

As an indication of how trusts are addressing different safety issues we have highlighted the following examples of the types of good practice reported by local auditors:

- There is always some risk to staff who handle 'sharps' and it is good practice for all injuries to be recorded along with details of subsequent action taken to prevent/minimise the risk of similar accidents. One trust extended this good practice to include 'near misses' which were reviewed by the infection control officer to ensure there were no gaps in staff training or procedures.
- Trusts' policies should detail the methods for disposing of waste and how various wastes should be packaged. These issues are well documented in the model Operational Policy, which also sets out how wards and departments should use clinical waste bag tag identifiers. In order to ensure that safety and legislation requirements are met (and that practical arrangements do not become compromised), several trusts issue clear instructions that waste not packaged in accordance with trust policy will not be uplifted by portering or other facilities staff.
- Most trusts:
 - include waste management issues in all appropriate induction and staff training programmes.
 - pay close attention to safety and security (eg. use of secure lockable trolleys and positioning of sharps boxes to minimise risk of injury).
- Other safety good practice covers issues as such single handling systems, with waste bags securely tied and tagged at point of origin and placed in a secure wheeled bin at collection points without need for further handling; the wheeled bin is used to transport waste through the hospital. This system reduces labour and, more importantly, improves safety by reducing the risks of spillage and injury. If waste is held prior to removal it should be held securely in facilities which are regularly cleaned and maintained – these should be supervised controlled areas to which there is no public access.

While trusts generally have good safety procedures in place, new regulations and the natural turnover of staff mean that safety is an area which needs regular review. This requirement is embodied in the good waste management principles.

From 1 January 2002 trusts will need to use rigid packaging for infectious waste transported by road. It is expected that the continued use of yellow bags from wards etc, will be allowed but they will have to be transported in approved Intermediate Bulk Carriers. Trusts, therefore, should be determining with some urgency the types and availability of containers needed to satisfy future requirements. Current indications are that some types of containers may prove to be very expensive, especially if they can only be used once or if the container is disposed of along with the waste, which will greatly increase the weight charged for. Trusts should consider negotiating with suppliers and working with Scottish Healthcare Supplies to explore a variety of options including multi-use containers and recycling.

The collaboration shown in the work of the Clinical Waste Steering Group and the creation of a contract covering 22 trusts and two island health boards is a significant achievement. The group is well placed to encourage trusts' focus on waste management in general and on specific issues such as the effects of

changes in legislation, recycling and major purchasing arrangements. The possibility of the Clinical Waste Steering Group and the Property and Environment Forum Executive working in conjunction with Scottish Healthcare Supplies to maximise bulk purchasing arrangements for containers, bags etc, should also be pursued.

Training

Staff must be provided with appropriate training if high standards of safety are to be achieved and maintained. Three key documents provide advice on staff training:

- *'Scottish Hospital Technical Note 3'* sets out relevant legislation, good waste management practice along with the necessary safety and training requirements. The document also reflects the *'National Waste Strategy for Scotland'*².
- The Management Executive emphasised safety and training in setting out the Health Department's *'Environmental Management Policy'*³. References to clinical waste included guidance that trusts should adopt best practice for the safe handling of waste and that staff should be adequately motivated and trained.
- *'Safe Disposal of Clinical Waste'*⁴.

While waste management is not a major activity in terms of expenditure it should be a high priority. Managed badly, infection and other safety issues can affect the health of both patients and staff. Training and instruction should be designed to ensure that all staff are aware of:

- what is expected of them
- where to get advice and help
- requirements for their own safety, and that of their colleagues and of the environment
- the cost and environmental advantages to be gained from good segregation.

Managers should ensure that there is appropriate provision of training and information to motivate staff towards good waste management practice. It is quite common for hospital waste to be handled and dealt with by contractors' staff, and in these circumstances trusts need to work closely with contractors to ensure that their staff also undergo all necessary training. Trusts should ensure that they have a performance monitoring system that identifies and investigates any incident resulting from a gap in training or a breakdown in agreed waste management procedures. The requirements of legislation, and the 'duty of care' requirements in particular, mean that there should be robust procedures to ensure that staff take all reasonable measures to manage and dispose of waste properly.

Generally, auditors found that staff training to ensure high safety standards was good, and our findings on matters of safety, including segregation, handling and storage, suggest that in most cases training is proving to be effective. A number of issues were raised at individual trusts; none of these was of great importance but they do act as a reminder that waste management training needs to be kept under review because of its potential impact on patient, staff and public safety.

² Scottish Environment Protection Agency, 1999

³ NHS MEL(1999)61

⁴ Health and Safety Commission, 1999

Environmental issues

There have been many changes over recent years in the legislation and rules governing waste disposal. These changes have in the main been introduced for environmental and safety reasons. World, European, national and local interest in environmental issues continues to increase. The government has a policy to address various aspects of global environmental, economic and social concerns according to the principles agreed at the Rio 'earth summit' of 1992 and the Kyoto conference of 1997.

Landfill tax (currently £11 per tonne) is one of the measures aimed at reducing the dependence on landfill for waste management, which is particularly strong in Scotland. This use of natural resources is not sustainable. Landfill tax will continue to increase at £1 per tonne per annum for the next five years; greater increases may be applied in future with further pressure to ensure that actions to reduce and recycle waste are effective and to move towards the principle that the polluter pays.

As part of its policy towards managing waste in more environmentally sustainable ways, the government has also introduced targets for local councils on recycling household waste. At present NHS trusts in Scotland undertake little recycling. There are three basic reasons for this:

1. lack of a sustainable market:
 - re-use and recycling will only be viable if suitably segregated waste can be turned into a product for which there is a continuing market
2. the economic argument:
 - the income from recycling has tended to be low and, perhaps more importantly, fluctuates considerably. The fluctuation can be so great that a contractor no longer finds it economic to collect waste for recycling and so withdraws the service
3. logistics such as:
 - arranging reliable contracts; this can be difficult due to a lack of contractors, particularly when prices are low
 - establishing a system:
 - training staff
 - finding sites for the additional receptacles required at convenient locations for staff to segregate paper, cans, bottles etc, without interfering with the smooth running of the hospital
 - finding central storage sites for each type of waste being recycled.

The savings achieved by recycling will become greater as the cost of domestic waste disposal increases. It is therefore likely that the economics of recycling will improve, making it easier to balance the costs of setting up and running a recycling system with the cost savings from less disposal. As disposal becomes more costly, and local councils take steps to ensure recycling is effective in their area in order to meet the government's targets, NHS trusts should find it easier to establish a reliable contract, either with the council or a private contractor. They will still, however, need to address the problems of establishing a robust local system to support recycling.

NHS trusts need to consider and discuss recycling in partnership with their local councils. The Clinical Waste Steering Group could provide a focus by disseminating good practice information (on training issues as well as contracts with councils and private contractors) to trusts and by taking a lead in establishing pilot sites.

Exhibit 2: Good practice in recycling domestic waste

In 1995 Derriford hospital, Plymouth had about 800 beds. It produced a little under 50 tonnes of household waste and almost 40 tonnes of clinical waste per month. A recycling initiative started in 1995 and increased the amount recycled, and halved the cost of household waste disposal.

The hospital formed a partnership with Devon Waste Management (part of Devon County Council). The council supplies and collects bottle banks and containers for glass and cardboard free of charge.

Over the next 12 months the hospital developed recycling for newspapers, metal and plastic. By the end of 12 months the recycled materials were over 25% of total weight and 60% of total volume.

Source: Audit Commission

With the rising cost of landfill, and increasing government and public conviction that all organisations have environmental responsibilities, trusts should now be taking action to establish how best to maximise waste recycling.

Recommendations

All trusts should have robust, formal monitoring and training procedures in place to ensure that waste management continues to incorporate high safety standards.

The training provided should be reviewed to ensure that it remains appropriate to changing legislation and continues to cater for new staff and working arrangements.

Trusts should review how recycling could be improved. They should consider how they might work with councils to recycle domestic waste. The Clinical Waste Steering Group and the Property and Environment Forum provide trusts with the opportunity to share experience and good practice and should take the lead in establishing pilot sites.

The Clinical Waste Steering Group should act as a focus for establishing the alternatives and best types of container to purchase to comply with the introduction of UN type approved rigid containers.

3 Costs

The total cost of disposing of hospital waste in Scotland was about £8 million in 1998/99. Of this clinical waste accounted for more than £6 million; most of the remainder related to domestic waste.

There are two potential ways of reducing the costs of disposing of waste:

- reducing the unit cost
- improving segregation, so that the quantity of waste requiring specialist treatment and disposal as clinical waste is minimised.

There is a range of different disposal arrangements in place across Scotland. The trusts in Greater Glasgow began working collaboratively in 1995 and have agreed a consortium contract which runs until 2005. In 1999, 22 trusts (out of 28) and two island boards entered into a ten-year consortium contract arrangement which is expected to reduce their annual clinical waste disposal costs by over £625,000. Although the contract will produce savings there is scope for trusts to consider further ways of reducing costs through reclassification, improved segregation and more effective transport arrangements. The two trusts in the Borders and Orkney Health Board have their own in-house facilities.

Both the main contracts are for ten years. There is a balance to be struck between awarding long-term and short-term contracts. The former provides a long enough contract for it to be worth the investment needed by the potential contractors to service the contract and guarantees a given price. A short-term contract will mean that the contractor's set-up costs must be recovered over a shorter period but flexibility is provided to enable trusts to relatively quickly take account of any favourable changes in the market. These considerations were debated and taken into account when determining the length of the current contracts.

Given the long-term nature of these contracts our study looked at the second aspect of cost ie, the amount of waste classified as clinical waste. There are two possible ways in which the amount of clinical waste might be reduced:

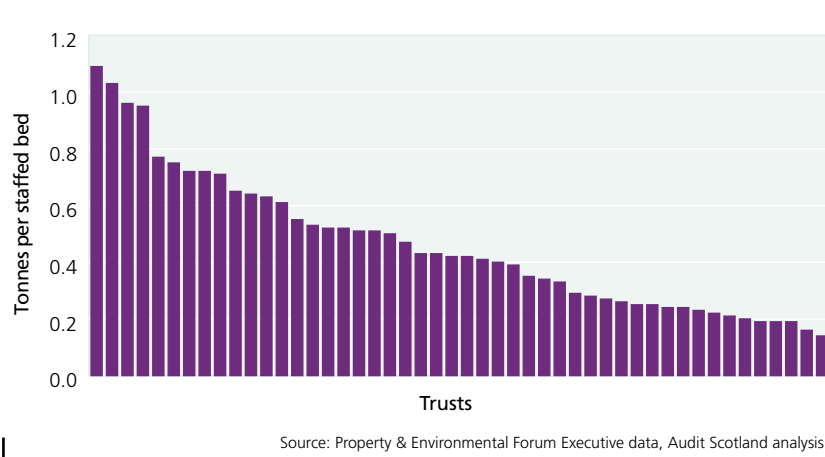
- better segregation of domestic waste from clinical waste
- reclassification of some clinical waste as domestic waste.

Segregation

Waste classified as clinical waste has to be specially treated to ensure that it is safe when it is finally disposed of. The treatment is expensive, and accounts for the difference between clinical and domestic waste disposal unit costs; on average clinical waste costs approximately £300 more per tonne than domestic waste. This means that for every tonne of clinical waste that can be safely reclassified as domestic waste, about £300 can be saved and made available for patient care.

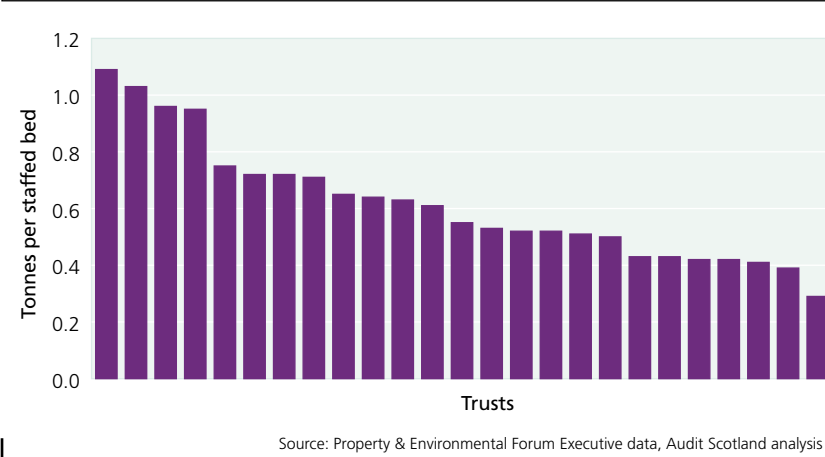
The volume per head of population of waste classified as clinical waste is higher in Scotland (and elsewhere in the UK) than in some other European countries⁵. The amount of waste disposed of as clinical waste by individual trusts varies considerably (see Exhibit 3). For 1998/99 the calculated range was 0.14 to 1.09 tonnes per staffed bed.

Exhibit 3: Clinical waste per staffed bed 1998/99



Acute hospitals generate more clinical waste (on average) than non-acute hospitals. Therefore we have shown acute trusts separately in Exhibit 4, but even within this group there is a greater than three-fold variation in the amount of clinical waste produced for each staffed bed. And there is no apparent relationship between size or type (eg, teaching/non-teaching, with or without maternity services) of trust and waste produced per staffed bed.

Exhibit 4: Acute trusts: clinical waste per staffed bed 1998/99



⁵ Scottish Technical Note 3 (SHTN3), 'Management and Disposal of Clinical Waste' compiled by the NHS in Scotland Property and Environment Forum Executive.

Some of the variation indicated in Exhibits 3 and 4 will be due to reasons over which waste managers have no influence, such as the needs of patients being treated. However, the level of segregation has a major impact and even those hospitals with comparatively low levels of clinical waste per bed may be able to further improve their segregation.

If all acute trusts achieved the tonnes per staffed bed currently achieved by those acute trusts at the bottom of the 1st quartile, then £980,000 would be saved. Including community trusts increases the likely savings from better segregation to over £1 million.

There are two main factors which contribute to the current poor performance in segregation. One is an over-cautious approach to risk management. At the time of our review two of the 21 trusts audited had a policy that clinical and domestic wastes were not segregated at wards and other clinical areas; instead all waste is treated as clinical waste. These policies were introduced in response to concerns about the risk that clinical waste could be disposed of incorrectly as domestic waste; in one case the trust had faced the threat of prosecution for wrongly disposing of clinical waste in domestic waste sacks.

These policies are exceptional; most trusts across the United Kingdom segregate clinical waste. Segregation of waste streams is also one of the main principles set out in SEPA's *'National Waste Strategy for Scotland'*. We believe that a non-segregation policy is over-cautious, and that to put ward waste such as old flowers or newspapers into clinical waste bags and pay an additional £300 per tonne for its disposal is unjustifiable. Safe segregation requires that staff are adequately trained, but it should be achievable by all trusts.

The two trusts with a policy not to segregate are among the first four trusts highlighted in Exhibit 2. The estimated saving from better segregation for these two trusts alone is over £350,000. The other two in the top four were not audited and therefore their policy is not known.

The other main reason for a high ratio of clinical to domestic waste is poor segregation of waste in practice. In these cases the trust's policy is to segregate waste, but staff are not adhering to it. The main reasons for poor segregation in practice are:

- lack of importance given to segregation by management
- poor practical arrangements for segregation
- no domestic waste bins in wards
- poor positioning of waste bins
- poor training of staff
- poor management information and monitoring.

Exhibit 5: Good practice in segregation

In 1998/99 Grampian Healthcare NHS Trust was among the NHSIS Greencode award winners for environmental benefits realised by good segregation. As a result of a more active approach to segregation, the trust reduced the amount of waste classified as clinical waste by 23% over a period of two years. This significant improvement was achieved through:

- the provision of good management information on costs, production levels and origin of waste
- raising staff awareness of the importance of good waste management
- introducing and maintaining clear advice to staff on measures aimed at eliminating poor segregation.

Similar results are reported as being realised by some other northern trusts.

The Audit Commission quoted examples from England of dramatic falls in the amount of clinical waste produced following intervention and monitoring by management. For one large trust:

- a random sample of sealed clinical waste bags was reopened and their contents reclassified into domestic and clinical waste according to agreed criteria. (This should only be undertaken by staff who are properly trained and suitably protected. It is, however, a useful check to identify instances of poor segregation).
- an educational programme provided for all appropriate staff
- clear segregation policies were announced and displayed throughout wards and selected areas. This action resulted in clinical waste disposal costs being reduced by £150,000 per annum.

Classification of sanpro waste

Clinical waste includes 'sanpro' waste, that is items used to dispose of urine, faeces and other bodily secretions or excretions but which do not contain identifiable human tissue and blood. Sanpro waste products may be classified domestic or clinical depending upon their origin. Sanpro waste generated in nursing or residential homes is treated as domestic waste. All hospital sanpro waste is currently treated as clinical waste.

There has been much debate about whether sanpro waste from hospitals, which in many cases will carry no more risk than similar waste produced elsewhere, should be treated as clinical or domestic waste. The current guidance from SEPA and the Health and Safety Executive is that if risk assessment identifies an infection risk during the handling and final disposal processes, then all such waste shall be treated as clinical waste. Effective risk assessments and robust controls to ensure strict segregation would allow trusts to dispose of significant amounts of sanpro in the same way as domestic waste.

The '*National Waste Strategy for Scotland*' promotes segregation (to ensure that the amount of waste treated as clinical waste is kept to a minimum) within an active approach to risk management. If a formal risk assessment demonstrates that there is no infection risk, then such waste need not be classified as clinical waste and may be disposed of safely in other ways. Most of the sanpro waste produced by primary care trusts and much of that produced at acute trusts is likely to be risk free, although '*Scottish Hospital Technical Note 3*' emphasises that the waste is of an offensive nature and adequate handling and disposal arrangements are needed.

Trusts should undertake such risk assessments, which could result in substantially reduced costs if sanpro were to be disposed of as domestic waste given the amounts and disposal costs involved. Consultants in Public Health Medicine are able to provide assistance with the guidance on undertaking risk assessments and risk assessment is covered in 'Scottish Hospital Technical Note 3'.

There is currently very little information on the amount of sanpro waste produced. However, 1997/98 estimates prepared by the Property and Environment Forum Executive indicated that sanpro accounted for some 40% to 50% of acute trusts' clinical waste, while for community trusts the figure was between 80% and 90%. This suggests that the NHS in Scotland currently produces over 9,000 tonnes of sanpro disposed of as clinical waste, at a cost of over £3.5 million.

There is the potential for substantial savings if significant amounts of sanpro waste were to be assessed as low risk and reclassified and disposed of as domestic waste. Exhibit 6 below shows the estimated savings available based on 1998/99 figures, splitting the savings between acute, mixed and community trusts. Whilst these figures are based on trusts before reconfiguration there is no reason to believe that reconfiguration would impact on the levels of potential savings.

Exhibit 6: Potential savings from reclassification of sanpro (see Appendix 1)

	Community trusts	Acute and mixed trusts		Total
Basis 1				
Savings based on 80% of clinical waste being sanpro	£1,016,000			
Savings based on 40% of clinical waste being sanpro		£1,345,000		
				£2,361,000
Basis 2	Community	Mixed	Acute	Total
Savings based on 80% sanpro if all trusts attained the low tonnages of clinical waste per staff bed that the community trust producing least clinical waste per bed achieves	£610,000			
Savings based on 40% sanpro if all trusts attained the low tonnages of clinical waste per staff bed that the trust of their type producing least clinical waste per bed achieves		£91,000	£653,000	
				£1,354,000

Based on saving £300 for every tonne reclassified as domestic waste. 80% and 40% based on the lower estimates of the Property and Environmental Forum Executive.

Better information is needed on the amounts of sanpro produced. All trusts should establish the levels of sanpro and other clinical waste generated as part of their waste management strategy; this can be used to carry out robust risk assessments so that the health and safety of patients, staff and the public are safeguarded and the potential savings can be calculated accurately. Risk assessments need to be repeated regularly, since they need to take account of the actual waste under consideration which is likely to be affected by changes in the patterns of patient care provided.

The estimated total savings from reclassifying sanpro range from £1.3 million to £2.3 million. The savings at primary care trusts are likely to be easiest to achieve, since the waste is likely to be in the same low risk category as that produced by residential and nursing homes; estimated savings at these trusts are between £610,000 and £1,016,000. These trusts could collaborate on a pilot study, agreeing that two or three would undergo a formal risk assessment. If the results confirm that significant amounts of sanpro pose no risk, and that significant savings are available, then consideration should be given to rolling out the approach to all primary care trusts and undertaking pilot risk assessments at acute trusts. It is important to ensure that the pilot process includes provision for testing both the adequacy of segregation procedures and staff training requirements.

Recommendations

While recognising that the potential savings in this section are based on estimates, we believe the estimated savings are significant and would therefore recommend the following actions.

Trusts should:

- *have clear segregation policies as regards clinical and domestic waste; not the avoidance of segregation because of possible risk but a considered approach which takes account of risks and of the costs and benefits of segregation*
- *review where domestic and clinical waste bags are located on wards etc, to ensure separation is encouraged*
- *raise staff awareness of the importance of good waste management by:*
 - *providing training, and refresher training, to all staff involved in waste collection and disposal*
 - *ensuring all staff are aware of the segregation policy and what should be treated as clinical and domestic waste respectively*
 - *informing staff of the cost implications of poor segregation*
 - *use of posters, wall charts and notices*
- *ensure good management information is collected and used to monitor performance (see next section)*
- *compare hospitals and trusts performance with other trusts*
- *undertake a formal risk assessment at a couple of primary care trusts to establish whether sanpro waste from certain hospitals could be treated as domestic waste*
- *establish how much sanpro waste they currently generate*
- *if pilot assessments conclude there is no risk and appropriate segregation procedures are approved consider rolling out assessments to all primary care trusts, followed up with pilot risk assessments at acute trusts*
- *ensure the results of pilot risk analysis are made widely known along with an explanation of why the treatment is different, or the same as, sanpro waste from nursing and residential homes.*

We recommend that trusts work collectively through the Clinical Waste Steering Group and the Property and Environment Forum Executive to implement the above recommendations.

4 Management information and monitoring

The management information required to monitor waste is not complex. At a basic level the information required to provide useful control and monitoring information should be readily available. In some instances the information is already being used for basic financial control purposes.

The following information should be used as the basis for simple monitoring:

- the amount of clinical waste generated/uplifted by the contractor
- the amount of clinical waste charged for by the contractor
- the cost of disposing of clinical waste; analysed by: disposal treatment, transport, cost of containers etc
- the amount of domestic waste generated/uplifted by the contractor
- the amount of domestic waste charged for by the contractor
- confirmation on completeness, including the nature and location of final disposal
- the cost of disposing of domestic waste, including disposal costs, landfill tax, transport cost of bags etc
- the number of staffed beds.

This basic information will allow a trust to confirm that charges relate to the amount uplifted, that costs are staying within budget and to identify any unusual trends in waste production. It is a simple matter to monitor the relationship between clinical and domestic waste and so spot if the ratio between them is changing (it will be necessary to ensure that any such change is not due to changing clinical practices, case mix, etc). This together with the tonnes of clinical waste per staffed bed will provide indicators of whether and where segregation can be improved.

Comparison between trusts may then be made in terms of clinical waste per bed, the ratio of clinical to domestic waste and disposal costs per tonne and a comparison of the main elements which make up these figures. The Scottish Property and Environment Forum Executive could undertake benchmarking of this kind with the analysis being supplied back to the trusts and to the Clinical Waste Steering Group.

The potential benefits from good basic management include:

- better financial control
- reduced costs resulting from improved segregation
- identification of higher than expected cost areas/higher than expected waste producers.

In addition to the above monitoring there should be regular review of staff training, waste management procedures and incidents such as needle stick injuries. This type of safety monitoring along with the weight and cost monitoring above will help to:

- provide assurance of compliance with changing legislation
- reduce staff injury/infection risks and hence compensation claims
- raise the trusts' safety and environmental profile.

Our study of a sample of trusts found considerable variation in the standard of management information and monitoring. In some trusts there is a good standard of basic information and monitoring of the type described above. However, we also found a number of trusts that had basic invoice data in the finance department giving weights and costs but no use was made of this data to assist in providing management information for monitoring purposes. There was no evidence of trusts producing or monitoring data on origin of clinical waste by site, ward, department etc, even on a periodic basis.

Information on domestic waste proved difficult to obtain and many trusts had only limited details available. Domestic waste is often charged for by uplift rather than weight. However, even in these circumstances trusts should be able to produce basic data as it should be relatively easy to estimate weights uplifted simply by weighing a sample of bags and then establishing the number of bags uplifted.

In addition to management information there is a more basic need for information for financial control purposes. The audit of a sample of trusts revealed that many did not record the weight of clinical waste uplifted (as opposed to invoiced). Many did undertake periodic checks by ensuring the contractors vehicle was weighed at a weighbridge but some do not undertake any check. This lack of checking leaves the trust open to overcharging but also it is unclear if the trust is discharging its duty of care if it is unaware of how much waste it has sent for disposal.

Recommendations

The basic management information described in this section should be collected by all trusts.

The basic monitoring, analysis and comparison described in this section should be undertaken by all trusts.

Trusts should conduct periodic reviews of the amounts of waste coming from different sources, such as sites, wards, departments and use this information to focus on higher than expected producers and those areas where waste production has increased.

Trusts should review their controls both in relation to their duty of care and their basic financial control over clinical waste.

5 Summary of recommendations

Safety, training and environmental issues

All trusts should have robust, formal monitoring and training procedures in place to ensure that waste management continues to incorporate high safety standards.

The training provided should be reviewed to ensure that it remains appropriate to changing legislation and continues to cater for new staff and working arrangements.

Trusts should review how recycling could be improved. They should consider how they might work with councils to recycle domestic waste. The Clinical Waste Steering Group and the Property and Environment Forum Executive should provide trusts with the opportunity to share experience and good practice and could take the lead in establishing pilot sites.

The Clinical Waste Steering Group should act as a focus for establishing the alternatives and best types of container to purchase to comply with the introduction of UN type approved rigid containers.

Costs

While recognising that the potential savings in this section are based on estimates we believe the estimated savings are significant and therefore recommend the following actions.

Trusts should:

- have clear segregation policies; not the avoidance of segregation because of possible risk but a considered approach which takes account of risks and of the costs and benefits of segregation
- review where domestic and clinical waste bags are located on wards etc, to ensure separation is encouraged
- raise staff awareness of the importance of good waste management by:
 - providing training, and refresher training, to all staff involved in waste collection and disposal
 - ensuring all staff are aware of the segregation policy and what should be treated as clinical and domestic waste respectively
 - informing staff of the cost implications of poor segregation
 - use of posters, wall charts and notices
- ensure good management information is collected and used to monitor performance
- compare hospitals and trusts performance with other trusts
- pilot formal risk assessments at a couple of primary care trusts to establish whether sanpro waste from certain hospitals could be treated as domestic waste

- establish how much sanpro waste they currently generate
- if pilot assessments conclude there is no risk, consider rolling out assessments to all primary care trusts and undertaking pilot formal risk assessments at acute trusts
- ensure the results of any risk analysis are made widely known along with an explanation of why the treatment is different, or the same as, sanpro waste from nursing and residential homes.

We recommend that trusts work collectively through the Clinical Waste Steering Group and the Property and Environment Forum Executive to implement the above recommendations.

Management information and monitoring

The basic management data described below should be collected by all trusts. The management information required to monitor waste is not complex. At a basic level the following data will provide useful control and monitoring information:

- the amount of clinical waste generated/uplifted by the contractor
- the amount of clinical waste charged for by the contractor
- the cost of disposing of clinical waste; including packaging, transporting, treatment and final disposal
- the amount of domestic waste generated/uplifted by the contractor
- the amount of domestic waste charged for by the contractor
- the cost of disposing of domestic waste, including disposal costs, landfill tax, transport cost of bags etc
- the number of staffed beds.

The basic monitoring, analysis and comparison described below should be undertaken by all trusts:

- ensure the amounts charged for are the same as the amounts uplifted
- ensure that costs are staying within budget
- monitor any unusual trends in waste production
- monitor the relationship between clinical and domestic waste and so spot if the ratio between them changing. This together with the tonnes of clinical waste per staffed bed will provide indicators of whether segregation can be improved
- compare performance with other trusts in terms of both clinical waste per bed and also the ratio of clinical to domestic waste
- compare performance with other trusts in relation to costs per tonne.

The above monitoring should be easy to put in place as the information in most instances should be readily available and already be being used for basic financial control purposes.

Trusts should conduct periodic reviews of the amounts of waste coming from different sources, such as sites, wards, departments and use this information to focus on high producers and those areas where waste production has increased.

Trusts should review their controls, both in relation to their duty of care and their basic financial control, over clinical waste.

Appendix 1: Calculation of potential sanpro savings

Our approach to calculating the estimated savings in Exhibit 6 was consistent in that we wished to avoid overstating the potential. For example, when applying the percentages (ie, sanpro waste of all clinical waste) we used the bottom of the ranges (ie, 80% for community trusts and 40% for acute trusts). Therefore the community trusts' figure of £1,016,000 is based on the consideration that 80% of the clinical waste produced could be disposed of as domestic waste at a saving of £300 per tonne (ie, 80% x 4,236 tonnes x £300). Similar calculations were undertaken for mixed and acute trusts.

The savings calculated in section B of Exhibit 6 do not take account of the possible potential savings from segregation if all trusts achieved the production rates of the lowest. In the case of community trusts these rates for 1998/99 ranged from 0.16 to 0.77 tonnes per staffed bed. We calculated the Exhibit 6 (B) estimated savings on the basis of all community trusts achieving 0.16 tonnes per bed; deeming that savings needed to reduce to this figure might be as achievable by improved segregation. In so doing we have taken the most conservative estimate and avoided any the risk of double counting potential savings. The figure of £610,000 for community trusts is the estimated savings if 15,899 staffed beds each produced 0.16 tonnes of clinical waste of which 80% is sanpro and could therefore be disposed of as domestic waste at a savings of £300 per tonne (ie, 15,899 x 0.16 x 80% x £300). Estimates for mixed and acute trusts were calculated on a similar basis. **Calculation details are as follows:**

Trust type 1.	Clinical waste produced (tonnes) 2.	Staffed beds 3.	Best reported rate (tonnes/staffed bed) 4.	Average savings in disposal costs per tonne (clinical less domestic) 5.	Estimated savings 6.
Basis 1					
Community: On basis that sanpro is 80% of clinical waste	4,236			£300	Col 1 % x col 2 x col 5 = £1,016,000
Acute and Mixed: On basis that sanpro is 40% of clinical waste	11,213			£300	Col 1 % x col 2 x col 5 = £1,345,000
Total basis 1					£2,361,000
Basis 2					
Community: Based on all trusts achieving best reported tonnes per staffed bed and sanpro being 80% of clinical waste		15,899	0.16	£300	Col 1 % x col 3 x col 4 x col 5 = £610,000
Mixed: Based on all trusts achieving best reported tonnes per staffed bed and sanpro being 40% of clinical waste		5,418	0.14	£300	Col 1 % x col 3 x col 4 x col 5 = £91,000
Acute: Based on all trusts achieving best reported tonnes per staffed bed and sanpro being 40% of clinical waste		13,972	0.39	£300	Col 1 % x col 3 x col 4 x col 5 = £653,000
Total basis 2					£1,354,000

Appendix 2: Glossary

Clinical Waste Steering Group	Set up in 1997 as the Clinical Waste Services Review Group. Membership includes representatives from trusts, Property and Environment Forum Executive and the Scottish Environment Protection Agency. The group's remit has evolved to cover the wider aspects of waste management such as compliance with legislation, operational policies, sharing of guidance and good practice, the use of performance indicators, etc.
Controlled waste	Defined by the Environmental Protection Act 1990 and the Controlled Waste Regulations 1992; includes domestic, commercial, industrial and special waste.
Duty of Care	Section 34 of the Environmental Protection Act 1990 imposes a duty of care on persons concerned with controlled waste. Basically, the duty applies to any person who produces, imports, carries, keeps, treats or disposes of controlled waste. Guidance is given in a Code of Practice published by HMSO 1996.
NHS in Scotland Property and Environment Forum Executive	Previously NHSIS Estates Environment Forum. In order to better reflect the national agenda and a wider remit the former executive committee became the Property and Environment Forum Board (P&EFB); and the Healthcare Engineering and Environment Unit became the Property and Environment Forum Executive (P&EFEx).
Sanpro waste	This includes any item of waste used for the collection or disposal of human excreta and secreta. It is excluded from the definition of clinical waste and is not considered dangerous for carriage. However, while infection risk is low, it should be recognised that items will often be of an offensive nature requiring adequate steps for handling and disposal arrangements.
Sharps	An item of clinical waste defined as type B (discarded syringes needles, broken glass, any other contaminated disposable sharp instrument or item). The handling and disposal of sharps create safety concerns to both users and disposers. Detailed guidance is set out in the ' <i>Model Waste Disposal Operational Policy</i> ' document (produced by the Clinical Waste Steering Group for incorporation in a revision to ' <i>Scottish Hospital Technical Note 3</i> ').
Single handling systems	The process by which clinical waste, once properly sealed and labelled at point of origin, is stored and transported in a manner so that it no longer comes into contact with people. The aim is to reduce the risks associated with multiple handling involving the repeated shifting of bags and containers.

Appendix 3: Advisory panel

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Mr M.J. Bews	Chief Executive Lomond & Argyll Primary Care NHS Trust
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