**Baling & Recycling Plastic Bottles and Cardboard**  
Renal Dialysis Centre, Newcastle upon Tyne Hospitals NHS Foundation Trust

**GGHH Agenda Goals**
- Recycling

**Hospital Goal**
Please state what Action Items the hospital hoped to accomplish. For example:
- Reduce waste costs
- Renal staff were keen to “do the right thing” environmentally
- Reduce environmental impact of renal care

**Progress Achieved**
- **Financial benefits** – over £7,000 ($10,000) saved in annual disposal costs
- **Environmental benefit** – over 90 tonnes of additional material recycled and almost 50 tonnes of CO₂e saved
- **Human health benefit** – more money generated for patient care (savings fed directly back to clinical budget), reduced harmful emissions associated with waste transport and disposal (better local air quality as a result)

![Graph 1: Impact of new baling and recycling investment at Freeman Hospital’s Renal Unit](image)
The Issue

The Renal Unit produces huge amounts of waste plastic and cardboard during its clinical activities. In order to recycle this waste the Trust installed two new pieces of equipment last year.

Valuable resources (card and plastic) were being disposed of as general waste at cost instead of being recycled with a rebate back to the Trust. It was estimated that over 10 tonnes of recyclable HDPE plastic was being disposed of in the general waste from the Renal Dialysis Unit at Freeman Hospital each year.

Renal Unit staff were keen to “do the right thing” environmentally as well as saving the Trust money. Project instigators had seen similar case studies on the green nephrology website and were keen to do this in our Trust.

A cardboard baler was installed to service the whole Freeman Hospital site in March 2011, which allowed the Renal Unit’s cardboard to be baled and recycled. In November 2011 a smaller twin baler was installed in the basement of the Institute of Transplantation to crush and bale the segregated 5L plastic bottles from each renal dialysis session.

Sustainability Strategy Implemented

Investing in this compaction equipment and segregating this waste for recycling helps reduce the environmental impact of kidney care. Recycling the 5L plastic renal dialysis bottles results in direct reductions in carbon dioxide equivalent emissions of 66kg CO2e. CO2e is the universal unit of measurement for the global warming potential of greenhouse gases. This is achieved by recycling the 5.11t of plastic instead of sending it to landfill. There are also direct reductions of 46,619kg (46.62 tonnes) CO2e achieved by baling and recycling the 87.63t of cardboard from the Freeman Hospital instead of sending it to landfill.

By segregating and recycling this material we are following the waste hierarchy set out in the Waste Regulations 2011, which states recycling is preferable to disposal. Recycling our plastic and cardboard allows them to be recycled into new products such as fleece jackets, plastic bags and new cardboard packaging. This reduces the need for virgin resources, such as plastic from oil (a non-renewable fossil fuel) and paper from trees to be used as raw materials for new products. Increasing the amount of waste we recycle helps to feed the circular economy by reusing our existing resources rather than extracting more from the earth. Unfortunately the benefits of this are hard to quantify, but we know that increasing the recycling of resources instead of just disposing of them makes sense.

An additional benefit of these projects is the compaction of this material using the equipment on hire. Cardboard boxes and 5L plastic bottles take up a huge amount of space if they are not compacted. If we stored and disposed of this material in its usual state we would require waste containers and vehicular transport over ten times the capacity and collection frequency. This is primarily due to the void space between the boxes and bottles. By compacting this material we virtually eliminate this void space. Again it is hard to quantify this benefit but this does save more CO2e emissions in large waste vehicle movements when compared to the small amount of electricity required to compact the waste on site. There is the additional benefit that the waste porters have reduced the number of trips required to transport this waste from inside the hospital out to the waste storage area.
The environmental savings stated in the previous section help the Trust to reduce its overall environmental impact, including its carbon footprint, allowing us to fulfil the aims set out in our Sustainability Strategy (publicly available via our website). Our Trust Annual Report includes details of our overall increase in recycling and reduction in waste related costs, but it doesn’t go into as much detail on the savings made by the Renal Unit. There may be scope to include case studies such as this each year to highlight good practice to our stakeholders.

Increasing the amount of waste recycled also reduces the amount of money spent on waste disposal. Despite the money invested in new compactors and balers these activities have still generated approximately £7,500 ($11,250) a year in savings. These savings are then reinvested into patient care either in form of new equipment or staff.

**Implementation process**

Resources: A Static Vertical Mill Sized Baler (MX600) on long term rental for all our cardboard. A twin chamber compact baler (Compact 75) on short term rental for bags of renal dialysis 5L plastic bottles.

Initial barriers included problems with siting the balers (health and safety rules, fire risk, electrical enabling works, delivery, access etc) and porter buy-in for carrying out the baling tasks. All barriers overcome through effective communication and options analysis. Beneficial drivers (cost and environmental savings) allowed us to convince all parties that it was the right thing to do. The barriers did place time delays on the project initiation but once approved and installed the successes have demonstrated it was worthwhile.

Sustained change has been maintained through positive reinforcement (telling staff and porters what we have saved so far by distributing graphs in our *Green News* and passing on information at team meetings) and regular visits by the Waste Officer to iron out any small issues. Problems that arose following implementation have mainly focused on contamination of the bottles resulting in residue on the baler (and difficult working conditions for the porters). This was overcome by showing renal staff the importance of rinsing and emptying all bottles before disposal. We also arranged a full service and clean of the twin baler and this issue hasn’t been raised since. To date there have been no issues with the cardboard baler.

We plan to continue with the dissemination of regular update graphs to staff (examples of which have been attached to this submission). This will hopefully help maintain the high levels of segregation and bottle rinsing by the unit staff. The Modern Matron for the unit has actually used this award submission to let staff know of our successes to date. We hope that this will not only help carry on the good work but also give staff the
confidence to suggest other ways of improving our environmental performance (as they can see that other suggestions have been taken seriously and acted upon). We want to be seen as a leading example of sustainable kidney care in our region and beyond.

**Tracking Progress**

Since the twin baler was installed in November 2011 we have recycled 5.11 tonnes of rinsed renal plastic bottles that previously would have been disposed of in the general waste. The renal unit has also been contributing its flattened cardboard to the main Freeman Hospital cardboard baler which has recycled 87.63 tonnes of cardboard so far. Unfortunately we are not able to break this down to the specific amount of cardboard produced by the Renal Unit as all areas of the hospital feed into the main cardboard baler.

**Challenges and lessons learned**

The plastic bottles are quite rigid and often return to shape after initial compaction due to the “memory” of the plastic. For this reason a twin baler was installed which allowed the porters to fill one side and leave the compactor down whilst the other side was filled. This period of 15-20 minutes removes the “memory” and makes for more compact bales of plastic bottles.

Another initial problem was renal unit staff not rinsing the acid concentrate bottles out effectively. This meant that a crusty residue formed on the baler and made it difficult to clean. After the renal staff were shown the problem they were more careful to rinse the bottles.

**Next Steps**

In order to further reduce the amount of waste produced by the renal unit they are trialing the use of lightweight LDPE plastic bags of acid concentrate rather than the rigid HDPE plastic bottles. This has the potential to reduce the weight of waste by an impressive 75% whilst having no impact on patient care and still allowing the waste to be recycled.

**Demographic information**

The Renal Unit at Freeman Hospital has 47 Haemodialysis Stations dialyzing and average of 260 patients a week. The unit carries out a total of 780 dialysis sessions each week (over 40,000 a year). The Freeman Hospital is part of The Newcastle upon Tyne Hospitals NHS Foundation Trust, one of the largest acute teaching hospital Trusts in the UK

(This is for internal use only, we won't publish it)
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Project Partners:
SITA UK (our general waste contractor) provided our mill-sized cardboard baler on a long-term fully maintained lease in March 2011, they also collect and give us a rebate for our baled cardboard and baled plastic bottles.
Local firm ATK Equipment provided our twin plastic bottle baler on a 2-year fully maintained lease in November 2011.
Project Instigators:
Dr Allison Brown (Consultant Nephrologist & Honorary Senior Clinical Lecturer) and Julia Harding (Modern Matron)

Project Facilitators:
James Dixon (Trust Waste Officer) and various waste porters from Freeman Hospital.

Quotes:
Quote from the National Green Nephrology Awards 2012 (where this case study was selected as the winning submission):

The UK Centre for Sustainable Healthcare, particularly Beverley Matthews (Director of NHS Kidney Care), Dr Andy Connor (Green Nephrology Fellow) and Chris Stait (UK kidney patient representative) “acknowledges with appreciation the outstanding contribution of The Newcastle upon Tyne Hospitals NHS Foundation Trust Baling & Recycling Project to improve the environmental sustainability of kidney care”. From the UK Green Nephrology Awards 2012 (26.09.12).

Notes
1. This is based on 21 kg CO2e per tonne of plastic recycled vs 34 kg CO2e per tonne of plastic sent to landfill (Annex 14, DEFRA 2012 Greenhouse Gas Conversion Factors for Company Reporting, available from: http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/)
2. This is based on 21 kg CO2e per tonne of cardboard recycled vs 553 kg CO2e per tonne of cardboard sent to landfill (Annex 14, DEFRA 2012 Greenhouse Gas Conversion Factors for Company Reporting, available from: http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/)