CENTRE for SUSTAINABLE HEALTHCARE

Green Nephrology

Green Nephrology (2009-10)
Summary Report

1. Introduction

In 2009, The Campaign for Greener Healthcare (CGH)[1] partnered with the Renal Association, the British Renal Society, Baxter Healthcare and the NHS Sustainable Development Unit to set up a Green Nephrology programme to support the transformation to sustainable kidney care. Following engagement of stakeholders at a Green Nephrology Summit (sponsored by Baxter Healthcare) in 2009, a key success of the past year has been the piloting of a Green Nephrology Fellowship (sponsored by NHS Kidney Care with contributions from the Association of Renal Industries), seconding a renal trainee to work full time on the programme within CGH. The Fellow has established a network of local representatives across the UK, who are now actively working to improve the sustainability of their kidney units. Case studies have been successful in transmitting good practice across the country – including initiation of new telephone follow up services for transplant patients.

Key Benefits

Green improvement projects have demonstrated significant financial as well as environmental savings. Furthermore, early exploration of alternative service models (including telemedicine and patient self-care) has indicated the potential for significant benefits to the quality of patient care.

Sustainable healthcare has proven to be a positive motivation for kidney care staff to engage in service improvement, with over 80% of kidney units now represented in the Green Nephrology network, while the Green Nephrology Fellowship has provided a valuable professional development opportunity in medical leadership and sustainable healthcare for a renal specialty trainee.

Summary

Working intensively in kidney care, the Green Nephrology programme has demonstrated a new approach to sustainable healthcare: creating a model of clinical transformation to inspire all clinical specialties. Leadership from kidney doctors is producing a cultural shift to include

[1] The Campaign for Greener Healthcare was re-launched in January 2011 as The Centre for Sustainable Healthcare

sustainability as an integral part of quality. Thanks to the partnership created between the clinicians, NHS management and industry, sustainable best practice is brought together to inform service redesign, commissioning and procurement, ensuring a far greater impact than could be made through a series of independent projects.

> *"Thanks to Green Nephrology, sustainability is now regarded as an integral part of quality. The work over the past year has caught the imagination of the whole kidney community and has launched a social movement to provide better, greener and leaner kidney care."*
>
> Dr. Donal O'Donoghue, National Clinical Director for Kidney Care

2. Background

Climate change has been identified as the greatest threat to global health in the 21st century (UCL/Lancet Commission, May 2009). International and national actions designed to limit the extent of climate change by reducing greenhouse gas emissions will impact significantly upon the provision of healthcare. The UK Climate Change Act of 2008 sets national carbon reduction targets of 34% by 2020, 64% by 2030 and 80% by 2050. These targets are mirrored in the NHS Carbon Reduction Strategy (www.sdu.nhs.uk, 2009), and NHS Trusts will be subject to the government's Carbon Reduction Commitment domestic carbon trading scheme from April 2011.

The NHS is responsible for 21 million tonnes of CO2 equivalents each year, around 25% of total public sector emissions. Kidney care contributes significantly to these emissions: a carbon footprint study carried out through this Fellowship suggests that, "just as kidney care is considered to be a 'high cost, low volume' specialty in financial terms, it seems likely that it is also a carbon intensive specialty when considered in terms of the numbers of patients treated with renal replacement therapy".

The NHS is currently facing a period of unprecedented financial challenge. Maintaining or improving current quality of care while substantially reducing both cost and carbon output will require the identification and widespread adoption of new models of care – including greater engagement of patients with kidney disease in their own care (identified by the Wanless report as critically important for reducing the rate of growth in the costs of NHS provision). A sustainability focus highlights opportunity areas for waste reduction in healthcare processes and has proven to be a positive motivation for kidney care staff to engage in service improvement.

3. Programme Design

With a small central resource, the Green Nephrology programme has produced a widespread impact in its first year. Key principles in the programme design have included:

Investing in People

- Creation of a "Green Nephrology Fellowship" for a renal trainee has ensured that the programme is led from within the kidney care community, while developing expertise in leadership for sustainable healthcare in a future consultant nephrologist.
- In turn, the Fellow's most important task has been the development of a network of local champions to lead change on the ground. The network has generated practical examples of sustainable care, increased local capability for service improvement and provided a vehicle for knowledge sharing.

Creating the context for change

- Endorsement from respected figures within the specialty has been crucial to Green Nephrology's visibility and public standing. This engagement of strategic partners was achieved through a multi-stakeholder Summit in 2009 and via ongoing participation on the Programme Board.
- The team has further worked to establish a peer-reviewed literature in sustainable kidney care, accessible via the online knowledge portal, www.sustainabilityforhealth.org.
- Next steps are to mainstream sustainable best practice via embedding in NHS reporting and commissioning standards for renal services.

Developing knowledge and resources

- Research projects and resource development have been selected for their value to empowering local champions in engaging colleagues and delivering local change.

4. Specific achievements in 2009-10

4.1 Local service improvement

- Identification of sustainability champions (Green Nephrology Local Representatives) in >80% of local renal services
- Design and implementation of an online baseline survey of sustainability in renal units; analysis and dissemination of results (publication of report in the *Journal of Renal Care*, and individualised slide sets sent to Local Representatives for

presentation to colleagues).

- Production of an online resource pack for local representatives: http://greenerhealthcare.org/green-nephrology-guide-local-representatives
- Development of a system for the collection of high quality case studies of environmental good practice within the provision of kidney care (accessible via an online database at: http://map.greenerhealthcare.org/green-nephrology-projects)
- Launch of "Green Stars" initiative to recognise green endeavours of local renal services (including visual map display, produced in collaboration with the Renal Registry)
- Population of the renal pages on SHEBA (sustainable health evidence base: www.sustainabilityforhealth.net/renal) to enhance access to published literature on sustainable kidney care
- Development (in collaboration with local units) of five sample case studies/ business cases for improvement:

  Case Study 1: Conserving water in haemodialysis (Ashford Dialysis Unit)

  - Implementation costs: £2,500
  - Savings per year: £10,558
  - ROI (5 years): 2112%
  - CO_2 savings per year: 750kg CO_2e

  Published: Toward Green Dialysis: A Case Study to Illustrate and Encourage the Salvage of Reject Water. Connor A, Milne S, Owen A, Boyle G, Mortimer F, Stevens PE. *Journal of Renal Care 2010;36(2),68-72*

  Case Study 2: Retrofit of heat exchangers to dialysis machines (East Kent Hospitals)

  - Implementation costs: £15,687
  - Savings per year: £3,998
  - ROI (5 years):127%
  - CO_2 savings per year: 22,603kg

  Presented in abstract form at the Renal Association May 2010: Heat exchangers in HD machines achieve significant environmental and cost savings. Campbell F, Milne S, Connor A, Stevens P.

  Case Study 3: Telephone clinics in follow up of renal transplant recipients (University Hospital of Coventry and Warwickshire)

  - Implementation costs: minimal
  - Savings per year: dependent on local tariff negotiations

- CO_2 savings per year: 2000kg.

Published: Saving Carbon and Time. The Follow Up of Renal Transplant Recipients by Telephone Consultation: Three Years Experience from a Single UK Renal Unit. Connor A, Mortimer F, Higgins R. *Accepted for publication in Clinical Medicine*

Case Study 4: Recycling: Use of Baling Machines to Compact Waste (Runcorn Road Dialysis Unit)

- Implementation costs: £4,087
- Savings per year: £4,150
- ROI (5 years): 322%
- CO_2 savings per year: 8,110kg CO_2e.

Published: Green Waste Management for Renal Medicine Units. Connor A, Thomson M, Mortimer F. *British Journal of Renal Medicine 2010;15(2):7-11.*

Case Study 5: Waste Reduction in Haemodiafiltration (Queen Margaret Hospital Renal Unit, Dunfermline)

- Implementation costs: £0
- Savings per year: £14,907
- CO2 savings per year (est.): 5,300kg CO2

Published (as above): Green Waste Management for Renal Medicine Units. Connor A, Thomson M, Mortimer F. *British Journal of Renal Medicine 2010;15(2):7-11.*

- Six additional case studies/posters generated through collaboration with Local Representatives and NHS Kidney Care, presented at the NHS Kidney Care Green Nephrology Reception (May 2010)

4.2 National service development

- Development of a carbon footprint for a local renal service in the UK.
  The decision was taken to analyse the carbon impact of Dorset renal service as a model for kidney care nationally, owing to the absence of national level data on procurement and travel associated with kidney services. Based on the findings, the study identified procurement (particularly of pharmaceuticals and clinical supplies) as responsible for 72% of greenhouse gas emissions from kidney care. This has been important in informing strategic priorities for carbon reduction. In addition, this study represents the first full carbon footprint of a clinical service and has established a methodology which may be applied in other clinical areas.

Published: The Carbon Footprint of a Renal Service in the United Kingdom. Connor A, Lillywhite R, Cooke MW. *Quarterly Journal of Medicine Advance Access published*

online on August 18, 2010

- Modelling of the carbon footprints of home and in-centre haemodialysis. Initial modelling of the carbon footprints of alternative modes of renal replacement therapy was undertaken to allow the implications of possible changes in patient flow and number on the carbon footprint to be modelled. Publication: The Carbon Footprints of Home and In-centre Maintenance Haemodialysis in the UK. Connor A, Lillywhite R, Cooke MW. *Accepted for publication by Kidney International.*
- Development of draft sustainability criteria for inclusion in procurement contracts for renal products, in consultation with the Association of Renal industries and Baxter Healthcare.
- Engagement of renal policy makers through their participation in the Project Board, and in the Green Nephrology Summit 2010.
- Inclusion of a sustainable commissioning presentation and workshop at the Green Nephrology Summit 2010.

4.3 Professional development of the Specialist Registrar Fellow

- The development of a sound understanding of environmental sustainability as relevant to kidney care; including the legal, financial and clinical aspects, and carbon management.
- The development of skills in systems improvement, healthcare management and leadership, sustainable procurement. Specific training/ experience provided:
    - Training in systems improvement: "A Systems Approach to Patient Safety" short course completed, University of Warwick
    - Training in project management: PRINCE 2 (Practitioner level) qualification obtained.
    - Completion of 2-week industry placement in Baxter Healthcare – including site visits to manufacturing plant and interviews with a range of senior staff.
    - Direct experience of medical leadership, including recruitment of local champions, written and spoken advocacy, development of metrics and tools, initiation of local improvement projects.
- The authoring of a range of papers relating to the sustainability of kidney care in peer-reviewed journals, including on the carbon footprint of kidney care (in the *Quarterly Journal of Medicine*) and on clinical transformation in Green Nephrology (in *Nephron Clinical Practice) – See Appendix 1: Publications list.*
- Attainment of a Masters degree (MD) from Warwick University (in progress)

- Presentation of key findings to kidney specific conferences as well as promoting the work being developed in kidney care to more generic audiences (presentations given to the British Renal Society / Renal Association annual conference, to senior groups including the Clinical Directors Forum and the Association of Renal Managers, and (by video recording) to the EDTNA/ERCA International Conference in September 2010.)

4.4 Professional development of wider staff in kidney care

- Individual and collective support provided to Green Nephrology Local Representatives in undertaking local change projects.
- Contributions to newsletters, journal articles and conferences *(see Appendix 1: Publications list)* to increase knowledge and awareness of sustainability as an issue in kidney care.
- Production of a Green Nephrology video, shown at the EDTNA/ERCA International Conference, and available via YouTube / CGH website / on DVD for use at local meetings.
- Contribution to two BMJ Learning (online) modules on climate change and health.

4.5 Additional Achievements

- Contribution of a case study on Green Nephrology to the *Marmot Review of Health Inequalities*.

5. Priorities for future work

In its first year, the Green Nephrology programme has demonstrated many potential benefits, including significant financial as well as environmental savings, benefits to patient experience and quality of care, and engagement of clinical staff in service improvement.

In order for these benefits to be realised, existing good practice must be mainstreamed, and the momentum of the programme maintained - to support innovation and continuous improvement.

5.1 Opportunities to support roll-out of existing good practice include:

- Support for Green Nephrology local representatives to successfully lead local change: understanding and responding to their needs. Opportunities identified by local reps at the Green Nephrology Summit 2010 workshop include:

- *Join up local representatives – via web, email (link individuals who have succeeded in green projects to others working on similar projects). Make communication two-way.*
- *Reduce exclusivity – more than one rep. per unit*
- *Smaller targets/actions – e.g. 10:10 Checklist*
- *More education / promotion*

*(*See *Appendix 2 – Green Nephrology Summit 2010 Report for Delegates)*

- Embedding levers for sustainable healthcare in external structures, e.g. Green Nephrology case studies on NHS Evidence, collection of comparative data on sustainability by the Renal Registry
- Inclusion in NHS commissioning contracts

5.2 Development areas:

- Procurement has been identified as responsible for 72% of carbon emissions from a local renal service. Future work will prioritise the reduction of supply chain emissions, for example through
  - Waste reduction in dialysis
  - Inclusion of sustainability criteria in renal procurement contracts
  - Partnership with suppliers to reduce environmental impacts of manufacture / encourage product innovation
- Early work has focussed on engaging members of the kidney community and identifying small-scale achievable goals. As momentum builds, Green Nephrology can have even greater impact by exploring whole-systems efficiencies and synergies with quality of care, e.g. through
  - disease prevention
  - patient empowerment
  - sustainability appraisal of clinical pathways/ service models
- Many lessons learned from Green Nephrology are applicable to other clinical services, while models of care from elsewhere could inform sustainable practices in kidney care. The Campaign for Greener Healthcare has developed a proposal for a collaborative sustainable specialties programme covering kidney care, cancer care, mental health services and occupational therapy

Dr. Frances Mortimer

Medical Director, Centre for Sustainable Healthcare

December 2010

Appendix 1 – Publication list, Green Nephrology Fellowship 2009-10

Appendix 2 – Green Nephrology Summit 2010 Report for Delegates

Appendix 1 – Publications List

Climate change and health: the role of the healthcare professional. John Somner, Frances Mortimer, **Andrew Connor**, Mark Thompson ***BMJ Learning***, published online November 2010. *Available at: http://learning.bmj.com/learning/search-result.html?&moduleId=10017515*

Climate change and health: the basics of climate science and the impacts of climate change. ***BMJ Learning***, John Somner, Frances Mortimer, **Andrew Connor**, Mark Thompson ***BMJ Learning***, published online November 2010. *Available at: http://learning.bmj.com/learning/search-result.html?&moduleId=10017629*

The Carbon Footprints of Home and In-centre Maintenance Haemodialysis in the UK. **Connor A**, Lillywhite R, Cooke MW. *Hemodialysis International (2011), doi: 10.1111/j.1542-4758.2010.00523.x*

The Carbon Footprint of a Renal Service in the United Kingdom. **Connor A**, Lillywhite R, Cooke MW. ***Quarterly Journal of Medicine*** *Advance Access published online on August 18, 2010*

Saving Carbon and Time. The Follow Up of Renal Transplant Recipients by Telephone Consultation: Three Years Experience from a Single UK Renal Unit. **Connor A**, Mortimer F, Higgins R. *Accepted for publication in* ***Clinical Medicine***

Green Waste Management for Renal Medicine Units. **Connor A**, Thomson M, Mortimer F. ***British Journal of Renal Medicine*** *2010;15(2):7-11.*

Eyes, economics and the environment - should green issues drive changes in ophthalmic care? Yes. Somner JEA, **Connor A**, Benjamin L. ***Eye (Lond)****. Eye (Lond). 2010 May 21. [Epub ahead of print]*

The Green Nephrology Survey of Sustainability in Renal Units in England, Scotland and Wales. Connor, A. and Mortimer, F. (2010). ***Journal of Renal Care***, 36: 153–160.

Heat exchangers in HD machines achieve significant environmental and cost savings. Campbell F, Milne S, **Connor A,** Stevens P. *Presented in abstract form at the Renal Association May 2010.*

Green Nephrology: Reducing kidney care's carbon footprint. **Connor A.** ***British Journal of Renal Medicine*** *2010;15(1)*

Toward Green Dialysis: A Case Study to Illustrate and Encourage the Salvage of Reject Water. **Connor A.** Milne S. Owen A. Boyle G. Mortimer F. Stevens PE. ***Journal of Renal Care*** *2010;36(2),68-72.*

Clinical Transformation – the Key to Green Nephrology. **Connor A**, Mortimer F, Tomson C. ***Nephron Clinical Practice*** *2010;116(3):201-206.*

Renal medicine can take the lead in greener healthcare. **Connor A**, Tomson C, Mortimer F. ***British Journal of Renal Medicine*** *2009/10;14(4):19-22.*