

Association of Surgeons of Great Britain and Ireland

CONSENSUS STATEMENT ON COST-EFFECTIVE SURGERY

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Association of Surgeons of Great Britain

in partnership with



Royal College of Surgeons in Ireland

CONSENSUS STATEMENT ON COST-EFFECTIVE AND SUSTAINABLE SURGERY

May 2012

Association of Surgeons of Great Britain and Ireland

CONSENSUS STATEMENT ON COST-EFFECTIVE SURGERY

FOREWORD

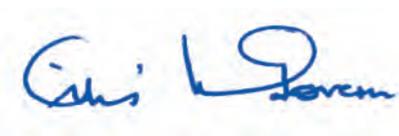
The worldwide economic downturn has resulted in contracting healthcare budgets, at a time of increasing demand for services due to demographic changes such as population expansion and an increasing proportion of elderly patients. As healthcare providers, we have to learn to deliver more with less, while preserving high-quality care and optimising patient safety.

At first glance, the relationship between surgical practice and climate change might not be obvious. However, there is now ample data to show that health service delivery is a major source of carbon pollution.

It is timely, therefore, for surgeons to consider how we might adapt our practice in a way which reduces the surgical carbon footprint and, at the same time, maximises cost-effectiveness.

The Royal College of Surgeons in Ireland was delighted to host the Association of Surgeons of Great Britain and Ireland's **Consensus Conference on Cost-Effective Surgery** in Dublin in November 2011, in the beautiful Georgian surroundings of the Boardroom of the College building in St Stephen's Green. This was the first time that a consensus meeting had been held here, and the scene was set by the first speaker, the leader of the Irish Green Party, whose impassioned delivery gave us an alternative view of the opportunities for change.

RCSI strongly supports the recommendations contained in this resulting Consensus Statement, and we hope that this initiative will stimulate debate, heighten awareness, and contribute to a culture change in modern surgical practice.



Eilis McGovern
President, RCSI



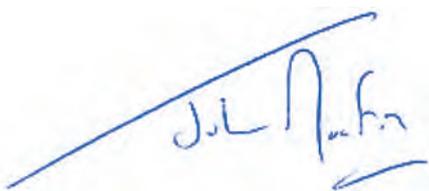
INTRODUCTION

The Association of Surgeons of Great Britain and Ireland embraces progress in surgery and service delivery, and recognises our responsibility to the environment. This one-day conference was an attempt to address the topic ‘reducing the surgeon’s carbon footprint’. We brought together a varied group of professionals whom we thought could make an important contribution to this debate. This included minimally invasive surgeons committed to technology, representatives from the NHS Sustainable Development Unit, politicians, members of the pharmaceutical industry and – last, but by no means least - surgeons with a green conscience. Our aim was to address some of the important topics, promote discussion and produce a document that would be a focus for on-going debate. As far as we are aware this is the first attempt by surgeons to collectively address the issue of environmental change.

This Statement is based on presentations delivered at a Consensus Conference held in Dublin, courtesy of the Royal College of Surgeons in Ireland, on Thursday 10th November 2011, discussions arising from them and the final interactive session. The Programme for the day can be viewed on-line at:

www.asgbi.org.uk/cost-effective-surgery

This final Statement includes feedback from those who contributed to the Consensus Conference and those who were invited to comment on earlier drafts. The document is, therefore, a statement arising from a conference, rather than the proceedings of a conference. Not everyone will agree with all the recommendations or conclusions. ASBGI has actively encouraged all stakeholders to submit individual responses to this document, and many have done so.



John MacFie
President, ASGBI



SUMMARY

1. The NHS is one of the biggest carbon polluters in the UK. A similar scale of problem exists in Ireland and, indeed, much of the world.
2. Every surgeon has a responsibility to the environment and should consider their own 'carbon footprint'.
3. Surgeons should, in future, consider environmental issues when appraising new technologies.
4. Future debate and discussion appertaining to reconfiguration of services should take into account the carbon costs of travel, of both patient and surgeon.
5. All hospitals need to raise awareness, amongst both patients and staff, as to energy conservation.
6. Sensible antibiotic prescribing will reduce costs.
7. Trusts, hospitals, clinics and surgeries should be encouraged to introduce measures to conserve heat and water.
8. Trusts, hospitals, clinics and surgeries, and individual clinicians, must ensure the most environmentally friendly disposal of theatre waste.

1. The problem

- 1.1 Climate change is a major threat to population health and well being. In the West, healthcare provision contributes significantly to carbon pollution. In the UK, for example, healthcare is responsible for 21 million tons of carbon dioxide annually, making the NHS one of the biggest carbon polluters. This represents 25% of all public sector carbon emissions in England and Wales ^[1]. In the United States, healthcare is the second largest contributor to waste. According to *The Lancet*, climate change is the biggest global health threat of the 21st Century ^[2].
- 1.2 Carbon footprint is a measure of all greenhouse gases produced, and is reported in kilograms (or tonnes) of carbon dioxide equivalent. It is used as an indicator of an individual’s or a company’s impact on global warming ^[3].
- 1.3 The Climate Change Act (2008) legally obliges NHS organisations to take action to reduce carbon dioxide equivalent emissions by 80% by 2050. The NHS carbon footprint in relation to recent legislation is given in *Figure 1*.

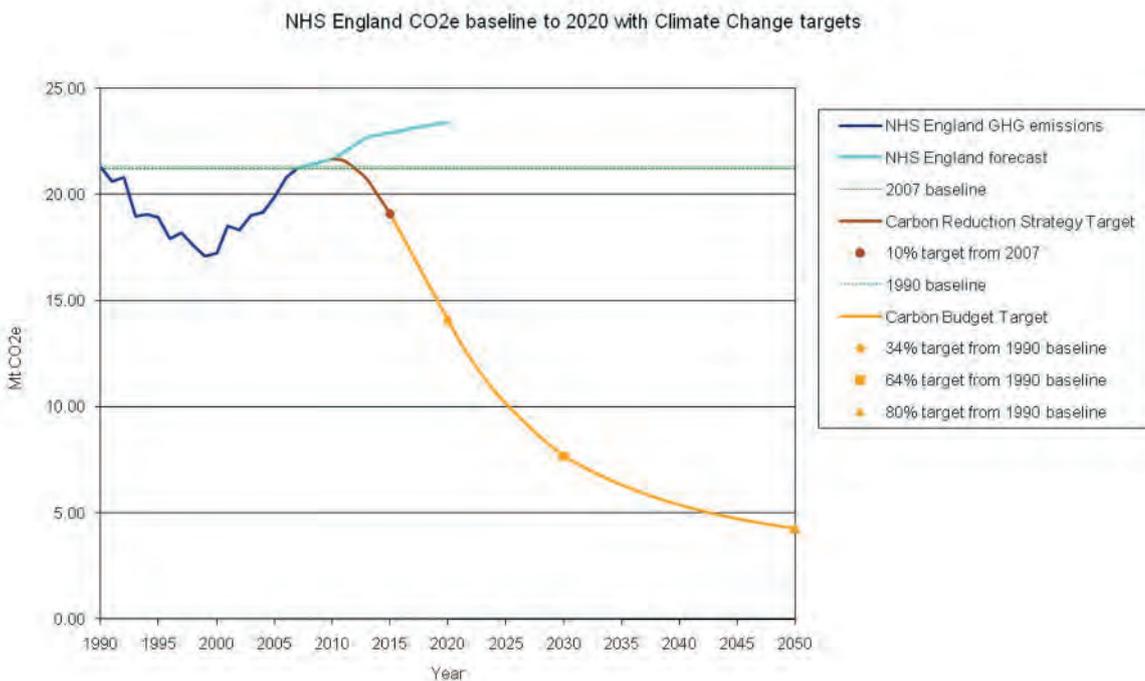


Figure 1: NHS England CO2 footprint 1990-2020 with Climate Change Act targets ^[4]

- 1.4 In the NHS, 5.5kg of carbon dioxide waste equivalent per patient are produced per day, of which 20% to 30% is generated in the operating theatre. This compares to 1.9 kg in France and 0.4 kg in Germany. The reasons for the differences are unclear.

1.5 60% of this waste is generated from procurements such as medical instruments and equipment, and only 22% from building energy use and 18% from travel [1]. A breakdown of comparative costs is shown in *Figures 2a and 2b*.

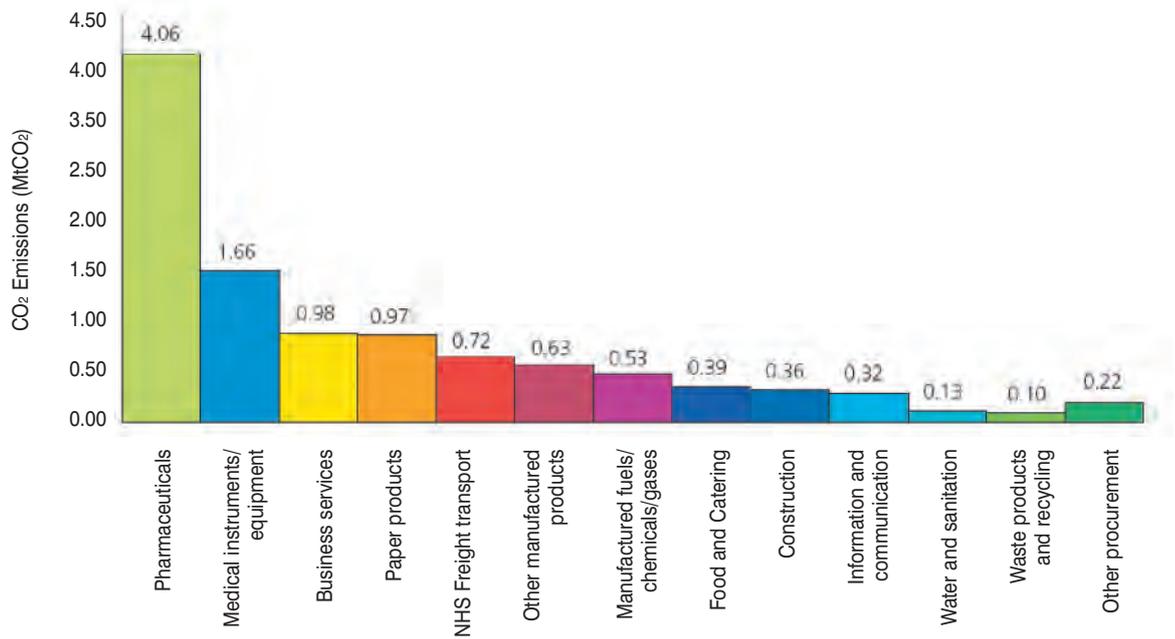


Figure 2a: Source of waste

These data can be summarised as follows:

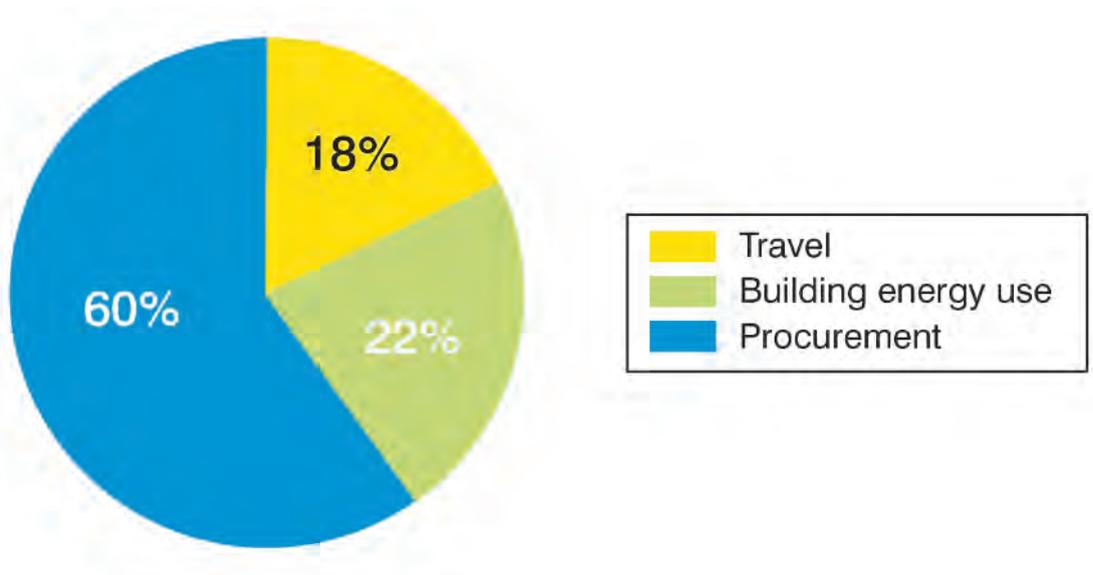


Figure 2b: Percentage breakdown of the source of carbon dioxide equivalent waste [1]

- 1.6 If the cost of healthcare continues to rise, and if the burden on our carbon footprint is not checked, in the current economic climate it will not be possible to sustain healthcare at its present level. However, it is possible for hospitals to adapt and reduce their carbon footprint. For example, in Germany, the landfill waste per patient episode is only 0.5 kg. In the UK, Guy’s and St Thomas’s Hospitals in London have produced a 20% reduction in their carbon output with a saving of £1.7 million per annum and the Medway NHS Foundation Trust, with a 15% reduction in carbon dioxide output, saved £390,000 per annum ^[4].
- 1.7 The surgeon is key to reducing the surgical carbon footprint and ensuring sustainable surgery. He/she is in a unique position to influence ‘sustainable’ surgery. Surgeons directly influence the clinical environment in which they work and, therefore, can be instrumental in reducing the carbon footprint of their workplace. Several aspects of the clinical environment can be influenced, including patient care, material utilisation, resource management, staff attitudes and efficient building policies.
- 1.8 Possible means of reducing carbon emissions are summarised below in *Figure 3*.

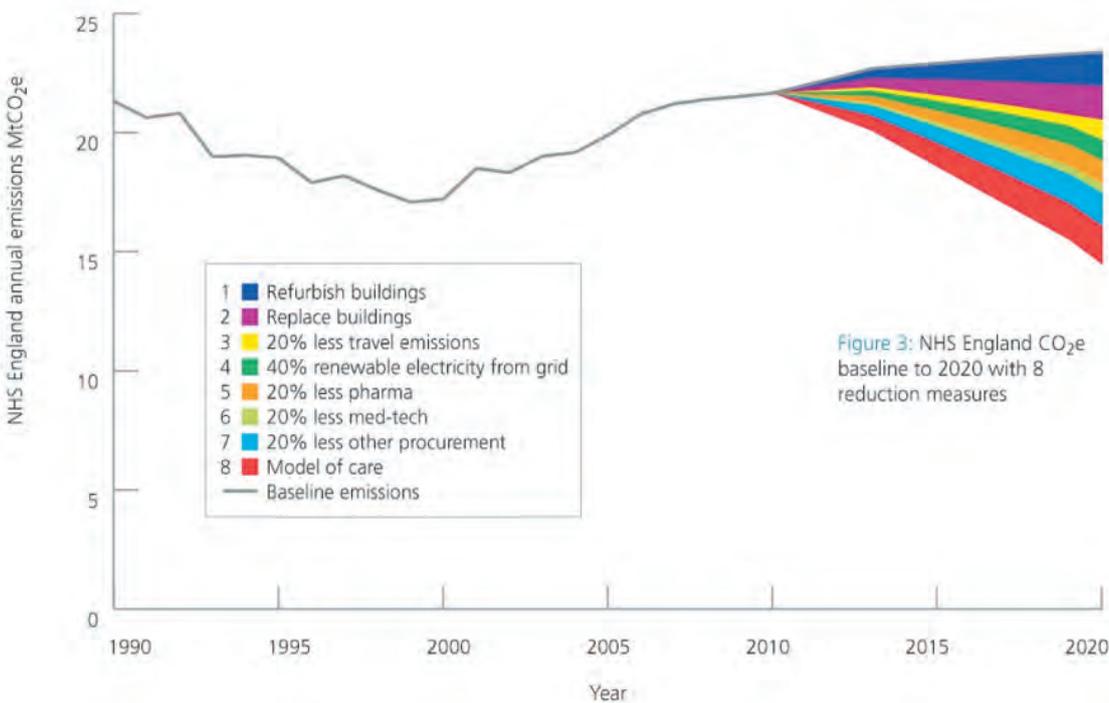


Figure 3: Reducing carbon emissions related to surgery

2. Reducing carbon emissions related to surgery: Avoiding inappropriate surgery or procedures of limited clinical value

- 2.1 The current Coalition Government is committed to reducing the number of surgical procedures performed each year, which might be deemed as having limited clinical effectiveness. This is termed their ‘Right Care’ initiative.
- 2.2 It is important to ensure patient value for each surgical procedure undertaken. There is significant unexplained and unwarranted variation in elective operative intervention between different PCT and provider populations ^[5]. The Audit Commission has estimated that the NHS could save £500 million a year by bringing high activity providers in line with the national median ^[6]. This does not take into account unnecessary investigations undertaken before and after a procedure. For many surgical procedures, there is a lack of evidence for effectiveness, cost-effectiveness and sustainability.
- 2.3 ASGBI supports the concept that there should be a national evidence base for the effectiveness and cost-effectiveness of specific surgical procedures. Surgeons need to contribute data so as to develop evidence of the effectiveness of procedures leading to the establishment of national guidelines. This also applies to the surgical approach undertaken (for example, laparoscopic as opposed to open).
- 2.4 In determining such evidence it is wise to be aware of the potential influence of industry, see *Figure 4*.

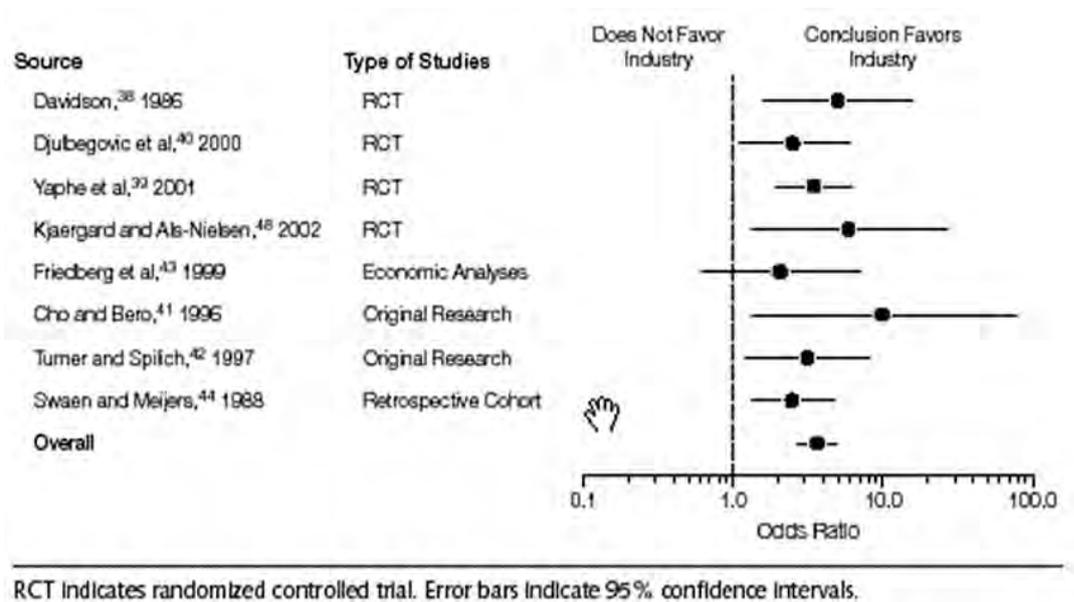


Figure 4: Relationship between study outcomes and industry sponsorship ^[7]

These data suggest that industry has a significant impact on the results of some studies. It is essential that published material, particularly relating to RCTs and meta analyses, clearly indicate potential conflicts of interest.

- 2.5 It is also important to make sure that all endpoints are considered, not only survival, but also quality of life and financial and environmental costs. This, at present, is the role of various bodies such as NICE, the Department of Health QIPP ‘Right Care’ team and the specialty organisations.
- 2.6 An example of the need for caution when interpreting patient value, is the role of laparoscopic surgery in colonic resection, where the average costs of laparoscopic colorectal cases are approximately twice that of an open procedure, and some audits have suggested that the one-day reduced length of stay advantage of a laparoscopic approach is lost if an ‘Enhanced Recovery Programme’ is followed. Similarly, the benefit of an earlier return to work following a laparoscopic approach may not be significant in a patient beyond retirement age ¹⁸.
- 2.7 Surgeons should always question the indications for a selected procedure in each individual patient. ‘Heroic’ surgery is to be deprecated as is any temptation by surgeons to list patients in order to increase numbers in personal series or recruitment to studies.
- 2.8 Morbid obesity is now recognised as a major public health issue in many countries in the world. From the perspective of reducing carbon footprints, there is the paradox whereby, on the one hand, one might argue that obesity is a product of a society that has ignored the future sustainability of health and acted in a profligate fashion. On the other hand, there is no doubt that bariatric surgical procedures are effective in the treatment of morbid obesity and, from this perspective, are beneficial to society and ultimately, therefore, our environment.

Therefore, it is inappropriate that there is inconsistency for funding of bariatric procedures. There is now overwhelming evidence of their long-term health benefits. These will impact on populations and the overall costs of healthcare. Most authorities now support bariatric surgery ¹⁹.

3. Reducing lengths of hospital stay

- 3.1 A single bed day saved reduces carbon emissions by 80 kg and saves £200. It has been estimated that 33 million (of 55 million) bed days could be saved in the NHS if the length of stay was reduced back to the 2008/9 national median. This would reduce the NHS carbon footprint by 10% ¹¹.
- 3.2 The UK government is committed to reducing time spent in secondary and tertiary referral centres. As Sir Bruce Keogh, Medical Director of the NHS, has stated, “*the expansion and growth of the hospital sector is a barometer of failure of primary care*”. Numerous initiatives attest to this: NHS improvement which actively supports enhanced recovery programmes, LapCo a government-funded initiative to mentor surgeons wishing to

develop laparoscopic skills, the Right Care programme referred to above and, of course, the ‘basket’ of procedures which clinicians are exhorted to carry out as day cases and upon which Trusts are judged. ASGBI supports, in principle, the move to increasing day case procedures and also advocates the increasing use of 23-hour services. There is good evidence to show that dedicated day unit facilities, together with committed nursing and anaesthetic staff, are instrumental in increasing the proportion of cases performed as day cases.

- 3.3 There is increasing evidence to support active discharge planning. This needs dedicated staff, but initial costs are rapidly offset by bed days saved.
- 3.4 Enhanced Recovery protocols are now well established. ASGBI has published guidelines on the implementation of enhanced recovery protocols ^[10]. The instigation of these protocols is associated with significant reductions in hospital stay, without adverse consequences on quality of care and with no commensurate increase in costs.

4. Reducing antibiotic use

- 4.1 The benefits of prophylaxis or therapeutic antibiotics are well established. However, misuse of antibiotics is potentially dangerous, particularly with respect to their propensity to cause the emergence of multi-resistant micro organisms. These bacteria are recognised as being the aetiological factor in many healthcare-associated infections. In a recent hospital audit, the antibiotics administered did not cover the appropriate spectrum in a third of cases, were given at the wrong time in a fifth of cases, and for the wrong duration in two-thirds of cases ^[11].
- 4.2 It is the surgeon’s responsibility to ensure that the indications for antibiotics (both prophylactic prevention and therapeutic) are appropriate and in accordance with published guidelines. All antibiotic prescribing should be time-limited and in accordance with defined hospital policy which has been evolved with expert microbiological advice. Therapeutic courses should be short. Most authorities now agree that prophylaxis should involve a single dose administered within two hours of surgery ^[12]. The timing of prophylaxis is significantly associated with outcome.
- 4.3 Many surgical procedures do not require antibiotic prophylaxis: for example, routine hernia repairs and non-prosthetic clean procedures including laparoscopic surgery.

5. Travel

- 5.1 Travel contributes almost 20% of our overall carbon footprint. Centralisation of specialist services is considered a patient benefit in most surgical specialties.
- 5.2 During discussions about hospital reconfiguration, politicians and NHS managers should not ignore the consequences of increased patient travel on carbon emissions.
- 5.3 Reducing the number of follow-up consultations, and the number of visits for different investigations, would reduce miles travelled and improve patient value. We should encourage the increased use of telephone follow up.
- 5.4 There needs to be recognition that “centralisation” of services has downsides with respect to travel costs. For example, centralisation of breast services in the Republic of Ireland is associated with 38,000 new referrals attending eight separate units. One solution could involve more services being provided by the General Practitioner or by a visiting specialist.

Innovative examples in urology include secondary care surgical specialists providing urology services in primary care facilities. This does demand access to diagnostic resources including flexible cystoscopy and ultrasound, but has been shown to be cost saving. The patient value has been even further improved with specialist nurses delivering domiciliary intra-vesical chemotherapy in Newcastle and domiciliary catheter support services following TURPs in Nottingham and Leeds. It does require careful planning as there is a need for experienced urology nurses in the community supported by consultants from secondary care. This also requires more ‘General Urologists’ and more incentives for the Secondary Care Trusts to support such initiatives.

- 5.5 Carbon emissions through travel can be reduced by encouraging public transport use and considering the use of bicycles. Facilitating this with bicycle parking, ramps and changing rooms indicates a positive attitude to carbon preservation. The repetitive increase in parking fees may increase Trust revenue, but does not necessarily reduce car usage and subsequent impact on the carbon footprint. As the NHS is one of the UK’s largest employers, these considerations could have a significant impact on reducing carbon emissions nationwide.
- 5.6 Clinicians and staff should be encouraged to use appropriate technology to improve the patient experience, e.g. telephone, video, and web conferencing between staff. If tele-conferencing replaced 5% of business mileage the NHS in England could save £13 million each year ^[13].

6. Patient education

- 6.1 Patients are subjected to media scares and find risk assessment without adequate facts difficult. This is demonstrated by a survey considering single use products ^[14], which found that 90% would prefer single-use products, 60% were afraid of contracting diseases from the reusable products, and a similar number were prepared to pay for single-use products. Interestingly, a similar survey of clinicians demonstrated that 70% of surgeons and nurses would also want single-use products for their family if they had to undergo surgery ^[15].
- 6.2 In reality, the risk of cross infection is infinitesimally small. But, hysteria about this leads to colossal waste. For example, it is difficult to justify the disposal of over a million stainless steel nail clippers each year because of a theoretical risk of transmitting prions. Similarly, the insistence by industry that certain instruments, such as diathermy hooks, must be single-use only might imply profiteering.
- 6.3 Surgeons can provide valuable information on the associated risks and benefits of sustainable surgery, so helping informed decision making.

7. Reducing surgical waste

- 7.1 It is estimated that, by undertaking acceptable safe reprocessing, there would be a 50% reduction in medical device costs compared with purchasing new equipment ^[16]. For example, in 2010, 98% of hospitals in British Columbia, Canada, undertook reprocessing measures which resulted in a C\$1.8M in cost savings ^[17].
- 7.2 Re-processing also reduces the amount of waste produced. It has been estimated that, with a 20% increase in hospital reprocessing, an average-sized hospital can divert 2,150 tons of medical waste from local landfill sites ^[13].
- 7.3 The American Society for Healthcare Central Service Professionals define ‘Reprocessing’ as the methods used to make reusable, single-use devices (SUD) or unused products that have been opened patient-ready ^[18] to make it suitable for additional patient use ^[19]. The US Food and Drug Administration consider a ‘Reprocessed Single Use Device’ to be a medical device that has been used and then subjected to additional processing and manufacturing.

The ease and acceptability with which a single-use device can be reprocessed can be classified into three grades (see *Figure 5*). The higher the grade, the higher the risk and, therefore, the less acceptable it is to be re-used. The FDA requires new devices to be classified, and inspects reprocessing establishments as well as reviewing device safety reports.

Surgeons should attempt to ensure that at least Class I devices are re-used in their hospital, and could work towards re-using Class 2 devices such as laparoscopic equipment, for example ports and diathermy needles.

	Class I	Class II	Class III
Patient risk of reprocessing	Low	Medium	High
Examples	Elastique bandages, pressure infuser bag, tourniquet cuffs, general-use surgical scissors	Pulse oximeter sensors, ultrasound catheters, drills, compression sleeves, most laparoscopic equipment	Balloon angioplasty catheters, percutaneous tissue ablation electrodes, and implanted infusion pumps
Incidence of SUD	25%	70%	5%

Figure 5: FDA classification of device risk of re-processing SUD. The higher the class, the higher the risk and, therefore, the less acceptable it is to re-use the SUD [20]

- 7.4 The present trend in operating theatres is the use of the surgical tray system for the provision of instruments at the table. This has been introduced in an attempt to improve efficiency and control infection. However, many instruments on the tray are not used and their repeated re-sterilisation is not justified. Conversely, the required instrument is often not available and a second tray is opened. Together, this can result in up to a five-fold increase in instrument ‘requirement’. Each tray has its own disposable wrapping and requires separate storage space [21].
- 7.5 Surgeons should audit the use of theatre trays regularly to ensure that only the necessary instruments are available and give more consideration to separate packing of rarely used equipment.
- 7.6 The argument for reusable gowns and drapes is not clear. Reusable garments consume approximately 4.5 times as many resources as single-use garments, primarily in terms of water usage in laundering [22]. Single-use gowns and drapes contribute only 2% of all hospital waste (i.e. 0.04% of all municipal wastes) [23].
- 7.7 A local cost/value assessment needs to be undertaken, considering the quality and cost of the gowns available and the distanced involved in order for them to be laundered.

- 7.8 It is central to Lister's doctrine of asepsis, that the surgeon's hands need to be as clean as possible. But assuming a flow of 5 litres/min, and a person scrubs for 2.5 minutes for every operation and at least three people scrub, this means that anything up to 500 litres of water could be used per day, per theatre. Other areas of water misuse could centre around re-sterilisation of equipment.
- 7.9 Water consumption could be reduced by not over-scrubbing, implementing water saving devices such as a reduced flow and light sensitive on/off switches, the use of disposable brushes, and considering the wider use of alcoholic cleansing agents [24].
- 7.10 Only around 10% of theatre waste needs to be treated in order to protect the public. But many hospitals, with medical waste incinerators onsite, burn most of their waste. However, up to 50% of theatre waste is similar to household waste and could be recycled, reused, reduced or eliminated [25].
- 7.11 Segregating and stratifying operating room waste at the time of initial discard would save costs and reduce incineration volumes, itself a significant health and environmental hazard.

8. Reducing hospital energy consumption

- 8.1 Buildings are responsible for 40% of the UK carbon footprint, and all new NHS buildings are to be 'low carbon' by 2015. This could also include the use of solar panels and rain harvesting systems. Nevertheless, electricity and energy consumption remains high. Computers and lighting left on when not in use in an average-sized UK hospital costs over £100,000 per annum [1].
- 8.2 An intranet service, which shuts computers off when not used for a given period of time, would reduce energy consumption. One Trust has found it cost-effective to employ staff to scour the hospital after hours to turn off the lights! Not all areas of a hospital (including day-case theatres) need to be maximally heated overnight. Likewise, in non-patient areas of the hospital, the ambient temperature of the rooms could be lowered.

9. Empowering staff

- 9.1 An essential first step in attempting to reduce ‘carbon footprints’ must be to raise employee awareness of the problem, and to ensure they are ‘engaged’ with a common purpose.
- 9.2 The surgeon is ideally placed to set an example with regards to conservation of material. A profligate approach to the use of disposables in the operating theatre must be discouraged.
- 9.3 There is good evidence to support the introduction of staff education programmes. In one city in the US, a 17-hospital consortium achieved a 33.5% reduction in waste disposal costs after introducing an education programme. This reduction was equivalent to an annual financial saving of \$3.7 million ^[32].

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