

Hippocratic Council Innovator Grant Application 2010-2011

Part 1 – Identifying Information

Title of Project: Operation Green – “Promoting environmental sustainability by reclaiming surgical supplies for the developing world”



Part 2 – Project Description

In the modern operating room (OR), many items are readied for surgery but remain unused at the end of the procedure and are discarded. These items represent superfluous waste and are called surgical “overage”.^{1,2} Overage items represent a significant environmental burden and negatively affect ecosystem health.

Unfortunately, medical research, awareness, and education regarding the health and environmental impacts of OR practices is lacking. In fact, Canadian healthcare activities generate 2.1% of Canada’s greenhouse gas emissions and 1% of solid waste.³ Although ORs occupy a relatively small area of hospitals, they generate 20-33% of hospital waste and a single operation may produce more waste than a family of four in a week.⁴ Furthermore, ORs represent 5.9% of hospital spending, with up to 56% of an OR budget dedicated to supplies.^{5,6} Given this substantial resource consumption, hospitals have strong incentives to encourage sustainable OR practices.

To assess the state of affairs at our own institution, we completed a waste audit of total knee replacements (TKRs) at the London Health Sciences Centre (LHSC) to analyze waste management.⁷ We found an average of 8.6 kg and 0.3 m³ of solid waste generated per TKR. Extrapolated to all TKRs performed in Ontario annually, this equals 185,605 kg and 6,960 m³ of waste, the equivalent of 435 garbage trucks by volume.

Operation Green (www.operationgreen.ca) is a student-led initiative at the Schulich School of Medicine & Dentistry which aims to reduce the detrimental effects of OR practices. Our project will collect “overage” items such as gloves and suture packs, and have medical students on international electives and residents and surgeons on service missions donate them to resource-poor areas. A similar initiative (REMEDY Project) at Yale University has been in operation since 1991 with its activities published in high-impact journals and over 50 tons of recovered materials donated.^{1,2}

Through this innovative and evidence-based approach to OR waste management, we aim to address the negative impacts of healthcare provision, while providing desperately needed surgical supplies to areas in need. This program also reduces hospital spending by

minimizing hauling and landfill costs. Importantly, these savings may then be used to improve patient care.

References

¹ Rosenblatt WH et al. JAMA. 1993 May 26;269(20):2647-9. Case-by-case assessment of recoverable materials for overseas donation from 1318 surgical procedures.

² Rosenblatt WH et al. J Clin Anesth. 1997 Sep;9(6):478-81. Assessment of the economic impact of an overage reduction program in the operating room.

³ Hancock T. Doing less harm: assessing and reducing the environmental and health impact of Canada's health care system. 2001. Canadian Coalition for Green Health Care.

⁴ Medscape Anesth. 2009 Oct. <http://www.medscape.com/viewarticle/710513>

⁵ Souhrada L. OR and materials: the yin and yang. 1999;1999/06/03:18-20.

⁶ Park KW, Dickerson C. Can efficient supply management in the operating room save millions? 2009;2009/03/20:242-248.

⁷ Stall, N et al. A Surgical Waste Audit of Total Knee Arthroplasties. AAOS 2011 Annual Meeting.

Part 3 – Selection Grading/Requirements

Why is your project innovative (max 150 words)?

Operation Green is an innovative approach to OR waste management as it combats the ecological footprint of healthcare provision, while providing aid to the developing world. Moreover, this program is attractive to hospital executives and healthcare economists as it can significantly reduce hospital spending and waste management costs. At Yale University, Project REMEDY has saved the Yale New Haven Hospital an average of \$2530 USD per year since the project's founding in 1991.

Furthermore, the Canadian Federation of Medical Students (CFMS) has identified global health and the environment as key priorities. This project is unique in that it attempts to address both issues. Importantly, medical student participants will have the opportunity to fulfill many CANMEDS physician roles with a focus on health advocacy and sustainable practices. The project is multidisciplinary and has the potential to include other faculties such as Nursing and Dentistry.

What is your objective with this initiative (max 150 words)?

Our objectives are to collect readied and unused surgical items which would otherwise be disposed of, and redistribute them to the developing world. We also aim to increase awareness of the environmental impacts of healthcare provision to motivate more sustainable practices.

We are currently operating our initiative at University Hospital, but with Hippocratic Council funding we plan to expand Operation Green to all London and Windsor hospitals associated with the Schulich School of Medicine & Dentistry. We are also in the process of expanding to include a Toronto Chapter, which will be associated with the University of Toronto and the University Health Network hospitals (Hippocratic Council funding will not be used to support these initiatives).

How will medical students be involved (max 150 words)?

Medical students play a vital role in the functioning of Operation Green. Currently, we have a small group of dedicated medical student volunteers who visit University Hospital on a weekly basis to sort and box collected overage items.

Operation Green is a very new project that has thus far been led by a three-member group. The initiative has recently garnered a great deal of support from surgeons, nurses, and OR staff, leading to a dramatic increase in collections. This has significantly increased our workload, and we are already looking to recruit new executive members to join our team.

It is our hope that by spring of 2011 we will have a committee of medical students oversee the following areas of practice: VP Logistics, VP Volunteering, VP Research, and VP Communications. We will also need to establish leaders at the Windsor campus to initiate Operation Green at the Windsor hospitals.

How do you plan on publicizing the initiative (max 150 words)?

Despite this being a new initiative, we have already begun to publicize. We have previously presented this initiative at CleanMed 2010 (Baltimore, MD) and EcoCare 2010 (London, Ontario). We will also be presenting Operation Green at the 2011 meeting of the American Academy of Orthopaedic Surgeons (San Diego, California).

Additionally, we have presented at LHSC to the orthopaedic surgeons, perioperative nurses and the Sterile Processing Department. An article was recently published in LHSC's OR newsletter, and we are currently working on a position paper for the CFMS. Furthermore, we plan on publicizing on a broader scale in early 2011, by contacting local and national newspapers and media outlets.

Finally, the delivery of Operation Green materials to the developing world has the exciting potential to draw global attention to the medical school and LHSC. We are also hopeful that Operation Green will establish new contacts for the Global Health Office.

What additional resources are required for the project (max 150 words)?

We have been very fortunate to receive initial funding for Operation Green from the 2010 CMA Leadership Innovation Fund. This funding has allowed us to initiate our project by supporting the purchase of many required materials and equipment used to setup the project at University Hospital.

We have been operating at full capacity in the University Hospital ORs for less than a month, and have already exceeded our expectations in terms of materials collection. However, it has become evident that the limiting factor to expanding our activities is

storage space. We will require vastly more space than that which is currently provided to us for free by the Sterile Processing Department.

We are hopeful that with financial support from the Hippocratic Council, Operation Green can function across the London Health Sciences Centre and Windsor hospitals. Fortunately, we have already received interest about initiating Operation Green from medical students in Windsor.

If necessary, how can the project be sustained for future years (max 150 words)?

We are confident that this project can be financially sustained for years to come. At Yale University, Project REMEDY has been in operation since 1991 with annual operating costs (after establishing the initiative) not exceeding \$200 USD. We met with the founder of REMEDY in New Haven, CT and our operational model is very similar to theirs.

We are also confident that this project can be sustained indefinitely by students at the Schulich School of Medicine & Dentistry. The environment and health care will continue to remain top issues for Canadians, and of relevant interest and urgency to medical students.

Finally, we have received numerous emails from parties who will be completing medical work overseas and who would like to bring Operation Green materials on their service missions. We are certain that this trend will continue into the future.

Part 4 – Detailed Budget

Item	Expense	Timeline
In-OR Recovery Bags	\$ 100/month	Monthly
Storage Unit Space	\$ 150/month	Monthly
In- OR Bag Dispensers	\$ 400	Single Expense
Website Costs	\$ 100	Single Expense
Storage Racks	\$ 1000	Single Expense
Signage, Media, Clerical Supplies	\$ 500	Ongoing
Total Costs	\$ 5 000	

Our budget is based on expenses incurred to date in order to establish Operation Green at University Hospital. Currently, 14 operating rooms are a part of the program which has required approximately \$1 500. We anticipate that expansion to additional sites will be similar in requirements for equipment, personnel, and logistical support.

Part 5 – Detailed Timeline

Date	Item	Status
April-Oct 2009	OR waste management literature review.	Complete
February 2010	Waste audit of 5 TKRs at LHSC under Dr. D. Naudie.	Complete
April 2010	Meet Dr. W. Rosenblatt, head of REMEDY, to discuss project.	Complete
July-Oct 2010	Meet with infection control, OR management, chief of surgery.	Complete
Sept-Oct 2010	Pilot project. Volunteer recruitment and training.	Complete
Nov 2010	Initiate materials collection.	Complete
April-May 2011	Assemble Operation Green Executive Committee with VPs.	Pending
July 2011	First delivery of materials to organizations for distribution to the developing world	Pending
June- Oct 2011	Meet with OR management, infection control, and surgery chief at Victoria Hospital, and Hotel Dieu and Metropolitan Hospitals (Windsor) to discuss expansion.	Pending
Sept-Oct 2010	Pilot project at new hospitals. Volunteer recruitment and training in Windsor.	Pending
Nov 2011	Initiate materials collection at new sites.	Pending

Part 6 – Additional Information



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November 30th, 2010

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Re: Letter of Support: **Hippocratic Council Innovator Grant, 2010**

I have known and supervised [REDACTED] since September 2009 on a student-initiated Medical Ethics Project. They first approached me with an idea to explore: "How environmentally friendly are our orthopaedic operating rooms?" We worked together over the course of the academic year, and completed a waste audit of total knee arthroplasty procedures. This work has been accepted for presentation at the largest international orthopaedic meeting of the year, the American Academy of Orthopaedic Surgeons, in San Diego, California this February 2011. Our intention is to also publish this work in the Journal of Bone and Joint Surgery (American) or the Canadian Journal of Surgery.

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These students have also presented related work at the CleanMed 2010 conference in Baltimore, Maryland. They presented a symposium on "Waste management in the operating room (OR): Exploring and improving the environmental, human health, and economic impacts." This consisted of an extensive literature review of the impact of the health care sector on the environment, and an analysis of the financial implications of wastage disposal to our hospitals.

Over the course of the academic year I have been very impressed with the passion and initiative displayed by this group of students. I think these traits become most apparent to me when they approached me to help initiate "Operation Green" at the University of Western Ontario (www.operationgreen.ca). This is a student-led initiative at the Schulich School of Medicine and Dentistry that aims to reduce the detrimental effects of operating room practices. Their project aims to collect "overage" items such as gloves and suture packs, and have medical students on international electives and physicians on service missions donate them to resource-poor areas. They have successfully secured some funding through the Canadian Medical

Association (CMA) Leadership Fund to lead this initiative. However, as outlined in their proposal, this initiative has really taken off, and they require further funding to sustain their efforts. These motivated students are applying for further funding through the Hippocratic Council Innovator Grant.

I have had a chance to review the purpose of the Hippocratic Council Innovator Grant, and firmly believe that "Operation Green" truly embodies the grant objectives of enhancing "the educational experience of Schulich students, our community, and our healthcare system." I have reviewed their budget and it appears very reasonable. I can vouch for the completion of their existing timelines, and anticipate that all stated initiatives and activities would be completed by December 2011, at which time these three students would be entering their final years of medical school and be focused on their residency career and ambitions. More importantly, I think this initiative will move forward for many years to come.

I wholeheartedly recommend them as ambassadors for the University of Western Ontario, and believe they are outstanding representatives for the Schulich School of Medicine. I hope this letter provides strong support to their application. I would be happy to provide any further information that you might require.

Sincerely,

A handwritten signature in black ink that reads "Douglas Naudie". The signature is written in a cursive style with a large, sweeping initial 'D'.

Douglas Naudie, MD FRCSC
Assistant Professor, Department of Surgery (Orthopaedics)
The University of Western Ontario
Consultant orthopaedic surgeon, Joint Replacement Institute
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Letter of Support from Yale New Haven Hospital CEO, provided by REMEDY

February 9, 2007

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Paul G. Ramsey
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Dear Ms. Brandenburg and Mr. Ramsey:

I understand your organization is considering participation in a hospital-based, medical supply and equipment recycling program, known as REMEDY.

We are fortunate that the founding physician of the REMEDY Program, Will Rosenblatt, M.D., is a member of Yale-New Haven Hospital's Anesthesia staff. He started the REMEDY Program in perioperative services as a way to assist and advance medical care in the developing world. Dr. Rosenblatt was concerned that contemporary U.S. medical practice prohibited the re-use of selected products that were not used during a surgical procedure. He also knew that perioperative procedures required significant preparation and the opening of planned equipment and supplies that sometimes would not be used. As a result, he conceived of the REMEDY Program to provide these unused supplies to developing healthcare systems throughout the world.

At first, there was some concern about over-utilization of supplies in perioperative services as a way of creating a source for this noble program. However, through specific research and the evolution of this program, the staff at Yale-New Haven has learned that careful attention to supply management has resulted in improved utilization of supplies throughout perioperative services. There has been far less waste, but some is inevitable. That is what fuels REMEDY, a program that we have enthusiastically supported for the last 16 years.

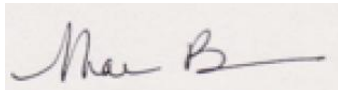
In addition to the obvious benefits of assisting developing healthcare programs in other countries, this program has also been resoundingly supported by our staff throughout the Hospital. Members of our staff volunteer their time and effort to support the program and package and send materials around the globe. It clearly appeals to the sensibilities of the kinds of wonderful people who have chosen healthcare as a passion in our organization and I'm sure in yours.

There has been significant legal research done that essentially eliminates liability for our hospitals, which I know is also of concern to any healthcare leader.

I hope that you will ask someone in your organization to seriously consider participating in REMEDY. I am certain that you will experience the same intrinsic rewards associated with participating in this program and knowing that you can make a difference in yet another way.

Thank you for your consideration.

Sincerely,



Marna P. Borgstrom - President and Chief Executive Officer

Additional Figures



Figure 1 - Total waste from a single total knee arthroplasty procedure at UH



Figure 2 - An Operation Green bag dispenser in a UH operating room



Figure 3 - Materials collected over 3 days of at UH



Figure 4 - An Operation Green storage rack in the Sterile Processing Department at UH



Figure 5 - An Operation Green collection bin in the Sterile Processing Department at UH



Figure 6 - Wheelchair, Mawenzi Hospital (Moshi, Tanzania) taken by [REDACTED] (Summer 2010)