

Allan Brooking NHS Travel Fellowship

## **Perspectives of Healthcare Technology in Boston: A report of a visit by the NHS Technology Adoption Centre**

10 – 14 March 2008

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## ACKNOWLEDGEMENTS

We would like to thank the following organisations for helping to make our visit to Boston a success:

Organisation	Website
	<a href="http://www.aboveandbeyond.org.uk">www.aboveandbeyond.org.uk</a>
	<a href="http://www.uktradeinvest.gov.uk">www.uktradeinvest.gov.uk</a>
	<a href="http://www.MIMIT™.org.uk">www.MIMIT™.org.uk</a>
	<a href="http://www.CIMIT®.org">www.CIMIT®.org</a>
	<a href="http://www.sermo.com">www.sermo.com</a>
	<a href="http://harvardmedsim.org/cms">http://harvardmedsim.org/cms</a>

## 1. Executive Summary

Boston is a global leader in both the fields of health and technology and provided the perfect destination for a visit by the NHS Technology Adoption Centre (formerly NHS National Technology Adoption Hub) to gain new perspectives. These perspectives stretched from learning about innovative ways of developing new technologies to meet diverse healthcare needs through to getting an understanding of how technologies are adopted and the associated training issues.

“ innovative ways of developing new products to meet diverse healthcare needs”

Much of the time spent in Boston was with CIMIT® (Centre for Integration of Medicine and Innovative Technology), a unique organisation that brings innovators in healthcare and technology together. Other sessions were also spent with other organisations involved in the healthcare technology arena in Boston including a management consultancy (“Boston Healthcare”) which specialises in working with medical technology companies, a membership organisation which represent healthcare technology companies (“MassMedic”) and an online networking site for doctors (“Sermo”).

This report has been written in a diary format of our time in Boston summarising the key lessons learnt.

The top 5 learning points from the visit can be summarised in the table below:

1	‘Let’s have a go’ culture! – The NHS is problem rich, but solution rich.	There appeared to be a greater propensity to take risk in the Boston area at all stages of the innovation pathway when compared to the UK’s NHS. This would sometimes mean going ahead with projects which might not necessarily be inline with general thinking. Examples of these were very evident at the CIMIT® Forum. Boston was also described as “problem rich, but solution rich” perhaps summing up this culture. The NHS would benefit from endorsing this approach as well.
2	Impact of a market system on healthcare innovation.	Healthcare is a large business in the United States consuming 14% of the country’s GDP primarily funded through a private insurance model with a large public funded element. Medical technology companies are very conscious of the reimbursement coding aspects of their products and this can influence how technology companies develop products.
3	Thinking differently	There was a lot of evidence at CIMIT® of encouraging people to think differently and facilitating people to think differently. An example included inviting bioengineering students from MIT to collaborate on projects with local clinicians.
4	Selection processes work but only 90% of the time.	CIMIT® itself has a very robust selection process in terms of its projects but it was identified that occasionally there can be excellent projects that do not meet the standard criteria mould. Mechanisms need to be in place to allow ‘unusual’ projects to be selected.
5	Future of networking to get something in place.	Networking has the opportunity to radically influence future medical practice, technology development and technology uptake. This networking can be facilitated by social network technologies which need to be harnessed by policy makers to both gauge opinion and inform of on the ground practice. However other more traditional opportunities for networking such as ‘CIMIT® forum’ style events are also important and should be appreciated for their potential impact. MIMIT™ could be a vehicle for such change.

## 2. Overview

In July 2007, the NHS Technology Adoption Centre applied for a travel bursary from the 'Above and Beyond' Charity for an Allan Brooking Travel Fellowship.

[www.aboveandbeyond.org.uk](http://www.aboveandbeyond.org.uk)

The aim of the bursary is to provide the opportunity for *'the educational development and enlargement of the professional knowledge, outlook and contribution of those involved in the non-clinical management of the NHS'*.

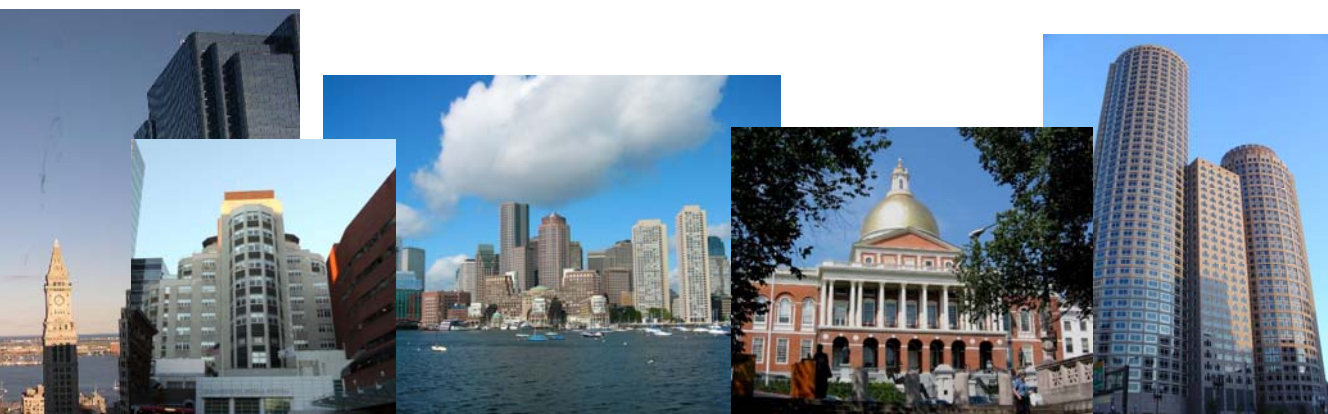
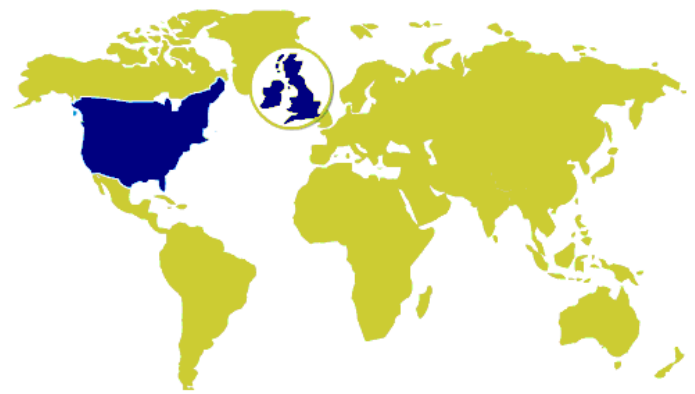
The NHS Technology Adoption Centre were successful in their bid for funding to visit the Centre for Integration of Medicine and Innovative Technology (CIMIT®) and other representatives of the healthcare industry in Boston.

The aims of the visit included:

- Gaining an understanding of how healthcare technology is best selected for pilot
- Learning how healthcare technology pilots are monitored and evaluated
- Investigating the comparisons between the UK and US healthcare systems with regards to the uptake of healthcare technologies
- Understanding how best to work at a network level to ensure positive multi-agency working to encourage the uptake of innovative healthcare technologies

“encourage the uptake of innovative healthcare technologies”

In January 2007, an organisation called MIMIT™ (Manchester: Integrating Medicine and Innovative Technologies) was formed with a similar, albeit developing, remit to CIMIT®. The trip to Boston was undertaken in association with MIMIT™.



### 3. Diary

Monday 10 March 2008

#### 3.1 Overview of CIMIT<sup>®</sup> & Discussion of Collaboration

*Introductory presentation by Coleen Kigin, CIMIT<sup>®</sup> Chief of Staff and Beverley Brown, CIMIT<sup>®</sup> Chief Development Officer.*

Colleen Kigin, Chief of Staff for CIMIT<sup>®</sup>, gave an overview of the growth of CIMIT<sup>®</sup>, their structure, funding and mission. Developing the organisation in Boston was particularly fortuitous as it is densely populated with high class hospitals, a strong medical device industry and exceptional academic talent on its doorstep (MIT, Harvard & Boston University).

#### CIMIT<sup>®</sup> Mission

To improve patient care by facilitating collaboration among scientists, engineers and clinicians to catalyze the discovery, development and implementation of innovative technologies, emphasizing minimally invasive approaches.

CIMIT<sup>®</sup>'s role is primarily as a facilitation organisation, “bringing together clinicians, academics and industry to resolve healthcare problems through the joint development of technology”

Central to their work are a range of programmes and supportive services which assist CIMIT<sup>®</sup> in meeting its mission.

It has rapidly grown since its establishment in 1998 to include 11 academic and medical institutions. One key factor for the growth of CIMIT<sup>®</sup> is the nature of the American Health Care System, which in itself creates both opportunities and challenges for different organisations. The prestige and incentives offered by the medical technology industry to

clinicians and academics and their associated institutions to develop a healthcare technology are high, especially if a spin out company and/or product is created. A key challenge for the hospitals is that they are competing for referrals, which bring revenue for the hospital. The hospitals therefore want to ensure that they provide the best possible treatments and services, and often new innovative technology and procedures are seen as a mechanism to achieve this. Colleen Kigin described this environment, particularly in Boston, as: “problem rich, yet solution rich”.

Another key factor in the development of CIMIT<sup>®</sup>, and their ongoing success is the people. CIMIT<sup>®</sup> was originally formed by 4 clinicians, who had all trained together at medical school, but upon graduation had gone on to work at ‘competing’ hospitals. As professional colleagues, they wanted to collaborate and share ideas – the creation of CIMIT<sup>®</sup> provided a ‘safety zone’ to be able to achieve this, perhaps highlighting the more market driven environment in healthcare in Boston. The intellectual curiosity of others made CIMIT<sup>®</sup> grow, many risked their promotions in their own institutions’ to join – while others waited to see the beginnings of success. After 10 years, CIMIT<sup>®</sup> sees itself as communicating its ethos about collaboration by delivering the following:

- Education & Networking
- Encouraging collaboration
- Soliciting appropriate projects
- Developing the next generation of medical device engineers (CIMIT<sup>®</sup> forum)
- Finding potential technologies through site miners

In terms of focus, CIMIT<sup>®</sup> is not basic research, traditional technology development or clinical trials. They are a catalyst for ideas and a ‘facilitation pool’ for mentors of best clinical practice. CIMIT<sup>®</sup> is funded by the federal government, Department of Defence (DoD) and its collaborating institutions.

## Key Learning for the NHS and the NHS Technology Adoption Centre

- Although multifunctional, CIMIT® has a very clear set of objectives which has given it a high status in the healthcare sector in the Boston area. Any similar organisations launched in the UK should define itself clearly and set out its values early on to ensure engagement with partners.
- CIMIT® changed its name early on as its *raison d'être* changed. As time goes on, technology organisations may need to shift their focus slightly and this is fine.

### 3.2 Overview of the Site Miner Role

*Presentation by Steven Schachter, MD (Site miner for CIMIT®)*

On their website it describes the 'CIMIT® Site Miners are a critical element in how the consortium identifies and connects clinical champions with scientists and technologies. Site Miners are well-established professionals on the staff or faculty of the CIMIT® Member institutions (the "Site")...The overarching responsibility of the Site Miner is to ensure that the Site benefits from all expertise and resources of CIMIT® and to guarantee each Site is thoroughly mined for opportunities to rapidly translate enabling technology into healthcare.'

Mr Steven Schachter MD gave an overview of the role of the site miner, explaining that every institution (hospital) has its own unique culture, set up and processes and a successful site miner is one who can see the healthcare technology opportunities in their organisation. The site miners meet as a group themselves within CIMIT®, and are selected on rotation from the institutions.

The role is primarily based on personal relationships or 'interpersonal liaisons'; these are culturally dependant and need time to establish and maintain. It is important that the site miner communicates the mission of CIMIT®; which is to identify and cultivate innovators.

In communicating CIMIT®'s mission, they also have the challenge of matching it with the mission of the institution (hospital) they are working in. Mr Schachter talked about the notion of

“cooper-tition; a mixture of co-operation and competition that exists within institutions linked to CIMIT®”.

CIMIT®'s core values are:

- Innovation
- Collaboration
- Integrity
- Entrepreneurism
- Excellence
- Compassion
- Respect

Using CIMIT®'s core values, the role of the site miner is also about bringing research bids closer to the 'patient / clinical care' arena; rather than it just being a scientific proposal.

Site miners must be confident in creating 'webs of connection' across the research and operational boundaries, being proactive and acting like a 'dating agency' to make introductions between people which would not of happened otherwise.

## Key Learning for the NHS and the NHS Technology Adoption Centre

- Can the MIMIT™ (Manchester: Integrating Medicine and Innovative Technology) site miners help the companies that spin out from the NHS, and also the companies already working with/supplying the NHS – to apply to become a Technology Implementation Project organised by the NHS Technology Adoption Centre?
- Can the work of ACTNoW stimulate some of the activities for the NHS Technology Adoption Centre? In terms of beginning the links and contacts with interested clinicians?

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### 3.3 Overview of the Industry Liaison Programme & Technology Support

*Presentation by Ann Humphrey Manager, CIMIT® Industry Liaison Program & Mireille Rosenberg, Director of the Office of Translational Support*

CIMIT®'s Industry Liaison Program provides member companies with customised services to ensure successful collaboration, accelerate the technology development process, and more quickly impact patient care. They have a support programme, offer project management, grant assistance and knowledge.

The programme is focussed on the implementation of 'platform technologies'; managing the Intellectual Property (IP) issues

as well as working with industry to look at how you build in an adoption strategy.

The Translation Support program at CIMIT® provides support for collaborative grant applications involving a small business partnering with institutional investigator(s) on projects aligned with CIMIT® mission. The Translational Support Programme is also

focussed on “educating the investigators to identify the opportunities for spreading good ideas wider”

#### Key Learning for the NHS and the National Technology Adoption Centre

- Membership of the Industry Liaison Partnership (ILP) is comparable to the services offered by Medilink (which have regional hubs across the UK) though perhaps more focussed. Could the NHS National Technology Adoption Centre collaborate more with the Medilink's as another avenue for receiving in new Technology Implementation Projects?

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### 3.4 Meeting with Thomas J. Sommer – President, MassMEDIC

The Massachusetts Medical Device Industry Council (MassMEDIC)

“is the voluntary grassroots association of medical device manufacturers and associated companies in the State”

MassMEDIC is the only organization in New England dedicated solely to promoting the unique interests of the medical device industry.

MassMEDIC strives to create a positive environment which will nurture developing companies, retain and help established medical device companies to grow, and attract new companies to Massachusetts.

MassMEDIC provides services, programs and collaborative initiatives with the goal of making Massachusetts the medical device research, development and manufacturing capital of the world”.

Massachusetts is second after Minnesota for the number of medical device manufacturers it has with 14 of the 16 US research centres in medical devices being in Boston. Interestingly approximately 60% of research is funded by the US government and MIT (<http://web.mit.edu/>) claims it has been responsible for spinning out over 20 companies within a 10 mile radius of the MIT campus. Massachusetts has also a high proportion of venture capital availability, ranking 2<sup>nd</sup> in the United States.

## Summary of the discussion

### ***Are companies vying for the same ground at a research institution?***

- There are often 'access hospitals' identified by medical device companies. If there is a lead clinician, or perhaps a spin-off company has been created – then it is easier to get a device into that particular hospital. Commercial sponsorship of clinicians to use a device is often seen as a tool used by companies; however the purchasing practices of each hospital is different.

### ***What are the issues with this sort of access to getting devices into the hospitals?***

- Prohibiting gifts to the healthcare provider is seen as a problem by industry. A lot of activity by medical device companies is seen as 'gifting' by legislators including training. Companies are sometimes fined for this; however the medical device industry argues that companies legitimately want to enter into the hospitals to train healthcare professionals to use the devices. Clinicians have to declare sponsorship, and act within guidelines that govern the relationship. It was highlighted that healthcare is a sensitive market; it is very much built on relationship management and trust. Chequebook diplomacy sends the wrong message to industry.

### ***What are the drivers for innovation / adoption?***

- Value + Quality (Price Point) and Cost + Quality. A big hurdle is not the FDA but the Centers for Medicare and Medicaid. Hospitals look at what the reimbursement tariffs are compared against the private insurers, if it doesn't have a 'code' – it doesn't easily get adopted. Getting the coverage is important, if it doesn't have the coverage, then it will be difficult to sell. At a market level it is the physicians and nurses that drive the change, to help medical device companies navigate this system.

### ***What is the approach to care outside of hospital in the United States?***

- Home healthcare, often called “untethered healthcare” has grown substantially. MIT have a healthy homes project ([http://architecture.mit.edu/house\\_n/documents/BusinessWeek.pdf](http://architecture.mit.edu/house_n/documents/BusinessWeek.pdf)) where volunteers can choose to live and be studied. The FDA (<http://www.fda.gov/>) regulates the claims that companies make, and stipulate how and what they can advertise. Advertising is done by very large companies – but R&D is done by all companies. There are federal R&D tax credits and state tax credits for R&D which provide incentives.

### ***What 3 key things which make Massachusetts, Boston in particular, such an effective environment for the development and deployment of medical devices?***

1. Research Capability
2. Workforce (both in skills and in cost)
3. Access to capital

## Key Learning for the NHS and the NHS Technology Adoption Centre

- Clinical champions are important to lead ideas
- Medilink UK operates in a similar way with industry, as MassMEDIC though there is a greater focus concentration of larger companies in MassMEDIC. These are known as Premium Members
- The drivers for technology adoption appear to be the coding system by Medicare and Medicaid. If Medicaid and Medicare support the technology, then there is wider take up of the technology

### 3.5 Center for Medical Simulation – CIMIT® Program: Simulation

*Presentation by Jordan Halasz – Operations Manager and Sandra Slarsky - Director of Business Development*

#### Background & Context

The Centre for Medical Simulation (CMS) based at Harvard University is **part of the CIMIT® programme for simulation.**

Simulation training is used as a training tool for 'teams' as opposed to individual task / process training focusing on

“ communication, collaboration and crisis management”

to develop skills and behaviours that are best learned actively under realistic conditions to

improve performance of individuals and teams in the real world”.

CMS focuses on obstetrics, gynaecology and anaesthetics, with the following programmes:

1. Clinical scenario training
2. Healthcare adventures
3. Institute of simulation
4. Research

A tour was given of the CMS and a video shown about how it works in practice.

It was highlighted that there were incentives for individuals to take courses at CMS, as clinician's indemnity premiums were reduced on successful completion of an accredited course.

#### Key Learning for the NHS and the NHS Technology Adoption Centre

- Simulation Technology to be used as a training tool for 'teams' as opposed to individual task / process training.
- Individual incentives exist for clinicians to undertake training programmes at CMS.
- A good example of the use of 'different thought' processes, was the fact that CMS offers 'spend an afternoon in an operating theatre' team building sessions to healthcare business executives as an income generator. This makes an interesting alternative to more traditional paint balling and exposes healthcare managers to some of the issues associated with working in an operating theatre.

### 3.6 Meeting with Steve Dawson, MD: a CIMIT® founder

*Steve Dawson further outlined some of further history of CIMIT®.*

In 1993, four physicians, Dr. Dawson, Dr. David Rattner, Dr. Norman Nishioka, and Dr. Keith Isaacson were instrumental in organizing the Center for Innovative Minimally Invasive Therapy, CIMIT®, and now known as the Center for Integration of Medicine and Innovative Technology.

CIMIT® originally started as something quite informal, becoming larger with a standard organisational infrastructure. It was stated that through setting up CIMIT® there were

mistakes made but this provided an opportunity for learning. An appreciation of organisational cultures is important in seeing a project through to completion, for example one hospital was considered quite rigid and risk averse, whereas another hospital had a much more open culture.

#### Key Learning for the NHS and the NHS Technology Adoption Centre

- A greater appreciation of strategies to manage inter/intra-organisational differences can allow for greater success levels with projects.

### 3.7 CIMIT® Education Programme

#### Lynn Osborn

Lynn Osborn undertook a presentation of how CIMIT® is involved in the education programme. Before presenting, CIMIT® advertises on disclosures of information.

CIMIT® offers a comprehensive education programme to support its mission. This includes:

- Educating and motivating investigators to benefit patient care
- Encouraging the exchange of ideas and information
- Promoting collaboration between diverse communities
- Providing an arena where interdisciplinary discussion can lead to breakthroughs

A range of components made up the educational programme. These included:

Component	Description
The CIMIT® Forum: Collaborating to Tackle Critical Health Issues	Weekly forum which provides a stimulus for ideas exchange among the members of the CIMIT® community.
Summer Education Series Engineering Medical Devices at MIT	In June, there is an education series in lieu of the CIMIT® Forum that focuses on the opportunities of working with engineering students.
Harvey Mudd Engineering Clinic Program	Every year Harvey Mudd College Engineers undertake a conceptual design project. This is in relation to the management of combat trauma.
Entrepreneurship Courses at Harvard Business School, Harvard Medical School and MIT	A range of courses helping doctors and scientists develop their clinical products into marketable and viable products.

#### Key Learning for the NHS and the NHS Technology Adoption Centre

- Following a web search it is clear that there is a paucity of entrepreneurship development opportunities in the UK for both medics and scientists. The development of a range of programmes that assist medics and scientists (as CIMIT® has) to think in an entrepreneurial way would be excellent.

### 3.8 CIMIT® Forum

The showcase piece of CIMIT®'s education programme is the CIMIT® forum which brings together all members of the CIMIT® community. This includes bringing together MIT students undertaking a biomedical engineering degree programme who develop a range of prototype products with local clinicians.

Described as “engaging graduate students and accelerating ideas into prototypes”, teams of MIT graduate students in Electrical Engineering and Mechanical Engineering spend a semester

collaborating with clinicians in CIMIT®-affiliated hospitals to develop innovative medical devices.

Approximately 100 people attended the forum which has an excellent reputation amongst the medical and engineering fraternity in Boston. Students are set a project by a clinician whereby they have to solve the problem within 8 weeks. Students then present their solution at the forum. Three projects were presented at the CIMIT® forum attended by the Technology Adoption Centre.

Project	Description
<p><b>Accurate Non-Invasive Electronic Monitor for Human Body Hydration</b></p>	<p>There is a continued need for a non-invasive method to accurately measure the level of hydration in human beings. Monitoring hydration is important to the titration of hormones, diuretics and fluids for individuals with water regulation disorders, such as diabetes insipidus, SIADH, or hypodipsia. In addition, it reduces the risk to individuals with no control over their fluid intake, such as those under intravenous feeding (G- or J-tube) or infants.</p> <p>The team's method uses low power RF energy from 100 kHz to 10 MHz to measure the loss tangent of the frontalis muscle (in the forehead). The team chose this site because of its large surface area, relatively consistent tissue profile among individuals, and copious vascularization. The loss tangent is a function of electrical conductivity and permittivity and is a material property and therefore independent of sensor electrode geometry. Studies show that the loss tangent is strongly a function of tissue osmolality and hematocrit which are strong indicators of hydration.</p>
<p><b>Catheter-based Device for Intra-Cardiac Mitral Valve Chord Manipulation</b></p>	<p>This project focuses on the design and implementation of a catheter-guided, intra-cardiac device that has the potential potential to help physicians mitigate the effects of mitral valve regurgitation. Mitral valve regurgitation occurs when the mitral valve becomes deformed as a result of disease or damage to the surrounding cardiac anatomy. The purpose of this device is to provide physicians with a tool that may be controlled externally and is capable of manipulating the chordae tendinae within the heart. The device is important because many patients do not have the stamina, or the required level of health necessary to survive open-heart surgery. A percutaneous procedure would be beneficial to these patients. This device could have a significant impact on the quality and length of patient's lives, and change how physicians perform this procedure.</p>
<p><b>Transfascial Hernia Fixation Device</b></p>	<p>Hernias are common surgical problems. Although hernias have been traditionally repaired by open surgery, laparoscopic repair is becoming increasingly more common. In this approach, small incisions are made in the abdominal wall, laparoscopic ports are placed, and the hernia defect repaired using a piece of prosthetic mesh. One of the most common laparoscopic hernia surgeries is laparoscopic ventral hernia repair. An important step in this operation is fixation of the mesh to the abdominal wall to prevent hernia recurrence. This fixation is usually achieved by tacking the mesh to the abdominal wall. Often the tacks do not provide adequate fixation, resulting in mesh migration and hernia recurrence. Many surgeons who perform this surgery reinforce the mesh by placing additional sutures. These sutures, referred to as 'transfascial sutures', are placed to provide long term secure fixation of the mesh to the abdominal wall. Placement of these sutures is often difficult, and results in significant pain and discomfort to the patient. The team proposed a novel way to fix a mesh to the abdominal wall during laparoscopic hernia surgery. This new device is easier to use, thus reducing operating room time and costs. It is also anticipated that this approach will result in less post-operative pain, benefiting the patient.</p>

Everyone who attended the forum was extremely impressed with the high level of presentation and the discussion that took place during the forum. In terms of outcomes, certain companies might enter discussion regarding developing the technology further.

There was an excellent social opportunity for clinicians and students to network after the forum.

### Key Learning for the NHS and the NHS Technology Adoption Centre

- ‘Delegating innovation’ from the busy clinician to another partner has the potential to increase the levels of innovation.
- Direct engagement of the future leaders in biomedical engineering industry by prominent clinicians is excellent for ensuring long term positive relationships between medicine and bioengineering. This approach also gives the opportunity for students to undertake a project involving real issues and test their learning in new areas.
- The NHS Technology Adoption Centre could use the CIMIT® Forum model to canvass opinions from clinicians, as to the problems they face – then horizon scan as part of a ‘Call for Technology Implementation Projects’ to map the submissions to the actual problems being faced.

Wednesday 12 March 2008

### 3.9 Operating Room of the Future

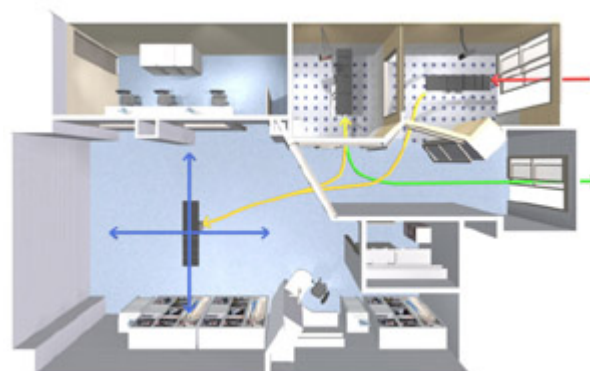
*Presentation by Coleen Kigin and David Rattner, MD*

Coleen Kigin introduced the session providing the context that it had been observed at a number of hospitals that the traditional operating theatre lent itself to inefficiencies and an operating theatre could be better designed. However devices designed to improving operating theatres tended to be ‘stand alone’ and were not coordinated with other developments. Furthermore these devices were often poorly implemented into the theatre environment.

CIMIT® thus introduced the “Operating Room of the Future” (ORF) project with Massachusetts General Hospital. The aim of the Operating Room of the Future was to be a platform that investigates new technologies and systems in a live theatre environment especially for minimally invasive surgery.

The purpose of the ORF is to allow “accurate data capture and analysis, multidisciplinary teamwork, and thoughtful integration of technology are the building blocks in this environment that optimizes patient safety and comfort, staff satisfaction, and financial efficiency.”

#### Operating Room of the Future - Layout



*Patient Flow through the MGH ORF*

Key aspects of the project included:

- The Operating Room of the Future was launched at Massachusetts General Hospital in August 2002 and was intended to be fully functional operating theatre.
- A variety of different individuals and companies were brought together for its development.
- The design of the ORF has been looked at a macro level to ensure process improvements in terms of patient flows.
- “Decision support systems combining patient-specific data with intelligent devices to create a peri-operative zone of safety” (CIMIT®, 2008) have been introduced.

- All medical devices used in the project had to meet “plug and play” standards for medical devices, a US national standard ensuring inter-connection between medical devices.
- Measuring outcomes to inform “evidence-based” Operating Room facility design.

have been changes in practice at other Operating Rooms across the United States.

One example of practice that has seen wide adoption is of key equipment in operating rooms being suspended from the ceiling so to avoid wires being on the floor. This is now becoming standard practice in new hospitals in the United Kingdom.

CIMIT® confirmed that many papers have been written following the formation of the Operating Room of the Future and that there

### Key Learning for the NHS and the NHS Technology Adoption Centre

- A range of companies were involved in this project and this needed a level of openness for the best to come of the project. Developing a culture of openness especially with competitor organisations can be difficult but when ground rules are established stakeholders become more confident in working with each other.

### 3.10 CIMIT®: Maxillofacial Reconstruction

*Presentation by Maria Troulis, DDS, MSc - Associate Professor, Oral and Maxillofacial Surgery, MGH*

The entire program and involvement with CIMIT® started in 1996. This was because of the clinicians’ interest and commitment to the field of distraction osteogenesis, a minimally invasive surgical technique which makes use of the body’s own healing potential to form bone and eliminate the need for a bone graft. It is a form of in-vivo tissue engineering in which bone forms in response to tension across a bone gap when activating a rigidly-fixed distraction device.

CIMIT® funded three of the five components.

- Laboratory component, where the comparison of the outcomes of standard techniques to minimally invasive ones are studied (National Institute for Health)

- Endoscopic techniques, where development of minimally invasive access to other parts of the face is studied (CIMIT®)
- Tissue engineering component (CIMIT®)
- Patient-oriented research, for retrospective and prospective clinical studies (National Institute for Health)
- Teaching component (CIMIT®)

*“Through the CIMIT® grant, this technique, to access the lower jaw using a small incision was developed and taken bench to bedside.”*

An example was given of a young child who has benefited from the procedure. It was stated that this area was not the most mainstream area of surgery however sometimes it is beneficial for niche areas to be tackled and the benefit given to individuals can not be underestimated.

### Key Learning for the NHS and the NHS Technology Adoption Centre

- The NHS focuses resources on the major conditions but sometimes less prevalent conditions need attention too. It is morally justified that a level of resource should be used to develop treatments for these conditions.

### 3.11 CIMIT® Selection Process

*Presentation by Kirby Vosburgh, MD*

Kirby Vosburgh gave an overview of the selection process of CIMIT® explaining it was not a static process. CIMIT® has both its own resources to invest into projects as well as orchestrating the financial support of projects

on behalf of other organisations. CIMIT® tries to

“be responsive and look at ‘new change’ not ‘new-old change’”

The initial criteria CIMIT® uses to select projects are:

- Clinical Impact
- Major change in practice and outcomes within a few years for an identified, differentiated tool
- Plausible case for clinical change – if an evidence-base states that there has only been one break-through, perhaps this is a project not to be invested in
- Clinician / Technologist leadership

Additional criteria include:

- It fits the CIMIT® mission, in that it is not pharmaceutical, not ICT and not basic research
- It brings together team members outside the normal range of collaborations by skills, experience and by organisation
- The project is not mundane or unduly aggressive
- The project will enable a major step change in the progress of a concept
- Relevant to the care of soldiers’ to meet the needs of the Department of Defence (DoD) funding.
- Supports the needs of the members of CIMIT®. There is a path to commercialisation.
- Supports Principal Investigator (PI) development (particularly to build careers in academic medicine).
- Broad impact: for example the technology or the concept is likely to apply beyond the narrow 1<sup>st</sup> application.
- Prior track record of the investigator / implementation team in terms of results and their CIMIT® citizenship

#### Key Questions

##### ***Do you get criticism for your selection process?***

Yes we do, but we have to do it somehow. Being strategic is the responsibility of the hospitals to implement the technologies. CIMIT® is trying to be incremental – they don’t just want ‘better’ technologies – they are looking for stepped change.

##### ***Are you robust with your selection criteria?***

Yes – however there are sometimes a range of projects that do not meet all the selection criteria though from a holistic perspective are a good idea. The organisation needs to have the confidence occasionally to go ‘off piste’ allowing exceptions to prove the robustness of the selection process.

#### Key Learning for the NHS and the NHS Technology Adoption Centre

- Do not send out an example of a proposal for project processes as it can potentially stifle creativity.
- Develop a mechanism so that a small proportion of excellent projects that do not meet all of a selection criteria can be selected.



**SAVE THE DATE!**  
**12 March 2008**

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**MARKET ACCESS TO THE UK'S  
NATIONAL HEALTH SERVICE**

**GUEST SPEAKERS INCLUDE:**  
PROFESSOR SIR MICHAEL RAWLINS,  
CHAIRMAN, NICE  
MELANIE OGDEN, ASSOCIATE DIRECTOR,  
GREATER MANCHESTER STRATEGIC HEALTH AUTHORITY  
GARETH REDMAYNE, EXTERNAL RELATIONS MANAGER,  
NHS NATIONAL TECHNOLOGY ADOPTION HUB

**LOCATION:** The British Consulate General, Boston  
**DATE:** Wednesday 12th March 2008  
**TIME:** 6:00pm-8:00pm

**TO ATTEND, OR FOR FURTHER DETAILS PLEASE E-MAIL:**  
valeria.bogomolnaya@fco.gov.uk

**NHS**  
National Technology Adoption Hub  
A National Resource Based in the North West

**BRITISH AMERICAN**  
BUSINESS COUNCIL OF NEW ZEALAND, INC.

**NHS**  
National Institute for  
Health and Clinical Excellence

The British Consulate General in Boston were informed that the Technology Adoption Centre were going to be in the area and asked 2 members of the team to present at a Market Access Event. A whole range of different organisations were present at the event including:

Academic and government / public bodies as well as several blue chip companies and SMEs were represented at the presentation.

The overall purpose of these events is to stimulate interest of potential foreign investment in the UK by United States firms as well as highlight to potential US companies of opportunities in the UK.

### Key Learning for the NHS and the NHS Technology Adoption Centre

- The NHS is a complicated market and economy and better explanations of its system would prove beneficial for inward investment into the UK. An NHS overseas office might prove beneficial.

### 3.13 Boston Health Care Associates

Boston Health Care is a boutique management consultancy that focuses on providing advice to pharmaceutical, diagnostic and medical technology companies regarding the marketing and distribution of their products.

Services include:

- Reimbursement advice
- Business development
- Market analytics

Three team members explained key issues were for the medical technology industry in the United States and why Boston Healthcare's services were in such demand.

Firstly it was emphasised that an understanding of the cost implications of a product for the user was vital regarding the product's marketing.

It was emphasised that “carefully targeted reimbursement strategies are the key to successfully launching new

medical products in today's cost-conscious health care environment” and companies needed to understand what the impact of their product would be the financial situation of hospitals and physician practices. In the United States this appears to have two aspects to it:

- The actual cost of using a medical device in terms of training time, consumables, staffing and other associated costs.
- The amount of money that can be billed to insurance companies from the use of a medical device product.

Much discussion took place regarding the large differences that exist between the NHS and the United State's insurance based model in terms of the fact that usage of a particular medical device in the NHS usually does not lead to the ability for a healthcare provider to charge more to a Primary Care Trust.

#### Key Learning for the NHS and the National Technology Adoption Centre

- With the further entrenchment of Payment by Results (PbR) and the choice agenda, it is likely that medical device companies in the UK will scrutinise in more detail the financial impact of healthcare providers introducing their product in a particular care pathway from the perspective of income generation. It will be interesting to see if some of the reimbursement issues seen in the United States transfer to the UK due to PbR.

**Sermo**

*Meeting with Alex Frost – Vice President,  
Research Initiatives*

Sermo isn't marketed as a social networking site – but more of a “knowledge ecosystem”

It operates in a similar way to a message board, where clinicians post questions and observations, and get responses from other clinicians in real-time to achieve better outcomes for patients.

Sermo has over 75,000 registered US physician members as of August 2008. Sermo's business model is information arbitrage where clients such as government

agencies, financial institutions and healthcare companies pay for the ability access the collective wisdom of the physician community. Sermo does not accept advertising and is free to US Physicians.

Sermo doesn't charge clinicians to participate in its network, indeed in some cases it can allow clinicians to be financially rewarded for their observations and clinical insights. This comes from companies who register with Sermo to access a stream of fresh and actionable information on emerging trends and market-changing events in healthcare.

Discussion took place regarding the impact of online networks with regards to healthcare technology.

**Key Learning for the NHS and the National Technology Adoption Centre**

- If Sermo enters the UK market it will be interesting to see what the market uptake compared to doctors.net
- Social networking is set to have a greater impact on clinical practice including technology usage as well as patient information.



## Lasting impressions ... one month on

The five days provided a huge insight and challenge to the usual approach taken to introducing new technologies within the NHS. We were inspired by the professionalism and generosity of CIMIT®, the commitment of its members and their willingness to share what had gone well and also what hadn't worked in some cases – with learning providing the ultimate outcome in a few cases.

Some of the people we met and projects we saw, made more of an impression than others, and have galvanised us into challenging “the norm” back in the UK. In addition to the content of our report, the following issues have left a lasting impression, that we haven't stopped telling people about since our return.

- Positive attitude and “can-do” culture that will allow clinicians to try new ways of working and technologies in a “safe” environment. Can the National Technology Adoption Centre replicate this culture?
- Valet parking for patients – when patients are ill and attending hospital, one of the most frustrating reported issues is trying to find a parking space – Mass General offer valet parking for their cancer patients to minimise the hassles when they are attending for chemotherapy/radiotherapy. Share the approach with the managed clinical networks – e.g. cancer networks
- Values of the CIMIT® organisation on the walls in the boardroom – it gave the feeling that these are people with common values to the NHS – and creates the mind-set – I can do business with these people. Do we need to explicitly remind ourselves (and our patients and carers) regularly of the values of our NHS organisations ?
- CIMIT® have a pipeline of suitable projects continuously being brought forward by their clinicians and companies, having established relationships over 10 years. Are there any of the CIMIT® projects in the US that would be suitable projects for the National Technology Adoption Centre ?
- Flexibility around the selection process for projects – although they have developed robust selection criteria – there are a few projects that had the “wow” factor that “trumped” the selection process at a given opportunity – can we have the same “entrepreneurial spirit” in a publically funded system?
- The projects and hospital management are clinician fronted – we do little to encourage clinician managers in the NHS – despite having medical and nurse directors on all NHS boards. The NHS next stage review has specifically required all NHS organisations to have a clinical board – would this now be the opportunity to target the Technology solutions via this route ?
- The US has a reward system that allows re-imburement of newer technologies to be used in clinical care – e.g. laparoscopic surgery vs open surgery. Can we replicate this in the Advancing Quality programme being piloted currently across the Northwest?
- Looking outside healthcare and working with unusual partners - the CIMIT® forum brought the MIT engineering students face to face with the clinical challenges of today's healthcare market – and gave them a time-limited project to develop solutions for - the students approaches were creative entrepreneurial and did not have the boundaries which the NHS and staff working within them have learned. Manchester has the same opportunity of a leading university facing the hospital's front door – yet we have little evidence of people crossing the road ...