



MATCH NEWSLETTER

Multidisciplinary Assessment of Technology Centre for Healthcare

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Welcome to Newsletter 6

Professor Terry Young

Welcome to our 6th newsletter. This newsletter reflects substantial achievements across all four of MATCH's projects.

- **Project I:** we have signed an agreement with BITECIC Ltd jointly to fund a position that will promote MATCH methods and tools through training. We have recruited Dr. Matthew Allsop, whom you will get a chance to meet over the next few months in workshops and seminars around the UK.
- **Project II:** Prof. Martin Buxton has been awarded a Lifetime Achievement Award for his significant and lasting contribution towards creating better health outcomes for people in the UK and across the world.
- **Project III:** this newsletter includes an article relating to forthcoming research and new MATCH PLUS Projects, as well as a piece recounting Dr. Jennifer Martin's work with the NPSA and details of the IEA Conference attended by PhD student Alexandra Lang.
- **Project IV:** we discuss Point of Care Technologies in Northern Ireland involving two parallel web based surveys.

An immediate challenge for us is our Year 7 IMRC Review, which will set the final course through to 2013. We have invested heavily in creating an impact during the last few years. If you have a story you could pass on to us of how MATCH has supported you or provided valuable insights, please e-mail it to me and we will ensure that it makes its way into our report.



Launch of New Partnership brings comprehensive value assessment expertise to Medical Device Sector!

Peter Taylor

BITECIC Ltd and MATCH, two organisations with respected track records in helping healthcare industry and commissioners assess the true value of innovative products and services, have joined forces to bring Industry and the NHS easier access to tools, methods and advice for achieving and demonstrating the value of new treatments. MATCH and BITECIC have been working closely for 18 months, jointly offering companies training and support in Health Economic Evaluation and Healthcare User Needs Elicitation, throughout the UK, in collaboration

with organisations such as the Association of British Healthcare Industries. "There's a clear synergy in this partnership", said Professor Terry Young from Brunel university. "MATCH is a successful developer of approaches and tools for assessing value and economic impact, while BITECIC provides ongoing operational support, especially to SMEs in the healthcare sector." BITECIC Director John Egan agrees. "This is an exciting opportunity for us to lend our experience in reaching out to a wider set of users who really need to understand and benefit from MATCH's

tools and guides as they enter a world that demands cost efficiency from new health technologies."

MATCH and BITECIC will concentrate on supporting the UK marketplace initially, and aim to extend into European, US and Asian markets within two years.



BITECIC

Eliciting and Using Information about User Requirements

Dr. Julie Barnett



One important focus of MATCH is the user of medical devices. Our programme of work in this area (Project III) is exploring the means, ease and value of assessing user needs requirements across various stages of medical device development. It aims to develop methods that are capable of accurately assessing user needs and presenting the data in ways that can be used by industry to produce products that will be improved from the users' perspective, that will lead to the intended health gains, and that will be cost effective.

The Project III programme for the next three years will be focusing on medical devices where the end users are primarily patients or carers rather than health professionals. We are developing a framework locating a range of self care devices to help us think systematically about important practical and conceptual issues such as adherence. Rather than assuming users are similar to each other we will also explore variations in device use across different types of users and the implications of this. As part of this work programme we will have two new PhD studentships (at Brunel and Nottingham) working in this area.

Of course, it is a key characteristic of MATCH work that it seeks to be relevant to the needs of companies and can be used by them to enhance their decision making processes. One thing we are currently working on here is an on-line tool to assist SMEs in choosing the best methods for establishing user requirements for a particular device.

Another exciting development in the last year has been the start of two other programmes of research that are aligned to Project III – one based in University of Nottingham and the other in University of Ulster. These are known as the MATCH PLUS projects.

The Ulster based project is exploring 'cognitive prosthetics' for people with dementia who have memory problems. Researchers have developed a solution which operates on conventional mobile phone based technology and has the ability to deliver video based reminder messages to the user at the appropriate times. The current project, being led by Prof. Chris Nugent, is extending this to include a detailed assessment of the impact of the technology on the quality of life of users at the varying stages of its implementation. It will also be assessing the value of incorporating additional user needs requirements during the process of medical device development.

The other MATCH PLUS project being led by Prof. John Crowe at Nottingham, aims to identify effective ways of incorporating information provided by users into health economic models. It is focused on developing and applying techniques that are suitable for eliciting perspectives of lay persons that can then be used to exemplify the value of including their needs in the processes of development, production and marketing of medical devices. The early work on the project is focused on characterising the medical devices that are most likely to prove a fruitful site for exploration and conducting work with users to discovering reasons for variations in adherence and the extent to which these are linked to features of the device itself.

We have a challenging set of research questions to address and we are looking forward to getting our teeth into these over the next 3 years. If you have any questions, if you have ideas for collaboration or if there are any ways we can help you, please don't hesitate to get in touch.



*Professor Ian Robinson Emeritus,
Dr. Sarwar Shah, Dr. Jennifer Martin.*

Brunel Professor Awarded Lifetime Achievement Award



Professor Martin Buxton receiving the award from Professor Sean Sullivan, of University of Washington (Seattle) who was chair of the ISPOR award committee, with Professor Mark Sculpher, previously at Brunel, who spoke about his research and achievements.

Martin Buxton, Professor of Health Economics, founder of Brunel's Health Economics Research Group (HERG) and MATCH Investigator, has been awarded a Lifetime Achievement Award for his significant and lasting contribution towards creating better health outcomes for people in the UK and across the world.

The 2010 Avedis Donabedian Outcomes Research Lifetime Achievement Award was bestowed on Professor Buxton by ISPOR (International Society for Pharmacoeconomics and Outcomes Research), a highly respected global organisation that promotes health economics and the evaluation of how health care interventions affect patient wellbeing. The Donabedian Award is presented to those whose research has shown demonstrable value to health outcomes, rather than purely academic achievement.

Professor Buxton, who is the eighth person to receive the prestigious award and only the second UK academic to do so, has been involved in research on the economics of health and medical care for over 35 years. His aim has always been to undertake policy-relevant research that is not just of academic interest but which will have a real impact on the effectiveness and efficiency of the healthcare system.

He has been involved in a large number of studies including international drug trials, evaluations of national programmes for heart and liver transplantation, screening for breast cancer and abdominal aortic aneurysms, assessments of the impact of medical audit and other organisational changes.

He has also been a member of the Appraisal Committee of the National Institute for Health and Clinical Excellence (NICE) and has advised most of the major pharmaceutical companies.

HERG, which Professor Buxton founded at Brunel over 20 years ago, has a well-established international reputation in health economics research. In the 2008 RAE, 95% of HERG's research activity was of an international standard, and 15% world-class. These impressive results helped elevate the HERG team and Brunel's related health research areas to 7th in the UK rankings for Health Services Research.

Speaking about receiving the award, Professor Buxton said:

"I am naturally delighted and honoured to receive this international recognition of my work, even if I fear that it might imply that they are not expecting much more of use from me. Let's hope I can continue to impress them for a while longer!"

Professor Buxton received his award at the ISPOR Fifteenth Annual International Meeting on 18 May 2010 in Atlanta, US.

Health Technology Assessment Considerations on Point of Care Technologies in Northern Ireland

Francis FitzGibbon



Project IV relates to implementation issues of tactical procurement and seeks to investigate means by which the value of new health technologies are assessed, particularly those which fall outside the remit of established health technology assessment. A key exemplar being lab-on-chip Point of Care Technologies (POCT). However, despite the fact that rapid diagnostic test advantages and improved clinical management, adoption and uptake of POCT within the NHS have been relatively slow compared to the US healthcare system. Two issues have been identified which act as barriers impeding uptake these include user issues and manufacturer pricing and reimbursement policies. MATCH in collaboration with MATCH partner, 'Adams Business Associates', has completed a study addressing these issues specifically within the NHS in Northern Ireland, in addition to those raised previously by Huckle et al, (2006 & 2008).²

The research involved conducting two parallel web based surveys in the form of structured questionnaires. One surveyed cardiac POCT device users within all 5 NHS Trusts in Northern Ireland, in order to identify significant user issues. The other survey appraised 5 UK manufacturers and suppliers of cardiac POCT devices to the NHS, to assess how their pricing and reimbursement policies impact on adoption within the NHS in Northern Ireland. The research also addressed how user and manufacturer pricing and reimbursement policy barriers might be overcome in order to facilitate better POCT implementation within the local NHS.

PART 1: User Issues, indicated that the most frequently reported POCT devices used within Northern Ireland Trusts were the Biosite Triage® and the Dade Behring Stratus CS. Drivers and incentives for enhancing POCT uptake were identified by users, such as patient convenience and demand, and improved clinical management. The clinician, nursing and laboratory users indicated that these were not influenced by financial profit or NHS government policy, suggesting that UK central government NHS policy drivers are not readily absorbed at the operational level within the regional Northern Ireland NHS. Issues including cost/test were perceived as significant adoption barriers by clinicians and nursing respondents, in addition to quality assurance, training, safety and accreditation. Laboratory scientist user respondents scored POCT consumable costs higher as an uptake barrier together with quality assurance, training and safety, though less for accreditation. All user respondents indicated that improved quality assurance measures such as ISO 22870 accreditation and better training and safety act as significant POCT uptake enhancement factors which contribute to satisfying NHS departmental and health trust clinical governance. POCT device user respondents within Northern Ireland NHS health Trusts emphasised the vital role of POCT coordinators within the NHS in relation to planning and regulating POCT implementation.

PART 2: Pricing and Reimbursement Policy Issues, identified three different procurement options for the POCT devices, Abbott i-stat, Biosite Triage®, Dade Behring Stratus CS, Response Biomedical Ramp and the Roche Cobas h232. These included, direct purchase, lease-rental & free product placement. The latter option depended on the purchaser achieving a mean annual threshold purchase volume of 1000 tests/year. NHS procurement favours the purchase option. The manufacturer survey also found that cardiac marker test panels may be supplied in either single or multiple test formats. Test panel pricing may be either fixed, irrespective of the annual purchase volume, or based on a discounted scale dependent on exceeding the threshold annual purchase volume. Biosite and Dade Behring, used fixed pricing for test panels. The other manufacturers Abbott, Response Biomedical & Roche adopted a discounted scale pricing policy based on exceeding the annual threshold purchase volume. The discounted test panel pricing option enables manufacturers to increase their market presence and to overcome the perceived test cost procurement barrier. Finally, the implications of the proposed changes to the NHS pathology tariff bundle were discussed in relation to its likely impact on POCT device uptake in the UK NHS.

The findings have resulted in two publications: Barriers Affecting the Adoption of Point of Care Technologies used in Chest Pain Diagnosis within the UK National Health Service (NHS): Part 1 – User Issues. Part 2 – Manufacturing Pricing & Reimbursement Policy Issues. This research further expands Match research in this field by FitzGibbon et al (2008).³

1 Adams Business Associates, 3 Buckingham Place, Oxford Road, High Wycombe, Bucks HP13 5HW.

2 Point of Care Diagnostics: will the hurdles be overcome this time? Huckle, D. *Expert Rev Med Devices* 2006;3(4):421-426. Point of Care Diagnostics: an advancing sector with non-technical issues. Huckle, D. *Expert Rev Mol Diagn.* 2008;8(6):679-688.

3 User Perspectives of Cardiac Marker Point-of-Care Testing for Hospital-Based Chest Pain Diagnosis. FitzGibbon, F.; Meenan, B.J.; Brown, A.; Dixon, D. *Point of Care: The Journal of Near Patient Testing* 2008;7(2):47-53.





Professor Terry Young was invited to speak at the Almaden Institute annual invitation-only conference, held at IBM Research – Almaden in San Jose, California, April 28-29, 2010. This influential conference brings together leading, deep domain experts in a particular area, in a program that aims to foster interaction and collaboration. Previous topics include privacy, the future of work, cognitive computing, complexity, nanotechnology, and energy storage. Past speakers include Nobel Laureates Burton Richter, Gerald Edelman, Richard Smalley, Horst Stormer, and Gerd Binnig, technologist Brian Arthur, Palm/Numanta CEO Jeff Hawkins, and many other distinguished academic, government, and industrial researchers and leaders.

The topic of this year's institute was "Smarter Health through Modeling and Simulation." The idea is this: The health of any nation is a complex system of systems – changes in agriculture, transportation, economics, family life, medical practices, and many other factors can have a profound influence on health and health costs. Decisions about investment in prevention or treatment programmes lead to many complex system interactions and consequences. For example, the treatment of chronic disease presents issues that the health sector alone cannot address. Problems such as obesity reflect cultural, social, educational, political, and economic conditions as well as policies, practices, costs, and prices of industries such as advertising, transportation, agriculture, and more.

Taking account of such a broad range of concerns in health decision making raises technical problems and human problems, and requires input and exchange among stakeholders from many different places and disciplines, such as government, industry, academia, not for profit bodies, public policy, economics, medicine, and modeling, to name just a few. The Almaden Institute brings together experts from all these diverse domains to establish conversations and connections that will drive ecosystem-wide, fact-based, and scientifically sound decision making about health.

Terry's talk is now available on YouTube http://www.youtube.com/watch?v=lyic_yo8Fas

MATCH Tools Workshops

Dr. Matthew Allsop



Dr. Matthew Allsop was recently appointed to the newly created, jointly funded MATCH-BITECIC role, with responsibility for facilitating easier access to MATCH tools, methods and advice for achieving and demonstrating the value of new treatments for both Industry and the NHS. Here Matthew introduces himself and talks about some of the opportunities offered by his role.

"As a Senior Project Manager at BITECIC Ltd, I will be supporting the MATCH-BITECIC partnership through the delivery of workshops to industry members, in which the existing and emerging tools will be discussed and explained, alongside promoting and supporting closer collaboration between BITECIC, MATCH, and those applying the tools within their own projects. I am excited about extending my work within the development of medical devices, and delighted that this can be done alongside the diverse and highly-skilled teams that comprise MATCH.

My own background training is as a psychologist, before I undertook my PhD in design engineering at the University of Leeds, where I was involved in a range of research projects that examined the involvement of users in the design and development of healthcare technology.

My company, BITECIC Ltd, is a spin-out company from the White Rose Universities' consortium and manages collaborations, as well as providing professional services to industry, universities and healthcare professionals in the fields of biomaterials, tissue engineering and related health technology.

Details of all forthcoming workshops in which I'll be involved will continue to be publicised through the MATCH website at <http://www.match.ac.uk/news/workshops.aspx> ."

IEA Conference summary for MATCH – Oct 2009

Alexandra Lang (PhD Research Student)



My name is Alex Lang and I am researching Medical Device Design for Adolescents. To date, the research project has explored the design and use of medical devices for, and by, adolescents and whether as a specific user group their needs are met.

The paper I submitted to the International Ergonomics Association Congress details the design and application of workshops with healthy adolescents as proxy users of the medical devices. These workshops provided evidence to support the hypothesis that adolescent user requirements are not adequately understood or considered in the design of medical devices and also demonstrated the importance of methods which are designed inclusively for this population.

Here is a brief account of my first conference experience.

Did the paper really get accepted? Have I read that right? Yes...it did! I'm off to the 17th Triennial Congress of the International Ergonomics Association!

A few months later, somewhere outside of Beijing in a huge conference venue....

The Congress is enormous, with over 2000 delegates and 700 presentations. Initially I have the thought of just spending the whole week standing against the wall, trying to blend in and not catch anyone's eye; this might save me from horribly embarrassing situations like saying something daft or actually having to explain my research.

Obviously this did not last long and I was soon chatting to a group of Canadians abouttravel...so far so good, I have not let on to anyone that I feel like a complete fraud.

Following this social breakthrough, the conference ticked along nicely showcasing some really interesting research by ergonomics researchers and practitioners. On the 3rd day of the conference it was my turn to present and also chair one of the healthcare slots. Having been nervous in the run up to my session, the reality of chairing did not turn out to be as bad as the anticipation. Although a traditional Chinese gong would have been useful to keep some of the speakers to time! As for my research, it was very well received with my target

user group of adolescents being a particular interest to the audience.

The conference has increased my awareness of how novel the focus of my research is. Even within Ergonomics on a broad scale and not just in healthcare, research involving this user group is still very scarce. It also appears that much of the work being done within the healthcare field focuses on the topical areas of patient safety and organisational issues. Very few of the presentations addressed the needs of users in regard to patient requirements; outside of the safety aspect, and so it is ever more apparent that the work being done within MATCH stands out by addressing the needs of users and not just the system.

The conference agenda culminated in a banquet with traditional food and entertainment, providing a very memorable round up to my first international conference. All in all, it was a fantastic experience. I hope to be able to return to China and explore more of its fascinating culture. Additionally I can also now look forward to my next conference, this time with less trepidation, armed with the confidence that this one has provided me with in respect to both my abilities and my ongoing research.

Working at the NPSA

Dr. Jennifer Martin



In 2009 I spent 9 months working at the National Patient Safety Agency (NPSA) after I was appointed as their Human Factors Lead, covering the position of Dr. Bev Norris whilst she was on maternity leave. Whilst I was there I ran a number of human factors projects within individual NHS trusts and advised the Welsh Assembly Government on how to improve patient safety.

A major part of my role was to analyse the safety incidents reported to the National Reporting and Learning System (NRLS). Since 2003, over 4 million patient safety incidents have been reported by healthcare staff; this data provides the NPSA with the ability to identify risks and hazards across the NHS. One of my tasks was to establish the root causes of these and to use human factors principles to develop strategies to prevent similar incidents from happening in the future. This was often difficult; in many cases, either reports provided insufficient detail, or they appeared to attribute the incident to a simple mistake made by themselves or someone else. Often when I investigated further I realised that there were a number of different factors that had contributed to the incident, and that the error was an inevitable consequence of failures within the system such as: patient notes with missing or incorrect information; unavailable or poorly maintained equipment; or the fact that the person who made the mistake had been at the end of a 12 hour shift with no breaks.

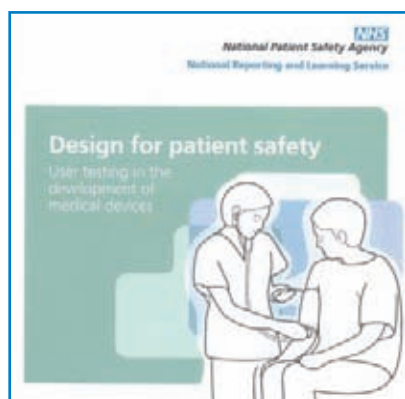
It was particularly interesting to see the number of incidents where a medical device was directly implicated. In many cases this was due to devices being poorly maintained or malfunctioning. However, there were also a number of incidents where the device in question had functioned exactly as the developer had intended but a patient had still been harmed. Some of these were related to the design of the device e.g. unintuitive controls or inappropriate feedback – whilst others were the result of issues such as inappropriate storage; missing or ignored warnings; a lack of training; or devices being used for tasks which they hadn't been designed for.

One way of preventing these types of incidents is to consider safety when purchasing and adopting medical devices and I initiated a project to investigate how human factors can be used to improve purchasing decisions. I suggested to the NHS Supply Chain that they include safety information on their online catalogue (NHS Cat), and allow developers to present evidence of how their devices meet NPSA safer practice notices or address current safety concerns. When this is in place, it will provide purchasers with easily accessible and up-to-date information and, hopefully, help us reach a point where there is a tangible commercial advantage for developers that take a broad and holistic view of device safety.

Another of my responsibilities was overseeing the joint MATCH and NPSA publication 'Design for Patient

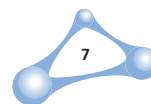
Safety: User testing in the development of medical devices'. The aim of this document is to provide developers with guidance on how to perform user testing of medical devices; a vital step in producing devices that are safe, clinically effective and meet the requirements of their users. The guide has been reviewed by bodies including The Department of Health, MHRA (Medicines and Healthcare products Regulatory Agency, The National Institute for Health and Clinical Excellence (NICE) and The Association of British Healthcare Industries (ABHI) and I'm delighted to say that it has now been published. It is available for download from the NPSA website, (<http://www.nrls.npsa.nhs.uk/resources/collections/design-for-patient-safety/?entryid45=74946>), however if you would like a hard copy then please contact me.

Working at the NPSA was a great experience. It gave me the opportunity to see firsthand how poor medical device design can result in death or severe harm to patients and to apply the knowledge and skills I've developed in my research career to solving important problems within the NHS. I've come away with a clear appreciation of the importance of the work that MATCH is doing as well lots of ideas for further research in this area.



NHS

National Patient Safety Agency



CEOs' Breakfast

Elizabeth Deadman



The MATCH Team at Brunel University held a CEOs' breakfast hosted by the Vice-Chancellor, Professor Chris Jenks, earlier this year at Brunel University. The purpose of this private function was to inform Chief Executives and Senior Company Officers of the emerging results from the MATCH programme related to investment and pricing decisions in markets subject to value-for-money evaluation (such as those informed by NICE guidance). We also solicited the views of our guests on how best to steer this highly promising research.

The rationale behind this topic is that, while manufacturers have become increasingly aware of the need to articulate the value of their technologies when bringing them to market – for instance in submitting evidence to a NICE appraisal, there has been limited scope for using this evidence to inform internal decisions. Recently, however, methods have been developed to enable the same value-based thinking to be applied internally in deciding which technologies to invest in, how to manage risk

along the product development pathway, or how to set prices.

MATCH is running a series of events that have proved to be a great networking opportunity for people within the healthcare industry. This event extends the usual brief by focusing on the strategic implications of the MATCH Programme.

If you would like information for future events, please contact Elizabeth Deadman.

About MATCH

MATCH is a collaboration in the field of healthcare technology assessment involving four leading UK universities and a cohort of industrial partners from the sector. It provides a critical research mass stretching across the UK healthcare technology sector.

It supports companies and user communities by creating methods to assess value, from concept through to mature product, and by engaging with regulatory bodies at home and abroad.

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