NHS CFHEP / 003 Evaluation of the pilot implementation of an IT specification for a blood tracking system.

The NHS Connecting for Health Evaluation Programme (NHS CFHEP) was established in April 2006. A main aim of the programme is to commission research on behalf of NHS Connecting for Health (NHS CFH), the Agency responsible for implementing the National Programme for Information Technology (NPfIT).

This call for proposals is to evaluate the pilot implementation of an IT specification for a Blood Tracking system. This will commence in September 2007 for one year in Mayday Healthcare NHS Trust. A further two health care trusts, in Central and Northern England, may also be involved in the evaluation, to allow comparisons with different electronic systems.

We request proposals from independent teams that are able to evaluate the system with a valid evaluation tool capable of withstanding independent scrutiny. The applicants should be prepared to demonstrate their independence from both the provider of the IT system and the organisation within which the system is being implemented.

Up to £200,000 has initially been made available for this project. Registrations of interest should be sent before 4pm Monday 16 July 2007. Further information and an application form can be obtained from http://www.pcpoh.bham.ac.uk/publichealth/cfhep/ or by contacting Nathalie Maillard on 0121 414 2634 or n.c.maillard@bham.ac.uk

The closing date for applications is 4pm Monday 6th August 2007.
CALL FOR PROPOSALS

NHS CFHEP / 003

Evaluation of the pilot implementation of an IT specification for a blood tracking system

NHS Connecting for Health Evaluation Programme
FURTHER PARTICULARS

NHS CFHEP / 003
Evaluation of the pilot implementation of an IT specification for a blood tracking system.

Introduction
The NHS Connecting for Health Evaluation Programme (NHS CFHEP) was established in April 2006. The main aims of the NHS CFHEP are:

1. to commission, manage and bring to a successful conclusion, a programme of urgent research on behalf of the NHS Connecting for Health (NHS CFH) which is responsible for implementing the National Programme for Information Technology (NPfIT).
2. to influence the longer-term national research programmes to develop capacity in relevant areas and to commission related work.
3. to assist the Department of Health and The UK Clinical Research Collaboration (UKCRC) in providing access to information collected on computer systems installed under NHS Connecting for Health.

The core tasks of the NHS Connecting for Health Evaluation Programme are to:

- Assess the usability, actual usage, functionality and impact of pilot and delivered systems and services.
- Provide informative, timely feedback to NHS CFH, contractors, Trusts and other relevant parties about what works, for whom, when and how systems can be improved.
- Disseminate important results to stakeholders in and beyond the NHS.
- Promote an evaluative culture in NHS CFH and the NHS and help build the capacity to carry out good quality evaluation studies on information technology as it is implemented in the NHS.

This call for proposals from independent teams is to evaluate the pilot implementation of an IT specification for a new blood tracking system in Mayday Healthcare NHS Trust and possibly two additional health care trusts, in Central and Northern England, which will allow comparison with different electronic systems. The specification was developed by the National Patient Safety Agency (NPSA) in conjunction with the National Blood Transfusion Committee (NBTC) and the Serious Hazards of Transfusion (SHOT), and it is endorsed by NHS CFH.
NHS CFH and patient identification systems

NHS CFH is working in partnership with the NPSA on a number of patient safety issues that are believed to be fundamental components of good clinical practice. One of these issues is ensuring the accurate management of patient identification systems, so that the **right patient always receives the right treatment**. Within this context, ensuring that the right patient receives the right blood is essential.\(^1\) It is recommended that all NHS and independent organisations in England and Wales who are responsible for the administration of blood transfusions should “systematically examine their local blood transfusion procedures, using formal risk assessment processes, and appraise the feasibility and relevance of using bar codes or other electronic identification and tracking systems for patients, samples and blood products”.\(^1\)

**Background information**

In UK hospitals, errors occur at all stages of the blood transfusion process. Data from SHOT indicate that the most frequent serious incident associated with blood transfusion is “incorrect blood component transfused” (IBCT) by which patients receive blood intended for another patient, putting them at high risk of a serious reaction. According to this data, the most serious type of IBCT, ABO incompatible red cell transfusions, occurs at a rate of 13 to 36 per year in the UK, resulting in 2 to 3 deaths per year.\(^2\) This highly avoidable incident rate led the NPSA to set a goal of reducing the number of ABO incompatible red cell transfusions by 50% over a period of 3 to 5 years starting January 2005 as measured by the SHOT database.\(^1\)

Recent research has found that the most important factor in IBCT incidents is mis-identification of the patient during the transfusion process, most frequently at the point of the final identity check carried out between the patient and the blood to be transfused, and considers these errors to be entirely avoidable through the adoption of more modern measures to improve transfusion safety.\(^3\) Indeed, the findings of recent studies conducted in several UK hospitals conclude that the use of IT for hospital blood transfusion procedures including the pre-transfusion bedside check could be an effective solution to the problem.\(^4,5\) The results of these studies also indicate the importance of thoroughly evaluating any new adopted technology to demonstrate its effectiveness and ease of use, as well as its financial acceptability to hospitals.\(^3,4,5\)
The proposed IT specification: purpose and scope.

A standard specification for IT Blood Tracking systems has been developed by the NPSA based on work carried out by the ‘Do Once and Share’ blood transfusion project team for NHS CFH and the NBTC IT steering group. The specification is based on the experience of users of currently available systems and the identification of patient safety risks associated with the transfusion process. It is aimed at reducing blood administration errors, consolidating this improvement by ensuring the competency of all staff involved in blood transfusion, and emphasising the importance of the final patient identification check, and making progress towards a structured national approach to the use of IT in blood transfusion. It also incorporates the requirement to trace all records of blood transfusion components and products from donor to recipient for 30 years by the Blood Safety and Quality Regulations.

The specification identifies the functionality and safety issues that future systems will need to address, its main objective being to support the correct performance of key steps such as checking that the patient receives the right blood, and the automated tracking of blood products throughout the many stages of the transfusion process, from the initial ordering of a blood transfusion to its administration and subsequent updates to the patients’ records. The scope of the specification includes routine blood transfusion, transfusion for special requirements, emergency issue of blood, and management of returned and unused blood units. The specification focuses therefore on the actual requisites for an IT tracking system to work, from the arrival of blood products at hospital through to administration including the identification of the staff carrying out each step of the process, but does not attempt to define or include any additional processes or guidelines that may need to be implemented (for example, transferring or transporting data to or from local systems). It is also anticipated that the specification could be extended to cover other clinical tracking applications in the future, such as tracking drugs and pharmaceuticals.

The specification is capable of being supported by both barcode and Radio Frequency identification (RFID) technology.

The pilot of an IT specification for a blood tracking system

In May 2007 the NHS CFH announced that Mayday Healthcare NHS Trust had been selected to pilot the implementation of the new IT Blood Tracking specification. The Trust serves a population of 350,000 in the Borough of Croydon. It provides services at four locations, and includes A&E, comprehensive inpatient and day case acute care, outpatient’s services, therapy services and associated diagnostic services and maternity. The pilot will take place in the London Wing. However at the start of the
project the Trust will switch to RFID wristbands for all patients throughout the hospital.

The Trust’s Blood Transfusion Laboratory reported 23 adverse incidents during 2004 -2006 to SHOT. Added to these incidents approximately 200 blood samples were rejected per month due to poor labelling. In the same period the laboratory reported 38 non blood matching events to the Trust’s Hospital Transfusion Team and Hospital Transfusion Committee. These ranged from inappropriate storage of blood products and incomplete traceability tags to fridge failures. In October 2005 the Trust introduced a paper based system to comply with the traceability component of the EU Directive 2002/98/EC; but it has not been proven to be an ideal solution to the problem.

As a result of the deployment of the pilot implementation of the IT Blood Tracking system, significant changes to the working practices of the Blood transfusion Department and clinical staff involved in giving blood will be required. All blood transfusion samples will be barcoded in the pilot areas, active Radio Frequency Identification (RFID) tags will be allocated to blood bags by blood transfusion staff and entered onto the Asset Tracking System. All bags will have a new patient ID label which includes a 2D barcode. To ensure a safe outcome rigorous checking practices and procedures based on the specification will be complied with, and all clinical staff will be trained in the relevant competencies.

Trust Pilot Project Plan

- Jan - June 2007 - Preparation: suppliers selected, network installation, workflow analysis.
- July - Sept 2007 - Deployment: testing system to identify further needs to meet specification and correct problems.
- Sept 2007 - Start pilot implementation.

Further details of the implementation plan can be obtained from Chris Ranger at NHS CFH, at christine.ranger@npsa.nhs.uk
On completion of the pilot, the Trust will deliver a report to NHS CFH detailing:

- The system – kit, software and related procedures and protocols
- The actions required to design and install the system
- The project management, technical and administrative skills required to implement the system
- The changes in clinical and other working practices required to implement the system
- Deficiencies / problems identified with the system and its use
- Description of any amendments/updates made to the system after its initial implementation
- Lessons learnt from the pilot which could be relevant to other users of the system
- The response of clinical and other staff to the system
- The efficiency, effectiveness and reliability of the system particularly in terms of ensuring the correct matching of patients and blood
- A detailed analysis of the costs of system design, planning, implementation and operation
- Ideas for capturing and learning from the experience
- Which parts of the IT specification the Trust could not or did not test/pilot

The Trust will be asked to release interim reports and products during the course of the pilot. Applicants are advised to take this into account in their applications and to explain how they intend to make use of this information. The evaluation required by this Commissioning Team needs to take a more global and in depth analysis of the pilot implementation than that carried by the trust. In order to avoid potential areas for overlap with the Trust’s own internal evaluation we will urge the successful applicants to liaise with Mayday Healthcare NHS Trust as soon as possible. It is envisaged that a briefing day will be held for all applicants on Thursday 19th July 2007 to receive further details on the evaluation to be undertaken by the Trust.
RESEARCH REQUIRED

Overview
The NHS CFHEP wishes to commission both a formative and summative evaluation of the pilot of the implementation of the IT blood tracking specification. There is an obvious risk in combined formative and summative assessments, in that the formative component can become part of the intervention. The research team should say how they propose to mitigate this risk.

One of the purposes of carrying out a pilot programme is to assess whether the IT specification as it stands could be implemented across a whole organisation. We therefore expect applicants to consider employing evaluation methods that can assess the potential NHS Trust-wide implementation of the specification. A strong priority will be given to applications that:

a) intend to conduct theory based analysis of the findings
b) involve a combination of methodological and evaluation expertise
c) are capable of producing generalisable evidence that will draw out general lessons for further implementations relative to the management of patient identification systems.
d) provide clarity as to whether the IT specification as it stands could be implemented across a whole organisation.

Tracking the implementation
We are particularly keen to ensure that the patient experience is explored. We are also keen to ensure that the views of Health Care Professionals who use the system are explored. Conceptually, evaluation and implementation are distinct stages in the development of IT systems and solutions. However, in practice it is desirable to begin evaluation before implementation and to track subsequent developments to provide baseline data and to ensure the rapid proliferation of beneficial systems while managing the risks related to any change within a complex environment (such as clinical medicine). As this IT specification aims to ensure that patients receive the right blood at the right time, applicants are asked to consider both formative and summative data and data collection tools that will explore these aims before, during, and after implementation.
Specific research and methods

A) Collection of baseline data

We recognise that there is currently a lack of routine data collection concerning the blood transfusion process. However the National Comparative Audit of Blood Transfusion (2005)\(^9\) requires all hospitals to collect data on bedside checking, and the Blood Safety and Quality Regulations (2005)\(^10\) require hospital blood banks to maintain the data needed to ensure full traceability of blood and blood components from the point of receipt of the blood by the hospital blood bank. In addition, the NPSA safer practice notice requires hospitals by May 2007 to “have agreed to and started to implement an action plan for competency-based training and assessment for all staff involved in blood transfusions”.\(^1\) Minimum baseline data sets prior to the implementation of its existing system may be available from the John Radcliffe Hospital. It may be possible to examine these retrospectively in order to gain insight into differences in potential errors across time periods of a new system being deployed.\(^4,5\)

The applicants are asked to identify baseline data requirements at Mayday Healthcare NHS Trust. Opportunity for baseline and comparative data may be gained from the geographically separate part of the Trust where the pilot will not be implemented and which can therefore act as a control. There is a possibility for the Trust to collect this data prior to October 2007. However, this needs to be defined in discussion with shortlisted candidates in September. Applicants are also asked to consider alternative sites in Central and Northern England, which may allow comparison with other electronic systems. A potential useful aspect to this project would be to consider the effects and impact of running two systems in parallel (e.g. the paper based system with the electronic based system).

B) Efficiency and effectiveness analysis

As the frequency of errors is too low to use as an outcome measure, we ask applicants to observe checking errors throughout the blood transfusion process along with factors that may predispose to errors. We envisage that the research team will need to use direct observation to assess the performance of bedside checking procedures before and during and after blood transfusion, with the use of both surrogate measures for decreases in IBCT and interviews with staff during the implementation. For an example of possible surrogate measures see Table 5 in Davies et al (2006)\(^5\).
As part of its final report, the commissioned team is also expected to provide the NHS CFHEP with an analysis of the following points:

- Changes in clinical and working practices required to implement the system (for example, a step-by-step Table, Figure or Flow Chart of previous practice compared to the practice with the electronic system)

- Potential areas for lessons-learned. Some examples are: training, maintenance, equipment utility, technical and IT problems such as wristband printing and linkage between IT systems, problems with specific patient groups such as neonates and children, and use of the system out of-hours and for emergencies. It would be interesting to have information about the feasibility and best manner of doing parallel running (where a small area of the Trust runs an initial pilot for the IT specification whilst at the same time continuing to run a paper-based system) for blood / RFID technology. Likewise, any lessons learned around the process of the Trust deciding the level of business continuity they will follow would be very welcome as this is a key area of concern.

- Response of staff from all sectors to the advantages and disadvantages of the system, with the use of in depth interviews.

- The effectiveness, efficiency and reliability of the system especially in terms of the correct matching of patients and blood. This includes the time to undertake tasks at baseline and post-implementation, accuracy of undertaking and completing the processes, and the documentation of errors.

It may be beneficial for the research teams to undertake a cost-effectiveness analysis of the new system compared to the existing one in conjunction with Mayday Healthcare NHS Trust following discussions. Attention should focus on cost savings in terms of staff time and number of staff needed throughout the process. Other effects that are likely to be associated with implementation of the proposed IT system and that could potentially be measured include hidden “knock on” effects on other areas, such as a possible reduction in prescriptions, the rationalisation of blood use for routine operations, and a reduction in general blood wastage.
The need for collaboration
The Commissioning Group requests that applicants state explicitly how their evaluation and the proposed implementation procedure will interact, and how the evaluation and implementation team will work together. Where it is not possible to obtain all information necessary to specify the final protocol, the applicants are asked to spell out in principle how they will approach evaluation and collaboration with NHS CFH, the pilot trust, the system provider and NHS CFHEP.

We expect the successful applicants to arrange internal and external steering groups, the latter composed of members of the Department of Health, NHS CFH, NPSA, NHS CFHEP, Mayday Healthcare NHS Trust and patient representation.

Money and timescale
The total sum available for research costs is £200,000 over 18 months. However, if only the Mayday Healthcare NHS Trust is to be involved the total sum available will be £150,000. Yet, we invite applicants to say what they could achieve with up to 25% more or less.

It is very important that the successful applicants are able to start as soon as the contract is awarded and keep to timescale during the implementation. This will be a priority when assessing proposals, and therefore applicants must specify the measures that they intend to adopt in order to ensure that time schedules are met as far as project developments permit.

This is a two stage process, in which shortlisted candidates will be invited to give a presentation to Mayday Healthcare NHS Trust and the Selection Panel by mid September, before the final candidate is selected.

HOW TO APPLY
This is a two stage application process. The application form, guidance notes, evaluation criteria and standard DH R&D contract can be downloaded from http://www.pcpoh.bham.ac.uk/publichealth/cfhep/ or alternatively electronic copies can sent by contacting Miss Nathalie Maillard (see below). The deadline for submitting a registration of interest form is 4pm Monday 16 July 2007. The closing date for applications is 4pm Monday 6 August 2007.
For scientific/project enquiries, please contact the Programme Director, Professor Richard Lilford on 0121 414 2226 or r.j.Lilford@bham.ac.uk. For enquiries related to the application process, please contact the Academic Manager, Mrs Jo Foster (0121 414 3573) or fosterjm@bham.ac.uk or the Deputy Programme Manager Miss Nathalie Maillard 0121 414 2634 or n.c.maillard@bham.ac.uk.

Applications, consisting of 1 signed paper copy and 1 electronic version (CD or via email), and marked clearly with “TENDER" and the NHS CFHEP/003 "Evaluation of the pilot implementation of an IT Specification for a blood tracking system" should be sent to:

Mrs JM Foster, Academic Manager (NHS CFHEP), Room 237, Public Health Building, University of Birmingham, Edgbaston, Birmingham, B15 2TT, 0121 414 3573, fosterjm@bham.ac.uk.

N.B. Please ensure that the paper and electronic versions are identical. If any discrepancies are noted, the paper copy will be taken as the definitive version, and this may slow the progress of your application.

An important criterion for selection will be strength in depth among the applicants from the applying organisation. Applications from consortiums are encouraged but a lead organisation bearing overall responsibility for governance and delivery must be nominated. The applicants should affirm their willingness to work in collaboration with the NHS Connecting for Health and Mayday Healthcare NHS Trust and their willingness to be responsive to the needs of the funders. A track record of working in collaborative mode with funders is therefore an advantage. We welcome applications from outside the UK, but the work must be done in sites specified in this call.

**Standard DH R&D Contract:**

Applicants are advised to note that when applying for this research project that the standard DH R&D contract conditions will apply and these can be found on the NHS CFHEP website. [http://www.pcpoh.bham.ac.uk/publichealth/cfhep/](http://www.pcpoh.bham.ac.uk/publichealth/cfhep/)

N.B: We are keen that applicants have received their host institutions acceptance of this contract prior to their application being submitted. This is
because the research team are expected to start the project with minimal delays following announcement of the award.

We would also like applicants to indicate what work they can take on following the award but before the granting of ethical approval.

References

6. Related documents are available at: www.connectingforhealth.nhs.uk/delivery/serviceimplementation/nks/doas