ECS Accident & Emergency Pilot Project Implementation Evaluation

for ECS Programme Board

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Issue Control

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Contents:

Executive Summary

This paper evaluates the pilot of NHS Ayrshire & Arran A&E access to the Emergency Care Summary (ECS) system over a four week period during November 2005. The evaluation looks at technical, operational, human, financial and strategic dimensions. Key lessons learned are also described, with recommendations.

The key issue for the pilot was whether the availability of ECS would enhance the quality of front-line care. Would the system be used? Would the patient's experience be improved? Would the availability of better information reduce risk?

From the key perspective - patient care - the overwhelming message from the pilot is that the A&E access to ECS was a great success. Clinicians found it to be a valuable decision support tool that led to improvements in clinical efficiency, safer prescribing and higher quality of data being transferred onwards with the patient.

M**ost important of all, there were many situations where access to ECS had helped avoid an adverse outcome for the patient, in one case even helping save a patient's life.**

Issues which came up fall into three categories according to how simply and quickly they can be resolved, for example …

Could be resolved fairly simply and quickly

- training requirements and communications with users – need for some fine tuning was identified
- frequency of updates to ECS came up, hence although updates from GP systems are twice daily one patient presented to A&E between updates
- frequency of enforced changes to passwords – resolved already.

Resolvable but not immediately

- the need for a single sign-on solution for access to computer information systems
- the lack of ECS records from outwith the pilot Board area – will be resolved by end summer 2006

More strategic/ longer term to resolve

- from the technical perspective, implementation and robustness was effective. The important caveat was around lack of 24/7 support arrangements, which raises critical questions about business continuity that need to be resolved before national roll out for A&E.

- availability of patient information from organisations outwith NHSScotland.

Recommendations on these and other issues are made where appropriate and will be referred in the first place to the national ECS Project Board.

Notwithstanding the fact that some issues may be take time to resolve, on the basis of the success of the pilot it is strongly recommended that NHS Ayrshire & Arran A&E departments continue use of the ECS 'as is'.   It is also recommended that A&E departments across NHSScotland are encouraged to use the standalone ECS utility and that funding should be provided to facilitate implementation where required.

1. Introduction

1.1 Purpose

This document sets out the evaluation of pilot study of NHS Ayrshire & Arran Hospitals Accident & Emergency departments access to the national Emergency Care Summary Store over a four week period during November 2005.

The document:

- describe the findings from the pilot study

- outline the key lessons learned

- reports on the conclusions formed

- makes a specific recommendation with regard to Ayrshire & Arran A&E department continuation of use of the ECS utility

- and further recommendations in respect of rollout of ECS Access to other NHS Board A&E departments

In present form this document is a draft for discussion.

1.2 Intended Audience

National ECS Programme Board
National ECS Project Manager
Ayrshire & Arran ECS Project Manager
NHS Ayrshire & Arran A&E Consultants
NHS Ayrshire & Arran Chief Executive
NHS Ayrshire & Arran Head of IM&T
ATOS Origin ECS Management Team
SEHD Director of EHealth Programme
SEHD Clinical Informatics Lead

1.3 Related Documents

Description	Document Reference
EHealth IM&T Strategy	http://www.show.scot.nhs.uk/ehealth
National GMS IM&T Programme	http://www.show.scot.nhs.uk/gmsimt
GMS IM&T Programme Checkpoint Reports	http://www.show.scot.nhs.uk/gmsit
ECS Solution Overview	NHSiS-OVW-00027 06/05/04
ECS_DraftPID_vol.doc	**NHSiS-PID**-00010 06/05/04
National ECS Project Initiation Document	NHSiS-PID-00010 23/06/04 Revised
ECS Project Plan	NHSiS-PLN-000097
A&E ECS Pilot PID	

2. The Pilot

2.1   Background

NHS Scotland is in the midst of ambitious modernisation. New computer-based information systems will improve the delivery of care by ensuring the right information in the right place at the right time. The Emergency Care Summary is one of a suite of key national IT products being developed to achieve this goal. It is envisaged that ECS Store will form a major part of the future national *Electronic Health Record* (EHR), providing access to patients' Emergency Care Summary Data.

The need for the ECS Store arose out of the way in which NHS Scotland is changing how Out of Hours Services are provided**.** The GMS IM&T Programme sponsored the initial Emergency Care Summary Implementation Project to provide Out of Hours clinicians with access to key patient information.

2.2   Overview of the utility

The ECS dataset is extracted from the local GP practice's computer system utilising an amended version of the national e-links Partners transport software. The ECS batch files are then presented to the national ECS Store web services, where file data quality is audited prior to storage. National security standards are abided by in all ECS file transfers. Each ECS record contains patient demographics information, clinical data on allergies and medication, and technical data i.e. consent and registration status. Any change to the content of a patients ECS record at the GP Practice will result in a new ECS file being created. The up-dated files are retrieved by the national ECS Store twice daily. The OOH clinicians have been provided with web browser access to search and view a patient's ECS record whenever a patient contacting OOH Services for health care advice/treatment provides them with his/her consent to do so.

The initial ECS pilot was successful and currently national rollout of ECS to OOH Services across NHS Scotland is underway. This national OOH Service rollout includes NHS24 access to ECS.

The intention at project outset was to quickly expand access to the ECS Store to Acute Accident & Emergency and Ambulance Services. The rationale was that the ability to access clinically accurate patient healthcare data would bring a number of important benefits:

- facilitate better clinical decision management,
- provide insight to a patient's past medical history, and
- potentially, improve prescribing safety.

2.3   Scope of evaluation

This evaluation will review Ayrshire & Arran Accident & Emergency Department's implementation and use of the ECS utility. The analysis will focus on the core technical, operational, human, financial and strategic dimensions of the project implementation.

Excluded: Initially it was also felt that Ayrshire & Arran Hospitals Acute Medical & Surgical Admission Ward access to the ECS Store should also be included in the pilot. However, the pre-pilot implementation study of patient information flows revealed that the majority of Acute Medical & Surgical admissions in Ayrshire & Arran go through the local A&E departments first. Therefore, Acute Admission Ward use of the utility would be minimal as A&E staff would provide the summary record along with the Admission card/sheet when needed.

2.4   The Approach

Due to resource limitation in the national ECS team, a pragmatic approach had to be adopted in setting up this pilot. Consultation over the feasibility of the pilot proposal with Senior Clinical and IM&T staff in Ayrshire & Arran took place quickly. These consultations primarily took the form of formal email, letter and face-to-face communication. Ayrshire & Arran requested a two week 'bedding-in' period of A&E department ECS use prior to commencing the formal review and this was sanctioned by the ECS Project Board. The A&E Evaluation Framework was tabled at the September 2005 ECS Project Board meeting and formal approval to proceed was granted by the Board.

The local Ayrshire & Arran ECS Project Manager then:

- arranged installation of the ECS web browser utility on all PC's in the 2 local Hospital A&E Departments (Crosshouse Hospital & Ayr Hospital)
- set-up and conducted the training programme for A&E Clinical staff on ECS use; and
- co-ordinated username & password allocation to the clinical staff.

An email was sent to all local GP practices in Ayrshire & Arran to inform them that the A&E ECS Access pilot was about to take place. Dissemination of the email was co-ordinated through the local ECS Project Manager and Primary Care IT division.

The author of this report adopted a facilitative role working alongside the local Ayrshire & Arran ECS Project team, attending meetings, maintaining regular telephone/email contact and encouraging a mutually collaborative approach to the overall evaluation process.

2.5   Participants

The Participants included:

- 1   The National ECS Project Manager
- 2   ATOSOrgin Technical Support Team members
- 1   Ayrshire & Arran ECS Project Manager
- 21 NHS Ayrshire & Arran Accident & Emergency staff:
    - 4 Accident & Emergency Consultants
    - 6 Staff Grade Doctors/SHO's

- o 3 Sister/Charge Nurses
- o 8 Staff Nurses

3. Evaluation Overview

3.1 Identification

For:	SEHD & NHSScotland GMS IM&T Programme
Location:	NHS Ayrshire & Arran
Project Name:	Emergency Care Summary Record, Accident & Emergency & Medical Implementation Evaluation
Start Date:	December 2005
Est. End Date:	March 2006
Estimated total Time:	3 months
Conducting the evaluation:	Kirsty MacLeod, eHealth Consultant, SEHD

3.2 The Aims

The aims of this evaluation are to:

1. Assess the Technical implementation of ECS:

- ➤ Was the technology deployed in the most effective way?

- ➤ Was testing effective?

- ➤ Was adequate training provided?

- ➤ Were the IM&T support arrangements useful?

2. Examine the Operational impact of ECS on the A&E Clinical staff:

- ➤ Did the A&E clinicians use the ECS utility?

- ➤ Did the clinicians encounter any problems when using the utility?

- ➤ Did the ECS system support clinical practice?

- ➤ Is there any evidence of avoidance of adverse events or health benefit gain as a result of more speedy access to accurate patient ECS data?

> ➢ Was the pre-implementation communication effective?

> ➢ Were the requirements of the ECS Access Protocol met?

3. Establish the Human impact of ECS on the A&E Clinical staff and the way they work –

> ➢ What has been the impact of the project on the A&E, Clinical staff?

> ➢ Did access to the ECS delivered the benefits that they personally expected?

> ➢ Were there effective consultation and feedback mechanisms?

> ➢ Did clinical work flow processes changed as a result of ECS availability?

> ➢ If the project had its time all over again, is there anything they would like done differently

4. Examine Financial issues -

> ➢ Did A&E clinician access to the ECS utility affect benchmarked positions (reference costs, prescribing budget, admissions etc.)

> ➢ Pilot Implementation Cost

> ➢ Cost of Continuation of Pilot

5. Examine the Strategic fit –

> ➢ What are the strategic dependencies between this ECS pilot project and other eHealth projects?

> ➢ What is the strategic relationship between this pilot and the planned future larger ECS integration project?

> ➢ Has A&E Clinician access to the ECS utility been beneficial?

> ➢ Has the further strategic direction for A&E staff access to ECS been formed as a result?

3.3   Ethical Considerations

All participants were assured of confidentiality and anonymity prior to participating in the interviews. But, while anonymity/confidentiality with regard

to data can be maintained, true anonymity may not be sustainable in the long term between clinical staff within the Ayrshire & Arran A&E department.

3.4   Materials/Apparatus

1. Project Management documentation
2. All formal project communication documentation pertaining to the pilot (emails & letters)
3. The A&E Clinical staff questionnaire
4. ESC Store SQL query printout data re department's use

3.5   DESIGN

A pragmatic design to the post implementation review evaluation was undertaken utilising both quantitative and qualitative data collection methods. First, all pilot project management documentation was reviewed. Then an interview schedule was developed to capture the A&E Clinicians' views on the technical implementation process, communication structures, the operational and human impact of ECS implementation and utility use, and to establish benefit delivery, if any, as a result of having access to ECS**.** The interview schedules mainly comprised a combination of both closed and open-ended questions. The interviews were conducted over one day – one morning in one hospital A&E department and the afternoon in the other.

SQL (sequel) report queries were run regularly on the ECS Store database to retrieve quantitative data on overall use of the utility, by the A&E Clinicians over phase one of the pilot.

Footnote: The original pilot design proposal was split into two parts and was initially accepted by two A&E departments. Part 1 (this study), a one-month observation period where A&E clinicians would be provided with access to the ECS Store and their use, and views on the impact of utility provision would be ascertained. This was to be followed by part two another four week period where A&E Receptionists would access the ECS Store for each patient that attended the department via the front desk. However, towards the end of first part of the pilot both A&E departments declined to participate in the second section. The principal reasons sited for this were:
> ➢ A general feeling that it wasn't necessary to access ECS for all patients attending A&E
> ➢ ECS was generally being used for acute situations not walk-ins
> ➢ It would reduce the speed by which the receptionists process patients at the front desk (logging in & out of 2 different systems)
> ➢ Costs involved in printing out ECS record (paper & printer ink cartridges)

> ➤ Too few printers in the A&E department as it is – this would permanently put at least one out of commission
> ➤ Concerns about confidentiality – in relation to having all that paper lying about in the A&E department

Therefore, following a quick preliminary analysis of the findings of part one of the pilot, it was agreed that section 2 would be shelved and, in its place, the pilot period would be extended for another month and the usage figures monitored.

3.6   Setting

All A & E clinical staff interviews took place in their natural work environment: that is, their respective operational A&E departments during day time shift.

3.7   Data Analysis

Multiple data sources will be used in the post implementation evaluation:

The technical evaluation - a systematic analysis was undertaken of all project management documentation pertaining to the pilot. The findings were cross-referenced and combined with the content analysis of the completed interview schedules with the A&E clinicians

The operational impact of the ECS pilot was measured by combining the findings from SQL queries on actual system usage and cross-referencing this data with reported system use from the A&E clinician interview schedule data.

The human impact of the pilot ECS implementation was measured through content analysis of specific questions pertaining to 'work environment' in the A&E clinicians interview schedule.

Financial evaluation – even though a detailed financial evaluation was not feasible due to the short duration of the pilot, the indications are that there is potential for savings.

Strategic evaluation - the overall evaluation of the pilot gives us an opportunity to take stock and to inform the future strategic direction of the ECS project.

4. Evaluation Results Part 1

4.1 Technical

Was the technology deployed in the most effective way?

<u>Yes</u>: following direction from the national ECS Project Manager, the URL to the national ECS Store was installed on the Citrix meta-frame at Ayr Hospital and an ECS icon was made available to 15 A&E department PC's. At Crosshouse Hospital the ECS URL was set up on a further 15 PC's in their A&E Department. Installation was arranged for a time that was mutually convenient to both the local ECS and ATOSOrigin technical teams and the two A&E departments. The set-up process was straightforward. All A&E PC's used in the pilot had Internet Explorer Version 6.0 in place and an NHS.net connection.

Was testing effective?

<u>Yes</u>: initial testing was carried out using the ECS test system in order to get a feel for any potential problems prior to live use. A second round of testing was then conducted with real usernames & passwords in the live A&E environment prior to the 'go-live' date. Again, testing was arranged for a time mutually convenient to both the technical teams and the two A&E departments. No significant problems were identified during testing.

Was adequate training provided?

<u>Yes</u>: Under direction from the local ECS project manager, the ECS Team Lead both co-ordinated and provided all ECS training to the two A&E departments' clinical staff. Training was arranged for a time that was mutually convenient to both parties (trainer & staff member). A cross-reference with the interview schedule data showed that 20 of the 21 A&E Clinicians interviewed had actually received training (all 20 from the ECS team leader/IT trainer). The one participant/staff grade doctor who had not received ECS training was in fact just starting her second week in the department. All 20 A&E Clinicians reported that the training they had received was adequate for their needs.

Interestingly, one key issue highlighted by the four A&E Consultants (participants) was the actual timing off the ECS pilot in relation to the training of junior Staff Grade Doctors. In Ayrshire & Arran, junior hospital doctors in A&E change/rotate through to other hospital departments every four months. The ECS pilot had commenced two weeks after the induction of a new group of Staff Grade doctors. All four Consultants felt that it would have been more practical/preferable to have included ECS training in the junior doctors' first-week induction programme. In fairness to the local ECS IT team had not been made aware of this specific 'timing

issue' in relation to the junior doctors' changeover when planning the pilot implementation.

The key lesson learned here is that for future roll out of the system it would be helpful to ensure more detailed consultation/communication with local stakeholders in order to identify any potential for fine-tuning the implementation to take account of local issues.

Were the IM&T support arrangements useful?

Partially: During the day, both A&E departments were provided with a dedicated ECS Support Desk telephone number. Over the pilot period, the majority of Support Desk calls concerned setting up new user accounts or re-setting forgotten usernames and/or passwords. A cross-reference with the interview schedule data showed that 70% of clinicians who actually used the ECS utility reported this particular service to be efficient.

The creation of Nominated Clinical Super Users to manage similar issues overnight was not as successful. Both A&E departments reported a few incidents where the Super User had forgotten their own password, resulting in ECS user access account dilemmas not being resolved until the next day/shift duty.

In addition, Crosshouse Hospital A&E clinical staff also highlighted two other local technology support issues that had arisen during the pilot:

- during one night shift they had received a 'blocked local network' message every time they tried to access ECS
- during the course of another night shift the printers stopped working (printer server problem), so they couldn't print out ECS records

Neither problem was rectified until the following morning.

There seems to be an inherent contradiction here: National Services Scotland are providing 24/7 support for the central store part of the system, but local parts of the system are supported locally through arrangements that rarely match the level of central support. Of course, this is not simply a support issue: it is about business continuity.

In summary, the technical implementation and testing were effectively managed. The training was felt to be generally sufficient, but better co-ordination with the junior A&E doctors' induction programme would have been helpful.   There was an intrinsic inconsistency in IM&T support arrangements. ECS is by definition a service that requires being available when the clinician needs it. Before the system is rolled out nationally, there should be clarity over the required levels of availability both at the centre and locally.   The design of the ECS system for the necessary resilience, recoverability and maintainability will need to go hand in hand with the design of support arrangements, backup and recovery processes and end user training that are also focused on the need for continuity of

service. It makes little sense to design the central parts of the system for high availability if system failures at the local level prevent it from being used.

4.2   Operational Implementation

Assessment of impact of ECS on delivery of front-line-care

Did the A&E Clinicians use the ECS utility?

<u>Yes</u>: the statistical data on Ayrshire & Arran A&E staff use of the Emergency Care Summary utility over the one month pilot period was ascertained by means of a SQL query run on the ECS Store.

Total Number of Records Accessed	168
ECS Demographic Records Access	86
Full ECS Clinical Record	82

The quantitative data was further analysed for patterns of use per A&E department, professional staff group and individual staff group member - see tables 1 & 2 below:

Table 1: Breakdown of ECS use by Hospital & Staff Group

Ayr Hospital		Crosshouse Hospital	
Total Number of ECS Utility Accesses:	**84**	**Total Number of ECS Utility Accesses:**	**84**
Demographic Records:	43	Demographic Records:	43
Demographic only:	2	Demographic only:	2
Full ECS	41	Full ECS	41
Actual Number of Accesses per staff Group:		**Actual Number of Accesses Per staff Group:**	
Doctors	36	Doctors	15
Nurses	7	Nurses	11
		Medical Receptionist	17

Initially these statistics appeared inexplicably identical. However, if you examine the breakdown in table 2 below, there is considerable variance in pattern of use by the two hospitals, therefore it is just coincidence.

Table 2: Actual ECS use by A&E Staff Group Members

Ayr Hospital		Crosshouse Hospital	
Actual No. of Doctors who used ECS	**5**	**Actual No. of Doctors who used the system**	**5**
Number of Accesses per Doctor:		**Number of Access Per Doctor:**	
Doctor 1	14	Doctor 1	5
Doctor 2	11	Doctor 2	4
Doctor 3	9	Doctor 3	3
Doctor 4	1	Doctor 4	2
Doctor 5	<u>1</u>	Doctor 5	<u>1</u>
	36		**15**
Actual No. of Nurses who used ECS	**4**	**Actual No. of Nurses who used ECS**	**3**
Number of Accesses Per Nurse		**Number of Accesses Per Nurse:**	
Nurse 1	3	Nurse 1	6
Nurse 2	2	Nurse 2	3
Nurse 3	1	Nurse 3	<u>2</u>
Nurse 4	<u>1</u>		**11**
	7		
There were NO Medical Receptionist Accesses		**Actual No. of Access by Medical Receptionists**	**17**
		Number of Access Per MR:	
		15 MR accessed 1 record	15
		1 MR accessed 2 records	<u>2</u>
			17

A total of 82 full ESC records were accessed over the four-week pilot period. This represents reasonable utility usage in respect of a new information support tool. Although both A&E departments conducted exactly the same number of ECS record accesses during the pilot period, it was interesting to note the variation in the volume of records viewed by the different professional staff groups at the two hospitals. For example, Ayr Hospital doctors viewed twice as many ECS records as Crosshouse doctors. On the other hand, Crosshouse Medical Receptionists accessed a reasonable number of ECS records, whereas Ayr Medical Receptionists did not use the utility at all.

In order to find explanations for the differences, and to add context to the access activity data, these results were evaluated against the A&E clinician interview transcript data on reported system use:

- 12 (60%) of the 20 A&E Clinicians trained to use the ECS system reported direct use of the utility.
- 8 of the 12 clinicians interviewed reported using the utility on multiple occasions.
- 5 (50%) of the 10 Ayr Hospital clinicians interviewed reported using the ECS utility. These were predominantly doctors, which correlates with SQL data in respect of Ayr hospital (see table 1 above).
- 7 (70%) of the 10 Crosshouse clinicians interviewed reported using the ECS utility. The doctor/nurse ratio here was 4:3 which again is similar to the SQL data in respect of overall use by Crosshouse hospital (see table above).

Unfortunately, no Medical Receptionists were interviewed at either hospital, as the author was unaware that they had been given ECS access. However, one practice reported by both A&E department clinical staff, but, more so by Crosshouse doctors, was the delegation of ECS access to specific team members in acute clinical scenarios:

> *'I often ask the nurse to access the information on my behalf when I'm busy with the patient in 'Resus' or if the nurse is busy the medical receptionists' (Crosshouse Doctor)*

> *'I often ask the nurse to get the ECS if I'm busy & can't remember my password' (Crosshouse Doctor)*

> *'If I'm busy I'll ask the receptions/clerk to get the ECS' (Crosshouse nurse)*

> *'I often use the ECS information fetched by another team member' (Ayr A&E sister)*

This is no more than efficient clinical resource management in medically challenging situations; it may also partially explain the difference in ECS access patterns between the two A&E departments.

40% (8) of the clinicians interviewed had been trained to use ECS, but had not directly used the utility themselves. The two main reason put forward for this were;

- they often delegated the task in an acute emergency scenario to another team member
- password problems, either forgotten or had expired before being able to use it

Indeed, half the clinicians who had not directly accessed the ECS utility had actually used the information in acute clinical situations. This is certainly reassuring. The password issue is discussed under 'problems' below.

Did the A&E clinicians encounter any problems when using the ECS system?

Yes: Five issues were identified:

1. Availability of other NHS boards ECS records in the national store

   Ayr Hospital clinicians pointed out that 50% of patient traffic through their A&E department is from Dumfries & Galloway. The ECS records for NHS Dumfries & Galloway patients were not in the national Store at the time the pilot was conducted. Therefore the Ayr Hospital clinicians could only potentially access ECS records for half the patients treated in their department during the pilot period. See comment below from Ayr sister:

   '50% of our patients come from Dumfries & Galloway; their records weren't there; I would have used it more often if they had been' (Ayr Hospital sister)

   'Half our patients come from Dumfries & Galloway. I tried a couple of searches but there were no ECS records for them' (Ayr doctor)

2. The quality of the ECS information

   At the time of the pilot patient ECS records were being updated twice a day - mid day and after 1800 hrs. Analysis of the interview data suggests that this is inadequate for A&E use, see comment below:

   'patients record wasn't up-to-date; the patient had been prescribed a drug earlier that day by GP, but it didn't appear in the patient's ECS' (Crosshouse Nurse)

3. Links to other systems

   The ECS only provides information about medications prescribed by GPs. The implication from the interview data is that it would be more beneficial for A&E if the ECS contained 'all' prescribed medications: i.e. NHS & non-NHS. See comment below:

   'We had a girl saying she was on certain medication – methadone; we looked up her ECS record, but it wasn't there. The girl was part of a methadone programme run by the 'bridge project' which is a local council run project – not NHS. There is no link between the drug rehab organisations and NHS. On this occasion we couldn't use ECS to corroborate her story' (Ayr Hospital Nurse)

4.   The frequency of password changes

Both Hospital A&E clinicians felt that the frequency of 'password changes' (every 30 days) was generally inconvenient and didn't coincide with other system password changes. Extracts from interview transcripts below:

'password changes are too often' (Crosshouse Consultant)

'password quick to expire, and it is a major annoyance that previous passwords cannot be used again after a change' (Crosshouse doctor)

we have to change our password too often & the timing isn't the same as the other IT system password changes, so its confusing' (Ayr doctor)

'issue with password before going on holiday, on return it had expired' (Crosshouse Charge Nurse)

5.   The lack of 24/7 IT support

The A&E staff referred to this in terms of two specific incidents, both of which occurred during night shifts. These were: a) blocked local network messages and b) printer server problem messages. The first prevented access to the ECS Store and the second stopped print out of the patient's ECS record. This specific issue is addressed in more detail in the Technical Section (page 12) above.

At the outset of the A&E pilot the three significant limitations described under categories 1 and 2 above in the system had been identified. While it was expected that the experience of clinicians during the pilot would confirm the practical significance of these shortcomings in the everyday use of the utility, the fact that some users of the system were unaware of them suggests there is room for improvement in pre-pilot communications and training for the user community.

Taking these issues individually, the availability of information across NHS board boundaries will cease to be an issue once national rollout of ECS   is complete and the appropriate information governance arrangements are in place. The timing of ECS updates, however, is an outstanding issue that need to be resolved as a priority prior to national roll out to other NHS Board A&E departments. This needs be raised taken forward by the ECS Project Board. The link to medication data prescribed by non-NHS agencies is significant but is not, as yet, an immediate priority.

Two of the issues identified were not identified before the pilot began: the frequency of password changes on the one hand and the general unavailability of local IM&T support over night on the other. The

password issue was immediately fed back to the local ECS team during the evaluation and the issue was quickly resolved (lengthened password expiry to 60 days). The lack of local 24/7 IM&T support is still outstanding, and this needs to be escalated to the national eHealth Programme Board.

In summary, the pilot was a success in that it delivered positive benefits to both A&E departments involved. On the whole there were relatively few problems, although five important issues were encountered. Three of these had been identified at the outset of the pilot and work to address the first two of is certainly underway. In relation to the methadone-type issue, for now we have to acknowledge that the full drug record cannot be achieved. One of the two remaining issues has been resolved (password expiry). The final issue, IT support and its relationship to overall system availability requirements, is still outstanding and needs to be addressed as a priority. These issues aside, the pilot has demonstrated that the ECS system is ready for national rollout.

Did access to the ECS system influence clinical practice?

<u>Yes</u>: firstly, the principal reason put forward by the A&E clinicians for using the ECS Store was to '*the need to know*' what medications a patient was taking, when no information or doubt existed over the data being provided. See extracts from interview transcripts below:

> '*when clinically we needed to know what drugs the patient was on*' (*Crosshouse A&E SHO*)

> '*when immediate treatment is required*' (*Ayr A&E Consultant*)

> '*when we have a clinical presentation which is of concern*' (*Crosshouse A&E SHO*)

> '*a collapsed patient and no information to hand on arrival*' (*Ayr A&E Nurse*)

> '*on both occasions it was when we had a patient in Resus and they couldn't give a history*' (*Crosshouse A&E nurse*)

> '*when we have breathless patients that can't speak*' (*Crosshouse A&E nurse*)

> '*mainly when we have confused or unsure patients, where the patient is poor at giving history & there's no family present*' (*Ayr A&E SHO*)

> '*to corroborate the medications a patient has said they were on*' (*Crosshouse A&E Consultant*)

There is an abundance of evidence from the interview transcript data that access to the ECS record data positively influenced the clinical practice of the A&E clinicians:

> *'yes it helps guide and quicken the decision making process'* (Ayr A&E SHO)

> *'yes the patients presentation became more clear when we saw the medication they were on'* (Crosshouse A&E SHO)

> *'yes undoubtedly, it is attention to detail. If you can verify accurately what medication a patient is on this both improves and speeds up the clinical decision making process'* (Crosshouse A&E Consultant)

> *'yes it helped us not prescribe something that was contraindicated, and not something the patient was allergic to'* (Ayr A&E SHO)

> *'yes, often patients come in and you suspect that they have alcohol abuse problems for example, but they don't divulge that they do, but their ECS records confirms your suspicions'* (Ayr A&E nurse)

Overall, it was clearly evident from the qualitative data, that all the A&E staff that used the ECS utility not only found it to be a useful clinical decision support tool, but also felt that it led to improvements in clinical efficiency, the quality of care delivered and the general management of the patients. Extracts from interview transcript below:

> *'there is less time spent searching for patient information by alternative means'* (Crosshouse A&E Consultant)

> *'there is a higher quality consultation – corroboration rather than interrogation'* (Crosshouse A&E Consultant)

> *'facilitates a quicker decision making process re drug administration in certain situations'* (Ayr A&E SHO)

> *'safer healthcare delivery – your not going to give them something they may have an adverse reaction to – particularly important if they are going to be admitted'* (Ayr A&E nurse)

> *'yes it is about attention to detail, all good clinicians care about attention to detail, access to a patient ECS improves the healthcare the patient receives'* (Ayr A&E Consultant)

> *'it takes ages to write up the patient's Kardex, having ECS speeds the process up enormously'* (Crosshouse A&E nurse)

In addition, most of the A&E clinicians who used the ECS utility felt that access to the patients ECS record resulted in a higher quality of data

being transferred onwards with the patient, potentially enhancing the follow-on care management the patient might receive.   Supporting transcript extracts are below:

> *'with ECS we pass on more clinically accurate patient information to the wards – this can only improve the care they receive' (Crosshouse A&E Consultant)*

> *'it helps us provide the wards with better quality information about the medication the patient is on' (Ayr A&E nurse)*

> *'for example we had a bradycardic patient, not on Beta blockers, and had forgotten the name of his cardiac medication – but it was there on his ECS' (Ayr A&E SHO)*

> *'we actually send the print out of ECS up to the ward alongside the patient's A&E card – it gives them accurate data' (Crosshouse Nurse)*

Was there any evidence of avoidance of adverse events or health benefit gain as a result of access to accurate patient ECS data?

Yes: All the clinicians interviewed who had used the ECS utility described scenarios where access to ECS had resulted in avoidance of an adverse health event. The clinical situations ranged from patients with Asthma, Epilepsy and Cardiac Anomalies through to the confused elderly, an unconscious patient, and attempted suicides. One illustration demonstrates access to ECS data helping save a patient's life. See interview extracts below:

> *'yes, in particular with Asthmatics and epileptics' (A&E Consultant)*

> *'yes, the bradycardic guy, that had forgotten what meds he was on' (A&E SHO)*

> *'yes, antibiotic sensitivity – patient unable to remember allergies and we couldn't query with GP' (A&E Consultant)*

> *'yes when we had an unconscious patient in Resus' (Crosshouse A&E Nurse)*

> *'yes with all overdose patients ECS has been extremely helpful' (A&E Consultant)*

> *'yes ECS access has helped us avoid overdosing patients on drugs they are already on' (Ayr A&E SHO)*

> *'yes, we actually used ECS to look up what drugs the patients father was on. The distressed father was with the patient, so we had explicit consent. The son had overdosed on the father's medication. But, by being able to determine quickly what the son*

had taken, we could act with greater clinical precision, accuracy and speed to save his life' (A&E Consultant)

In summary, these real life examples demonstrate that the availability of the ECS not only can but does in practice bring significant improvements to the quality of patient care delivered by A&E clinicians, and even, saves lives.

Was the pre-pilot communication effective?

<u>Partially</u>: All appropriate NHS staff who were required to provide permission for the pilot to proceed were consulted (see approach section above). All NHS Ayrshire & Arran GP practices with patient summary records in the national Store were informed of the pilot in advance of its taking place. The communication between the national ECS Project Manager, ATOSOrigin, the local ECS Project Manager and A&E departments with regard to the technical set-up, and testing, was well coordinated and efficient.

Indeed, all 20 A&E clinicians who received training on use of the ECS utility felt the communication they received with regard to the pilot was sufficient. The two areas, (already identified in this study), where the communication mechanisms were not effective were in relation to:

- feasibility & understanding of the original part 2 of this pilot
- co-ordination of ECS training with junior doctors induction programme

A revised Section 2 has since been negotiated and agreed with the A&E departments and ECS Project Board. It is now clear from the local project management documentation that there is now in place a more organised A&E department ECS training programme that coincides with the junior doctors' 4 monthly induction programmes.

No mass public media coverage was undertaken due to the planned short timescale of the pilot. There was, however, ongoing local press coverage about provision of ECS access to out of hours services. The ECS Board considered this to be an adequate interim measure, as there is a planned future public media campaign for ECS.

Were the requirements of the ECS Access Protocol met?

<u>Yes</u>: The monthly audits conducted by the local ECS Project Manager confirmed that each ECS record accessed had a corresponding A&E attendance record, as required by the National ECS.

4.3 Human Impact

What was the impact of the pilot on the A&E clinicians?

From the A&E clinician interview transcript data it is clearly apparent that the impact of the Emergency Care Summary has been extremely positive. The 12 clinicians who each used ECS stated that they found the ECS information to be '*very useful'*, see selection of comments below:

> '*it's extremely useful to know what medications a patient is on*' (*Ayr A&E Consultant*)
>
> '*it provides a list of current medications which is very useful information*' (*Crosshouse A&E SHO*)
>
> '*it gives you ready access to patient information that would otherwise have been difficult to obtain*' (*Crosshouse A&E Consultant*)

In addition, while all 12 A&E clinicians who had used the ECS utility wanted to be able to continue to use it, 33% (4 consultants) felt quite strongly that a solution should be sought for the local 'multiple systems, multiple password' problem:

> '*it is a step in the right direction – but access to multiple systems, through multiple passwords is problematic and piecemeal*' (*Crosshouse A&E Consultant*)

Did access to the ECS utility delivered the benefits that they personally expected?

Yes: The 12 A&E clinicians who used the ECS utility unanimously felt that the ECS utility had delivered the benefits they were expecting. Extracts from interview transcripts follow:

> '*yes it improves the overall patient /doctor communication*' (*Crosshouse A&E Consultant*)
>
> '*yes ECS provides access to essential information that influences important patient management decisions*' (*Ayr A&E Consultant*)
>
> '*yes, it facilitates quicker decision making process and safer drug administration*' (*Ayr A&E SHO*)
>
> '*yes, safer healthcare delivery – your not going to give them something they have an allergy too*' (*Ayr A&E nurse*)
>
> '*yes, access to a patient ECS improves the healthcare the patient receives*' (*Ayr A&E SHO*)

'yes for all the reasons I have described already – e.g. overdose cases' (*Crosshouse A&E Consultant*)

'yes it has as I have described in all the scenarios above' (*Crosshouse A&E Consultant*)

'yes, I could make a clinical decision without picking up the telephone to the patients GP surgery to check meds' (*Crosshouse A&E consultant*)

yes, we also pass on more clinically accurate information which can only enhance the care the patient receives' (*Crosshouse A&E SHO*)

Were there effective consultation and feedback mechanisms?

Partially: Analysis of the national and local project management documentation and the A&E clinicians' interview transcript data confirms that the pre-pilot consultation processes were effective with the exception of two specific areas:

1. Part 2 of the original pilot proposal:

- No local feasibility investigation undertaken
- No one ensured the requirements of part 2 were understood in sufficient detail locally: the implications only became fully apparent to the clinicians during phase 1 of the pilot

2. The timing of the pilot in relation to new Junior doctors starting in the A&E department:

- Initial lack of coordination of ECS training with junior doctors' induction programme

Both issues have now been addressed. The qualitative data also demonstrated that a comprehensive post-pilot feedback system was in place.

Did access to the ECS result in changes to the A&E clinicians clinical work flow processes?

All 12 clinicians agreed that the availability of ECS had introduced a valuable change to their clinical work flow processes in relation to certain types of acute presentations/admissions, in that they were able to manage these admissions more efficiently and effectively. Improvements included better quality of the communication between patient & clinician and a reduction in the number of phone calls to GP surgeries.

See transcript extract below:

'yes, I corroborate drug history now with patients rather than interrogate them for a drug list – which was largely wasteful of patient & doctor time as patients rarely remember more than two drugs' (Crosshouse A&E Consultant)

'yes, in that we don't need to phone up GPs anymore to find out what drugs the patient is on. The GP surgery line is often engaged and you have to try several times, and of course GP's not available at night' (Crosshouse A&E Consultant)

'yes it has made my life a bit easier, in that I can process patients more quickly and efficiently, there is nothing worse than patients that can't tell you what medication they are on' (Ayr Hospital A&E Nurse)

If the pilot had its time all over again, is there anything the A&E Clinicians would like done differently?

On the whole the A&E clinicians interviewed were happy with the way in which the ECS utility had been implemented, although a number of helpful suggestions were made for future implementations of the system. These generally fell into two categories:

Pre-Implementation lesson learned:

1. Ensure review of local capacity before implementation and replace/up-grade where necessary prior to pilot commencement; e.g. printers
2. Ensure the funding implications of increased us of paper are taken into account.
3. Lengthen the frequency of the password change time – a major nuisance
4. Create more awareness of the product prior to pilot start.

System Developments:

1. Expand the content of the ECS record to include Past Medical History
2. Integrate ECS to the A&E system
3. Provide 'single-sign-on' solution

The pre-implementation proposals, which generally cover the main 'lessons learned' described earlier in this document, should be useful for other sites planning A&E implementation of the standalone ECS product. What the pre-implementation suggestions underline is the need to prepare the ground thoroughly before systems are put in place. The point about printer capacity is well made, but what we should be doing is looking at all local IT components to make sure they are fit for purpose. The issue of funding made in point 2 is potentially complex and it would be helpful to have a clear position on such issues before the system is rolled out nationally.

The expansion of ECS to include Past medical History is an important issue which falls under the remit of the ECS Project Board. This is a complex area that needs be taken forward by the ECS Board in full consultation with all stakeholders. Some high level decisions have been made at the eHealth Programme level in respect of the integration of ECS with the national A&E system, but no timescale has yet been agreed. The potential advantages of a single sign-on, subject to proper security controls, are widely recognised. This large and technically complex issue, which falls under the remit of the eHealth Programme Board, is being addressed but will take some time to resolve.

The clear conclusion from the evaluation is that the pilot was a success with clear benefits to patient and clinician alike, but not surprisingly there were some local pre-pilot preparation, training and communications issues that could be improved upon.

(Due to the short timescale of the pilot the 'patient' views/perspective on A&E/ECS implementation was not included as part of the evaluation process).

4.4   Financial issues

Did A&E Clinician access to the ECS utility affect benchmarked positions (reference costs, prescribing budget, etc.) ?

Although the main benefits of this ECS pilot are more about the quality of patient care than financial advantage, it is important to have some measure of the financial implications of the project. Given that this was a limited pilot over a relatively short timescale, the quality of the financial information that can be obtained will be naturally limited. Nevertheless, the indications are that there will be reasonable efficiency gains from use of ECS, which in time may lead to real savings by reducing the length of time patients are kept waiting in A&E departments, the number of phone calls to GP Practices, and potentially the prescribing budget through facilitating improved accuracy of prescribing.

Waiting times is an important NHS performance indicator for A&E departments. A decision-support tool that delivers all the benefits listed above, in addition to having a positive effect on this outcome measure, is likely to be welcomed by most A&E departments in NHSScotland.

What was the Total Cost of the A&E Pilot Implementation Project?

See **Table 3** below:

Pilot Implementation Costs:	
Pilot Project Management Costs	£ 1,500
Technical Set-up costs	
& support costs	£ 1,500
Training	£ 15,000
Printers (4 x £250)	£ 1,000
Local A&E Dept. **Pilot** Implementation costs:	
Paper & Printer cartridges	£ 1,000
	£ 20,000
Annual Ongoing Support costs:	**£ 5,000**

It is envisaged that similar costs will be incurred for each NHS Board A&E implementation, although of course, there will be variances in the overall cost depending upon size and number of Accident & Emergency departments involved.

The issue of who will pick up these costs will be raised by the author of this report.

Cost of continuing the Ayrshire & Arran A & E Access to ECS?

Minimal: The technology is in place, username & passwords set-up, and a more co-ordinated new-starts training programme is operational. There are three local ongoing IT resource costs:

- the IT administrative resource to conduct the   security/audits specified in the national ECS Access Protocol.
- the regular ECS Trainer resource for new A&E Staff Grade Doctors
- the additional IT administrative resource for set-up, management and help desk support for new ECS account holders - an estimate annual total cost of £5,000

NHS Ayrshire & Arran ECS IT support team have intimated they are perfectly happy to take these costs on board.

4.5   The Strategic fit

What are the strategic dependencies between this pilot, ECS and other eHealth projects ?

The continuation of this pilot & ECS in general is strategically dependant upon:

- All GP Practices computer systems (including commercial suppliers) being able to continue to generate the XML batch files
- The continuing availability of NHS.net/N3 network
- National e-Links/Partner team monitoring of the transportation mechanism
- ATOSOrigin support services monitoring file receipts at the ECS Store, notifying of non-receipt of Practice files & checking data quality

Other eHealth projects that may influence the future strategic direction for ECS include:

- Managed Server Hosting Platform Project
- NHSScotland eHealth Strategy (revised), & EHR Programme

Specifically in relation to Accident & Emergency departments, the recent completion of national A&E System procurement and early implementer site rollout is of importance. It has been agreed at eHealth Programme Board level that ECS A&E systems integration will be undertaken in the first instance with the national A&E system – as a pilot. Thereafter, all other accredited A&E systems will be encouraged to interface to the ECS Store via the generic web services. No delivery timescales have been set as yet.

In sum, it is proposed that local A&E department access to the national ECS Store via the standalone application will be encourage in the short-term, as an intermediary step until the systems integration solution becomes available.

Were the A &E Clinician pilot project objectives delivered?

Yes: This pilot was a very short explorative study, with four high level objectives:

1. Establish whether A&E Clinician access to the ECS Store via web browser can deliver health care benefit.
2. Inform ECS Project Board of the findings from the pilot
3. Make a recommendation with regard Ayrshire & Arran A&E department continuation of use of the ECS utility
4. Make a formal recommendation with regard to roll out to other NHS Board A&E departments

All four objectives have been achieved.

Has further strategic direction for A & E Clinician ECS access been formed as a result?

<u>Yes in part</u>**:** As outlined above, the national eHealth Programme Board has decided that the strategic way forward in the longer term is a systems integration solution and have recommended ECS integration with the new NHS Scotland A&E system as the first step in this process. The ECS Project Board have not yet discussed an action plan in this respect, as they have been awaiting the findings of this evaluation report and the release of the additional project management resource required to take this forward.

A decision to allow NHS Ayrshire & Arran to continue Accident & Emergency department use of the ECS utility was made by the ECS Project board in December 2005 following early feedback of the preliminary results of the A&E evaluation.

No decision has been taken yet by the ECS Project Board in respect of roll out of ECS access to A&E departments in other NHS Boards. During the intervening period, the national ECS Project Management documentation shows that both a number of formal requests have been received from other NHS Boards requesting permission to roll out ECS access to their local A&E department.

Recommendation 1: In light of the findings of this evaluation the it is recommended that access to the standalone ECS utility should if requested be provided to local A&E departments, as an interim step, while awaiting the integrated A&E system solution.

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5. Results Part 2

5.1   Month 2 ECS Utility Usage Figures

The revised Section 2 of the pilot is a quantitative analysis of Ayrshire & Arran A&E staff use of the Emergency Care Summary utility over a further one-month period from 1st to 28th December 2005. The data again was ascertained by means of a SQL report query run on the national ECS Store.

	December 2005	November 2005
Total Number of ECS record accesses:	231	168
Demographic Records:	120	86
Full ECS Record	111	82

In comparison to the previous month's usage data, there was an overall increase of 37.5% in the total number of ECS records accessed, and, more importantly, there was a significant 35% increase in the number of full ECS records accessed. At this stage it is not clear whether this increase is due to greater staff familiarity with and confidence in the utility or to an increase in the number of acute presentations during December. Whatever the reason(s) for the increase, however, it is certainly encouraging that the use of the utility is increasing.

Similarly to Section 4.2 above, the December data was further analysed for patterns of use between the A&E departments, professional staff groups, and individual staff members

Table 4: Breakdown of ECS use by Hospital & Staff Group

Ayr Hospital		Crosshouse Hospital	
Total Number of ECS Utility Accesses:	**122**	**Total Number of ECS Utility Accesses:**	**109**
Demographic Records:	63	Demographic Records:	57
Demographic only:	2	Demographic only:	3
Same demo set x2	2	Same demo set x 2	2
Full ECS	59	Full ECS	52
Actual Number of Accesses per staff Group:		**Actual Number of Accesses Per staff Group:**	
Doctors	48	Doctors	29
Nurses/unknown	11	Nurses	13
		Medical Receptionist	10

Overall the greatest increase in use was at Ayr Hospital. In total, there was a 45% increase in the number of ECS accesses. But of more importance is the 44% increase in full ECS records viewed. Crosshouse hospital clinicians saw an overall 30% increase in ECS record accesses and a 27% increase in Full ECS records seen (see table 4 above).

Table 5: Actual ECS use by A&E Staff Group Members

Ayr Hospital		Crosshouse Hospital	
Actual No. of Doctors that used ECS	**3**	**Actual No. of Doctors that used the system**	**6**
Number of Accesses per Doctor:		**Number of Access Per Doctor:**	
Doctor 1	29	Doctor 1	13
Doctor 2	7	Doctor 2	9
Doctor 3	<u>1</u>	Doctor 3	3
	37	Doctor 4	2
		Doctor 5	1
		Doctor 6	<u>1</u>
			29
Acutal No. of Nurses that used ECS	**3**	**Acutal No. of Nurses that used ECS**	**3**
Number of Accesses Per Nurse		**Number of Accesses Per Nurse:**	
Nurse 1	11	Nurse 1	7
Nurse 2	10	Nurse 2	4
Nurse 3	<u>1</u>	Nurse 3	<u>2</u>
	22		**13**
There were NO Clerical Officer Accesses		**Actual No. of Access by Clerical Officers**	**10**
		Number of Access Per CO:	
		Clerk 1	7
		Clerk 2	1
		Clerk 3	1
		Clerk 4	<u>1</u>
			10

Similarly to November, there were differences in the pattern of use of the utility by the two hospitals. Overall Ayr Hospital Accident & Emergency clinicians conducted more ECS access events than Crosshouse clinicians. 50% of the total Ayr Hospital ECS access events were performed by one A&E Trauma Consultant. Also noteworthy was the 200% increase in the number of ECS records viewed by Ayr A&E nurses on the previous month.

It does appear that in respect of Ayr Hospital, ECS use during December was predominantly conducted by senior permanent A&E staff.

Where at Crosshouse Hospital there appears to be a wider variance in access activity across the different staff groups. Crosshouse doctors accessed doubled the number of ECS records during December than the previous month, with twice as many Staff Grade doctors using the utility than at Ayr Hospital. Clerical Officers continue to utilise the ECS utility, their access events   accounting for 20% of the overall Crosshouse department total.

In summary, while it has been interesting to observe the different individual A&E department day-to-day operational work practices in relation to ECS use. More importantly, it was exceedingly encouraging to note the significant 35% increase in use of the ECS utility during the second month of the pilot.

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6.   Discussion

The overall aim of this study was to evaluate Accident & Emergency clinician access to the ECS over an initial one period, (which was later extended to 2 months) and make recommendations both with regard to whether Ayrshire & Arran use of the utility should continue or not and national roll out of ECS to other NHS board A&E departments.

The evaluation focused on the technical implementation, and then on the operational, human and financial impact of the utility on Accident & Emergency department clinical front-line health care delivery. The report also examines the dependencies, and the strategic fit in the context of decisions already agreed by the national eHealth Project Board with regard to the longer term strategic Accident & Emergency systems integration model.

Technical: The systematic examination of project documentation initially showed that the technical implementation was   straightforward and that the project management and decision making structures had been effective in delivering the requirements of Part 1 of the pilot.   However, following commencement of the pilot, two communication issues were identified it became clear that the technical IT resource implications of Part 2 of the original pilot proposal had not been fully understood locally.

The key technical lessons learned were that there is a need:

a) for a review of the local hospital department IT to ensure there is sufficient capacity to meet the needs of the new system prior to implementation.
b) to ensure that local IT support arrangements are fully consistent with the availability requirements for the system.

In relation to b), the two tier approach to support is a significant concern. There is little point in designing the central parts of the national system for high availability if system failures at the local level prevent it from being used. If ECS is to be available whenever the A&E clinician needs it, there must be a strong argument for 24/7 IM&T support.

Recommendation 2: The ECS Project Board escalate this issue to the nation eHealth Programme Board as a high priority.

Operational: A combination of quantitative and qualitative data collection methods were used to assess the impact of ECS utility on the delivery of A&E front-line care. The findings indicate that there was reasonable use of the ECS utility by the A&E clinicians over the one-month period, with slight variations in patterns of use of the utility by the different professional groups.   There was

correlation between the quantitative and qualitative data on reported system use.

Interestingly, although 40% of the clinicians trained to use ECS reported not directly using the system themselves, half of these clinicians stated they had used ECS information in a clinical situation. The task of retrieval of the record had been delegated to another team member. This practice was common to both A&E department clinical teams, but used more so by Crosshouse Hospital. Password problems, forgotten or expired, was the only other principal reason given for non use of the ECS system.

Before the pilot was undertaken, it was known that there were three significant limitations in the system:

1. Non-availability of other NHS board ECS records
2. The timing of the ECS up-date files
3. No link to medication data prescribed   by non-NHS agencies

The experience of clinicians during the pilot confirmed that these limitations were of practical significance in the everyday use of the utility.

The fact that for some users of the system these limitations were not expected suggests that pre-pilot communications and training for the user community were not sufficient.

Turning to the issues themselves, the availability of information across board boundaries will cease to be an issue once national rollout is complete and appropriate governance arrangements are in place. **The timing of ECS updates is however an outstanding issue that need to be resolved as a priority prior to national roll out to other NHS Board A&E departments**. The link to medication data prescribed by non-NHS agencies is significant but is not an immediate priority.

Two unanticipated issues identified by the A&E staff who used the ECS utility were a) the frequency of password changes – now resolved, and b) the general unavailability of local IM&T support over night – addressed above in the section on technical.

The qualitative findings provide ample evidence of the ECS Store having a positive influence on the Accident & Emergency clinical practice and on the quality of front-line care delivery. As one might have predicted, the principal reason for utility use was the need to know an accurate patient medication history in order to progress an admission. When used, the utility acted as a clinical decision support tool that improved the quality of clinical communication between patient and doctor, increased the efficiency with which patients could be processed through the

department and reduced the number of telephone calls to GP practices.

More importantly, the *'real life'* examples of avoidance of harmful/life-threatening health events described by the A&E clinicians explicitly illustrate that the availability of ECS not only can, but does prevent in practice the kind of errors that put patients at significant risk and consequently can save lives.

It is evident from both the systematic examination of project documentation and the qualitative data that the pre-pilot communication could have been more effective. While the qualitative data analysis shows that A&E Clinicians were generally content with the information they received, it is clear there were two areas of miscommunication: a) the operational implications of part 2 of the original pilot proposal, and b) the co-ordination of ECS training with the junior A&E doctors' induction programme.

Human: The human impact of ECS availability on the way the A&E clinicians work was assessed through the qualitative interviews. In summary, the impact of the utility was extremely positive for the 12 clinicians who used it and for the 4 clinicians who indirectly used ECS information. They described the utility as particularly useful in resolving queries and in clinical decision making, and in doing so provided clear evidence that the expected benefits of the ECS system were being delivered.

The eight main areas of benefit delivery cited by the A&E clinicians were:

1. Improved quality of patient/doctor communication
2. Being able to process patients more efficiently & effectively
3. Improved the quality of patient care delivered
4. Facilitated better clinical decision making
5. Facilitated safer prescribing
6. Reduced the number of telephone calls to GP Surgeries
7. Enhanced the follow-on care management of the patient
8. Having knowledge at their fingertips

Also noteworthy was that the A&E clinicians unanimously agreed that there had been a valuable change to their clinical work flow processes in relation to certain types of presentations/admissions, in that they were able to manage these calls more efficiently and effectively.

The majority of clinicians interviewed were happy with the way in which the ECS utility had been implemented, although a number of helpful suggestions were made for future implementations of the system. These generally fell into two categories – pre-implementation lessons learned, covered in this report, and systems developments which should be addressed by the ECS Project Board.

Financial: There are very strong indications from this A&E pilot that there will be significant efficiency gains from using ECS that in time may lead to real savings by reducing the length of time taken to process patients through A&E departments and by increasing accuracy of prescribing. The former is particularly important in relation to the current A&E 'waiting times' performance indicator.

Strategic: The long-term solution discussed (in strategy section above) is based on the implementation of a fully integrated solution. The timescale and cost for implementing the fully integrated solution are not yet clear and more work needs to be done on this. What is clear is that the fully integrated solution is some time away, and it would be of value to maintain the momentum from the pilot in the meantime.

There are two courses of action that would enable NHSScotland to maintain momentum from the pilot. The first of these is to confirm that Ayrshire and Arran should continue to use ECS as an operational facility. This can be done at minimal cost. The second is to roll out the ECS standalone product to other NHSScotland A&E Departments as an interim measure while awaiting the integration solution. This will result in continuation of delivery of the efficiency gains identified in the pilot, but on a Scotland-wide scale. This will come at a cost of approximately £200,000, but, given that this is a positive step towards the agreed long-term strategy, it is felt that this is a prudent investment at this time.

7.   Conclusion

This evaluation has proved to be a highly informative and valuable exercise. Too often with national IM&T implementation projects resource limitations mean evaluation is not seen as a priority, and this can often lead to erroneous assumptions as to why a product is not used or hasn't delivered the expected outcome.

From pilot project outset it was recognised that the longer term goal would be an integrated A&E/ ECS system solution. However, with no resource commitment or timescale for delivery on the horizon, the question was whether the standalone ECS product could deliver sufficient health care benefit to A&E patients and clinicians in order to justify its deployment on a national scale as an interim solution.

The findings from this evaluation are that the national roll out of the standalone ECS product as an interim solution is fully justified.

8.   Recommendations

1.   NHS Ayrshire & Arran A&E departments continue use of the ECS standalone utility until an systems integration solution becomes available.

2.   A&E departments should be encouraged to use the standalone ECS utility and funding should be provided to facilitate implementation where required.

3.   The ECS Board to escalate the issue of local 24/7 support to the national eHealth Programme Board

Other Actions for ECS PB:

1.   The ECS Project Board to agree policy on release of funding for project management resource to progress exploration of an A&E/ECS systems integration solution.

2.   The ECS Project Board to invite A&E Department Consultant representation onto the national Board

3.   The ECS Project board to make decisions on increasing the frequency of updates to the national ECS Store.

4.   The ECS Project Board need to consult/ask the eHealth Programme Board for a direction over future priorities for ECS e.g. increase dataset content versus integration with other national systems

Appendix 1:

Emergency Care Summary Programme A&E Implementation Evaluation Part 1

A&E Clinician Interview Schedule

1.   In what capacity are you employed to work in A &E? (job title & how long)

2.   Have you received training to use the Emergency Care Summary IT utility? Yes/No

  (a) If No, do you know why you haven't received training?   Yes/No

        If Yes, explain……………

  (b) Are you able to use the ECS utility without having been trained?   Yes/No
       (i.e. have you been issued with a username & password)

  (if answers No 2(a) & 2 (b) stop questionnaire & finish interview)

3.   If Yes to question 2, who conducted your training (i.e. IT trainer, clinical colleague) ?

4.   In your opinion was the training you received adequate?   Yes/No

  If No, please describe why not?

5.   Have you used the Emergency Care Summary Utility?   Yes/No

  If No, please describe why not?

  (If No, go to question 8 then finish interview….)

6.   Approximately how often have you used the ECS utility in the past month?

7.   Have you encountered any problems when using the ECS utility?   Yes/No

  If Yes, please describe?

8.   Please describe the key factors that would influence your decision to use the ECS utility or not?

9.   In your personal experience, has access to a patients ECS record influenced your clinical decision making process in any way?   Yes/No

         If yes, please describe in what way….

10.   In your personal experience, has access to a patients ECS record resulted in any improvement to patient health care delivery?   Yes/No

         If Yes, please describe in what way……

11.   In your personal experience to date, has access to an individual patient's ECS record resulted in avoidance of any adverse health events?   Yes/No

         If Yes, please describe the event…………………

12.   Taking in to consideration your personal experience of using the ECS utility, has access to a patients ECS record had any effect on patient transfer/discharge – follow-on care management?   Yes/No

         If Yes, please describe

13.   Are you using the utility as often as you expected to?   Yes/No

         If No, please describe why not…

14.   In your opinion is their anything that we can do to improve use of the ECS utility?

15.   In your opinion, has access to the ECS utility delivered the benefits you were expecting it to deliver?   Yes/No

         Please elaborate…………………………..

16.   Has access to the ECS utility resulted in any change/s to the way you do your job?
                                                                                                            Yes/No

If Yes, please describe

17.   Following the implementation of ECS access in A&E do you feel that the support
       you have received with regard to use of the utility has been adequate?   Yes/No

       If No, please describe…..

18.   Are you aware of any feedback mechanisms that have been put in place re ECS
       utility?   Yes/No

       If yes, please describe what these are….

19.   Overall, have you found access to the ECS utility useful?   Yes/No

        (a) If yes, please describe…?

       (b) If no, please describe why not?

20.   In your opinion, is there anything about the way in which ECS was implemented in
       A&E that you would like done differently?   Yes/No

       If yes, please elaborate