The Scottish Emergency Care Summary: an evaluation of a national shared record system aiming to improve patient care

ABSTRACT

The Emergency Care Summary (ECS) is a shared record system offering controlled access to medication and adverse reactions details for 99.97% of patients in Scotland. It holds a secure central copy of these parts of the GP practice's record and is updated automatically twice daily. It is accessible by clinicians working in Out of Hours Organisations, NHS24, and Accident and Emergency departments if they have consent from the patient and a current legitimate relationship for that patient's care.

Evaluation forms were emailed to 300 NHS24 clinicians and 81% of the 113 respondents said that ECS was helpful or very helpful and felt that it changed their clinical management in 20% of cases.

In conclusion, we have shown that ECS has been implemented in Scotland nationwide and has improved patient care.

Introduction and context

Since the 1990s, Out of Hours care had been moving from general practices towards Out of Hours Service Providers and in Scotland responsibility moved explicitly to them with the new GP Contract in 2004. By 2004, all general practices in Scotland used electronic prescribing [i], with prescribing records being routinely updated on the practice system. In Scotland, out of hours calls were all filtered through NHS24 but the clinicians receiving triage calls had no direct access to patient records.

Aims of the Emergency Care Summary

The aim of the ECS is to improve the safety of patient care in unscheduled consultations when the GP practice is closed. Many patients have difficulty remembering all their medications or pronouncing drug names, especially when ill or confused. An accurate record of the GP's prescribing intentions when these patients call NHS24 or are seen in hospital as an emergency, should help save clinician time and reveal some of their medical history. Potential benefits of ECS therefore include more efficient assessment and reduced drug interaction, adverse reaction and duplicate prescribing rates.

The ECS was first piloted in 2004 and launched nationally across Scotland in 2006. Since then, it has grown to be a national system

across all 14 Health Boards in Scotland covering over 5.4 million patients. The information for ECS is provided from GP practice information systems. Details of prescribed medications and adverse reactions for patients who have not opted out are copied twice daily from the GP practice systems to a central store. With patient consent, these data can be accessed by clinicians treating patients outside the GP practice in out of hours (OOH) services, accident and emergency (A&E) and the national call centre for Scotland (NHS24). The ECS contains records of 99.9% patients in Scotland and 50,000 records are accessed every week. 1,740 (0.03%) patients or 1 in 3000 have opted out of the system and all patients are asked for their consent for each access to their record. Warnings on the limitations of the data held in ECS are given to users, and advice given to General Practitioners to ensure that prescribing data is as accurate as possible, by promptly recording medications prescribed by others and those which have been discontinued.

We have found that clinicians feel that use of the ECS can improve unscheduled care of patients and it is now relied on by many clinicians as an integral part of such consultations.

This contrasts with the evaluation published in June 2010 reporting on the English Summary Care Record, (SCR) a direct equivalent of the Emergency care Summary consisting of medication and adverse reaction information for patients extracted from GP records in England. Coiera reported that “the only major SCR

evaluation to date, in England, found that rates of usage were low, and any impact on care was difficult to quantify [ii]" Greenhalgh carried out a mixture of qualitative and quantitative studies to look at the SCR and found that "When the SCR is accessed, the main benefit seems to be that the doctor or nurse finds the consultation "easier" and less stressful. The evaluation did not directly demonstrate an improvement in patient safety but the findings were consistent with a rare but important impact of the SCR on reducing medication errors

Aims of the study

The Scottish Emergency Care Summary is one of the first shared record systems to achieve universal coverage nationally. It is believed that sharing information on medicines prescribed will improve patient care but it is difficult to prove specific clinical benefits of ECS. A randomised trial was proposed but rejected by clinicians working out-of-hours as they felt it would be unethical to manage some patients without ECS support. Following establishment of the ECS system, clinicians now depend on its availability, and many others working in scheduled situations are keen to have access too. Instead, a modified critical incident study[iii] was carried out in 2009 to record narratives and insights about how ECS was used and whether it helped or hindered the work of NHS staff.

Evaluation forms were sent to all clinicians working in one of the three NHS24 call centres in Scotland over a one week period in January 2010. The forms were developed by researchers in the Health Informatics Group of the University of Dundee and piloted in the Out of Hours department in Grampian. (see appendix 1) Modifications were made in order to ensure that the questions were understandable to users and that the answers would be unambiguous. Forms were emailed to each clinician working on a shift during the study week and they were invited to give feedback on their experience of the ECS, whether good or bad. No reminders were sent out as different staff were on duty each night. The questions asked whether users considered the ECS helpful, whether it changed management, and to give examples of any critical incidents. The results were entered into an excel spreadsheet so that scores for usefulness and change in management could be presented in graph format. The comments were all individually recorded and quotes illustrating particular points have been extracted to illustrate common themes.

Results

A total of 118 replies were received from a potential 300 users. Overall, 81% of respondents rated the ECS as helpful or very helpful (Table 1) and they said that ECS had changed their management in 20% of reported incidents (Figure 2). Many NHS24 clinicians said that even an empty record was useful to

confirm a patient's claim to be in good health. ECS was particularly helpful if patients were confused or receiving multiple medications.

However, 43 replies (36%) pointed out that the medicines listed on ECS, drawn from the GP practice system, did not match those reported by the patient. This concords with the evaluation of the SCR by Greenhalgh (11) which states "The evaluation showed that SCRs sometimes contain inaccuracies (e.g. incomplete medication lists or missing allergies), but that clinicians use their judgement when interpreting such data and take account of other sources of information including the patient.

Discussion

We believe that the response rate of 37% still gives representative results as many users did not feel strongly positive or negative about ECS and the people who did feel strongly were motivated to fill in the form.

From these responses we have identified the following data quality issues in GP systems:

- Discontinuation of drugs is not always promptly updated
- Delay or failure to transcribe into the GP record system prescriptions written by others, e.g. nurse prescriptions, drug

trials, hospital-only drugs, private prescriptions, methadone from Drug Services

- Non-concordance with prescribed treatment and use of over the counter drugs is rarely recorded

NHS24 staff comments on ECS are summarised under three categories in Appendix 2.

ECS System design and implementation

Initially, patients and clinical groups were consulted to verify our understanding of the problem and opportunity. Clinical leadership came from the Royal College of General Practitioners, Colleges of Nursing and the Scottish General Practitioners' Committee, as well as clinicians in Out of Hours services. It was clear that working without patient data in unscheduled care when GP practices are closed posed a significant clinical risk. A focus group study was carried out to explore patient views[iv].

Many requests were received to allow unrestricted access to GP records, but this was unacceptable to patients and to GPs, as custodians of patient-identifiable data. A two stage opt out then opt in consent model was therefore developed. Upload of data from GP systems to ECS uses implied consent with opt-out for patients who request it, while the second stage requires explicit consent with patients being asked to give permission for their data to be

read by any clinician involved in that episode of care. This minimises privacy risks and operational delays, and was approved by the Information Commissioner.

Information is held on ECS in a secure database, the “ECS Store,” to professional standards of IT security, guided by the Data Protection Act and relevant professional guidance. Patients across Scotland were informed about ECS by leaflets[v], a mailing to each household, and local publicity as each Health Board joined the project. Special training was cascaded within NHS24, along with guidance, publicity and other materials. General practice staff were informed by newsletters, posters, leaflets, individual letters and local user meetings. Since data uploads are automatic, training for practices was only needed on how to mark the records of patients who had opted out of ECS and how to check the audit log of any accesses to their own patients’ records.

All accesses to ECS are recorded in a full audit trail, and 94% are further controlled by integration with the systems used by NHS24 and Out of Hours Organisations, whose staff can only access the ECS records of patients during an open call on those systems. Health Boards are required to check all accesses for misuse, especially those made from a different Health Board. Every clinician receives training on information governance and data quality issues such as data provenance and incompleteness before receiving a password. A screen on the ECS warns users that this is only one of several sources of prescribing information

for a patient, and may not include information on handwritten prescriptions nor all drugs prescribed by non-practice clinicians. It also advises staff to verify information with the patient, and that other methods such as letters, handwritten lists and bags of pills brought into the hospital should all contribute to full medicines reconciliation.

The ECS was rolled out to everyone registered with a GP in Scotland. By 2006, over 99.9 % of Scottish residents had an ECS record, and at 15/05/10 ECS contained 5,482,406 individual patient records. 1,740 patients have chosen to opt out, representing 0.03% of patient records on ECS; 336 General Practices have at least 1 opted out patient and over 99% of practices have sent ECS extracts. The number of accesses to ECS records gradually increased to a steady figure of 50,000 per week with peaks at busy holiday times such as New Years Day and Easter Monday. NHS24 make the highest number of accesses to ECS (60% of total) and only a tiny minority of patients refuse to give permission to access their record. The impact of extra calls due to the swine flu epidemic can be seen in the graph of total accesses in 2008 and 2009 at Figure 1.

Other evaluation studies and results

Evaluations of the pilots were carried out in 2006,[vi] and by pharmacists using ECS for medicines' reconciliation in acute receiving units in 2008. Key measures of success were whether

transfer of medication and adverse reaction data from GP records to ECS is acceptable to patients and helpful for clinicians.

Views about ECS varied widely and are best described by role. For example, many pharmacists cited valuable time saved in medicines reconciliation by not having to phone GP practices or ask relatives to bring in medications. More experienced clinicians working in A+E found that they look at ECS records infrequently, but when they did it was for the more complex cases, where the information was considered vital. One consultant A&E clinician said "*I only access ECS once a day but when I do it is absolutely critical*". GPs working out-of-hours are experienced in making clinical decisions when there is uncertainty due to partial information. For other clinicians in NHS24 and OOH, ECS is used to confirm details and reduce uncertainty about the medication history, thus increasing confidence for the clinician and safety for the patient.

A total of 6.2 million accesses have been made to ECS records since the national launch in September 2006. There is a 37% increase in 2009 use compared to 2008 and 2,170,921 ECS accesses were made from January to December 2009 (Figure 1). Details of overall figures can be found in the Summary of ECS National Usage[vii].

One cost to Health Boards is for monitoring and profiling the access logs to identify security issues, and of following up the

three events that have occurred. One of these resulted in the dismissal of a consultant. After 4 years there are no known incidents of material harm arising from any security breach.

An independent evaluation on cost – benefits carried out by EHI Impact shows how initial costs have stabilised and the benefits are increasing year on year[viii].

Other recent evaluations have reported significant benefits to patient safety in NHS24, Out Of Hours and A&E departments[ix]. The benefits of ECS generally stem from clinicians accessing medication information faster than by traditional methods. However, on some occasions ECS alerted clinicians to a clinically relevant fact (e.g. a nephrotoxic drug, allergy to erythromycin not penicillin) where this information was not otherwise available - see clinician comments, Appendix 3.

A further benefit is for clinicians to be able to review records of the approximately 3,000 (7%) patients per week attending an A&E department in a different Health Board. This average figure hides some interesting variations, for example a quarter of all accesses in Glasgow and Highland A&E departments are for such visitors (Figure 4), as are 80% of all Highland accesses during the winter sports and summer holiday seasons.

While the ECS medication record is updated twice daily from GP systems and is much better than nothing, the data quality issues discussed above limit its reliability, so it could be further improved

by adding medication information from other sources. This is consistent with the conclusions of an Audit Scotland report[x].

Lessons learnt and conclusions

Our study shows that many clinicians report that ECS can improve patient safety and care, save significant time for clinicians and reduce risks to patients by alerting clinicians to potential adverse reactions and risk of overdose of prescribed medication.

ECS can benefit patient care by increasing the accuracy of medicines management. This is particularly beneficial where patients cannot give details of their medication over the phone. The medication summary as taken from the GP prescribing record may lack details of medication prescribed by other agencies or acquired by the patients themselves.

In conclusion, deployment of effective clinical information technology on a national scale takes time. Clarity of objectives and an incremental approach based on using IT to address real clinical problems are critical to success. This report on the clinical benefits of ECS should help to inform the debate on the safe and effective sharing of health data in other nations.

Figure 1: Year on year trend analysis

The following graph shows the change in ECS use from 2008 to 2009

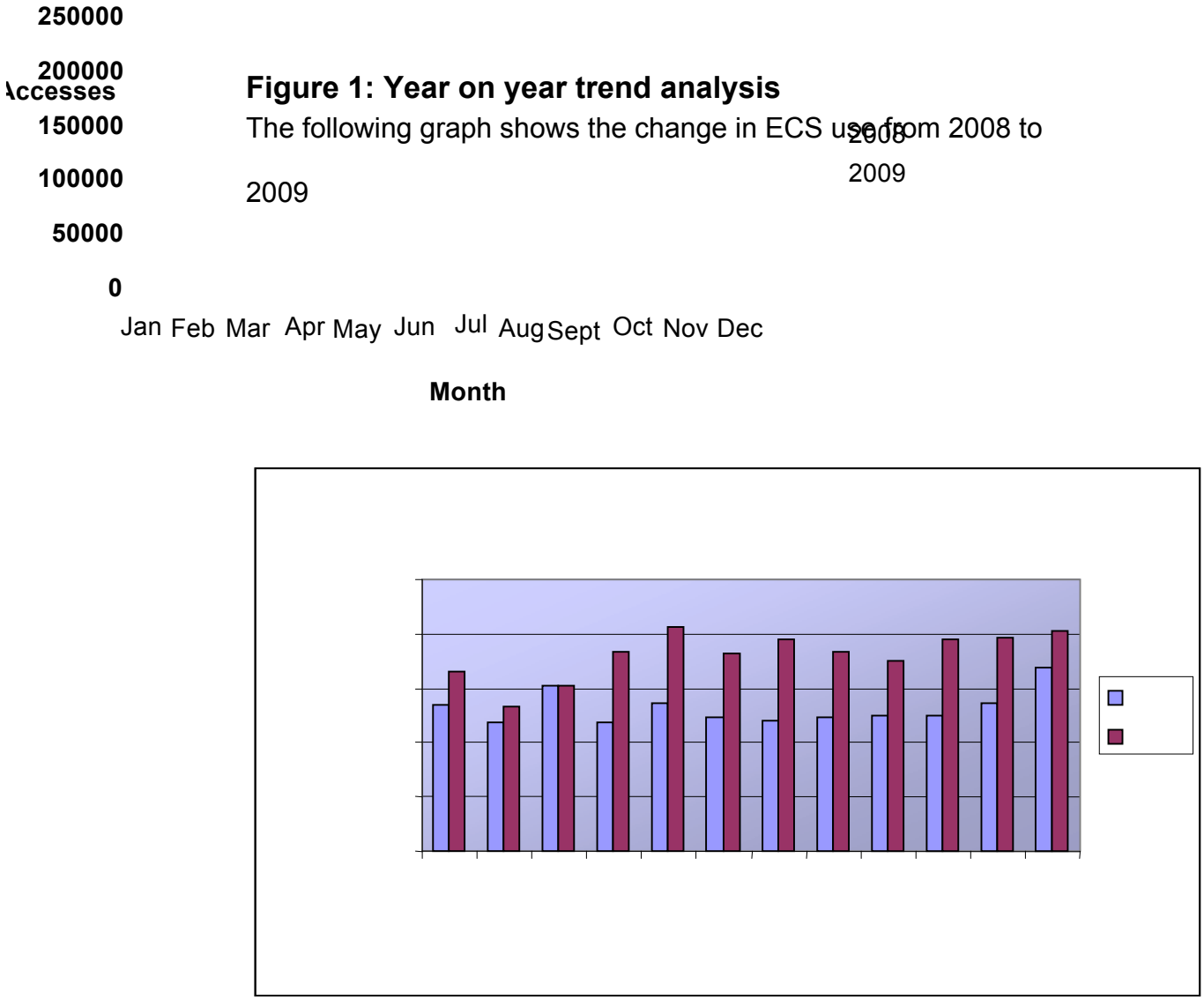


Figure 2: Responses of 118 NHS24 clinicians about the value of ECS in the current care episode, by professional group

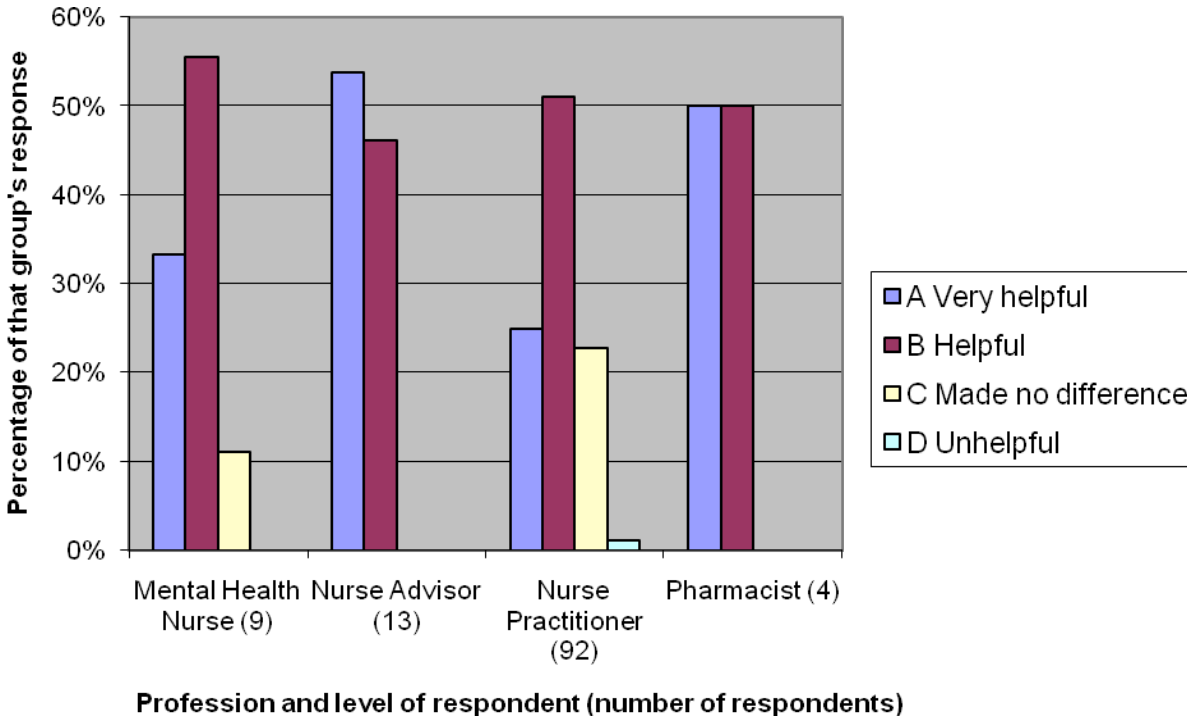


Figure 3: Response of 118 NHS24 clinicians to the question: Did ECS change your clinical management?

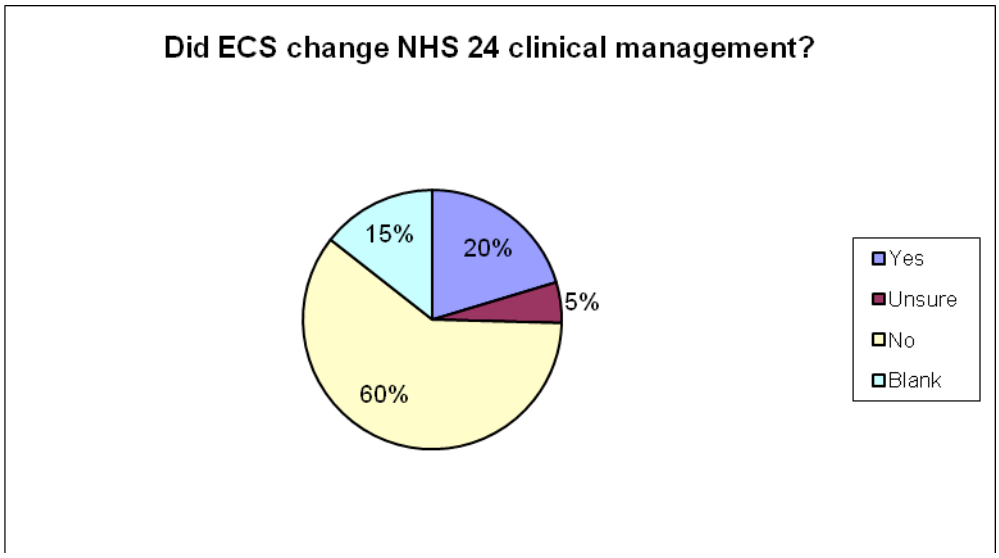
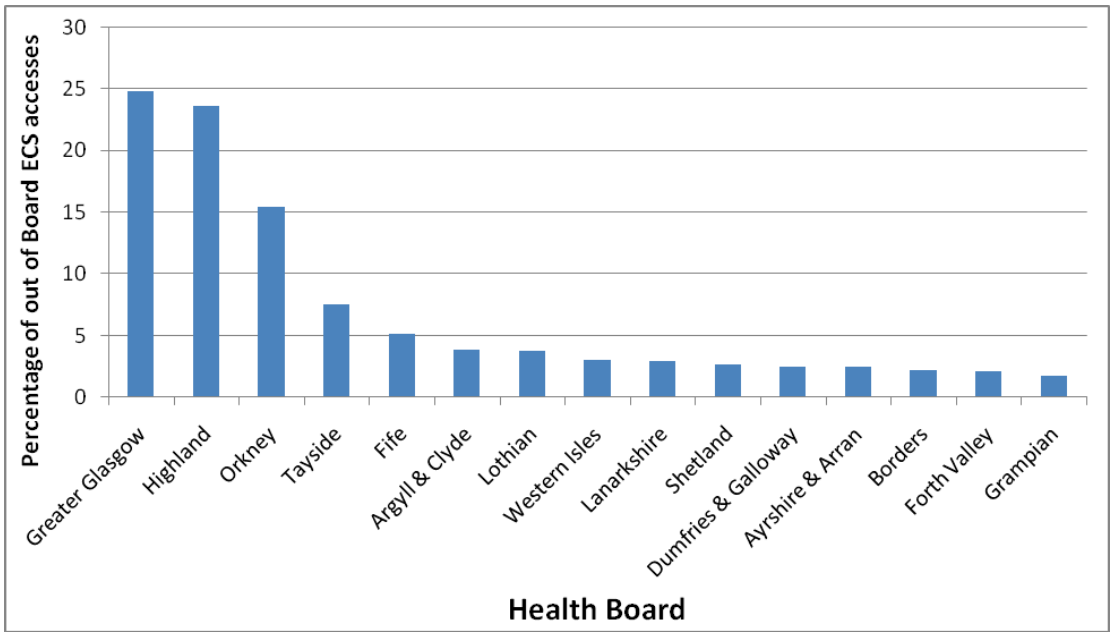


Figure 4: Graph showing the proportion of ECS accesses to the records of visitors, defined as patients living in a different Health Board (2009 data)



Appendix 1: Emergency Care Summary Evaluation Form

The ECS has been established in Scotland for over 5 years and is widely used in A/E, Out of Hours and NHS 24. We would like to hear about your experiences, both good and bad. Please feedback any incidents or problems you have experienced, and please tell us about any cases where it has changed your decision or the outcome for the patient. We would like to know about any stories, good and bad, in order to further evaluate and inform plans for future development.

Board Area

_____

_____

Your Role

_____

_____

Patient sex and age (please do not give any identifying details)

_____

Brief detail of presenting problem

About the Emergency Care Summary

Do you feel the ECS was helpful in the care of this patient?

Very helpful		Helpful		Made no difference		Unhelpful		Very unhelpful	

Please explain your answer below.

Did it change your clinical management?

For example would your plan for investigations, admission or treatment have been different if you hadn't been able to access ECS?

Appendix 2: Comments from NHS24 users

NHS24 clinicians stated that the ECS record was helpful for:

A patient who was intoxicated and had blacked out

A patient with dementia and 3rd party caller who had limited info of PMH

There were many comments referring to general benefit, for example:

'Good if updated regularly by GP practice'

'Very helpful - especially with elderly patients who often don't know what medical problems they have'

'It informs my practice and assessment. There are occasions when consent is withheld and I am unable to access ECS so therefore reliant totally on the history as stated by the patient'

Many replies stated that the ECS had become an automatic part of the process for assessing calls taken for patients in the OOH period, for example:

Checking ECS is an automatic part of the call - like checking previous call history

Appendix 3: Comments made by Out of Hours clinicians

A male patient (62) was admitted to the renal unit with acute renal failure. The ECS showed that he had recently started a new potentially nephrotoxic drug. The drug was stopped and he was monitored rather than taken straight to Ultrasound and renal biopsy.

A 78 year old male admitted with a stroke, Patient unable to communicate. ECS gave quick and easy access to patient's drug history and allergies

A 20 year old male with tonsillitis said he was allergic to penicillin so the clinician advised him they would prescribe Erythromycin after he stated he was not allergic to that. On checking the ECS, it stated he was allergic to Erythromycin. After a long discussion, he finally remembered about the Erythromycin allergy (he collapsed).

A patient with angina was about to be treated with nitrate but ECS showed that he was already on 120mg isosorbide therefore required an alternative. Without ECS it would not have been known that the patient was already on nitrate (because patient couldn't remember, paramedic crew hadn't brought in patient's meds and GP practice closed).

“Easy to use. If printed off at point of emergency admission this would be a great improvement to patient care. Can a national directive not be given that this should be done in all cases across Scotland?”

“What a huge difference it makes to caring for many of our patients. Whether it be finding out what they're on, when they can't remember, or if the patient is saying something different, because they didn't get a repeat prescription when they did. Also multiple allergies. PS. could tetanus status be added to it?”

“An excellent system! Absolutely invaluable on the wards. Saves a massive amount of time not having to phone GP surgeries and eliminates the potential errors of transcripting drug histories from GP receptionists e.g. EC/MR/inhale types”

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