

BMJ Open Quality Improving access to the KIS in secondary care

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ABSTRACT

Background Effective communication of anticipatory care planning (ACP) discussions between patients and general practitioners across different healthcare settings is vital. In Scotland, the Key Information Summary (KIS) is a new piece of software that allows clinical data for selected patients to be shared electronically across the wider National Health Service from the primary care record. This can include details of ACP discussions and decisions. The KIS is now routinely accessible in secondary care and is available through the hospital electronic record in two formats (abbreviated and full versions).

Aim The primary aim of this project was to significantly improve clinician access to the full KIS record within secondary care.

Methods Four Plan Do Study Act (PDSA) cycles were undertaken in total to improve access to the full KIS between October 2014 and March 2016 in the Medical Admissions Unit of a Scottish hospital.

Results Baseline data showed poor awareness and use of available KIS information by clinicians for patients admitted to hospital. Most were unaware the KIS was available and only 19% had seen the KIS for their patient. Where a KIS existed for a patient, clinicians felt the information contained within it was useful in 75% of cases, and one in every five KIS could alter clinical management. Data collection following the first 3 PDSA cycles revealed a significant increase in access to the full KIS after 5 months (from 4% to 45%). However 1 year on after a fourth PDSA cycle to implement sustainable interventions this level of access was not maintained.

Conclusions Reasons for these results are discussed, as well as limitations to certain interventions. Access to the full KIS at the point of hospital admission can be significantly improved using a quality improvement approach. Improved access to this information may influence the clinical management of selected patients. However sustainable, system-wide strategies are needed to maintain these changes in the longer term.

PROBLEM

Electronic patient records have been used by general practitioners (GPs) for some time, but up until recently details of these records were not routinely accessible in secondary care in Scotland. Patients with an existing care plan or anticipatory care plan (ACP) in place previously had documents shared with out of hours (OOH) services, but there was no reliable way of sharing this information with secondary care.

The Key Information Summary (KIS) evolved to try to address this problem by creating an electronic platform to convey important clinical details about patients with complex healthcare needs to different healthcare settings. However, despite publicity and awareness raising within the health board, there was a sense that many acute clinicians were unaware of the KIS and its potential to improve patient care on admission to hospital. Anecdotal reports from GPs raised concerns that information contained in the KIS was being ‘ignored’ by hospital teams, when in fact secondary care clinicians may not have been aware that they could and should be accessing the KIS for their patients.

The aim of this project was to significantly improve access to the full KIS, at the point of acute hospital admission using quality improvement (QI) methodology. Secondary aims were to assess the usefulness of the KIS from the clinicians’ perspective and examine the sustainability of interventions used over a 1-year time period.

The project took place at the Medical Admissions Unit (MAU) at St John’s Hospital, Livingston, Scotland. This is a busy unit receiving admissions to the medical wards from both a 24-hour Accident and Emergency (A&E) department as well as a GP referral Primary Assessment Area (PAA). St John’s is a modern teaching hospital in West Lothian, serving a varied population from Livingston, West Edinburgh and the wider West Lothian region. The electronic patient record system used to access the KIS by St John’s and other acute hospitals in NHS Lothian is TRAKcare (InterSystems). This system is referred to throughout this paper as ‘TRAK’.

The project was undertaken primarily by CCH (Specialty Dr in Palliative Care), who collected and analysed data, with supervision from JAS (consultant, Palliative Care) and advice and guidance from CL (GP and Clinical Lead for Anticipatory Care Planning) and AF (Marie Curie Edinburgh Research lead). The project was supported by the St John’s Associate Medical director, MAU



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clinical director, MAU administrative teams and hospital palliative care team.

BACKGROUND

The KIS was pioneered in Scotland in 2013 and is an evolution of the previously existing Electronic Care Summary (ECS) and electronic Palliative Care Summary systems. These summaries were previously only accessible via two separate clinical systems within secondary care, requiring separate logins. From September 2014 the KIS became available across NHS Lothian via the TRAK system, which is now NHS Lothian's primary hospital electronic care record system.

A KIS record contains information about the patient extracted from the GP record in a read-only format. A KIS can only be created or updated by those with access to the GP system (eg, GPs or practice nurses). A KIS can be created (with consent) for any patient with a long-term condition or complex healthcare needs. It is created in discussion with the patient or those close to patients who lack capacity and it can be accessed widely by GP OOH services, NHS 24, the Scottish ambulance service and in secondary care.

The KIS is tailored to each patient and includes information on patient demographics, diagnosis and medical history. It can also include an array of additional information, including details on resuscitation status, a 'special note' (free text) as well as many other data fields. A summary of ACP discussions and agreed goals of care can be contained within the KIS (usually within the special note) with the potential to support any clinical team to engage with the patient in realistic shared decision-making at points of crisis.¹ The Scottish government has highlighted the importance of the KIS in its Health and Social Care Delivery plan 2016: it has pledged that by 2021 all who would benefit from a KIS will receive one, and that more people will have the opportunity to develop their own personalised care and support plans.²

The KIS template in the GP system is populated in three main ways; clinical information is auto-populated from the GP record for certain data fields; the option of completing 'drop down' is available for other data fields, and there is the option to complete a free text box (the special note) which is often the most valuable part of the KIS, as it contains tailored clinical information. A recent study looking at 605 deceased patients across NHS Lothian found that 60% of these patients had a KIS completed a median of 18 weeks before death.³

Two versions of the KIS are available via TRAK. First, the abbreviated KIS is attached to the ECS medications summary; however, this contains only certain data fields. The ECS medications summary is already widely accessed at the point of hospital admission for medicines reconciliation. This version was developed due to concerns that adding the complete KIS to this document would result in excessive download times and a loss of usability.

The full KIS is available as a document that is accessed separately within TRAK. The full KIS includes all available KIS data including additional data fields and palliative care summary data which may have been added. [Table 1](#) highlights the potential differences between the full and abbreviated versions of KIS available through TRAK. Clinicians have read-only access to KIS information irrespective of which version they access. Only those with access to the GP-based clinical system can create and update a KIS.

BASELINE MEASUREMENT

A baseline measurement from 100 patient records of people admitted to the Medical Assessment Unit (MAU) was undertaken to determine the awareness, access and usefulness of the KIS at St John's Hospital between October and November 2014. Notes of MAU inpatients were examined on a Wednesday and Thursday of each week until sufficient data were collected for the sample size. As well as examining the notes, these patients' TRAK records were accessed to ascertain which KIS versions (if present) had been accessed at the point of admission, as well as the content of the KIS.

Measures, relating to aims:

- ▶ Number of patients admitted with a KIS was recorded: to inform how commonly patients with a KIS were being admitted to the MAU.
- ▶ All admissions were screened with the SPICITTM tool (Supportive & Palliative Care Indicators Tool, www.spict.org.uk online appendix 1) to ascertain whether patients at risk of deterioration or dying were more likely to have a KIS: that is, are KIS being completed for the patients who may need it most?
- ▶ Of patients with a KIS, the frequency of admitting doctors accessing the two versions of KIS was measured before and after interventions. This was to assess the primary aim: whether access to the full KIS was improved and whether this was sustained after 1 year
- ▶ Content of each KIS record was analysed in the baseline measurement by documenting which data fields were present. This was to ascertain the frequency of certain data fields being completed and allowed comparison of the KIS versions in terms of the information conveyed by each
- ▶ Analysis of the free text parts of the KIS was undertaken at baseline to assess special note 'quality': criteria used to evaluate this came from suggested content from NHS Lothian-wide GP education sessions ([table 2](#))
- ▶ Structured interviews with 'yes/no/unsure' answers were undertaken with admitting clinicians to ascertain views of admitting teams as to 'usefulness' of the KIS and its relevance to clinical practice ([table 3](#)).

One quarter (24%) of all medical patients admitted had a KIS. For those patients admitted who were at risk of deterioration or dying (according to SPICIT criteria), the likelihood of a KIS being present more than doubled (53%). In terms of access to the KIS, the ECS medications

Table 1 Information potentially contained within the two versions of the Key Information Summary (KIS)

Full KIS*	Abbreviated KIS
<ul style="list-style-type: none"> ▶ DNACPR/CYPADM form in place? ▶ Resuscitation status ▶ Guardian ▶ Legal power of attorney ▶ Adult with Incapacity form in place? ▶ Emergency contact details ▶ Carer/next of kin details ▶ Special note (free text) ▶ ACP (±comment) ▶ Medical history (plus free text ‘comments’ by GP) ▶ Self-management plans ▶ Access information ▶ Contact list ▶ Other agencies involved ▶ Moving and handling information ▶ Additional drugs available at home ▶ Catheter/continence equipment ▶ Diagnosis information (are patient and family aware of diagnosis?) ▶ Treatment information (chemotherapy, radiotherapy, surgery or other) ▶ Preferred place of care ▶ Preferred place of dying ▶ Out of hours Information (Including whether GP can sign the death certificate out of hours) 	<ul style="list-style-type: none"> ▶ DNACPR/CYPADM form in place? ▶ Special note (free text) ▶ Medical history ▶ ACP (±comment)

*The full KIS will only contain those data fields the GP or practice nurse inputs which are relevant to the individual patient. Of those fields available this can include the following:

ACP, anticipatory care planning; CYPADM, Children and Young Persons Acute Deterioration Management Form; DNACPR, Do Not Attempt Cardio-Pulmonary Resuscitation; GP, general practitioner.

summary (which includes the abbreviated KIS) was accessed in 89% of all admissions as part of the established medicines reconciliation process. It later became apparent during the interviews that in spite of this high level of access, clinicians were often not aware the abbreviated KIS was present. The full KIS file was accessed for only one patient (4%) where a KIS was present (figure 1).

Analysing the content of the KIS revealed that of those seen they contained variable amounts of clinical information. The full KIS contained additional information to the abbreviated version in 67% of cases. Following a previous Lothian ACP audit,⁴ GPs in Lothian have been advised to summarise important ACP information within the special note section. Some KIS contained free text within the ‘Anticipatory Care Planning: comment’ data field which was also analysed. The content of the free text sections of the KIS is summarised in table 2.

Sixteen patients were identified to have a KIS and were identified to be at risk of deterioration or dying (using the SPICT tool). Structured interviews were held with doctors from these patients’ admitting team (grades ranging from FY2 to consultant). Both versions of the KIS were printed and presented to the clinicians and questions asked, including whether the clinician had heard of and seen

either version of the KIS and whether they thought the information in the KIS was useful or would have altered clinical management (table 3). The feedback from clinicians at the interviews was ‘the more [useful] information gathered at the point of admission, the better’.

Results from the interviews showed that all clinicians had heard of the KIS but that most were not aware it was now accessible through TRAK. Most were unaware of the two KIS versions and how to access these. When shown the KIS for their patient, the majority (75%) thought the KIS was useful and in three cases (19%) the KIS would have changed their patients’ management. When shown the differences between the abbreviated version and the full version, 63% of clinicians felt the additional information contained in the full KIS would have been useful at the point of admission.

DESIGN

From the data collected at baseline, it was clear that clinicians had heard of the KIS (100%) and the majority thought it was useful (75%). However, the knowledge of how to access either version of the KIS was low with only 4% accessing the full KIS despite this being considered

Table 2 Content analysis of Key Information Summary (KIS) records

	Number	%
KIS records analysed (total number of KIS)	24	100
Full KIS contains additional clinical information (from abbreviated version)	16	67
Full KIS contained palliative care information (not available in abbreviated KIS)	4	17
KIS contained DNACPR information (contained in both versions)	4	17
KIS contained a special note or ACP comment (free text sections—seen on both versions)	19	79
<i>Special note/ACP comment content (containing):*</i>		
Baseline health/mobility	16	84
Past investigations/treatment	15	79
Threshold for admission	6	32
Patient wishes	5	26
Patient cognition	5	26
Appropriate levels of intervention	4	21
Behavioural warnings	4	21

*Special note content was assessed according to criteria suggested at Lothian-wide GP training. Not all data fields will be relevant to every patient; therefore, these data are more informative of trends rather than being presented against a particular standard. ACP, anticipatory care planning; DNACPR, Do Not Attempt Cardio-Pulmonary Resuscitation.

useful. Although improving awareness/access to the abbreviated KIS was a potentially simpler solution (due to an already high level of ECS medication summary access), this version of the KIS does not convey the complete set

Table 3 Qualitative measures: Key Information Summary (KIS) awareness and usefulness (October to November 2014)

	Number	%
Number of interviews	16	100
Have you heard of the KIS? Answer 'yes':	16	100
Have you seen the KIS for your patient? Answer 'yes':	3	19
Is the information in your patient's KIS useful? Answer 'yes':	12	75
Would this information have altered clinical management of this patient? Answer 'yes':	3	19
Would the additional information appearing in the full KIS have been useful? Answer 'yes':	10	63

of data. Thus, clinically important information could be missed.

Interventions were therefore designed to improve full KIS access and awareness of its importance. Interventions needed to be cost-effective, reproducible and sustainable for wider use across NHS Lothian and Scotland. A focus group was held and emails circulated among the associate medical director, the clinical director for acute medicine, as well as the service improvement manager at St John's Hospital to ensure that all agreed the proposed interventions were feasible.

Interventions were designed and refined over four Plan Do Study Act (PDSA) cycles with data collection at baseline, after PDSA cycles 2 and 3 and 1 year later after PDSA cycle 4.

Initial interventions included staff education and awareness raising. An ACP 'checklist' (online appendix 2) was designed and introduced to the MAU admissions paperwork, along with a SPICT tool for a period of 1 month from February to March 2015. 'Sustained' interventions following this included circulating a slideshow to all rotating doctors at their hospital induction. The main challenge anticipated by the focus group was the introduction of new paperwork to the medical admissions document. It was felt that this would require particular testing due to resistance to change from staff towards new paperwork at the point of admission.

STRATEGY AND IMPROVEMENT CYCLES

PDSA cycle 1

Plan

To improve general education on ACP and raise awareness of the presence of the full KIS and the need to access it. The plan was to use feedback gathered from an education session to ensure the interventions would be appropriate before implementing them in a small-scale trial.

Do

A formal education session was advertised and held at the hospital's weekly medical meeting in early February 2015. A presentation was given to the medical consultants and junior doctors covering the baseline measurement results, information on ACP and the importance of accessing the full KIS. The proposed ACP checklist and awareness posters were displayed to the group.

Study

Feedback and comments were gathered regarding the proposed interventions from this education session. Some wording changes were suggested to the ACP checklist but the majority agreed that a small-scale trial of the ACP checklist and SPICT tool was appropriate. The group felt that awareness posters would be helpful if placed above computers in MAU and admitting wards.

Act

The ACP checklist was duly amended and furthermore sent to two additional palliative care consultants who gave

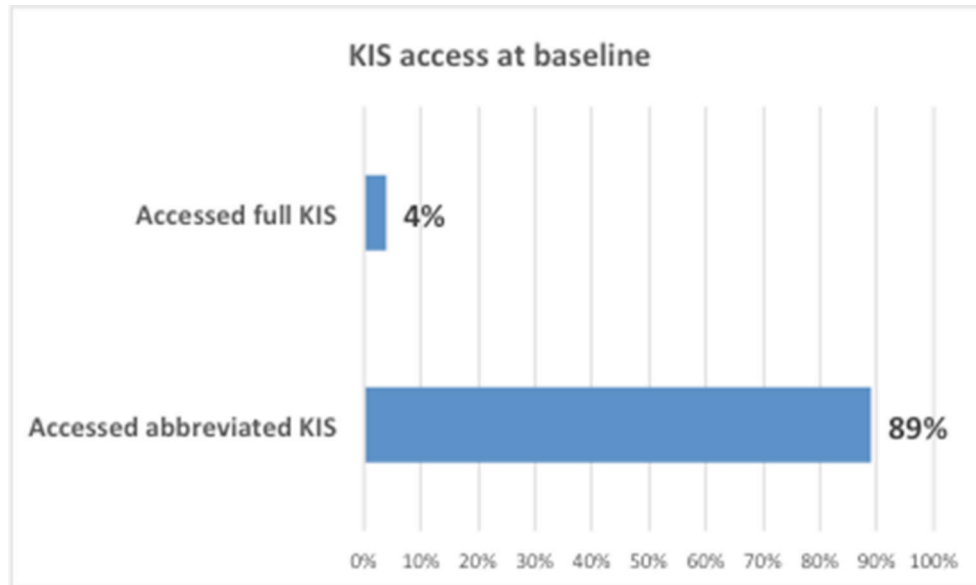


Figure 1 Key Information Summary (KIS) access at baseline. Abbreviated KIS is accessed via Electronic Care Summary medications summary, which is accessed routinely for medicines reconciliation.

feedback. Further changes were made before the ACP checklist was finalised (online appendix 2).

PDSA cycle 2

Plan

To trial the ACP checklist in MAU on a small scale following adjustments made in PDSA cycle 1.

Do

Two hundred ACP checklists plus SPICT tools were attached to stocks of admissions booklets in MAU (clipped to the 'Management Plan' section at the rear of the admissions booklet). Administrative and nursing staff were informed of the reasons for this and to ensure that only amended booklets were used for new patients. KIS awareness posters were placed above TRAK computers (online appendix 3).

Study

A spot-check audit of all MAU patients 48 hours later revealed that only 9 out of 22 (41%) of patients that had been clerked-in had amended admission booklets. Of those with checklists present, none were annotated. Further investigation revealed that many patients had been clerked at PAA and A&E departments. Volunteers making up admissions 'packs' (medical and nursing admissions documents) were not aware of the test. MAU administrative staff commented that they had no access to restock supplies. Due to nursing staff turn over, many were not aware of the study and significantly there had been a 'change-over' of junior doctors since the initial education session (PDSA cycle 1). Thus many medical staff were still not aware of the study or the KIS.

Act

Based on these findings, PAA and A&E departments were stocked with the amended admissions booklets. PAA and

A&E staff (including volunteers) were briefed about the study. Charge nurses agreed to update nursing staff daily for two weeks at their morning safety brief about the study and the new booklets. MAU administrative staff received electronic copies of the ACP checklist and SPICT tools, so were able to restock the booklets when supplies ran low.

PDSA cycle 3

Plan

To improve education and awareness among all medical staff of the forthcoming study and the need to access the full KIS. Continued lack of awareness was apparent following junior doctor change-over after the initial education session as well as staff having missed the education session due to shift patterns.

Do

An abbreviated KIS education/awareness PowerPoint slideshow was tested on palliative care team colleagues showing how to access the KIS and why this was important. Feedback was positive and this slideshow was sent to all St John's junior medical staff to remind them how and why to access the full KIS. Consultants were also sent an amended version of the slides to encourage them to check for the presence of a KIS at the first ('post-take') ward round after admission.

Study

Verbal feedback from medical staff was that the PowerPoint slideshow was helpful but that they were also keen to be shown how to access the KIS in 'real time'.

Act

In response to this feedback, additional 'informal' education sessions took place on the wards showing doctors how to access the versions of the KIS in February 2015.

PDSA cycle 4

Plan

Sustainable interventions were needed to maintain awareness and access to the full KIS from March 2015 until March 2016. Discussions were held with St John's MAU clinical director and at the Lothian-wide ACP Forum regarding the most sustainable interventions. The ACP forum included professionals with active interests in ACP. It was decided that the ACP checklist was too labour intensive to continue; however, education and awareness interventions could be continued and shared electronically throughout NHS Lothian.

Do

The PowerPoint slideshow was emailed to all new doctors at their induction at St John's Hospital over the following year. Ward KIS access information posters remained in place.

Study

Data were collected in March 2016, showing that full KIS access had dropped back to near baseline levels.

Act

Further meetings were held among the ACP forum and it was agreed that system-wide changes to the format TRAK software would be more effective at improving access to the full KIS in the longer term. Recommendations for change were submitted to the TRAK development board including (1) changing the title of a tab to improve ease of access the full KIS and (2) replacing the abbreviated KIS with the full version on the ECS medications summary.

SUMMARY OF RESULTS

Following the completion of PDSA cycles 1–3 in March 2015, a second set of data was recorded. This was 5 months after the baseline data were collected and was a retrospective case note analysis of consecutive patients admitted to MAU at the time when checklists were in place (and followed the educational interventions: during the middle two weeks of March 2015). This coincided with some

notes being sent off-site to be scanned and destroyed as part of the hospital's move towards a paper-light change over. Therefore, it was not possible to obtain 100 sets of notes from this time period and the numbers reviewed were less than the baseline audit (n=66).

The results of the data collection in March 2015 following interventions tested in PDSA cycles 1–3 revealed that the numbers of patients admitted to MAU with a KIS remained similar between 24% and 27%. Seventy-four per cent of case notes contained an ACP checklist; however, completion of these remained poor (31%). The majority of the checklists were blank (69%), and some had been removed or were missing. Access to the ECS medication summary (with abbreviated KIS) was consistently high (89% in both measurements). Compared with the baseline measurement, however, there was a significant improvement in access to the full KIS from 4% to 45%.

A third data set was collected 1 year later in March 2016 after the fourth PDSA cycle to ascertain the effectiveness of the longer-term (educational) interventions and can be seen in [table 4](#). Using the MAU admissions log book, the TRAK records of a further consecutive 100 patients admitted to St John's MAU from 1 March 2016 were reviewed to assess the frequency of ECS medications summary and full KIS access by admitting teams ([figure 2](#)).

The data from March 2016 revealed consistent numbers of patients admitted with a KIS (27%). Access to the ECS medications summary (\pm abbreviated KIS) had improved to 96% of admissions. However, access to the full KIS (excluding the hospital palliative care team so as not to skew results) had fallen from 45% to 7%, which was closer to the level of KIS access in the original baseline measurement.

In summary, PDSA cycles 1–3 resulted in a significant increase in full KIS access in March 2015. A further PDSA cycle was undertaken to test sustained interventions; however, the improved full KIS access was not sustained 1 year later.

Table 4 Baseline, repeat and 1-year measurements

	Baseline measurement October–November 14	March 2015 following PDSA cycles 1–3	March 2016 following PDSA cycle 4
	N (%)	N (%)	N (%)
Number of patients audited	100 (100)	66 (100)	100 (100)
Percent of patients with a KIS	24 (24)	18 (27)	27 (27)
ACP checklist still present	N/A	49 (74)	N/A
ACP checklist blank	N/A	46 (69)	N/A
ECS medications summary accessed (includes abbreviated KIS)	89 (89)	59 (89)	96 (96)
Full KIS access where KIS present	1 (4)	30 (45)*	2 (7%)

*Significant increase in access to full KIS in reaudit following initial interventions.

ACP, anticipatory care planning; ECS, Electronic Care Summary; KIS, Key Information Summary; N/A, not available.

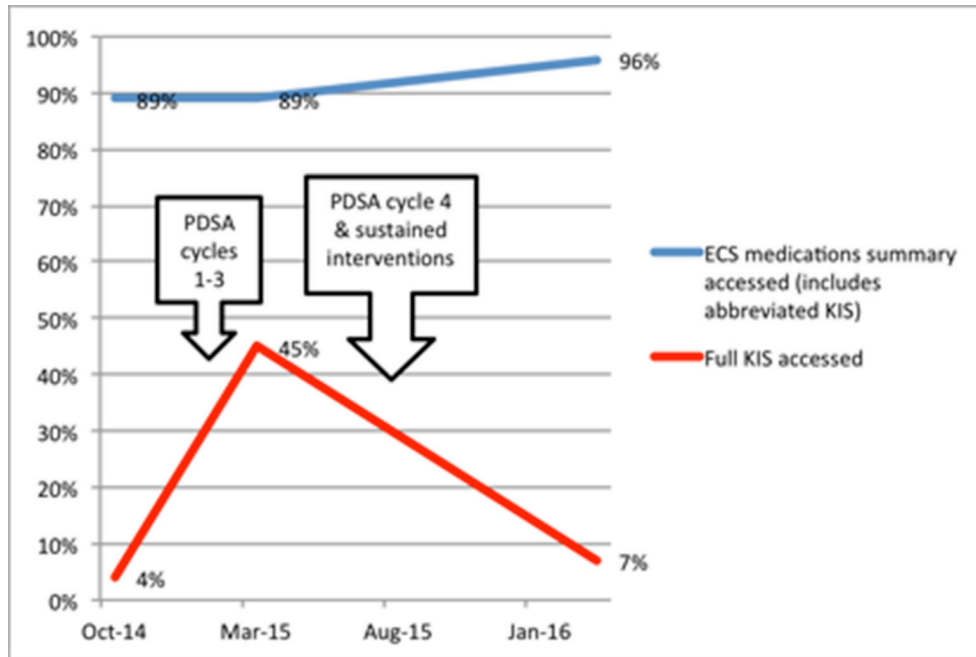


Figure 2 Line graph showing trends in Key Information Summary (KIS) access from October 2014 to March 2016 in relation to PDSA cycles. ECS, Electronic Care Summary.

LESSONS AND LIMITATIONS

There were some limitations to the project's methodology. It was not possible to collect data in the same manner at each collection. The baseline measurement included a large data collection with a combination of case note and TRAK reviews, structured interviews and KIS content analysis. Data were collected over a number of weeks and this differed from the second measurement, where a retrospective case note review was undertaken looking at consecutive admissions over 2 weeks immediately after PDSA cycles 1–3. The final data collection in March 2016 was an analysis of TRAK records alone of 100 consecutive MAU patients to check for KIS access. The data collections were at different time points in relation to the interventions, and therefore some of the differences in KIS access may have been due to chance. If the increase in access to the full KIS in March 2015 was due to the project's multiple recent preceding interventions, it is hard to tell what effect the 'sustainable' interventions had after PDSA cycle 4 because the repeat measurement was taken after a longer time period. It would be preferable to undertake frequent measurements throughout the year with more numerous smaller PDSA cycles testing these 'sustainable' interventions to see if they had any effect on level of KIS access. This would allow more reliable conclusions to be drawn on their effectiveness rather than surmising their effect from a single measurement alone.

The PDSA cycles were used primarily to develop multiple interventions implemented in the project, with larger numbers of data collected subsequently. This differs from some QI methodology where PDSA cycles are used to hone a single intervention, which is subsequently rolled out with measurements of change recorded. As multiple interventions were used, it was hard to conclude which

were potentially most effective in leading to sustainable improvements. It may have been preferable to focus on using PDSA cycles testing a smaller number of interventions (such as the ACP checklist alone or an educational intervention). This project did use different educational interventions, yet did not test whether learner's knowledge of the KIS had improved after each one. Employing an educational assessment may have helped to ascertain the effectiveness of the educational interventions and could have tested knowledge retention over time.

The project itself highlights some of the difficulties with introducing any new system and awareness-raising. For a process to become an embedded practice, it takes time for a 'culture change' to occur.⁵ Substantial and strong leadership support and involvement are recognised factors that can positively influence a change in practice.⁶ Education therefore needs to target senior staff who provide the continuity in secondary care. The formal education session held at the medical meeting in February 2015 captured most medical consultants and junior doctors and was a useful way of spreading awareness; however, this was delivered prior to a junior doctor change over. If the senior staff are aware of the benefit of accessing the full KIS, they are more likely to ensure changes are sustained through their practice and that this is passed on to their junior colleagues. In order for a culture change to occur, there needs to be widespread uptake, and even though many medical consultants attended the education session, they may not have necessarily changed their practice based on this and the email alone.

Educational interventions are relatively low cost and can have a high impact through repetition. Formal education sessions can be replicated or shared at other hospital education meetings. The induction slideshow emailed to

new doctors seemed to be an effective intervention, but methods of ensuring this continues are needed, which this study did not include. Educational interventions are more cost-effective as they can be easily shared, including the awareness posters which were placed above computers in admitting wards. The benefit of awareness posters is likely to be limited over time as old posters are replaced with new and get removed/covered on busy ward notice boards.

The data showed a transient increase in access to the full KIS after the first three PDSA cycles (45%) but the level of access to the full KIS was never as high as access to the ECS medications summary and abbreviated KIS (89%–96%). Accessing the ECS medications summary is an embedded process for newly admitted medical patients. As a result of the action phase of the fourth PDSA cycle, recommendations for change were made to the TRAK development board for ways to improve ease of access to the full KIS. The first of these recommendations has since been implemented: a change in the title of a tab within TRAK from: 'Patient Preferences' to; 'KIS/Patient Preferences', which may make accessing the full KIS more intuitive. This was implemented after the final measurement in this study so whether this has increased access to the full KIS is yet unclear.

The second recommendation to the TRAK development board, to replace the abbreviated KIS version with the full KIS version, has yet to be implemented. This system-wide intervention could potentially bring access to the full KIS up to the same level as the ECS medications summary (89%–96%). With improved connection speeds the prior concern of excessive download speeds is also negated. As well as this, hospitals are evolving to use TRAK to become fully paperless. There is now a 'one click' direct hyperlink to the full KIS available during the electronic clerk-in process, which was not in place at the time of this study.

The least effective intervention was the ACP checklist. This took a lot of work to implement, and checklist completion remained poor (31%). Introducing additional paperwork for doctors to complete during the time-pressured process of admitting patients is likely a significant barrier to its effectiveness. Staff need to be aware of why an intervention is important; otherwise, interventions are at risk of being seen merely as additional short-term projects adding to workloads, and not as priorities.⁵

Lack of education among other staff groups may also have confounded the effectiveness of the interventions. Our interventions targeted predominantly doctors; however, in many units medical admissions to hospital are seen by advanced nurse practitioners, especially when admitted OOH in some areas. Education for broader staff groups on the importance and potential impact of QI projects in the future may therefore improve effectiveness. Empowering all staff to believe that QI is part of their working culture may improve the sustainability of change.⁶

CONCLUSIONS

The number of patients admitted to St John's Hospital MAU with a KIS between 2014 and 2016 was reliably around one in four patients, and of these medical admissions, one-third were identified at risk of deterioration or dying (as screened by the SPICT tool). This number was similar to that shown in other studies.^{7,8} Patients identified by the SPICT are more than twice as likely to have a KIS (53%), which can contain vital ACP information. Considering that only around 4.6% of all NHS Lothian patients have a KIS,⁹ GPs are therefore completing KIS for appropriate patients.

KIS access through TRAK at St John's Hospital MAU was low in October–November 2014 and there was poor awareness of the two KIS versions or where to locate them. The majority of admitting clinicians found the KIS information useful, and where present, the KIS data could change the management of one in five patients. The majority of full KIS contain additional clinical information compared with the abbreviated version, which if not accessed means important ACP information may be missed.

Interventions at St John's Hospital significantly improved access to the full KIS initially (from 4% to 45%). However, not all of these interventions were sustainable and the level of full KIS access dropped after 1 year back to baseline levels in spite of ongoing education. System-wide interventions have since been put in place due to recommendations from this project. Further work to ascertain whether these system-wide IT interventions reliably improve full KIS access is needed.

Care planning for patients at home, in hospital or in care homes, can reduce the number of hospital admissions and increase the chance of them dying outside of hospital.^{10,11} Evidence has shown that patients with a KIS are more likely to die outside of hospital³ and that palliative patients with an electronic care record are more likely to die in the place of their preference.¹² Patients with an ACP communicated via their KIS, accessed reliably in secondary care may be less likely to undergo unwanted, inappropriate treatments or interventions, and this would be an interesting area for future research. A secondary outcome measure that could also be investigated is whether the use of a KIS makes any difference to the patient's journey from their perspective.

Using a QI approach, access to electronic care records can be significantly improved at the point of hospital admission. Longer-term change provides more of a challenge and may require more system-wide, coordinated and reliably delivered interventions. The interventions tested here and lessons learnt can be applied to other sites across the UK hoping to improve access to such electronic care systems.

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