Appendix 1: Description of Tools

Concise Safe Systems Checklist

The Concise Safe Systems Checklist addressed gaps in assessing patient safety in family practice. We used a 9-item checklist:

Four items measured information flow within the practice (e.g. ensuring that laboratory test results and hospital correspondence were followed up in a timely and effective manner).

One item assessed safety information (whether practices provided safety information about the practice to staff members).

Three items looked at safe prescribing (whether practice worked with patients to ensure safe prescribing of medications).

One item examined how practices used their IT systems when prescribing (Did practices make the most effective use of their clinical computer systems to ensure patient safety?)

NHS Education for Scotland Medicines Reconciliation tool [18]

An essential part of the admission and discharge process is communication about medications. There are many different approaches to medicines reconciliation but we have chosen the most appropriate method for UK systems. National Education for Scotland uses five criteria for assessing the safety of medicine reconciliation in the interface between primary and secondary care, these criteria are applied to 10 consecutive discharge summaries from acute medical admissions or from any admissions of patients aged >75years. We used the tool to assess 20 patients per practice.

The six items were:

Summary processed and with GP within 2 working days of receipt by practice?

Any changes to medications required? (If NO, the respondent did not fill out subsequent questions).

Documentation of changes present? (If NO, the respondent did not fill out subsequent questions).

How many working days did medicines reconciliation take?

Did discussion with patient/carer occur?

Was discussion with the patient/carer clinically necessary?

NHS Education for Scotland PC-SafeQuest

The PC-SafeQuest is an NHS education GP team climate tool.[17] This 30 item questionnaire is grouped across 5 domains; workload, communication, leadership, teamwork and safety systems. The project steering group that developed this tool agreed on 13 factors and 61 questions, which was piloted with 118 staff in six GP practices. The resulting 48-item questionnaire was refined by an 11-member Delphi panel, all items reached agreement (defined as 3 or 4 on a scale of 1-4) but some were lost in factor analysis. The PC-SafeQuest was tested in 49 practices chosen at random from a sample of 200 Scottish practices, 563 of 667 questionnaires were returned (a very high return rate), and as such it is the best validated of all the climate tools analysed in the review. The authors also reported on the results from practices that used the questionnaire – the mean score was 5.48 out of a possible 7 with leadership items producing the highest scores and the workload items producing the lowest. The work surrounding PC-SafeQuest has been incorporated into the website of the Scottish Patient Safety Programme.

NHS Education for Scotland Trigger Tool

Trigger tools use events or 'triggers' to quickly find patients who may be at risk of a potential safety incident from a large potential population of patients.[15-16] Using trigger tools has several advantages over retrospective reporting of error: 1) large numbers of events can be identified, 2) the process does not rely on memory for events or willingness to report events, 3) common rather that rare events are identified and, 4) the focus is on patient outcomes. The NHS Education for Scotland Trigger Tool was developed in 2009[16] for use in patients in primary care. A nurse or GP looked for the presence of any of eight triggers in a sample of 25 records and determined whether an adverse event or a potential adverse event relating to a trigger occurred. After practice and training this process can take between 2-4 minutes for every trigger that is identified. Resources are available on the instrument website to train practices in using this tool. With repeated use, practices can track their error rates and see

improvement over time.   The rate of harm in the development sample[16] was one event for every 48 consultations with 42% of these considered preventable.

PREOS-PC

The Patient Reported Experiences and Outcomes of Safety in Primary Care[19.20] (PREOS-PC) is a 58-item questionnaire that was designed to assess patient safety in family practice by gathering information about patient experiences and outcomes. This tool was designed specifically for UK primary care assessment of patient reported outcomes with respect to patient safety and is meant to discriminate between practices over time. It contains 5 domains:

1) Practice Activation (creating a safe environment for patient safety)
2) Patient Activation (are patients pro-active in creating a safe environment)
3) Experiences of Patient Safety Problems
4) Harm
5) Overall Perceptions of Patient Safety

Prescribing Safety Indicators[21,22]

1. Patients with a history of peptic ulcer who have been prescribed a non-selective NSAID without gastroprotection
2. Patients with asthma who have been prescribed a beta-blocker
3. Patients aged 75 years and older who have been prescribed an ACE inhibitor or a loop diuretic long-term who have not had a computer-recorded check of their renal function and electrolytes in the previous 15 months
4. Proportions of women with a past medical history of venous or arterial thrombosis who have been prescribed the combined oral contraceptive pill
5. Patients receiving methotrexate for at least three months who have not had a recorded full blood count (Outcome 5a) and/or liver function test (Outcome 5b) within the previous three months
6. Patients receiving warfarin for at least three months who have not had a recorded check of their INR within the previous 12 weeks
7. Patients receiving lithium for at least three months who have not had a recorded check of their lithium levels within the previous three months
8. Patients receiving amiodarone for at least six months who have not had a thyroid function test within the previous six months

Appendix 1 - Table A: Number and Percentage of Triggers Found in Patient Records

Indicator	Number	Percentage
> 3 consultation in 7 days	75	19%
New significant diagnosis	100	25%
New allergy Read Code added	4	1%
Repeat oral/injectable medicine added	53	13%
Out of hours/A and E attendance	110	27%
Emergency hospital admission	46	11%
Hemoglobin concentration < 100 grams/liter	12	3%

Appendix 1, Table B: Average Subscale and Total Score on the PC-Safequest with 95% CI

Scale	Average	95% CI
Communication	4.71	4.58-4.84
Workload	4.16	4.01-4.31
Leadership	5.48	5.35-5.61
Teamwork	5.29	5.16-5.42
Safety Systems	5.48	5.36-5.60
Total Score	5.13	5.02-5.24

Appendix 1, Table C: Intra-Class Correlation Coefficients and Reliability
Coefficients for PC-Safequest

Scale	ICC (95% CI)	Practice Mean Reliability Coefficient[a]
Workload	0.12 (0.02 to 0.22)	0.59
Communication	0.04 (0.00 to 0.11)	0.31
Leadership	0.13 (0.03 to 0.24)	0.62
Teamwork	0.14 (0.03 to 0.25)	0.63
Safety Systems	0.05 (0.00 to 0.12)	0.36
Total	0.10 (0.00 to 0.19)	0.53

[a]Reliability coefficients were based on approximately 11 staff in each practice.

Appendix 1, Table D: Number and Percentage of 'Yes' Responses to Medicines Reconciliation Bundle

Indicator	Number	Percentage
Summary processed and with GP within two working days of being received by practice?	259	85%
Any changes to medications required?	141	45%
Documentation of changes present?	126	89%
Has the GP completed medicines reconciliation within two working days of receipt?	95	75%
Did discussion with patient/carer occur?	59	47%
Was discussion with the patient/carer clinically necessary?	69	57%

Appendix 1, Table E. Prescribing Safety Indicators: Number (numerator/denominator and percentage) of "at-risk" patients identified

Query	Prescribing safety indicator	Numerator/ Denominator	(%)
1.	Patients with a history of peptic ulcer prescribed an NSAID without a PPI/ Patients with a history of peptic ulcer without a PPI	23/1767	1.30
2.	Patients with asthma prescribed a beta-blocker/Patients with asthma	449/20223	2.22%
3.	Patients aged ≥75 on long term ACEIs or diuretics without urea and electrolyte monitoring in the previous 15 months/Patients aged ≥75 on long term ACEIs or diuretics	459/3725	12.32%
4.	Female patients with a history of venous or arterial thromboembolism and arterial thrombosis prescribed combined oral contraceptives/Female patients with a history of venous or arterial thromboembolism and arterial thrombosis	6/5012	0.12%
5a.	Patients prescribed methotrexate for ≥3 months without a full blood count in last three months/Patients prescribed methotrexate for ≥ 3 months	56/298	18.79%
5b.	Patients prescribed methotrexate for ≥ 3 months without a liver function test in last three months/Patients prescribed methotrexate for ≥ three months	56/298	18.79%
6.	Patients prescribed warfarin for ≥ 3 months without an INR in last three months/Patients prescribed warfarin for ≥ three months	295/1201	24.56%
7.	Patients prescribed lithium for ≥ 3 months without a lithium level in last three months/Patients prescribed lithium for ≥ three months	37/102	36.27%
8.	Patients prescribed amiodarone for ≥ 6 months without a thyroid function test/Patients prescribed amiodarone for ≥ 6 months	54/104	51.92%

Appendix 1, Table F: Number and Percentage of 'Yes' Responses to Safe Systems Checklist[a]

Item	Number	Percentage
Vulnerable patients discharged from hospital are followed-up by a member of the clinical team within one month	6	75%
Non-collection of prescriptions is monitored or followed-up and is a trigger for review and audit in partnership with local pharmacies	6	75%
The practice keeps a log of minor operations.	7	87%
Where incoming clinical information requires follow-up or diarised activity, this is recorded in the patient's record and acted upon.	7	87%
The indication for all repeat medications is coded with the electronic record.	7	87%

[a] Total number of items on Safe Systems Checklist is 8.