

The Primary Care Trigger Tool: Practical Guidance for GP Teams

Reviewing electronic patient records to detect avoidable harm

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Introduction

What is a 'trigger tool'?

A trigger tool is a simple checklist containing a selected number of clinical 'triggers' that a reviewer searches for when screening medical records for patients who may have been unintentionally harmed. ...

"Triggers" are defined as: "...easily identifiable flags, occurrences or prompts in patient records that alert reviewers to potential adverse events that were previously undetected..." For example, an international normalised ratio (INR) of >5 would be a "trigger" for the reviewer to undertake a more focused examination of the record for evidence of bleeding.

The trigger tool process facilitates **the structured, focused and rapid review** of a sample of medical records by primary care **clinicians**.

- Clinical reviewers should undergo brief training.
- The trigger tool enables front-line clinical staff to serially measure levels of harm found in different populations of patients in their local practice, for example patients aged 75 years and over or patients taking high risk medications. The key outcome measure is the avoidable 'harm rate' within the practice and the goal is ultimately to minimise this figure over time.
- The trigger tool can also be used by the practice team and individual clinicians to identify learning needs and help prioritise improvement efforts.

Key points for reviewers and teams

- The focus is on identifying avoidable harm, not error. Harm is defined as: '...anything that happens to a patient as a result of interaction with healthcare services (environment, workers, and treatment) that you would not want to happen to you or your relatives...'
- When reviewing groups of patients, the review should focus on a specific period in the record – usually three months. Choosing full calendar months facilitate the review.
- The maximum time that should be spend on reviewing any one record should be twenty minutes. The objective is to detect 'obvious' problems, rather than every single trigger and episode.
- If there is reasonable doubt whether harm occurred, the incident should not be recorded.
- The trigger tool is better at detecting acts of commission (something that was done) which led to error and harm. Evidence suggests that focusing on acts of commission improves the willingness of healthcare teams to confront safety issues and adopt improvement initiatives more readily. However, reviewers may still want

to make a note about detected acts of omission (something that was not done but should have been) for personal learning and reflection.

- The scale and type of harm that is detected is variable and dependant on a number of factors. This makes benchmarking and comparisons between two different practice teams unreliable, unhelpful and to be avoided.
- There is no 'correct' number of triggers – a balance needs to be struck between available time and resources to conduct the review (less triggers) with the potential to detect greater levels of harm (more triggers). Around ten triggers is, therefore, considered optimal.
- Consistency is essential to obtain a 'reliable' rate of harm in the patient group being reviewed. This may be improved by the same reviewer(s) applying the same method in the same manner at periodic intervals over time.

Summary of the trigger tool process (Appendix 1)

The process can be simplified into three main steps:

STEP 1: Planning and preparation

STEP 2: Review a random sample of records

STEP 3: Reflection and further action.

The process is flexible and can be adapted according to the improvement aims of individual clinicians and primary care teams – examples of how and why the trigger tool process may be used are shown in Appendix 3.1 and 3.2.

Step one: Planning and preparation

What is the aim of the review?

- **Individual clinicians (e.g. GP specialist trainees, GPs (salaried, locum and principals) and practice nurses)** may undertake a review **of records** to identify specific learning needs **to inform**:
 - Specialist training,
 - Professional appraisal and revalidation,
 - Continuing professional development.
- **Practice teams** may wish to undertake a review to:
 - Identify their collective patient safety leaning needs,
 - Measure and quantify their levels of undetected harm or
 - As part of targeted improvement initiatives.

A clear aim (or aims) can help to guide clinicians and teams in adapting the trigger tool process and informs their planning and preparation (see Appendix 3).

Sampling medical records

- **Which records should be chosen?**
(What are the inclusion and exclusion criteria?) Two examples are shown below:
 - A practice team aims to improve the quality of prescribing in their elderly patient population. They agree the following inclusion criteria: all patients > 75 years of age, registered with the practice for > 12 months and prescribed >4 repeat medication items. The only exclusion criterion will be nursing home residents.
 - A practice team aims to serially measure the harm rate in their whole patient population. They agree inclusion criteria: all patients > 18 years who have been registered for > 12 months with the practice.
- **How many records should be reviewed?**
Practical experience suggests that it is feasible to review up to 25 records in a four-hour session. The clinician or practice can choose the specific number depending on their aim (see Appendix 3).
- **How often should records be reviewed?**
This depends on the clinician or practice's aim (see Appendix 3). For measuring purposes we recommend that a minimum of twenty (20) records are reviewed every three months.
- **How should records be selected?**
This depends on the clinician or practice's aim. For measuring purposes we recommend that a minimum of twenty (**n=20**) records are reviewed every three months.

- **How should records be selected?**

Medical records should be selected randomly, especially if the review aim is to establish a 'reliable rate of preventable harm'. Every patient record should therefore have an equal chance of being selected. There are various ways to ensure true randomisation. One feasible method would be to manually select every nth record in the relevant patient population. Alternatively, a random number generator may provide an automated solution. An example can be found at <http://www.graphpad.com/quickcalcs/randomN1.cfm>.

- **What period of time will be reviewed in each record?**

We recommend reviewing three consecutive calendar months in every record. We also recommend that the selected periods of time do not overlap in serial measures. However, any number of months may be chosen, depending on a clinician or practice's specific aims and available resources. Longer periods of time may increase the total number of detected harm events but it will not necessarily increase the harm rate, will require additional resources and some harm events may be 'outdated'.

Clinical triggers: how many and which ones?

Between eight and ten triggers should provide the optimal balance between sensitivity (in detecting levels of harm) and feasibility (in terms of having sufficient time and resources necessary to complete the chosen review).

There are a number of **core triggers**, shown below:

- ≥Three consultations in seven days
- A 'high' clinical priority read code was added
- An allergy or allergic drug reaction read code was added
- A 'repeat' medication item was discontinued
- An out of hours (OOH) or A&E attendance
- Any hospital admission

The clinician or practice may select further triggers according to the specific aim of their review. Examples of additional triggers include:

- INR > 5.0' (this would be an appropriate trigger if the aim was to detect anticoagulant-associated adverse events)
- Haemoglobin < 10.0 (This may be a suitable trigger for various sub-populations, including patients prescribed DMARDs, anticoagulants, the elderly, those with confirmed renal disease or heart failure)
- WCC < 3.5 (Consider when screening patients prescribed DMARDs or receiving chemotherapy)
- AST/ALT > 150 (Consider in patients prescribed DMARDs)
- eGFR deteriorates by > 5 (Consider in patients with heart failure or the elderly)

What data should be collected?

Essential data to be collected for every patient record reviewed includes:

- A patient unique identifier
- Whether a harm event(s) is detected.

Essential data to be collected when a harm event(s) is detected includes:

- The number of detected 'harm events';
- The grade of harm severity,
- Whether the event was judged to be preventable;
- The setting where the harm event originated.

Depending on the review aim it may be necessary to also extract the following data:

- The number and type of consultations;
- The number of triggers found;
- The time taken to review each record;
- A brief narrative description of the harm incident.

There may also be important, incidental findings. This should not distract reviewers from achieving their main objectives or unnecessarily slow the process, but this information can potentially be documented for later consideration. For example:

- Clinical errors not resulting in harm
- Administrative and systems failures
- Inadequate record keeping
- Acts of omission.

Practical support

Specific consideration should be given to:

- Who will be involved in the project?
- What will their responsibilities be?
- How much time should be allocated for specific tasks?

Administrative staff may play a key role in providing important practical support when applying the trigger tool. They may help in generating list of records, selecting relevant samples, undertaking initial completion of data proformas and entering collected data into a spreadsheet. A practice nurse will be able to pre-screen records for agreed clinical triggers and also identify probable harm incidents. The GP and practice nurse are then able to jointly discuss detected harm events and describe harm characteristics. The whole team may be involved in reflecting on the results, help to prioritize events and in planning and implementing improvement.

Step two: Systematic review of records

Every record in the random sample is reviewed consecutively. A maximum of 20 minutes review time should be allowed for every record. Reviewers should move on to the next record if they cannot finish in the allotted time. This is quite rare for experienced reviewers who typically require only a few minutes per record. The data to be extracted from each record should be entered onto a proforma (Appendix 2).

A primary care record normally consists of patients' personal information, contained in a demographic section, and clinical information. The types of clinical information can be grouped into **five main sections**:

- Clinical encounters section (all types of documented consultations)
- Medication-related section (for example acute and chronic prescribed or discontinued items, item intervals, dosages, directions and indications)
- Clinical read codes section (Various events such as allergic drug reactions, diagnoses, interventions and investigations can be coded. Some systems allow codes to be prioritized as low, medium or high importance)
- Correspondence with other health care providers (including referrals, reports, discharge summaries and clinic letters)
- Investigation requests and results (for example biochemistry, haematology, microbiology and imaging)

The reviewer should systematically screen each individual section to identify the evidence necessary (or otherwise) to answer the following key questions.

Can triggers be detected – yes or no?

If yes, detected triggers should prompt the reviewer to examine the relevant section of the record in more detail to determine if the patient came to any form of harm. The majority of detected triggers will not be linked to harm incidents. In some instances more than one trigger may help to detect the same episode of harm. Similarly, a single trigger may help to detect more than one harm incident. If no trigger is detected or if 20 minutes has elapsed, the reviewer should proceed to the next record and repeat the process for the whole sample.

Did harm occur – yes or no?

It may be necessary for the reviewer to examine other sections of the record before deciding whether a harm incident has occurred. If evidence of harm is detected, the reviewer should consider where it originated, the severity level and judge perceived preventability. If no harm is detected, the reviewer should continue reviewing the record or commence with the next record if applicable. When reviewers are uncertain whether harm occurred they should not record the incident.

What was the severity of harm detected?

The reviewer should attempt to grade the severity of every incidence of detected harm as 'E' through 'I' using the classification system (shown on the Trigger Tool data proforma – Appendix 2).

Was the detected harm incident preventable?

The reviewer should make a decision on whether the detected harm was preventable, which is based on a combination of the evidence found in the medical record and their professional judgement at that point in time. If a more in-depth analysis is required to support or refute a judgement it should be undertaken after the review.

Where did the harm incident originate?

As before, the reviewer should arrive at an initial decision based on the recorded evidence and their professional judgement. The circumstances leading to the eventual harm event may have originated in primary or secondary care, or a combination of both.

Practical examples that illustrate these questions are provided in Appendix 5.

Incidental findings and additional information

Reviewers may wish to add some of their incidental findings to the results. In some cases these findings may provide additional insight, context and opportunities for improvement. The reviewer should also consider whether there is sufficient evidence to analyze the harm events in a meaningful manner, and the degree of certainty with which the harm characteristics were judged. There may be a need to further explore harm events by reviewing certain records again in more detail and at greater length. It may also be useful to consider the systems and processes underpinning the decisions and actions taken in individual cases. The reviewer may also have to consider utilizing other improvement tools, for example significant event analysis (SEA).

One way in which harm incidents may be prioritized is to consider and grade specific characteristics, including severity, likelihood of event occurrence and detection, perceived preventability and origin. Further information is provided in Appendix 4 for the interested reader. Events with higher risk scores may be more susceptible to intervention or require consideration. This does not imply that events with lower scores are not important or serious but merely reflects the team's perceived ability to deal with and prevent similar, future events.

Step three: Reflection and further action

The clinician or practice team can use the review process and results in a number of ways. Some of the possible actions are described in more detail below:

Immediate actions

- Arguably, the first task for the clinician or practice is to acknowledge the detected levels of harm, irrespective of whether errors had occurred.
- In those instances where an error occurred it may be necessary to apologize to affected patients.
- With regard to those patients where harm was detected - there may still be an opportunity to intervene to prevent further progression or alleviate complications.
- It may be possible through early, targeted intervention to prevent similar harm to other patients.

Two examples: a reviewer may have detected a female patient with severe migraine attacks thought to be complicated by the combined hormonal contraceptive pill AND the reviewer found a case of Warfarin and Aspirin being co-prescribed. In both examples an audit or focused review of similar records may identify other cases and help to prevent future harm.

Reflection and Opportunities for collective learning

The clinician or practice team may wish to share and collectively reflect on the review findings as part of routine educational or business meetings. We recommend including every practice team member whenever possible, including those that did not participate to the process. This may help to identify individual or practice-based learning needs which require to be addressed in the short or medium term.

An example of the educational application of the trigger tool: A GP trainee detects a case where an elderly patient's INR temporarily increases to > 5 after prescription of an oral antibiotic for a suspected urinary tract infection. The learning point that patients prescribed anticoagulants requires more intensive monitoring during illness is shared with clinical team members during the practice meeting.

Measurement and calculating a harm rate

If the review aim is measurement and calculating a harm rate the collected data from the individual records should be aggregated and patient identifiers removed. This can be achieved in a number of ways, for example by entering data into a simple spreadsheet or using specific online tools designed for this purpose. Clinicians and practices can register for free at www.gptriggertool.com. This website allows the collected data to be entered and generate a report. Data can then be analysed in a number of different ways, depending on the initial purpose of the review.

At a basic level, an overall harm rate may be calculated for the defined patient population, once a number of reviews have been undertaken. The rate may be

expressed in percentage terms and refers to the proportion of patients in a defined population who suffered harm in the previous 12 month period. The harm rate can also be expressed in a number of alternative ways, for example as an incidence of harm per x consultations. It is also possible to adjust the rate to reflect only preventable harm or harm judged to have originated in primary care. Calculated harm rates from previously conducted, comparable reviews may also be displayed graphically in statistical process control or run charts to aid further analysis. The amount and type of data to display in a report can be customized according to the initial aims.

Preventing and reducing harm

The reviewer or team should consider how they can prevent or reduce harm and improve care quality. In any review (e.g. a sample of 20 medical records) it is likely that a number of avoidable harm incidents will be identified, mainly of a low grade of severity. Unfortunate as it may seem it is possible that many practices will lack the time and resources to fully consider the implications of and respond effectively to every incident. It is more likely that some incidents will have to be prioritised over others as it is neither feasible nor possible to investigate all.

Different improvement methodologies are available. One method that is currently promoted extensively in all UK patient safety initiatives is the IHI model for improvement. This method consists of three questions and a PDSA cycle.

Sharing and reporting the findings

We recommend that results are shared with the wider team. It may also be useful and necessary to share specific findings with relevant stakeholders, for example:

- Other general medical practices.
- Secondary care
- Some events may have to be reported through the appropriate local or national reporting systems.

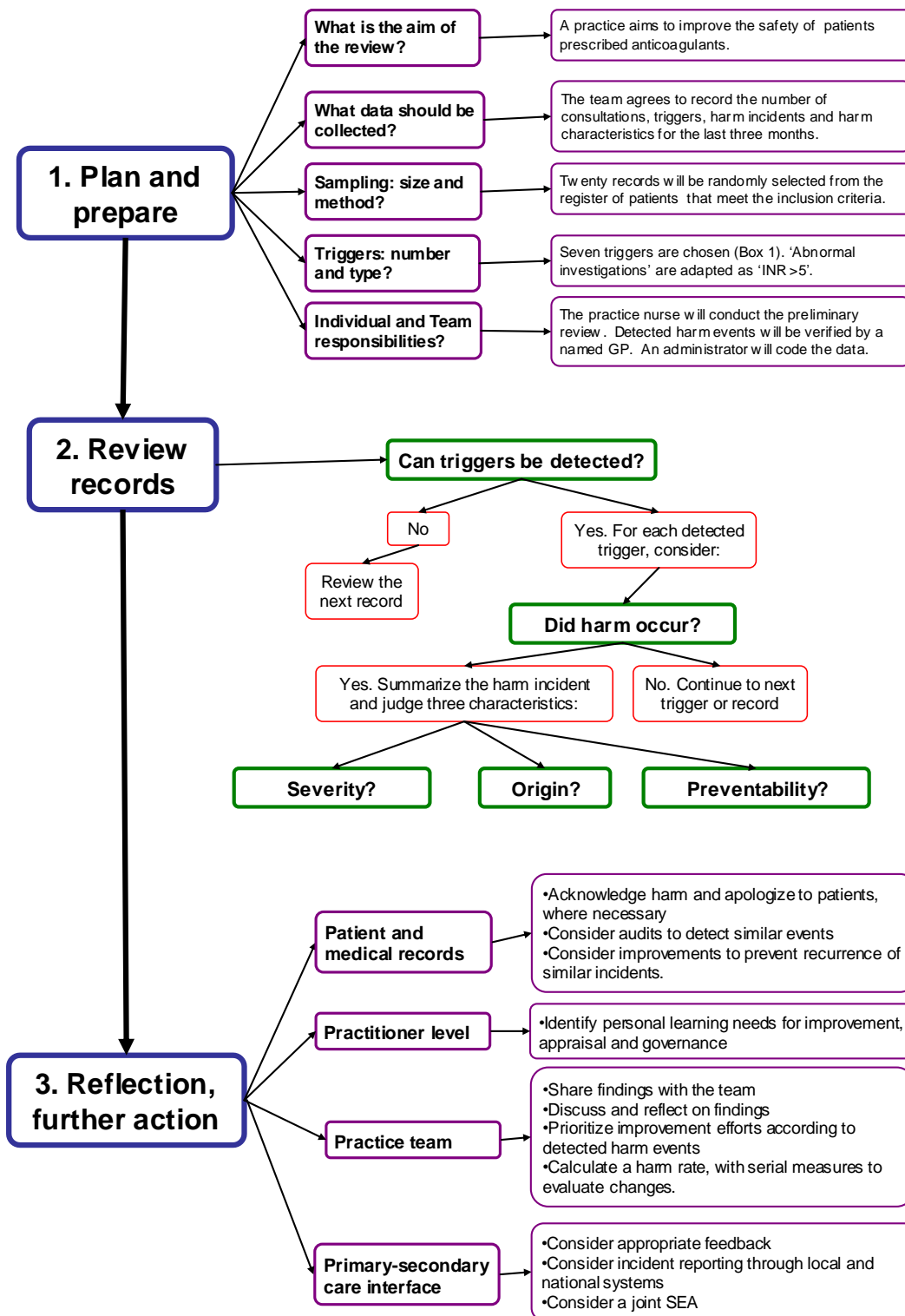
Evaluating and sustaining change

Regular application of the trigger tool has a number of potential benefits:

- Additional harm may be detected (providing further opportunities for improvement) with each review
- Comparison of serial measures may provide evidence of efficacy of improvement initiatives
- Further educational needs may be identified
- It provides a measure of an individual clinician or practice's commitment to safety to a variety of potential stakeholders.

These benefits may be realized by repeating reviews within the same patient population. We recommend that reviews should take place at **three monthly intervals** and that the **same method** should be followed wherever possible.

Appendix 1: The trigger tool process



Trigger Tool Proforma

General information

Date of review

Time to review record

CHI no

Classification of severity

- E** Temporary harm to the patient - required intervention
- F** Temporary harm to the patient - required hospitalization
- G** Permanent patient harm
- H** Required intervention to sustain life
- I** Death of patient

Number of consultations

Telephone

GP - surgery

GP - home visit

Practice nurse

Other

Triggers	Is Trigger present?		Did harm occur? Prev*			Severity?	Harm origin? ?=unsure			Preventable? ?=unsure		
	Yes	No	Yes new	Yes prev	No		Prim	?	Sec	Yes	?	No
New 'high' priority read code added	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
'Repeat' medication item discontinued	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New allergy read code added	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
≥3 consultations in 7 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OOH / A&E attendance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hospital admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional trigger: INR >5, < 1.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional trigger: Hb < 10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Further, optional triggers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Prev=tick this box if the harm incident has been recorded before.

Brief description of harm event(s)	Incidental findings
1.	
2.	
3.	

Appendix 2. The trigger tool data collection proforma

Appendix 3.1. Trigger tool process: a summary of potential application aims and methods for the primary care team and individual clinical groups

	GP Specialist Trainees	Individual GPs (sessional, salaried, principals)	Individual GP Nurses	Practice Team (Basic)	Practice Team (Intermediate)	Practice Team (Advanced)
	<i>More likely to aim for 'non-measurement' purposes</i>				<i>More likely to aim for 'measurement' purposes. May combine two functions</i>	
Aim of review:	To identify patient safety learning needs as part of specialist training	To identify patient safety learning needs as part of professional appraisal and revalidation	To identify patient safety learning needs as part of continuing professional development	To identify collective learning needs and areas for improving patient safety	To identify collective leaning needs; measure and reduce harm rates in a given sub-population	To identify collective leaning needs; measure and reduce harm rates across the practice population
Patient population:	Group of previous consultations or random sample	Group of previous consultations or random sample	Group of previous consultations or random sample	Specific sample e.g. patients with heart failure or chronic asthma	Specific sample, e.g. high risk medication group or patients. >75 years	Global random sample
Core triggers:	Apply All	Apply All	Apply All	Choose Triggers Relevant to Patient Group	Choose Triggers Relevant to Patient Group	Apply All
Sample EPR size (n):	15	15	15	20	25	50
Annual Frequency:	x1-2	x1	x1	x1-2	x3	x4
Estimated time to conduct review (hours)	2-3	2-3	2-3	5-6	6-7	8-10
Examples of Multi-Purpose Evidence for Professional, Team and Governance Obligations	Education & Training Clinical Audit	Appraisal Regulation Lifelong learning RCGP CPD credits Clinical Audit Patient Safety	Appraisal Regulation Lifelong learning RCGP CPD credits Clinical Audit Patient Safety	Patient Safety Clinical Governance Collective Learning Safety Culture Accreditation	Patient Safety Clinical Governance Collective Learning Safety Culture Accreditation	Patient Safety Clinical Governance Collective Learning Safety Culture Accreditation

Appendix 3.2. Examples of how and why the trigger tool may be applied by practice teams and different groups of clinicians

Example Scenario 1

- A practice team aims to quantify and reduce the rate of avoidable harm across their whole practice population (i.e. calculate a global rate). The population to be sampled is all patients >17 years and registered with the practice for >12 months. They serially measure the harm rate in the patient population by screening a random sample of 50 medical records every three months.

Example Scenario 2

- A practice team aims to quantify the avoidable harm rate in their elderly patient population. They review a sample of records of patients >74 years, who have been registered with the practice for >12 months and are prescribed >4 repeat medication items. They decide that nursing home residents will be excluded.

Example Scenario 3

- A GP partner aims to identify and address potential learning needs as part of her continuing professional development plan. She reviews a random sample of 15 patients who consulted with her in the previous three months to find specific harm events that may have been preventable and identify other incidents or issues with learning potential.

Example Scenario 4

- As part of her specialist training, a GP trainee aims to review a random sample of 15 patients who consulted with her in the past three months. She plans to detect potential harm events or other incidents with potential learning interest and conduct a significant event analysis for training purposes.

Example Scenario 5

- A sessional GP who works occasionally in the same local practice, negotiated access with the surgery to review the care of a random sample of 15 patients taking anti-coagulant drugs who consulted with her in the past 12 months. She plans to detect potential harm events or other incidents with potential learning interest. Depending on the outcome, the GP can use the review findings to record: a learning point (e.g.); a learning need (e.g.), immediate action (e.g.) or to suggest that a significant event analysis is necessary.

Appendix 4. Prioritizing harm incidents

Table 4.1. Suggested criteria and scores to prioritize detected harm incidents

Harm incident characteristic	Low = 1	Medium = 2	High = 3
Severity	E	F and G	H and I
Occurrence (Likelihood of event occurring again or its relative frequency)	Yearly or less	Monthly or less	Weekly or less
Detection (Likelihood of event being detected)	Audit, automatic inspection or 'shut off'	Double-check process in place	Requires manual inspection or no known method
Preventability (Perceived ability of reviewer or team to prevent future events through intervention)	Harm is recognized and accepted complication of appropriate clinical care	Additional resources have to be earmarked	Feasible changes to systems and addressing individual learning needs will suffice
Origin (Health care setting where harm originated)	Secondary care	Mixed	Primary care

Table 4.2. Examples of harm incidents prioritized and scored according to characteristics. Risk priority numbers were calculated by summation of scores.

Harm event	Severity	Occurrence	Detection	Preventability	Origin	Risk priority number
Elevated INR with haemarthroses requiring admission	2	1	2	3	3	11
Self-limiting allergic drug reaction	1	2	3	1	3	10
Iatrogenic septic arthritis	2	2	2	2	1	9

Appendix 5. Practical examples to illustrate step two (record review) of the trigger tool process

The five questions that the reviewer should ask while reviewing records are:

- Can a trigger(s) be detected? This question will not be discussed further in this section
- Did harm occur?
- What was the severity of the harm?
- Was the harm incident preventable?
- Where did the harm incident originate?

The following examples provide a clinical scenario and brief description of alternative health care professional actions and patient outcomes. The NCCMERP Index (A – I) which is used to grade the severity of detected harm is used as a framework to discuss the review process. In addition to the questions (above) we also consider the question: ‘did an error occur?’ before providing a brief discussion.

Example one

Scenario: Mrs. Jones is a 45 year old school teacher that presents with a few days of malaise and coughing. She has used over-the-counter medications with slight benefit. She has no repeat prescription items, no documented chronic illness and no hospital attendance in the last few years. Her GP diagnose a respiratory tract infection.

A (events with capacity to cause error)

This first severity classification is very rarely used in the literature. It could be argued that all of health care has the capacity to cause error.

B (An error occurred but did not reach the patient)

The GP checks through the record and notices an entry from a year before that suggests that the patient had suffered a likely Penicillin allergy. This allergy should have been ‘read coded’ (i.e. electronically tagged) to alert clinicians and prevent future prescriptions. The GP now does the necessary coding and prescribe an alternative antibiotic.

- **Did an error occur?** Yes
- **Did harm occur?** No
- **Discussion:** Although this incident may be important for many reasons, it is unlikely that the trigger tool could have detected it, illustrating the method’s dependency on records and record keeping. In this instance, an alternative method such as SEA might have been more useful. Errors are common but fortunately often mitigated.

C (An error reaches the patient, but no harm occurred)

The GP does not check through the record, assumes the patient does not have an allergy and gives the prescription to the patient who leaves. A few moments later there is a knock on the door. The patient returns and raises her concerns about her possible Penicillin allergy. The GP clarifies and confirms this, enter the necessary code and prescribe an alternative antibiotic.

- **Did an error occur?** Yes
- **Did harm occur?** No
- **Discussion:** Again, it is unlikely that the trigger tool method would have detected this incident, especially if the GP had deleted the erroneous prescription.

D (An error reached the patient and required monitoring or intervention to confirm it resulted in no harm)

The pharmacist phones the surgery the following day. She had been checking the previous day's dispensing as they have had a locum and noticed the prescription for Penicillin for a patient which their system has flagged up as potentially being allergic. The GP phones the patient. After three doses she has not noticed any new or worsening symptoms. The patient and GP decide that it might be prudent to discontinue the medication.

- **Did an error occur?** Yes
- **Did harm occur?** No
- **Discussion:** Various interpretations for 'monitoring' can be used. In practice any further, unscheduled or extra patient contact initiated by a health care worker could be considered as 'monitoring' or an 'intervention'. This should be seen as a separate action to a review phone call checking on a patient's progress. Examples of 'monitoring' can include telephone calls, letters, consultations, imaging or laboratory investigations.

E (Temporary harm to the patient, requiring an intervention)

The patient attends two days later with an itchy rash. The GP considers the possibility of a Penicillin allergy and they agree to discontinue the medication. At a follow up consultation a few days later (whether telephone or in surgery) the rash has resolved and the patient feels well overall.

- **Did an error occur?** If this patient had never been prescribed Penicillin before there could be no realistic way for the GP to know that she is allergic. In that case, it should hopefully be clear that no error had occurred (in choice of antibiotics. Whether an antibiotic should have been prescribed at all is a different matter and may be considered after the review (during step 3 – data analysis). However, if there had been previous evidence of an allergy, an error did occur. The exact nature of the error can take many forms, for example inadequate history taking or inadequate record keeping.

- **Did harm occur?** Yes. Irrespective of whether an error occurred, it should hopefully be clear that the patient suffered harm. If uncertain, it may be helpful for the reviewer to turn the situation into a personal question: ‘Would I have liked to have had an itchy rash for a few days? Would I have liked to have had to take more time off work to re-attend the surgery?’
- **Discussion:** From this grade of severity and higher the trigger tool method’s sensitivity to detect harm increases substantially. The reviewer is looking for objective, concrete events. There is no ambiguity about whether or not the patient had a rash – that is indisputable. This should be the main focus of the reviewer. The question of whether or not an error had occurred should not detract from the review process. If necessary, it may be considered after the review as part of step 3 – data analysis.

F (Temporary harm to the patient requiring hospitalization of any length)

The patient becomes increasingly short of breath after taking the first tablet. She seeks urgent medical attention (whether GP or A+E). The diagnosis of a Penicillin allergy is made. The patient is appropriately treated with oxygen, Adrenaline, antihistamines and a period of observation in hospital. She makes a full recovery and is discharged.

- **Did an error occur?** The answer is the same as for E above. Even though the consequences (i.e. harm) of an error may become more serious (F, G, H then I) this does not and should not change whether and what type of error occurred. (Human factors research have found that the vast majority of people, including skilled professionals, are biased to judge errors according to consequences)
- **Did harm occur?** Yes
- **Discussion:** The vast majority of reviewers would hopefully agree that harm had occurred. A minority might raise arguments such as: ‘but she had excellent care’ and ‘no one could have known she would react like that’ and ‘we all know there is a small risk involved when we take an antibiotic for the first time’. Even though all of these statements contain some truth, the reviewer is reminded to ask: ‘Would I have liked to have ended up in a hospital and receiving injections?’

G (Permanent patient harm)

The patient becomes increasingly short of breath after taking the first tablet. She seeks urgent medical attention (whether GP or A+E). The diagnosis of a Penicillin allergy is made. An inexperienced doctor attempts an emergency tracheostomy before senior help arrives. The patient’s vocal chords are permanently scarred and she has a disfiguring scar.

- **Did an error occur?** See D and E above. The question could be expanded to ask *how many* errors occurred. From the vignette some reviewers would argue that there was insufficient senior supervision (for whatever reason), the ‘wrong’ intervention was chosen and the intervention chosen was poorly executed. There might be many more, just as there are many reasons why a minority of reviewers would refute that these actions were errors. Again, it may be more useful to focus on the question below.
- **Did harm occur?** Yes

- **Discussion:** In practice there is often a degree of 'overlap' between some grades of severity. If the patient had truly required a tracheostomy the severity would have had to be classified as an 'H' (See below). Similarly, if a tracheostomy was performed in 'H' which then led to permanent harm, it would also have to be classified as a G. When faced with these questions the reviewer should write a brief account of the event, discuss with a colleague or assign both grades. After the review is conducted she may then consider the case again in more detail. There are various possible definitions of 'permanent harm.' At present the consensus is to accept harm that persists past one year. In practice it may be possible to grade it as 'permanent' earlier if the prognosis is clear. In this example the 'scar' could be seen as 'permanent' from the time of hospitalization. The 'hoarseness' may or may not recover over the following weeks to months after discharge.

H (Intervention to sustain life is required)

The patient becomes increasingly short of breath after taking the first tablet. She seeks urgent medical attention (whether GP or A+E). The diagnosis of a Penicillin allergy is made. In spite of optimal medical treatment her condition deteriorates and it is necessary to intubate the patient and ventilate her for a few hours. She makes a full recovery and is discharged.

- **Did an error occur?** As above
- **Did harm occur?** Yes
- **Discussion:** Fortunately, the frequency of harm incidents decreases with an increase in the severity grading. Most practices may already have alternative, appropriate systems in place for dealing with some of these events, such as SEA.

I (Patient death)

The patient becomes increasingly short of breath after taking the first tablet and eventually dies (Whether in the community, practice or hospital).

- **Did an error occur?** As above
- **Did harm occur?** Yes
- **Discussion:** See 'H' above.

Where did the harm originate?

All harm incidents in this example originated (at least initially) in primary care. Incident analysis should not be superficial, but include an attempt to understand the systems-factors that contributed to harm. Some would argue that a few of the more serious harm incidents occurred in secondary care. While this is partially true it is important to acknowledge when primary care contributes (even inadvertently).

Were the harm incidents preventable?

This is a difficult and complex question to answer. It could be argued that some of the harm incidents may or may not have been preventable in the secondary care setting – for example through provision of ‘better’ supervision. The answer would also depend on whether there was any knowledge or indication of a possible allergy before the events. It is important for reviewers to retain an ‘open’, honest and objective mind when considering the facts and reflecting on the incident. Even if no error had been committed, might it still have been possible to prevent, minimize or manage the harm better?

Acts of commission and omission

The GP’s various potential actions may be simplified into two options:

- **An act (or acts) of commission.** These acts imply specific actions, such as prescribing an antibiotic or cough mixture. The trigger tool is especially useful to detect these kinds of acts and this will be the only type that will be considered in this discussion. In this example a specific ‘act of commission’ was the prescription of a course of oral Penicillin.
- **An act of omission.** Acts of omission does not necessarily mean ‘doing nothing’. The GP might have reassured the patient, explored her health beliefs or arranged for a review appointment.

Both types of acts may be equally appropriate or inappropriate and both may result in positive or negative patient outcomes (Table 5.1.)

Table 5.1. Acts of commission and omission, their perceived appropriateness and patient outcomes. Clinical examples are provided in brackets.

	Was the act appropriate?	Patient outcome as a result of the act
Act of commission (Prescription for antibiotic)	Appropriate (The patient has fever, tachycardia and unilateral chest signs suggesting pneumonia)	Positive (Patient fully recovers)
		Negative (Patient’s condition worsens, for example due to atypical pneumonia or she has a severe allergic drug reaction)
	Inappropriate (Patient has a viral infection with non-specific signs)	Positive (Patient fully recovers)
		Negative (Allergic drug reaction)
Act of omission (No prescription)	Appropriate (Patient has a viral infection)	Positive (Patient fully recovers)
		Negative (Patient develops secondary infection and is hospitalized)
	Inappropriate (Patient has a bacterial pneumonia)	Positive (Patient fully recovers)
		Negative (Pt admitted as an emergency. Could this have been prevented through earlier AB use?)

Example Two

Scenario:

Mrs. Smith is a 32 year old administrative clerk that presents a few days after a caesarean section which was performed at the local hospital. She is concerned about redness around the incision and a pussy discharge. The GP diagnose cellulitis (a soft tissue infection). The same format is used as for example one, but severity grades A-D have been omitted.

E (Temporary harm to the patient, requiring an intervention)

The GP prescribes on oral antibiotic and take wound swabs. She reviews the patient a few days later. Her examination at that time reveals that the wound is healing well.

- **Did an error occur?** Reviewers are likely to disagree. However, if the GP had found absorbable sutures exposed on the skin surface (causing irritation and inflammation), the conclusion would be yes.
- **Did harm occur?** Yes. Irrespective of whether the infection was preventable or whether it was caused by error, it should hopefully be clear that the patient suffered harm as a direct result of her contact with health care. Some reviewers might argue that infections are a known complication of the procedure, but should be reminded to ask: 'Would I have liked...?'

F (Temporary harm to the patient requiring hospitalization of any length)

The patient returns a few days later. In spite of the oral antibiotics the redness is spreading and she is feverish. She is admitted to hospital for intravenous antibiotics

- **Did an error occur?** As above
- **Did harm occur?** Yes

G (Permanent patient harm)

The patient returns a few days later. In spite of the oral antibiotics the redness is spreading and the wound is gaping wide open. She eventually recovers after many months of dressings by the district and practice nurses but is left with an unsightly scar and residual tenderness.

- **Did an error occur?** As above
- **Did harm occur?** Yes

H (Intervention to sustain life is required)

The patient is re-admitted to hospital for intravenous antibiotics. She continues to deteriorate. There are a number of delays before she is diagnosed with intra-peritoneal sepsis. She is taken to theatre as an emergency case during the night to drain a large collection of pus.

- **Did an error occur?** Yes

- **Did harm occur?** Yes

I (Patient death)

The patient is re-admitted to hospital for intravenous antibiotics. She continues to deteriorate. There are a number of delays before she is diagnosed with intra-peritoneal sepsis. She is taken to theatre but pass away hours later in ICU.

- **Did an error occur?** Yes
- **Did harm occur?** Yes

Where did the harm originate?

Secondary care

Was it preventable?

This specific case might not have been preventable. However, the scenario provides examples of many potential opportunities to prevent harm and improve care quality.

Additional examples of preventable harm detected in general medical practice records

- An elderly patient in a nursing home is prescribed Diclofenac (NSAID) for back pain without gastric cover. She is admitted with acute renal failure a few days later.
- A patient is prescribed a statin and returns with considerable muscle pains and raised LFTs. The symptoms and results settle after discontinuation.
- An elderly patient on Warfarin is prescribed Gabapentin. He is dizzy and falls in the house, injured his lower limb and required admission.