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CVDPREVENT

A National Primary Care Audit

FEASIBILITY REPORT

The ***CVDPREVENT*** feasibility project has been led and funded by the British Heart Foundation.

Prepared by PRIMIS

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1. Strategic overview

CVDPREVENT, a national Cardiovascular Disease Prevention Audit, will support professionally led quality improvement in primary care. Cardiovascular disease (CVD) is common and places a major burden on individuals and society. It accounts for almost a quarter of all premature deaths with 33,800 premature CVD deaths per year in England; 4,600 in Scotland; 2,500 in Wales and 1,100 in Northern Ireland[i]. CVD continues to be a major driver of health inequalities - for example, in England there is a 27% life expectancy gap for males and 24% in females between the most deprived and most affluent communities is due to CVD[ii].

CVD is also very preventable. Primary prevention through modification of lifestyle risk factors is of course essential and will have the greatest long term benefit. However, there is also substantial benefit to be gained by improving detection and management of the high risk conditions for CVD - atrial fibrillation (AF), high blood pressure, high cholesterol, diabetes, non-diabetic hyperglycaemia and chronic kidney disease. Although these conditions all substantially increase risk of heart attack, stroke and dementia, and although treatment is very effective at preventing cardiovascular events, large numbers are undiagnosed or under treated[iii].

Four out of ten people with hypertension – that's 25,000 people in the average English CCG – remain undiagnosed. And even when the diagnosis is made, around four in ten do not achieve the NICE treatment targets.

Around a quarter of people with atrial fibrillation in England are undiagnosed, and even when the diagnosis is made, many do not receive anticoagulation: amongst those with a confirmed diagnosis of AF who go on to suffer a stroke, only half have been treated with anticoagulants

Fewer than half of people with a raised cholesterol and high cardiovascular risk in all four nations in the UK are treated with statins.

Routine audit is the only way to systematically identify individuals whose clinical risk factors are sub-optimally managed - not least because these conditions usually have no symptoms to alert the patient. Optimising treatment in the under treated provides the opportunity for every health economy to prevent heart attacks and strokes at scale in a very short time frame. For example in Lambeth and Southwark CCGs, 1,300 people with AF were newly anticoagulated preventing around 45 strokes in 15 months[iv]. Routine audit will also allow clinicians to identify people who are at risk of treatment related harm, for example because of frailty or co-morbidity.

CVDPREVENT will help busy clinicians across the UK to optimise patient care and will offer real time local and national reporting. It will allow practices and Primary Care Networks to quantify opportunity for improvement and to develop new models of care that improve outcomes for patients and communities and minimise the burden on general practice.

This initiative will sit within a broader strategic intent to work with system partners to drive CVD quality improvement in each of the four nations. Discussions have already commenced in England with NHS England, NHS Rightcare and Public Health England and broader partners to scope the development of a CVD prevention programme. It is envisaged that this project will drive a broader partnership quality improvement programme.

2. Introduction

This paper examines the feasibility of producing a common, four nation CVD tool to improve early diagnosis and management of Cardiovascular Disease (CVD) (see Appendix 2). It recommends an approach and the risks associated with it.

3. Background

The British Heart Foundation (BHF), Public Health England (PHE) and NHS England (NHSE) in consultation with a four nation reference group (see Appendix 2 for membership) including representation from a wide range of partners and stakeholders with strong primary care clinical engagement, wish to explore the potential of a UK wide CVD prevention audit and decision support tool - *CVDPREVENT*. This early testing of feasibility and development of a supporting business rule set (separate report) have been funded by the British Heart Foundation.

The following organisations were represented on the four nation reference group: NHS England, Public Health England, NHS Digital, NICE, RCGP, NHS Medway CCG, NHS Bradford Districts CCG, various GP practices; Universities of Nottingham, Surrey and Glasgow, Aneurin Bevan University Health Board (Wales), Cardiac Network (North Wales), Greater Manchester AHSN, the Scottish Government and SPIRE (Scottish Primary Care Information Resource).

The group has agreed that general practice should be the focus of a tool to identify and manage the six high-risk conditions Hypertension, Hypercholesterolemia including FH, Atrial Fibrillation (AF), non-Diabetic Hyperglycaemia, Diabetes and Chronic Kidney Disease in order to prevent strokes, heart attacks and other cardiovascular events.

The tool should comprise of three main components:

i. **Case finding** - identification of patients who are at increased risk of CVD because of the presence of one or more undiagnosed or sub-optimally managed high risk conditions (see Appendix 1)
ii. **Patient management support** - built-in GP system prompts to assess risk or to optimise patient management support
iii. **Reporting** within practices (identifiable patient level data to aid patient care) and at aggregate level (CCG, Network, STP, Health Board and national) at agreed timely intervals to monitor progress on achieving the stated aims of the tool, and to support professionally led quality improvement.

The four nation reference group has identified the following requirements:

- The tool should include the high risk conditions that increase the risk of CVD (detailed above).
- The tool should be NICE compliant for all disease areas for which guidance is available and aligned with the NHS Rightcare approach to CVD prevention. It should not replicate the Quality Outcome Framework (QOF). However, where home nation guidance is at variance with the above then parallel alternative approaches may be invoked.

- The tool is to be available during practice consultations for use by a variety of clinical professionals providing appropriate system-based customizable prompts to assess risk and optimise management in 'real- time'
- Be embedded within the GP IT systems (EMIS Web & PCS, TPP SystmOne, INPS Vision and Microtest) without the need for separate log-ins and bolt on screen views.
- Easy to use i.e. embedded within current practice processes both from an IT system perspective and a process/pathway perspective and should not require additional software.
- Value for money.
- Provide reporting at aggregate level, both regionally and nationally.
- Be available throughout the four nations of the United Kingdom.
- Although not articulated in the brief, BHF wish to ensure that the tool can be sustained and maintained for multiple years.
- Be drawn from data that would be expected to be normally recorded in primary care management and not add to the data burden of practices.

4. The GP IT system landscape

The GP systems that are in use in each of the four countries are used to support direct patient care (creating the electronic patient record). They enable practices to enter coded data for the management of the health of patients in their population allowing them to call and recall patients for specific reviews and/or care processes such as vaccinations. Practices can generate reports from the system to support their proactive clinical work in attempting to prevent disease exacerbation and/or further deterioration.

EMIS Health, TPP, InPS Vision and Microtest provide the systems that are in use in England. The other three countries also use the same suppliers although the countries may be on different versions of the software:

	EMIS Web	EMIS PCS	TPP SystmOne	Vision	Microtest	Merlock
England	✓		✓	✓	✓	
Scotland	✓	✓		✓		
Wales*	✓	✓		✓	✓	
Northern Ireland	✓	✓		✓		✓

* NHS Wales Informatics Service has completed procurement on its next IT contract and the EMIS sites will be migrated to either Vision or Microtest during 2019 & 2020.
From February 2018 all EMIS LV sites across the UK have been migrated to EMIS Web or PCS.

Typically each country has a body that is responsible for procuring and managing contracts with each of the GP System Suppliers (GPSS) on behalf of the practices in that country. Practices then have a choice of approved clinical systems and benefit from discounts through centralised purchasing. This central organisation will often mandate the use of specific reporting tools within that country.

Several of the countries have either recently been through or plan to go through a procurement exercise with the GPSS which may result in changes to the GP system landscape in that country. This is illustrated in the table below:

Country	Responsible body	Contract	Status
England	NHS Digital	GP Systems of Choice (GPSoC) Lots 1-3. https://digital.nhs.uk/GP-Systems-of-Choice/GPSoC-Services Lot 1 – Principle clinical IT system plus some 'subsidiary modules' Lot 2 - Additional services Lot 3 - Interoperability services i.e. share information across healthcare providers	Will be replaced by GP IT Futures during 2019. Under GPSoC Lot 1 is centrally funded to a prescribed budget. If requests exceed the central budget, a request is made to NHS England or the costs are passed through to the requesting body. Lots 2 and 3 are paid for by the practice or the CCG.
Scotland	NHS Scotland		A procurement exercise is currently in progress. It is worth noting that Scotland has a central reporting programme called SPIRE.
Wales	NHS Wales Informatics Services		Has just completed a procurement exercise which enables GP practices to select Vison or Microtest solutions only.
Northern Ireland	Health and Social Care Board in Northern Ireland		Have an ongoing programme to move older versions of EMIS to EMIS Web by the end of 2018

5. SNOMED CT

The development of the specification for this tool is being completed as England moves towards the implementation of SNOMED CT in 2018. This means that there will be at least 3 data coding terminologies in play during the early development of this project, one of which (SNOMED CT) is completely new to the GP IT environment. PRIMIS has remained in close contact with the GPSS and UK Terminology section of NHS Digital during SNOMED CT implementation.

The GPSS entered into a test phase for their SNOMED CT compatible systems with a small number of practices in England from 1 May 2018. After the successful completion of the 'First of Type' testing, it is expected that the GPSS will start the wider roll out of SNOMED CT compliant systems during the late summer of 2018. The other home nations countries are not planning to transition to SNOMED CT until 2020.

The initial roll out of SNOMED CT will involve dual coding from the legacy terminologies RV2 & CTV3 (whichever is appropriate) alongside the equivalent codes in SNOMED CT. Initial data entry plans will restrict the use of codes to those SNOMED CT terms which have maps in the relevant legacy terminology (referred to as “the GP Subset”). During this phase all data entry and extraction processes should continue to replicate existing mechanisms. If testing is satisfactory, then wider SNOMED CT terms will be permitted that do not have maps to the legacy terminologies and at this point existing data entry and extraction mechanisms will need to be updated. It is possible that this latter phase may be implemented for some systems from late 2018.

Whilst SNOMED CT is a more powerful and comprehensive coding system, as explained above it will take time for users to transition between the more limited coding systems available now (RV2 and CTV3) and SNOMED CT; the timescales for this are unclear.

6. Options for data extractions and reporting

For the purpose of this project, coded entries in the patient record will need to be analysed for the case finding, management and reporting elements of the CVD tool. These coded entries represent diagnostic information, observable patient information, such as blood pressure values, recorded test results and patient medication. This analysis does not include free-text entries.

The presence of these data items is entirely dependent on individual practice data quality.

Our understanding is that the following data are required:

- Patient identifiable data for case finding and management of patient care within practices
- Practice identifiable aggregate data for locality and national comparative analysis

6.1 Internal GP IT system reporting (practice level)

- Utilises the search and reporting modules inherent in the GP IT systems
- These reports will produce both identifiable patient lists and associated relevant datasets relating to those patients for use within the practice to assist optimising patient management, along with numerator/denominator indicator output reports
- Low or zero cost but appropriate skillset is required to develop the searches
- Enables better utilisation of the data structure of each GP IT system. However, this may result in some difficulties in implementing the specification in an exactly comparable manner across all GP IT systems

- Distribution is best achieved via the GPSS to limit the workload at local level in replicating the searches, as well as minimising errors. This would naturally enable distribution across all the home nations. However, this may result in increased costs in the commissioning of the GPSS to write, maintain and distribute the searches. An alternative is to commission a locality to develop and test the searches, and then distribute to the GPSS estate.
- Output can be at patient level and can be patient identifiable within the practice
- Tends to have low information governance concerns
- Data sharing agreements would be required for any aggregate practice data leaving the practice, where there is no national mandate
- Customer would need to commission each GPSS to send practice level data to a centralised database. This would require specifying a standard format output in order to bring data together from disparate systems.

6.2 Internal GP IT system reporting (locality level using 'enterprise' solutions

- Enterprise solutions allow CCGs, Public Health, GP Federations and Health Boards to perform centralised searches and reports on data held by practices in their health economy, where practices are of the same GPSS
- Broadly as for practice level reporting but searches are distributed or run by a locality organisation, such as GP Federation, CSU or CCG (where an enterprise solution has been purchased)
- Tends to be at aggregate level rather than patient level, although patient level searches can be distributed by the locality umbrella organisation
- Data sharing agreements are required to support the distribution or running of aggregate, patient identifiable and patient de-identifiable data
- Enterprise solutions are not widespread and are tied to one GP IT system (not common in multi system localities)

6.3 Third party solutions

- These solutions can be described in three broad categories:

    1. Providers that search on the GP IT system using an Application Process Interface, commonly known as API which involves direct software interaction between the host and third party programmes. (examples include Vision's Outcomes Manager and Informatica's Audit+).
    2. Providers that search on a copy of the entire practice database located at the practice (example includes Apollo's SQL Solution)
    3. Providers that host the entire practice database at a central locality (examples include GraphNet, Discovery Data Service and local data warehouses some of whom use TPP's Strategic Reporting Extract)

- Solutions are commissioned and driven locally and therefore releasing the CVD tool may be problematic across multiple sites.

- In England some providers make their solutions freely available under current GPSoC arrangements, lowering costs for local NHS organisations. It is important to consider however that these arrangements may be time or funding limited. GP IT Futures may provide additional solutions not currently available under GPSoC.
- Cooperation of GP practices may be more challenging owing to increased information governance concerns
- Costs are variable across providers and funding for development, ongoing maintenance and distribution would be required
- Data sharing agreements are required to support the distribution or running of aggregate, patient identifiable and patient de-identifiable data searches

Due to implementation difficulties some of the solutions cited above use more than one approach to extract data.

6.4 National reporting programmes

- This includes General Practice Extraction Service (GPES) and bespoke services commissioned by national NHS organisations.
- GPES enables routine data extraction exercises across England's GP estate. There are similar solutions in the other home nations such as SPIRE in NHS Scotland.
- There are competing priorities for GPES and the approval process may not be suited for projects with a rapid implementation timeframe
- GPES enables the customer to commission its requirements centrally rather than with the individual GPSS
- Alternatively, customers can enter into a commercial relationship with one or more GPSS. The commissioning process would require separate agreements with each GPSS. It should be noted that GPSS development schedules are planned well in advance and therefore there may be a waiting period. If the CVD tool were to be mandated under GP IT Futures or comparable programmes in the other home nations, then some of this risk would be mitigated.

6.5 General considerations

For this programme, MIQUEST can be discounted as a data extraction solution. In April 2017, NHS Digital announced that it would no longer be supporting MIQUEST. As a mandated tool within the current GPSoC arrangements, the use of MIQUEST can only be guaranteed until December 2018.

The commissioners of the CVD tool are advised to consider validation of any implemented solution (GPES has its own internal validation system) to ensure a standardized approach has been delivered by any services that have been commissioned.

Data extraction routines can be scheduled at regular intervals.

A major consideration will be the General Data Protection Regulations coming into force from May 2018, which place greater emphasis on the processing of patient level data,

including de-identified patient level data and the role and responsibilities of the data processor.

Once the data are extracted, a method of reporting and presenting the data in a meaningful way may be required to aid analysis.

6.6 Recommendations for the proposed approach for reporting

In conclusion, the mechanisms to extract the required data are feasible and have been implemented in other programmes previously. This indicators listed in Appendix A are technically feasible and therefore implementable.

Our recommendations are:

- The development of a national surveillance data set, ultimately where anonymous data is extracted from general practice and aggregated at Primary Care Network, CCG, STP/ICS and national level, in a process similar to that of the National Diabetes Audit, ideally with practice data fed back as close to real time as possible. The aggregated data should be practice identifiable. The customer needs therefore to consider the provision of a centralised database, potentially with reporting interfaces to manage these data requirements. This would also require the appropriate central directives and consideration of associated patient opt outs.

- Practice level, patient identifiable reports to be made available to individual practices, allowing clinicians to review, discuss and improve individual and practice wide patient care.

- Colleagues from NHS Digital have indicated that there is no capacity for GPES to oversee the data extraction work during 2018/19. It is possible however that *CVDPREVENT* could be scheduled for implementation in GPES in 2019/20, subject to NHS Digital overcoming capacity issues. We understand that the timescales from discussion to implementation are approximately 6 months, and therefore, for a 2019/20 implementation, discussions would need to commence in November 2018.

- NHS Digital have recently unveiled plans for an upgrade to GPES, which is expected to be delivered under GP IT Futures (the replacement to GPSoC) from 2020 onwards. With this in mind, the customer may wish to consider implementing *CVDPREVENT* initially with the individual GPSS, perhaps among a small group of CCGs, with the longer term strategy of using the GPES upgrade from 2020. This approach would provide an opportunity for pre-testing and feedback prior to full national roll-out and ease the transition to GPES (or its upgrade).

- In the absence of a GPES implementation, we recommend that the technical specification, including business rule and clinical indicators are shared with the GPSS for national implementation and distribution. This would provide the most efficient mechanism for distributing the searches whilst minimising the risks of error. At least one validation exercise should be considered to ensure that a standardised approach has been adopted.

- Regardless of the eventual solution used, the specifications for each of the indicators will need to be updated and maintained on an annual basis at a minimum (new terminology codes are released twice yearly and national guidelines may also be updated at regular intervals).

- Proposed data linkage at a future point in the project is feasible subject to Section 251 and/or 254 approval.

- From an implementation perspective it is advised that this project is delivered in a phased approach to initially test the processes and develop the subsequent steps.

7. Tools for optimising patient management within consultations

Within live consultations, the GP IT systems may provide a variety of mechanisms to optimise patient management. These include:

- Predefined data entry screens (often called templates) that bring together uniform data entry prompts to assist in appropriate data collection, sometimes in conjunction with text displays providing relevant information to health professionals e.g. a template would be used during a diabetic review to ensure that all aspects of care are discussed and recorded. An example relating to contraception management is shown below (Fig 1.) with various predefined coded data entry prompts and on-screen advice shown with links to further information.

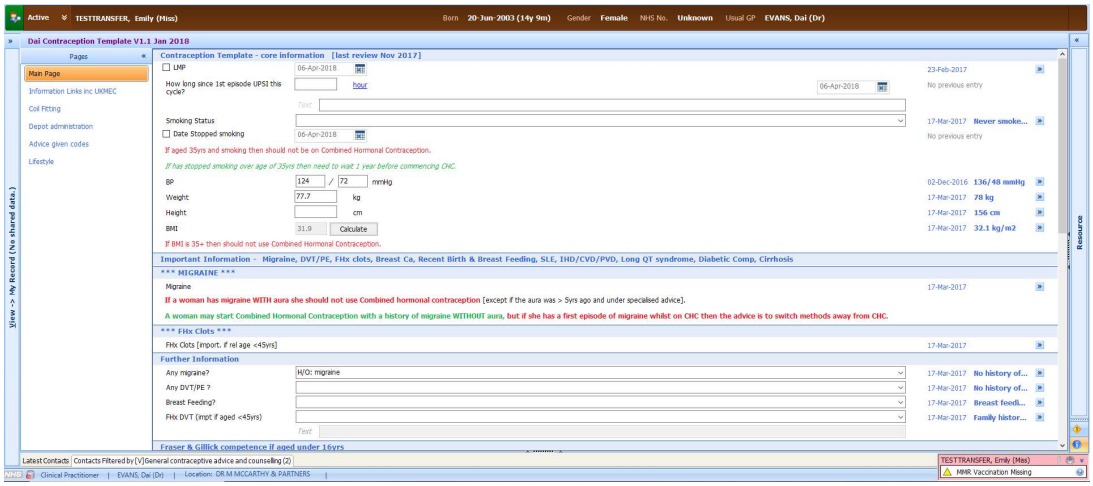


Fig 1

- Customisable patient alerts providing on screen prompts and/or information when certain conditions are met (such as missing information or target levels not met e.g. an alert will 'pop-up' when a patient's record is accessed to let the clinician know that a patient being prescribed warfarin hasn't had their INR recorded in the last 3 months or in the example above (bottom right corner) that the patient has not had an MMR vaccination.

- More complex logical software procedures (often called protocols) that may carry out a variety of processes, including those above, for data capture and information display, when logical rules based on data entries in a patient's record are processed e.g. in the example below (Fig 2), because a data entry of a significantly high pulse rate for this age group has been entered, the Sepsis protocol has been triggered with an appropriate information screen displayed advising action. This screen is then followed by others requesting information entry to record what action is being taken.

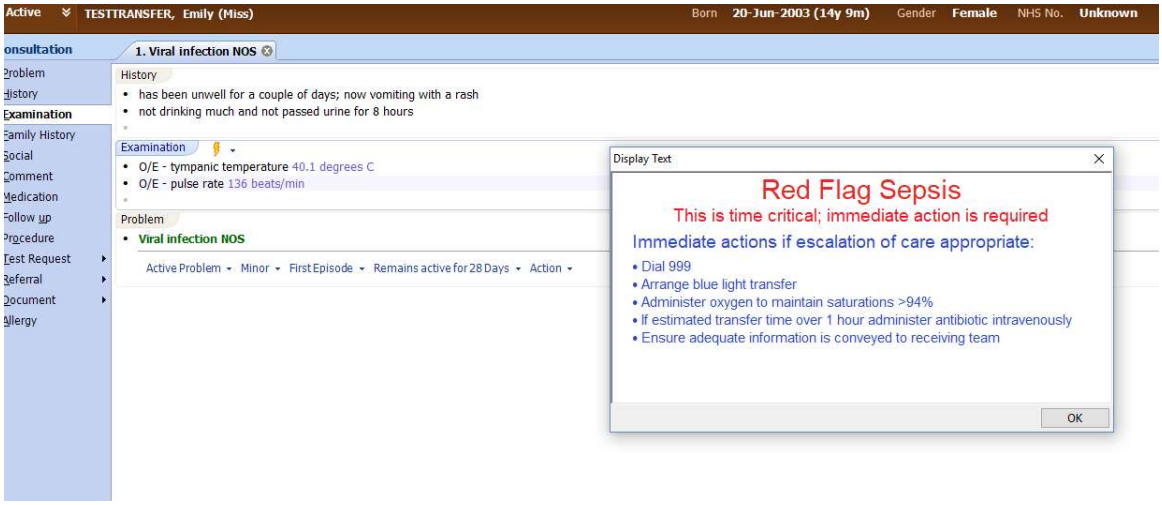


Fig 2

Whilst care needs to be taken that such tools are not regarded as medical devices, (as stringent rules exist around their use), caution must be taken that any such tools are clinically safe. They should fit in with normal practice processes else they will not be used and there is also much evidence that tools producing too many alert messages tend to be ignored (otherwise known as “Alert Fatigue”).

All the GPSS currently have one or more patient management tools, although their precise functionality does vary and will not necessarily be comparable. Similar functionality is available between the two larger suppliers EMIS and TPP. Some third-party companies (e.g. Informatica and Visions Outcomes Manager) can provide such functionality, but they may have restricted footprints across the GP estates (although Informatica is currently present in the entire Welsh estate).

It should be noted that distribution of some of these tools is not necessarily straightforward currently, particularly for the more complex implementations even where the GPSS are involved. As such, distribution, particularly across the EMIS estate, needs to be handled by the GPSS. One example of a similar implementation across the GPSS would be the data entry templates, with associated information providing screens, used in the adult Sepsis programme.

Like the reporting mechanisms discussed above, all these techniques need updating on a regular basis to ensure that they handle both terminology code updates as well as updates in conceptual guidance if national clinical guidance management changes. Variations may need to be produced where necessary for the home nations, not least where SNOMED CT implementation is concerned.

7.1 Recommendations for the proposed approach for optimisation tools

Our recommendation is that:

- Outline tool specifications are produced
- That these are passed to the GPSS for implementation and distribution either alone or with a partner programme. Instructions to demonstrate the aim and intended outcome of the optimisation tools should be produced to ensure that the GPSS implement the tools comparably.
- That these are regularly reviewed and updated on an at least annual basis

Appendix 1 – List of clinical indicators

In support of the early testing of feasibility, the British Heart Foundation funded the development of a supporting business rule set (separate report) in collaboration with members of the 4 nations reference group. This appendix provides an overview of the indicators included which have been written for *CVDPREVENT* to help GP practices assess the degree to which the practice has addressed the various cardiovascular disease risk factors in patients with cardiovascular risks.

The indicators also assess the degree to which relevant interventions have been made on the sub-populations within a practice (such as QRisk calculations for primary prevention or calculating stroke risk scores in patient with AF).

Generally, the indicators produce a denominator and numerator (as integers). These could be used to produce percentage achievement figures if required.

The main areas addressed are smoking, blood pressure control, lipid management, atrial fibrillation, chronic kidney disease & diabetes. Others have been compiled to consider non-diabetic hyperglycaemia. In several of these areas, case finders have been produced to try to enable practices to find patients without the correct diagnostic codes.

The reports are generally based on NICE guidance and also reflect SIGN guidance where this diverges from NICE.

Other indicators that were felt to be additionally useful have been added after the suggestions of various members of the four nation reference group who oversaw the development of the indicators.

Finally, there are some indicators which attempt to identify patients who may be being “over-treated”, for example in palliative care patients.

As a general rule, the indicators do not take into account the many exception codes that are used in QOF to remove patients from denominator groups. This was an agreed principle by the four nation reference group, so the denominators in some cases will produce a different cohort of patients than might be the case in a QOF report looking at the same parameter.

Where CKD is mentioned, grades 3-5 have been used by default, rather than including grades 1-2. However, all grades are considered when looking for a co-morbidity that would be clinically relevant, such as patients with diabetes and their BP targets.

Atrial fibrillation resolved codes have not been used, on the basis that patients with previous AF might still need anticoagulation despite clinical resolution. This of course differs from the way QOF handles these patients.

For most of the indicators, patients with any palliative care codes are removed from the denominator as it was felt inappropriate to subject such patients to potentially inappropriate over-treatment or other interventions.

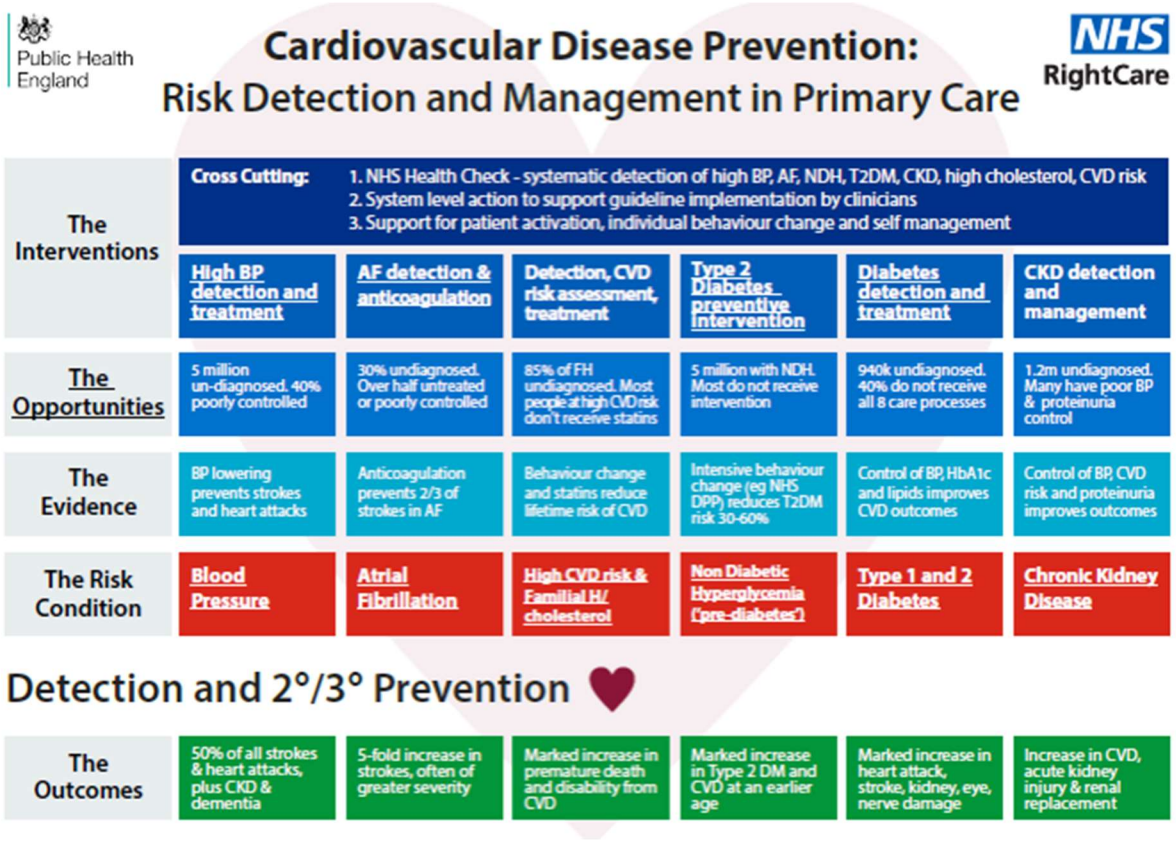
Smoking status recording and smoking status cessation
Report 1: % of patients in smoking trigger conditions group with smoking status recorded
Report 2: % of patients in smoking trigger conditions group with smoking status “current smoker”
Report 3: % of patients in smoking trigger conditions group with smoking status “current smoker” with smoking cessation intervention in the last year (including advice, referral or prescribed smoking cessation products)
Blood pressure control and lifestyle advice
Report 1: % of patients in group achieving target BP of 130/80 or lower
Report 2: % of patients in group achieving target BP of 135/85 or lower
Report 3: % of patients in group achieving target BP of 140/80 or lower
Report 4: % of patients in group achieving target BP of 140/90 or lower
Report 5: % of patients in group achieving target BP of 150/90 or lower
Report 6: % of patients with any type of diabetes: BP target of 130/80
Report 7: % of patients with new diagnosis of hypertension (excluding diagnoses of severe hypertension recorded in the last 12 months) with home readings or ABPM documented within 90 days of the diagnosis
Report 8: % of patients with hypertensive disease with eGFR checked in previous 12 months
Report 9: % of patients with hypertensive disease who have been given lifestyle advice in the preceding 12 months
Reports 10-12: Report on patients with no hypertensive disease code whose latest BP was in the following bands: a). Either Systolic >=180 or Diastolic >=110 AND last BP was > 90 days ago b). Either Systolic >= 160 AND <=179 or Diastolic >= 100 AND <=109 AND last BP was > 90 days ago c). Either Systolic >=140 AND <=159 or Diastolic >=90 AND <=99 AND last BP was > 90 days ago
Lipid management
Report 1: Number of patients are coded as having Familial Hypercholesterolaemia
Report 2: % of patients with no Familial Hypercholesterolaemia diagnosis with cholesterol values in the "at risk" range
Report 3: % of patients with high cholesterol values that have had secondary causation excluded AND been referred to a lipid or endocrine clinic
Report 4: % of adult patients with no Familial Hypercholesterolaemia diagnosis whose last TC or LDL was in the "at risk" range with assessment for possible Familial Hypercholesterolaemia
Report 5: % of patients in high risk groups that have been prescribed a medium or higher intensity statin in last 7 months or had an offer of statin in the previous 12 months
Report 6: Excluding patients in high risks groups, and including patients with FH or probable FH, the % of patients prescribed a medium or higher intensity statin in last 7 months or had an offer of statin in the previous 12 months.
Report 7: Excluding patients from report 5 or 6, % of patients with a latest QRisk >= 20%, that have been prescribed a statin in last 7 months.
Report 8: Excluding any patients from report 5 or 6, % of patients with a latest QRisk >=10% and <20% that have been prescribed a statin in the last 7 months.
Report 9: In patients aged >=85, % of patients that have been prescribed a statin in the last 7 months or have a coded offer of statin therapy

Report 10: % of patients with Type 1 Diabetes (see below) that have been prescribed a medium or high dose Statin in last 7 months Denominator group is: patients with Type 1 Diabetes who fulfil any of the following criteria: a.) Age >= 40 b.) Diagnosis date > 10 yrs ago c.) Established nephropathy (CKD3 or worse) or coded Microalbuminuria or worse. d.) Other CVD risk factors: (only Hypertension or Smoker)
Report 11: % of patients who have ever had a triglyceride value >10 mmol/litre that have had all the appropriate tests to look for secondary causes. (TFT, LFT incl' GGT, & HbA1c). Tests can be done at any time from 3 months before first qualifying triglyceride value to any time after.
Report 12: % of patients in group that have not had a QRisk assessment. Group is (all): Age >= 40 AND last total cholesterol >5.0 mmol/ AND not on a statin AND no CHD AND no familial hypercholesterolaemia AND no CKD 3-5 AND no non-haemorrhagic stroke AND no TIA AND no PAD AND no AAA.
Report 13: % of patients in group that have had a BP checked in the 12 months. Group is (any): AF, CKD3-5, familial hypercholesterolaemia, NDH, diabetes, coded hypertension, last QRisk >= 10%, prescribed statin in the last 7 months.
Report 14: % of patients in group and excl. those that have been prescribed a statin in the last 7 months that have had a total cholesterol checked in the last year. Group is (any): AF, CKD3-5, familial hypercholesterolaemia, NDH, diabetes, coded hypertension, last QRisk >=10%
Atrial Fibrillation
Report 1: % of patients with AF or atrial flutter, in whom stroke risk has been assessed using the CHA2DS2-VASc score risk stratification scoring system in the preceding 12 months (excluding those patients with a previous CHADS2 or CHA2DS2-VASc score of 2 or more)
Report 2: % of patients with AF diagnosed in the last year who are prescribed an anticoagulant in last 7 months that have had a HAS-BLED score coded.
Report 3: % of patients with AF who have a CHADS2 or CHA2DS2-VASc score of 2 or more who have been prescribed an anticoagulant in the 12 months.
Report 4: % patients with AF who have a CHADS2 or CHA2DS2-VASc score of >=1 for male patients and >=2 for female patients who have been prescribed an anticoagulant in the last 12 months.
Report 5: % of patients with AF who are prescribed a Vitamin K antagonist who have had a documented TTR in the last 12 months.
Report 6: % of patients with AF, currently treated with an anticoagulant, who have had a review in the last 12 months.
Report 7: % of patients registered at the practice aged 65 years and over who have been diagnosed with one or more of the following conditions: coronary heart disease, heart failure, hypertension, diabetes, CKD, PAD, or stroke/TIA who have had a pulse rhythm assessment in the last 12 months. (excluding those with coded AF and atrial flutter)
Chronic Kidney Disease
Report 1: In patients with CKD grades 3-5, % that have had further appropriate interval eGFR testing as determined by their last CKD grade
Report 2: % of patients with CKD grade 3 or greater who have a record of a urine albumin:creatinine ratio (or protein:creatinine ratio) test in the last 2 months.
Report 3: % of patients with CKD 3-5 who also have the appropriate degree of proteinuria treated with a Renin - Angiotensin antagonist. Denominator group is: a.) Any patient who has any previous recorded ACR of >= 70mg/mmol.) b.) Patient has Hypertension AND any previous recorded ACR of >= 30mg/mmol. c.) Patient has Diabetes AND any previous recorded ACR of >= 3mg/mmol.

Report 4 – % of patients whose last eGFR was <=30 ml/min (CKD4 or worse) that have had serum calcium, phosphate and PTH checked since the first coded eGFR of <=30 ml/min.
Report 5: % of patients with CKD 3b, 4 & 5 with a documented haemoglobin recorded in the last 12 months
Report 6: Number of patients without a CKD code of CKD3 or worse, whose last 2 eGFR's with a gap of at least 2 weeks were both < 60 ml/min or lower.
Report 7: Number of patients without a CKD code of CKD3 or worse, whose last eGFR was < 60 ml/min or lower at least 4 months ago without having had another eGFR
Report 8: % of patients with CKD3 or worse with a last waist circumference of >=90 cm (men) or 80 cm (women) who have had referral to a dietician since the measurement was made.
Non Diabetic Hyperglycaemia
Report 1 - % of patients with non-diabetic hyperglycaemia that have ever been referred to a local intensive lifestyle change programme.
Report 2 - % of patients with NDH ever and excluding any patients with diabetes, % that have had an HbA1c test or fasting plasma glucose in the last 12 months.
Report 3 - % of patients with NDH who have had their BMI re-added in the last 12 months.
Report 4 – Number of patients with latest HbA1c of 42-47 mmol/mol (6.0 – 6.4%) without also having either a valid non-diabetic hyperglycaemia code on their record or a valid diabetes code on the record.
Report 5 - % of patients who have had previous gestational diabetes, diagnosed more than 12 months ago, who have had an HbA1c test or other appropriate screening test in the preceding 12 months.
Type 2 Diabetes
Report 1 - % of patients with diabetes added in the last 12 months who were referred for diabetes education within 9 months of diagnosis.
Report 2 - % of patients with type 2 diabetes with last HbA1c measured in last 12 months is at target.
Report 3 - % of patients with Type 2 diabetes with all 8 care processes coded.
Report 4 - % of patients with of Type 2 diabetes that have had retinal screening recorded in last 12 months
Report 5 - How many patients with no qualifying diabetes code (including those with a Diabetes code & a later "diabetes resolved" code) have their last 2 consecutive HbA1c results which are both >=48 mmol/mol
Report 6 - % of patients not currently coded with diabetes with last HbA1c code as >= 48mmol/mol?
Report 7 - % of patients not currently coded with diabetes with a code for diabetes that does not qualify for inclusion under QOF
Type 1 Diabetes
Report 1 - % of patients with Type 1 diabetes diagnosed in the last 12 months with referral to diabetes education ever.
Report 2 - % of patients with Type 1 diabetes that have a most recent HbA1c (taken in last 6 months) of <= 48mmol/mol.
Report 3 - % of patients with Type 1 diabetes with a review of their CVD risk factors in the last 12 months.
Report 4 - % of patients with Type 1 diabetes who have had retinopathy screening in the last year?
Report 5 - % of patients with Type 1 diabetes that have all 8 care processes coded.
NHS Health Checks
Report 1 - % of patients aged 40-74 who do not have any of the NHS Health Check exclusion criteria.

Report 2: Of those eligible for an NHS Health Checks, % of patients with an invitation for an NHS Health Check in the last 5 years.
Report 3: Of those eligible for an NHS Health Check, who should have had a health check by now (catchment group 40-74 year olds & aged at least 45), % that have had a health check in the last 5 years.
Potential Over Treatment Indicators
Report 1: Of those with current hypertensive disease and on at least one antihypertensive treatment, % that have a last systolic <= 100 mm Hg (excluding patients with palliative care, GSF Red, Amber or Red and severe frailty codes)
Report 2: Of those with current hypertensive disease and on at least one antihypertensive treatment, % that have a last systolic <= 110 mm Hg (including patients with palliative care, GSF Red, Amber or Red and severe frailty codes)
Report 3: Of those with diabetes and on at least one diabetes drug, % that have a last HbA1c (taken > 90 days ago) with a value <42 mmol/mol.
Report 4: Of those with diabetes, who are 80yrs or over and on at least one diabetes drug, % of patients with last HbA1c (taken > 90 days ago) of 48 mmol/mol or lower.
Report 5: Of those with diabetes who are on at least one diabetes drug and who also have co-morbidities which may reduce life expectancy (CKD 3-5, HF or CVD), % of patients have a last HbA1c (taken > 90 days ago) of < 58 mmol/mol
Report 6: % of patients with a palliative care code are being prescribed statins possibly inappropriately.
Report 7: Of those whose latest stroke risk score was 0 or 1, % of patients are on an anticoagulant

Appendix 2 – NHS RightCare CVD Prevention Pathway



Appendix 3 – Reference group

- Dr Matt Kearney, National Clinical Director CVD Prevention, NHS England (Chair)
- Nicholas Hodgetts/Ian Robson, Sustainable Improvement Team, NHS England
- Dr Masood Nazir, National Clinical Lead Digital Transformation of General Practice, NHS England
- Lorraine Oldridge, National Improvement Lead, British Heart Foundation
- Dr Peter Green, GP, Chair, NHS Medway CCG
- Dr Youssef Beaini, GP, clinical lead for cardiovascular disease at NHS Bradford Districts CCG
- Dr Gareth Forbes, GP Partner, Leadgate Surgery, County Durham
- Dr Phil Koczan, GP, Churchill Medical Centre
- Mark Minchin, Associate Director - Quality, NICE
- Dai Evans, Lead Clinical Adviser, PRIMIS
- Simon Clay, Clinical Adviser, PRIMIS
- Miriam Lemar/Lauren Fensome, Project Manager, PRIMIS
- Andy Marshall, Senior Information Analyst, PRIMIS
- Dr Peter Short, Clinical Advisor, NHS Digital
- Kathryn Salt, Principal Data Manager, NHS Digital
- Lindsay Blyth, GPIT Futures, NHS Digital
- Dr Emma Seria-Walker, Public Health Consultant, Public Health England
- Mark Ewins, Public Health England
- Catherine Lagord, NHS Health Check Principal Analyst, Public Health England
- Professor Simon deLusignan/Dr Rachel Coyle, The University of Surrey/RCGP
- Professor Nadeem Qureshi, The University of Nottingham
- Dr Mike Ogonovsky, Aneurin Bevan UHB, Wales
- Dr Graham Thomas, GP lead for Cardiac Network (North Wales)
- Dr Bob Young, National Diabetes Audit Clinical Lead
- Julia Wilkins, Imperial College London, Greater Manchester AHSM
- Prof Naveed Sattar, chair of SIGN 97 Guideline Development Group, University of Glasgow
- Jennifer Wilson, Primary Care Division, Scottish Government
- Dr Lucy Munro, Primary Care Division, Scottish Government
- Dr Gregor Smith, Deputy Chief Medical Officer for Scotland (GP, Lanarkshire)
- Dr Hester Ward, SPIRE – Scottish Primary Care Information Resource
- Dr John Nugent, Primary Care Services, Scottish Government
- Dr Brendan O'Brien, Consultant Clinical Informatics Specialist, Northern Ireland

Appendix 4 – What works well and what to avoid

Implementation and support is outside the scope for this phase of the project and will be subject to further consultation. However in the interests of ensuring that input is not lost, it is captured below.

The implementation approach adopted in each locality/region will vary as a result of the local context however it is clear that an 'implementation package' will be required to support localities and to facilitate standardisation where feasible.

Having a national sponsor (NHS England, Public Health England, British Heart Foundation) to support and endorse the programme of work will be a strong factor in encouraging practices to use the tool particularly if there is no cost to using the tool for the end user. The programme will however, need to evidence that it can reduce workload for practices i.e. be a no-brainer. Investment at a local level, through incentive schemes and clinical leadership will encourage successful local implementation.

The branded 'package' should consist of:

- Identified support and leadership at a regional level (Network, CCG, AHSN, Health Board)
- Effective engagement with CCGs and practices from the outset to deliver a clear, strong message of the intended outcomes of the project. Where engagement has been well thought out and inclusive, quality improvement projects have had greater success.
- A national, visible, data set allowing practices and their combined organisations to compare and contrast, identify variation and demonstrate improvement. Data should be displayed in a meaningful way as to encourage action at a local level
- Visibility of the codes being used within the tool to aid understanding and support improvement
- Training and support to ensure the tools are being used to their best ability, as well quality improvement, data quality and root cause analysis training, ensuring that the tools are implementing alongside existing local pathways.
- Information Governance guidance and templates to support implementation within a practice, federation, ACS, Health Board context plus sharing of aggregate data for reporting locally and nationally
- Evaluation guidance
- Patient engagement

The ongoing maintenance and support of the tools and associated specifications also needs consideration. If the GPSS are engaged in delivering the tools, the support package should ensure that:

- Regular code updates are completed
- Processes are in place to ensure that the tools are kept in line with guidance
- A method for managing the dissemination of updates and bug fixes in the four countries is established
- Clinical Safety Review and assurances

Appendix 5 - Case studies

National Diabetes Audit – NHS Digital

One of the largest annual clinical audits in the world, integrating data from both primary and secondary care sources, making it the most comprehensive audit of its kind. The National Diabetes Audit is a major national clinical audit which measures the effectiveness of diabetes healthcare against NICE Clinical Guidelines and NICE Quality Standards, in England and Wales. The NDA successfully collects patient level data and analyses it in an aggregate manner for use by a range of stakeholders to drive changes and improvements in the quality of services and health outcomes for people with diabetes. The legal basis for data collection is under Section 254 of the Health and Social Care Act 2012. It produces a short report some 6 months after the end of the reference period and a longer more detailed report 11 months after. Whilst this report produces practice level reports, it does not produce patient level reports for individual patient management within practices.

GRASP AF - delivered by PRIMIS in partnership with NHS England

GRASP AF has been used in circa 3.5k practices across England. It allows practices to both case find and manage patients with atrial fibrillation optimising their medication as required. Practices see patient identifiable information so that they can develop appropriate action plans. The practice based tool uses MIQUEST or system searches to extract the practice data, analyse it and present it using PRIMIS's CHART software tool. Practices can then upload one line per patient data to PRIMIS CHART Online, a comparative database, so that national trends can be seen, including the improvement in anti-coagulant prescribing over time. The data is normalised so that comparisons can be made.

FHC (Familial Hypercholesterolemia) - delivered by Informatica on behalf of NHS Medway and Kent

The identification of patients with Familial Hypercholesterolemia was improved by providing practices with tools that are integrated into the GP IT system. In Medway CCG practices use different practice systems across the estate necessitating the need for a common tool that will allow access to data across all practices. Informatica provides Medway with that infrastructure. Although an independent software package to that of the GP IT systems, this is 'invisible' to the practice user providing the appropriate alerts and guidance when certain conditions are triggered. It can also provide local and CCG level reporting across the estate.

National Vaccination Monitoring programme - PHE

The specifications for the national vaccination monitoring programme are produced by a third party (PRIMIS) and provided to the GPSS for implementation. Data extracts are produced by the GPSS on a monthly or annual basis and are sent to PHE for analysis, under an arrangement that PHE has with each of the GPSS. PRIMIS extract sample data from a selection of practices to validate the centrally extracted data by highlighting statistically significant variations to expose any implementation errors. This programme is different to the CQRS extraction for payment purposes run by NHS Digital.

NHS Scotland – SPIRE delivered using MSDi

SPIRE is the Scottish Primary Care Information Resource, a service which has been developed to help GPs, the NHS in Scotland and researchers to learn from information held at GP practices and so improve the care, health and wellbeing of the Scottish population. The aim of SPIRE is to provide a single national system to extract data from GP IT systems in Scotland. Patient information from GP patient records is securely transferred and safely processed by NHS National Services Scotland (NSS) – the NHS Scotland organisation responsible for Scotland's health statistics. Patients are not identified as the data are encrypted before leaving the GP practice. SPIRE analyses and reports on the data extracted for specific and approved purposes MSD Informatics (MSDi) are contracted to provide some parts of this infrastructure, particularly the software that will be deployed to general practices to facilitate data extraction and reporting at practices.

The IM&T DES Data Quality Programme 2006-2010

This programme was based on a combination of MIQUEST and GPSS queries run at individual practices in England, usually by Data Quality facilitators to maintain and improve Data Quality. Patient level data was extracted to PRIMIS' CHART tool for further processing, analysis and production of feedback reports. Further aggregate data was sent to PRIMIS' CHART Online database for locality and national comparison. Data was received from over 7,200 practices for comparison probably in part due to the use of facilitators and practice incentive monies.

Appendix 7 – Project Scope Document

Introduction

This Project Scope Document was produced following a workshop of the reference group that took place on 10/10/2017, and subsequent teleconferences on 7/12/17 and 21/12/17. The purpose of this document is to record the outputs of the three meetings and to summarise the expected scope of the *CVDPREVENT* project. The next steps are to obtain confirmation of the Project Scope Document followed by a more detailed feasibility report, leading to a first draft of required business rules. It is intended that the final version of this document acts as a confirmation of project direction to enable subsequent steps to be constructed appropriately.

The clinical domains:

The fundamental core of this project relates to firstly improving the identification of patients at increased risk of cardiovascular disease and then secondly improving any necessary management of identified risks.

The clinical domains are:

- Detection and management of hypertension
- Detection and management of atrial fibrillation
- Detection and management of those with high CVD risk such as high calculated QRisk score or familial hypercholesterolaemia
- Detection and management of non-diabetic hyperglycaemia
- Detection and management of diabetes [all types]
- Detection and management of chronic kidney disease

The broad techniques:

- Case Finding - population level searches based on practice registers to identify patients with increased risk because of the presence of one or more undiagnosed or sub-optimally managed high risk conditions for developing cardiovascular disease.
- Patient Management Support - data entry templates and protocols with associated logical business rules to improve the collection of appropriate data and the display of any relevant management information [*note avoidance of term "Decision Support" due to concerns regarding Medical Device Regulations*]
- Reporting at different levels to collate aggregate (non-patient level) information at CCG, STP and national levels with patient level reports at practice level to support practice management.

The initial population level searches will identify those patients who have recorded evidence in their electronic patient records (EPR) to indicate that they have a high risk condition i.e. hiding in plain sight. An example of this would be identifying patients with diabetes who have diagnostic levels of HbA1c or fasting blood sugars without a coded diagnosis of diabetes. It does not currently include searches to detect or stratify patients who might be

at increased risk but who have inadequate data within their EPRs to make such an assessment.

There will need to be a core dataset relating to initial case identification, but if any patient is identified as having one of the index conditions then they may need assessment with an appropriately wider dataset than the core.

There will also be patient level, practice based population reports to assess how well patients with the relevant high risk conditions are managed. These reports will be based on agreed national guidelines.

Aggregate versions of these reports (i.e. not patient level) will be collated, where permission is granted, across organisations and localities for comparative purposes. It is intended that these reports include aggregate information on deprivation and ethnicity status where possible, so long as this does not contravene information governance guidance such as reporting on small numbers.

To assist in optimal patient management, patient alerts, data entry templates and associated protocols will be constructed to ensure appropriate collection of the required data items along with the display of recommended guidance in direct patient contact situations. The specific implementations of these system architectural features varies between GP Clinical systems. There will be a requirement to produce a small number of tailored tools to allow for different implementations of this project [such as different guidance across national boundaries and possibly other contextual situations such as staff type].

The information governance requirements surrounding any patient searches depend on the context of service provision but need to be more fully outlined in the subsequent feasibility report.

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