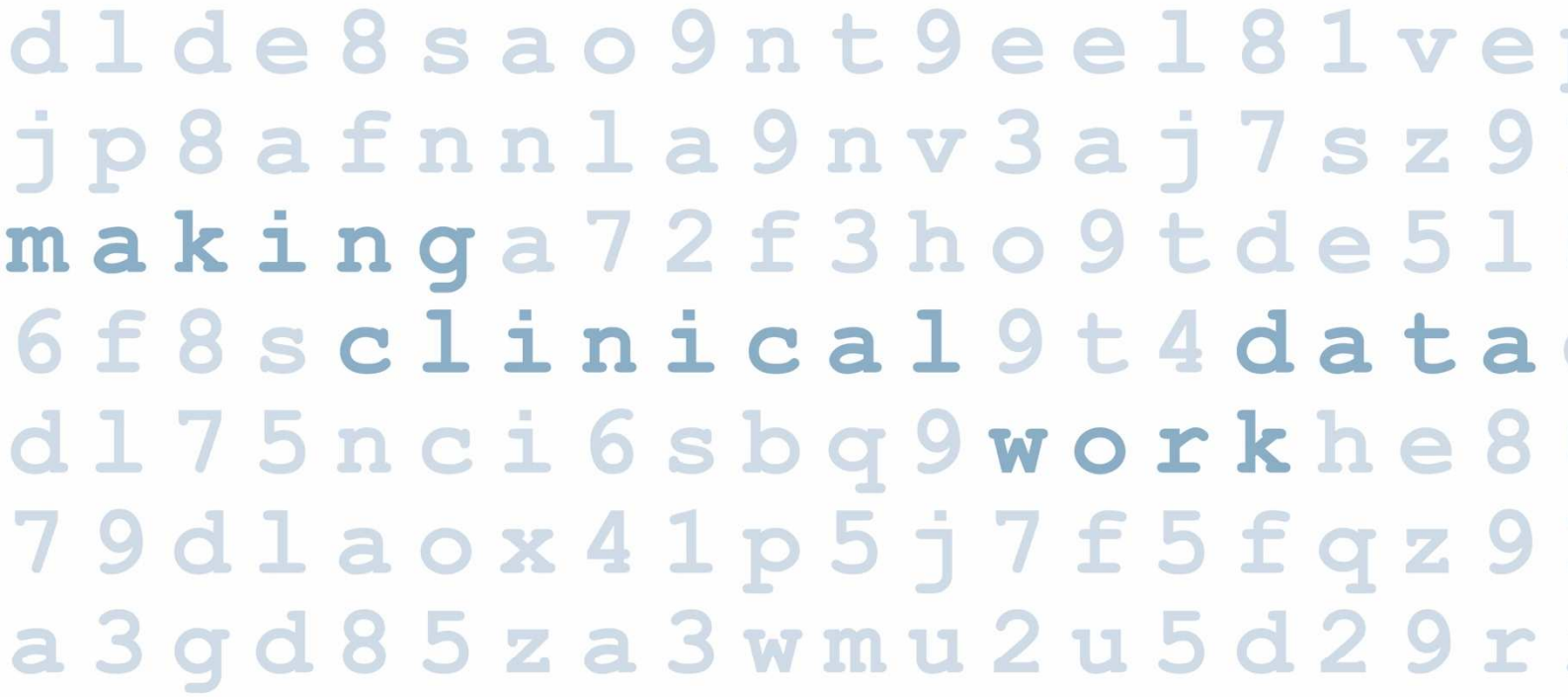
PRIMIS

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Quality Improvement Tool Instruction Guide
GRASP-AF



The GRASP-AF quality improvement tool has been developed by PRIMIS and delivered in partnership with NHS England.

Prepared by PRIMIS
September 2017

Contents

Introduction

The Guidance on Risk Assessment in Stroke Prevention for Atrial Fibrillation (GRASP-AF) tool forms part of the GRASP suite of quality improvement tools, developed by PRIMIS in partnership with NHS England. GRASP-AF was the first of the tools in the GRASP suite to be developed.

GRASP-AF, GRASP-COPD (Chronic Obstructive Pulmonary Disease) and GRASP-HF (Heart Failure) help practices achieve a systematic approach to the identification, diagnosis and optimal management of patients with these life-long conditions. Although they differ in aetiology and clinical presentation, they have certain similarities: all are under-diagnosed, their prevalence is forecast to increase as the population ages and evidence suggests that the use of effective interventions to delay the progression of these conditions and improve quality of life is currently sub-optimal.

The GRASP suite supports practices to:

- maintain complete and accurate disease registers
- compare patient care against national standards and guidelines
- maximise achievement of Quality and Outcomes Framework (QOF) points
- provide evidence of audit for inclusion in GP revalidation portfolios and CQC assessment
- work towards the goals outlined in domains one (Preventing people from dying prematurely) and two (Enhancing quality of life for people with long-term conditions) of the NHS Outcomes Framework[1]

Atrial fibrillation

Atrial fibrillation (AF) is the most common heart arrhythmia. Prevalence and incidence of AF increases with age and it is commonly associated with and complicated by congestive heart failure and stroke. AF is often a consequence of pre-existing conditions or procedures such as cardiothoracic operations[2]. AF is a known precursor for stroke, increasing its risk and severity[3].

> **"The arrhythmia is associated with a five-fold risk of stroke and a three-fold incidence of congestive heart failure, and higher mortality. Hospitalization of patients with AF is also very common. This arrhythmia is a major cardiovascular challenge in modern society and its medical, social and economic aspects are all set to worsen over the coming decades. Fortunately a number of valuable treatments have been devised in recent years that may offer some solution to this problem."**
>
> 2012 Focused Update of the ESC Guidelines for the Management of Atrial Fibrillation[4]

The National Institute of Health and Clinical Excellence[5] and the European Society of Cardiology (ESC)[4] recommend that stroke risk is assessed using the CHA_2DS_2-VASc scoring system. CHA_2DS_2-VASc more effectively identifies patients who are 'truly low risk' and is considered a more inclusive and accurate scoring system than its predecessor $CHADS_2$. However, the AF clinical indicators within the Quality and Outcomes Framework until 2015/16 focus on $CHADS_2$ and as a result this scoring system may be more widely used within general practice. The GRASP-AF tool features both the $CHADS_2$ and CHA_2DS_2-VASc scoring systems.

Prevention of stroke

Oral anticoagulants (OAC) are commonly used for the prevention of stroke and systemic embolism in adults with AF. Despite strong evidence[6] supporting the efficacy of anticoagulants in preventing thromboembolism related to AF, many patients who would benefit from anticoagulation are not receiving it. The following quotation is based on actual data from practices that have used the GRASP-AF tool:

> **"Over one-third of patients with AF and known risk factors who are eligible for anticoagulants do not receive them. There is a high use of antiplatelet among patients not receiving anticoagulants. Uptake of anticoagulants is particularly poor among patients aged 80 years and over."**
>
> [7]Cowan C, Healicon R, Robson I, et al. (2013) The use of anticoagulants in the management of atrial fibrillation among general practices in England. *Heart* Vol. 99, pp. 1166–1172.

The NICE guidelines on AF[5] recognise the superiority of warfarin to aspirin in stroke prevention. The guidelines recommend the use of warfarin in preference to aspirin amongst patients identified as being at high risk of stroke.

Data quality and risk scoring systems

It must be emphasised that the scores provided within this tool **should not** replace clinical decision making and are only included to help inform that decision. No risk scoring system is considered perfectly accurate and patients must be reviewed to confirm the accuracy of recorded information before management is decided.

Calculation of the $CHADS_2$ and CHA_2DS_2-VASc score(s) are dependent upon certain risk factors being present and coded within the patient's electronic record. The condition might not have been coded or alternative Read codes may have been used that could be inaccurate or too generic. As an example, within the $CHADS_2$ and CHA_2DS_2-VASc scoring system, ischaemic stroke is included as a risk factor. Frequently in practice, patients are simply recorded as having had a stroke without clarification on whether it was haemorrhagic or ischaemic. Currently over a third of strokes are recorded simply as *Stroke NOS* (Not Otherwise Specified). These have been included as ischaemic strokes for the purposes of this score. It is pertinent therefore that practices record such clinical data in as much detail as is possible and is relevant.

A list of the included risk factors for each scoring system can be found in the appendices of this document.

Latest version of GRASP-AF library (March 2015)

Previous versions of the GRASP-AF tool included patients with a record of haemorrhagic strokes within the stroke element of the $CHADS_2$ and CHA_2DS_2-VASc algorithm. A review of the original research papers has revealed that whilst the S in CHADS represents Stroke, there is a degree of ambiguity about whether this includes haemorrhagic strokes and subsequent validation studies specifically exclude haemorrhagic stroke.

PRIMIS and NHS England have agreed that patients with haemorrhagic strokes will now be excluded from the stroke element of the $CHADS_2$ and CHA_2DS_2-VASc algorithm. It is still considered worthwhile reviewing patients with a history of haemorrhagic stroke to assess whether they might benefit from oral anticoagulation. These patients can be identified by filtering the datasheet within the GRASP-AF tool.

Aim of the GRASP-AF quality improvement tool

The aim of the GRASP-AF tool is twofold; to assist with case finding activity and to report upon the level of care being offered to patients with known AF.

The casefinder element provides practices with a list of patients identified as having *possible* or *probable* AF. By undertaking a review of these patients and adding any missing diagnosis codes, practices can improve the quality of their AF register, establish a more accurate prevalence rate and ensure that patients receive appropriate treatment.

The care management part of the tool helps practices identify where they can improve the quality of care they provide to patients with known AF and reduce their risk of stroke.

The GRASP-AF tool enables practices to extract and analyse relevant clinical data from their clinical information system. GRASP-AF works across all clinical information systems and presents data in an easy to use format allowing practices to gain insight and knowledge into their management of patients with AF.

GRASP-AF helps practices by:

- Generating a list of patients with possible/probable AF worthy of review to determine whether a diagnosis code is missing from the electronic record
- Allowing practices to achieve a more accurate prevalence rate for AF within their practice population
- Identifying all patients who have a history of AF and facilitating clinical audit against national standards
- Calculating $CHADS_2$ and CHA_2DS_2-VASc score for each patient with known AF
- Highlighting individual patients with known AF who are at risk of stroke but are not currently on anticoagulant therapy
- Calculating how many high risk patients are likely to have an AF related stroke if left untreated
- Providing the facility to compare data with other practices both locally and nationally and the option to share aggregated data with their CCG
- Contributing to the delivery of the NHS Outcomes Framework and the Quality and Outcomes Framework (QOF)

Clinical audit notes and GP revalidation

This quality improvement tool has been designed to support GP revalidation. GPs can use the various displays within the CHART software to review clinical data at both patient and practice level, enabling them to maintain an overall picture of how they're managing patients at a population level but at the same time, look in detail at the care of individual patients:

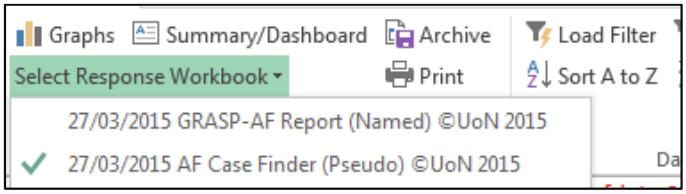
- This is a retrospective clinical audit - looking back at clinical practice that has already taken place
- When conducting clinical audit for GP revalidation, GPs might choose to audit just their own clinical practice. Note that the GRASP-AF tool will report on all patients with an AF diagnosis or factors suggesting possible AF. Be aware therefore that data on the activity of others will also be gathered
- Involve fellow GPs in the clinical audit project. Several GPs who work together as a team can undertake a common audit. This is acceptable for the purpose of GP revalidation, as long as each GP can demonstrate that they have contributed fully to the clinical audit activity. Alternatively, seek their permission
- A clinical audit on the care of patients with AF (or possible AF for casefinder searches) matches the following criteria:
  - it is of concern for patients and has the potential to improve patient outcomes
  - it is important and is of interest to you and your colleagues
  - it is of clinical concern
  - it is financially important
  - it is of local or national importance
  - it is practically viable
  - there is new research evidence available on the topic
  - it is supported by good research

Running the GRASP-AF quality improvement tool

Before running the searches you must ensure that CHART is installed and you are familiar with how to use the software. Detailed instructions on CHART installation and using the software can be found on the PRIMIS website: www.nottingham.ac.uk/primis/tools-chart/chart/guides-information.aspx

There are two MIQUEST query sets contained within the GRASP-AF tool: one set for the casefinder and another for the management of patients with known AF.

Within the CHART software, practices can switch between the 'AF Casefinder' and the 'GRASP-AF Report by using the 'Select Databook' function as illustrated below:



Both sets will only search on patients who are currently registered at the practice. It is recommended that the searches are run frequently (e.g. quarterly or six monthly) to monitor standards of care.

CHART Online

Pseudonymised patient level data on patients with known AF can be uploaded securely from the GRASP-AF tool to the PRIMIS comparative analysis tool, CHART Online. Variations in data management and activity are more visible when compared across groups of GP practices. Comparative data analysis provides a powerful tool for standardising care across localities.

Many users of the GRASP-AF tool frequently upload data to CHART Online resulting in a comprehensive, well-populated database that contains valuable information regarding AF care within England. As at August 2018, over 2,976 practices from 165 Clinical Commissioning Group (CCG) areas had uploaded GRASP-AF data to CHART Online. These data show 424,090 patients with a diagnosis of AF equating to a recorded prevalence of 1.90%.

See page 31 for more information on GRASP-AF within CHART Online including some examples of the comparative views available.

Please note that data from the AF casefinder cannot be uploaded.

GRASP-AF casefinder

It is strongly recommended that practices use the casefinder before going on to examine the management of patients with known AF. Using the casefinder as a starting point will ensure that people with AF are diagnosed earlier, receive appropriate treatment and that the practice AF register and practice prevalence rate are as accurate as possible.

The GRASP-AF casefinder helps practices to answer the following questions:

- Do we have any patients with AF who do not have the diagnosis coded in their electronic record?
- Are there any patients who would benefit from review for possible inclusion in the register and relevant treatment?
- How accurate is the practice prevalence rate for AF?

The casefinder includes patients who are currently registered at the practice **AND** have a diagnosis of AF or atrial flutter **OR** have Read coded entries that suggest probable AF or possible AF. Likelihood of AF is determined by the type of entry found; factors are classified into possible or probable AF.

PROBABLE AF	**POSSIBLE AF**
ECG indicates probable AF	ECG indicates possible AF
$CHADS_2$ risk score	Irregular pulse*
CHA_2DS_2-VASc risk score	Supraventricular tachycardia (SVT)
AF monitoring code	History of atrial fibrillation/atrial flutter
QOF AF exception code	AF related procedure
AF resolved code	AF prescription in the last six months

The CHART datasheet provides a count of the possible/probable codes contained within each patient record. This allows practices to prioritise patients with the greatest likelihood of having uncoded or possibly undiagnosed AF.

*Important note regarding irregular pulse entries

The Version 2 Read code 243.. has two terms associated with it;

243..00 O/E - pulse rhythm (the preferred term)
243..11 O/E – irregular pulse (a synonymous term)

The synonymous term makes it clear that the patient's pulse is irregular whereas the preferred term (243.. 00) does not make a distinction between regular or irregular. As a result, patients whose latest pulse entry is made using 243..00 will not automatically appear in the 'Possible AF' category. These patients must have another possible/probable AF code present in order to include them in the search.

Casefinder output

The GRASP-AF casefinder provides the following views in CHART:

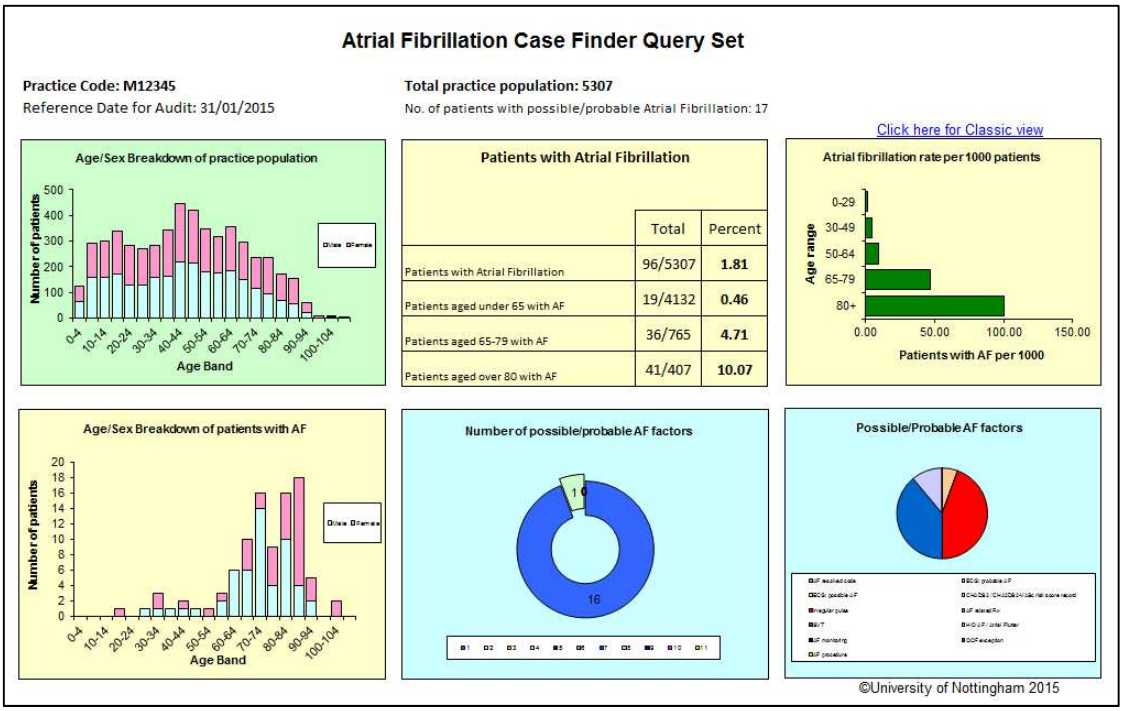
1. Summary sheet - both dashboard view and classic view
2. Datasheet
3. Pre-set graphs - four in total

View 1 - Summary sheet

CHART summary sheets provide a snapshot of all the relevant data recorded by the practice. For the AF casefinder there are two summary sheet views available; the dashboard view and the classic view. The dashboard view provides a visual display of the data whereas the classic view presents data in tabular form.

Dashboard view

An example of the AF casefinder dashboard is shown below:

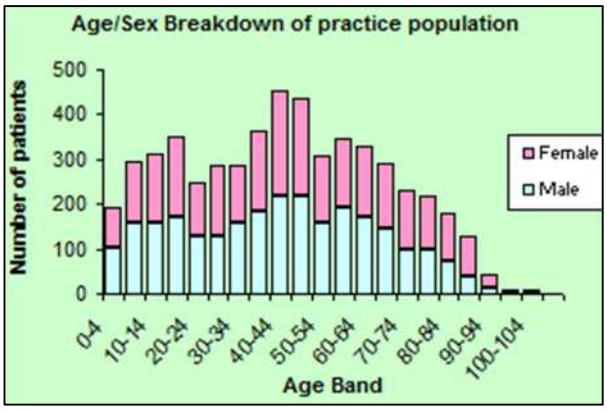


The first two lines of data provide some important pieces of information:

- the practice national code;
- an up to date count of the registered practice population;
- a reference date for the searches, and;
- the number of patients found with possible/probable atrial fibrillation codes.

Within the six boxes, the light coloured boxes display data on patients with **known AF** and the last two blue boxes display data on patient with **possible/probable AF**.

Age/Sex Breakdown of Practice Population



The first box (top left) shows a complete age/sex breakdown of the practice population in five year age bands.

This is useful for understanding the demographic profile of the practice. As AF prevalence increases markedly with age, practice prevalence rates can be affected by having a population that is older or younger to some degree.

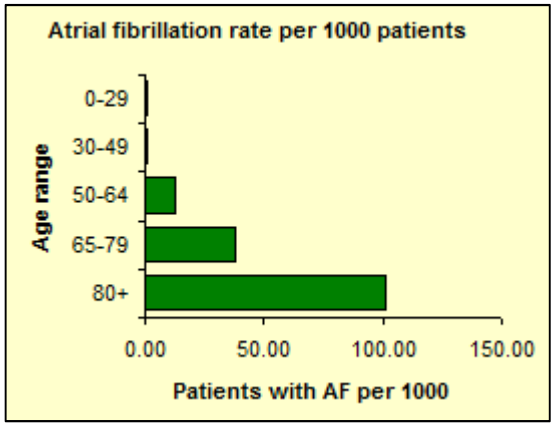
Patients with Atrial Fibrillation

The top middle box contains useful information about practice prevalence based on patients with a recorded diagnosis of AF. Prevalence is broken down by distinct age bands demonstrating an increase in prevalence with age. Patients who have an AF resolved code subsequent to an AF diagnosis code are excluded from these prevalence figures.

Patients with Atrial Fibrillation

	Total	Percent
Patients with Atrial Fibrillation	95/5368	**1.77**
Patients aged under 65 with AF	18/4120	**0.44**
Patients aged 65-79 with AF	34/830	**4.10**
Patients aged over 80 with AF	43/418	**10.29**

Atrial Fibrillation Rate per 1000

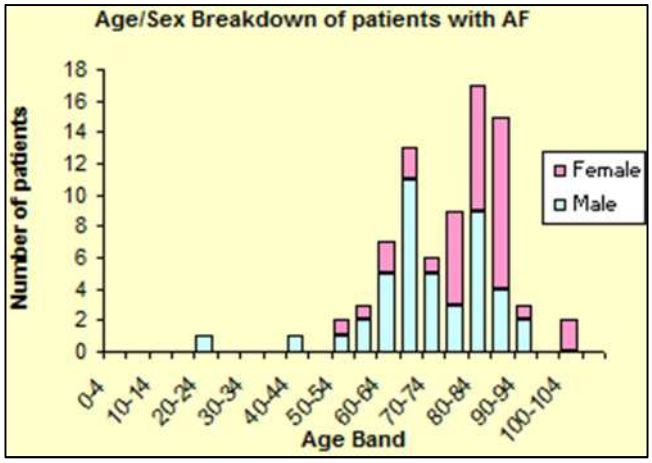


The top right box presents AF prevalence as a bar chart and prevalence is expressed as rate per thousand. This method of expressing prevalence is useful when making comparisons with other practices of differing patient list sizes.

Within CHART a pop up giving the exact number of patients will appear when the mouse hovers over the green bars.

Age/Sex Breakdown of Patients with AF

The bottom left box is the final graph displaying data about patients with an existing diagnosis of AF.

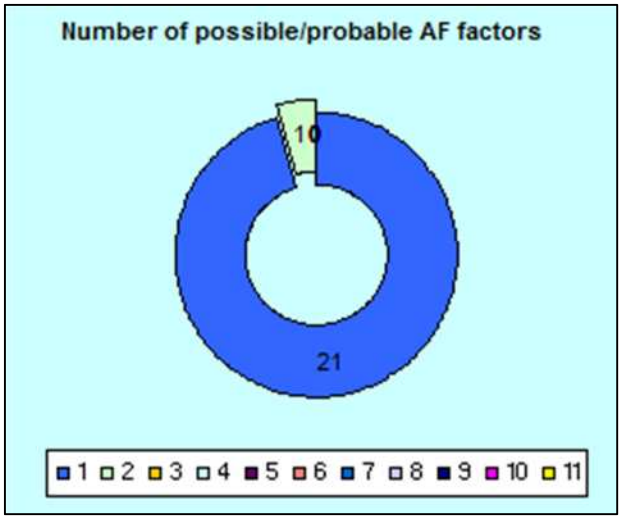


This graph provides an age/sex breakdown of patients with AF. Again this normally confirms that prevalence of AF increases with age and allows observation of prevalence by age and sex within the practice.

As a check on accuracy, practices can use this graph to identify any suspicious results, such as AF recorded in younger age bands.

Number of Possible/Probable AF Factors

The bottom middle box shows a 'doughnut' graph. The different colour segments represent a count of the number of possible/ probable factors contained within each patient record for patients without a diagnosis of AF. Patients with more than one factor should probably be reviewed first.

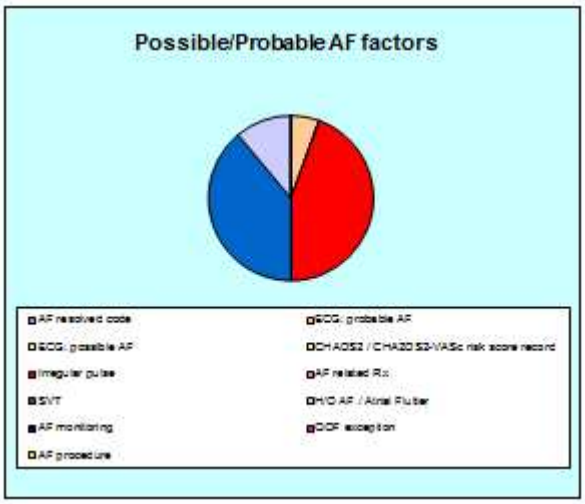


The example to the right shows that a total of 22 patients have data items suggestive of AF in their medical record. 21 patients have just 1 data item (dark blue) and one patient has 2 data items (light blue). Note that the 0 on the doughnut chart represents the fact that there are no patients with 3 or more factors.

The pre-set filters available in the datasheet view will quickly list patients identified as having possible or probable AF (see page 17). Patients and/or their records can then be reviewed to determine whether a diagnosis code is missing.

Possible/Probable AF Factors

The bottom right pie chart shows the incidence of each possible/probable factor. This can be used to identify any trends or patterns and can be helpful when investigating why some patients do not have a diagnosis code of AF.



The 'classic' tabular view of the summary sheet contains an alternative presentation this data. Switch to the 'classic' tabular view by selecting the *'Click here for Classic view'* link in the top right hand corner of the dashboard.

Patients who have an 'AF resolved' code after their latest AF recording will be highlighted as having *probable AF*. This is intentional as practices may wish to review these patients to confirm that this is still accurate. Patients with a history of AF may experience recurrence and can still be at increased risk of stroke.

For the purposes of QOF, if a patient has been diagnosed with AF and successfully treated, the presence of the 'AF resolved' code will effectively remove that patient from the AF register. However, this should not be done for paroxysmal AF (PAF), diagnosis which is clinical and based on patient history.

Classic view

The classic view of the summary sheet presents practice data in a tabular format. Data items are largely the same as those described for the dashboard view.

Atrial Fibrillation Case Finder

	No	Percent
Total number of patients currently registered with the Practice	5307	
Total number of patients with atrial fibrillation/atrial flutter	96	1.8

	No	Percent
Practice population aged 65+ with atrial fibrillation/atrial flutter	77 / 1172	6.6

Patients with possible/probable AF	No	Percent
Number of patients with possible/probable AF	17	0.3

Possible/Probable AF Factors	Number of patients	Percent of total possible/probable AF
AF resolved code	0	0.0
ECG: probable AF	1	5.6
ECG: possible AF	0	0.0
CHADS2 / CHA2DS2-VASc risk score record	0	0.0
Irregular pulse	8	44.4
AF related Rx	0	0.0
SVT	7	38.9
H/O AF / Atrial Flutter	2	11.1
AF monitoring	0	0.0
QOF exception	0	0.0
AF procedure	0	0.0

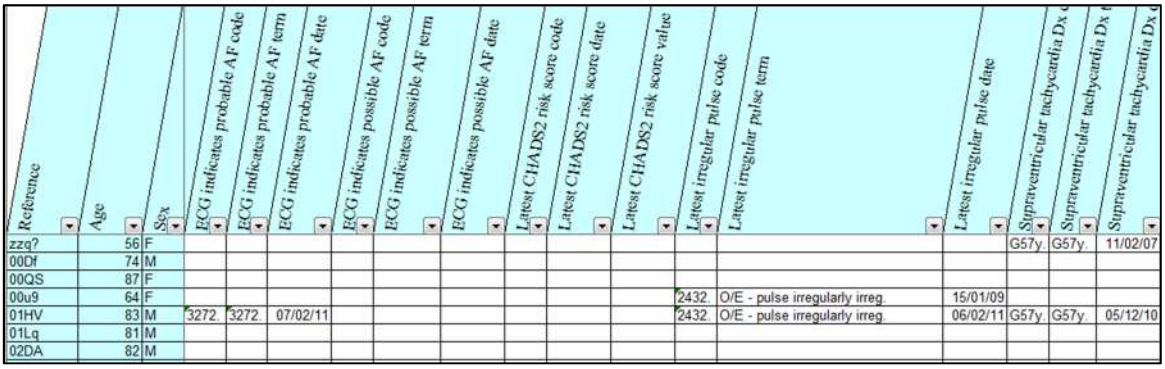
What to note about this practice

- The recorded prevalence rate for AF is 1.77% (rounded to 1.8% above). This is comparable to the rate stated within the ESC guidelines[4] of between 1.5%-2% of the general population but marginally lower than the rate of all data within CHART Online (1.90% as at August 2017)
- 17 patients have factors in their medical record suggestive of AF
- There are 18 factors identified in the list meaning one of the 17 patients has two factors suggestive of AF in their medical record
- The most common factors suggesting possible/probable AF are SVT and irregular pulse. One patient has an ECG result suggesting probable AF and two have a history of AF/Atrial Flutter

View 2 - Datasheet

The datasheet (accessible via this icon from the toolbar) is perhaps the most valuable part of the AF casefinder. It allows practices to access patient level data and assists with casefinding activity by helping to identify patients who may have missing AF diagnosis codes.

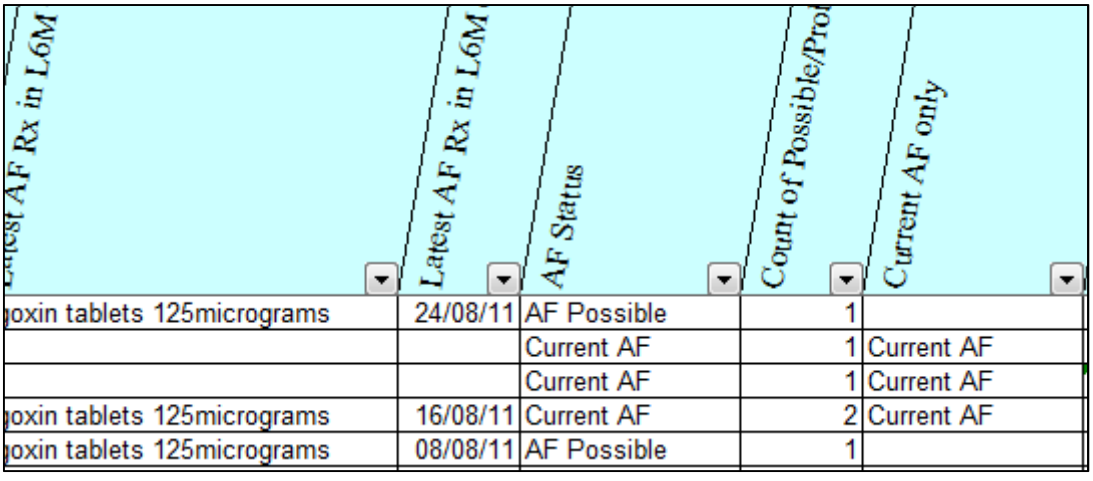
When preparing the queries to run on the clinical system, practices must decide whether to run a pseudonymised set (as shown below which uses a patient reference number) or a patient identifiable set that will return named patient information. The patient identifiable set is the most useful for casefinding activity.



Reference	Age	Sex	ECG indicates probable AF code	ECG indicates probable AF term	ECG indicates probable AF date	ECG indicates possible AF code	ECG indicates possible AF term	ECG indicates possible AF date	Latest CHADS2 risk score code	Latest CHADS2 risk score date	Latest CHADS2 risk score value	Latest irregular pulse code	Latest irregular pulse term	Latest irregular pulse date	Supraventricular tachycardia Dx	Supraventricular tachycardia Dx	Supraventricular tachycardia Dx
zzq?	56	F													G57y.	G57y.	11/02/07
00Df	74	M															
00QS	87	F															
00u9	64	F										2432.	O/E - pulse irregularly irreg.	15/01/09			
01HV	83	M	3272.	3272.	07/02/11							2432.	O/E - pulse irregularly irreg.	06/02/11	G57y.	G57y.	05/12/10
01Lq	81	M															
02DA	82	M															

The CHART datasheet contains many columns of relevant data. A full list of available columns is included in the appendices of this document. As an example, on the far right of the datasheet a column titled *'AF Status'* will contain one of the following values:

- Current AF
- AF Possible
- AF Probable
- AF Resolved

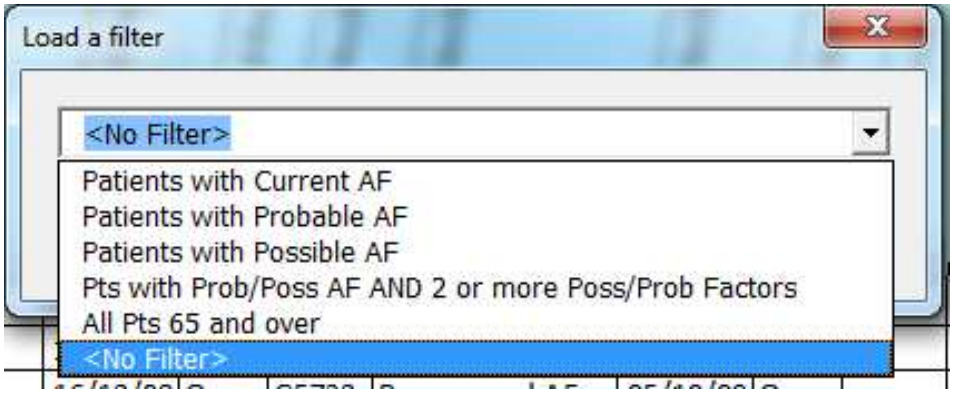


Latest AF Rx in L6M	Latest AF Rx in L6M	AF Status	Count of Possible/Prob	Current AF only
oxin tablets 125micrograms	24/08/11	AF Possible	1	
		Current AF	1	Current AF
		Current AF	1	Current AF
oxin tablets 125micrograms	16/08/11	Current AF	2	Current AF
oxin tablets 125micrograms	08/08/11	AF Possible	1	

The datasheet can be filtered as desired by the practice, to produce bespoke lists of patients.

Pre-set filters

In addition to creating custom filters, there are five pre-set (or pre-loaded) filters provided with the casefinder. *Accessed via 'PRIMIS CHART', 'Load Filter'.*



Load a filter as desired and then review the columns containing data items suggestive of AF to determine the value of reviewing the patients' records in more detail. This will also assist with prioritising patients for review. Filters 2 and 4 will identify patients with the greatest likelihood of a missing diagnostic code for AF; however it is worth reviewing all patients highlighted as having probable/ possible AF.

Suggested actions

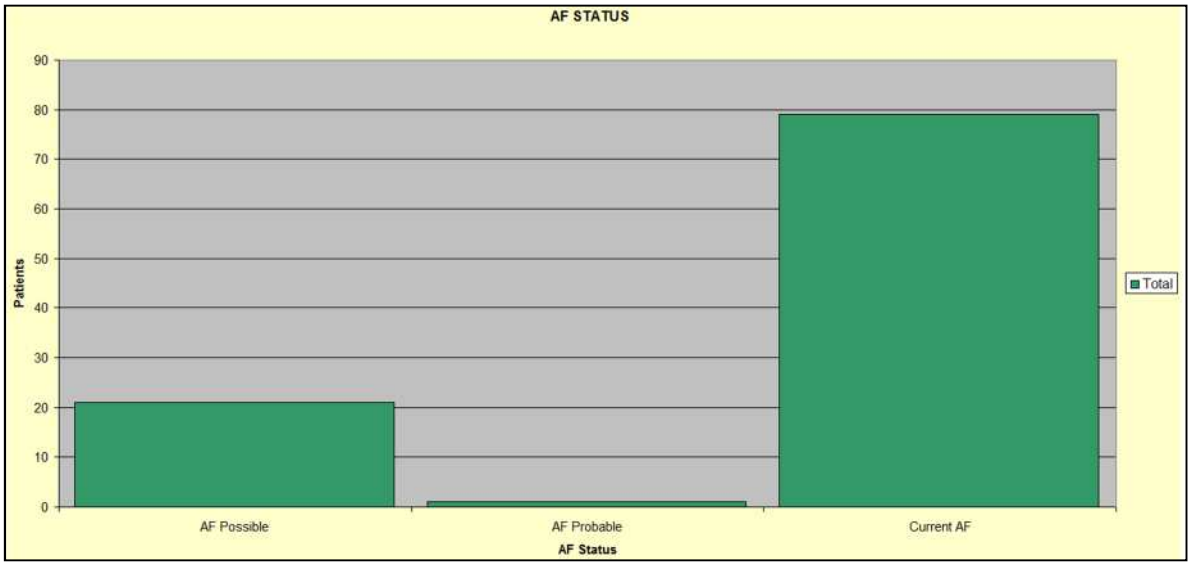
- Using the pre-set filters available in the datasheet view, access the lists of patients with possible and probable AF (starting with those patients who have multiple factors – filter 4). Examine the datasheet (and practice clinical system if required) for further supporting information such as the type of factors present and the dates entered to help determine whether a diagnosis of AF is missing from the electronic record

- Based on the findings, enter any missing diagnostic codes to the patient electronic health record or contact patients to arrange any necessary conclusive tests, as required

- Once you are confident about the accuracy of the practice AF disease register move on to the next part of the tool examining the care of patients with known AF

View 3 – Pre-set graphs

There are four pre-set graphical views available within the casefinder, one of which is shown below. This graph displays the AF status of all patients included in the datasheet:



Other pre-set graphs include:

- Age-sex of patients with current AF
- AF status by age
- Patients with count of factors

It is possible to 'drill down' through any bar on the chart to reveal the included patients in the underlying datasheet. To drill down, click once on the section of the chart you are interested in, and then double click. It is essentially a quick way of accessing filtered data.

GRASP-AF care management

The GRASP-AF care management tool helps practices to answer the following questions:

- What is the practice prevalence rate for AF?
- What are the $CHADS_2$ and CHA_2DS_2-VASc scores for our patients with AF? How well are these recorded? How many patients appear in the high risk category for stroke? Which are the most common risk factors for stroke?
- Are our AF patients on the optimum treatment pathway based upon their category of risk?
- Are there any patients who would benefit from review to determine whether anticoagulation would be appropriate?
- What is the expected number of strokes within the practice this year based upon current treatment plans?

GRASP-AF care management output

The GRASP-AF care management tool provides the following views in CHART:

1. Summary sheet - both dashboard view and classic view
2. Datasheet
3. Pre-set graphs - nine in total

Detailed information on each of these data views can be found below.

View 1 - Summary sheet

CHART summary sheets provide a snapshot of all the relevant data recorded by the practice. For GRASP-AF care management there are two different summary sheet views available; a dashboard view and a classic view. The dashboard view provides a visual display of the data whereas the classic view presents data in tabular form.

The summary sheets for GRASP-AF are unique in that users can easily switch between the two different risk scoring systems of $CHADS_2$ and CHA_2DS_2-VASc, essentially offering users multiple views of the data. Use the 'Select Risk Score' drop down box in the top left corner to switch between the two scoring systems.

The screenshots on the next page contain data based on the default CHA_2DS_2-VASc risk score.

Example CHART care management summary sheet views using the CHA_2DS_2-VASc scoring system

The 2014 NICE guidance[5] recommends CHA_2DS_2-VASc as the preferred stroke risk algorithm. As a result, for the remainder of this document all summary view screenshots are based on the CHA_2DS_2-VASc risk scoring system.

The classic view to the left shows summary care management data based upon the CHA_2DS_2-VASc scoring system in tabular form.

The dashboard view to the right presents care management summary data based upon the CHA_2DS_2-VASc scoring system in a more visual way.

M12345

Data extracted on 23/03/15 using Reference date 31/01/15

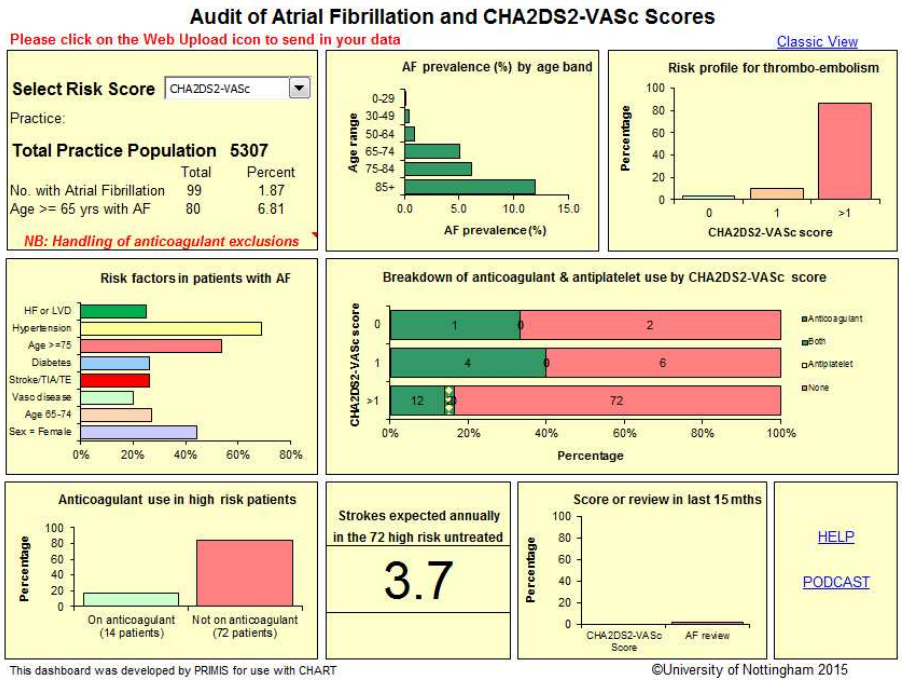
Audit of Atrial Fibrillation and CHA2DS2-VASc Scores ©University of Nottingham 2015

Click here for Dashboard view

Select Risk Score CHA2DS2-VASc

	No	Percent
Total No of patients currently registered with the Practice	5307	
Total No of patients with atrial fibrillation / flutter	99	1.87
Practice population aged 65+ with atrial fibrillation / flutter	80	6.81
Risk profile for thromboembolism		
CHA2DS2-VASc score = 0	3	3.03
CHA2DS2-VASc score = 1	10	10.10
CHA2DS2-VASc score > 1	86	86.87
Anticoagulant use in high risk patients (CHA2DS2-VASc >1)		
Patients on anticoagulants	14	16.28
Patients not on anticoagulant	72	83.72

Patients on anticoagulant and anti-platelet drugs in CHA2DS2-VASc groups	None	Anti-platelet	Anti-coagulant	Both
CHA2DS2-VASc score = 0	2	0	1	0
CHA2DS2-VASc score = 1	6	0	4	0
CHA2DS2-VASc score > 1	72	0	12	2



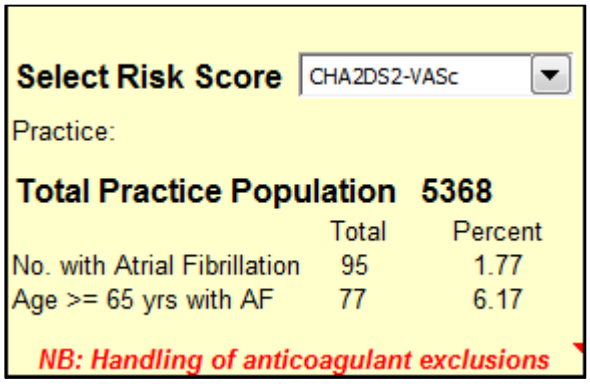
Dashboard view

Detailed information on each section of the dashboard can be found below:

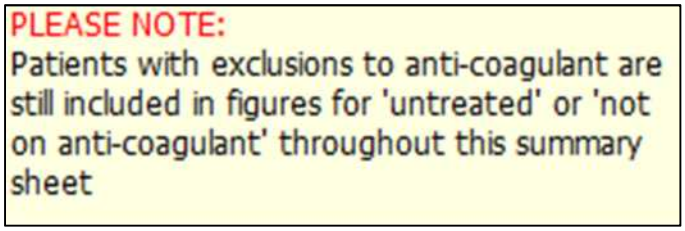
Select Risk Score

The top left corner of the dashboard features the drop down selection box that determines the risk scoring system used within the calculations.

Key statistical data is also provided here including an up to date practice population count and the practice prevalence rate of AF.



When the mouse hovers over the '*NB Handling of anticoagulant* exclusions' text the following pop up text box appears:



Patients who may have declined oral anticoagulant treatment in the past or had a contra-indication recorded historically may be worth reviewing to see if the original cause of the exclusion still applies.

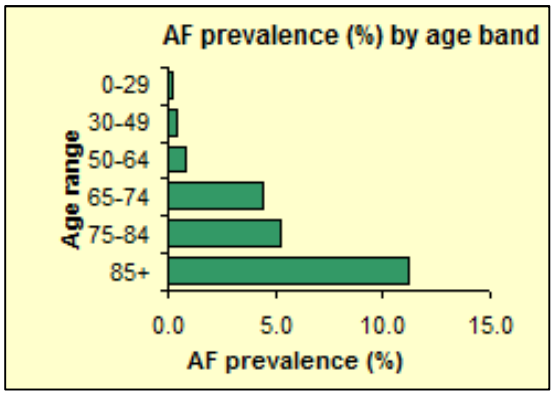
What to note about this practice

- The practice prevalence of AF is 1.77%. This is lower than the CHART Online prevalence rate (of 1.9% as at August 2017). It is not normally the case that prevalence rates match exactly but practice should consider whether their rate is significantly higher or lower than the average.
- 6% of patients aged 65 years or more within the practice have a diagnosis of AF

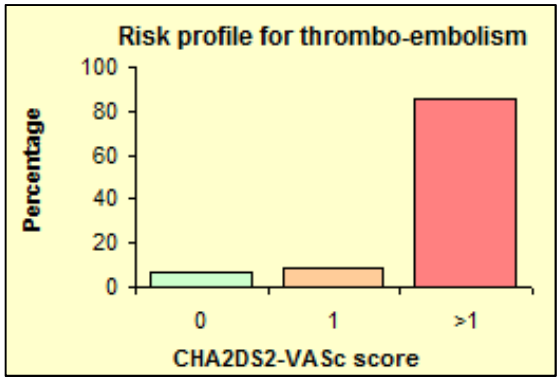
AF Prevalence (%) by Age Band

The top middle section of the dashboard is a graphical display of AF prevalence by distinct age bands.

This graph illustrates how AF prevalence increases with age within the practice population.



Risk Profile for Thromboembolism



The bar chart in the top right corner of the dashboard shows the percentage of patients with AF categorised as low, medium and high risk (using the chosen risk scoring system).

A score of >1 is generally considered high risk.

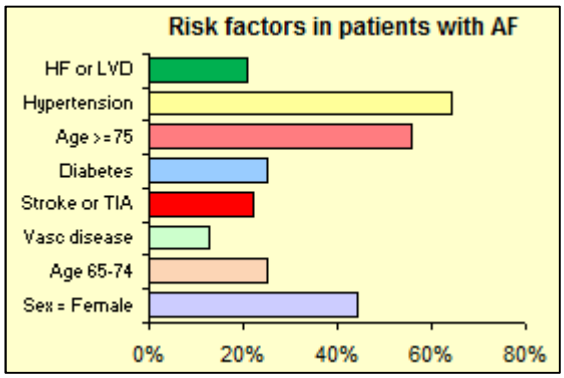
What to note about this practice

- Of the patients with AF in this practice, 85% are identified as being at high risk of stroke (a CHA_2DS_2-VASc risk score of >1). Using the alternative $CHADS_2$ scoring system, the percentage classified as high risk (in this practice) decreases to 60% but as previously mentioned, this scoring system is considered to be less inclusive than CHA_2DS_2-VASc.

Risk Factors in Patients with AF

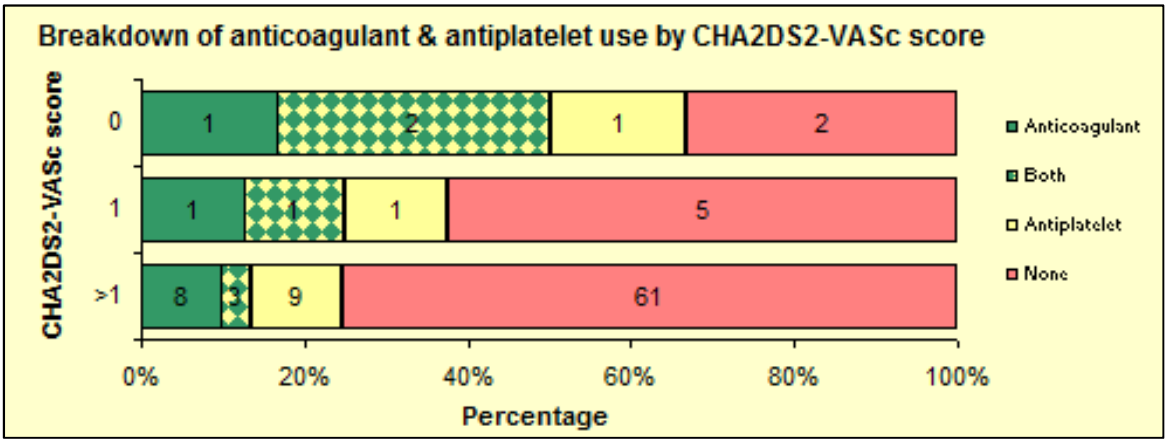
The middle row left chart shows the incidence of each of the key risk factors that contribute to the chosen scoring system.

Data is expressed as a percentage of the total number of patients with AF.



Breakdown of Current Treatment by CHA_2DS_2-VASc Score

The chart in the centre right of the dashboard, allows practices to assess the efficacy of patients' treatment pathways (based upon risk score) and presents an opportunity to optimise their medication. It shows the proportion of AF patients that are being treated with oral anticoagulants and/or antiplatelet drugs (in the last six months) by risk score category.



The green and yellow hatched area indicates patients who are on both anticoagulants and antiplatelets. The pink section indicates patients who are receiving neither oral anticoagulant nor antiplatelet medication.

Antithrombotic therapy is not recommended in patients with AF who are aged <65 who are 'truly low-risk' (a CHA_2DS_2-VASc score of 0), as their risk of stroke is so low[3]. Female patients with a CHA_2DS_2-VASc score of 1 whose only risk factor is their gender also do not need anticoagulation if they clearly fulfil the criteria of age <65 and lone AF[3, 5]. When reviewing the data in the above graph be aware that patients could be on an anticoagulant or antiplatelet for another indication.

NICE guidance states that aspirin monotherapy should not be given solely for stroke prevention to people with atrial fibrillation[5].

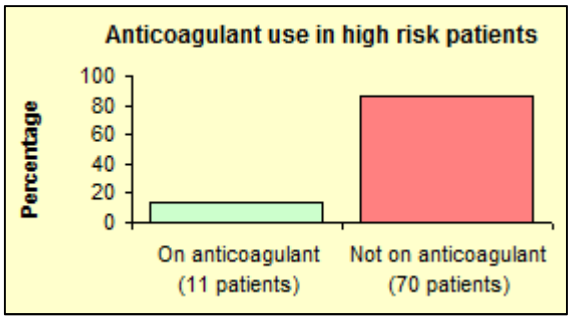
What to note about this practice

- 81 AF patients have a CHA_2DS_2-VASc score of >1
- 11 of the 81 patients (13.6%) in this high risk group are being treated with an anticoagulant (8 plus 3 on both anticoagulant and antiplatelet)
- 70 patients (86.4%) identified as being at high risk of a stroke are not receiving oral anticoagulant treatment. Nine of those patients are on antiplatelet medication alone

The CHART pre-set filters can help practices to quickly access the relevant patient lists (see page 28).

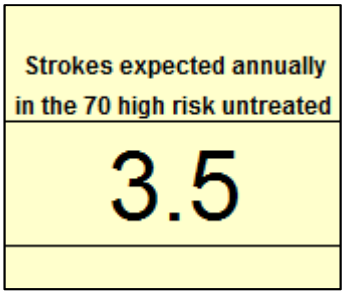
Anticoagulant Use in High Risk Patients

The chart in the bottom left corner of the dashboard clearly displays the number of patients in the high risk group that are receiving or not receiving anticoagulation therapy.



As previously mentioned, patients who have declined or are contraindicated are also included in the category 'not on anticoagulant'.

Outcomes



This box calculates the number of AF related strokes this practice can expect within a year given current management plans. It is based on the annual AF related stroke risk for each patient in the high risk category.

High risk patients with contraindications to oral anticoagulants or who have declined treatment have been included in this calculation.

What to note about this practice

- The practice can expect 3.5 AF related strokes in the next year if the 70 high risk patients remain untreated with oral anticoagulants

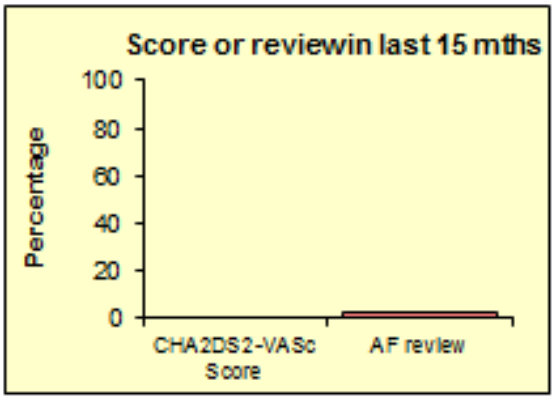
Suggested action for practices

- Use the datasheet and pre-set filters to identify high risk patients who are not on oral anticoagulation (see page 28 for information on how to do this)

Score or Review in Last 15 Months

NICE guidance recommends that patients with AF are regularly reviewed, are assessed for risk of stroke/thromboembolism and have this risk assessment recorded[5]. Additionally, indicator AF006 of the QOF requires that all patients with AF have their stroke risk recorded every 12 months (excluding those whose previous $CHADS_2$ or CHA_2DS_2-VASc score is greater than 1). This indicator has been developed to measure the effectiveness of the provision of a clinical care component for patients on the atrial fibrillation register.

The chart, on the bottom right of the dashboard, shows the percentage of patients with AF who have had their CHA_2DS_2-VASc score calculated and entered as a Read code into their electronic record in the last 15 months.



The second bar shows the percentage of patients who have had an annual AF review Read code entered into their electronic record in the last 15 months.

A timeframe of 15 months rather than 12 months is used in order to capture patients who fall just outside of the 12 month window e.g. 12 months and three weeks.

What to note about this practice

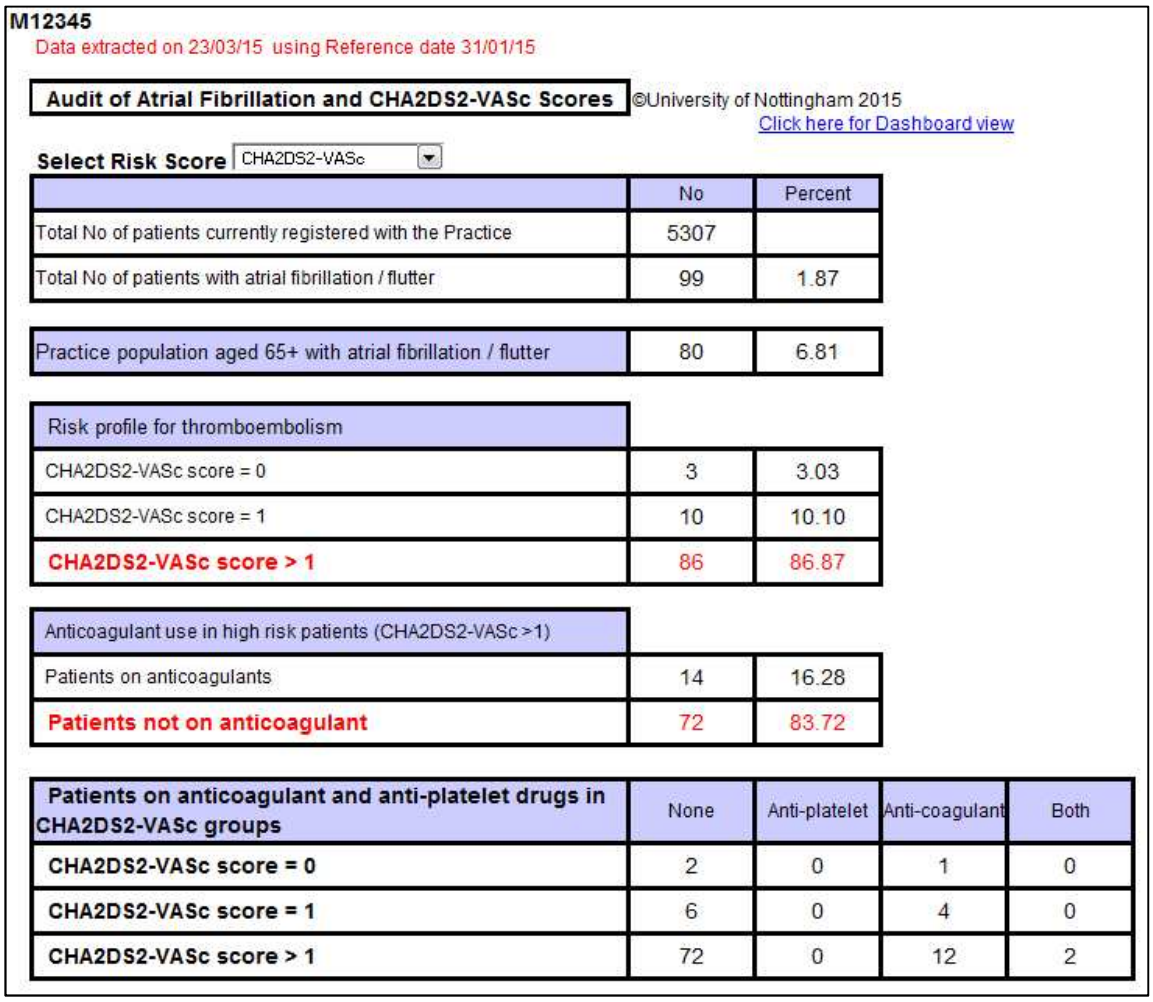
- The small number of CHA_2DS_2-VASc risk score Read codes in the last 15 months is unusual as this is required for achieving indicator AF006 of the QOF. The practice may wish to review how it is capturing and recording CHA_2DS_2-VASc risk scores. There are numerous methods available to calculate the CHA_2DS_2-VASc score. Some clinical systems can calculate the score (when prompted by the user), alternatively the GRASP-AF tool can be used to generate scores which can then be added to patients' records
- Additionally there are few AF review Read codes entered in the last 15 months. The practice should review the data entry procedures used when undertaking reviews of patients with AF and ensure correct Read codes are entered

Help and podcast

The bottom right corner of the dashboard includes links to online guidance on using the GRASP-AF tool. In addition a link to a seven minute podcast, recorded by Professor David Fitzmaurice of The University of Birmingham, outlines the evidence supporting the benefits of better anticoagulant prescribing to reduce the risk of strokes amongst patients with AF.

Classic view

The classic view of the summary sheet presents practice data in a tabular format. An example is shown below:



M12345

Data extracted on 23/03/15 using Reference date 31/01/15

Audit of Atrial Fibrillation and CHA2DS2-VASc Scores ©University of Nottingham 2015

Click here for Dashboard view

Select Risk Score CHA2DS2-VASc

	No	Percent
Total No of patients currently registered with the Practice	5307	
Total No of patients with atrial fibrillation / flutter	99	1.87
Practice population aged 65+ with atrial fibrillation / flutter	80	6.81
Risk profile for thromboembolism		
CHA2DS2-VASc score = 0	3	3.03
CHA2DS2-VASc score = 1	10	10.10
CHA2DS2-VASc score > 1	86	86.87
Anticoagulant use in high risk patients (CHA2DS2-VASc >1)		
Patients on anticoagulants	14	16.28
Patients not on anticoagulant	72	83.72

Patients on anticoagulant and anti-platelet drugs in CHA2DS2-VASc groups	None	Anti-platelet	Anti-coagulant	Both
CHA2DS2-VASc score = 0	2	0	1	0
CHA2DS2-VASc score = 1	6	0	4	0
CHA2DS2-VASc score > 1	72	0	12	2

The practice national code and the search reference date are shown at the top. The drop down selection box allows practices to select the risk scoring system they want to apply to the data.

The next section displays the current practice population count along with prevalence of AF/atrial flutter. NB: patients with resolved AF have been included in the count as they are at increased risk of a future episode even though the first episode may appear to have resolved.

The risk profile section displays the CHA_2DS_2-VASc scores categorised into low, medium or high risk. Patients in the high risk category appear in **red**. The next section breaks down the use of oral anticoagulant treatments amongst those patients in the high risk category. The number of high risk patients not receiving oral anticoagulant therapy appears in **red**. The final section displays the number of patients currently receiving treatment as per their CHA_2DS_2-VASc score risk categories.

View 2 - Datasheet

The datasheet is accessible via this icon from the toolbar. It allows you to access patient level data and will assist with identifying patients who may benefit from being reviewed regarding oral anticoagulation.

When preparing the queries to run on the clinical system, practices must decide whether to run a pseudonymised set (as shown below which uses a patient reference number) or a patient identifiable set that will return named patient information. The patient identifiable set is the most useful for audit and patient care but to achieve the benefits of comparative analysis (using CHART Online), **only the pseudonymised set can be uploaded** in order to keep patient data secure.

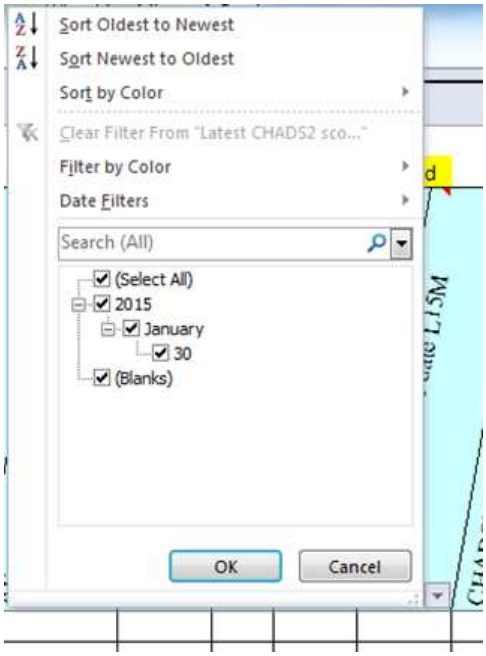
Reference	Age	Sex	Registration date	Earliest AF code	Earliest AF date	Latest AF code	Latest AF date	Latest AF resolved date	AF resolved status	Latest AF review date L15M	Female	Click + to view Risk Factors	CHADS2 score	Click + to view CHADS2 Score in Record	CHADS2 risk category	CHADS2 risk group	CHA2DS2-VASc score	Click + to view CHA2DS2-VASc Score in Record	CHA2DS2-VASc risk category
zzyw	68	M	09/11/09	G573.	07/01/08	G573.	07/01/08						0		Low risk	.0	1		Medium
00uQ	84	M	08/04/99	G5730	15/12/09	G5730	21/06/10						1		Medium risk	.1	2		High risk
01Ud	62	M	16/03/09	G5730	16/12/08	G5732	05/10/09						1		Medium risk	.1	1		Medium
01Yv	76	M	16/03/09	G573.	11/04/97	G573.	11/04/97						2		High risk	>1	3		High risk
02QC	92	M	06/06/11	G573.	09/11/97	G573.	29/08/14						3		High risk	>1	4		High risk
00Df	75	M	16/03/09	G5730	02/07/08	G5730	02/07/08						4		High risk	>1	6		High risk
00QS	88	F	09/01/06	G573.	28/09/04	G573.	29/08/14				F		6		High risk	>1	8		High risk
00hG	74	M	06/06/11	G573.	29/08/14	G573.	29/08/14						2		High risk	>1	4		High risk
00u9	65	F	08/04/09	G5730	04/11/08	G5730	12/04/09				F		1		Medium risk	.1	3		High risk

The CHART datasheet contains many columns of relevant data. A full list of available columns is included in the appendices of this document.

Both the $CHADS_2$ and CHA_2DS_2-VASc scores are calculated and shown side by side within the datasheet. Each line (row) of the datasheet represents a patient and they are colour coded according to the following key:

RED	Patient with a CHA_2DS_2-VASc score >1 who are not on oral anticoagulant
AMBER	Patient with a CHA_2DS_2-VASc score of 1 who are not on oral anticoagulant
BLACK	Patient with a CHA_2DS_2-VASc score of 0.
MAGENTA	Patient with a H/O of haemorrhagic stroke who is on anticoagulant or antiplatelet

Filtering the datasheet



The datasheet can be filtered as desired, to produce bespoke lists of patients. An example would be to filter on the blank cells in the column titled '*Latest CHA_2DS_2-VASc score date L15M'.* You will find this located behind the + button above the column titled *'CHA_2DS_2-VASc Score, Click to view CHA_2DS_2-VASc score in record'.*

The resulting display will contain those AF patients without a record of a CHA_2DS_2-VASc risk score in the last **15 months***

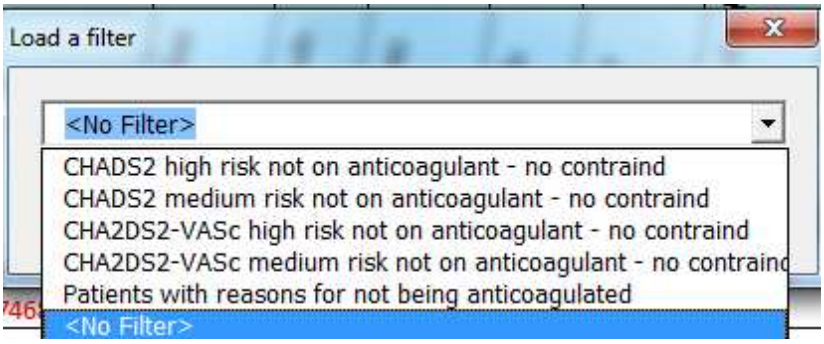
This could be used as a list to work from to increase the routine recording of CHA_2DS_2-VASc risk scores when carrying out AF reviews.

*NB. Indicator AF006 of the QOF searches for CHA_2DS_2-VASc risk scores within the last **12 months**.

Please refer to CHART instructions for further information on how use the filter functionality.

Pre-set filters

In addition to creating custom filters, there are five pre-set (or pre-loaded) filters provided within this tool. *Accessed via 'PRIMIS CHART', 'Load Filter'.*



These are provided in order to allow quick access to useful lists of patients. See the next page for a list of suggested actions for practices.

Suggested action for practices

- Firstly, identify the untreated high risk patients without known contraindications (pre-set filter number 3). Consider reviewing these patients to assess the benefits of commencing oral anticoagulant treatment

- Secondly, use pre-set filter 5 to identify patients with a record of a past contraindication or where the patient previously declined oral anticoagulant treatment. Undertake a risk versus benefit assessment of these patients commencing oral anticoagulant treatment

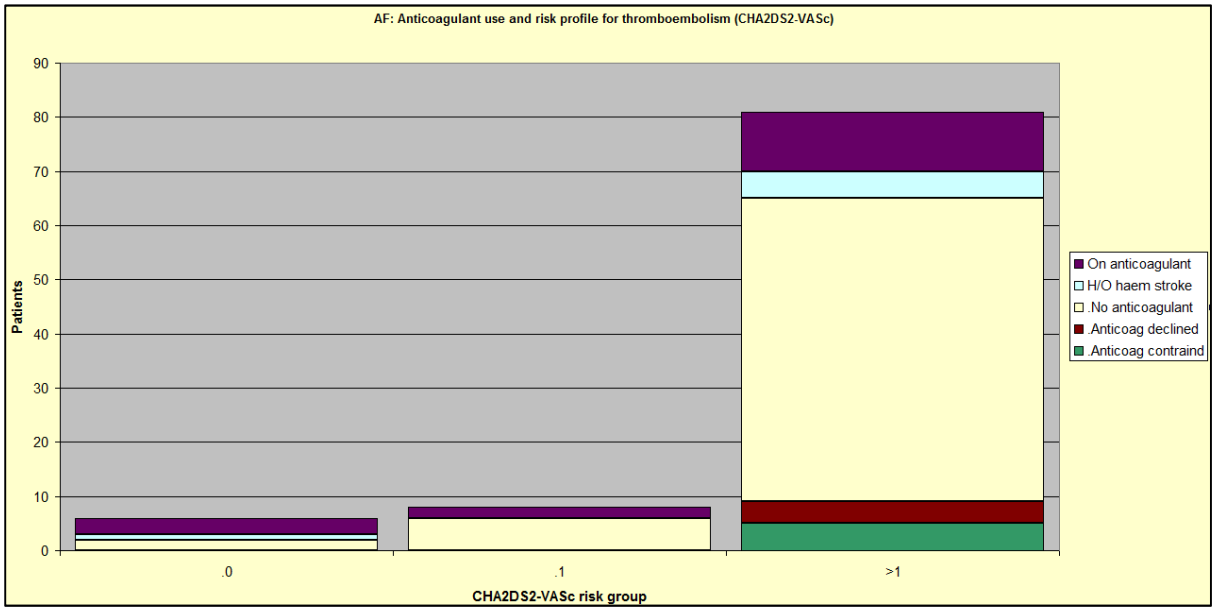
- Identify any patients with a history of haemorrhagic stroke who are on anticoagulant or antiplatelet (colour coded in magenta on the datasheet). These patients should not be receiving anticoagulant or antiplatelet and should therefore be reviewed

- Perform various data quality/data entry checks such as establishing recording levels of CHA_2DS_2-VASc risk scores and annual reviews on the clinical system. Review how accurately and precisely stroke is being recorded in the practice (i.e. ischaemic versus haemorrhagic and not *Stroke NOS*)

- Upload data to CHART Online for benchmarking and comparison. Repeated uploads allow practices to track improvements in management of AF patients. Practices can anonymously benchmark themselves against others both locally and nationally and plan improvements accordingly. CCGs can monitor care provision at an aggregated level within their locality

View 3 – Pre-set graphs

There are nine pre-set graphical views available for GRASP-AF care management, one of which is shown below. This graph reports on anticoagulant use and risk profile for thromboembolism using the CHA_2DS_2-VASc risk score:



Other pre-set graphs include:

- AF: Age sex profile
- AF: $CHADS_2$ scores
- AF: CHA_2DS_2-VASc scores
- AF: Warfarin use and risk profile for thromboembolism $CHADS_2$
- AF: NOAC use and risk profile for thromboembolism $CHADS_2$
- AF: Warfarin use and risk profile for thromboembolism CHA_2DS_2-VASc
- AF: NOAC use and risk profile for thromboembolism CHA_2DS_2-VASc
- AF: Antiplatelet use and risk profile for thromboembolism $CHADS_2$
- AF: Antiplatelet use and risk profile for thromboembolism CHA_2DS_2-VASc

It is possible to 'drill down' through any bar on the chart to reveal the included patients in the underlying datasheet. To drill down, click once on the section of the chart you are interested in, and then double click. It is essentially a quick way of accessing filtered data.

Recommended views in CHART Online

CHART Online is a secure web enabled tool that helps practices improve performance through comparative data analysis. Using CHART Online, practices can explore and compare the quality of their own data with anonymised data from other practices, locally or nationally, through interactive graphs. CHART Online helps practices and Primary Care Organisations (PCOs) to improve data quality and identify ways to enhance patient care. Variations in data management and activity are more visible when compared across a group of GP practices.

Pseudonymised patient level data on patients with known AF can be uploaded securely from the GRASP-AF tool to CHART Online. As at August 2017, over 2,976 practices from 165 Clinical Commissioning Group (CCG) areas had uploaded GRASP-AF data to CHART Online, contributing to the largest dataset on patients with AF in the country. These data show 424,090 patients with a diagnosis of AF equating to a recorded prevalence of 1.90%.

A dataset of this size allows meaningful comparisons to be made country-wide and provides reliable data relating to prevalence and management of patients with AF. In a recent study by Cowan et al (2013)[7] regarding anticoagulation use in general practice, aggregated information from the GRASP-AF tool and CHART Online dataset were examined. Observations were able to be made regarding the prevalence of AF (which was higher than previously reported rates) and the low number of patients with AF receiving anticoagulants:

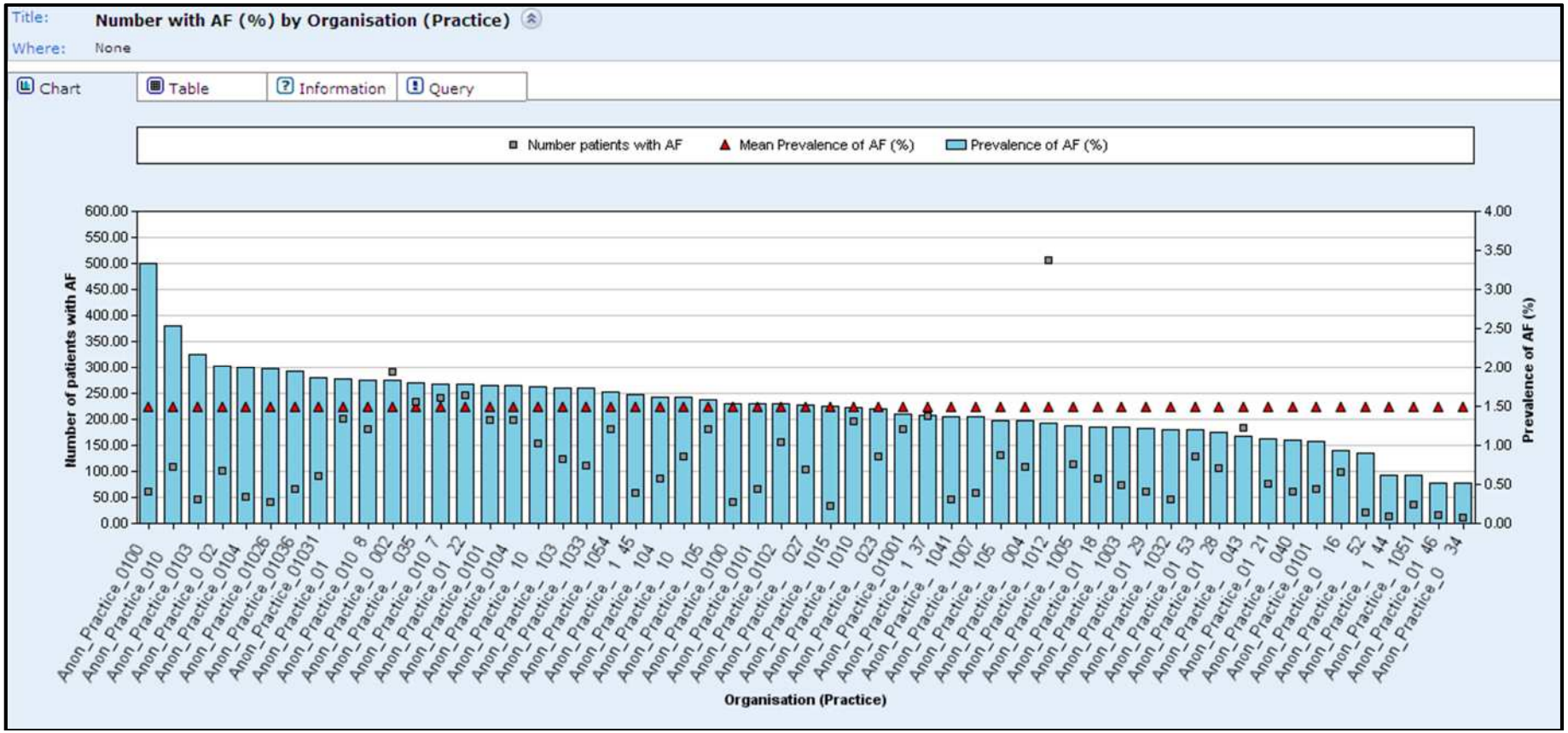
> **"Over 20% of general practices in England have uploaded data on their AF patients using the GRASP-AF tool. Analysis of these data show that uptake of AC has improved in comparison with previous studies, but even so, over one-third of high-risk patients remain untreated. AP agents are very frequently used as an alternative, particularly among the elderly. Education on the benefits of AC in comparison with AP offers great potential for stroke prevention."**
>
> [7]Cowan C, Healicon R, Robson I, et al. (2013) The use of anticoagulants in the management of atrial fibrillation among general practices in England. *Heart* Vol. 99, pp. 1166–1172.

More information on the benefits, features and security aspects of CHART Online can be found on the PRIMIS website:
http://www.nottingham.ac.uk/primis/tools-chart/chart-online.aspx

A selection of example views from CHART Online have been included on the following pages.

Comparative view 1 – Prevalence of AF (%)

This chart shows prevalence rates of AF for individual practices within a locality and an average prevalence rate for all data that have been uploaded. This is a quick way to establish whether a practice rate is higher or lower than the average. In the example below the average is 1.5% and is depicted by the row of red triangles.

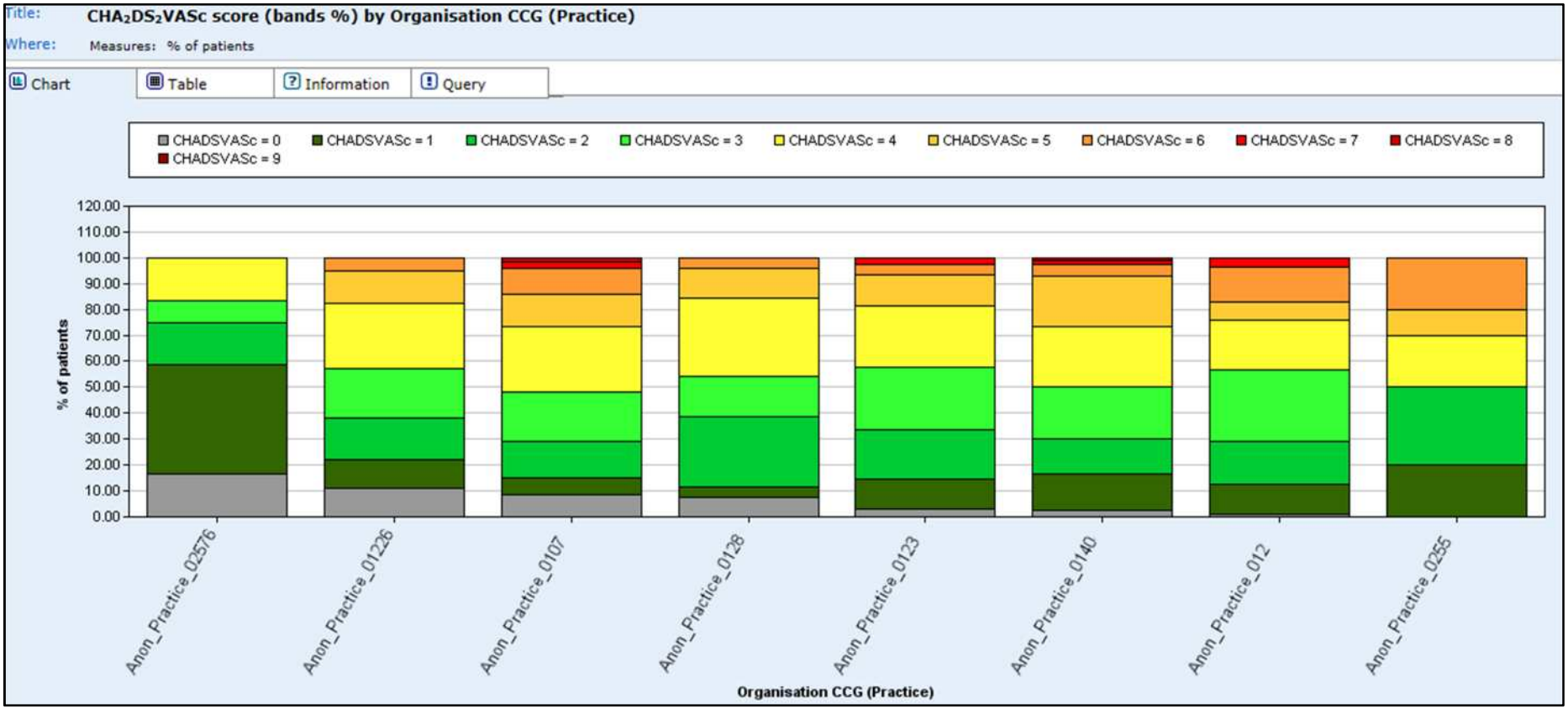


The chart has been ordered by prevalence rate for ease of viewing. This does not infer that practices have a target rate to work towards but instead helps to show outliers. Outliers may exist due to demographic reasons (eg. a more elderly population) or coding reasons (eg. under or over recording of diagnoses).

Comparative view 2 – CHA_2DS_2-VASc score (bands %)

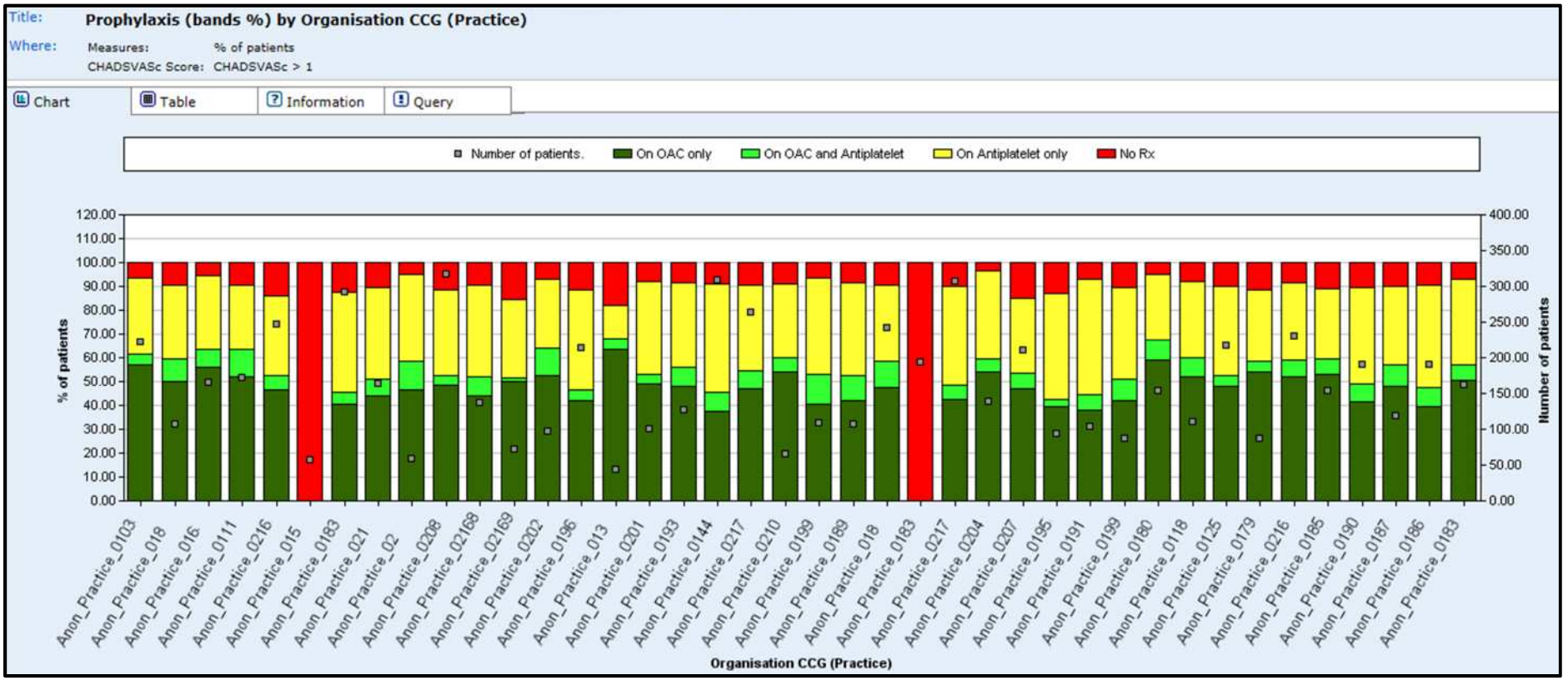
This chart shows the proportion of AF patients in each risk category (CHA_2DS_2-VASc) for each practice within a locality. Each of the different colour blocks represents a different CHA_2DS_2-VASc score category.

Views can be manipulated to sort by each of the different CHA_2DS_2-VASc scores as desired. The example chart below has been sorted by CHA_2DS_2-VASc score of 0.



Comparative view 3 – CHA_2DS_2–VASc score >1 showing care management by practice

This view allows you to examine the treatment of high risk AF patients, comparing rates for anticoagulant use only (dark green), neither antiplatelet nor anticoagulant (red), both antiplatelet and anticoagulant use (lime green) and antiplatelet only (yellow). Only patients with a CHA_2DS_2–VASc score greater than 1 are included in this view.



In this example there is a wide variation in management across practices. There are a large number of patients already on anticoagulant (the dark and lime green) but many patients are not on either antiplatelet or anticoagulant (red stacks). NICE guidelines[5] recommend the use of anticoagulation in preference to antiplatelet amongst patients identified as being at high risk of stroke.

Key questions for GP practices

- How accurate is our practice prevalence rate for AF?
- Do we have any patients with AF who do not have a diagnosis coded in their electronic record?
- Are there any patients who would benefit from review for possible inclusion in the register and relevant treatment?
- Are we caring for our patients with AF as well as we could be?
- Are we actively preventing strokes by prescribing anticoagulants where we can, in line with current evidence and national guidelines?
- Are key data items being recorded routinely and accurately?
- How accurately and precisely are we recording strokes (ischaemic vs haemorrhagic)?
- Are we missing key aspects during reviews with our AF patients?
- Are we treating our patients with AF in a way that is cost effective?
- Do we need to review our policy on prescribing anticoagulants?
- Is our treatment policy in line with NICE guidance?
- How does our data compare with others locally and nationally?

Recommended follow-up work

- Review treatment options with individual patients identified
- Overall review of treatment policy for patients with AF
- Improve data recording and accuracy of clinical coding
- Comparative data analysis using CHART Online – allowing comparison with others locally and nationally
- Re-run the searches and upload data to CHART Online every six months

References

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2. National Collaborating Centre for Chronic Conditions. (2006) *Atrial fibrillation: national clinical guideline for management in primary and secondary care.* London: Royal College of Physicians.

3. Camm, A.J., Kirchhof, P, Lip, G.Y. et al. (2010) 'Guidelines for the management of atrial Fibrillation. The Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC)', *European Heart Journal,* Vol. 31, pp. 2369–2429

4. Camm, A.J., Lip, G.Y., Caterina, R.D. et al. (2012) 'Focused update of the ESC Guidelines for the management of atrial fibrillation', *European Heart Journal,* Vol. 33, pp. 2719–2747

5. National Institute for Health and Clinical Excellence. (2014) *Atrial fibrillation: the management of atrial fibrillation.* NICE guideline. June 2014.

6. Hart, R., Pearce. L. and Aguilar, M. (2007) 'Meta analysis: antithrombotic therapy to prevent stroke in patients who have non-valvular atrial fibrillation', *Annals of Internal Medicine,* Vol. 146, pp. 857-867

7. Cowan. C., Healicon. R., Robson. I., et al. (2013) 'The use of anticoagulants in the management of atrial fibrillation among general practices in England', *Heart*, Vol. 99, pp. 1166–1172

Glossary

AF	Atrial Fibrillation
CCG	Clinical Commissioning Group
$CHADS_2$ see page 39	Risk scoring system based upon: cardiac failure, hypertension, age, diabetes, stroke (doubled)
CHA_2DS_2-VASc see page 39	Risk scoring system based upon: cardiac failure, hypertension, age ≥75 (doubled), diabetes, stroke (doubled)-vascular disease, age 65–74 and sex category (female)
COPD	Chronic Obstructive Pulmonary Disease
DM	Diabetes Mellitus
Dx	Diagnosis
ECG	Electrocardiography
GRASP	Guidance on Risk Assessment for Stroke Prevention
HF	Heart Failure
HO	History of
Lone AF	AF without overt structural heart disease, and defined by a normal clinical history and examination, ECG, chest X-ray and echocardiogram
LVD	Left Ventricular Dysfunction
NICE:	National Institute for Health and Care Excellence
NOAC	New/Novel Oral Anticoagulant
NOS	Not Otherwise Specified
O/E	On Examination or Observed/Examined
QOF	Quality and Outcomes Framework
Rx	Prescription

Appendices

The use of risk scores in CHART quality improvement tools

There are an increasing number of risk calculators available to practices and many are now included in CHART quality improvement tools. They are provided as assistance to clinical decision making and are not intended to replace clinical judgement.

No risk scoring system is considered perfectly accurate and by their nature they are open to interpretation by the user. PRIMIS has used its best endeavours to implement risk scores correctly, however calculation of risk scores are dependent upon certain risk factors being present and coded within the patient's electronic record. The condition might not have been coded or alternative Read codes may have been used that could be inaccurate or too generic. As an example, within the $CHADS_2$ and CHA_2DS_2-VAS_c scoring system, ischaemic stroke is included as a risk factor. Frequently in practice, patients are simply recorded as having had a stroke without clarification on whether it was haemorrhagic or ischaemic. Currently over a third of strokes are recorded simply as *Stroke NOS* (Not Otherwise Specified). These have been included as Ischaemic strokes for the purposes of this score. It is pertinent therefore that practices record such clinical data in as much detail as is possible and is relevant.

Additionally, when selecting the series of codes that represents each risk factor; it can be difficult to be exact and precise. It is possible to either spread the net widely to ensure all possible patients are included, or choose to only use codes where there is absolute certainty of the presence of that risk factor. In each case a pragmatic decision is made about specificity and sensitivity. In the original research papers the concepts were not always very precisely defined either.

All of these factors should be borne in mind when using a risk score calculated in CHART and it is the responsibility of the user to ensure that software and quality improvement tools are kept up to date to ensure all latest codes are included. Ultimately, it is the clinician's responsibility to ensure that patients are reviewed to confirm the accuracy of information before management is decided.

Scoring systems

Stroke risk

The $CHADS_2$ stroke risk score is calculated within the CHART software using the following criteria:

$CHADS_2$ stroke risk score		
Risk factor		**Points**
C	Congestive cardiac failure (diagnosis)	1
H	Hypertension (diagnosis)	1
A	Age ≥ 75	1
D	Diabetes (diagnosis)	1
S	Stroke* or TIA (diagnosis) *excludes haemorrhagic strokes but includes ischaemic stroke or *Stroke NOS*	2
	Maximum score	6

CHA_2DS_2-VASc stroke risk score		
Risk factor		**Points**
C	Congestive heart failure/LV dysfunction (diagnosis)	1
H	Hypertension (diagnosis)	1
A	Age ≥ 75	2
D	Diabetes mellitus (diagnosis)	1
S	Stroke*/TIA/thrombo-embolism (diagnosis) *excludes haemorrhagic strokes but includes ischaemic stroke or *Stroke NOS*	2
V	Vascular disease (diagnosis)	1
A	Age 65-74	1
Sc	Sex category (female)	1
	Maximum score	9

Columns included within the GRASP-AF casefinder datasheet

The following is a list of the data columns contained within the datasheet of the GRASP-AF casefinder tool.

Pseudonymised set	Patient identifiable set
Reference (MIQUEST pseudo ref)	Usual GP
	Practice number (system ID number)
	Surname
	Forename
	Date of birth
	NHS number

Both sets

Age
Sex
Registration_Date
Over 65s
Earliest Atrial Fibrillation Dx code
Earliest Atrial Fibrillation Dx term
Earliest Atrial Fibrillation Dx date
Earliest Atrial Fibrillation Dx episode type
Latest Atrial Fibrillation Dx code
Latest Atrial Fibrillation Dx term
Latest Atrial Fibrillation Dx date
Latest Atrial Fibrillation Dx episode type
AF Resolved code
AF Resolved term
AF Resolved date
Latest Atrial Fibrillation Resolved code
Latest Atrial Fibrillation Resolved date
ECG indicates probable AF code
ECG indicates probable AF term
ECG indicates probable AF date
ECG indicates possible AF code
ECG indicates possible AF term
ECG indicates possible AF date
Latest CHADS2/CHA2DS2-VASc risk score code
Latest CHADS2/CHA2DS2-VASc risk score term

Latest CHADS2/CHA2DS2-VASc risk score date
Latest CHADS2/CHA2DS2-VASc risk score value
Latest irregular pulse code
Latest irregular pulse term
Latest irregular pulse date
Supraventricular tachycardia Dx code
Supraventricular tachycardia Dx term
Supraventricular tachycardia Dx date
History of atrial fibrillation/atrial flutter code
History of atrial fibrillation/atrial flutter term
History of atrial fibrillation/atrial flutter Dx date
Latest AF Monitoring code
Latest AF Monitoring term
Latest AF Monitoring date
QOF AF exception code
QOF AF exception term
QOF AF exception date
AF related procedure code
AF related procedure term
AF related procedure date
Latest AF Rx in L6M code
Latest AF Rx in L6M term
Latest AF Rx in L6M date
AF Status
Count of Possible/Probable Factors
Current AF only
Under65s filter

Columns included within the main GRASP AF datasheet

The following is a list of the data columns contained within the datasheet of the GRASP-AF quality improvement tool.

Pseudonymised set	**Patient identifiable set**
Reference (MIQUEST pseudo ref)	Usual GP
	Reference (system ID number)
	Surname
	Forename
	NHS number

Both sets

Age
Sex
Registration_Date
Earliest AF code
Earliest AF date
Latest AF code
Latest AF date
Latest AF resolved date
AF resolved status
Latest AF review date L15M

Earliest heart failure code	**Risk Factors**
Earliest heart failure date	
Earliest LVD code	
Earliest LVD date	
Earliest heart failure/LVD code	
Earliest heart failure/LVD date	
Earliest hypert code	
Earliest hypert date	
Age 75 or over	
Earliest DM code	
Earliest DM date	
Earliest isch/unspec stroke code	
Earliest isch/unspec stroke rubric	
Earliest isch/unspec stroke date	
Earliest thrombo event code	
Earliest thrombo event date	
Earliest isch stroke/thrombo event code	
Earliest isch stroke/thrombo event date	
Earliest vascular disease code	

Earliest vascular disease date	
Age 65-74	
Female – *expand + to see risk factor columns listed above*	
Latest $CHADS_2$ score value L15M	**Score in record**
Latest $CHADS_2$ score date L15M	
$CHADS_2$ score - *expand + to see $CHADS_2$ columns listed above*	
$CHADS_2$ risk category	
$CHADS_2$ risk group	
Latest CHA_2DS_2-VASc score value L15M	**Score in record**
Latest CHA_2DS_2-VASc score date L15M	
CHA_2DS_2-VASc score - *expand + to see CHA_2DS_2-VASc columns above*	
CHA_2DS_2-VASc risk category	
CHA_2DS_2-VASc risk group	
Latest haemorrhagic stroke code	
Latest haemorrhagic stroke rubric	
Latest haemorrhagic stroke date	
Latest warfarin drug code L6M	**Warfarin status**
Latest warfarin drug L6M	
Latest warfarin drug date L6M	
Latest warfarin declined code	
Latest warfarin declined date	
Latest warfarin CI code	
Latest warfarin CI date	
Warfarin status - *expand + to see Warfarin columns listed above*	
Latest NOAC drug code L6M	**NOAC status**
Latest NOAC drug L6M	
Latest NOAC drug date L6M	
Latest NOAC declined code	
Latest NOAC declined date	
Latest NOAC CI code	
Latest NOAC CI date	
NOAC status - *expand + to see NOAC columns listed above*	
Latest anticoag NOS declined code	**Anticoag NOS status**
Latest anticoag NOS declined date	
Latest anticoag NOS CI code	
Latest anticoag NOS CI date	
Anticoag NOS status - *expand + to see Anticoag NOS columns above*	

Latest anticoagulant drug code L6M	**Anticoagulant status**
Latest anticoagulant drug L6M	
Latest anticoagulant drug date L6M	
Latest anticoagulant non drug code L6M	
Latest anticoagulant non drug L6M	
Latest anticoagulant non drug date L6M	
Latest anticoagulant code L6M	
Latest anticoagulant L6M	
Latest anticoagulant date L6M - *expand + to see columns listed above*	
Exclusions from anticoagulant Rx	
Anticoagulant status	
Latest antiplatelet drug code L6M	**Antiplatelet status**
Latest antiplatelet drug L6M	
Latest antiplatelet drug date L6M	
Latest antiplatelet non drug code L6M	
Latest antiplatelet non drug L6M	
Latest antiplatelet non drug date L6M	
Latest antiplatelet code L6M	
Latest antiplatelet L6M	
Latest antiplatelet date L6M	
Latest antiplatelet declined code	
Latest antiplatelet declined date	
Latest antiplatelet CI code	
Latest antiplatelet CI date	
Exclusions from antiplatelet Rx	
Antiplatelet status - *expand + to see antiplatelet columns listed above*	
H/O haemorrhagic stroke on therapy	