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Preventing strokes in people with atrial fibrillation by improving ABC

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ABSTRACT

Nationally, anticoagulation for atrial fibrillation (AF) is improving but remains characterised by marked provider variation. Uncontrolled blood pressure and coronary artery disease further increase cardiovascular risk. Redbridge Clinical Commissioning Group (CCG) and local National Health Service (NHS) hospital trusts supported a programme to improve anticoagulation, blood pressure and cholesterol management; the ABC of AF improvement.

The programme was delivered by a clinical pharmacist in 43 general practices, who used Active Patient Link (APL-AF) software to identify and electronically review the records of AF patients potentially suitable for anticoagulation. These patients were invited for a general practitioner (GP)-pharmacist consultation with initiation of anticoagulation where appropriate. Blood pressure and lipid treatment were also optimised.

The university-based Clinical Effectiveness Group (CEG) provided software support using standard data entry templates from which the APL-AF software was enabled. This identified suitable patients (eg, on aspirin monotherapy, no treatment or inappropriate dual treatments) for clinical and treatment review. It also reported real-time overall practice performance. Additionally, GP education on direct oral anticoagulant initiation in general practices, use of software and performance reviews, took place for all practices in Redbridge.

A weekly multidisciplinary team (MDT) video conference discussed complex patients with a cardiologist, haematologist, GP with specialist interest in cardiology, GP coordinator and clinical pharmacist. This enabled sharing of patient records between GPs and hospital specialists with improved communication and learning.

Over 1 year 2016–2017, anticoagulation in eligible AF patients (CHA_2DS_2-VASc≥2) increased significantly by 6.3% from 77.0% to 83.3% ($p<0.0001$), in comparison to 2.8% average improvement in England. Exception reporting was also significantly reduced from 10.0% to 5.8%; a reduction of 4.2% in comparison to a reduction in England of 1.5%. Use of antiplatelet monotherapy was approximately halved, from 12.3% to 6.4%.

These methods are being scaled locally in other London CCGs and are potentially scalable nationally, specifically targeting the poorer performing CCGs.

PROBLEM

The aim of the programme was to improve anticoagulation and optimise other cardiovascular risk factors in eligible atrial fibrillation (AF) patients in all general practices in one London Clinical Commissioning Group (CCG) over 1 year.

Stroke prevention in AF is a national priority as outlined by Public Health England (PHE).[1] The national Quality and Outcomes Framework (QOF) supports quality of care for patients with long-term conditions including AF. In 2016/2017, the QOF data for Redbridge CCG showed that only 77% of eligible AF patients at a high risk of stroke (CHA_2DS_2-VASc≥2) were anticoagulated. This indicator placed Redbridge CCG in the bottom 10% of CCGs compared with other regions in England which averaged 81%. In addition, the 2016/2017 Redbridge QOF data revealed that higher than expected numbers of eligible patients were 'excepted' from anticoagulation because of clinical contraindications or the patient declined treatment.[2]

The Sentinel Stroke National Audit Programme demonstrated that in Redbridge, 37% of patients admitted to hospital with a stroke and known to have AF, were not receiving anticoagulation at the time of admission.[3]

In 2017, a national CCG anticoagulation target of 80% was set by PHE and the London Academic Health Science Networks for the following year.[4]

To bridge this gap in anticoagulation, a review of the AF patient pathway was undertaken to improve anticoagulation and other cardiovascular risk factors across all the GP practices in Redbridge CCG from April 2017 by:

1. Identifying the high-risk AF patients (CHA_2DS_2-VASc≥2) on either no anticoagulation therapy or inappropriate antiplatelet monotherapy.
2. Initiation of appropriate anticoagulant therapy and elimination of antiplatelet monotherapy for stroke prophylaxis in AF in line with National Institute for Health and Care Excellence (NICE) guidance (CG180).[5]
3. Reviewing the exception reporting to anticoagulation therapy for eligible patients with AF.

4. Reviewing blood pressure (BP) control and QRisk scoring to optimise statin use in line with NICE guidance (CG127 and CG181)[6 7]

BACKGROUND

AF affects one in eight patients over the age of 75 years and is associated with a fivefold increased risk of stroke, resulting in either moderate to severe disability or death in approximately half of the patients.[8] Anticoagulation reduces stroke risk by two-thirds.[9] Patients with AF-related strokes are more severely affected than strokes from other causes and in-hospital mortality is 70% greater.[10] NHS costs are estimated at £12 228 per stroke per annum excluding social care costs.[11]

The previous model of anticoagulation initiation in Redbridge CCG following AF diagnosis involved general practice referral to the hospital anticoagulation clinic, often involving delays of several weeks and a number of lengthy hospital visits for patients who were often elderly with multiple comorbidities. Timely anticoagulation closer to home was a key objective to ensure better patient experience, better health outcomes and avoidance of strokes and other cardiovascular morbidity.

NICE[5] recommends patients be offered anticoagulation at a CHA_2DS_2-VASc≥2, which defined eligible high-risk patients in this study. In addition, uncontrolled blood pressure and concomitant coronary artery disease increase the stroke risk further.[10]

Evidence exists for improving anticoagulation utilising established patient care pathways which for many include onward referrals.[12] However, no studies include care models with clinical pharmacist support for a medicines optimisation approach to stroke prevention within primary care for AF patients.

MEASUREMENT

The improvement measures were electronically extracted centrally by the independent Clinical Effectiveness Group (CEG) from the electronic patient health record for each general practice in Redbridge to produce a quarterly report comparing the performance of each practice in comparison to the other practices in the CCG. These reports were reviewed by commissioners and practice staff.

QOF data only reports on anticoagulants. QOF data and additional CEG data on antiplatelets were available for April 2016 and April 2017 for all 43 practices. The outcome measures are shown below:

1. AF patients CHA_2DS_2-VASc≥2 (2016/2017 QOF, CEG).
2. AF patients CHA_2DS_2-VASc≥2 on an anticoagulant (2016/2017 QOF, CEG).
3. AF patients CHA_2DS_2-VASc≥2 exception reported (2016/2017 QOF).

CEG data on the additional metrics below; was available only for 33 practices using the EMIS computer electronic record system April 2017 and April 2018:

1. AF CHA_2DS_2-VASc≥2 patients on antiplatelet monotherapy.
2. AF CHA_2DS_2-VASc≥2 and BP≥140/90 mm Hg.
3. AF CHA_2DS_2-VASc≥2 on statins.
4. AF CHA_2DS_2-VASc≥2 and serum cholesterol <5 mmol/L.

CEG data were reported quarterly, QOF data were reported yearly.

DESIGN

Stakeholder engagement and consensus

An initial meeting with primary care clinicians in Redbridge CCG and secondary care clinicians including pharmacists, discussed ideas to improve outcomes for AF. A business case was developed highlighting the gap in patients being treated suboptimally. Local reports of delays in initiating anticoagulation indicated that strategies to treat patients closer to home, with initiation of anticoagulation in GP practices, might result in more timely treatment. The possible cost implications to the healthcare system were presented. Baseline QOF data and yearly trends were also reviewed. Using driver diagrams, the team explored change ideas to include a trained anticoagulation clinical pharmacist and a multidisciplinary team (MDT) across the primary and secondary care settings to review cardiovascular and bleeding risk management.

Local incentive scheme

GPs were engaged by developing a local incentive scheme to allow AF registers to be reviewed by a clinical pharmacist; to promote GP participation in educational and MDT meetings; and for GP participation in the optimisation of therapy for the AF patients, triggering a payment on achieving a target of 80% or more anticoagulation in eligible patients. All GPs signed up to the AF incentive scheme.

Trained pharmacist and decision support software

General practitioners were supportive of the extra resource provided by a clinical pharmacist trained in anticoagulation management and qualified to prescribe independently who was seconded from a specialist clinic from a local hospital. The pharmacist worked in the CCG 3 days/week.

At each practice, the following steps were taken to identify patients with AF with suboptimal management and improve this by:

1. Practice administrative staff implementing the APL-AF identification and decision support tool so that it was ready for the pharmacist to use. This takes a matter of minutes to load and display.
2. The pharmacist used the APL-AF tool which imports data from any of the four existing electronic health record systems which identified all eligible high-risk patients with AF CHA_2DS_2-VASc≥2, and displayed each patient's relevant characteristics and current prescribing for a quick 'virtual' review. It also summarises the

overall practice performance for AF anticoagulation. The different clinical systems compatible with the APL-AF tool are EMIS, Vision, SystemOne and Microtest (this is freely available for download from https://www.qmul.ac.uk/blizard/ceg/apl-tools/). A screen shot of the APL-AF tool is shown in figure 1.

If patients were not on anticoagulants or other treatments were suboptimal, patients were then called in for a face-to-face joint GP-pharmacist consultation to review and optimise therapy. Other cardiovascular risk factors including hypertension and the need for statin therapy were reviewed and optimised in accordance with NICE guidance. The joint consultations also supported training of GPs to ensure skills legacy for ongoing primary care initiation of anticoagulation.

Education and training

A series of educational sessions highlighting the unmet need, use of the APL-AF software, risk stratification and treatment options including dispelling misconceptions associated with anticoagulation, was undertaken as part of the protected learning events to support the theoretical knowledge around AF and anticoagulation.

MDT meetings

In recognition of the variable complexity of patients with AF, and the high exception report from QOF, a video conference MDT was setup with the aim to provide faster access to specialist secondary care review, avoid unnecessary onward referral and provide learning to GPs in upskill GPs in initiating anticoagulation.

Complex patients identified during the virtual review of AF registers were referred to the weekly MDT meeting which were held for 1 hour via a video conferencing platform (OmniJoin). Video conferencing allowed the team members to discuss the patient from their office within their care settings and to share and view the patients' records either from the general practice or hospital setting. The MDT consisted of a consultant cardiologist, haematologist, GP with specialist interest in cardiology, GP coordinator and the clinical pharmacist. Patients were consented for their condition to be discussed in the MDT. Some examples of patients referred to the MDT included; distinguishing AF from atrial ectopic beats on an ECG; confirming AF burden in patients with pacemakers; significance of previous bleeding; dementia.

Following the MDT, there were four possible outcomes and definitions as follows:

1. *AF resolved*: developed AF as a result of a reversible factor, however, reverted back into sinus rhythm, that is, thyrotoxicosis, postoperative AF, sepsis and so on. For all these patients, a recommendation was made to monitor for ongoing symptoms of AF and regular pulse checks in view of the lower threshold for developing AF in the future. These patients were recoded as 'AF resolved' to remove them from the AF register.
2. *Exception report*: risk of anticoagulation outweighs the benefit, for example, palliative care, unable to tolerate anticoagulation, patient refuses anticoagulation and understands the risks involved.
3. *Anticoagulate*: clear indication for stroke prevention therapy to be initiated.
4. *Further investigation required*: further investigations included, for example, the requirement to confirm AF diagnosis using a Holter monitor, gastrointestinal (GI) investigations to rule out GI ulceration, further information from stroke specialists to clarify significance of bleed history.

STRATEGY

The CEG central collection and analysis of data from all practices provided a continuing report on individual practice performance in comparison to other practices. The main outcome measures for anticoagulation and antiplatelet use in eligible patients were reported by practice quarterly using funnel plots and bar charts. These enabled practices to visualise in near real-time, their performance in comparison to other practices in the area and to understand 'how they were driving' at that point in time and 'how far there was to go' to reach the target by the end of the year.

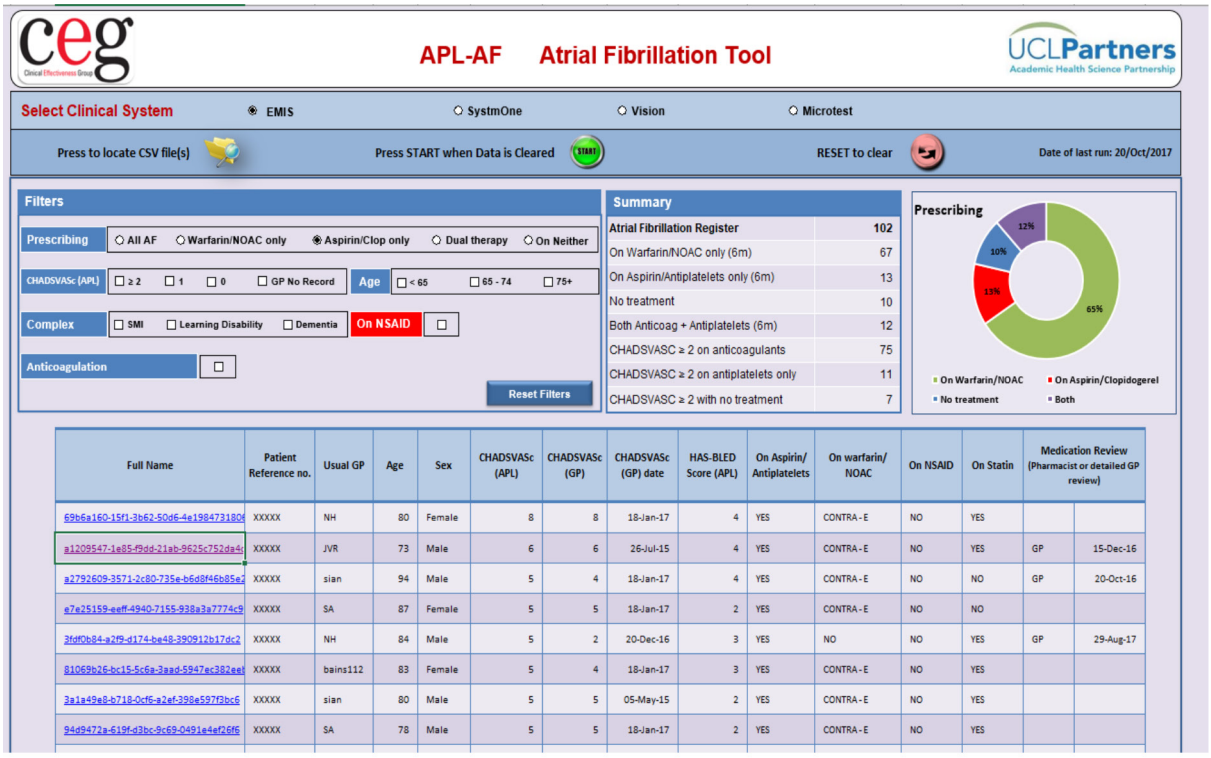
A learning point was the recognition that while most warfarin prescriptions were issued by the GPs, some warfarin was issued and monitored by third parties under a Patient Specific Direction (PSD) with local community pharmacists or by the hospital and that this was important to record. All practices undertook a safety review exercise where such 'third party anticoagulation' was identified as a new code to be recorded on the data entry template. This identified all patients taking warfarin whose supply and/or monitoring was either undertaken by the community anticoagulation service or hospital anticoagulation clinics. In addition, all patients managed by third party providers had their time in therapeutic range requested and recorded onto the GP system to ensure these were managed in line with NICE guidance. This improved safer prescribing.

RESULTS

In 2016/2017, Redbridge CCG consisted of 45 general practices with a patient list size of 310 972. Data from QOF 2016/2017 show there were 2431 patients with high-risk AF (CHA_2DS_2-VASc≥2), of whom 77.0% (1871/2431) were anticoagulated and 10.0% (243/2431) were exception reported.

By 2017/2018, Redbridge CCG had 43 general practices with a patient list size of 320 422. Data from QOF 2017/18 show there were 2593 patients with high-risk AF of whom 83.3% (2161/2593) were anticoagulated and 5.8% (149/2593) were exception reported.

There was therefore, an increase of 6.3% (290 people) in the proportion of AF patients' anticoagulated over the previous year (95% CI 4.1% to 8.5%, p<0.0001). This was the greatest improvement in London and the second most improved among the 194 CCGs in England in the QOF



Individual patient review sheet for a patient on an antiplatelet agent but not an anticoagulant

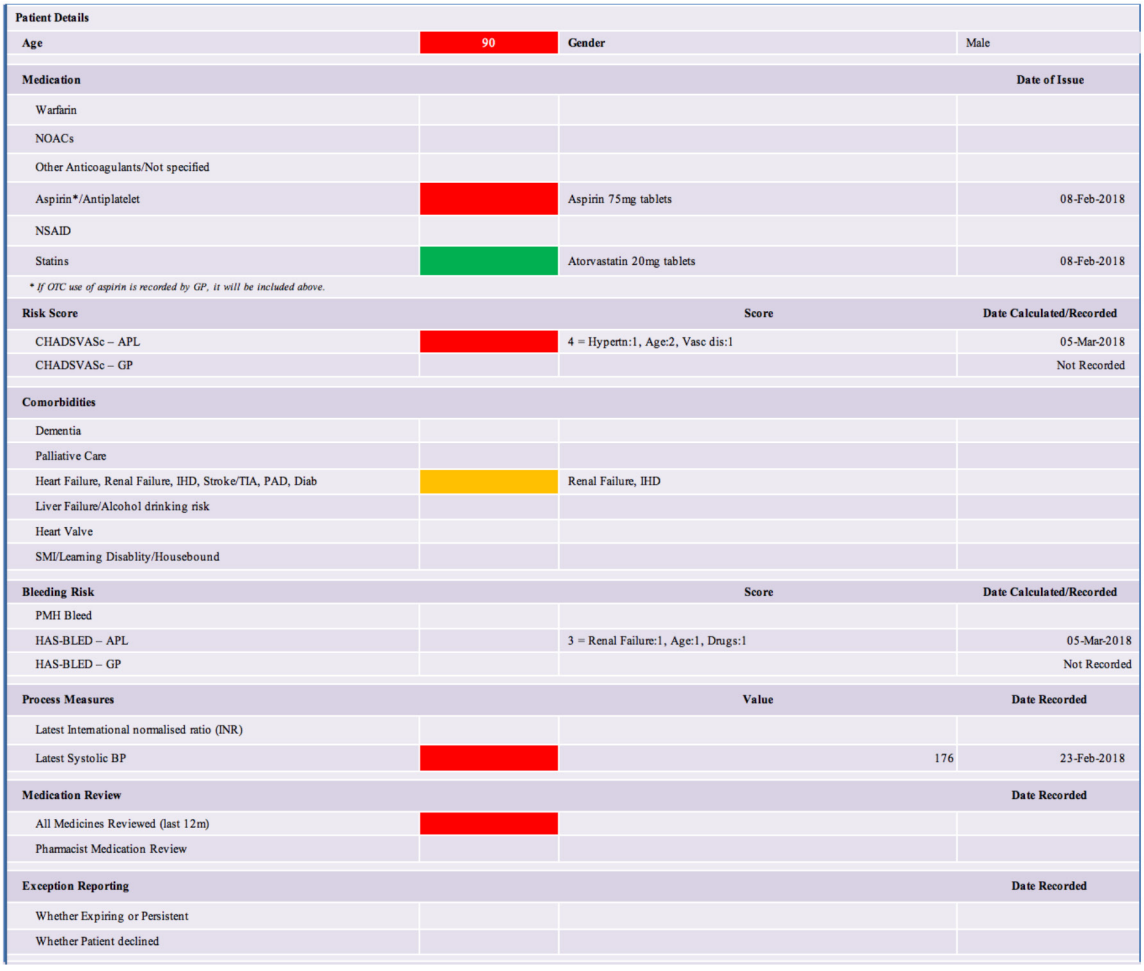


Figure 1 APL-AF tool: summary sheet and individual patient review sheet.

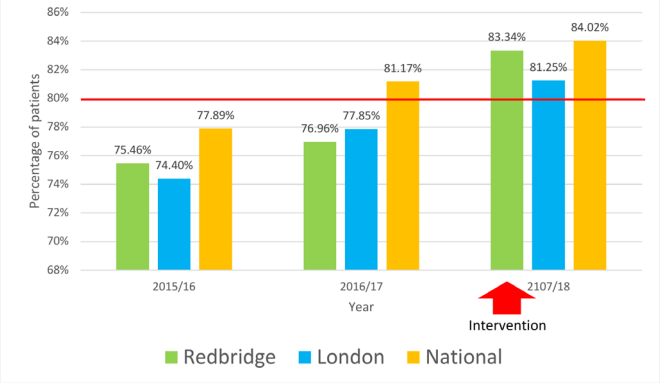


Figure 2 Percentage increase in AF patients CHA_2DS_2-VASc≥2 on anticoagulation from 2015 to 2018. Redbridge, London and England (Quality and Outcomes Framework data). AF, atrial fibrillation.

reports 2017 to 2018 where the average increase was 2.8% nationally. In Redbridge, the anticoagulant improvement in the preceding year 2015–2016 was 1.5%. The trends from 2015 to 2018 in Redbridge, London and England are described in figure 2, which demonstrates the target of 80% was exceeded. The national exception rates 2016 to 2017 decreased by 1.5% in comparison to the decrease in Redbridge of 4.2% (table 1).

In 2016/2017, 296/2408 (12.3%) eligible patients were on antiplatelet monotherapy in comparison to 158/2478 (6.4%) patients in 2017/2018, a decrease of 138 fewer patients on inappropriate antiplatelet monotherapy (p<0.0001); a 48.0% decrease from previous year.

One hundred and fifty-four complex patients were reviewed in the MDT meetings for the suitability of anticoagulation for which the outcomes were: AF resolved n=61 (40%), exception report n=30 (19%), anticoagulated n=16 (10%), further investigation required n=47 (31%).

In regards to other cardiovascular risk factor optimisation in AF patients CHA_2DS_2-VASc≥2, there was no significant difference in systolic blood pressure control ≥140 mm/90 mm Hg: April 2017 2.9% (54/1831) compared with 3.2% (62/1961) in April 2018.

Use of statins also showed a non-significant increase from 66.8% (1223/1831) to 68.1% (1334/1961). Serum cholesterol control <5 mmol/L improved significantly by 3.8%, from 64.2% (1176/1831) to 68.0% (1335/1961) (p=0.012).

With the support of the APL-AF tool, it typically took the pharmacist 15–20 mins to clinically review each patient record of those individuals who were identified on less than optimal medication. The subsequent face-to-face consultations typically lasted 30 min. It took the pharmacist a year to review all 2593 patients with AF in all 43 GP practices. This averaged 60 patients 'virtually reviewed' for which anticoagulation status improved by 6 patients per practice.

Table 1 Overall exception rate in England: high-risk AF patients for anticoagulation

	England (%)	London (%)	Redbridge (%)
2015	10.2	11.5	7.5
2016	8.2	9.1	10.0
2017	6.7	7.6	5.8

AF, atrial fibrillation.

LESSONS AND LIMITATIONS

Both the QOF and the performance data collated by CEG are dependent on the quality and completeness of coding within GP practices.

From the MDT meetings, it was found that there was a common misconception on the definition of 'AF resolved' and 'exception' coding among GPs. Revisions to these codings had an impact on the final recording of performance, in particular on 'exception reporting' which was substantially reduced as a result of the reviews.

One of the learning points that emerged from the MDT was the large number of patients with either questionable historic or transient AF diagnoses mostly acquired during hospital admissions. As a result, only 10% of patients considered in the MDT were subsequently anticoagulated with a much larger group being reclassified AF resolved.

The factor limiting the speed of improvement in anticoagulation was the rate at which the clinical pharmacist was able to visit all practices to review AF registers and then coordinate joint GP consultations. To support the initiative, staff members working within the CCG or at the practices were asked to facilitate APL-AF reports in advance of the specialist pharmacist attending to be able to review the patients more effectively.

Now that NHS England have promoted the recruitment of practice-based pharmacists (PBPs), with the aim of reducing the workload of GPs, the pharmacist training has been expanded to include them, with the aim of continuing to provide pharmacist support for initiating and monitoring patients receiving anticoagulation in a more sustainable way.

No health economic analysis or detailed workload analysis was undertaken.

At the end of the programme, a 'Guide for primary care initiating anticoagulation for stroke prevention in non-valvular atrial fibrillation' was developed and introduced sharing the experience of MDT including cases to provide further guidance for other GPs to support primary care initiation which is available here on: https://uclpartners.com/what-we-do/clinical-themes/cardiovascular/atrial-fibrillation/, under the primary care initiation of anticoagulation therapy for stroke prevention heading.

The feedback from patients and GPs was positive. A patient, who had experience in guideline development as a lay member, was impressed to see implementation of guidelines and a preventive initiative being translated into practice. GPs were also prepared to support the identification of high-risk patients using the AF-APL tool and the ongoing weekly MDTs with consultants where

patients' ECGs could be shared using telemedicine. The organisation of the telemedicine MDT sessions required substantial administrative support to arrange and sustain. The MDTs allowed live screen sharing of electronic health record information when logged in to the meeting but more integrated use of health data in the future could considerably improve this.

CONCLUSION

The programme aims were met with:

1. An important improvement in anticoagulation rates, reduced inappropriate antiplatelet monotherapy and reduced exception reporting.
2. Optimisation of other cardiovascular risk factors including statin use and advice on blood pressure control.
3. Increased capability to initiate anticoagulation in general practice without the need for routine referral to secondary care.
4. Provision of care closer to home, improving the patient's experience.
5. Upskilling of general practitioners in anticoagulation initiation and review.
6. Closer links between GPs and hospital specialists.

Improvement in Redbridge CCG in 2018 was the highest in London and second highest in England following the intervention and achieved 83.3% anticoagulation rates, exceeding the initial target of 80%, largely by reducing inappropriate antiplatelet monotherapy. Exception reporting in patients potentially eligible for anticoagulation was reduced from 10.0% to 5.8%, a reduction of 42% and aspirin monotherapy from 12.3% to 6.4% a reduction of 48%.

This proved to be a successful and generalisable model of improvement achieved by engaging stakeholders and alignment with a local financially supported incentive scheme in combination with clinical pharmacist support, adopting a multidisciplinary approach including a clinical pharmacist, and the use of digital technologies to support decision-making and regularly report real-time performance.

The success of this improvement programme for stroke prevention in AF patients' has helped develop a more sustainable, longer-term model by engaging with PBPs newly recruited as part of an NHS England initiative and helped foster continuity of care between primary and secondary care services. It is intended to continue working across organisational boundaries to deliver standardised patient care using such structured support mechanisms and to replicate this model for managing other longer-term conditions such as asthma, diabetes or heart failure.

This way of working has been recognised as an exemplar model of care by the local Academic Health Sciences Network, UCLPartners and the NHS Sustainability and Transformation Partnerships who are now extending the programme to improve outcomes with adoption at scale across 12 more CCGs in North East and Central London covering a population of ~4 million.

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