South London
Cardiac and Stroke Network

Stroke Prevention
A Priority for SEL Commissioning

1. Why focus on stroke prevention?

Stroke is the third largest cause of death in England[1] with a national prevalence of 2.5%[2]. Stroke has a devastating and lasting impact on the lives of people and their families, often leaving people with a long-term disability[3]. The economical implications to the NHS are paramount, with an estimated annual cost of £7 billion, with £2.8 million in direct costs to the NHS.

It is therefore recognised that stroke prevention and management are national priority areas for the NHS, with an estimated 200,000 strokes per year potentially avoidable through preventative work[4]. Locally, work on stroke prevention through the early detection of AF has also been identified as a priority, with sector wide participation in a NHS improvement national priority project.

Atrial Fibrillation (AF) is a known risk factor for stroke, increasing its risk and severity. AF accounts for 14% of all strokes, with 18% of patients presenting with AF at time of stroke. AF is the most common of all the arrhythmias and affects more than 600,000 patients in England, with the prevalence in primary care estimated at 1.3%. Data from the Framingham[5] heart study demonstrated that AF is associated with a 1.5-1.9-fold higher risk of death, which is in part due to the strong association between AF and thromboembolic events. It is estimated that 12,500 strokes per year are attributable to AF[6] with the associated cost per AF associated stroke estimated at £11,900 in the first year following stroke occurrence, versus £383 total estimated cost of maintaining one patient on Warfarin for one year.

Current data indicates that the identification and management of AF is sub-optimal, estimating that 46% of patients who should be on Warfarin are not receiving it[7] and therefore improvements in these areas would dramatically reduce the number of strokes occurring per year, resulting in reductions in financial and personal costs.

2. How should we increase identification of AF in primary care?

2.1 Screening for AF; Opportunistic or Systematic

NICE[8] recommends targeted/opportunistic screening of patients to allow the identification of patients with AF, specifying that 'in patients with any of the following;

- breathlessness/dyspnoea
- palpitations
- syncope/dizziness
- chest discomfort
- stroke/TIA

a *manual* pulse palpitation should be performed to assess for the presence of an irregular pulse that may indicate underlying AF." The NICE implementation document (p7 and 8) supports this and states that 'opportunistic case detection and the targeting of pts at increased risk are essential if undiagnosed patients with AF are to be identified, and treated sooner.' This concept of active screening through pulse checks is supported by a multi-centre cluster RCT[9] which carried out a study to assess whether screening improves the detection of AF, including a comparison of systematic vs opportunistic screening. The authors concluded that active screening for AF detects additional new cases over current practice, which reached statistical significance at $p<0.01$. The preferred method of screening in patients aged >65yrs in primary care is opportunistic pulse checking, with follow-up ECG for confirmation to diagnosis (supported by Somerville,

Somerville, Croft & Lewis 2000[10]). The SAFE trial does not give us the expected age adjusted AF prevalence which would provide a more realistic view of AF prevalence. In SEL the following adjusted prevalence's have been deduced;

Table 1: AF prevalence in South East London

AF Prevalence	NHS Bexley	NHS Bromley	NHS Lambeth	NHS Lewisham	NHS Greenwich	NHS Southwark
Non-standardised	1.2%	1.4%	0.5%	0.6%	0.8%	0.6%
Age standardised	TBC	TBC	TBC	TBC	TBC	TBC

A health technology assessment of the SAFE trial identified that opportunistic screening was also found to be cost-effective when compared to systematic screening[11].

2.1.1 How to ensure opportunistic screening takes place?

There are many ways to provide opportunistic screening to assist primary care in identifying and targeting patients with AF;

I. include pulse checks into the chronic disease template and new patient checks
II. primary care database to 'flag up' reminder for GPs to carry out pulse check for those patients attending a routine appointment who are >65yrs or with other AF risk factors
III. incorporate pulse check into flu clinic and/or NHS health checks

2.1.2 Diagnosing AF

NICE recommends that "an ECG is performed in all patients, whether symptomatic or not, with an irregular pulse in whom AF is suspected." The SAFE[9] trial supported the value of ECG confirmation, and further proposed that routine ECG is unnecessary for the detection of AF, **as long as healthcare professionals are conscientious about feeling the pulse."** Diagnosing AF can be delivered in the community as long as specialist support is provided by secondary care as appropriate e.g., development of a LES with electronic transfer for reporting results. Primary care clinicians need to be accurately trained and confident in ECG recording/reporting.

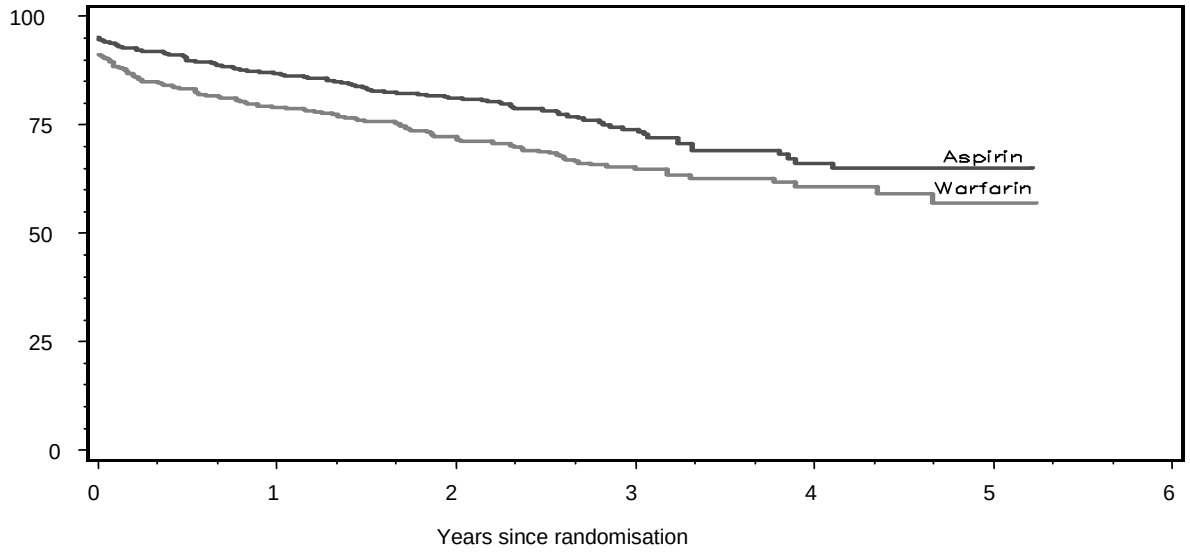
3. Treating AF for stroke prevention

3.1. Warfarin Vs Aspirin

The benefits of Warfarin have been clearly demonstrated and NICE recommends that all people in AF at high risk of stroke and some patients at moderate risk of stroke should be treated with more than Aspirin[12]. A recent meta-analysis of studies indicated that Warfarin reduced the risk of stroke by 64% in comparison with placebo[13]; Aspirin in contrast is relatively ineffective, reducing the risk of stroke by 22%.

In a recent RCT, the Birmingham Atrial Fibrillation Treatment of the Aged (BAFTA)[14], patients over 75 with AF were randomised to treatment with Warfarin or Aspirin, with the primary endpoints of fatal or non-fatal disabling stroke, other intracranial haemorrhage or arterial embolism. The benefits of Warfarin over Aspirin were confirmed and stroke risk was halved in the Warfarin group and there was no increased bleeding risk with Warfarin in comparison with Aspirin (see figure below). **The BAFTA trial therefore indicates that Warfarin protects the elderly against the risk of stroke associated with AF, the group with the highest incidence of stroke and highest prevalence of AF.**

Figure 1: *Number of participants without primary endpoints*



It is also important to recognise that sub-therapeutic INR is in effective and unsafe (see appendix B) and there is a need to aim for >65% time in therapeutic range (see appendix D).

3.1.2 Identifying patients who should be on 'more than Aspirin'?

A risk stratification approach useful in primary care is to base risk assessment on a simple clinical risk score, the CHADS2 score[15], see table 1 below.

Components of CHADS2	Points per indication
Congestive heart failure	1
History of hypertension	1
Age >75	1
Diabetes	1
Stroke/TIA	2

Warfarin is indicated when CHADS2 score ≥2 (see appendix A and C).

3.1.3 Starting treatment in primary care

Despite the evidence base indicating Warfarin in the management of AF there can be some reluctance by primary care to initiate the treatment. The notion of initiating anticoagulation therapy in primary care is supported by NICE and the national patient safety agency (NPSA), who has released documentation for helping GPs to initiate anticoagulation therapy in primary care, highlighting actions to overcome any safety concerns. [16] Systems should however be put in place to support GPs in the risk stratification and in the decision to commence patients on Warfarin, with embedded pathways in place to support the appropriate onward referral for secondary care treatment of patients.

4. Optimising treatment

Warfarin is considerably underused. An audit by NICE estimated that 46% of patients were not on the correct therapy (a similar finding has been confirmed in local audits). If these figures were to be applied nationally and all patients currently identified as having AF (and in a high risk category for stroke) were treated appropriately with Warfarin, could potentially prevent up to 6,000 strokes and 4,000 deaths each year[18].

4.1 How to identify current patients with AF who are not being appropriately treated?

A free database search tool, Guidance on Risk Assessment and Stroke Prevention in AF (GRASP-AF)[17] has been developed to aid the identification of patients already known to have AF who are at increased risk of stroke and are not optimal therapy (Warfarin). The toolkit identifies patients with a READ code for AF and calculates their CHADS2 score based on existing database information and those designated at high risk should be reviewed for Warfarin consideration.

5. Cost efficacy of anticoagulation

Warfarin tablets are inexpensive. The main costs of anticoagulation with Warfarin relate to the cost of anticoagulation monitoring. NICE[18] estimates that the total cost of maintaining one patient on Warfarin for one year, including monitoring is £383, compared to a cost of £11,900 cost per AF associated stroke. Currently, some SEL PCTs have locally enhanced service (LES) agreements in place which aim to provide anticoagulation closer to home at a convenient time for patients and research is currently being done to establish details of any LES across SEL.

The following table is extracted from a DH toolkit[19] (ASSET) which shows the estimated prevalence of AF in the PCTs population, an estimate of the additional number of AF patients that should be on anticoagulants according to the NICE guidelines for AF[12] and the subsequent reduction in strokes if the NICE guidelines were fully complied with;

	Bexley	**Bromley**	**Lambeth**	**Lewisham**	**Greenwich**	**Southwark**
Estimated prevalence of atrial fibrillation for your population (persons)	2,100	3,100	1,400	1,600	1,700	1,500
Estimated additional number requiring Warfarin according to NICE guidance for AF (persons)	730	1,060	490	550	570	530
Total number of strokes avoided p.a. if fully compliant with NICE guidelines for AF	28	41	19	21	22	20

5.1 Number needed to treat to prevent one stroke

The number needed to treat (NNT) for one year to prevent one stroke is approximately 37 for primary prevention and 12 for secondary prevention[18]. For a mixed population NNT is approximately 25. Using these figures and including the cost of one year anticoagulation therapy, the cost of preventing one stroke is estimated at £10,000 to £14,000 per year[6]. Also see appendix A for more information on NNT.

5.2 Social care and personal impact associated with stroke

Stroke has a devastating and lasting impact on the lives of people and their families and individuals are often left with the effect for the rest of their lives[1], as well as impaired quality of life following stroke.[20]
A third of people who have a stroke are left with a long-term disability[3], the effects of which can include aphasia, depression, physical disability, loss of cognitive and communication skills and other mental health problems.

Stroke costs the NHS and the economy about £7 billion a year[1];

- £2.8 billion in direct costs
- £2.4 billion of informal care costs
- £1.8 billion in income lost to productivity and disability.

6. So what needs to be done?

Primary prevention through the identification and management of AF will reduce mortality and morbidity from stroke. It is estimated that it will take 12-24 months for practices to improve case detection and appropriately anticoagulated and treat patients. This will involve a combined approach between primary, secondary and tertiary care, ensuring appropriate engagement across the whole pathway.

In order for this to be effective and in line with the evidence presented above, the following work needs to be made a priority;

1. To engage with primary care to increase the identification and confirmation of AF.
2. To develop and embed pathways to support the triage, referral and management of AF patients.
3. Optimisation of therapy for existing patients (using the GRASP-AF toolkit) and ensuring those newly identified patients are initiated on effective, safe and therapeutic anticoagulation.
4. A review of current diagnostic (ECG), anticoagulation and other AF treatment (DCCV/ablation) services across both primary and secondary care needs to be carried out in order to ensure the potential increase in demand can be proactively managed further down the pathway. Links also need to be made with TIA clinics to ensure patients presenting with undiagnosed AF are managed.
5. Education to both patients and primary and secondary care clinicians promoting the effective management of AF needs to be provided.

The work above is promoted and actively supported by the South London Cardiac & Stroke Networks.

Appendices;

A) Clinical Indication and NNT with Warfarin; extracted from Go, A., Hylek, E, Chang, Y., et al (2003) and Gage, B., Waterman, A., & Shannon, W. (2001).

CHADS2 Score, Thromboembolic Risk, and Effect of Warfarin in 11,526 Patients with Nonvalvular Atrial Fibrillation and No Contraindications to Warfarin Therapy†

Clinical parameter	Points
Congestive heart failure (any history)	1
Hypertension (prior history)	1
Age ≥75	1
Diabetes mellitus	1
Secondary prevention in patients with a prior ischemic stroke or a transient ischemic attack; most experts also include patients with a systemic embolic event	2

CHADS2 score	Event-rate, percent per year*		NNT
	Warfarin	No warfarin	
0	0.25	0.49	417
1	0.72	1.52	125
2	1.27	2.50	81
3	2.20	5.27	33
4	2.35	6.02	27
5 or 6	4.60	6.88	44

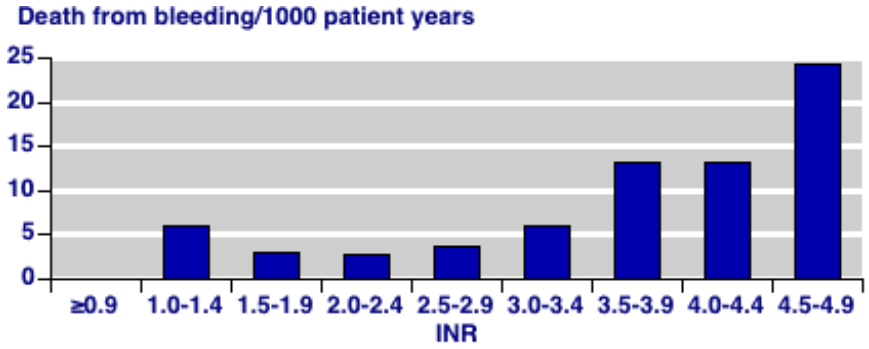
*The CHADS2 score estimates the risk of stroke, which is defined as focal neurologic signs or symptoms that persist for more than 24 hours and that cannot be explained by hemorrhage, trauma, or other factors, or peripheral embolization, which is much less common. Transient ischemic attacks are not included. All differences between warfarin and no warfarin groups are statistically significant except for a trend with a CHADS2 score of 0.

NNT = number needed to treat to prevent one stroke per year with warfarin.

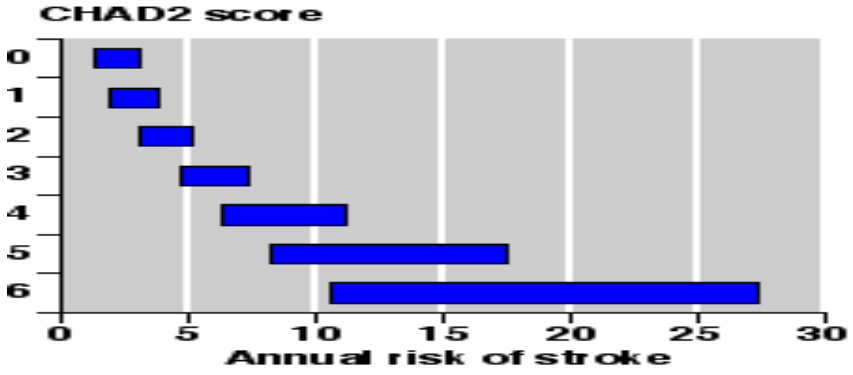
Patients are considered to be at **low risk** with a score of 0, at **intermediate risk** with a score of 1 or 2, and at **high risk** with a score ≥3. One exception is that most experts would consider patients with a prior ischemic stroke, transient ischemic attack, or systemic embolic event to be at high risk even if they had no other risk factors and therefore a score of 2. However, the great majority of these patients have some other risk factor and a score of at least 3.

†Data from Go, AS, Hylek, EM, Chang, Y, et al, JAMA 2003; 290:2685; and CHADS2 score from Gage, BF, Waterman, AD, Shannon, W, JAMA 2001; 285:2864.

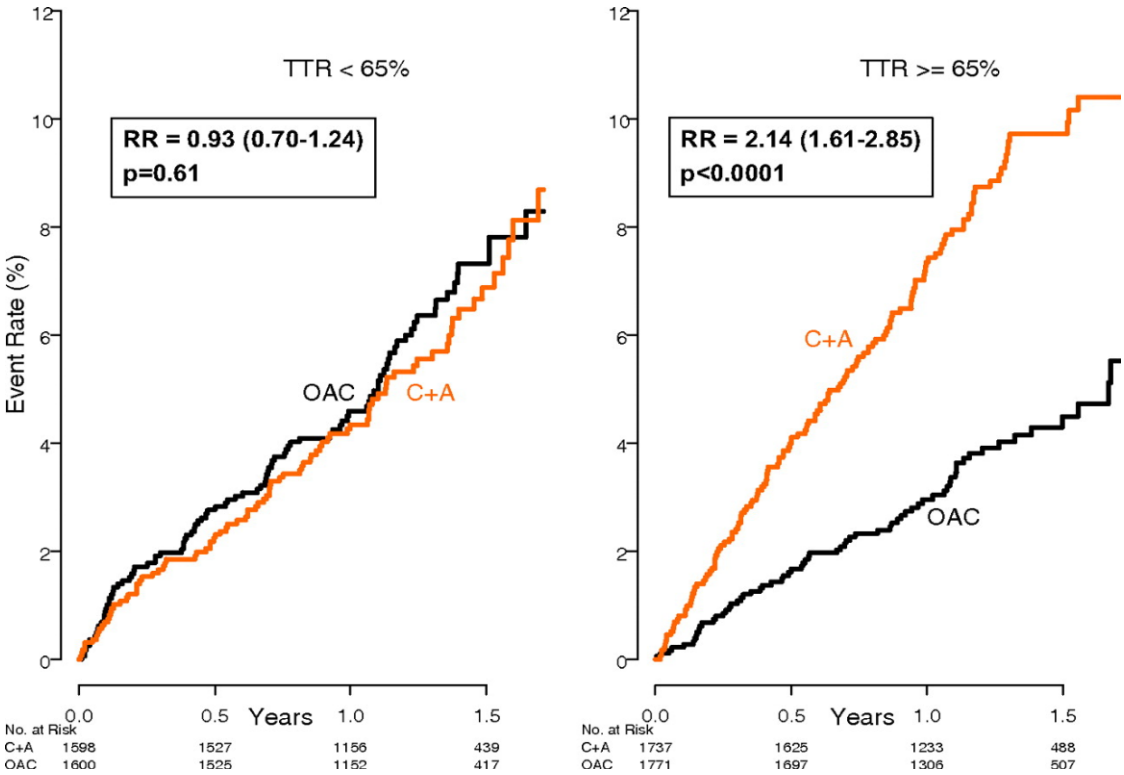
B) Death from bleeding versus INR after 1.25 million INR measurements in 42,000 patients. Extracted from Bandolier paper available at www.medicine.ox.ac.uk/bandolier/band89/b89-3.html



C) CHADS score and risk of stroke; extracted from Bandolier paper available at www.medicine.ox.ac.uk/bandolier/band89/b89-3.html



D) Cumulative risk of stroke, myocardial infarction, systemic embolism, or vascular death for patients treated at centres with a TTR below or above study median (65%). Extracted from Connolly, S. J. et al (2008) Circulation, 118, 2029-2037.



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