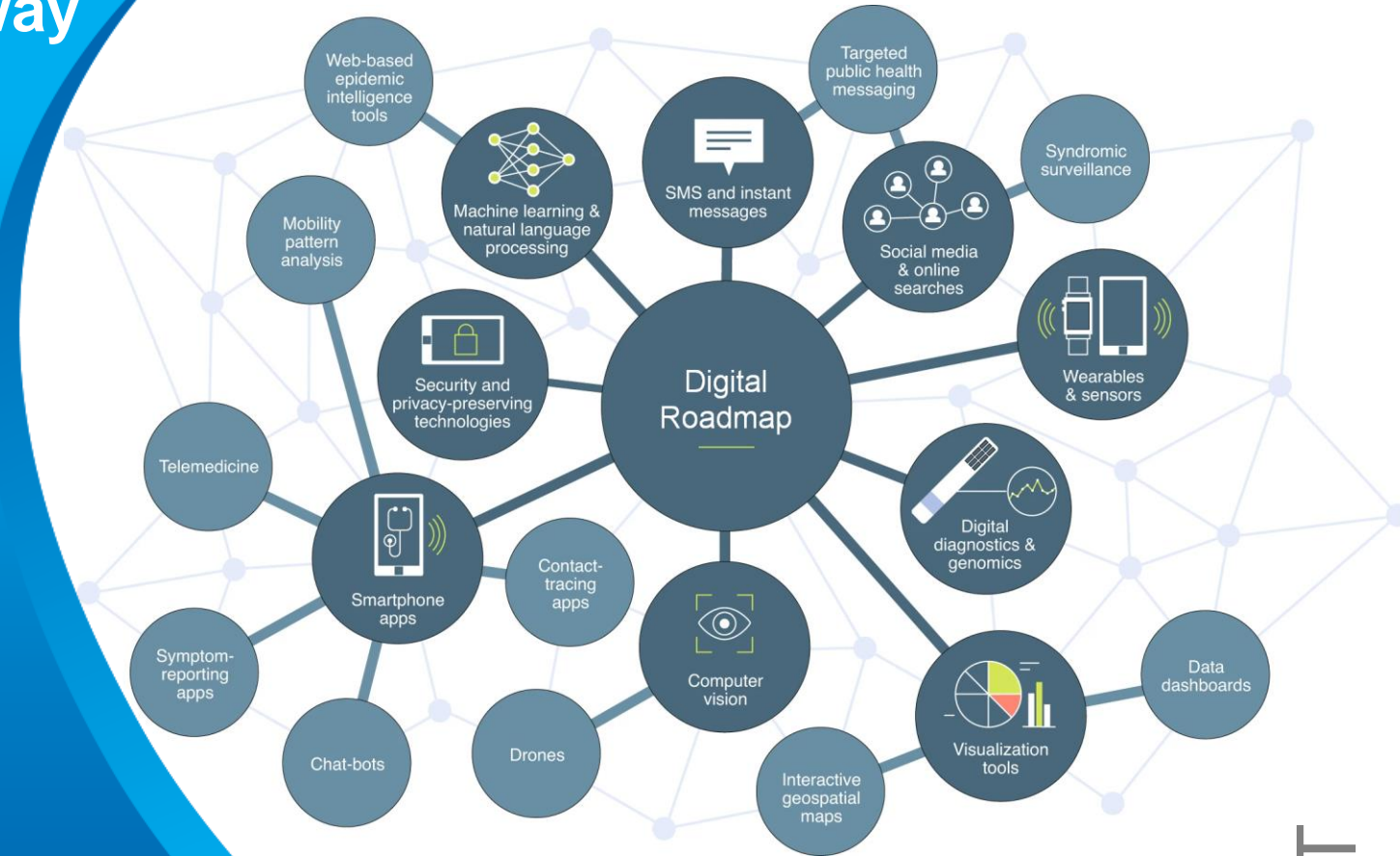


Accelerating AI in the Stroke pathway

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Stroke physician

14th March 2023



DRAFT



Agenda - STROKE PATHWAY

1. Changes in the last two years with analytics and AI
2. In-pipeline changes
3. Future areas of the work



Disclaimer

1. I am a Stroke Doctor who works on the natural neural network of the brain.
2. I was the principal investigator of the AI trial –no relation with evil robots taking over.

Research

International
Journal of Stroke 

e-ASPECTS software is non-inferior to neuroradiologists in applying the ASPECT score to computed tomography scans of acute ischemic stroke patients

International Journal of Stroke
2017, Vol. 12(6) 615-622
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DOI: 10.1177/1747493016681020
journals.sagepub.com/home/wso

 SAGE

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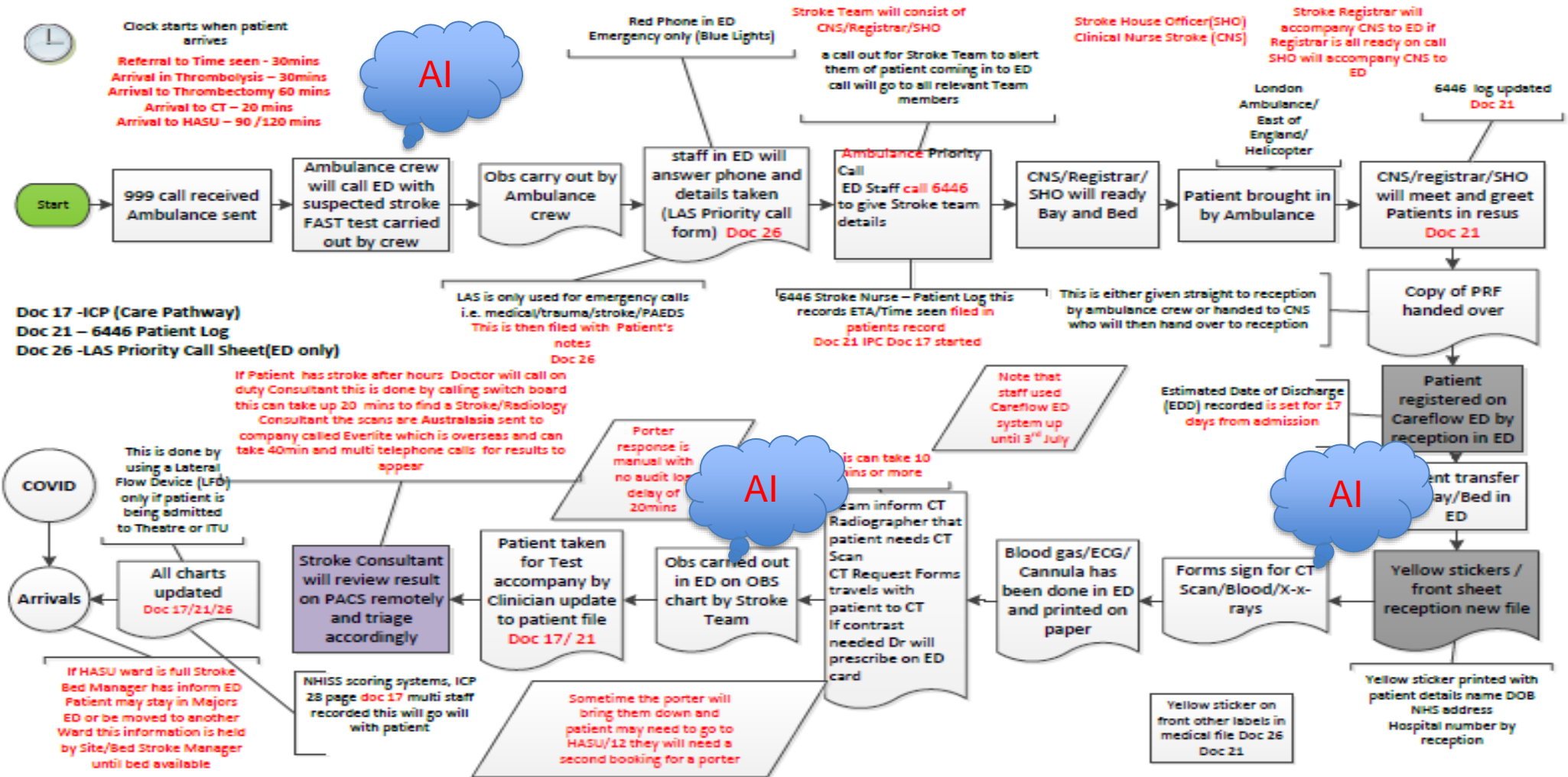
Stroke Clinical Pathway – The Process



Blue Light Patient in ED **Risk** **Process** **Careflow PAS** **Connect** **Patient Flow** **Vitals** **Bluespир** **PACs/ Cyberlab** **EPRO** **iFIT** **NHS Mail/ Outlook** **External Systems** **Excel Process Ste**

1 hour to see and treat Patient

Ambulance arrival Blue light



TIME IS BRAIN

- One minute = 1.9 million neurons
- One hour = The brain ages 3.6 years without treatment



The poster is divided into four horizontal sections, each with a close-up image of an elderly woman's face or hand. The top section shows her face with the text 'FACE' and 'Has their face fallen on one side? Can they smile?'. The second section shows her hand with the text 'ARMS' and 'Can they raise both arms and keep them there?'. The third section shows her mouth with the text 'SPEECH' and 'Is their speech slurred?'. The bottom section shows her hand holding a smartphone with '999' on the screen and the text 'TIME' and 'To call 999 if you see any single one of these signs'. To the right of these sections is a large yellow area with the NHS logo at the top, the text 'WHEN STROKE STRIKES, Act F.A.S.T.', and the 'Act F.A.S.T. help us help you' logo at the bottom.

FACE
Has their face fallen on one side? Can they smile?

ARMS
Can they raise both arms and keep them there?

SPEECH
Is their speech slurred?

TIME
To call 999 if you see any single one of these signs

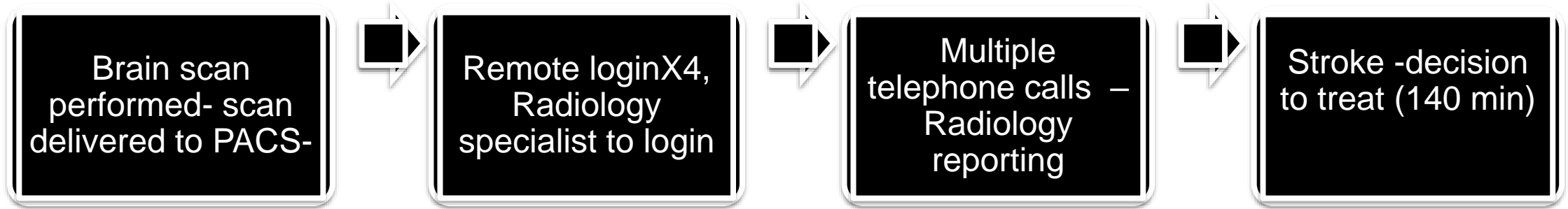
NHS

WHEN STROKE STRIKES, Act F.A.S.T.

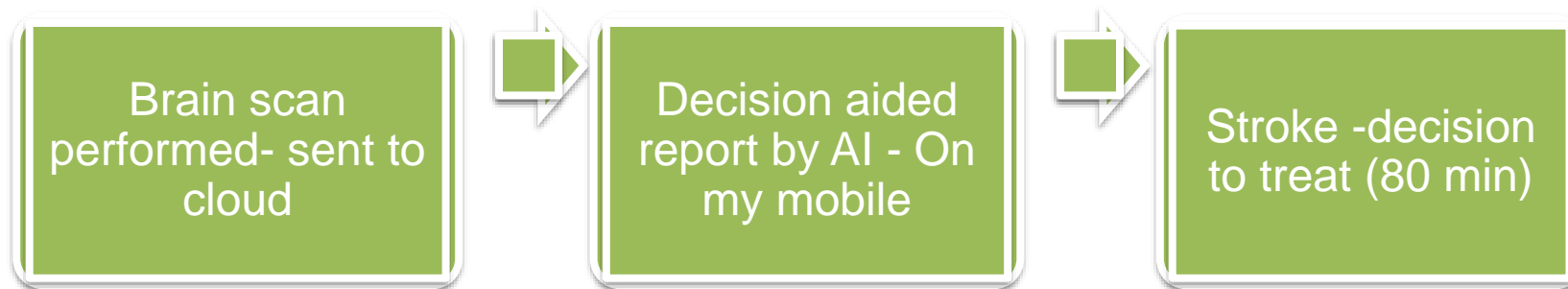
Act F.A.S.T. help us help you

Scan decision aid for clot removal or emergency drug.

- The process take a lot of time , when I don't have time –



- What if

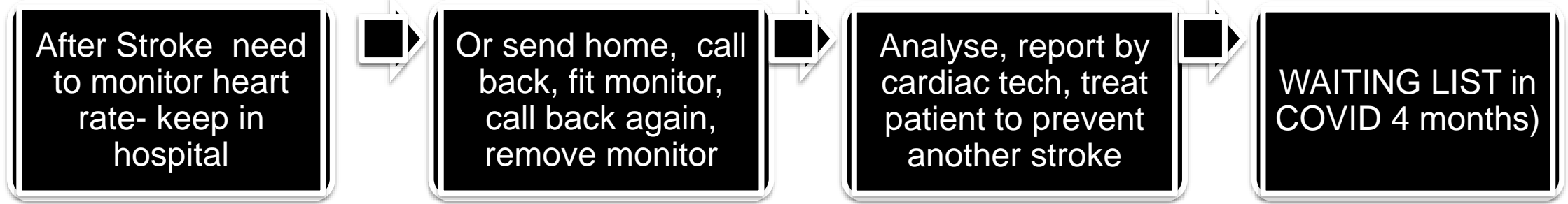


THE DIFFERENCE IT MADE- 60 MINUTES FASTER

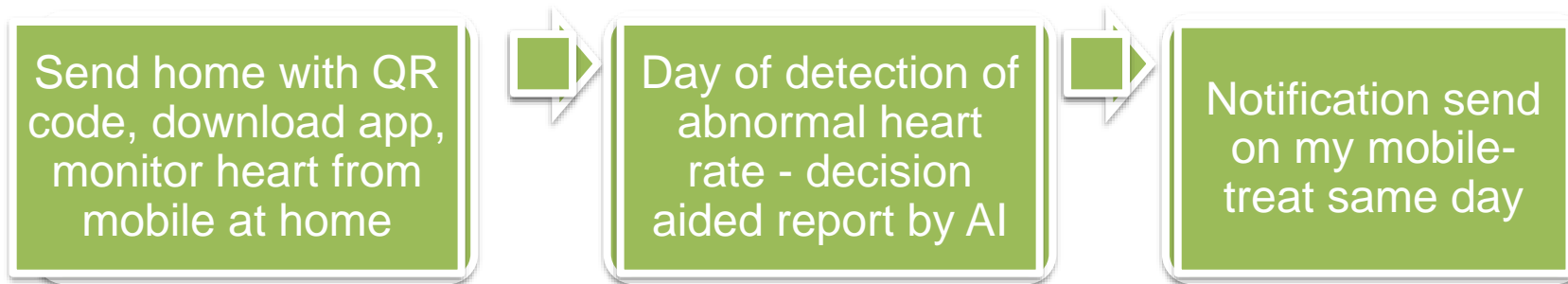


Smart heart rate monitor to stop another stroke- .

- The NHS process take a lot of resources , when I don't have resources



- What if

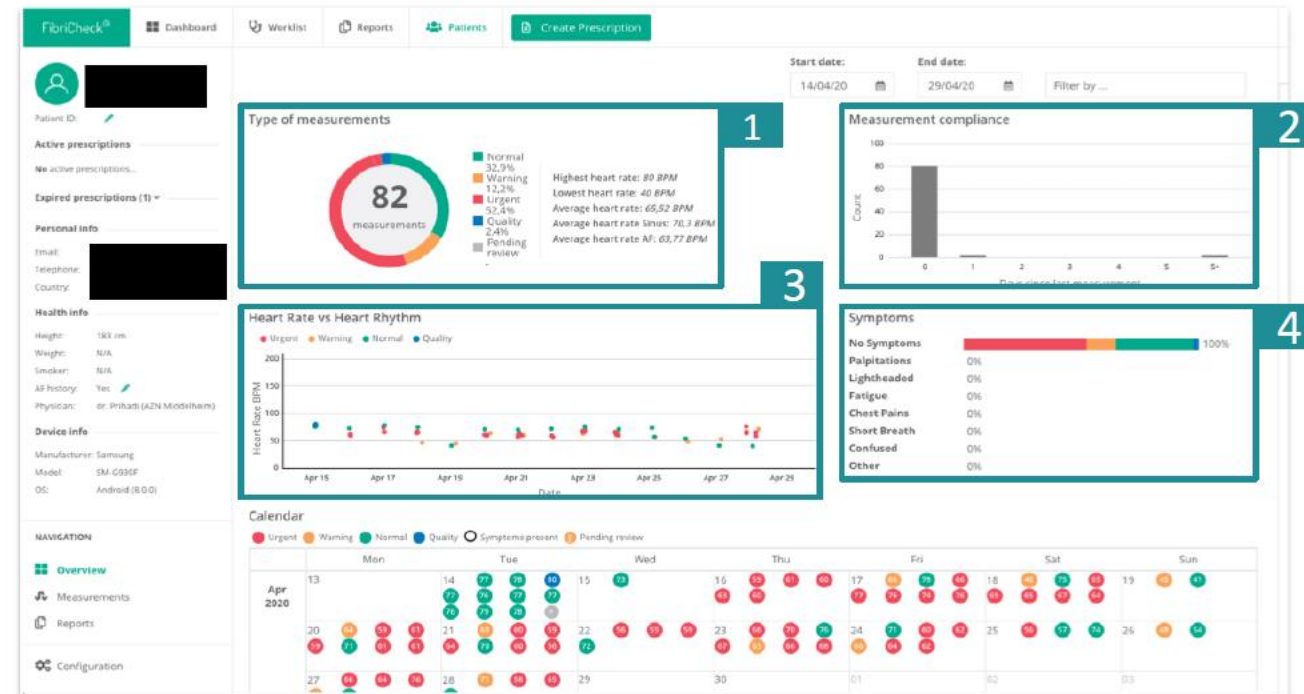




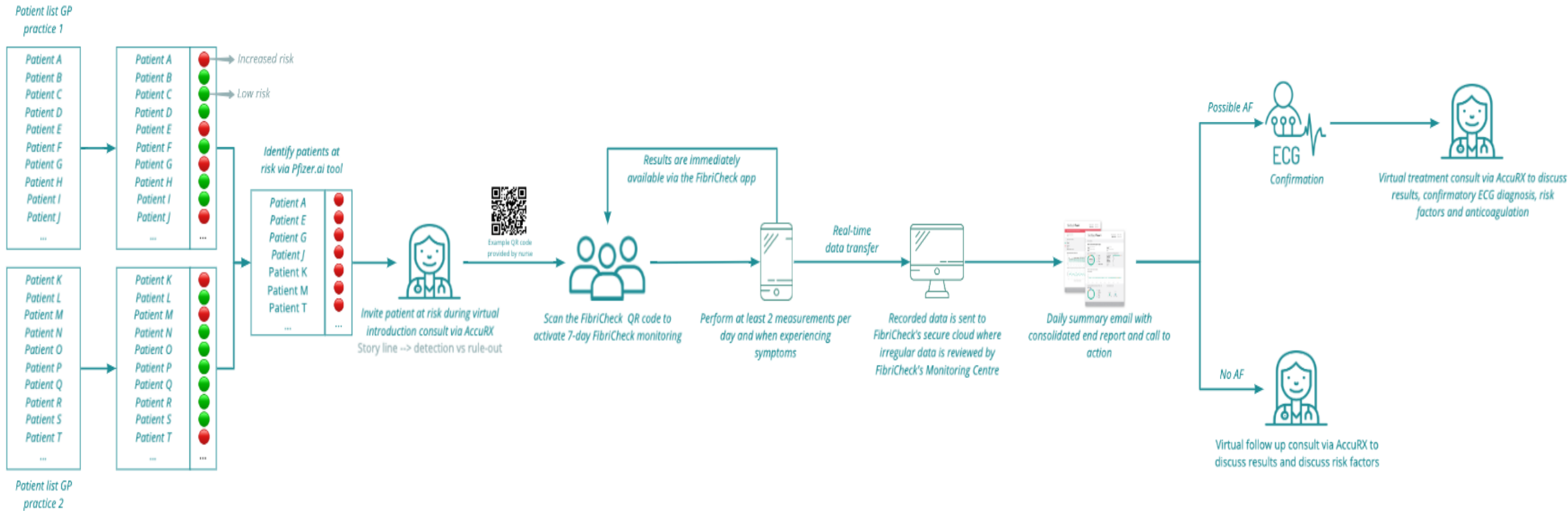
Assess patient data via the Hub Dashboard

Global view

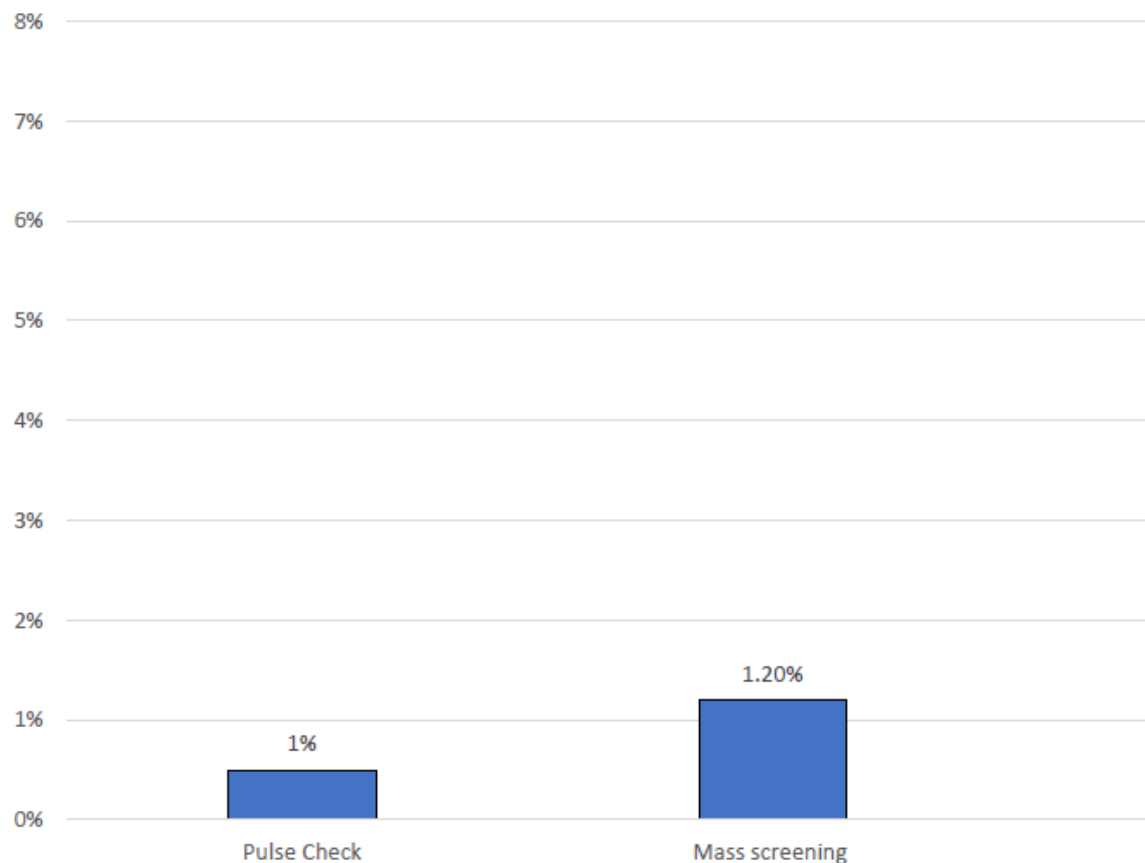
1. Distribution of the type of measurements
1. Compliance
1. Overview heart rate and heart rhythm over time
1. Symptom rhythm correlation



Stroke risk prediction and Pathway change



Detection rate (RED)



these tasks during daily practice in primary care to prevent stroke.

Purpose:

This program aimed to establish an end-to-end pathway to identify, detect, diagnose, and manage high-risk patients with no prior AF diagnosis.

Methods:

The AF Stroke Prevention Hub program was aimed at patients aged 65 and above with a history of heart failure or stroke/transient ischemic attack. Data from electronic patient records identified these patients, while exclusion criteria consisted of known AF, implanted cardiac devices, end-stage renal disease and end-of-life care. The program used a medically certified smartphone application to monitor heart rate and rhythm and track symptoms using photoplethysmography (PPG). Patients were facilitated to perform a minimum of two measurements per day, for seven days. Those who were digitally excluded were offered an assessment in a face-to-face clinic appointment. Based on the PPG recordings, patients with a positive finding received a confirmatory ECG examination and anticoagulation therapy, once the diagnosis was established, within 48 hours.

Results:

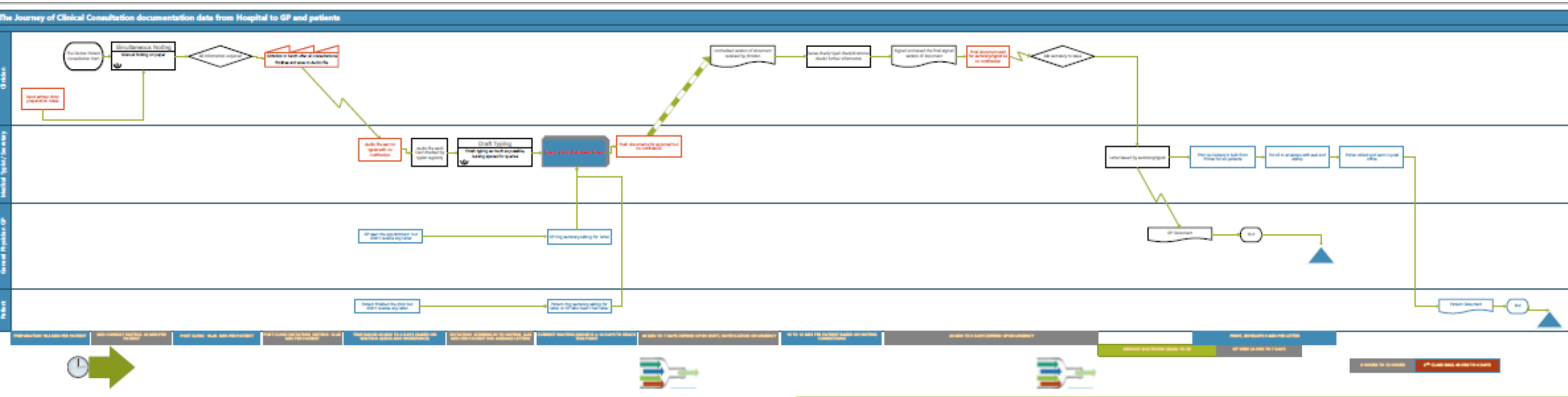
Between February 2022 and February 2023, after applying inclusion and exclusion criteria, six hundred and sixty-nine patients were found to be eligible from 4 primary care practices. Two hundred and sixty-seven patients were issued PPG applications after obtaining consent. In total, two hundred and ten patients completed the PPG-based, 7-day monitoring period. The technology adoption rate was 78.65% in this group of patients.

Among the high-risk group of cardiac failure, four patients were detected with possible AF based on the PPG recordings. All four were confirmed via a 12-lead ECG or a Holter monitor, with an AF detection rate of 9.09%. Combining all stratified risk patient cohorts, ten (4.76%) were detected with possible AF based on the PPG recordings and six (2.8%) were verified based on a confirmatory 12-lead ECG or a 7-day Holter. All patients with newly diagnosed AF received anticoagulation therapy and were managed accordingly, while the remaining patients received advice regarding self-management, lifestyle, and yearly health checks.

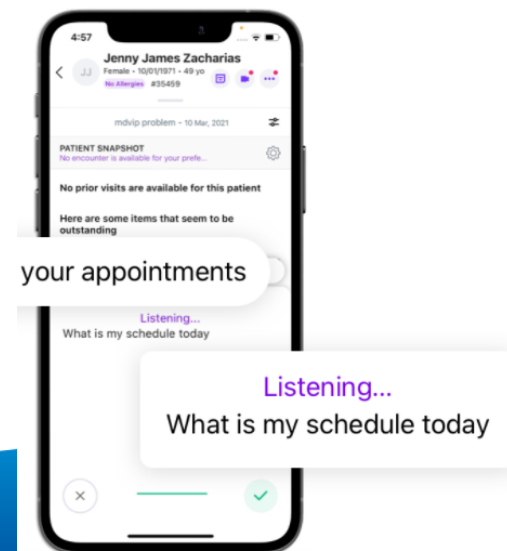
Conclusion:

Compared to the current NHS opportunistic pulse check, where the detection rate is <1%, the AF Stroke Prevention Hub program successfully identified patients with a significantly higher detection rate. The hub delivered an end-to-end pathway allowing real-time reporting and triaging of patients, early detection, appropriate confirmation, and rapid treatment with favorable real-life technology adoption. Expanding the data-driven program to a wider difficult-to-reach population could reduce the burden on NHS and improve patient outcomes.

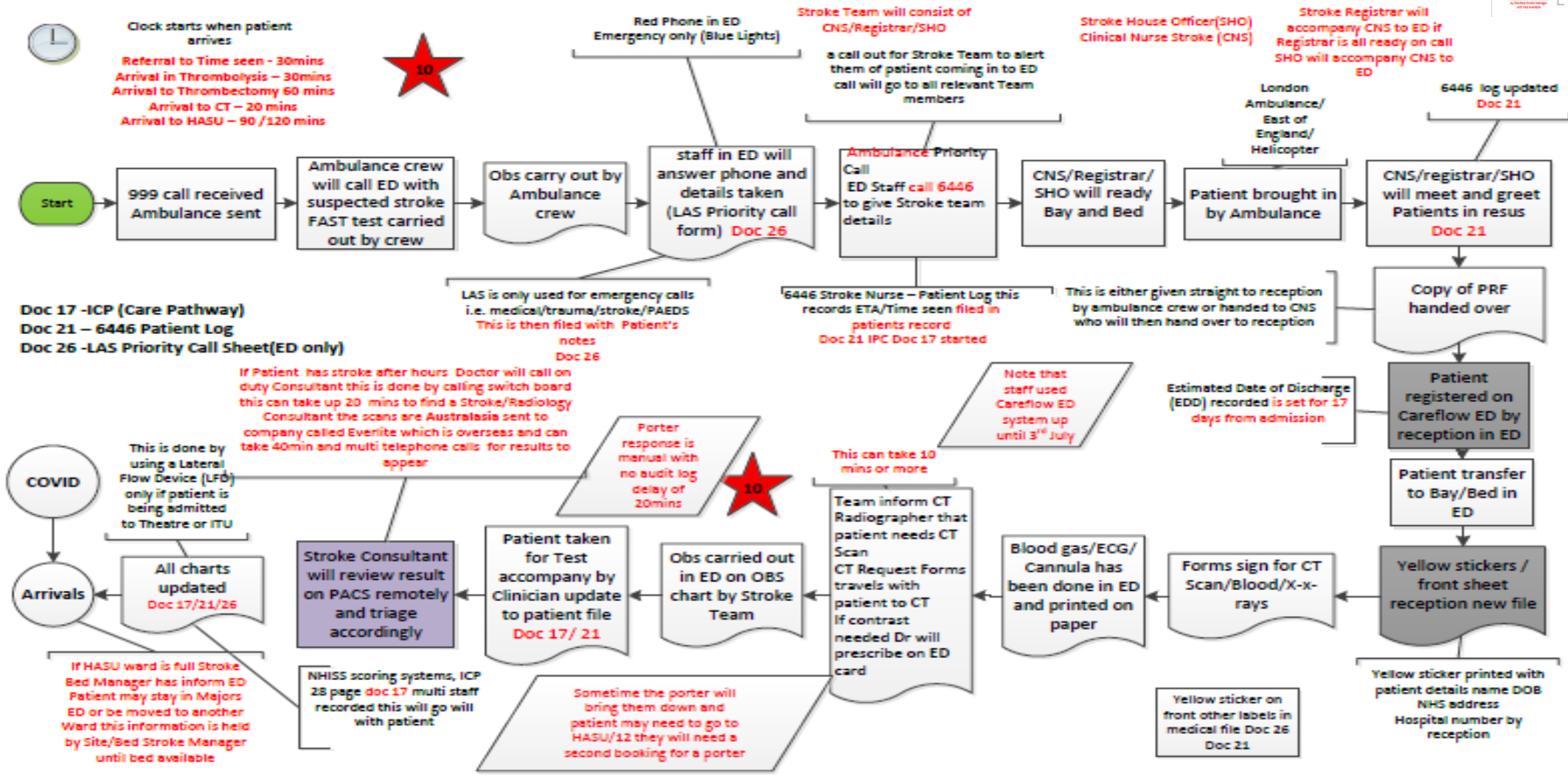
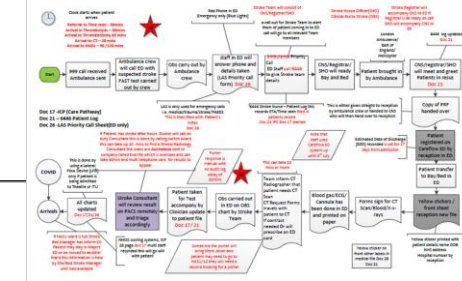
Work in progress- Speech AI



- Pattern Recognition, noisy clinical areas
- Voice command, template automation



Other AI potential on my clinical floor



Questions before the product

Bring Analytics and Artificial intelligence in the process to me to do what -

1. Can I change the process altogether
2. Can I cut down steps for better flow
3. Can I work smartly with less clutter

What problem is it going to solve?

There are many ways to solve one problem.

