

Uncovering the invisible patients with heart valve disease

Next steps for proactive detection in community pharmacy



Introduction

Acknowledgements

Wilmington Healthcare held a roundtable meeting in May 2023 to evaluate the feasibility of using e-stethoscopes to detect heart valve disease (HVD) within community pharmacy. Our thanks to the members of the panel for their expert input and contribution to the writing of this report:



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Foreword



Cardiovascular disease (CVD), along with cancer, are the largest causes of morbidity and mortality in the UK and worldwide and the importance of both have been recognised in the NHS Long Term Plan (2019) and the 2024 NHS Operational Planning Guidance.

Whilst most appreciate that acute 'heart attacks' or 'stroke' are immediately life threatening there is much less awareness of heart valve disease (HVD) and chronic cardiac conditions such as aortic stenosis (the commonest form of HVD), which, when severe and untreated, has a prognosis worse than most cancers.

Both conditions benefit from better preventive measures and their outcomes are similarly improved by earlier detection and diagnosis.

In this context it is highly encouraging to see the outcome of this pilot study from Farnborough, which showed that diagnostics can be undertaken effectively by non-specialists (pharmacists), with interpretative assistance from an AI algorithm, and with effective onward referral for echocardiography alongside the more conventional GP pathway.

It demonstrated an excellent service, endorsed by those who used it, and that sees the NHS acting on current policy objectives, such as utilising the full capabilities of community pharmacists, and the use of innovative technology.

The next step must obviously be to evaluate whether the project can be scaled upwards to a larger service. If shown to be a cost-effective pathway it offers the real prospect of increased detection and treatment of HVD in future, without increased pressure on GP services.

Those who have undertaken this pilot project are to be congratulated on having demonstrated its feasibility and to have shown it to be welcomed by the pharmacist workforce and patients seeking advice in pharmacy settings.

More needs to be done to assess healthcare resource implications before widespread implementation is considered, but this first step is highly welcome and offers hope that we can at last reduce the burden of underdiagnosed HVD and meet NHS Long-Term Plan objectives.

The support received by pharmacy leaders has been crucial, demonstrating their commitment to widening the role of pharmacists in general, and specifically to the proactive detection of HVD within the community.

Professor Huon Gray CBE

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Consultant Cardiologist Emeritus and previously National Clinical Director for Heart Disease, NHS England (2013-19)





1. Executive summary

1. Executive summary

This report outlines the recommendations for Integrated Care Boards (ICBs) to increase proactive detection of heart valve disease (HVD) and support the strategic use of the community pharmacy workforce and setting, in support of The NHS Long Term Plan¹ objectives for cardiovascular disease (CVD).

Why is this project important?



High numbers of people with HVD are left undiagnosed and untreated.



Outcomes for HVD patients lag significantly behind other European countries.



Untreated HVD has a poor prognosis and a high mortality rate, which is unrecognised despite presenting a large challenge to NHS services. This is particularly true of severe aortic stenosis which is the most common form of HVD.



Healthcare inequity for older people: HVD does not receive the same focus as other conditions of older age with a similarly poor prognosis, such as cancer and dementia.



A lack of awareness of HVD's prevalence is a major reason the condition is currently under-recognised and under-detected.



HVD detection is an NHS priority listed in The NHS Long Term Plan¹; all systems in England are required to make improvements over the next six to seven years.



HVD primarily affects older people and is becoming more prevalent as the population ages.

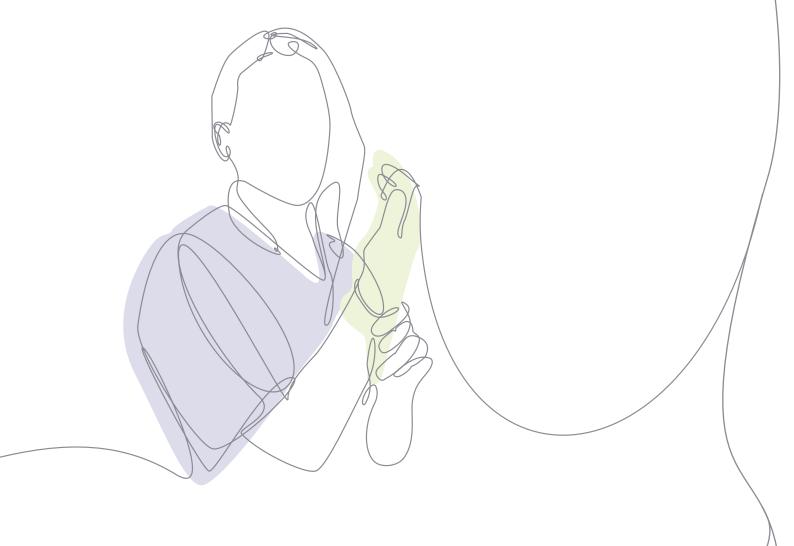


Innovative ways of detecting HVD should be embraced if the NHS is to make meaningful progress to address HVD.

1. Executive summary

The Farnborough PCN community pharmacy HVD detection service pilot project shows a lot of merit and could potentially be offered in other areas. The roundtable discussion explored the feasibility of scaling up the service within the NHS, with consideration given to:

- Implications of a community pharmacy HVD detection service – what would need change at national and local level.
- Practicalities within the community pharmacy setting around facilities, workforce capacity and acceptance of this extended role.
- Development of a larger pilot study to make a strong business case for the service.
- Issues that would need to be addressed to enable adoption of the service, such as digital integration, data and information governance, service specification, pharmacy contracts, and reimbursement.
- Organisations in the NHS landscape that could be involved, such as the Cardiac Clinical Networks (CCNs), Health Innovation Networks (HINs) (previously known as Academic Health Science Networks, AHSNs), and ICBs.
- Recommendations and next steps.



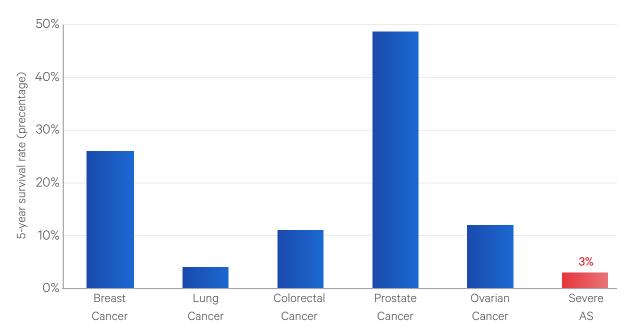


HVD is common, treatable, but generally poorly recognised, as is its severity. For instance, untreated severe aortic stenosis (AS) carries a worse prognosis than most metastatic cancers: up to 50% of people with severe AS who do not receive effective or appropriate treatment do not survive two years. Its prevalence increases with age and its associated symptoms, such as reduced exercise tolerance and breathlessness, are often attributed to advancing years so patients tend to be identified at a much later time when the disease is advanced.

High mortality

with severe symptomatic AS: 50% at 2 years² & 97% at 5 years²

Figure 1. Comparison of the 5-year survival rates for untreated AS and the most common metastatic cancers in the UK²

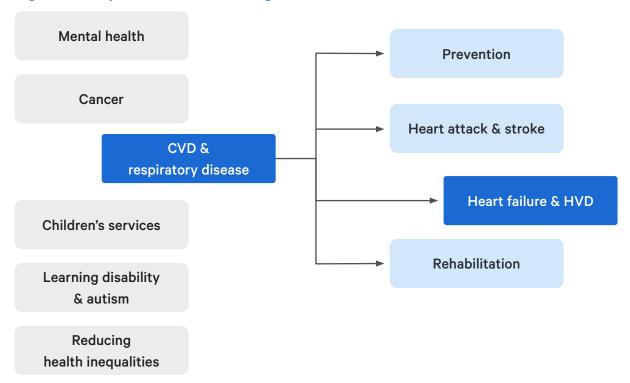


20%

of severe AS patients develop heart failure if left untreated 4

CVD is a core priority of The NHS Long Term Plan¹ (2019) and HVD is a key component of it. The plan highlights the need for earlier diagnosis of HVD, which in turn has raised the challenge of increasing awareness of the condition and ensuring earlier detection.

Figure 2. Core priorities of the NHS Long Term Plan¹



Historically, initial detection has rested on clinical suspicion, followed by cardiac auscultation by a GP, but over recent years, shorter appointment times and the shift towards telephone and virtual consultation, especially during and after the COVID-19 pandemic, have reduced auscultation in the community and made detection even more challenging.

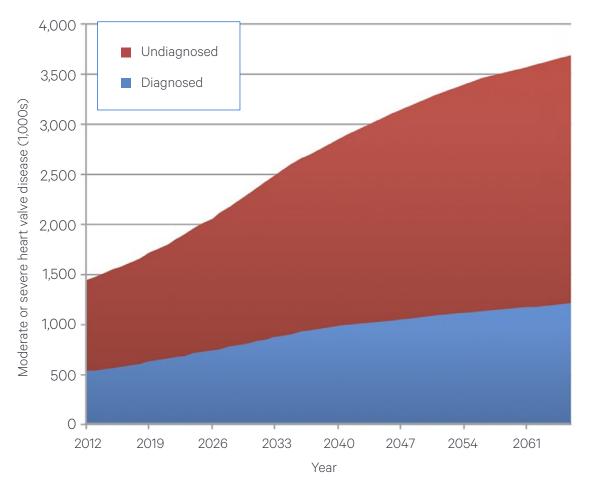
Up to 53%

of patients with severe symptomatic are estimated to go undetected and untreated in England each year 5-7

People with moderate-to-severe HVD are commonly left undiagnosed and untreated; for example, up to 53% patients with severe AS in England each year.⁵⁻⁷ These invisible patients cannot access life-saving treatment options to replace or repair their heart valves.

Untreated HVD is not only a disaster for patient health and wellbeing, it also places an unsustainable burden on the healthcare system. A 2018 economic analysis⁴ mapped the escalating healthcare costs of severe AS. In a realistic fictional scenario of delayed diagnosis and no treatment, the patient had very poor quality of life, requiring intensive support including multiple emergency admissions, at a total care pathway cost of £57,182. In the alternative scenario, with prompt HVD detection and rapid treatment intervention, the patient had a significantly better quality of life, much more independence and his life was extended by three years – and yet the overall cost of care was £37,635 - a saving of £19,548. This cost saving rose to £45,965 where broader social care costs were taken into account. This analysis underscores the financial implications of prompt diagnosis and treatment for people with HVD. With an ageing population, the incidence rate of this treatable disease will continue to rise⁵⁻⁸ – now is the time for intervention.

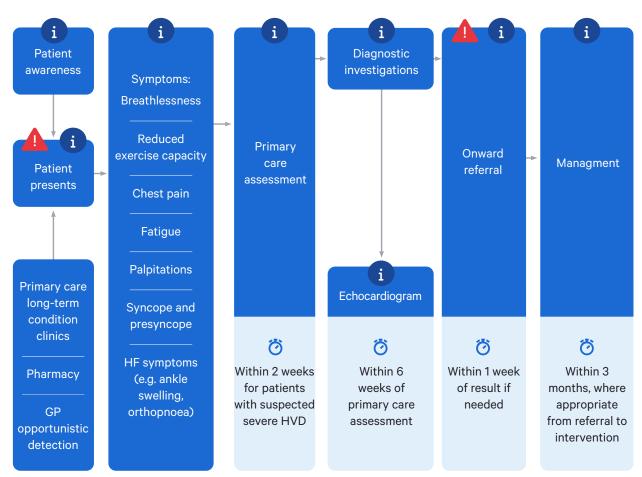






With such a large number of people with undiagnosed and untreated HVD, how could the problem be addressed? An exemplar community detection care pathway was developed to map out the route a patient with HVD takes through services, including the different potential avenues of presentation in the community (Figure 4). This included possible presenting symptoms, initial tests, primary care assessment, referral to echocardiography, onward referral to a specialist. An important entry point is primary care, where a patient presents to their GP with symptoms suggestive of HVD or during a long-term condition annual review carried out by a practice nurse. Patients could also present in a pharmacy with symptoms so this could be an alternative gateway into the care pathway. Community pharmacists are highly accessible healthcare professionals who are generally well trusted by patients. We hypothesised that they could increase the detection of undiagnosed HVD in the community with the aid of e-stethoscope technology and AI (artificial intelligence) software that assists with murmur detection.

Figure 4. An exemplar pathway was developed to support detection of HVD in the community⁶



We developed a service evaluation in Farnborough Primary Care Network (PCN), Hampshire, to test whether digital auscultation by a community pharmacist could be an effective entry point to the HVD pathway towards diagnosis and treatment.¹⁰ It was designed to assess whether a meaningful number of murmurs could be detected, and whether this would translate to a meaningful number of HVD diagnoses. This would be compared over the same time period with the current, standard GP auscultation and referral pathway within the same PCN. The service evaluation would help determine whether this type of service is logistically feasible in a busy pharmacy and whether staff could manage the extra workload. In addition we hoped to gauge if patients would accept a heart check in this setting and whether local GPs and administrators would buy into the process.



eMurmur 🕷

The pharmacist was trained to use the e-stethoscope which assists with murmur detection using eMurmur¹¹ Al software.

All patients over 75 years were eligible, as well as any patient with: hypertension, type 2 diabetes, ischemic heart disease, or atrial fibrillation. It was also decided that walk-ins with symptoms suggestive of HVD would be accepted. The project ran from mid-June 2022 for six months. At the point of dispensing, eligible patients were given a leaflet about the service, accompanied by face-to-face engagement or a follow-up

telephone call. Where a murmur was detected during the auscultation appointment, a digital referral was sent to the community echocardiography service and copied to their GP. The echocardiography service assessed and processed the patients into significant murmurs (needing follow-up or immediate management) or insignificant murmurs (could be returned to their GP with no follow-up). Where no murmur was detected at auscultation GPs were notified the patient had undergone the test.

During the study period 86 patients underwent digital auscultation by the community pharmacist, all of whom were successfully recorded, which identified murmurs in 39 patients (45%) who were referred to echocardiography. Auscultating manually, GPs in the area made 24 referrals to echocardiography for suspected murmurs during the same time period.

Following echocardiography, patients were classified as normal or with trivial, mild or moderate/severe HVD. For normal patients or those with trivial HVD, there was no significant difference between the proportion of patients referred by general practice versus community pharmacy (58% [14/24] vs 56% [22/39]).10 GPs however referred a higher proportion of patients found to have mild HVD: 33% (8/24) compared to 23% (9/39) from pharmacy.¹⁰ For moderate/severe HVD however, the gap was greater: 8% (2/24) vs 21% (8/39). Excluding normal or trivial HVD, community pharmacy referred 70% more patients found to have mild or moderate/severe HVD than GPs (17 vs 10 patients).10

Figure 5. Farnborough project flow diagram

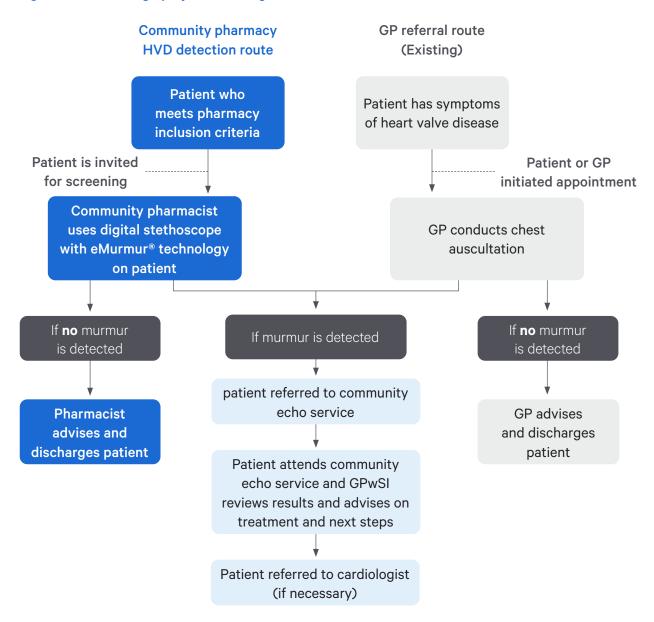
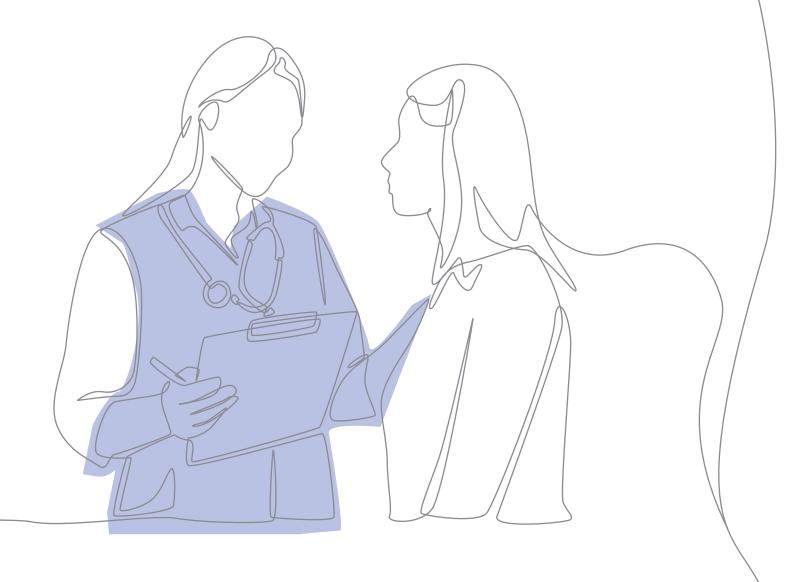


Figure 6. Referrals to echocardiography

	Community pharmacy	GP
Total referrals	39 / 86 (45%)	24
Moderate/severe HVD	8 (21%)	2 (8%)
Mild HVD	9 (23%)	8 (33%)
'Normal' or 'trivial HVD'	22 (56%)	14 (58%)

The pilot in Farnborough highlights that community pharmacists could play an important role in proactive detection of HVD, by identifying and referring patients who would not otherwise have been found. Crucially, the AI technology can support healthcare professionals to make potentially lifesaving referral decisions, by enabling rapid data sharing with specialist colleagues. This was powerfully illustrated during the pilot project in two critical cases requiring immediate treatment, which had previously been missed by clinicians unfamiliar with specialist auscultation. This shows that community pharmacy referrals, made outside the usual GP/hospital route, could result in successful diagnoses of otherwise undetected serious disease and the accessibility of this community service could be a powerful asset to the HVD pathway.

Although the total number of patients auscultated by GPs during the analysis is unknown, based on the number of referred patients found to have significant non-trivial disease, Al technology may potentially improve the quality of referrals to echocardiology.



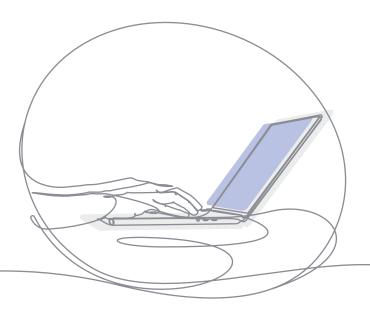




NHS agenda

Currently there is a drive towards community pharmacy delivering more clinical services, and the group can envisage an HVD detection service being well adopted, especially following on from the hypertension case finding service already in place. It is thought that this will be seen as an opportunity to engage in a 'proactive pharmacy' agenda. NHS England is assessing how all pharmacists graduating from 2026 can play a role as independent prescribers. Already however, a number of pharmacies are driving ahead with the proactive agenda and demonstrating the business case for such services. While there are now a lot more services in private community pharmacies doing independent prescribing and listening to the heart and lungs, onward referral is currently thought to be very minimal. There will also be wide variation in the amount of private services community pharmacies are able to offer depending on factors like level of deprivation and financial backing.

HVD falls within The NHS Long Term Plan¹ as part of NHS England's Cardiac Transformation Programme, so within that landscape, addressing healthcare access and inequity in deprived areas is a priority for ICBs. In the past, mobile screening projects have used buses to broaden the reach of a service. However, the existing community pharmacy workforce is accessibly located and has the potential to be a more sustainable long-term strategy for delivering services more equitably. Also in light of the strain on general practice, utilising community pharmacy as a health provider is arguably a better use of workforce.



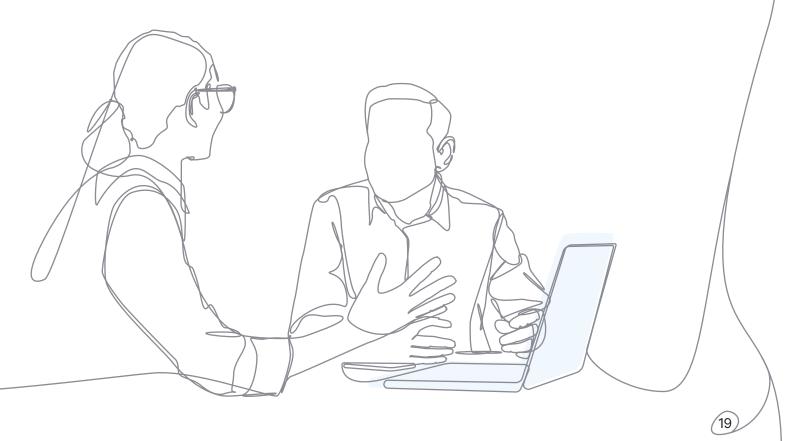


A good fit

HVD detection fits well with the existing hypertension case finding service, ¹² making for an obvious next step for another clinical service. It would be a worthwhile extension of the CVD focus in community pharmacy and an opportunity to collaborate with and support general practice, which would no doubt be welcomed. The same AI technology has a valuable broader application: respiratory auscultation for detection of lung crackles is in development.

To roll out digital auscultation widely it will be crucial to upskill the workforce with the right training. This fits well with the drive towards renewing the clinical skills that are part of pharmacy training but seldom used in routine practice. Utilising tools like the stethoscope to examine patients is part of the advanced skills training available. In a small number of community pharmacies, forward thinking independent prescribers are taking advantage of enhanced training to put private services in place.

The roundtable discussion explored the implications of a community pharmacy HVD detection service. Careful consideration was given to the implications for pharmacy, particularly issues around workforce, practicalities within this setting, and whether there would be enthusiasm for or acceptance of this extended role. The group was mindful of how this innovative technology could be rolled out further within the NHS, initially supported by a larger pilot study, and potential obstacles that would need to be addressed. They discussed how to go about moving forward, in terms of the implications, and other stakeholders to involve, gain agreement or insight from, and what each member individually or as an organisation could do to progress the project.





Service capacity

During the pilot, GPs were responsive and welcomed additional support identifying patients with a murmur. The expert group agreed that community pharmacy would be an ideal workforce for the service, while also acknowledging that constraints affect the capacity of pharmacies to deliver additional services. The group felt strongly that this type of initiative could not be simply added into the global sum for pharmacy, as this would deem the project to be unfeasible. However, when commissioned correctly there can be capacity (e.g. The 'Winter Fit' service rolled out in South West London: 35 pharmacies had consultations with 10,000 individuals over the age of 65 in four weeks¹³). The new NHS recovery plan¹⁴ has removed a lot of the barriers to utilising staff considered as unregistered staff or healthcare assistants. This has enabled more members of pharmacy teams to be trained up to deliver clinical services. The digital stethoscope offers added value as a way to help facilitate this. Granting access to patient lists/records would enable pharmacies to identify at-risk patients, taking full advantage of this opportunistic detection approach; however, to roll that out would require that the right IT is in place.

A key concern is whether Al software too sensitive to trivial murmurs could run the risk of being cost ineffective if echocardiography were flooded with referrals, thereby exacerbating the existing pressures on this service and potentially increasing waiting times. Although this was not found to be the case during the pilot study, it would be important to approach a service from a wider pathway perspective to avoid creating bottlenecks elsewhere in the system that could create anxiety for patients. The pilot highlighted that generally patients who receive a diagnosis of HVD, once fully informed at follow-up, are reassured that their condition has been picked up and that treatment options are available. However, a service model would need to factor in follow-up avenues for these patients, because not all areas have the easily accessible GP-led cardiology service that is available in Farnborough. The constraints on echocardiography and follow-up services should not limit the impetus to improve HVD detection though, because patients with undiagnosed severe HVD have a very poor prognosis. The pilot in Farnborough uncovered a group of previously invisible patients with significant disease who needed immediate attention – findings that make a powerful case for improving service capacity.

There is the option to adjust the AI software to be less sensitive to trivial/mild murmur, only referring patients in urgent need of echocardiography. While this might seem like it would make better use of resources, HVD is progressive so it is very important to identify and monitor any patient with HVD to prevent unnecessary deterioration and hospital admissions. The pilot primarily did not seek to assess symptoms, although some walk-in patients with symptoms suggestive of HVD were included. By incorporating some assessment of symptoms in the service it may be possible to increase the positive predictive value of the test. While this approach might reduce workload and associated costs, again this would likely prove a false economy because asymptomatic patients could be missed which would incur greater overall costs for the system.



Digital integration

The NHS Long Term Plan¹ underpins the importance of technology for the future NHS, setting out digital transformation as a critical priority. A national data infrastructure and fully integrated digital systems are crucial to working smarter and enabling the ongoing improvement of services. This will be key to implementing projects like community HVD detection at scale, to resolve the significant digital integration challenges currently between community pharmacy and other sectors across primary and secondary care. The expert group raised serious concerns about systems that are cumbersome, risky and "simply do not work", and therefore unnecessarily absorb significant staff time.

Compared to a traditional referral letter advising follow up, the AI software's digital report of the evaluation, which links directly to the sound recording online, is an extremely valuable feature. These can be kept on file and listened to again at any time, and compared with later recordings to monitor for changes. Giving clinicians immediate remote access is especially important in critical cases, as seen during the Farnborough pilot, because it can enable a life-saving rapid referral decision. The NHS undoubtedly cannot gain full benefit from introducing this technology unless full IT connectivity between services is in place from the outset.



Facilities

Perceptions of pharmacy and the role it plays have evolved. NHS 111 has been referring patients to community pharmacy for the last five years and people are increasingly familiar with it as a place to seek clinical advice and services for a number of issues. When pharmacy vaccination services were introduced there was some reluctance but for most people this is now the preferred option. Similarly patients are likely to become accustomed to and embrace a heart check service. Patients certainly seemed comfortable with the pilot service.

The suitability of consultation room facilities in pharmacies is another important aspect of implementation. The Farnborough pilot pharmacy had enough space to accommodate a couch for the patient to lie down but this may not always be the case. Only a very small number of pharmacies have premises so small that they are unable to meet the current requirement to have a consultation room. Rooms must be able to accommodate the clinician and patient, and ideally a wheelchair and/or third person. There is no requirement for a couch or bed; however a chair back that can recline to 45 degrees would be suitable for the purpose of cardiac auscultation. Some pharmacies have invested in consultation rooms in order to adopt extra services, especially since COVID-19, therefore an HVD auscultation service would be attractive if it can be demonstrated to make profitable use of this space.



Building on the pilot

The pilot project in Farnborough needs to be validated in a larger study in other localities. It would be valuable to see how the same service would work in areas with different systems and would help make a powerful case for rolling the service out more widely. Extending the pilot would help to assess issues such as the level of minor disease detection and suitability of the Al algorithm's sensitivity to murmur, and the effect on increasing waiting times and patient anxiety.

HVD detection is a key objective for ICBs and CCNs. HINs are especially involved with developing innovations in the early stages and may be interested in collaborating with a larger scale project to develop the dataset and evaluate its potential for wider implementation. The service could fit well within a broader existing project to develop an overarching pathway. It would be helpful to approach HIN leads who have already expressed an interest in CVD, which potentially may also have funding available. There is already indication that two HINs (formally AHSNs) and possibly an ICB may be interested in supporting a scaled-up pilot project.



Facilitating adoption

The group agreed that even if the service is demonstrated to be highly effective, successful take up will hinge on having the right resources and infrastructure in place. The Farnborough pilot project was funded through Edwards Lifesciences on a per patient basis; however, funding arrangements for further pilots will need to be agreed. The possibility of a one-off setup fee was discussed that recognises the initial startup costs.

An economic analysis which makes the business case for the project will be key to making it attractive and also sustainable for pharmacists. Local projects, negotiated with the Local Pharmaceutical Committee (LPC), require a concrete proposal with a service specification that maps exact requirements, such as the equipment required, whether this is provided or needs to be purchased, and the type and duration of training. The group agreed it would be very helpful to develop a standard service specification based on the pilot project which clearly breaks down how the service could fit into other localities and can be populated and amended. This could include a flow diagram mapping out data flows so that these could be easily reproduced. HVD detection ties in with the future of community pharmacy, where the focus is on orientating towards clinical service delivery, so mapping a clear pathway with a uniform approach to implementation could be beneficial.

The National Pharmacy Association (NPA) provides indemnity to pharmacies and pharmacists, which includes cover for clinical services. It was noted that community HVD detection is unlikely to be high risk from an insurance perspective; it would probably be encompassed by blanket policies for mainstream services without attracting an additional premium.



Data and information governance

To support service setup some assurance around data and information governance should be provided. Based on the pilot, a data flow map could be developed, describing the data governance in place at each stage and defining the individual data controller responsible, to ensure the correct agreements are in place throughout. This will include:

General Data Protection Regulation (GDPR)

The <u>General Data Protection Regulation</u> (GDPR) is an EU law with mandatory rules for how organisations and companies must use personal data.

• Data Protection Impact Assessment (DPIA)

Falling under GDPR is <u>Data Protection Impact Assessment</u> (DPIA), a process to identify and mitigate data protection risks. We may be able to provide much of the information to assist other localities with this. DPIA forms are similar yet different across each ICB and the level of internal assurance processes may vary.

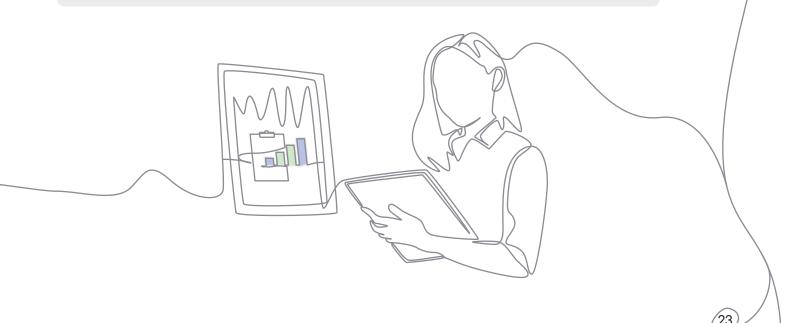
• Digital Technology Assessment Criteria (DTAC)

Compliance is critical with the NHS Digital Technology Assessment Criteria (DTAC) for health and social care to ensure digital health tools meet the clinical safety, data protection, technical security, interoperability and usability and accessibility standards. It is designed to be used by healthcare organisations to assess suppliers at the point of procurement or as part of a due diligence process.

Clinical Safety Officer approval

Every ICB should have a Clinical Safety Officer that signs off on digital implementations. Their role is to assess the digital technology within a proposed pathway. This can take time, particularly if an area does not have their own Clinical Safety Officer.

ICBs are likely to want some governance oversight, even if not providing funding for the service.





Communicating with stakeholders

The group is keen to raise awareness of the project as widely as possible, both to raise general awareness about HVD which is an objective of The NHS Long Term Plan¹, and to spread the concept of HVD detection in community pharmacy to generate interest and provide an opportunity to get involved. The project could begin to scale up organically if enthusiastic pharmacies implement successful pilot services, prompting others to join. Edwards Lifesciences have produced a film about the Farnborough pilot that may help to encourage involvement.

The project underlines the value of pharmacy and is a good example of how AI technology can be used to improve healthcare, ease workforce demands and avoid misdiagnosis, as well as tapping into the current interest in extending the pharmacy workforce. Enthusiasm will be a key determinant of the project's success, so the group must identify opportunities for network support. CVD is a top priority in The NHS Long Term Plan¹ and HVD is a recognised component which is important for ICBs and Integrated Care Systems (ICSs) to address. Currently there is a lot of enthusiasm for AI technology and its potential role in care pathways is being actively explored. The group notes that this innovative application of AI technology and workforce would align with the HIN remit. It was highlighted that as part of the Cardiac Transformation Programme, CCNs are already implementing similar detection initiatives.

The group made a list of bodies and individuals to potentially involve in or be made aware of the project, although were minded that any approach needs to be carefully considered and accompanied by a comprehensive plan going forward. These stakeholders included NHS England, Integrated Care Boards (ICBs), Health Innovation Networks (HINs) (previously known as Academic Health Science Networks, AHSNs), Cardiac Clinical Networks (CCNs), all-party parliamentary groups (APPGs), and professional and patient organisations.





5. Recommendations and next steps

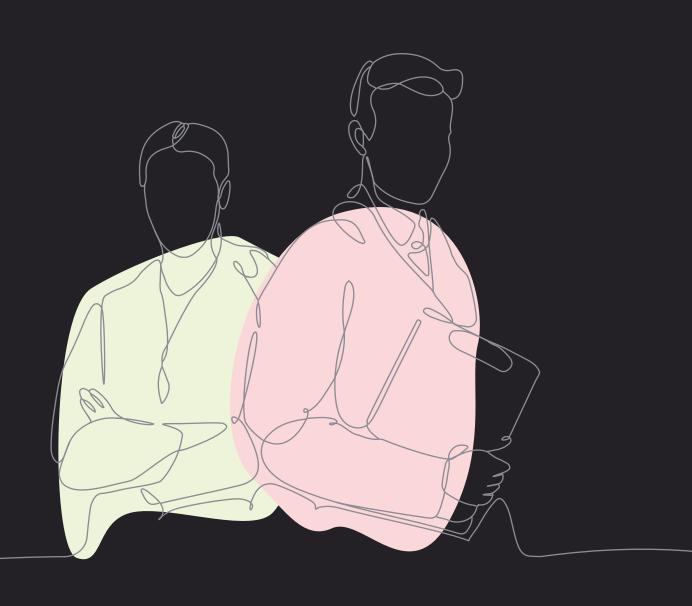
5. Recommendations and next steps

This initial pilot project in Farnborough is a promising first step towards transforming outcomes for people with HVD. Although the experts recognised the challenges around funding, facilities, digital integration etc, they believe these could be overcome. An extended community pharmacy role, which is already established in areas like hypertension and atrial fibrillation, should be pursued for murmur detection – initially by expanding the pilot study and then potentially commissioned in the future by ICBs in collaboration with CCNs.

The expert group will develop a clear route to implementation to take the project forward. To support other areas to adopt the service they will develop resources for the participation process, governance arrangements, due diligence, data flows, service specification, potential funding flows and echocardiography service arrangements that could streamline the project.

Responsible for 1 in 4 deaths, CVD sits amongst the top killers in the UK.¹ In spite of this, CVD – including HVD – does not receive the appropriate level of attention. Other conditions with a similarly poor prognosis, such as cancer and dementia, have a much higher health profile in the consciousness of the nation. HVD primarily affects older people and is therefore becoming more prevalent as the population ages. Government can no longer neglect this concerning healthcare inequity for older people.

The NHS Long Term Plan¹ requires all systems in England to make meaningful progress on HVD – this means taking action to find the missing patients. For ICBs to achieve this, developing new strategies to improve murmur detection will be crucial. Championing initiatives that create this change should be a priority for patient organisations and CCNs. Pharmacy leadership is also well placed to support the community detection project – a powerful example of pharmacy's potential to make important headway on a major NHS objective.



Abbreviations

Abbreviations

AHSN Academic Health Science Network

Al Artificial Intelligence

AS Aortic stenosis

CCN Cardiac clinical network

CPCL Community Pharmacy Clinical Leads

CRG Clinical Reference Group

CVD Cardiovascular disease

DPIA Data Protection Impact Assessment

DTAC Digital technology assessment criteria

GDPR General data protection regulation

GIRFT Getting It Right First Time

GPwSI General practitioner with special interest

HIN Health Innovation Network

HVD Heart valve disease

ICB Integrated care board

ICDN Integrated cardiac delivery network

ICS Integrated care system

LPC Local pharmaceutical committee

NPA National Pharmacy Association

PCN Primary care network

PhIF Pharmacy Integration Fund



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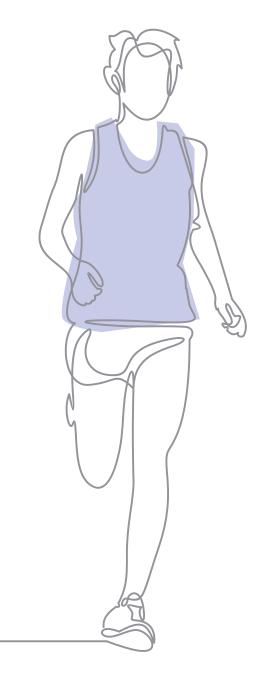
Disclaimer Data

England Full Disclaimer

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Disclaimer Data

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