

South East

Clinical **senate**

**Enabling Improvement and Reducing Inequalities
in Hypertension and Cholesterol Detection and
Management in South East England**

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Foreword

We are pleased to share this comprehensive report prepared by Johanna Kaminer on behalf of the South East Clinical Senate and Public Health, NHS England South East.

Cardiovascular disease (CVD) remains a significant cause of premature mortality, despite being largely preventable, and it continues to drive health inequalities and disability across the region. This report highlights the urgent need for improved detection and management of hypertension and high cholesterol, as well as evidence based actions to achieve this improvement.

Hypertension is the highest global risk factor for death worldwide and hyperlipidaemia is the 6th highest. Both risk factors not only impact life expectancy but also healthy life expectancy, directly and through associated disease, in particular CVD including heart disease and cerebrovascular disease. In the South East region women live an average of 19.1 years with disability before death and men an average of 15.5 years. Both hypertension and hyperlipidaemia are significant contributors to the CVD burden and hypertension is the most prevalent long term condition from age 50 upwards. The disease burden carries with it costs related to work productivity, unemployment, and lost productivity due to premature mortality or early retirement. All of which may also impact care partners, who may struggle to balance other demands with the care needs of an individual with disability and frailty. The South East region carries a high burden of CVD, disability and frailty, particularly prevalent in coastal areas. All compelling reasons for early identification and treatment of risk factors that lead to the increased disease burden. While we have seen progress in treatment rates for hypertension and hyperlipidaemia returning to pre-pandemic levels, it is concerning that the South East still lags behind the national average and fails to meet yearly NHS targets.

The recommendations outlined in this report are based on the latest evidence, and qualitative insights and learning from CVD leads at Integrated Care Board and practice levels; and provide a clear roadmap for enhancing quality improvement efforts across the region.

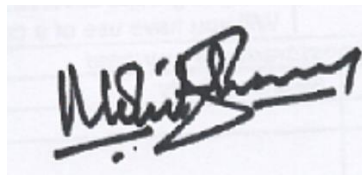
We firmly believe that by adopting a pro-active and evidence based approach to CVD prevention at every level, we can significantly improve the quality of service, reduce inequalities, and ultimately save lives. The Government has a focus on 3 shifts in healthcare, one of these is sickness to prevention and the imperative to shorten the amount of time spend in ill health and prevent illnesses before they happen.

We encourage all stakeholders to read this report and take the necessary steps to integrate these recommendations into practice.



Paul Stevens

Chair South East Clinical Senate



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1. Introduction

The aim of this report is to:

- provide guidance to help the CVD prevention workforce at all levels choose and implement interventions to improve the diagnosis, monitoring, and treatment of hypertension and high cholesterol in the South East
- demonstrate 'what good looks like' for the South East, and
- inform service redesign as appropriate to maximise positive outcomes for the population.

The background section provides information on the importance of CVD prevention and health inequalities in hypertension and cholesterol diagnosis and management in the South East and explains the need for action for quality improvement. The key findings section provides an overview of findings from our data analysis and evidence-based literature review of quality improvement strategies. The recommendations section gives practical guidance to support system service change by providing a list of evidence-based quality improvement interventions at national, regional, systems, and practice level to consider, together with examples of good practice. Further information, resources, and tools are signposted to throughout the report.

2. Background

2.1 Understanding Cardiovascular Disease (CVD): significance and impact

Cardiovascular diseases (CVDs) are a group of disorders that affect the heart and blood vessels, and are leading causes of morbidity, disability, and mortality globally and in the United Kingdom. In England, around 6.4 million people are living with heart and circulatory diseases and about 390 people, of which one in four is under the age of 75, will die from heart or circulatory disease every day.¹

CVD is also a key driver of health inequalities. In the South East of England, CVD is the leading cause of the life expectancy gap of 7.2 years between the most and least deprived quintiles in males, and 5.4 years between the most and least deprived quintiles in females.² Across England, South Asian and Black communities face the highest risk of CVD and experience cardiac events much younger than white patients.

¹ <https://www.bhf.org.uk/-/media/files/for-professionals/research/heart-statistics/bhf-cvd-statistics-england-factsheet.pdf>

² OHID Segment Tool, <https://analytics.phe.gov.uk/apps/segment-tool/>

South Asian groups have some of the highest death rates from several cardio-vascular related illnesses, including stroke, heart attacks, and heart failure. CVD-event related outcomes among some ethnic groups remain poor even among people in the least deprived groups.³

2.2 CVD in the context of the COVID-19 pandemic

The COVID-19 pandemic added to the urgency focus on CVD prevention. Existing cardiovascular disease (CVD) and some individual cardiovascular risk factors, such as diabetes and hypertension, were associated with severe COVID-19 outcomes among hospitalised patients and COVID-19-related deaths. Individuals without pre-existing CVD but with raised cardiovascular risk were more likely to experience severe COVID-19 outcomes.⁴ From the onset of the COVID-19 pandemic to June 2023, there have been nearly 100,000 excess deaths in England involving ischemic heart disease (IHD) or other cardiovascular diseases (CVD); and while deaths from Covid-19 have fallen year-on-year since the beginning of the pandemic, the number of deaths involving CVD have remained above expected levels.⁵

2.3 CVD-related inequalities and social determinants of health

The disparities seen among patients with CVD are influenced and driven by social determinants of health (SDoH), such as income, housing, education, early childhood development, the environment, and access to health and social care.⁶

In England, people living in the most deprived areas are nearly four times as likely to die prematurely (that is, under the age of 75 years) from CVD compared to those in the least deprived areas.⁷ Although there is a lack of specific data on individuals with learning disabilities,⁸ broader evidence indicates that people in economically disadvantaged situations experience multiple health conditions earlier and more frequently than their more affluent counterparts.⁹

³ Source: Linked GPPS and SUS data. Analysis completed by the NHSE national Economics and Strategic Analysis team

⁴ Source: Warren-Gash C, Davidson JA, Strongman H, Herrett E, Smeeth L, Breuer J, Banerjee A. Severe COVID-19 outcomes by cardiovascular risk profile in England in 2020: a population-based cohort study. *Lancet Reg Health Eur.* 2023 Apr;27:100604. doi: 10.1016/j.lanepe.2023.100604. Epub 2023 Mar 7. PMID: 36911072; PMCID: PMC9991014.

⁵ British Heart Foundation: Excess deaths involving CVD in England since the onset of the Covid-19 pandemic: an analysis and explainer. June 2023. <https://www.bhf.org.uk/what-we-do/news-from-the-bhf/news-archive/2023/june/100000-excess-deaths-cardiovascular-disease>

⁶ <https://www.bhf.org.uk/what-we-do/our-research/heart-statistics/health-inequalities-research/inequalities-in-heart-and-circulatory-diseases-in-england>

⁷ [https://www.gov.uk/government/publications/health-matters-preventing-cardiovascular-disease/health-matters-preventing-cardiovascular-disease#:~:text=Those%20in%20the%20most%20deprived,the%203%20most%20deprived%20deciles,](https://www.gov.uk/government/publications/health-matters-preventing-cardiovascular-disease/health-matters-preventing-cardiovascular-disease#:~:text=Those%20in%20the%20most%20deprived,the%203%20most%20deprived%20deciles,file:///C:/Users/G4XM9GPH/Downloads/Health_inequalities_cardiovascular_disease.pdf)

⁸ file:///C:/Users/G4XM9GPH/Downloads/Health_inequalities_cardiovascular_disease.pdf

⁹ <https://www.bhf.org.uk/what-we-do/our-research/heart-statistics/health-inequalities-research/inequalities-in-heart-and-circulatory-diseases-in-england>

Economic instability is strongly linked to CVD. Individuals facing economic hardship often encounter chronic stress, and numerous challenges such as limited access to healthcare or healthy food, all of which contribute to a higher risk of developing cardiovascular diseases. Research also shows that early adverse experiences, such as abuse or neglect, exacerbate this risk by disrupting neurodevelopment and fostering behaviours that increase susceptibility to CVD later in life.¹⁰

Social factors, including social isolation, loneliness, and discrimination, play a crucial role in cardiovascular health. Poor social support and community engagement are associated with higher CVD risk; and the environment we live and work in, the neighbourhood socioeconomic status and environmental attributes, such as access to healthy food and safe living conditions, have a significant impact on CVD risk.¹¹

The evidence highlights the need for integrated and holistic approaches to address CVD. Interventions should not only focus on the improvement of healthcare related interventions but should also always consider broader social factors that influence cardiovascular health. Incorporating SDoH into CVD prevention strategies is essential for reducing health inequalities and improving outcomes for all populations.¹²

2.4 Modifiable risk factors for CVD

The majority of CVD cases are preventable with modifiable risk factors explaining up to 90% of CVD incidence;¹³ which is why the NHS Long Term Plan identified it as the single biggest area where the NHS can save lives, through lifestyle changes and earlier detection and treatment.¹⁴

The main modifiable risk factors include hypertension, tobacco use, unhealthy diet and obesity, high cholesterol, and low physical activity.¹⁵ In the United Kingdom, high systolic blood pressure remains the leading modifiable risk factor for CVD ranking highest in the risk factors attributable to deaths from cardio-vascular disease, followed by dietary risks, and high LDL (low-density lipoproteins) cholesterol.¹⁶

¹⁰ <https://discovery.ucl.ac.uk/id/eprint/10172592/1/JAHA.123.029765.pdf>

¹¹ <https://discovery.ucl.ac.uk/id/eprint/10172592/1/JAHA.123.029765.pdf>

¹² <https://discovery.ucl.ac.uk/id/eprint/10172592/1/JAHA.123.029765.pdf>

¹³ https://assets.kingsfund.org.uk/f/256914/x/ed99b2b14b/cardiovascular_disease_in_england_2022.pdf

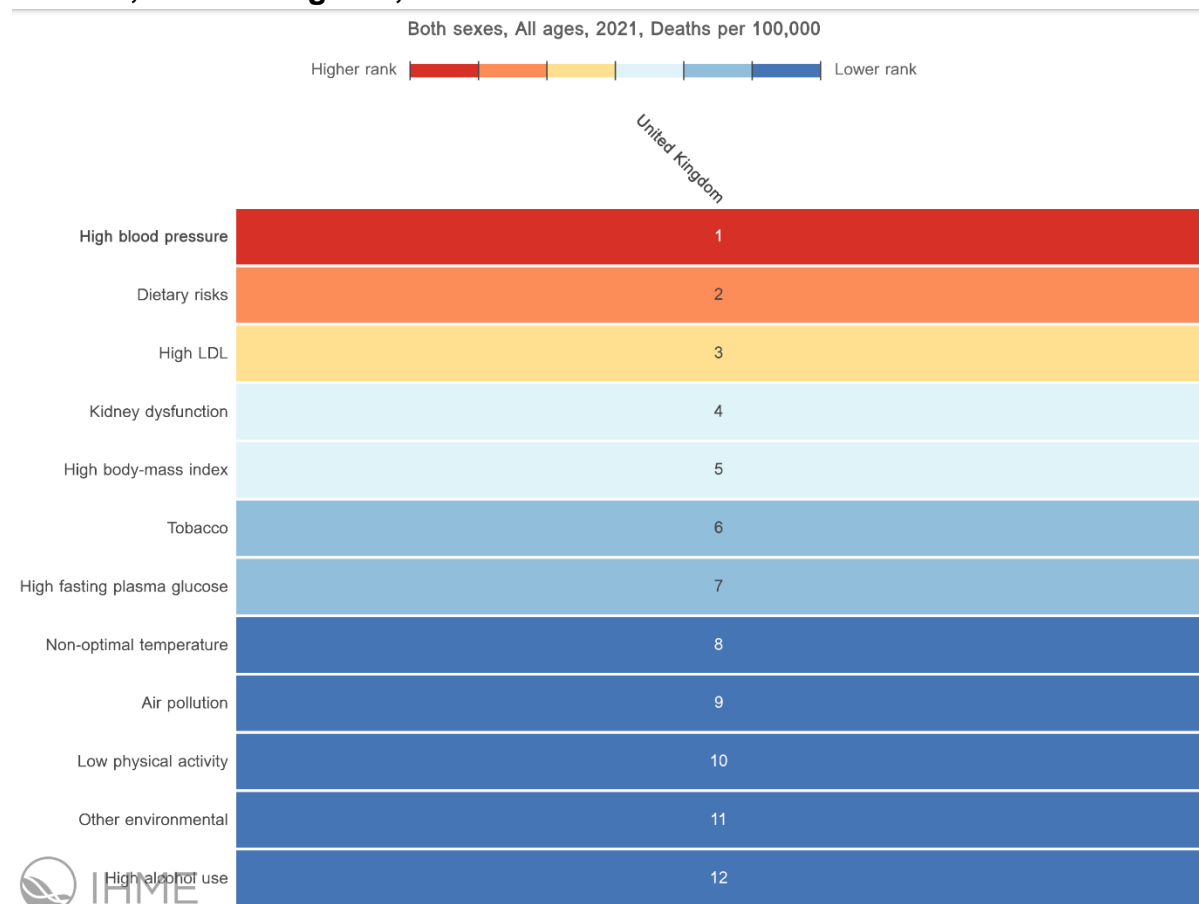
¹⁴ <https://www.longtermplan.nhs.uk/>

¹⁵ Vaduganathan, M, Mensah, G, Turco, J. et al. The Global Burden of Cardiovascular Diseases and Risk: A Compass for Future Health. JACC. 2022 Dec, 80 (25) 2361–2371.

<https://doi.org/10.1016/j.jacc.2022.11.005>

¹⁶ Source: Global Burden of Disease Study, <https://vizhub.healthdata.org/gbd-compare/>

Figure 1: Ranking of risk factors attributable to deaths from cardiovascular disease, United Kingdom, 2021



Source: Global Burden of Disease Study, <https://vizhub.healthdata.org/gbd-compare/>

However, whilst cost-effective interventions for CVD prevention and treatment are readily available, they are not as widely implemented as the National Institute for Health and Care Excellence (NICE) guidelines and national ambitions advise. For hypertension, the national ambition is to ensure 80% of patients with hypertension are treated to target by 2029, with a key objective for systems to increase the proportion of patients with hypertension treated to target to 77% by March 2024.¹⁷

For cholesterol, the national ambitions aim at ensuring that by 2029, 75% of people aged 40 to 74 have received a validated CVD risk assessment and cholesterol reading recording on a primary care system; that 45% of people aged 40-74 with high risk of

¹⁷ <https://www.england.nhs.uk/blog/under-control-why-getting-to-grips-with-blood-pressure-is-a-win-win-intervention-for-healthcare-systems/#:~:text=The%20latest%20data%20shows%20recovery,to%2077%25%20by%20March%202024.>

developing CVD are treated with statins; and that 25% of people with familial hypercholesterolaemia (FH) are diagnosed and treated optimally.¹⁸

However, in England, even before the beginning of the COVID-19 pandemic, only around 70% of patients with high blood pressure were treated to the recommended target. The pandemic disrupted the diagnosis and management of hypertension and high cholesterol across the board, leading to a drop in treatment-to-target rates to around 50%, which significantly increased the risk of heart attack and stroke for many. Nearly four and a half years after the pandemic onset, most systems have still not recovered to pre-pandemic levels with almost one in three people not receiving optimal treatment for hypertension.¹⁹

2.5 Clinical and Financial Benefits of CVD Prevention

Treating hypertension and high cholesterol to target offer significant opportunities for preventing strokes and heart attacks, but also chronic kidney disease and dementia,²⁰ and saving lives in a relatively short time period. If just 80% of people with diagnosed high blood pressure in England were on optimal treatment, it could prevent over 11,000 heart attacks and strokes and over 3,500 deaths in just three years, resulting in £180 million savings to the NHS. Each ICB would see hundreds of these life-saving outcomes in only three years' time. In addition to saving lives and disabilities, and preventing premature deaths, each ICB could generate large savings if more people have their treatment optimised.

UCLPartners estimate that 100 strokes cost the NHS almost £1.4 million, and social care over £950,000; and 100 heart attacks cost the NHS over £740,000.²¹

In the South East, the proportion of adult patients with hypertension treated to target has recovered to pre-pandemic levels (see Figure 2), with 70.1% as of March 2024 (compared to 70.9% across England). However, additional efforts are needed to achieve the national target of 80%. And reaching this ambition is essential—doing so could prevent over 2,600 heart attacks, strokes, and deaths in the South East in just three years.

Similarly, for high cholesterol, if 90% of people with CVD were treated with statins across England, over 7,700 heart attacks and strokes, and over 900 deaths could be prevented in three years. Increasing this to 95%, would prevent over 15,500 cardiovascular (CV) events and over 1,800 deaths in England overall, and over 2,800 CV events and 345 deaths in the South East.

¹⁸ <https://stpsupport.nice.org.uk/cholesterol/index.html>

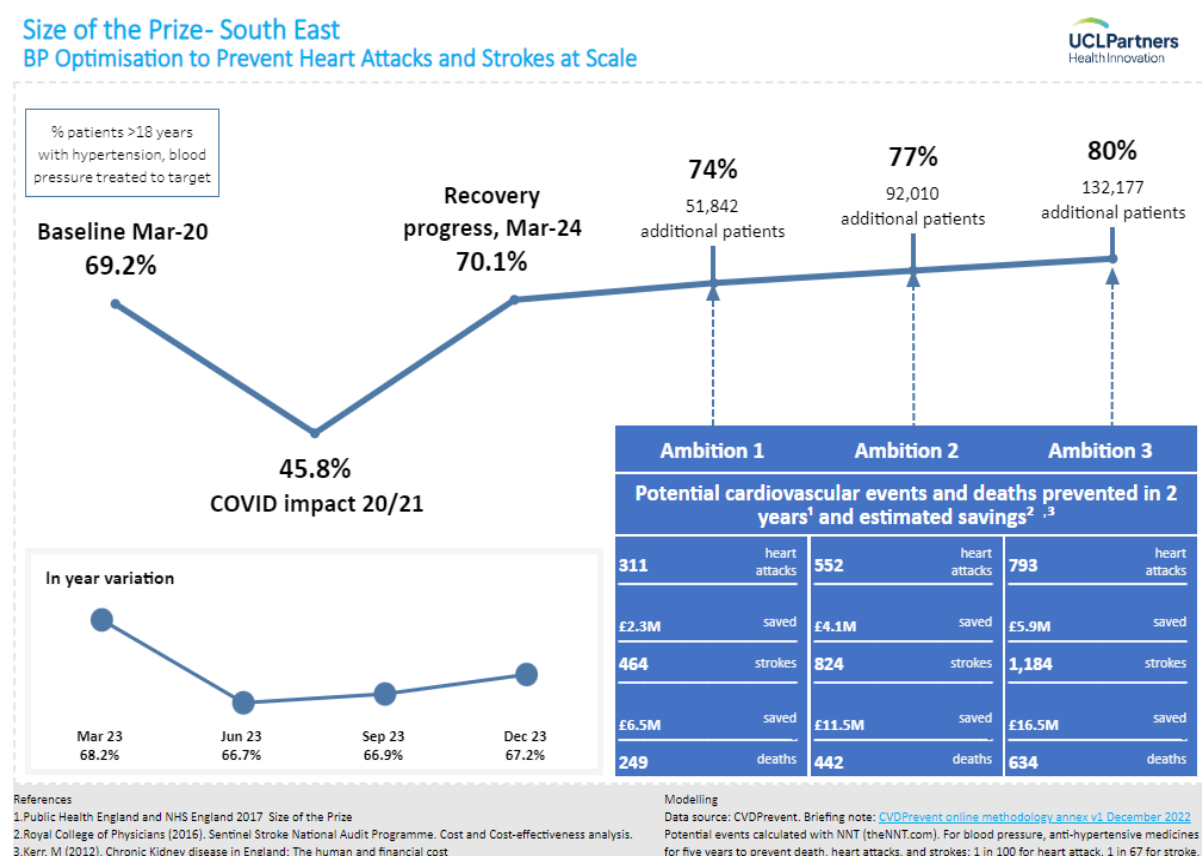
¹⁹ <https://uclpartners.com/project/size-of-the-prize-for-preventing-heart-attacks-and-strokes-at-scale/>

²⁰ [NHS RightCare » Preventing CVD by managing the high risk conditions \(england.nhs.uk\)](https://www.england.nhs.uk/rightcare/preventing-cvd-by-managing-the-high-risk-conditions/)

²¹ UCL Partners: Size of the Prize – Helping the NHS to Prevent Heart Attacks and Strokes at Scale, [Size of the Prize for high blood pressure \(uclpartners.com\)](https://uclpartners.com/size-of-the-prize/)

For cholesterol, it is important to recognise that treating patients with CVD with lipid-lowering medication is just the most obvious opportunity for improvement – the above relates to patients with CVD receiving any statin treatment. In addition to the one in five patients with CVD not taking any lipid lowering therapy, large numbers of people are on insufficient treatment to lower their cholesterol. Optimising treatment in these patients will prevent even more cardiovascular events.²²

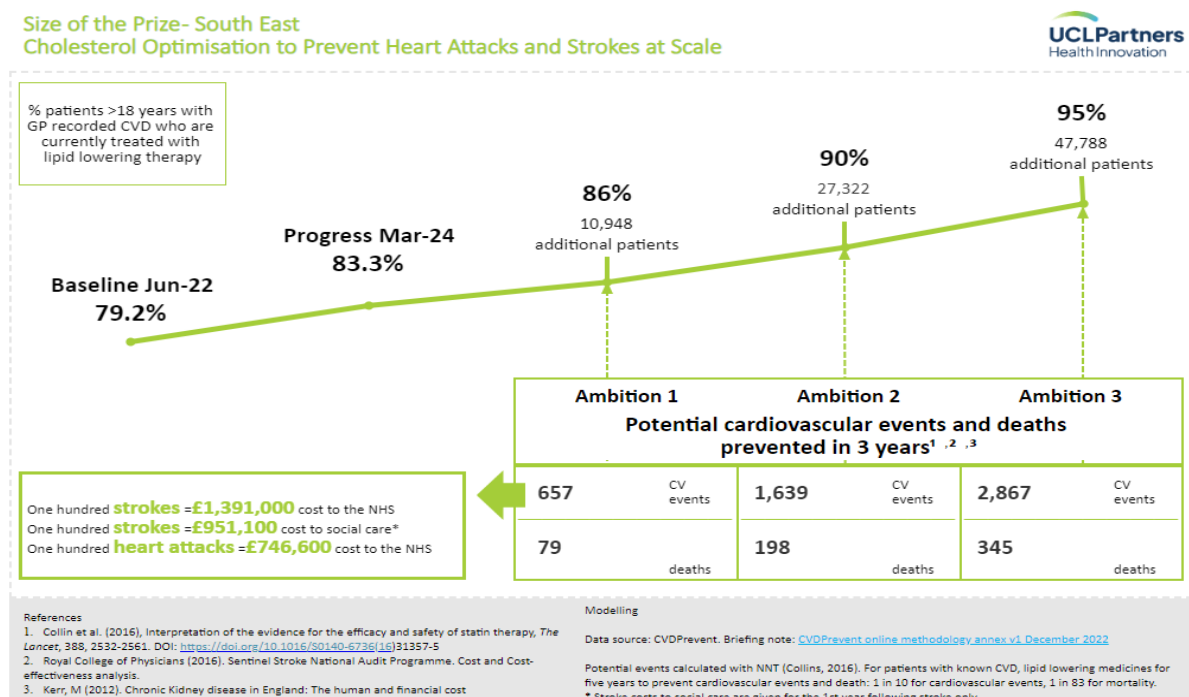
Figure 2: Size of the Prize for High Blood Pressure, South East



Source: UCLPartners Health Innovation, Size of the Prize – Helping the NHS to Prevent Heart Attacks and Strokes at Scale

²² <https://uclpartners.com/project/size-of-the-prize-for-preventing-heart-attacks-and-strokes-at-scale/>

Figure 3: Size of the Prize for High Cholesterol, South East



Source: UCLPartners Health Innovation, Size of the Prize – Helping the NHS to Prevent Heart Attacks and Strokes at Scale

2.6 Variation and Inequalities in CVD Prevention in the South East

An analysis of the Cardiovascular Disease Prevention Audit (CVDPREVENT) data, undertaken by the NHSE Public Health Directorate and the Local Knowledge and Intelligence Service South East (LKIS), Office for Health Improvement and Disparities (OHID), showed stark variation in the monitoring and management of blood pressure and cholesterol across the region. Compared to other regions within England, the South East has the third lowest proportion of adults with hypertension and a blood pressure reading within the preceding 12 months; and the third lowest proportion of adults with hypertension treated to age-appropriate targets; and one of the lowest proportions of patients with CVD or at high risk of CVD on lipid lowering treatment.²³

This report therefore aims to describe current inequalities and variation in the identification, monitoring, and treatment of hypertension and high cholesterol in the South East; and to recommend evidence-based interventions to improve and promote the monitoring and management of hypertension and high cholesterol at national, regional, system, and practice level.

²³[Cardiovascular Disease Prevention Audit \(CVDPREVENT\)](#)

3. Methodology

3.1 Methodology of the CVDPREVENT data analysis

CVDPREVENT is a national primary care audit that automatically extracts routinely held GP data using the General Practice Extraction Services (GPES)²⁴. The audit commenced in 2021²⁵ and data are reported quarterly.

Using published audit data from CVDPREVENT we investigated inequalities in performance across several key indicators reported in CVDPREVENT for hypertension and cholesterol. The indicators included in the analyses were selected by a small internal working group based on population impact and national priority. The indicators included for analysis were:

CVDP007HYP - % of adults with GP recorded hypertension, in whom the last blood pressure reading (measured in the preceding 12 months) is below the age-appropriate treatment threshold.

CVDP003CHOL - % of patients with GP recorded QRISK score of 20% or more and no GP recorded CVD on Lipid lowering therapy.

CVDP009CHOL - % of patients with GP recorded CVD, (narrow definition) who are currently on Lipid lowering therapy (LLT).

CVDP007CHOL - % of adults with GP recorded CVD, (narrow definition), in whom the most recent blood cholesterol level (measured in the preceding 12 months) is non-HDL cholesterol less than 2.5mmol/l or LDL-cholesterol less than 1.8mmol/l.

Sub-group analysis

Sub-groups were defined by CVDPREVENT and include national deprivation quintile (1-most deprived, 5-least deprived), ethnicity (Asian, Black, Missing, Mixed, Not Stated, Other, White), age group (18-39, 40-59, 60-79, 80+), sex (female, male) to assess inequalities in performance. Deprivation quintile is based on patients' residence Lower Layer Super Output Area (LSOA) matched to the Index of Multiple Deprivation 2019 which ranks all LSOAs in England from most to least deprived.²⁶ LSOAs are sub-ward geographies with an average population of 1600 people and 670 households.

²⁴ [CVDPREVENT Online Methodology Annex v1.1 Dec 22 - PDF.pdf](#)

²⁵ [Outputs | CVDPREVENT](#)

²⁶ [Indices of Deprivation - OCSI](#)

3.2 Literature review to identify high impact quality improvement interventions

A systematic search of the literature was conducted in collaboration with the UK Health Security Agency Knowledge and Library Service (UKHSA KLS), across four databases (Medline, Embase, Emcare, and Global Health) in June 2024. Furthermore, grey literature was reviewed to capture relevant studies not published in peer-reviewed journals. Sources of grey literature included reports, governmental websites, and official organisations such as NHS, Public Health England, British Heart Foundation, American Heart Association, Health Equity Evidence Centre. For consistency, the same inclusion and exclusion criteria were applied to the grey literature.

The search query included a combination of keywords and controlled vocabulary for hypertension, cholesterol, detection, management, and quality improvement. Improvement (see appendix B for detailed search strategy).

Searches were limited to English-language publications from 2014 to 2024. Initially, no geographical limitations were applied to ensure a comprehensive collection of relevant studies.

However, studies were excluded if they focused on paediatric populations, were clinical studies on hypertension and cholesterol, including medication trials, were conducted in low-or-middle-income countries (LMIC), or focused solely on familial hypercholesteremia.

The search yielded over 1,100 results after removing duplicates and before screening. Citation titles and abstracts were screened by the author of this report.

Data from the included studies were extracted systematically and transferred into a defined data extraction form. The extracted data included study characteristics, such as study name, country, sample size, effect size (if applicable), and types of Quality Improvement (QI) strategies.

QI strategies were mapped and categorised based upon the level of the intervention (i.e. system-level, practice-level, patient/provider-level) and the taxonomy of quality improvement strategies from the “Closing the Quality Gap” series.²⁷ This taxonomy includes various QI strategies such as organisational change, provider- and patient-oriented interventions, as well as financial or regulatory interventions.

²⁷ McDonald KM, Chang C, Schultz E. Through the Quality Kaleidoscope: Reflections on the Science and Practice of Improving Health Care Quality: Closing the Quality Gap: Revisiting the State of the Science [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2013 Feb. Appendix D, Taxonomy of Quality Improvement Strategies. [Taxonomy of Quality Improvement Strategies - Through the Quality Kaleidoscope: Reflections on the Science and Practice of Improving Health Care Quality - NCBI Bookshelf](#)

Each QI strategy was reviewed to understand its application and effectiveness on the detection and management of hypertension and high cholesterol.

In addition to the systematic search, a supplementary review of the literature was conducted to explore barriers and enablers for the implementation of clinical practice guidelines. This review was not systematic but involved the identification and analysis of six large systematic reviews and meta-analyses on the topic. These reviews were selected based on their comprehensive coverage and relevance to clinical guideline implementation.

3.3. Lessons learned from a high-performing Integrated Care Board (ICB) in Yorkshire

A qualitative part this work involved conducting a semi-structured interview with two subject matter experts from a high-performing ICB in Yorkshire, one of the highest performing regions in the country with regard to hypertension and cholesterol diagnosis and management. The purpose of this interview was to gather insights and best practice examples from an ICB in a top-performing region to identify strategies that may help improve hypertension management and reduce variation across the South East, enhancing overall quality of care.

The interview was conducted with two CVD leads in the Humber and North Yorkshire Health and Care Partnership, and facilitated by Johanna Kaminar (JK), Public Health Registrar in the NHSE SE Public Health Directorate.

The semi-structured interview covered topics such as organisational and leadership structures, use of data for quality improvement, system-wide plans and strategies for CVD prevention, networks and partnerships, and innovative models for CVD prevention.

From these interviews, several key enablers and best practices were identified (see section 7).

3.4 What good looks like at practice level in the South East

A qualitative study was conducted to identify and learn from the highest-performing GP practices and Primary Care Networks (PCN) across the South East. We used a purposive sampling strategy to select altogether four practices for interviews. The selection was made in collaboration with the SE CVD ICB leads in the SE CVD Improvement Task and Finish Group. Practices were chosen based on several performance criteria, including overall performance as of March 2024 CVDPREVENT

data, significant improvement in performance over time, and representation of diverse patient populations.

Data were collected through semi-structured interviews. The interview guide (Appendix A) included open-ended questions and prompts designed to elicit detailed responses across various domains, including the practices' hypertension management process, blood pressure monitoring practices and data usage, treatment and prescription strategies, patient education and lifestyle changes, and strategies to address health inequalities.

Interview process:

Key staff members from each of the four selected Practices were interviewed. These included General Practitioners (GPs) and non-clinical staff. Each interview lasted approximately 60 minutes, allowing for an in-depth discussion of each Practice's processes, management strategies, and key enablers. Interviews were conducted by Ben Crawford virtually, using Microsoft Teams. The conversations were recorded with the consent of the interviewees.

Data Analysis:

BC and JK, transcribed the information, and analysed the qualitative data using thematic analysis.

Limitations:

Whilst the methodology was robust and co-designed with the SE CVD Improvement Task and Finish Group, there are certain limitations. The purposive sampling method may limit the generalisability of the findings to all Practices in the South East. Additionally, the reliance on self-reported data may introduce bias.

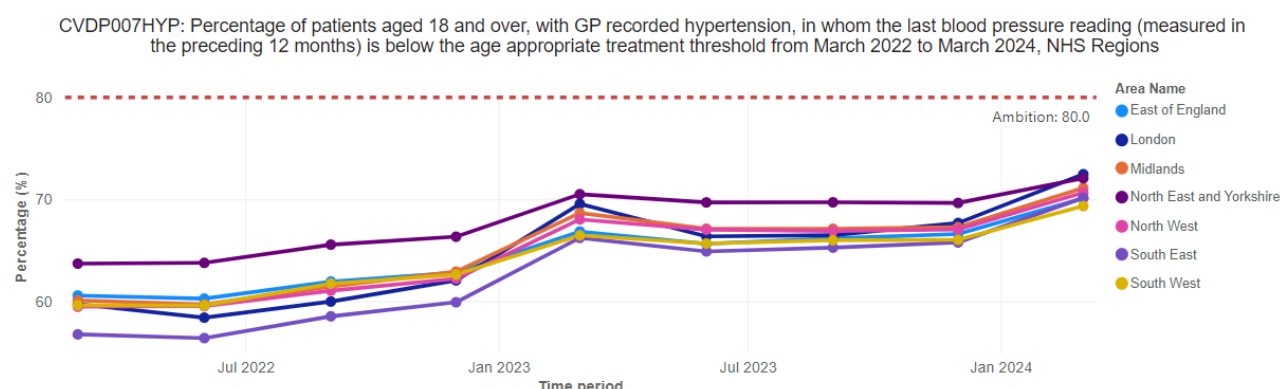
4. Key Findings from the CVDPREVENT Audit

The latest CVDPREVENT data up to March 2024 show an encouraging upward trend in both hypertension and cholesterol management indicators, including an increase in the percentage of patients treated to target for their hypertension, and in the proportion of patients with CVD on lipid-lowering therapy. This highlights the dedicated efforts of the workforce at all levels to improve hypertension and cholesterol management.

4.1 Hypertension

In the South East region 70.1% of adults with diagnosed hypertension are treated to age-appropriate targets, the third-lowest proportion after the South West, and East of England, and is below the England average.

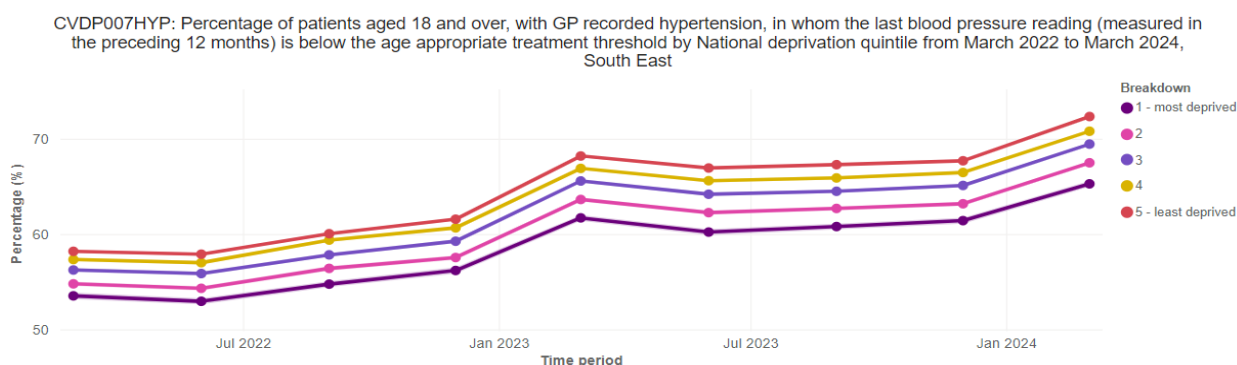
Figure 4: Percentage of patients aged 18 and over with hypertension treated to age-appropriate targets, NHS Regions



Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

At regional level, treatment to age-appropriate target is associated with deprivation at each level, with more deprived patients being less likely to be treated to target. In March 2024, 65.3% of patients in the most deprived national quintile in the South East were treated to age-appropriate targets compared to 72.3% in the least deprived quintile.

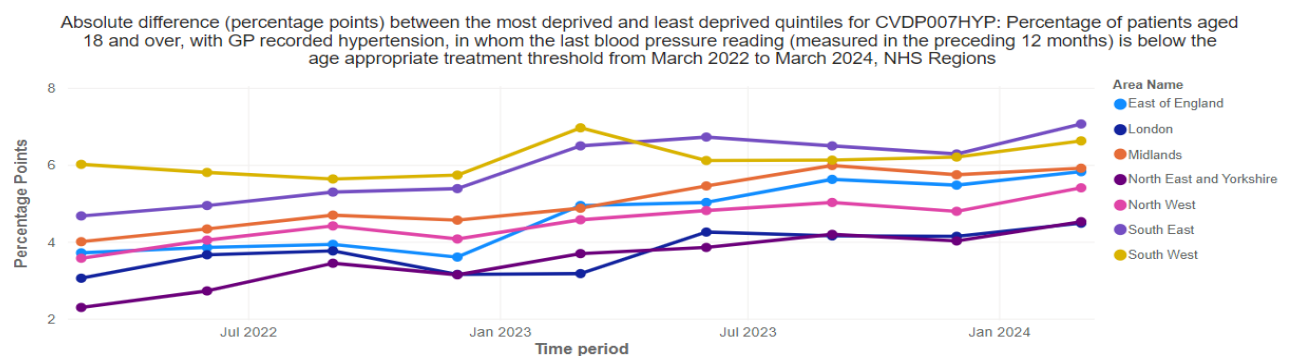
Figure 5: Percentage of patients aged 18 and over with hypertension treated to age-appropriate targets, by National deprivation quintile



Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

Additionally, the South East has among the largest percentage points gap between the least and most deprived deprivation quintiles for treatment to age-appropriate target compared to other NHS regions, a gap which has also increased slightly over time.

Figure 6: Absolute difference (percentage points) between the most and least deprived quintiles for proportion of adults with hypertension treated to age-appropriate targets



Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

The proportion of adults treated to age-appropriate target also varies by ethnicity. Patients with hypertension in the black ethnic groups have with 60.1% the lowest proportion treated to age - appropriate target; 11.2 percentage points lower compared to patients in the white ethnic group.

This is particularly important as people from black ethnic groups are at higher risk of cardiac events, therefore it is crucial to address these disparities in prevention. Systems and places are best placed to understand what is driving these differences, particularly since the ethnic groups do not represent homogenous populations. However, it is important to consider that whilst a higher proportion of patients with hypertension are not treated to target among ethnic minority groups, a large absolute number of patients in the white ethnic group (over 320,000 people) are not being treated to target, reflecting the South East demographic profile.

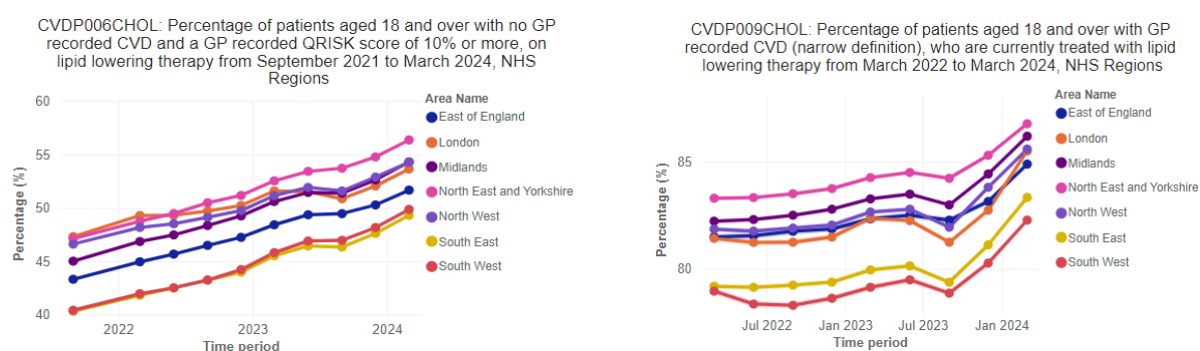
There are also disparities in hypertension treatment by age and sex. Younger age groups have the lowest rates for achieving hypertension treatment targets, leaving them with increased lifetime exposure to experience adverse CVD events. For example, only 59.7% of patients with recorded hypertension in the 40-59 year old age group were treated to target, compared to 79.3% in those aged 80 years and older. Men were less likely to be treated to target (68.9%) compared to women (71.4%).

4.2 High Cholesterol

The risk of developing a heart attack or a stroke within the next 10 years can be calculated using a risk stratification algorithm known as the QRISK score. The higher the score, the greater the risk. Patients with a QRISK score above 20%, for example, have at least a two in ten chance of experiencing a stroke or heart attack within the next decade.²⁸ Therefore, NICE recommends that adult patients with a QRISK score of 10% or more should be offered lipid lowering therapy alongside discussions about the benefits of lifestyle changes.²⁹

Compared to hypertension management, cholesterol treatment presents a slightly different and more complex picture in the South East and nationally. A large proportion of patients in the South East, who either have CVD or are at high risk of CVD (i.e. have a high QRISK score) do not have a recent prescription for lipid lowering therapy (LLT), and the SE region has one of the lowest proportions nationally. For instance, in the South East, 49.3% of patients with a QRISK score of 10% or higher were currently treated with LLT compared to 56.4% of patients in North East and Yorkshire. In patients with diagnosed CVD, 83.3% were currently treated with LLT in the South East compared to 86.8% in the North East and Yorkshire.

Figure 7: Percentage of adult patients with QRISK score of 10% or more (left graph) and those with CVD (right graph) on lipid lowering therapy



Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

In contrast to hypertension treatment, patients with diagnosed CVD in the most deprived deprivation quintiles are more likely to be prescribed lipid-lowering therapy (84.3% in the South East) compared to those in the least deprived deprivation quintile (83.0% in the South East), but are less likely to achieve the target cholesterol thresholds: in the South East, 34.7% of patients with CVD achieved cholesterol

²⁸ [Cardiovascular Risk Score \(QRISK2\) and the Use of Statins - Albany House Medical Centre](#)

²⁹ <https://www.nice.org.uk/guidance/ng238/chapter/Recommendations>

treatment targets in the least deprived quintile compared to 30.5% in the most deprived quintile.

In those with CVD, patients from the Asian ethnic group are more likely to be prescribed LLT and achieve the target treatment threshold, whereas patients from the black ethnic group are less likely to meet treatment threshold or be prescribed LLT.

Women and younger patients aged 18-39 perform worse across almost all cholesterol treatment indicators.

In the South East, 87% of male patients with CVD were receiving LLT compared to 77.2% of female patients; and 37.2% of men with CVD were treated to target compared to 26.9% of women.

A recent national deep dive report on inequalities in cholesterol management supports this regional finding at the national level. Across England, among people with CVD, women were less likely than men to have a recent prescription for a lipid lowering therapy (LLT), and they were also less likely to achieve threshold cholesterol levels compared to men. The deep dive report found that these disparities were present across all ethnic groups and by different levels of socioeconomic deprivation. In England, approximately 200,000 women with CVD had a record of high cholesterol and no recent LLT prescription. The report also found that women with a recent LLT prescription were much more likely to have achieved threshold cholesterol levels than women with no recent LLT prescription, suggesting that a considerable number of women with CVD could potentially benefit from such a prescription.³⁰

Similar disparities have also been observed in the United States, where a study found that women eligible for statin therapy were less likely than men to be treated with any statin or guideline-recommended statin intensity. The study findings suggested that a combination of women being offered statin therapy less frequently, while declining and discontinuing treatment more frequently, accounted for these sex differences in statin use. The study found that underlying factors from both patient and provider contributed to the problem and concluded that patients and providers alike must be educated on the safety and efficacy of LLT to optimise treatment efforts.³¹

³⁰ <https://www.cvdprevent.nhs.uk/news/gibz20o69gkhct17vcg0omaehl93jc>

³¹ Nanna MG, Wang TY, Xiang Q, Goldberg AC, Robinson JG, Roger VL, Virani SS, Wilson PWF, Louie MJ, Koren A, Li Z, Peterson ED, Navar AM. Sex Differences in the Use of Statins in Community Practice. *Circ Cardiovasc Qual Outcomes*. 2019 Aug;12(8):e005562. doi: 10.1161/CIRCOUTCOMES.118.005562. Epub 2019 Aug 16. PMID: 31416347; PMCID: PMC6903404.

5. Evidence-based QI strategies to improve hypertension and cholesterol detection and management - key findings from the literature review

Our comprehensive literature review identified 1100 studies. Following a rigorous screening process, 98 studies remained for detailed analysis. As mentioned in the methodology section, QI strategies in these studies were mapped and categorized based on the taxonomy of quality improvement strategies from the “Closing the Quality Gap” series.³² However, numerous studies included multi-component interventions. To manage the complexity of the combination of QI strategies, we adopted a systematic approach to identify a primary QI strategy for each study, based on either the effect size – identifying the intervention with the greatest impact – or the frequency of related interventions. For example, in studies where patient outreach and education were predominant, we categorized the primary strategy as patient education.

To ensure comprehensive analysis, we summarised all additional QI strategies in a separate section (see Appendix B).

Of the 98 studies, only 9 studies examined QI strategies related to the diagnosis or management of cholesterol or dyslipidaemia; whereas 80 studies examined outcomes in regard to hypertension diagnosis or management. The remaining studies had general outcomes, such as CVD or metabolic syndrome.

27 of the 98 studies were either systematic reviews (17) or Randomised Controlled Trials (RCTs, 10 studies). The main QI strategies examined in these systematic reviews and RCTs included organisational changes (8 studies, 7 of which related to team changes), followed by patient education (6 studies), promotion of self-management (5 studies), provider reminder systems (3 studies), facilitated relay (2), provider education (2), and audit and feedback (1).

5.1 Distribution of Primary Quality Improvement Strategies

Among the 98 studies reviewed, the majority of quality improvement interventions related to organisational change (37 studies), of which 21 studies examined team changes, such as adding new members to an established team; or creating multidisciplinary teams.

³² [Taxonomy of Quality Improvement Strategies - Through the Quality Kaleidoscope: Reflections on the Science and Practice of Improving Health Care Quality - NCBI Bookshelf](#)

The second most frequently reviewed QI strategy involved patient education (17), followed by provider education (15), promotion of self-management (10), and facilitated relay of data to providers (9) [Table 1]. Patient reminders, such as call-recall were examined in several studies, however not as part of the main quality improvement strategy.

Overall, this review highlights the wide range of QI strategies evaluated in the literature. It is important to note that most of these interventions were implemented in combination, reflecting a multi-faceted approach to QI.

Table 1. Number of studies by primary Quality Improvement strategy

| Taxonomy of Quality Improvement Strategies | Details | Number |
|---|---|---------------|
| Organisational change | Team or staff changes, includes adding new members to a team (e.g. pharmacist); or changing the roles of existing team members | 21 |
| | Changes in medical records systems, such as patient tracking systems | 9 |
| | Disease management or case management, including the coordination of assessment, treatment and referrals by a multidisciplinary team | 5 |
| | Continuous quality improvement techniques, including process remeasurements | 1 |
| | Communications, case discussion and exchange of information | 1 |
| Patient education | Focused on educating patients individually or in groups using print or audio-visual materials, often as part of multifaceted QI strategies | 17 |
| Provider education | This encompasses various educational interventions, including workshops or webinars aimed at changing clinical practices | 15 |
| Promotion of Self-Management | Involves providing resources and information to patients to help them manage their conditions, such as self-monitoring devices and follow-up calls. | 10 |
| Facilitated relay of clinical data to providers | This involves transferring patient-collected clinical data to providers through non-traditional means like phone transmissions | 9 |
| Provider reminder systems | Include any patient or clinical encounter-specific information given to clinicians to prompt care processes or evidence-based recommendations. | 7 |
| Audit and feedback | Summaries of clinical performance over specific periods are reported to providers or institutions to guide improvements, sometimes using benchmarking against leading organisations | 3 |
| Patient reminders | Efforts by providers to encourage patients to maintain appointments and adhere to their care plans. | 0 |
| Total | | 98 |

5.2 Detailed findings

For the purpose of this report, we will describe literature findings from the most frequently examined and most effective QI strategies in more detail, including team

changes, patient and provider education, and promotion of self-management. The most impactful evidence from the remaining quality improvement strategies will be summarised in brief.

5.2.1 Organisational Change – Team changes and exchange of information

Quality Improvement strategies involving team changes may include adding new members to a team (such as pharmacists, nurses), creating multi-disciplinary teams, changing the role of existing team members, or simply adding more healthcare practitioners to a setting.

A systematic review examining the levels of hypertension detection in primary care in England found that whilst few system factors were associated with detection, higher numbers of General Practitioners (GPs) per 1000 population increased detection rates.³³

Several studies demonstrated that integrating pharmacists or community health workers into the care pathway or implementing nurse-led hypertension or cholesterol interventions can lead to a reduction in high blood pressure and cholesterol, and increased patient satisfaction, particularly in underserved populations.^{34 35 36 37 38} Some studies also highlighted the cost-effectiveness of involving pharmacists or nurses in the hypertension and cholesterol care pathway.^{39 40} Additionally, some community-based initiatives showed improved hypertension control as well as reduced barriers to hypertension management.⁴¹

³³ Baker, R., et al. (2018). Levels of detection of hypertension in primary medical care and interventions to improve detection: A systematic review of the evidence since 2000." *BMJ open* 8(3): e019965.

<https://bmjopen.bmj.com/content/early/by/section>

³⁴ Pasha, M., et al. (2021). "Health Care Delivery Interventions for Hypertension Management in Underserved Populations in the United States: A Systematic Review." *Hypertension* 78(4): 955-965.

<https://www.ahajournals.org/journal/hyp>

³⁵ Isetts, B. J., et al. (2016). "Evaluation of Pharmacists' Work in a Physician-Pharmacist Collaborative Model for the Management of Hypertension." *Pharmacotherapy* 36(4): 374-38.

³⁶ Proia, K. K., et al. (2014). "Team-based care and improved blood pressure control: a community guide systematic review." *American journal of preventive medicine* 47(1): 86-99.

³⁷ Ingoo, L., et al. (2021). "Improving the identification of patients with a genetic diagnosis of familial hypercholesterolaemia in primary care: A strategy to achieve the NHS long term plan."

Atherosclerosis 325: 38-45. <https://www.elsevier.com/locate/atherosclerosis>

³⁸ Bullo, L., et al. (2023). "Effectiveness of nurse-led interventions to manage hypertension and lifestyle behaviour effectively: A systematic review and meta-analysis." *Europace* 25(Supplement 1): i1247.

³⁹ Lee, P., et al. (2019). "Using lean thinking to improve hypertension in a community health centre: a quality improvement report." *BMJ open quality* 8(1): e000373.

⁴⁰ Schultz, B. G., et al. (2021). "Cost-Effectiveness Analysis of a Pharmacist-Led Medication Therapy Management Program: Hypertension Management." *Value in Health* 24(4): 522-529.

⁴¹ Nasser, S. A. and Ferdinand K. C. (2018).

"Community Outreach to African-Americans: Implementations for Controlling Hypertension."

Current hypertension reports 20(4): 33.

https://www.researchgate.net/publication/324406688_Community_Outreach_to_African-Americans_Implementations_for_Controlling_Hypertension

"Community collaboration improves blood pressure control by 13.5% in a medium-sized metropolitan area."

Journal of the American Society of Hypertension 8(4 SUPPL. 1): e50.

Another systematic review (Walsh et al, 2006) demonstrated that team changes, including assignment of some responsibilities to a health professional other than the patient's physician, were associated with the largest reductions in blood pressure outcomes, defined as either actual change in blood pressure or change in the percentage of individuals with blood pressure within a target blood pressure range.⁴²

A recent study by Vora et al (2024) made the case for the integrated, interdisciplinary management of managing CVD, kidney, and other metabolic diseases together as an interdisciplinary CaReMe model of care with greater integration between specialties allowing for early treatment and reducing the risk of major events.⁴³

Other studies highlighted the benefits of creating integrated models of care and exploring the expansion of hypertension and cholesterol pathways in other settings, outside of the usual primary care settings. For instance, a quality improvement project by anaesthesiologists who successfully implemented a hypertension protocol in the perioperative period, showed the potential to identify and manage patients with undiagnosed or poorly controlled blood pressure and reduce public health burden through multidisciplinary collaboration.⁴⁴ Equally, a study by Rao et al. (2018) highlighted the role of dentists in the early diagnosis of hypertension, suggesting that screening in dental offices can be an effective method for detecting undiagnosed hypertension and preventing life-threatening complications.⁴⁵

In addition to the benefits of integrated care and multi-disciplinary work across specialties, a study conducted by Presley-Cantrell et al. (2016) examining the impact of The Million Hearts Learning Collaborative (MHSLC) in the United States demonstrated that large learning collaboratives involving public health, healthcare systems, and communities, through quality improvement processes, can increase hypertension detection and control.⁴⁶

5.2.2 Patient education

Quality improvement strategies related to patient education may include in-person patient education, either individually or in groups, web or app-based education

⁴² Walsh, J. M. E., et al. (2008). "Implementing Effective Hypertension Quality Improvement Strategies: Barriers and Potential Solutions."

The Journal of Clinical Hypertension 10(4): 311-316.

⁴³ Vora, J., et al. (2024). "Inter-relationships between cardiovascular, renal and metabolic diseases: Underlying evidence and implications for integrated interdisciplinary care and management."

Diabetes, Obesity and Metabolism 26(5): 1567-1581. <https://dom-pubs.onlinelibrary.wiley.com/doi/10.1111/dom.15485>

⁴⁴ Pfister, C.-L., et al. (2020). "A Multicenter, Cross-Sectional Quality Improvement Project: The Perioperative Implementation of a Hypertension Protocol by Anesthesiologists."

Anesthesia and analgesia 131(5): 1401-1408.

⁴⁵ Rao, S. S., et al. (2018).

"Is screening in dental office an effective method of detecting undiagnosed hypertension?"

Indian journal of dental research : official publication of Indian Society for Dental Research 29(4): 534-539.

⁴⁶ Presley-Cantrell, L., et al. (2016). "Improving hypertension control through the million hearts learning collaborative." Circulation 134(Supplement 1).

interventions, or the introduction of print or other education material. Often, patient education interventions were one component of a multi-faceted QI strategy.

Several studies showed that educational programmes and counselling, including in group settings, have been successful in improving patient knowledge and self-management, leading to better blood pressure control. Gibson et al. (2018) and Meredith et al. (2020) demonstrated significant BP reductions and lifestyle improvements, such as exercise levels, weight reduction, and reduced salt intake, through tailored education programs.^{47 48} Integrating lifestyle medicine with virtual group visits and home BP monitoring, as in Mirsky et al. (2022), showed improved BP control and medication adherence. Additionally, behavioural interventions emphasizing diet, exercise, and medication adherence improved blood pressure outcomes.^{49 50}

A systematic review of QI strategies to improve outcomes in patients with CVD yielded mixed results for patient support and its association with lipid and blood pressure control, though the interventions were found to be feasible and cost-effective. Printed information showed no meaningful effect.⁵¹

Culturally tailored educational interventions to manage hypertension were shown to be feasible and effective in a small study aimed at improving BP control in Haitians and other black immigrant communities,⁵² whilst generic, non-tailored interventions showed mixed results: Ogedegbe et al. (2014) found that a non-tailored multicomponent intervention was no more effective than usual care in improving BP control among hypertensive Black patients.⁵³

An intervention in England where patients with blood pressure measurements around a certain threshold were advised by nurses to visit their GP showed an increase in earlier diagnosis and medication use. However, after four years, there were no perceivable gains in health outcomes, indicating that although a nudge process can

⁴⁷ Gibson, I., et al. (2018). "Assessing the impact of a novel community based education programme on the self management of hypertension." *Heart* 104(Supplement 7): A25.

⁴⁸ Meredith, A. H., et al. (2020). "Group education program for hypertension control." *Journal of Clinical Hypertension* 22(11): 2146-2151.

⁴⁹ Mirsky, J. B., et al. (2022). "Hypertension Control and Medication Titration Associated With Lifestyle Medicine Virtual Group Visits and Home Blood Pressure Monitoring." *American Journal of Lifestyle Medicine*.

⁵⁰ Miller, E. R., III, et al. (2021). "Evaluation of a Video-Assisted Patient Education Program to Reduce Blood Pressure Delivered Through the Electronic Medical Record: Results of a Quality Improvement Project." *American journal of hypertension* 34(12): 1328-1335.

⁵¹ Singh K, Bawa VS, Venkateshmurthy NS, et al. Assessment of Studies of Quality Improvement Strategies to Enhance Outcomes in Patients With Cardiovascular Disease. *JAMA Netw Open*. 2021;4(6):e2113375.

doi:10.1001/jamanetworkopen.2021.13375. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2780951>

⁵² Marseille, B. R., et al. (2021). "Improving hypertension knowledge, medication adherence, and blood pressure control: A feasibility study." *Journal of clinical nursing* 30(19-20): 2960-2967.

⁵³ Ogedegbe, G., et al. (2014). "Counseling african americans to control hypertension: Cluster-randomized clinical trial main effects." *Circulation* 129(20): 2044-2051. <https://pubmed.ncbi.nlm.nih.gov/24657991/>

lead to early detection, without comprehensive follow-up it may have limited long-term benefits.⁵⁴

Overall, quality improvement strategies related to patient education that combine education, lifestyle modifications, team-based care, and community engagement seem to be more effective than single-component interventions. Equally, quality improvement interventions that were personalised and culturally tailored and those that included long-term follow-up and continuous patient engagement showed better hypertension outcomes.

5.2.3 Provider education

As mentioned in previous sections, provider education was usually one component of multi-faceted quality improvement strategies.

Provider education interventions mentioned in the reviewed studies included in-person or virtual education sessions, monthly coaching and webinars, and sharing of resources. Education interventions were provided to a wide range of healthcare providers, including junior doctors, physicians, nurses, and community health coaches. Education and training addressed risk-based treatment, accurate BP measurements, guidelines and medication reconciliation, the availability of different BP monitoring methods, accurate data entry into electronic health systems, communication and behaviour change strategies, and motivational interviewing.

Provider education initiatives have been shown to be effective at practice as well as at system-level:

- A multi-component QI intervention study aimed at reducing racial disparities trained practice staff and community health providers in communication and motivational interviewing. Whilst the study did not show a differential effect on the intervention by race, it demonstrated a significant and sustained improvement in hypertension control in both White and African American patients.⁵⁵
- A large, regional QI collaborative in the USA aimed at improving blood pressure control in low-income populations included quarterly webinars, links to resources, and consultations with subject matter experts, and resulted in an average 5% increase in hypertension control rates across 9 counties in California.⁵⁶

⁵⁴ Rodriguez-Lesmes, P. (2021). "Estimating the gains of early detection of hypertension over the marginal patient." PLoS one 16(7 July): 0254260. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254260&type=printable>

⁵⁵ Cene, C. W., et al. (2017). "A multicomponent quality improvement intervention to improve blood pressure and reduce racial disparities in rural primary care practices." Journal of clinical hypertension (Greenwich, Conn.) 19(4): 351-360.

⁵⁶ Backman, D. R., et al. (2017). "Implementing a Quality Improvement Collaborative to Improve Hypertension Control and Advance Million Hearts Among Low-Income Californians, 2014-2015." Preventing chronic disease 14: E61.

- Offering training on accurate BP measurements to medical assistants and nurses demonstrated positive effects on hypertension control in several studies.^{57 58 59} A large pre-post implementation study in the USA confirmed these findings: a multi-component initiative focussing on provider education and accurate BP measures showed rapid and sustained improvement in hypertension control, with control rates increasing from 64.4% to 74.3% ($P < 0.0001$) in 16,787 hypertensive adults in only 6 months.⁶⁰

Overall, provider education is an important element of an effective QI strategy and can lead to significant and sustained improvements in hypertension management.

5.2.4 Promotion of Self-Management

The strategies to promote self-management have some overlaps with patient education and patient reminder strategies. The initiatives to improve self-management included mobile apps, home blood pressure measurement, and mHealth interventions, which is defined as the use of mobile devices, like mobile phones or other wireless devices to send tailored messages to patients, foster interactive communication, or monitor vital signs in real-time.⁶¹

Promoting self-management has shown to be greatly effective in hypertension control, as highlighted by Manalili et al (2022) in their systematic review on the effectiveness of person-centred quality improvement strategies.⁶²

Another systematic review and meta-analysis of the effectiveness of self-management of hypertension using mobile health technologies included the use of mobile devices for apps, text messages, emails or phone calls. Li et al (2020) demonstrated significant reductions in systolic and diastolic blood pressure measures, increased medication adherence, and behavioural change. The study demonstrated that tailored messages based on patients' health status and readiness, two-way interactive communication, and multifaceted functions can produce better effectiveness in the self-management of hypertension.⁶³ These findings were confirmed by Alessa et al (2018) in their systematic review of the effectiveness and user satisfaction of mobile apps to support

⁵⁷ Sadeghi, C., et al. (2019). "Improving blood pressure control by optimization of guideline directed therapy for hypertension in a primary care setting: Quality improvement project." *Journal of general internal medicine* 34(2 Supplement): S257.

⁵⁸ Abdalla, M., et al. (2023). "Implementation Strategies to Improve Blood Pressure Control in the United States: A Scientific Statement From the American Heart Association and American Medical Association." *Hypertension* 80(10): e143-e157.

⁵⁹ Shaikh, U., et al. (2020). "Improving blood pressure screening and control at an academic health system." *BMJ open quality* 9(1): e000614 <https://bmjopenquality.bmj.com/content/9/1/e000614.abstract>

⁶⁰ Egan, B. M., et al. (2018). "Improving Hypertension Control in Primary Care With the Measure Accurately, Act Rapidly, and Partner With Patients Protocol." *Hypertension* 72(6): 1320-1327.

⁶¹ <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/4774>

⁶² Manalili, K., et al. (2022).

"The effectiveness of person-centred quality improvement strategies on the management and control of hypertension in primary care: A systematic review and meta-analysis." *Journal of evaluation in clinical practice* 28(2): 260-277. <https://onlinelibrary.wiley.com/doi/abs/10.1111/jep.13618>

⁶³ Li, R., et al. (2020). "The Effectiveness of Self-Management of Hypertension in Adults Using Mobile Health: Systematic Review and Meta-Analysis." *JMIR Mhealth Uhealth* 8(3): e17776. <https://mhealth.jmir.org/2020/3/e17776/>

the self-management of hypertension. Whilst the author pointed out the high risk of bias, most of the studies reviewed reported significant decreases in blood pressure.⁶⁴ Cao et al (2018) developed a patient-centred engagement framework for hypertension self-management, highlighting the important role of engagement in intervention effectiveness and the essential roles of patient factors in tailoring, interactivity, and engagement.⁶⁵

The distribution of devices to enhance a patients' ability to manage their condition shows promising results in the context of hypertension and cholesterol control. A standardised remote blood pressure and cholesterol management programme, involving home BP device integration, remote education on behavioural changes, and medication recommendations indicated a significant improvement of hypertension and cholesterol measures and a reduction of CVD risk among diverse populations.⁶⁶

Equally, a home BP digital intervention in the UK using BP home monitoring led to better hypertension control with low incremental cost.⁶⁷

Overall, promoting self-management seems to be a highly effective QI strategy in the improvement of hypertension and cholesterol management, particularly through the use of person-centred, tailored approaches that include patient education, mHealth interventions, and home BP measurement.

5.2.5 Audit and feedback, patient and provider reminders, facilitated relay, and changes to the medical record system

Audit and feedback

Three large studies in the USA reviewed the effectiveness of audit and feedback mechanisms as the main QI strategy and found significant absolute risk reduction for CVD⁶⁸, increased screening rate for lipid levels and better adherence to lipid modification guidelines⁶⁹, and increased hypertension control.⁷⁰ These multi-faceted,

⁶⁴ Alessa, T., et al. (2018). "Mobile Apps to Support the Self-Management of Hypertension: Systematic Review of Effectiveness, Usability, and User Satisfaction." JMIR Mhealth Uhealth 6(7): e10723.

⁶⁵ Cao W, Milks MW, Liu X, Gregory ME, Addison D, Zhang P, Li L. mHealth Interventions for Self-management of Hypertension: Framework and Systematic Review on Engagement, Interactivity, and Tailoring. JMIR Mhealth Uhealth. 2022 Mar 2;10(3):e29415. doi: 10.2196/29415. PMID: 35234655; PMCID: PMC8928043. <https://mhealth.jmir.org/2022/3/e29415>

⁶⁶ Blood, A. J., et al. (2023). "Results of a Remotely Delivered Hypertension and Lipid Program in More Than 10 000 Patients Across a Diverse Health Care Network." JAMA cardiology 8(1): 12-21.

⁶⁷ McManus, R. J., et al. (2021). "Home and Online Management and Evaluation of Blood Pressure (HOME BP) using a digital intervention in poorly controlled hypertension: Randomised controlled trial." The BMJ 372: m4858. <https://www.bmj.com/content/372/bmj.m4858>

⁶⁸ Lindner, S. R., et al. (2023). "Estimating the Cardiovascular Disease Risk Reduction of a Quality Improvement Initiative in Primary Care: Findings from EvidenceNOW." The Journal of the American Board of Family Medicine 36(3): 462.

⁶⁹ Bertoni AG, Bonds DE, Chen H, Hogan P, Crago L, Rosenberger E, Barham AH, Clinch CR, Goff DC Jr. Impact of a multifaceted intervention on cholesterol management in primary care practices: guideline adherence for heart health randomized trial. Arch Intern Med. 2009 Apr 13;169(7):678-86. doi: 10.1001/archinternmed.2009.44. PMID: 19364997; PMCID: PMC2937279.

⁷⁰ Jaffe, M., et al. (2014). "The Kaiser Permanente Northern California Hypertension Project 2001-2012: How an integrated care delivery system increased and maintained blood pressure control rates from 44% to 86% in 11 years." Journal of the American Society of Hypertension 8(4 SUPPL. 1): e11. <https://www.sciencedirect.com/science/article/abs/pii/S1933171114001405?via%3Dihub>

system-level initiatives to help practices improve hypertension and cholesterol management and guideline adherence, included guideline dissemination, provision of facilitation, performance benchmarking data, and audit and feedback. These initiatives have been effective in both cholesterol and hypertension management, as well as in reducing CVD risk.

Organisational Change – changes in medical record systems

Conducting plan-do-study-act cycles involving programmable electronic health records, creating customised workflows using digital technologies, implementing clinical decision support systems, and using standardised measurement and treatment algorithms have all been shown to be effective in increasing statin therapy, improving the management of dyslipidemia, and increasing hypertension detection and management.^{71 72 73 74}

The infrastructure, support, and involvement across all levels of the health system with rapid and continuous performance feedback is pivotal in increasing hypertension control rates, as identified by Sim et al. (2014) in their review of systemic implementation strategies to improve hypertension in a large ethnically diverse population of more than 3.6 million people.⁷⁵

Facilitated relay

Facilitated relay, the transfer of clinical patient data to provider via non-traditional means such as e-health, including tele-health and mobile health methods, is often part of a multi-component tiered QI programme, and has overlaps with patient education and promotion of self-management. In the studies reviewed, patients usually provide information about their health status via web-based monitoring, apps, and tablets, and receive feedback from healthcare providers or health coaches regarding medication optimisation and lifestyle changes. Most studies showed improved BP control and lifestyle change, as well as increased patient engagement. In their systematic review of the most effective BP monitoring methods, Constanti et al (2021) found ambulatory

⁷¹ Apple, S. J., et al. (2023). "Closing the Gaps in Care of Dyslipidemia: Revolutionizing Management with Digital Health and Innovative Care Models." *Reviews in Cardiovascular Medicine* 24(12): 350.

⁷² Bakhai, S., et al. (2018). "Optimisation of lipids for prevention of cardiovascular disease in a primary care." *BMJ open quality* 7(3): e000071.
<https://bmjopenquality.bmj.com/content/7/3/e000071.abstract>

⁷³ Meador, M., et al. (2018). "Improving Identification and Diagnosis of Hypertensive Patients Hiding in Plain Sight (HIPS) in Health Centers." *The Joint Commission Journal on Quality and Patient Safety* 44(3): 117-129.

⁷⁴ Fontil, V., et al. (2018). "Adapting and Evaluating a Health System Intervention From Kaiser Permanente to Improve Hypertension Management and Control in a Large Network of Safety-Net Clinics." *Circulation. Cardiovascular quality and outcomes* 11(7): e004386.

⁷⁵ Sim, J. J., et al. (2014). "Systemic implementation strategies to improve hypertension: The Kaiser permanente southern california experience." *Canadian Journal of Cardiology* 30(5): 544-552.
<https://pubmed.ncbi.nlm.nih.gov/24786445/>

BP measurement, which involves a wearable device to monitor a patient's blood pressure over a 24-hour period, the most cost-effective option.⁷⁶

Patient and provider reminder systems

Two systematic reviews of QI strategies focused on electronic health record-driven initiatives in primary care to improve hypertension control included interventions such as clinical decision support systems and provider-facing best practice alerts. The studies demonstrated modest, though promising results regarding implementing clinical decision support and best practice alerts.⁷⁷ An effective implementation approach included a combination of guideline-concordant decision support interventions implemented with clinician-directed education and process intensive, tailored stakeholder-engagement strategies to enable adoption of the intervention.⁷⁸

In their pre- and post-implementation study, Bangash et al (2024) were able to show the effectiveness of provider reminder systems in the form of a clinical decision support system on cholesterol control, likely due to higher rates of clinician-led lipid-lowering therapy initiation and intensification.⁷⁹ Rashid et al (2022) showed similar improvements to statin prescription rates after the implementation of a new clinician-facing, online interactive tool, the display of guideline summary in the workspace, and documentation reminder in the electronic health record.

QI improvement strategies including patient reminders and follow up showed some positive results, particularly around patient engagement.^{80 81}

5.2.6 Summary

Overall, effective Quality Improvement strategies to improve hypertension and cholesterol control include the following components:

- Organisational change, including team changes, creating multi-disciplinary and integrated models of care

⁷⁶ Constanti, M., et al. (2021). "Options for the diagnosis of high blood pressure in primary care: a systematic review and economic model." *Journal of human hypertension* 35(5): 455-461.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC8134050/>

⁷⁷ Ose, D., et al. (2023). "Electronic Health Record-Driven Approaches in Primary Care to Strengthen Hypertension Management Among Racial and Ethnic Minoritized Groups in the United States: Systematic Review." *Journal of medical Internet research* 25(1): e42409.

⁷⁸ Kamath, C. C., et al. (2020). "Improving Blood Pressure Management in Primary Care Patients with Chronic Kidney Disease: a Systematic Review of Interventions and Implementation Strategies." *Journal of general internal medicine* 35(Supplement 2): 849-869.

⁷⁹ Bangash, H., et al. (2024). "Effect of clinical decision support for severe hypercholesterolemia on low-density lipoprotein cholesterol levels." *npj Digital Medicine* 7(1): 73.

⁸⁰ Anderson, M. L., et al. (2017). "Outcomes of a multi-community hypertension implementation study: the American Heart Association's Check. Change. Control. program." *Journal of clinical hypertension* (Greenwich, Conn.) 19(5): 479-487.

⁸¹ Miller, E. R., III, et al. (2021). "Evaluation of a Video-Assisted Patient Education Program to Reduce Blood Pressure Delivered Through the Electronic Medical Record: Results of a Quality Improvement Project." *American journal of hypertension* 34(12): 1328-1335.

- Personalised and tailored patient education including lifestyle modifications, and community engagement; and promotion of self-management using mobile health technologies and home BP measurement
- Provider education addressing guideline implementation, training on accurate measurements, communication, and behaviour change strategies; and provider reminders including clinical decision support and best-practice alerts
- System-level initiatives with guideline dissemination, performance benchmarking, and audit and feedback.

6. Findings from the review of studies on the implementation of Clinical Practice Guidelines (CPG)

A review of six systematic reviews on QI strategies to improve clinical practice guideline implementation, yielded similar results to the more specific review of QI strategies focused on hypertension and cholesterol improvement.^{82 83 84 85}

Key interventions that have proven to be effective in CPG implementation studies included:

- well-coordinated, multi-disciplinary teams with clearly defined roles and integrated care models
- continuous education and training for healthcare providers and patients
- supportive leadership
- management support
- stakeholder involvement
- and robust audit and feedback mechanisms.

⁸² Correa, V.C., Lugo-Agudelo, L.H., Aguirre-Acevedo, D.C. et al. Individual, health system, and contextual barriers and facilitators for the implementation of clinical practice guidelines: a systematic metareview. *Health Res Policy Sys* 18, 74 (2020). <https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-020-00588-8>

⁸³ Abdalla M, Bolen SD, Brettler J, Egan BM, Ferdinand KC, Ford CD, Lackland DT, Wall HK, Shimbo D; American Heart Association and American Medical Association. Implementation Strategies to Improve Blood Pressure Control in the United States: A Scientific Statement From the American Heart Association and American Medical Association. *Hypertension*. 2023 Oct;80(10):e143-e157. doi: 10.1161/HYP.000000000000232. Epub 2023 Aug 31. PMID: 37650292; PMCID: PMC10578150.

⁸⁴ Chan WV, Pearson TA, Bennett GC, Cushman WC, Gaziano TA, Gorman PN, Handler J, Krumholz HM, Kushner RF, MacKenzie TD, Sacco RL, Smith SC Jr, Stevens VJ, Wells BL. ACC/AHA Special Report: Clinical Practice Guideline Implementation Strategies: A Summary of Systematic Reviews by the NHLBI Implementation Science Work Group: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2017 Feb 28;69(8):1076-1092. doi: 10.1016/j.jacc.2016.11.004. Epub 2017 Jan 26. PMID: 28132746.

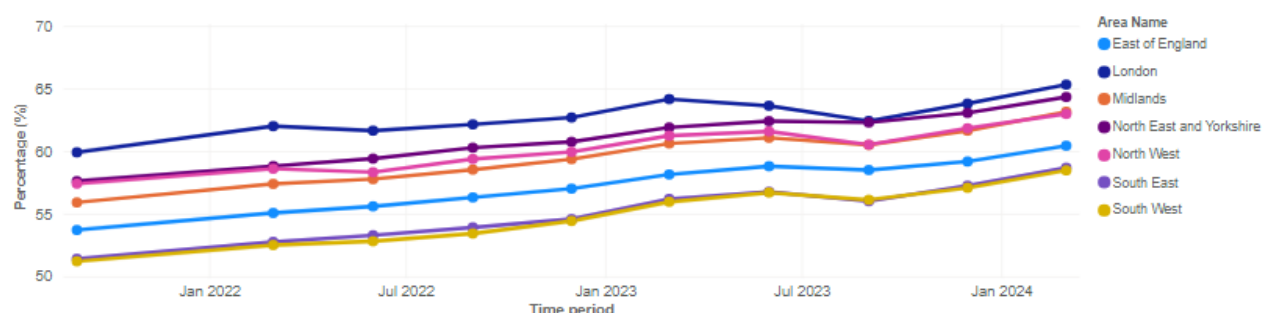
⁸⁵ Zhou P, Chen L, Wu Z, Wang E, Yan Y, Guan X, Zhai S, Yang K. The barriers and facilitators for the implementation of clinical practice guidelines in healthcare: an umbrella review of qualitative and quantitative literature. *J Clin Epidemiol*. 2023 Oct;162:169-181. doi: 10.1016/j.jclinepi.2023.08.017. Epub 2023 Aug 30. PMID: 37657616.

Additionally, two studies highlighted the importance of organisational culture in improving clinical guideline implementation, particularly in promoting physicians' adherence to the guidelines.^{86 87}

7. Findings from a semi-structured interview with CVD leads in the high performing North East and Yorkshire region

CVDPREVENT data show that the North East and Yorkshire region have been consistently highly performing in hypertension and cholesterol diagnosis and management. (Figure 8 and Figure 9). The North East and Yorkshire region includes 4 integrated care systems: Humber and North Yorkshire Health and Care Partnership, North East and North Cumbria ICS, South Yorkshire ICS, and West Yorkshire Health and Care Partnership.

Figure 8: Percentage of patients aged 18+ with a GP recorded QRISK score of 20% or more on lipid lowering therapy, NHS regions, Sep 2021-Mar 2024

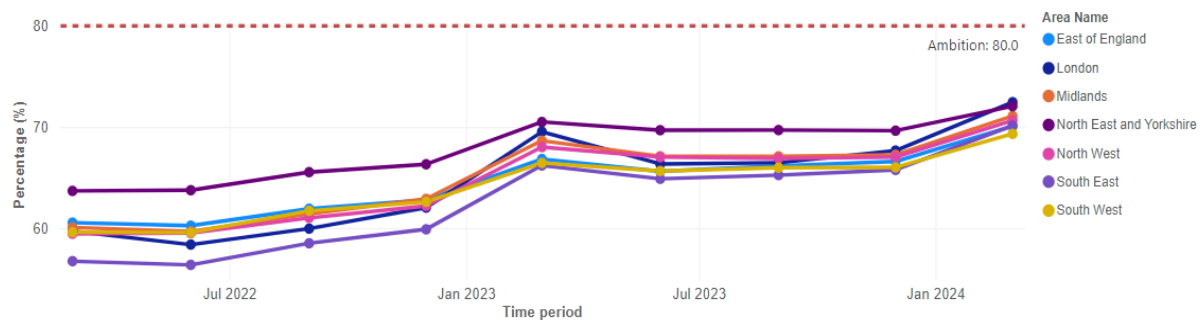


Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

⁸⁶ Pereira VC, Silva SN, Carvalho VKS, Zanghelini F, Barreto JOM. Strategies for the implementation of clinical practice guidelines in public health: an overview of systematic reviews. Health Res Policy Syst. 2022 Jan 24;20(1):13. doi: 10.1186/s12961-022-00815-4. PMID: 35073897; PMCID: PMC8785489.

⁸⁷ Wang T, Tan JB, Liu XL, Zhao I. Barriers and enablers to implementing clinical practice guidelines in primary care: an overview of systematic reviews. BMJ Open. 2023 Jan 6;13(1):e062158. doi: 10.1136/bmjopen-2022-062158. PMID: 36609329; PMCID: PMC9827241.

Figure 9: Percentage of patients with recorded hypertension treated to age-appropriate target, NHS regions, Sept 2021-Mar 2024



Source: Office for Health Improvement and Disparities, CVD Prevention Quality Improvement Dashboard. © Crown copyright 2023

We conducted a semi-structured interview with two CVD leads in an ICB in the North East and Yorkshire region. The ICB covers a population of 1.7 million over across a region of 1500 square miles, including some of the most deprived areas in the country. The system has a diverse population with significant areas of deprivation, making one-size-fits-all solutions ineffective.

In the interview, we identified five main categories or factors that enabled the system's improvement of hypertension and cholesterol diagnosis and management:

7.1 Establishing CVD as a key priority at system and local level

CVD is part of the ICB's transformation plan and is one of the 4 big outcome priorities. The two ICB leads are working with place-based CVD leads to make CVD a priority on place-based plans and strategies.

7.2 Using a data-driven approach

CVDPREVENT data are used for network meetings and planning guidance, and a regional data analyst regularly compiles a report at system level with highlights from CVDPREVENT data, which also includes data on inequalities. Access to local data has proven to be crucial, however, access varies across places. For example, the ICB data analysts can access SystemOne data but not across the whole system as some practices use EMISWeb. The ICB CVD leads are working on attaining place-based data analysis across the whole system to help local CVD clinical leads plan targeted, needs-based and evidence informed interventions

7.3 Place-based clinical leads help drive local change

Each place, often aligned with former Clinical Commissioning Groups (CCG) footprint/local authority footprints, has a clinical lead for CVD, which helps drive local change. The ICB CVD leads are well connected with place-based CVD leads and join the regular monthly place-based updates and meetings. In those meetings ICB CVD leads provide the place-based team with regional updates and get feedback and insight from places. Whilst consistency and systematic approaches vary across places, several places have an established solid community of practice, including innovative, place or Primary Care Network (PCN) based improvement models. For instance, one PCN has developed a multi-disciplinary team-based intervention, with a team consisting of a dietitian, data analyst, social prescriber and lead GP, working across the whole PCN, and focusing on the 10% most deprived in their population and their main concerns, either health-related or social determinants related, rather than on a specific condition.

The two ICB leads stated that ideally, interventions should be tailored, rather than a broad system-wide approach and take into account the wider determinants of health.

7.4 Integrated, multi-disciplinary networks and partnerships:

The ICB CVD leads stated that integrating the system's CVD and Long Term Condition (LTC) teams under the health inequalities team has enabled moving away from a disease specific pathway to prevention of long- term conditions in general and addressing wider determinants of health.

Additionally, the ICB's CVD team is working together with a wide range of stakeholders, which helps integrate CVD prevention with schemes and initiatives that address health inequalities and the wider determinants of health. For instance, the ICB has an established CVD prevention network with a wide range of partners and joint leadership and chairing of the network meetings between the Local Authority and ICB. The network and CVD prevention teams are using a life course approach to manage the condition and the Population Health Management (PHM) methodology to identify populations with the greatest need. The wide partnership, with Local Authorities taking on co-leadership, helps ensure that primary, secondary, and tertiary prevention is in focus and work is aligned across the different organisations.

The ICB CVD leads also stressed the importance of having a good overview of and engagement from all – and not only clinical - stakeholders involved in CVD prevention and to map CVD prevention networks and infrastructure across the system.

7.5 Setting clear and achievable objectives

Lastly, the two ICB CVD leads stated that it helped them to focus “on the basics”, including ensuring a functioning data infrastructure, before innovating. Recognising the large scale of the work, they recommended keeping the programme plan focused and manageable, and “breaking the work down into doable chunks”, making sure to align deliverables with existing capacities. They stated that it is helpful to be clear about the scope of the work, setting achievable goals and priorities.

8. Findings from semi-structured interviews with high-performing General Practices in the South East

A thematic analysis of semi-structured interviews on hypertension management with four high-performing practices across the South East showed several themes aligned with findings from the literature, highlighting the importance of implementing evidence-based practice.

Despite differences in size and population characteristics among the GP practices – ranging from list sizes of 4000 with a predominantly elderly population to practices with over 10,000 younger and more diverse patients - several key themes emerged, highlighting best practice and strategies used in successfully managing hypertension across diverse healthcare settings.

8.1 Proactive Hypertension Identification and Management, and Increasing Access

All practices showed a proactive approach to identifying and managing hypertension, using personalised call-and recall systems, and increasing access to blood pressure monitoring and NHS Health Checks at various opportunities, for instance by offering weekend clinics, or integrating NHS Health Checks into flu and RSV vaccination clinics. Practices highlighted the importance of increasing access by adapting services to offer appointments outside typical working hours and using every patient contact with the healthcare setting as an opportunity for BP monitoring and treatment optimisation.

All practices emphasize the need for prevention over reactive management. Regular health checks, lifestyle advice, and community-based interventions were felt to be key to preventing the progression of hypertension.

8.2 Leadership, Culture, and Continuous Learning

Strong leadership focused on CVD and hypertension management was a recurring theme. GP partners or dedicated CVD leads within the practices play a significant role in achieving QOF targets and guiding the team's approach to chronic disease management.

A culture of continuous and shared learning, regularly reviewing internal processes to adapt and improve the practices' hypertension management, and a move from focusing solely on hypertension to a holistic management of all long-term conditions were found to be particularly helpful in driving quality improvement. Regular team meetings, attendance in and presenting at ICB-led events, participation in pilot programmes, and implementation of guidelines were some examples of team involvement and a culture of shared learning.

8.3 Team- Based, Integrated, and Collaborative Care

All practices showed a team-based approach, involving not only the patient's physicians but also clinical pharmacists, GP partners, nurses, healthcare assistants (HCAs), social prescribers, and administrative staff in managing hypertension. Each team member plays an important role in hypertension management, from data entry and recalls, to patient education and prescription reviews.

Practices stressed the importance of integrated working and collaboration between different teams and roles, including care coordinators, wellbeing teams, and dieticians to ensure that hypertension management goes beyond medication treatment to include lifestyle advice and referrals to weight management or exercise programmes. For instance, one of the practices has an in-house physiotherapist, offering treatment and advice to those struggling to be physically active.

8.4 Patient Education and Self-Management

One of the prevalent themes across all four interviews was the emphasis on patient education, tailored to the practice's demographic. Practices used various methods, depending on their population characteristics, including multi-lingual staff, newsletters, social media, and health promotion days to inform patients about the risks of hypertension and the benefits of lifestyle changes.

Practices also promote patient self-management, encouraging patients to monitor their blood pressure at home or send remote readings, however, several practices also highlighted the importance to offer BP-reading in the practice at various opportunities to prevent digital exclusion. For instance, one practice installed an automated ICB-funded BP and health kiosk in the practice's reception area, allowing

for immediate BP checks and reducing the reliance on digital tools for those who are not digitally enabled.

8.5 Audits, Data-Driven Management, and Technology Use

The interviewed practices highlighted the importance of a data-driven approach and to review performance data, such as Quality and Outcomes Framework (QOF) metrics, to guide planning and resource allocation. Some practices have dedicated staff to do this, such as a QOF admin staff member, in another practice, one of the GP partners is in charge of the operational running of the practice, including the QOF data review.

Additionally, all practices are optimising medication management through regular audits, either by clinical pharmacists, medication management teams, or peer-to-peer audits.

The integration of technology such as Accurx for communication and patient recalls, EMIS and Ardens to monitor BP trends, identify at-risk patients, and optimise care are crucial in improving hypertension management. This involves staff training, to ensure that all staff are able to accurately read BP results and code into patient records.

However, whilst practices effectively use technologies that help automating patient recalls, sending life-style messages, and enabling facilitated relay of BP readings from home BP measures into patient records, practices also highlighted the importance of not only relying on automated communication systems.

For instance, one practice identified coding issues in their call-recall system in one of their audits, which led them to adopt a manual approach to identify and contact patients on their hypertension register.

Another practice follows up non-responders to three automated text re-calls with a personalised phone-call, highlighting that many of these patients are on multiple re-call lists (e.g for diabetes or obesity).

8.6 Addressing Health Inequalities

In addition to mitigating against digital exclusion, focusing on prevention, and personalising patient education, practices highlighted the need to address health inequalities by removing barriers to access to care. Several practices developed solutions to overcome these barriers, tailored to their population. For instance, a practice with a predominantly elderly population offers home visits for the elderly and

patients with dementia, or manual recalls by phone to ensure patients are not missed, especially older or digitally excluded individuals. Another practice with a diverse and younger population employs multilingual staff and offers weekend appointments.

All practices emphasized the need for personalized care, with examples like manual birth month recalls and doctor-signed communication. Practices found that personalized communication improved engagement, particularly among patients who are hesitant to participate in routine hypertension monitoring and treatment.

9. Recommendations for Quality Improvement at National, Regional, Integrated Care Boards (ICBs) and Practice Level

Even before the COVID-19 pandemic, health and care systems were overstretched, and the pandemic has exacerbated pressures on services even further. Systems are facing unprecedented demand, workload, and cost pressures, and are operating in an environment marked by organisational and political change.

These recommendations are intended as considerations for further quality improvement in CVD prevention at every level, aiming to support ongoing CVD prevention work amidst these challenging circumstances.

9.1 General recommendations

For any QI intervention or strategy, it is important to consider the implication to the wider system and the impact on health inequalities. For instance, one physician-facing QI initiative to increase the control of high cholesterol, led to an increase in racial disparity: the initiative which used a clinical decision support system, calling attention to patients who were not currently treated to target for cholesterol, led to a disproportionately large number of black patients with previously controlled LDL cholesterol to miss treatment targets during follow up, as the system did not encourage physicians to assess patients' current medication use or detect medication discontinuation proactively.⁸⁸

To ensure that QI initiatives are effective and equitable, they should align with the statutory guidance principles for working in partnership with people and

⁸⁸ Zhang, R., et al. (2013). "Factors Influencing the Increasing Disparity in LDL Cholesterol Control Between White and Black Patients With Diabetes in a Context of Active Quality Improvement." American Journal of Medical Quality 29(4): 308-314.

communities⁸⁹, emphasising inclusivity, community-centred approaches, and shared learning.

To adequately address health inequalities, QI interventions should ideally be:

- Connected, with coordinated services across the system
- intersectional, accounting for differences within patient groups
- flexible, by making allowances for the different needs of population
- and inclusive, by integrating patients' views and cultural references ⁹⁰

Additionally, QI interventions should be evaluated at all levels, and not only be assessed by their effectiveness in achieving clinical outcomes but also by their potential to reduce or exacerbate health inequalities.

⁸⁹ <https://www.england.nhs.uk/publication/working-in-partnership-with-people-and-communities-statutory-guidance/>

⁹⁰ [https://www.thelancet.com/article/S2468-2667\(23\)00093-2/fulltext](https://www.thelancet.com/article/S2468-2667(23)00093-2/fulltext)

9.2 Recommendations at National, Regional, System, and Practice Level

Based on the collective evidence, we have created a list of specific recommendations at national, regional, systems, and practice level with examples of good practice.

Recommendation 1: Establish multi-organisational leadership

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| Rationale | Tackling CVD and improving CVD prevention requires robust leadership and management support at all levels. Many ICBs have established dedicated CVD leads but it is important to have CVD prevention leads and champions throughout the entire system and at all levels, advocating for the entire CVD pathway, including primary prevention. Notably, CVD leadership often comes from the clinical sector, which may lead to an under-emphasis on prevention. |
| National Level | <ul style="list-style-type: none">• Facilitate funding flows to support a shift of resources to primary care, community, and preventative services, taking a long-term approach to investment in prevention. This aligns with the recommendations of the Darzi report, which calls for rebalancing care towards the community, often described as the “left shift”. Achieving this shift requires dedicated government funding not only for prevention but also for bolstering primary care and community-based services.⁹¹• Strengthen the national CVD strategy by integrating the current diverse CVD policy and funding landscape (including NHS Long Term Plan, Core20plus5, QOF and Direct Enhanced Services (DES), CVD prevention recovery programme, Cardiac Pathway Improvement programme (CPIP), and the NHS Long-term Workforce Plan, which sets out expectations for ICBs to work with NHSE and LAs to create a CVD prevention competent workforce⁹²), allowing for greater alignment between the multiple initiatives. Additionally, links between CVD prevention efforts and other related conditions (e.g. diabetes and kidney disease) should be explored and incorporated/integrated. |

⁹¹ <https://www.gov.uk/government/publications/independent-investigation-of-the-nhs-in-england>

⁹² [NHS England » NHS Long Term Workforce Plan](#)

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| Regional Level | <ul style="list-style-type: none"> • Continue to facilitate the multi-organisational strategic CVD prevention network to coordinate CVD prevention efforts across the region. • Regional re-alignment of resources in keeping with efforts towards a CVD prevention left-shift in the South East. • Support the development of a regional, ICB-led CVD prevention agreement, ensuring alignment of goals and collaborative decision-making. |
| System Level | <ul style="list-style-type: none"> • Establish dedicated CVD prevention leads and champions throughout the entire system and at all levels, advocating for the entire CVD pathway, including primary prevention. This may include CVD prevention leads from a diverse range of sectors, including local government and the community. • Create multi-disciplinary networks with a wide range of stakeholders and clearly defined roles to enable a shared understanding of the local population's health needs and the CVD prevention landscape, and to shift the focus from healthcare interventions to initiatives that address health inequalities and the social determinants of health. • Ensure adequate resourcing of CVD prevention efforts at ICB level. • Consider additional incentives for case finding and treatment to improve performance. • Ensure CVD prevention is a priority in ICB implementation plans and local health and wellbeing strategies. |
| Practice Level | <ul style="list-style-type: none"> • Appoint dedicated lead for CVD management, ensuring that CVD prevention remains a priority and shifting practice culture to pro-active and preventative care and a holistic management of long-term conditions. |
| Example of good practice | <ul style="list-style-type: none"> • North Yorkshire and the Humber: joint chairing of CVD prevention network meetings between NHS and local government (section 7). • Frimley's system leadership approach to hypertension⁹³, which aims to change the way CVD is prevented through cross-sector collaboration beyond just health partners, inspiring a wider range of partners to collaborate on tackling high blood pressure within their area of scope. • Support to bid for national funding and incentives to focus resources on case finding and management.⁹⁴ |

⁹³ Frimley ICS - NHS Joint Forward Plan 2023/24 – 2027/28, [PowerPoint Presentation \(frimleyhealthandcare.org.uk\)](https://www.frimleyhealthandcare.org.uk)

⁹⁴ [Improving cardiovascular health \(thehealthinnovationnetwork.co.uk\)](https://thehealthinnovationnetwork.co.uk)

Recommendation 2: Support patient education, and promotion of self-management

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| Rationale | Person-centred and tailored patient education and promotion of self-management have shown to be effective, leading not only to better hypertension and cholesterol control but also improved life-style change and patient engagement. |
| National Level | <ul style="list-style-type: none"> • Explore the use of new technologies, such as AI-driven personalised education tools, integrated into national digital health platforms like the NHS app, to provide tailored education and support for patients. Additionally, the NHS app can be enhanced with a blood pressure management algorithm that not only tracks and relays BP readings to healthcare providers but also provides evidence-based recommendations for patients, such as reminders to take medications and alerts for when to seek medical help if readings fall outside a safe range. • Continue and expand national awareness campaigns, such as the Get Your Blood Pressure Checked⁹⁵ and Know Your Numbers campaign. |
| Regional Level | <ul style="list-style-type: none"> • Utilise data analytics to target regional CVD prevention communication outreach to areas and communities with the greatest need. • Support the evaluation of interventions and guide implementation of those proven to be effective <p>Support the tailoring of patient education programmes and community interventions by leveraging regional data analytics.</p> |
| System Level | <ul style="list-style-type: none"> • Understand the population's CVD needs which will vary by ICB and local footprints within ICBs. This will help identify high-risk communities to reduce CVD risk factors and ensure that access to and uptake of care along CVD pathways is proportionate to need, which can reduce local health inequalities and improve overall population health. • Ensure that evidence-based and trauma informed approaches are used to identify and address the specific needs of Inclusion Health populations to address the specific needs and enable equity and inclusion our most vulnerable communities.⁹⁶ |

⁹⁵ <https://www.gov.uk/government/news/get-your-blood-pressure-checked>

⁹⁶ <https://www.pathway.org.uk/resources/beyond-pockets-of-excellence-integrated-care-services-for-inclusion-health/>

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| | <ul style="list-style-type: none"> • Tailor patient oriented education and community interventions. Approaches to promote self-management, such as mHealth interventions or home BP measurements have proven to be particularly effective when they are person-centred and tailored. • Promote digital health literacy initiatives to ensure patients can effectively use the technologies available to them.⁹⁷ <p>Offer CVD prevention education directly; or support patient education by facilitating provider education and continuing professional development.</p> |
| Practice Level | <ul style="list-style-type: none"> • Adhere to NICE guidance^{98 99} by consistently offering advice and support patients to achieve a healthy lifestyle, periodically assessing diet and exercise, providing tailored guidance and resources, supporting smoking cessation and informing patients about local health initiatives to promote sustained lifestyle changes. • Adhere to the principles of person-centred care, taking into account people's needs and preferences. People should have the opportunity to make informed decisions about their care and treatment, in partnership with their health professionals.¹⁰⁰ This can be facilitated by providing a tailored care management plan to patients, which can be shared via accessible tools such as the NHS APP, promoting patient ownership, self-monitoring, and adherence to the agreed care plan. • Encourage patients to take up the NHS Health Check which provides blood pressure measurement and cholesterol assessment in eligible 40-74 year olds. • Increase opportunistic blood pressure testing in the practice. • Offer ambulatory or home blood pressure monitoring, when appropriate. • Implement strategies to enable Inclusion Health populations to access screening and treatment for hypertension and hyperlipidaemia. |

⁹⁷ <https://www.england.nhs.uk/long-read/digital-skills-for-patients/>

⁹⁸ <https://www.nice.org.uk/guidance/ng136/chapter/Recommendations#diagnosing-hypertension>

⁹⁹ <https://www.nice.org.uk/guidance/ng238/chapter/Recommendations#lifestyle-changes-for-the-primary-and-secondary-prevention-of-cardiovascular-disease>

¹⁰⁰ <https://www.nice.org.uk/guidance/cg43/chapter/Person-centred-care-principles-for-health-professionals>

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| <p>Example of good practice</p> | <ul style="list-style-type: none"> • Patient oriented public campaigns and community interventions, such as the award-winning, ‘How’s Thi Ticker campaign’, an evidence-based blood pressure check campaign which increases access by bringing free blood pressure checks directly to the community in South Yorkshire.¹⁰¹ • ICB-led CVD Prevention Decathlon programme: this 10 week structured education programme implemented in South West London ICB is designed to help individuals avoid being diagnosed with CVD. It includes holistic wellbeing information and in-person or virtual physical activity sessions. Participants work as a team and ‘compete’ with other teams to win ‘sweatcoins’ that can be redeemed for prizes.¹⁰² • Coordinating the implementation of the BP@Home scheme¹⁰³, a programme to improve BP control in people with hypertension through home monitoring by identifying who is at greatest risk from their hypertension, recruiting patients to either buy their own BP monitor, or if unable to, supplying a free BP monitor, and providing resources for guided self-monitoring, and monitoring their average home BP using a structured process. • Implementation of self-health kiosks in GP practice receptions¹⁰⁴: the Self-Health Kiosks allow patients to answer health questions and assessments for long term-conditions such as diabetes and hypertension, and take vital signs, including BP measurements independently of a clinician. The results are then integrated onto the patient record, ready for a clinician to review. • Humber and North Yorkshire ICB has with inclusion health a shared strategic priority for public sector partners as outlined in their Joint Forward Plan.¹⁰⁵ |
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¹⁰¹ <https://southyorkshire.icb.nhs.uk/news/how-s-thi-ticker-team-wins-national-public-health-award?newsID=#:~:text=How's%20Thi%20Ticker%20is%20an,checks%20directly%20to%20our%20communities>.

¹⁰² <https://www.southwestlondonics.org.uk/our-work/personalised-care/long-term-conditions/prevention-decathlon/cardiovascular-disease-prevention-decathlon/>

¹⁰³ <https://www.midandsouthessex.ics.nhs.uk/get-involved/insights/evaluation-of-mid-and-south-essex-integrated-care-board-bphome-scheme/>

¹⁰⁴ <https://mendipvale.nhs.uk/services/self-health-kiosk#:~:text=The%20Self%2DHealth%20Kiosk%20is,Diabetes>

¹⁰⁵ [Joint-Forward-Plan-How-we-will-deliver-our-strategy-from-2023-to-2028-1.pdf](#)

Recommendation 3: Support organisational change, focusing on team changes

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| Rationale | Given the pressures health and social care systems are facing, creating multi-disciplinary teams, strengthening community-based interventions, or assigning responsibilities in the CVD prevention pathways to health professionals other than the patient's physician, have shown to be effective and to reduce barriers. ¹⁰⁶ There are clear benefits of integrated care as many people with CVD have multiple and sometimes complex comorbidities, requiring integrated continuity of care across multiple providers and services. |
| National Level | <ul style="list-style-type: none"> • Grow the general practice workforce. • Support the expansion of nonphysician healthcare practitioner-led (e.g nurse- or pharmacy-led) interventions by expanding the scope of practice for allied health professionals. • Develop and promote standardised national training and certification programmes for allied health professionals with a focus on preventative care. |
| Regional Level | <ul style="list-style-type: none"> • Continue working collaboratively within NHSE regional directorates, including across Public Health, Public Health Commissioning, NHSE Analytics team, and the NHSE Medical Directorate. • Continue working collaboratively across regional teams, including NHSE, the Office for Health Improvement and Disparities (OHID), and the Local Knowledge and Intelligence Service (LKIS). • Provide regional data to help identify variation in care and areas that would benefit the most from interventions. • Share insights on effective models of CVD prevention involving non-physician healthcare practitioners • Encourage the sharing of best practice and lessons learned across the region, including the implementation and evaluation of successful pilot programmes.¹⁰⁷ |

¹⁰⁶ Guo X, Ouyang N, Sun G, Zhang N, Li Z, Zhang X, Li G, Wang C, Qiao L, Zhou Y, Chen Z, Shi C, Liu S, Miao W, Geng D, Zhang P, Sun Y; CRHCP Study Group. Multifaceted Intensive Blood Pressure Control Model in Older and Younger Individuals With Hypertension: A Randomized Clinical Trial. JAMA Cardiol. 2024 Sep 1;9(9):781-790. doi: 10.1001/jamacardio.2024.1449. PMID: 38888905; PMCID: PMC11195599.

¹⁰⁷ <https://www.england.nhs.uk/2024/09/blood-pressure-checks-at-the-dentist-and-optician-to-catch-those-at-risk-of-heart-attacks-and-strokes/>

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| System Level | <ul style="list-style-type: none"> • Establish integrated working at systems level by joining up workstreams, such as health inequalities and long-term-conditions. • Create integrated, interdisciplinary models of care, such as managing CVD, chronic kidney disease, diabetes, and other metabolic diseases together. • Implement nurse- or pharmacy-led interventions, including for case-finding. • Consider piloting CVD prevention programmes outside traditional primary care settings, including dentistry or ophthalmology. • Foster collaboration between health and social care pathways, particularly for patients with complex health needs. |
| Practice Level | <ul style="list-style-type: none"> • Adapt a pro-active and team-based approach, involving not only patients' physicians but also clinical pharmacists, nurses, healthcare assistants, social prescribers, and administrative staff in the management of long-term conditions. • Create integrated, interdisciplinary models of care, that manage CVD, chronic kidney disease, diabetes, and other metabolic conditions together by establishing multidisciplinary teams, coordinating call/recall and care pathways, and developing joint prevention strategies that target shared risk factors (e.g. obesity, hypertension). • Consider enhancing capacity by managing high-risk groups by GPs or pharmacists and lower-risk groups by non-physician healthcare practitioners such as nurses and healthcare assistants. • Consider embedding social prescribing across practices and PCNs. |
| Example of good practice | <ul style="list-style-type: none"> • Pharmacist-led hypertension review project in Black (African and African-Caribbean origin) patients – City and Hackney¹⁰⁸: Practice Supports Pharmacists (PSPs) who work in general practice were tasked with setting up hypertension clinics to review Black (African or African-Caribbean origin) patients with uncontrolled blood pressure and inviting them to a hypertension clinic. |

¹⁰⁸ [Health Inequalities Strategy Implementation Plan - Case Studies | London City Hall](#)

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| | <ul style="list-style-type: none"> • Ways to Wellness, a “hub” model of working in which a non-medical link worker trained in behaviour change methods offers a personalised service to identify health and wellness goals, as well as connecting patients, when indicated, to community and voluntary groups and resources.¹⁰⁹ • Nurse-led hypertension clinic¹¹⁰, which included initial assessment, blood pressure measurement, review of anti-hypertensive medication and compliance, medication optimisation and structured follow up by specialist nurses. • Pharmacy technician-led data cleansing initiative ¹¹¹, which included patient record review and robust code cleansing. |
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¹⁰⁹ <https://golab.bsg.ox.ac.uk/knowledge-bank/case-studies/ways-wellness/#:~:text=other%20public%20services,-,The%20impact,activity%20and%20improved%20mental%20health>.

¹¹⁰ Dean SC, Kerry SM, Khong TK, Kerry SR, Oakeshott P. Evaluation of a specialist nurse-led hypertension clinic with consultant backup in two inner city general practices: randomized controlled trial. Fam Pract. 2014 Apr;31(2):172-9. doi: 10.1093/fampra/cmt074. Epub 2013 Dec 19. PMID: 24356073.

¹¹¹ <https://www.southeastclinicalnetworks.nhs.uk/hypertension-and-atrial-fibrillation/>

Recommendation 4: Facilitate provider training and implement provider reminder and clinical decision support systems

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|-----------------------|--|
| Rationale | <p>Provider education is an important element in quality improvement strategies and may focus on training in guidelines, accurate measurements, data entry, communication, motivational interviewing, and provision of advice on behavioural change. Provider education initiatives have shown to be effective at practice as well as at system-level, leading to rapid and sustained improvements in hypertension control. Large scale implementation and dissemination of evidence-based strategies to improve BP control have been successful in accelerating the translation of evidence into care. Additionally, implementing clinical decision support systems, and using standardised measurement and treatment algorithms have all been shown to be effective in increasing statin therapy, improving the management of dyslipidaemia, and increasing hypertension detection and management.</p> |
| National Level | <ul style="list-style-type: none"> • Workforce development: invest in training of generalist clinicians and for specialists to maintain a wider range of generalist skills.¹¹² • Improve and ensure the digital literacy of the workforce. • Implement teaching on prevention in established training curricula. • Consider “Making Every Contact Count” (MECC) training as formal professional development, with trainers attending and receiving a qualification or certificate to acknowledge their efforts. • Continue supporting the establishment of IT infrastructure to enable the implementation of clinical decision support systems and risk assessment tools. • Create specific protocol for CVD risk factor detection in MECC templates and toolkits. |
| Regional Level | <ul style="list-style-type: none"> • Share and spread good practice in the South East by creating a large QI learning collaborative involving public health, healthcare systems, local government, and communities. • Develop a regional communication plan to allow for timely communication on national and programme updates, patient education, and gathering of insights. |

¹¹² Tomorrow's region report

| | |
|---------------------------------|---|
| System Level | <ul style="list-style-type: none"> • Support and facilitate provider training on accurate BP measurement, MECC, motivational interviewing, and behavioural change. • Improve the digital literacy of the workforce.¹¹³ • Support and facilitate provider training on population health management, coding, data entry, and data review. • Consider the commissioning of ICB-wide clinical decision support systems, risk assessment tools, and digital templates to enable accurate coding¹¹⁴ and reduce variation in practice. |
| Practice Level | <ul style="list-style-type: none"> • Explore behaviour change models to optimise clinical practice, leveraging a variety of evidence-based behaviour change frameworks, such as the COM-B model (Capability, Opportunity, Motivation - Behaviour) to guide interventions that drive lasting behavioural change among staff, recognising that healthcare providers need not just training but opportunity and motivation to use skills in brief advice, risk communication, motivational interviewing, and person-centred communication. • Ensure that all staff members, including clinical and non-clinical, are trained in MECC. • Provide training on accurate BP measurement, and incorporate periodic audits and feedback. • Offer digital literacy training to ensure all staff members are proficient in using EMR, data entry, and coding. • Embed Decision Support Systems and evidence-based protocols into the practice's EMR, which should provide evidence-based recommendations for the management of hypertension, statin use, and overall CVD risk. Ensure that the system flags high-risk patients, prompts guideline-based interventions and provider reminders for follow-ups, medication optimisation, or referrals. |
| Example of good practice | <ul style="list-style-type: none"> • Cheshire and Merseyside (C&M) Blood Pressure Quality Improvement (BPQI) package for general practice nursing teams offering BP quality improvement through EMIS-embedded dashboard and audit tool (NICE standards-aligned), EMIS-embedded consultation templates (for new and existing patients), practice protocols, and training support.¹¹⁵ • Implementing the 'Making Every Contact Count' initiative into an ICS.¹¹⁶ |

¹¹³ <https://digital-transformation.hee.nhs.uk/building-a-digital-workforce/digital-literacy>

¹¹⁴ <https://www.qmul.ac.uk/ceg/what-we-do/success-stories/supporting-extraordinary-improvement-in-a-challenging-region/>

¹¹⁵ <https://www.gov.uk/government/case-studies/high-blood-pressure-quality-improvement-in-cheshire-and-merseyside>

¹¹⁶ Rebecca Turner, Lucie Byrne-Davis, Panayiotis Michael, Nia Coupe, Caroline Holtom, Cheryl Smith, Jo Hart, Experiences of implementing the 'Making Every Contact Count' initiative into a UK integrated care system: an interview study, *Journal of Public Health*, Volume 45, Issue 4, December 2023, Pages 894–903, <https://doi.org/10.1093/pubmed/fdad173>

Recommendation 5: Establish robust audit and feedback mechanisms

| | |
|-----------------------|---|
| Rationale | <p>Many people are not receiving care in line with recommended NICE guidance, leading to unwarranted local variations in CVD clinical process and outcomes measures.</p> <p>Audit, feedback, and benchmarking are continuous improvement initiatives that can be used to evaluate performance and present data reflecting the status of guideline use and provider adherence to national standards. Audit and feedback mechanisms have been shown to improve quality of care for CVD and seem to be particularly effective when they are used as a “learning” exercise and run in a non-punitive learning environment which provides the opportunity for interaction and sharing of best practice.</p> |
| National Level | <ul style="list-style-type: none"> • Continue to support and develop the CVDPREVENT audit. • Consider expanding the scope of the CVDPREVENT audit to adopt a more comprehensive, population-wide approach. This may include developing or expanding CVDPREVENT metrics to shift the focus from just patients at high risk for CVD events or those already on the hypertension record to identifying the wider population with elevated BP or cholesterol readings. • In collaboration with NICE, support ongoing research and evidence reviews to evaluate the effectiveness of emerging CVD risk assessment tools, particularly those incorporating wider risk factors, such as kidney disease, metabolic risk factors, or socio-economic determinants.¹¹⁷ |
| Regional Level | <ul style="list-style-type: none"> • Establish a regional improvement collaborative. • Continue specific analysis to support QI across the South East, including the use and enhancement of the South East regional CVDPREVENT dashboard. • Share insights from the data on a periodic basis. |

¹¹⁷ Anderson TS, Wilson LM, Sussman JB. Atherosclerotic Cardiovascular Disease Risk Estimates Using the Predicting Risk of Cardiovascular Disease Events Equations. JAMA Intern Med. 2024 Aug 1;184(8):963-970. doi: 10.1001/jamainternmed.2024.1302. PMID: 38856978; PMCID: PMC11165411.

| | |
|---------------------------------|--|
| System Level | <ul style="list-style-type: none"> • Establish a quality improvement team providing feedback and practice-level improvement assistance, including the provision of specialist support. • Facilitate multi-disciplinary outreach meetings involving audit and feedback and sharing of resources. • Create a system-level initiative with guideline dissemination, performance benchmarking, and audit and feedback. |
| Practice Level | <ul style="list-style-type: none"> • Utilise CVD ACTION, a smart data tool developed by UCL Partners, which provides GP practices with CVD PREVENT data but with patient identifiable information so that clinicians can prioritise and optimise care where needed.¹¹⁸ • Regularly audit automated call-re-call systems. • Ensure a robust system for the review of patients on long-term conditions registers (such as the diabetes or hypertension register), allowing for an integrated and holistic approach to managing long-term conditions and addressing patients not treated to target. |
| Example of good practice | <ul style="list-style-type: none"> • CVD Lead Pharmacist team facilitates multi-disciplinary educational outreach meetings in practices across the ICB, including sharing of local data, and action plans, and monitoring outcomes.¹¹⁹ |

¹¹⁸ <https://uclpartners.com/our-priorities/cardiovascular/cvdaction-transforming-the-prevention-of-cardiovascular-disease/>

¹¹⁹ [CVD Prevent](#)

9.3 Recommendations at Individual Level



Source: <https://www.nhs.uk/conditions/coronary-heart-disease/prevention/>

While there are some important steps that individuals can take to support their cardiovascular health, it is equally essential to recognise that many face wider social and environmental challenges that may affect their ability to make lifestyle changes.

GPs or pharmacists will be able to offer information on smoking cessation programmes, and local services that provide healthy lifestyle support. Individuals can work with social prescribers, health coaches and other professionals who can address the broader social determinants of health – such as debt or housing - that might be barriers to improving cardiovascular health.

The NHS App is helpful to stay informed about upcoming appointments, tracking prescriptions, and accessing test results. It can also be used to facilitate communication and collaboration between patients and healthcare providers.

Most importantly, patients should feel empowered to actively participate in the development of their individual care, and to ask for and receive support, whether it is for managing their cholesterol, lowering blood pressure, or achieving a healthy weight and making lifestyle changes.

10. Conclusion

Even though CVD is largely preventable, it remains a leading cause of death and a key driver of health inequalities and disability. Improving hypertension and high cholesterol detection, monitoring, and treatment is essential to reducing premature and preventable deaths and reducing CVD-associated inequalities and disability.

Whilst significant efforts have already been undertaken to improve hypertension and cholesterol detection, monitoring, and control – evidenced by hypertension and cholesterol treatment rates that have returned to pre-pandemic levels - the South East is still below the national average and is not achieving the nationally recommended targets.

Our recommendations, based on the latest evidence from the literature and qualitative insights from CVD leads at ICB and practice levels, are intended as considerations for further quality improvement at every level, aiming to support ongoing CVD prevention work amidst these challenging circumstances.

The recommendations proposed highlight the importance of prioritising CVD prevention, implementing multi-organisational leadership, supporting patient education and self-management; and establishing team changes, provider education, and robust audit and feedback mechanisms. Tailoring interventions to the specific characteristics and needs of the respective population or patient is essential to maximise impact and reduce health inequalities and disability.

The alignment between the themes identified in our interviews with high-performing practices and ICBs and the broader evidence base highlights the importance of adhering to evidence-based practice. Doing what the evidence proposes is crucial to making meaningful progress in CVD prevention and reducing health inequalities.

Additionally, QI interventions should be thoroughly evaluated at all levels, not only in terms of their effectiveness in achieving clinical outcomes but also for their potential impact on health inequalities.

We would encourage that every opportunity be taken in decision-making processes around service change to address CVD prevention and ensure equitable care for all. By taking a pro-active and evidence-based approach at every level, the quality of care for those at risk of CVD will improve, ultimately saving lives and reducing the burden on the healthcare system.

Appendix A – Semi-structured interview guides

Semi-Structured Interview Guide for Practice Interviews

| Domain | Questions | Prompts |
|--|---|--|
| Role and organisation | Could you briefly describe your role and your organisation? | Overview of practice, including patient demographics, practice size, setting, typical patient population served? CVD leadership in practice? |
| Hypertension Management Process | Could you explain the process undertaken for patients identified as hypertensive? | Who is involved in the assessment and follow-up? Can you describe the roles of different team members in managing hypertension? |
| | | How is communication handled with these patients? How often do you call/recall? |
| | | How does patient self-management integrate into your hypertension management process? |
| Blood Pressure Monitoring and Data Usage | How do you monitor and follow up on blood pressure measurements in your patients? | What methods do you use for BP readings (in-house, at home, pharmacy etc.)? |
| | | How are external readings incorporated into patient records? |
| | How do you assess your practice's performance in managing hypertension? | Do you review and utilize data on your hypertension management practices? |
| Treatment and Prescription strategies | How do you ensure appropriate prescribing for | How do you audit and monitor prescribing practices? |

| | | |
|---|--|--|
| | hypertensive patients? | Do you use specific guidelines, such as NICE guidelines, for prescriptions? |
| | | Which staff is involved in the monitoring of medication adherence, prescription review, and follow up? |
| Patient education and lifestyle changes | What strategies and resources do you use to educate patients about their condition and encourage lifestyle changes in hypertensive patients? | (How) Do you assess and tailor these strategies to specific populations? How do you ensure that patients are engaged and compliant with treatment plans? What strategies do you use to motivate patients to adhere to lifestyle changes and medication regimens? |
| Inequalities | How do you address inequalities in hypertension management in your practice? | Do you prioritise specific cohorts for interventions? |
| | | If so, how do you prioritise these cohorts and which specific interventions have you used? |
| | | Are there any strengths or assets in the population group that might help improve their hypertension management? |
| | | What challenges do you face in managing hypertension among disadvantaged groups? |
| Best practices | What are the key enablers or best practices you have identified? | Are there organisational or systemic facilitators? Outer setting: Local attitudes Partnerships & connections (including pharmacies, local community assets etc). Inner setting: Structural characteristics (funding, space, workforce, IT, materials and equipment), Resources (e.g. access to knowledge & information, training), Leadership |

| | | |
|--|--|--|
| | | Work infrastructure (organisation of tasks and responsibilities within and between individuals) Culture (shared values, beliefs and norms). |
| | What advice or top tips would you give to other practices? | |

Semi-Structured Interview Guide for ICB Interviews

| Domain | Questions | Prompts |
|-----------------------|--|---|
| Role and organisation | Could you briefly describe your role and your organization? | ICB size; population (age, ethnicity, deprivation); |
| Best practices | What are the key enablers or best practices you have identified? | Are there organisational or systemic facilitators? |
| | | What role did data play in driving quality improvement? To increase awareness, driver for QI etc? how are they accessing data? Are they receiving support from NHSE intelligence? |
| | | Partnerships and connections: Across region: CVD leads network? How often do they meet? How are these meetings structured? Within ICBs: do you have regular meetings set up with PCNs/Practices? Partnerships with advocacy group? Community work? |
| | | Financing: any additional funding? Incentives? |
| | | Specific work/initiatives on reducing health inequalities? |
| | | Performance measurement/communication: how does oversight look like? Is data shared with practices and if so, how? Feedback loop? Formal and informal information sharing? Sharing of best practices? |
| | | IT infrastructure: new innovations? Apps, tele monitoring? |

| | | |
|--|--|--|
| | | Guidance and training for healthcare providers? |
| | | Work infrastructure: organisation of tasks and responsibilities within and between individuals? |
| | | Leadership? On regional/systems/PCN and practice level? What has worked well? |
| | | Joint strategy? Transformation plan? |
| | | Collaboration with OHID? NHSE? |
| | | Any specific Quality improvement actions taken, especially around reducing variation in performance at practice level? |
| | What advice or top tips would you give to other ICB CVD leads? | |

Appendix B – Literature Searches

Search terms

- Used search filter for [Cross-Disciplinary, Multi-Agency, Wraparound Care](https://guides.library.ualberta.ca/c.php?g=734066&p=5299669) from <https://guides.library.ualberta.ca/c.php?g=734066&p=5299669>
- Used search filter for Quality Improvement studies from <https://hsls.libguides.com/Ovid-Medline-search-filters/experimental-studies>

Databases / search strategies

Ovid MEDLINE(R) ALL <1946 to June 21, 2024>

- 1 exp *Hypertension/ or *Blood Pressure/ or exp *Hyperlipidemias/ or exp *Cholesterol/ 416005
- 2 exp *Mass Screening/ or exp *Preventive Health Services/ 373268
- 3 1 and 2 4240
- 4 exp *Hypertension/di, dg, dh, dt, pc, rh, th [Diagnosis, Diagnostic Imaging, Diet Therapy, Drug Therapy, Prevention & Control, Rehabilitation, Therapy] 82398
- 5 exp *Hyperlipidemias/di, dg, dh, dt, pc, rh, th [Diagnosis, Diagnostic Imaging, Diet Therapy, Drug Therapy, Prevention & Control, Rehabilitation, Therapy] 20692
- 6 (hypertensi* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 31618
- 7 ("high blood pressure*" adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 726
- 8 (hyperlipid?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 1172
- 9 (hyperlip?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 154
- 10 (hypercholester?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 80
- 11 (hypercholesterol?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 1896
- 12 (hypercholesterin?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 5

13 ((elevated or high) adj1 cholesterol* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf.51

14 (("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol*) adj3 (control or regulation or maintenance or manag* or treatment)).ti,kw,kf. 9751

15 (("not detected" or undetected or undiagnosed or under?diagnos*) adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 212

16 (unrecogni#ed adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 30

17 (untreated adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 517

18 (undertreated adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 13

19 or/3-18 124737

20 Quality Improvement/ 34100

21 ((implementation adj1 "research") or ((assurance or improve or improvement or improvements or improving or indicator or indicators or measure or measures or metric or metrics) adj1 quality) or ((improvement or pay) adj2 performance) or (knowledge adj2 translation) or (lean adj2 (methodology or principles or tools)) or (rapid adj1 cycle adj1 (change or changes)) or (report adj1 (card or cards)) or (right adj1 care) or (six adj1 sigma) or squire).ti,kw,kf. 56102

22 "Quality of Health Care"/ 78262

23 quality improv*.ti,kw,kf. 25102

24 (quality adj1 (care or health)).ti,kw,kf. 6312

25 Practice Guidelines as Topic/ 128767

26 (best practice* or gold standard* or guidance or guideline* or policy or policies or "high impact" or impactful).ti. 198076

27 or/20-26 434730

28 "Delivery of Health Care, Integrated"/ 14586

29 ("integrated care board*" or "integrated care system*" or "clinical commissioning group*").ti,ab,kw,kf. 954

30 intersectoral collaboration/ or models, organizational/ or multi-institutional systems/ or hospital shared services/ or ("wrap around" or wraparound or interagenc* or "inter agenc*" or "across agenc*" or "among agenc*" or "across organization*" or "across disciplin*" or "across sector*" or inter-organization* or multi-

organization* or "cross organization*" or "cross disciplin*" or "cross sector*" or "supportive care" or comprehensive or multicomponent* or "multi* component" or "community care" or integrat* or "multi* disciplin*" or multidisciplin* or interprofessional or "inter professional" or "interdisciplin*" or "inter disciplin*" or intersect* or "inter sect*" or overarch* or dove-tail* or "hand-shake" or "side by side" or collaborative or interlock* or (together adj3 (agenc* or organization* or sector* or profession*)) or ((bundle* or ongoing or shared) adj3 (service* or care))).mp.

1701557

31 ((health* or care) adj2 system*).ti,kw,kf. 52367

32 or/28-31 1741030

33 ((increas* or improv* or enhanc*) adj3 (detection or diagnos* or referral* or identification)).ti,kw,kf. 18037

34 ((decreas* or reduc*) adj3 undetected).tw,kw. 87

35 early diagnosis/ 30862

36 or/33-35 48721

37 19 and 27 and 32 373

38 19 and 36 426

39 37 or 38 791

40 limit 39 to (english language and yr="2014 -Current") 397

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&NEWS=N&PAGE=main&SHAREDSEARCHID=6yaDBmeAfgPRIJhg6PVeukP3J5kcPfe3BnzSla4Sp8pR4GmMPOXOOUPPgXpK932DD>

Embase <1974 to 2024 June 21>

1 exp *hypertension/ or exp *blood pressure/ or exp *hyperlipidemia/ or exp *cholesterol/ 586164

2 exp *screening/ or exp *preventive health service/ 252658

3 1 and 2 5074

4 exp *hypertension/di, dm, dt, pc, rh, th [Diagnosis, Disease Management, Drug Therapy, Prevention, Rehabilitation, Therapy] 114444

5 exp *hyperlipidemia/di, dm, dt, pc, rh, th [Diagnosis, Disease Management, Drug Therapy, Prevention, Rehabilitation, Therapy] 24142

6 (hypertensi* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 37054

7 ("high blood pressure*" adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 970

8 (hyperlipid?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 1637

9 (hyperlip?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 100

10 (hypercholester?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 19

- 11 (hypercholesterol?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 2737
- 12 (hypercholesterin?emia* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 12
- 13 ((elevated or high) adj1 cholesterol* adj3 (control or regulation or maintenance or manag* or treatment or detection or identification or diagnosis or diagnostic* or investigation or screening or prevent* or therap* or "case finding")).ti,kw,kf. 76
- 14 (("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol*) adj3 (control or regulation or maintenance or manag* or treatment)).ti,kw,kf. 13681
- 15 (("not detected" or undetected or undiagnosed or under?diagnos*) adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 282
- 16 (unrecogni#ed adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 38
- 17 (untreated adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 783
- 18 (undertreated adj3 ("blood pressure" or "diastolic pressure" or "pulse pressure" or "systolic pressure" or cholesterol* or hypertensi* or "high blood pressure*" or hyperlipid?emia* or hyperlip?emia* or hypercholester?emia* or hypercholesterol?emia* or hypercholesterin?emia* or "high cholesterol" or "elevated cholesterol")).ti,kw,kf. 20
- 19 or/3-18 173114
- 20 total quality management/ 98479
- 21 ((implementation adj1 "research") or ((assurance or improve or improvement or improvements or improving or indicator or indicators or measure or measures or metric or metrics) adj1 quality) or ((improvement or pay) adj2 performance) or (knowledge adj2 translation) or (lean adj2 (methodology or principles or tools)) or (rapid adj1 cycle adj1 (change or changes)) or (report adj1 (card or cards)) or (right adj1 care) or (six adj1 sigma) or squire).ti,kw,kf. 80763
- 22 health care quality/ 282061
- 23 quality improv*.ti,kw,kf. 35718
- 24 (quality adj1 (care or health)).ti,kw,kf. 8013
- 25 exp practice guideline/ 751811
- 26 (best practice* or gold standard* or guidance or guideline* or policy or policies or "high impact" or impactful).ti. 248851
- 27 or/20-26 1248792
- 28 integrated health care system/ 14075

29 ("integrated care board*" or "integrated care system*" or "clinical commissioning group*").ti,ab,kw,kf. 1706

30 intersectoral collaboration/ or multihospital system/ or ("wrap around" or wraparound or interagenc* or "inter agenc*" or "across agenc*" or "among agenc*" or "across organization*" or "across disciplin*" or "across sector*" or inter-organization* or multi-organization* or "cross organization*" or "cross disciplin*" or "cross sector*" or "supportive care" or comprehensive or multicomponent* or "multi* component" or "community care" or integrat* or "multi* disciplin*" or multidisciplin* or interprofessional or "inter professional" or "interdisciplin*" or "inter disciplin*" or intersect* or "inter sect*" or overarch* or dove-tail* or "hand-shake" or "side by side" or collaborative or interlock* or (together adj3 (agenc* or organization* or sector* or profession*)) or ((bundle* or ongoing or shared) adj3 (service* or care))).mp. 2134892

31 ((health* or care) adj2 system*).ti,kw,kf. 64074

32 or/28-31 2183723

33 ((increas* or improv* or enhanc*) adj3 (detection or diagnos* or referral* or identification)).ti,kw,kf. 24468

34 ((decreas* or reduc*) adj3 undetected).ti,kw,kf. 1

35 early diagnosis/ 135135

36 or/33-35 158873

37 19 and 27 and 32 937

38 19 and 36 1295

39 37 or 38 2215

40 limit 39 to (english language and yr="2014 -Current") 1135

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&NEWS=N&PAGE=main&SHAREDSEARCHID=6iOQ6NgSL4QpEflmdh5POH2bZf5DCPBCTj7tCdwaumv4Hkl0V4IU8JWJQEjFJnigK>

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Sally Smith, Vice Chair of South East Clinical Senate

Paul Stevens, Chair South East Clinical Senate

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