Hypertension risk stratification: Quality Improvement Project

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Abstract

Hypertension is a key risk factor for cardiovascular disease, yet initial assessments often fall short of guideline standards. This quality improvement project audited compliance with NICE guideline [NG136] in a large Nottingham general practice and evaluated the impact of introducing an electronic checklist.

Key words: Hypertension, quality improvement, NICE guidelines, risk stratification

Background

Hypertension, defined as a persistent elevation in systolic (≥140 mmHg) or diastolic (≥90 mmHg) blood pressure, remains one of the most prevalent and modifiable risk factors for cardiovascular disease (CVD) worldwide (World Health Organisation, 2021). It is primarily classified as either primary (essential) hypertension, which accounts for approximately 85% of cases with no identifiable cause, or secondary hypertension, which is attributed to underlying medical conditions (Ferri F, 2019).

Globally, one in four adults has hypertension, a figure expected to rise to over 1.5 billion by 2025 (World Health Organisation, 2021). In England alone, 26.2% of adults (11.8 million people) were estimated to have hypertension in 2017, with a significant proportion remaining undiagnosed (Public Health England, 2020). Hypertension contributes substantially to cardiovascular morbidity and mortality by causing damage to target organs such as the heart, kidneys, retina, and brain. The burden of CVD in England was reflected in an estimated healthcare cost of £7.4 billion in 2019/20, driven by over one million hospital admissions and 5.5 million bed days (Ahmed S et al, 2023).

Preventive strategies focusing on modifiable risk factors are essential. The National Institute for Health and Care Excellence (NICE) highlights the importance of early identification and management of CVD risk factors and target organ damage at the point of hypertension diagnosis (NICE guideline [NG136], 2019). Timely assessment enables stratification and appropriate therapeutic interventions, improving long-term outcomes.

Aims and Objectives

This quality improvement project aimed to assess compliance with NICE guideline in the evaluation of cardiovascular risk and target organ damage in newly diagnosed hypertensive patients. The audit specifically sought to:

- Evaluate the proportion of patients who underwent guideline-recommended assessments.
- Identify areas for improvement in clinical performance.
- Implement a hypertension checklist template within the electronic medical record system to enhance compliance.
- Re-evaluate compliance post-intervention to measure impact.

Standards Used

This audit was based on NICE Guideline [NG136]: Hypertension in Adults: Diagnosis and Management.

Key standards for newly diagnosed hypertensive patients include:

1. QRISK calculation to estimate 10-year cardiovascular risk.
2. Urinalysis for proteinuria and microscopic haematuria.
3. Blood tests for HbA1c, renal function (creatinine, eGFR, electrolytes), and lipid profile.
4. 12-lead ECG to detect left ventricular hypertrophy, arrhythmias, or ischaemic changes.
5. Fundoscopic examination to assess for hypertensive retinopathy.

Patients newly diagnosed with stage 1 hypertension should start antihypertensive medication if their QRISK score is 10% or higher or if there's evidence of target organ damage. NICE guidelines also recommend considering statin therapy for primary prevention of cardiovascular disease when the QRISK score is 10% or more (NICE guideline [NG238], 2023).

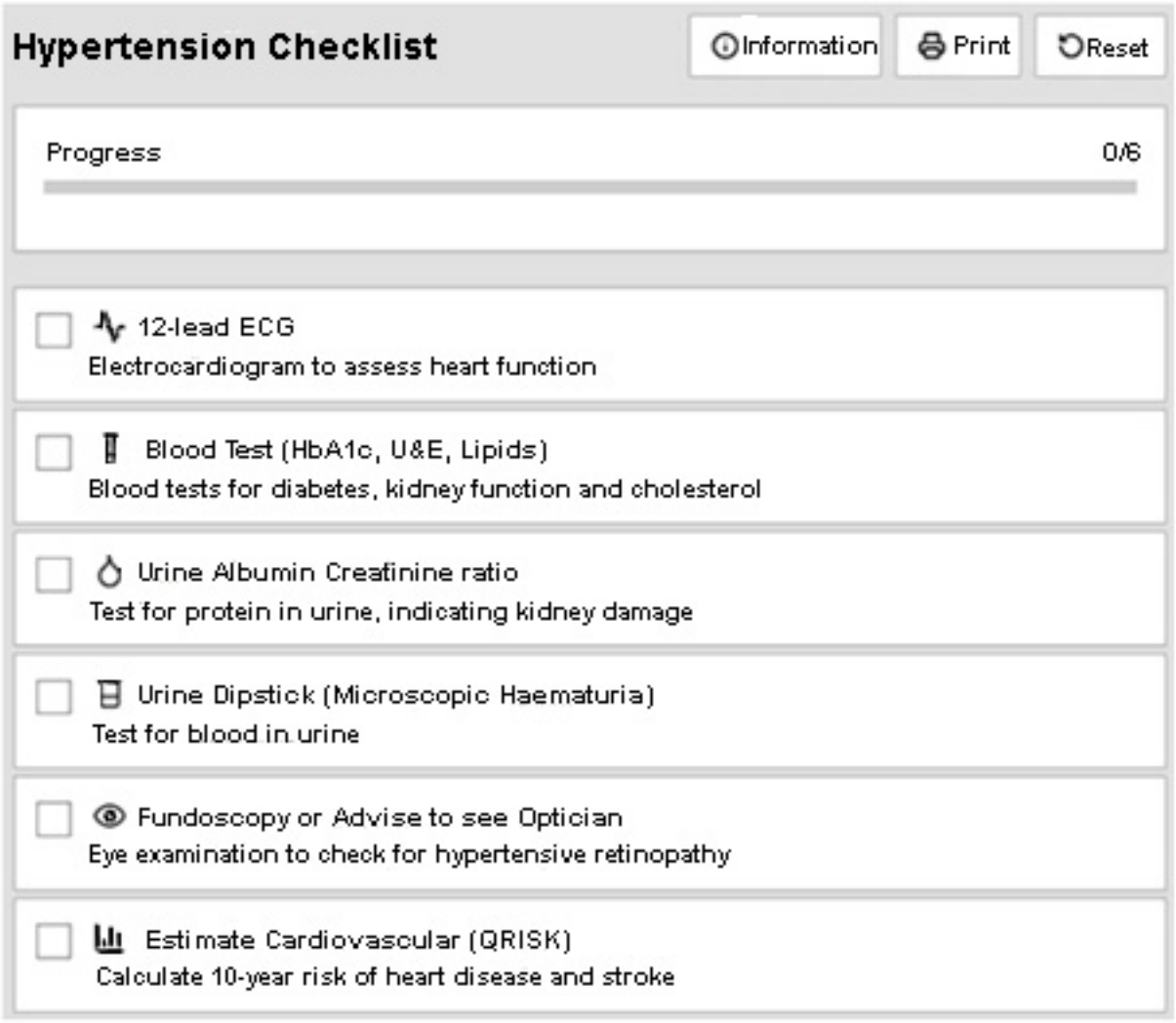
Method

A retrospective audit was conducted using SystmOne, the primary electronic health record system at a large Nottingham general practice. A search identified newly diagnosed hypertensive patients between May 2018 and May 2019. Patients with existing diagnoses of chronic kidney disease (CKD), diabetes mellitus, coronary artery disease, or cerebrovascular disease were excluded to isolate new hypertension cases.

From the eligible patients identified, a random sample of twenty patient records were randomly selected and reviewed to assess compliance with NICE guidelines. Following the initial audit, results were disseminated to clinical staff, and an intervention was implemented. With help from the IT department a hypertension checklist template was introduced into SystmOne (Figure 1). This template was triggered by hypertension-related Read codes or elevated BP readings. The template prompted clinicians to complete relevant assessments and remained active until all checklist items were completed. Nurses and healthcare assistants were encouraged to opportunistically collect urine samples during routine blood tests or ECG appointments.

Twelve months later, a second retrospective audit was conducted using the same methodology and sample size to assess changes in compliance.

Figure 1: Hypertension checklist template



Results

First Audit cycle (Pre-Checklist Implementation) – Table 1

Out of a practice population of 15,045, 1,845 (12.3%) were diagnosed with hypertension between May 2018 and May 2019. After excluding patients with comorbidities, 846 were identified with isolated hypertension. A sample of 20 patients was reviewed:

- Blood tests: 55% compliance.
- ECG: 35%.
- Urinalysis (dipstick): 30%.
- Urine microalbumin: 25%.
- Fundoscopy: 0%.
- QRISK2 score documented: 35%.
- Overall Compliance: 30%

Second Audit cycle (Post-Checklist Implementation) – Table 2

Another random sample of 20 newly diagnosed patients was assessed one year later:

- Blood tests: 100% compliance.
- ECG: 80%.
- Urinalysis (dipstick and microalbumin): 85%.
- Fundoscopy: 30% (note: no in-practice fundoscopy was performed; patients were referred to opticians).
- QRISK2 score documented: 75%.
- Overall compliance improved from 30% to 75.8% following the intervention.

Collective analysis demonstrated improvements across all assessment domains. Review of individual patient records revealed the early identification of several patients with significant findings, including pre-diabetic states, one confirmed diabetic patient, two patients with possible renal disease, and five individuals with QRISK scores exceeding 10%, prompting timely therapeutic

Table 1: Pre-Intervention analysis

CVD Risk Assessment ands target organ damage assessment within 6 months from diagnosis	Number of medical records analysed																			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Percentage**
Blood test - UE / HBA1c / Lipids	✓		✓				✓	✓		✓		✓		✓	✓		✓	✓		✓	55
12 lead ECG	✓		✓				✓	✓						✓	✓					✓	35
Urine dipstick for blood / protein					✓				✓					✓	✓			✓		✓	30
Urine microalbumin	✓		✓				✓	✓												✓	25
Fundoscopy / advice to see optician																					0
QRISK2 score calculated and recorded	✓		✓				✓	✓						✓	✓					✓	35
Overall																					30

Table 2: Post-intervention analysis

CVD Risk Assessment ands target organ damage assessment within 6 months from diagnosis	Number of medical records analysed																			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Percentage**
Blood test - UE / HBA1c / Lipids	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100
12 lead ECG	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓	80
Urine dipstick for blood / protein	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	✓	85
Urine microalbumin	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	✓	85
Fundoscopy / advice to see optician	✓		✓				✓	✓										✓	✓		30
QRISK2 score calculated and recorded	✓	✓	✓	✓	✓		✓	✓		✓		✓		✓	✓	✓		✓	✓	✓	75
Overall																					75.83

Discussion

There is a significant national initiative to enhance cardiovascular disease (CVD) management in primary care, with the ambitious goal of reducing heart attack and stroke mortality by 25% over the next decade (British Heart Foundation, 2024). The importance of this work cannot be overstated: in England alone, optimising blood pressure treatment for just 80% of diagnosed hypertensive patients could prevent over 17,000 cardiovascular events within three years, saving the NHS nearly £200 million (UCLPartners, 2025). Similarly, increasing statin treatment rates to 90-95% among CVD patients could prevent between 9,000-18,000 cardiovascular events over three years (ULCPartners, 2025). Early detection and comprehensive management of cardiovascular risk factors at the point of hypertension diagnosis represents a substantial opportunity to improve outcomes.

This audit revealed significant gaps in the initial assessment of newly diagnosed hypertensive patients, with only 30% overall compliance with NICE guidelines in the first cycle. Factors contributing to underperformance likely included time constraints, variability in clinician knowledge, lack of systematic prompts and limited awareness or application of guidelines.

Trainee GPs demonstrated higher adherence to guidelines, possibly due to longer consultation times and more recent training. Notably, fundoscopy was not performed in any case, reflecting practical limitations in primary care. Given the lack of strong evidence supporting routine fundoscopy in hypertension management (Van den Born BJ et al, 2005), advising patients to undergo optician assessments was considered a pragmatic alternative.

Following the introduction of a digital checklist, marked improvement was observed across all parameters. The checklist served as an effective reminder facilitating timely investigations, better documentation, and follow-up planning. Furthermore, the checklist promoted team-based care with nurses and healthcare assistants playing a key role in actively contributing to improved data collection, early detection of comorbidities and escalating abnormal findings. The checklist facilitated early detection of significant comorbidities including diabetes, renal disease, and elevated QRISK scores. This early identification enabled prompt therapeutic interventions, including appropriate antihypertensive medications and statins, potentially averting future cardiovascular events through timely risk factor management.

Conclusion

This quality improvement project demonstrates how a simple, systematic approach to hypertension assessment can significantly improve adherence to evidence-based guidelines and enhance early detection of cardiovascular risk. By implementing structured assessment tools in primary care, we can contribute meaningfully to national targets for CVD prevention while improving patient outcomes through comprehensive, evidence-based management that focuses on individual patient needs.

Suggestions

- Integration of clinical checklists: Embedding electronic templates into practice management systems can improve adherence to guidelines.
- Team-based care approach: Utilising the wider healthcare team, including nurses and HCAs, can enhance data collection and patient monitoring.
- Ongoing education: Regular training and updates for all clinicians on current guidelines is essential for maintaining standards of care.
- Fundoscopy recommendations: Until more practical solutions are available in primary care, referral to opticians should be standard practice for ocular assessment.
- Continual auditing: Regular audits should be performed to monitor progress, reinforce good practice, and guide future quality improvement initiatives.
- Scaling intervention: The successful checklist template should be disseminated to other practices within the region to support broader improvements in hypertension management.

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