

## Review Article

# Strategies That Promote Sustainability in Quality Improvement Activities for Chronic Disease Management in Healthcare Settings: A Practical Perspective

### **Alexander Evans, MSc**

OPC Researcher, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

### **Seyi Soremekun, PhD**

OPC Senior Researcher, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

### **Brooklyn Stanley, MSc**

OPC Senior Data Analytics Manager, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

### **Francis Appiagye, BA**

OPC Clinical Lead, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

### **Amy Couper, BSc**

OPC Research Assistant, Observational and Pragmatic Research Institute, Singapore, Singapore

### **Oliver Taylor, BSc**

OPC Information Technology Lead, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

### **Thao Le, BComm**

OPCU Global Engagement and Recruitment, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom; Optimum Patient Care Australia, Brisbane, Australia

### **Rachel Pullen, MBChB**

OPC Medical Scientist, Observational and Pragmatic Research Institute, Singapore, Singapore

### **Sophie Jones, BA**

OPC QI Facilitator, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom; Optimum Patient Care Australia, Brisbane, Australia

### **Victoria Carter, BSc**

Research and Operations Director, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom; Observational and Pragmatic Research Institute, Singapore, Singapore; Optimum Patient Care Australia, Brisbane, Australia

### **Chris Price, LLB**

Commercial and Legal Director, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom; Observational and Pragmatic Research Institute, Singapore

### **Rupert Jones, MD**

Professor of Respiratory Medicine at the Observational and Pragmatic Research Institute, Singapore

### **Kerry Hancock, BMBS**

Chandlers Hill Surgery, Happy Valley, South Australia

### **Sinthia Bosnic-Anticevich, PhD**

Sydney Medical School, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia; Central Sydney Local Area Health District, Sydney, Australia

### **Dermot Ryan, MD**

Honorary Clinical Research Fellow at the University of Edinburgh, Usher Institute, University of Edinburgh, Edinburgh, United Kingdom

### **David Price, FRCGP**

Director of Observational and Pragmatic Research Institute (OPRI) Pte Ltd, Global Quality Improvement Programme, Optimum Patient Care Limited, Cambridge, United Kingdom

## ABSTRACT

Healthcare providers recognise the value of quality improvement (QI) activities that enhance the care received by service users. QI is particularly effective for the management of long-term conditions requiring linked care. However, starting and sustaining QI programmes in practice can be time-consuming and difficult and may produce inconclusive and/or inconsistent results. As a not-for-profit social enterprise, Optimum Patient Care (OPC) has been delivering effective and sustainable QI since 2005 in healthcare systems in several countries.

This paper provides a roadmap for the implementation of collaborative QI programmes in a range of settings across three countries. It summarises the barriers we have experienced in the QI cycle and solutions we have identified in our history of working with healthcare providers to deliver QI programmes in primary and secondary care. Key lessons include the strategic involvement of partners in the fields of medicine, health IT, data science and epidemiology, to harness, understand and act on the insights gained from patient and practice electronic

health data (EHR) alongside crucial input from patients and practicing clinicians themselves.

QI aims resource-poor healthcare providers to increase the precision of identifying key patient groups requiring further follow-up – such as those at risk of worsening health outcomes using risk prediction tools. Parallel goals are to increase the proportion of patients receiving prompt and appropriate treatment and to increase patient engagement. We achieve this by providing customised software tools and disease management algorithms to our healthcare partners to allow for automation of aspects of QI that have traditionally involved a manual process. Sharing our experience of these methods helps to embed a sustainable programme of QI in many systems in varied settings.

**Keywords:** Quality Improvement, Chronic Disease, Patient Care, Patient Reported Outcomes, Electronic Medical Records, Sustainable Development

## Introduction

Managing chronic diseases in healthcare is challenging as patients require consistent, joined-up support and personalised treatment over the long term [1]. The practice of quality improvement (QI) - the use of formal or informal tools to assess and improve the quality of the care patients receive, is a key part of optimising patient management in this setting [2–4].

Whilst there is much enthusiasm for QI as a key route to improving patient outcomes, in practice it can be much more difficult to implement and make routine. Central to this is the variability in approaches to and needs of QI [4-5], and the perceived lack of time and competing resources required to do it well [3,6]. Despite a proliferation in the QI literature particularly on broader issues of success and sustainability [7-9], there remains a gap for practical, implement solutions for time-poor clinicians.

Optimum Patient Care (OPC) is a non-profit social enterprise founded in 2005 (Figure 1), to work alongside healthcare providers to deliver sustainable chronic disease QI programmes. OPC delivers an evidence-based, guideline-driven, expert-led and general practice informed implementation strategy to deliver effective QI. Here we discuss the successes and lessons learnt in addressing some of the key barriers to sustainable QI.

### The QI Cycle: Common Barriers to Sustainable QI and Solutions

We approach QI as a cycle of activities (Figure 2) which: first seeks to understand the context and needs of the healthcare setting (step 1), reflect on these needs in parallel with national or international standards for care (step 2), work with practitioners to set achievable and measurable targets (step 3), implement change (step 4), re-evaluate the care provided and embed QI in routine practice (step 5).

**Step 1: Current Practice:** Demonstrating the need for improvement using practice and patient data can be a persuasive

tool to engage staff in QI [6]. Physicians often cite lack of buy-in or resources as reasons for poor engagement with QI [6,7] a shortage of the skills required to harness the wealth of clinical data they produce [8,9] and/or little understanding of how to involve patients in these processes [10]. To support practices in the assessment of the current state of care provision and potential areas for improvement, we have developed simple, automated tools to collect and assess data from electronic medical records (EMR) and patient questionnaires (patient reported outcomes/information – PRO/I).

As data privacy is a legitimate concern, we take a strict approach to de-identifying data – we do not collect any practice/ patient identifiers; we use irreversible hashing algorithms to pseudonymise patient identifiers (IDs), and in the absence of inexpensive commercial options, we developed a robust custom redaction tool (<https://optimumpatientcare.org/redaction/>) to redact free text data to further enhance anonymity.

**Step 2: Reflect on Current Standards:** In an environment of continuously updated guidelines and “pay for performance” funding, clinicians struggle to keep abreast of recommendations and best-practice [11]. Standards that are linked to financial incentives can be limited in scope, focused on a select group of patients where exception-reporting (exclusion of patients from formal audit or QI) [12], may mean that key groups of excluded patients do not benefit from improved care practices. Using the latest guidance informed by our steering committees of clinical experts [13-14]. We summarise guidelines/standards in clear and accessible formats for practitioners, which are reviewed against data collected for the practice. Following feedback from the clinicians and experts, our programmes provide recommendations for both broad groups and individual patients, reflecting current, local or national guidance.

**Step 3: Establish Targets:** Like many others, we have found that setting targets for QI is a difficult, protracted process requiring colleagues to overcome a lack of consensus in choosing which

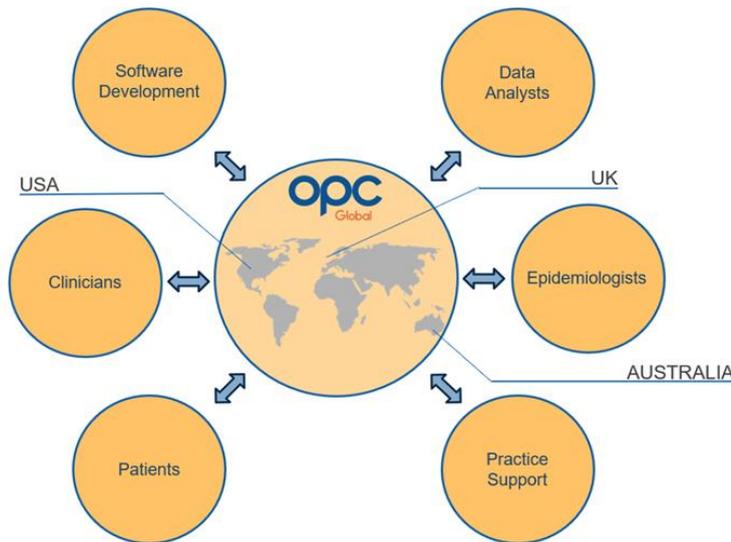


Figure 1: Optimum Patient Care: Locations and areas of focus for supporting quality improvement.

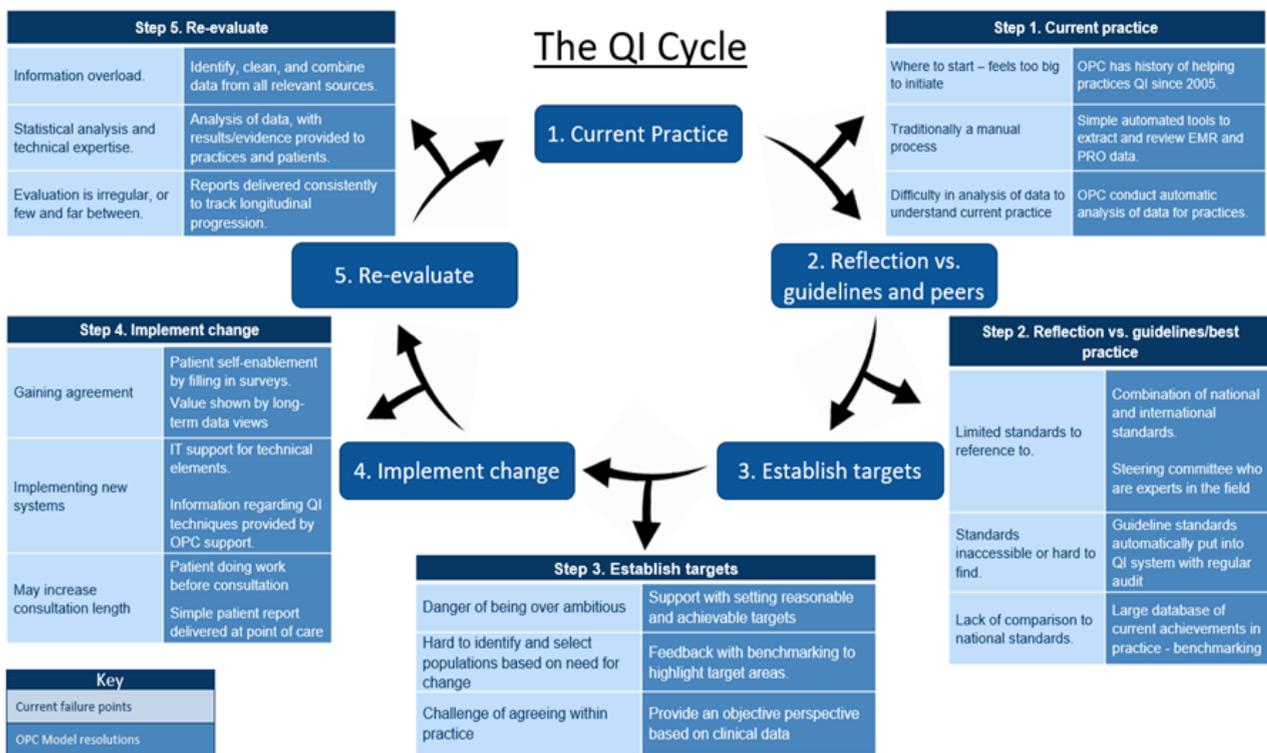
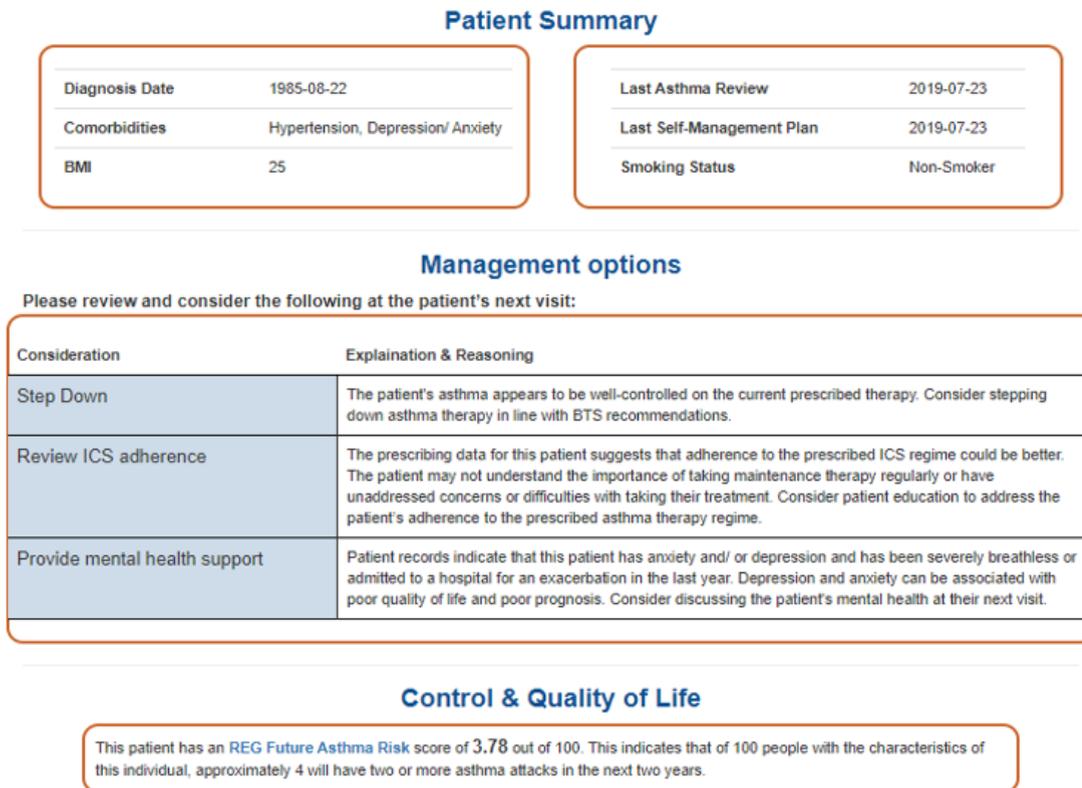


Figure 2: The Cycle of Quality Improvement in Primary Care: Barriers and OPC solutions.

problems to address [6]. Often compounded by previous negative experiences with overambitious targets [2]. Our evolutionary approach helps to set reasonable targets by using practice and patient information to describe current practice, comparing this to local, national or international standards coupled with documented histories of achievable targets successfully implemented by providers in similar situations. We provide digital templates for standardised data entry, practice and patient level reports which are simple and clear with visualisations; summarising current care and recommending measurable targets for improvement. While we develop our own feedback system, we use pre-existing work when appropriate. An example target is the identification of high-risk asthma patients which may be ‘hidden’ to clinicians: We have implemented a peer-reviewed automated risk-prediction algorithm [15] that scores

each patient on the likelihood of future asthma attacks (Figure 3) and have used the validated Target COPD algorithm to identify patients at risk of COPD.

**Step 4: Implement Change:** We have learnt that clinicians respond well to patient stories. Patients also feel listened to when they are invited to see their GP after completing an OPC questionnaire, or when provided with an individualised report. Evidence shows that routinisation of QI activities like these is key to sustainability [16]– thus our reports and templates are designed to be embedded in routine care and to support everyday clinical decision making. This process has grown out of experience and requires technical infrastructure and expertise, which is not always readily available to practices. A key lesson was to move from simply implementing systems that support



**Figure 3:** Application of the Respiratory Effectiveness Group (REG) algorithm to predict the risk of future exacerbations in patients with asthma in quality improvement programmes: Excerpt from an anonymised OPC UK asthma patient report showing individualised output of the asthma risk predictor (yellow box).

data-driven QI, to also maintaining and developing them for the healthcare providers we support.

**Step 5: Re-evaluate:** An important motivator for continuing QI is the “I” - “Improvement” aspect – the ability to demonstrate improvement and the value of what has been achieved [10-11]. Assessing the impact or success of a QI programme is no small undertaking. Figure 2 step 5 highlights several reoccurring themes, summarised as a requirement for both resources and a willingness to re-engage with the cycle. Our evaluations are time-bound to maintain momentum and are based on periodic re-extraction of EMR and PRO/I data and auto-generation of reports to help healthcare providers track their improvements. A recent evaluation of our chronic obstructive pulmonary disease (COPD) QI programme in UK demonstrated that practices which implemented the programme saw an overall 20% reduction in the proportion of high risk patients having a COPD exacerbation in the 12m following the start of the QI programme, compared to 10% reduction across all practices not actively doing QI [7,17-21].

### Conclusion

It is increasingly recognised that healthcare practitioners, patients, the health service and the economy can benefit from improvements in patient care for chronic diseases. We have shown that large scale, collaborative QI programmes can have clear measurable benefits with little impact on workload. Following a decade of refinement of our chronic disease QI model, we have learnt that working alongside primary care clinicians to integrate automated, non-resource-intensive programmes that involve both clinic staff and patients can be a highly effective means to promote a long term culture of QI.

### Submission Declaration

This contribution is original. The work has not been published previously and is not currently under evaluation by another journal.

### Ethical Approvals:

Quality Improvement programs do not fall under ethical approvals.

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### Conflicts of interest

Alexander Evans, Seyi Soremekun, Brooklyn Stanley, Francis Appiagye, Amy Couper, Oliver Taylor, Rachel Pullen, Sophie Jones, Victoria Carter and Chris Price are employees of Optimum Patient Care and the Observational and Pragmatic Research Institute, which has conducted research in respiratory disease funded by the following organizations in the past 5 years: Anaxys, Astra Zeneca, Boehringer Ingelheim, British Lung Foundation, Chiesi, Circassia (formerly Aerocrine),

GlaxoSmithKline, Harvey Walsh, Mapi, Morningside Healthcare, Mundi pharma, Mylan (formerly Meda), Napp, Novartis, Orion, Plymouth University, Regeneron, Respiratory Effectiveness Group, Roche, Sanofi, Takeda, Teva, University of East Anglia, Zentiva (a Sanofi company).

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Kerry Hancock declares no conflict of interest.

Sinthia Bosnic-Anticevich has received honorarium for participation in expert advisory boards and given lectures for Teva Pharmaceuticals, AstraZeneca, GSK, Mundi pharma, Sanofi, Mylan and received unrestricted research grants from Mylan, AstraZeneca, Teva and Mundi pharma International.

Dermot Ryan has (in the last 3 years) lectured on behalf of, received sponsorship from, or acted as a paid advisor to Mylan, AZ, Chiesi, Novartis, GSK, Boehringer Ingelheim and Regeneron.

David Price has board membership with Amgen, AstraZeneca, Boehringer Ingelheim, Chiesi, Circassia, Mylan, Mundipharma, Novartis, Regeneron Pharmaceuticals, Sanofi Genzyme, Teva Pharmaceuticals, Thermofisher; consultancy agreements with Amgen, AstraZeneca, BoehringerIngelheim, Chiesi, GlaxoSmithKline, Mylan, Mundipharma, Novartis, Pfizer, Teva Pharmaceuticals, Theravance; grants and unrestricted funding for investigator-initiated studies (conducted through Observational and Pragmatic Research Institute Pte Ltd) from AstraZeneca, BoehringerIngelheim, Chiesi, Circassia, Mylan, Mundipharma, Novartis, Pfizer, Regeneron Pharmaceuticals, Respiratory Effectiveness Group, Sanofi Genzyme, Teva Pharmaceuticals, Theravance, UK National Health Service; payment for lectures/speaking engagements from AstraZeneca, Boehringer Ingelheim, Chiesi, Cipla, GlaxoSmithKline, Kyorin, Mylan, Mundipharma, Novartis, Regeneron Pharmaceuticals, Sanofi Genzyme, Teva Pharmaceuticals; payment for the development of educational materials from Mundipharma, Novartis; payment for travel/accommodation/meeting expenses from AstraZeneca, BoehringerIngelheim, Mundipharma, Mylan, Novartis, Thermofisher; funding for patient enrolment or completion of research from Novartis; stock/stock options from AKL Research and Development Ltd which produces phytopharmaceuticals; owns 74% of the social enterprise Optimum Patient Care Ltd (Australia and UK) and 74% of Observational and Pragmatic Research Institute Pte Ltd (Singapore); 5% shareholding in Timestamp which develops adherence monitoring technology; is peer reviewer for grant committees of the Efficacy and Mechanism Evaluation programme and Health Technology Assessment; and was an expert witness for Glaxo Smith Kline.

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#### ADDRESS FOR CORRESPONDENCE:

David B. Price, Academic Primary Care, Division of Applied Health Sciences, University of Aberdeen, Polwarth Building, Foresterhill, Aberdeen AB25 2ZD, UK, E-mail: [dprice@opri.sg](mailto:dprice@opri.sg)

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