

Quality Improvement – training for better outcomes

March 2016

Contents

04	Executive summary
06	A four nation approach
08	Stakeholders
09	Acknowledgements
10	Foreword from The Health Foundation
11	Foreword from Health Education England
12	Foreword from the patient's perspective
13	Foreword from the Chair of the Academy
14	Definitions
15	Introduction
17	Talking point: Clinical audit or quality improvement: The debate
21	Work stream 1: Quality improvement curriculum
29	Talking point: Patient involvement in quality improvement
32	Work stream 2: Education, learning and development
37	Enablers for the development of delivery and quality improvement training
43	Talking point: I don't have time to improve!
45	Work stream 3: Mapping examples of quality improvement in practice
49	Talking point: Senior clinician engagement
52	Work stream 4: Strategic and supporting infrastructure
59	Talking point: Parity of esteem of quality improvement with research
61	Discussion
62	Talking point: Quality improvement and sustainability
64	Limitations
65	Appendix 1: Recommendations
70	Appendix 2: Task and finish group members and affiliations
72	Glossary
74	References

List of Figures

- 16 Figure 1. The four work stream topic areas
- 18 Figure 2. Use of aggregated data versus time series data to understand the impact of change
- 20 Figure 3. Moving from audit to quality improvement and time series data
- 22 Figure 4. Knowledge, skills, and values & behaviours required within a quality improvement curriculum at all levels of training
- 31 Figure 5. A multidimensional framework for patient and family engagement in health
- 35 Figure 6. The key elements determining the development and delivery of quality improvement training
- 37 Figure 7. Learning in the modern workplace - based on Jane Hart's model reproduced with permission
- 41 Figure 8. Inter-professional Learning Curriculum model

List of Tables

- 63 Table 1. Benefits of building sustainability into quality improvement

Executive summary

“In order to practise medicine in the 21st century, a core understanding of quality improvement is as important as our understanding of anatomy, physiology and biochemistry”

Stephen Powis, Medical Director, Royal Free London NHS Foundation Trust, 2015

Through new medical science and models of delivery, the systems and reliability of healthcare provision have become more complex – something all too obvious to the staff. Professional training has traditionally, and not unreasonably, focused on the specific clinical skills and knowledge of medicine, rather than knowledge of how to work on the system in which it is practised. To equip professionals to respond to such challenges needs the embedding of improvement methodology as a core competence in practice for all doctors. Quality improvement does make a difference. The outcome will be the continuous improvement of patient care, creation of a more capable and resilient workforce, together with financial, social and environmental sustainability.^{1,2}

Until now, trainee involvement in quality improvement has largely been through clinical audit. However, this has become something of a token effort, and to a large extent, simply data collection. There is a need to move from this traditional approach to implementing repeated real-time measurable changes using quality improvement methodology. Many colleges and medical schools have recognised this, and are implementing curricula enabling trainees to develop improvement science capability. The availability of support and facilitation to implement quality improvement at regional and/or organisational level across the UK varies from a ‘smorgasbord’ of great practice to being patchy at best. Many senior doctors, and the multi-professional team within which they work, are new to the idea of improvement as a systematic methodology.

The Academy of Medical Royal Colleges has drawn together a wide range of stakeholders, to align efforts to implement quality improvement training as a core competence in practice. Experience, expertise and insight have been gained from many different organisations – clinicians and non-clinicians, and most importantly patients – providing a richness and momentum to efforts to enable all trainees (and senior clinicians), and so their patients, to benefit from developing this capability. The vision has been to provide strategic direction to the content, resources and supporting architecture on all matters relevant to training in quality improvement for undergraduate and postgraduate trainees.

The key recommendations are:

- A progressive curriculum in quality improvement activity should underpin all training stages of a doctor, building capability and leadership, and a foundation for on-going lifelong learning and implementation
- Quality improvement should be integral to all clinical and non-clinical job descriptions and appraisal, and career recognition given for quality improvement achievements
- Patient involvement should be advocated and included at every level with recognition that this may be achieved in a variety of ways

- All trainees, and their trainers and multi-professional teams with which they work, should have access to quality improvement training
- Quality improvement activity should be supported at all levels, locally, regionally and by royal colleges and specialist societies in the form of enabling ‘core’ quality improvement support aligned with existing educational structures to permit expert facilitation, coaching, mentoring and inter-professional learning, with protected time to undertake it
- Health and social care executives and non-executives should role-model best practice quality improvement approaches and create an open culture with the focus on learning, ownership and accountability rather than reprimand, as this facilitates a quality improvement culture
- A repository of quality improvement activity should be established to empower learning and sharing
- A stakeholder group should be established under the auspices of a national body such as the Academy of Medical Royal Colleges to align planning in quality improvement activity by key stakeholders and topic experts for the long-term, that is applicable to everybody, and to contribute to improving patient outcomes through education, training, research and collaboration

The ambition has been great, and it is acknowledged that the recommendations are not exhaustive. They are the starting point and need to be brought to life through their practical implementation. By providing support for partnership working and fostering collaboration with the relevant stakeholders and organisations, the Academy of Medical Royal Colleges aims to ensure that the momentum created by this work is maintained and the report’s recommendations are put into practice. The long-term aim is to reduce the variability between organisations’ capability, and to ensure that work is coordinated at all levels throughout healthcare to build quality improvement into its foundations and at its core.

“If I’m being entirely honest I think we as doctors, perhaps not surprisingly, slip back into the medical model and the medical conversation, and the big challenge is truly to listen to other members of the multi-disciplinary team. So it has to be learning together within teams including patients and carers, with no hierarchy.

In no way do I underestimate the challenge, but this is both exciting and important work.”

Professor Dame Sue Bailey, Chair of the Academy of Medical Royal Colleges

A four nation approach

“Scotland's globally recognised quality improvement and patient safety work would not have been possible without a focus on quality improvement training at every level. We have much more to do and I welcome this report to further drive up standards and consistency of quality improvement training across the UK”.

Professor Jason Leitch, National Clinical Director, Scottish Government

“Building improvement skills and giving staff opportunities to change systems and processes of care has fuelled our progress in quality improvement & safety across Health and Social Care. This report will be an important guide on our journey. The call for a “progressive curriculum in quality improvement ... building capability and leadership” embodies the thinking behind our Quality 2020 Attributes Framework.”

Dr Gavin Lavery, Clinical Director, Health & Social Care Safety Forum, Northern Ireland

“Wales, like many nations, has been involved in quality improvement for some years. We have started to teach quality improvement methodology at undergraduate level and widely across the health system and welcome this report's ambition to increase the exposure doctors in training have to quality improvement. There is no doubt that a step-change in capacity and capability is needed for quality improvement in healthcare to have a big impact on the Triple Aim, and this report is a welcome and important step on that journey.”

Aidan Fowler, Director of NHS Quality Improvement and Patient Safety/Director of 1000 Lives Improvement Service, Public Health Wales

“Education and training interventions can actively improve patient safety. There is a real need for a systematic approach that uses learning tools effectively, both for short term reduction in risk to patients and also to build a long-term, sustainable learning environment within healthcare that is centred on patients and on the need for the safest care possible. Getting it right involves instilling the right culture from the very beginning of a healthcare worker's career. This report gives us direction as we navigate the way forward together.”

Patrick Mitchell, Director of National Programmes, Health Education England

Stakeholders

All four countries of the UK have been involved in this work, with representation from 35 organisations made up of patients, trainees, experts in the field, and those actively involved in quality improvement work. The stakeholder organisations are listed below, and all members of the task and finish group are listed in Appendix 2.

Academy of Medical Royal Colleges	Medical students
Academy Patient Lay Group	National Medical Director's Clinical Fellows
Academy Quality Improvement Group	NHS Education for Scotland
Academy Trainee Doctors' Group	NHS England
Association for the Study of Medical Education	NHS Employers
BMA Junior Doctors' Committee	NHS Improving Quality, moving to become part of NHS Improvement
Centre for Sustainable Healthcare	Public Health Wales
Council of Deans of Health	Royal College of Anaesthetists
Conference of Postgraduate Medical Deans (UK)	Royal College of General Practitioners
Faculty of Intensive Care Medicine	Royal College of Obstetricians and Gynaecologists
Faculty of Medical Leadership and Management	Royal College of Midwives
Faculty of Public Health	Royal College of Nursing
Future Focussed Finance	Royal College of Physicians
General Medical Council	Royal College of Surgeons of England
Health and Social Care Northern Ireland	Scottish Deans' Medical Education Group
Health Education England	The Health Foundation
Joint Royal Colleges of Physicians Training Board	UK Foundation Programme
Medical Schools Council	

Acknowledgements

The work was commissioned by the Joint Academy Training Forum, and the Task and Finish Group was chaired by Dr Emma Vaux. Sincere thanks are extended to all members of the Task and Finish Group and their employing organisations. The work was funded by Health Education England and The Health Foundation. The NHS IQ Advancing Change Team also designed and funded the accelerated learning event. We are grateful to the team from the Faculty of Medical Leadership and Management Trainee Steering Group Think Tank, who undertook a survey of junior doctors' views on their current experiences of quality improvement.

We wish to acknowledge the contribution to the talking points by Francis Mortimer, Medical Director, Centre for Sustainable Healthcare, Paul Sullivan, Consultant Acute Physician and Health Foundation Improvement Fellow, Tricia Woodhead, Health Foundation Improvement Fellow and Improvement Advisor and Associate Clinical Director for Patient Safety West of England AHSN, and Jocelyn Cornwell, Founder and CEO, Point of Care Foundation.

Foreword from The Health Foundation

Almost a decade ago, the improvement science experts Paul Batalden and Frank Davidoff, argued that if healthcare was to achieve its full potential, ‘change making’ had to become an ‘intrinsic part of everyone’s job, every day, in all parts of the system’.³ In the years since their now widely-quoted editorial was published, the profile and stock of quality improvement in the UK has undoubtedly risen. Improvement practitioners, determined to make change happen, can be found in every part of the NHS. In some providers, quality improvement has become embedded into the fabric and culture of the organisation: their boards have made a clear, long-term commitment to building their organisations’ improvement capability, and staff at all levels, clinicians and non-clinicians alike, are encouraged, if not expected, to develop quality improvement skills and then hone them on live improvement projects. These organisations can now point to improved patient outcomes and better experience scores – for both patients and staff – over several years.

Many royal colleges and professional bodies have also become enthusiastic quality improvement proponents. The Royal College of Physicians’ *Learning to Make a Difference* programme, which gave junior doctors the chance to undertake a quality improvement project in place of a clinical audit, has been a particular success. Other colleges have worked hard to develop practical guides and resources specifically tailored to the needs of their members: the Royal College of General Practitioners’ recently-published quality improvement guide for GPs and the wider practice team is a good example.

But there is still much more to be done. There are plenty of organisations in which quality improvement remains a marginal activity, undertaken by a few isolated enthusiasts with scant support. Elsewhere, a greater familiarity with common quality improvement tools and techniques has not been accompanied by a clear understanding of how to drive and sustain change in a complex system. There is also a tendency in some places to rush to ‘the solution’ before really understanding what the problem is, or whether, in fact, it is the right one to tackle.

If we are to create a health service of committed improvers, who are ready and willing to make change happen then we need to engage professionals in quality improvement at the very start of their training. Moreover, we need to ensure that they are used to working collaboratively both with people in other health professions and roles, and, crucially, patients.

The Academy of Medical Royal College’s quality improvement task and finish group, which the Health Foundation has supported, has played an important role in helping to make this possible. It has brought together people with a shared interest in improvement from right across the medical education world, with a view to exploring how we can embed quality improvement into the curriculum and training in a consistent way. Critically, it has also looked at the infrastructure and context needed to support effective quality improvement training.

The quality improvement group’s aims fit well with the Health Foundation’s goal of embedding improvement into the way in which people learn and work across the health and social care system. ‘Q’, for instance, the initiative led by us and supported and co-funded by NHS England, which aims to connect people skilled in improvement across the UK, provides a great opportunity to build on the group’s findings and outputs. The fact that a number of the founding cohort of ‘Q’ have also been closely involved in the quality improvement group is good to see. I’m delighted therefore that the Health Foundation has had the chance to support the group’s important work.



Penny Pereira, Deputy Director of Improvement, The Health Foundation

Foreword from Health Education England

It is a fundamental duty of all doctors to contribute to systems of quality assurance and quality improvement. Promoting patient safety and the medical workforce in training is of particular importance.

Evidence from Health Education England's Better Training Better Care programme, which aimed to improve the quality of training for the benefit of patient care, demonstrated the importance of quality improvement in allowing junior doctors to bring about change.

The trainee medical workforce rotates through numerous, varied, clinical posts over a period of several years and observes different models of care delivery in the process. At the frontline of service delivery, doctors in training are perfectly placed to perceive how systems in the immediate environment influence the delivery of patient care. Using this clinical experience, doctors in training can plan and implement innovative improvement strategies. To date, trainee involvement in quality improvement has largely been through clinical audit, but there is increasing evidence that junior doctor-led audit is failing to deliver, with junior doctors perceiving their involvement as a 'tick-box exercise'. Crucially, audits undertaken by doctors in training often fail to change practice.

It is now widely recognised that there is a need to move from this traditional approach to one that implements repeated, real-time, measurable changes using quality improvement methodology. There are already encouraging signs locally, regionally and nationally – of which the Royal College of Physician's *Learning to Make a Difference* initiative is a good example. But this groundswell of effort needs to be facilitated by training, local support and through the selection processes, assessments and tools by which curricula are articulated.

This HEE-sponsored project led by the Academy of Medical Royal Colleges aimed to provide a robust structured framework to embed improvement methodology as a core competence in all doctors. It has identified supporting infrastructure required to build reflective and enthusiastic improvers, and professional and personal resilience in doctors in training. The overall aim was to increase capability and capacity across the workforce for healthcare teams to make a positive difference to delivering safe and effective patient care. The four work streams of the project have looked at curriculum development, quality improvement training models and methodologies, supporting infrastructure, and mapping resources together with identifying multi-professional ways of working.

There is a win-win here for doctors in training, the organisations in which they work, and our patients by engaging a large proportion of the healthcare workforce with quality improvement at an organisational level, while offering opportunities for doctors in training to undertake activities that we know will prepare them for future leadership roles and responsibilities.



Patrick Mitchell, Director of National Programmes, Health Education England

Foreword from the patient’s perspective

Quality improvement in healthcare is in everybody’s interest, especially the patient. In order to ensure this is a rigorous and sustained objective, patients must be involved in the ways in which improvements are delivered to ensure high quality outcomes.

“You have the right to be involved, directly or through representatives in the planning of healthcare services commissioned by NHS bodies, the development and consideration of proposals for changes in the way those services are provided and in the decisions to be made affecting the operation of those services” NHS Constitution 2015⁴

The 2013-2015 NHS Business Plan was a substantial commentary on the partnership between the NHS and those it was serving, the public and patients. It emphasised the importance of delivering outstanding care, described in relevant high quality standards. It put patient safety first, especially through the ability to identify patient experience factors. Patients were characterised as advocates for quality improvement. NICE, CQC, HEE, Monitor were among the leading public NHS organisations through which standards and the delivery of quality improvements were to be achieved.

The 2013 Francis Review thoroughly endorsed the role of the patient in the drive to fundamentally change the culture and ethos of the NHS in order to put people first.

The Healthcare Quality Improvement Partnership (HQIP) has a specific role to ensure patient and public engagement in the process of improving and developing a working model of patient led activity including training and education.

“The goal is not for patients and carers to be the passive recipients of increased engagement, but rather to achieve a pervasive culture that welcomes authentic patient partnership – in their own care and in the processes of designing and delivering care. This should include participation in decision making, goal-setting, care design, quality improvement and the monitoring and measuring of patient safety”⁵

Added to this list, the Academy of Medical Royal Colleges is now in the forefront of delivering quality improvement. The Academy Patient Liaison Group has been active in the formulation of the Academy’s Quality Improvement Project. We congratulate the Academy on this important initiative. We have welcomed this opportunity and the contribution it will make to the training, development and implementation of high quality improvement through the medical profession in the UK. We hope and expect the patient perspective to continue to be a substantial part of this important project.

Peter Rees, Patricia Peattie and Derek Prentice
Academy Patient Lay Group members

Foreword from the Chair of the Academy

I am delighted to see the publication of this report identifying ways of embedding quality improvement training in medical education. This work has drawn together stakeholders from all four nations of the UK, and has created a consensus on methods of ensuring that improvement methodology becomes a core competence for all doctors.

Our trainees are pivotal to good patient care, and the work they do is crucial. In order to build an NHS which is a learning organisation, seeking continuous improvement, it will be essential to make quality improvement integral to the work of all staff, rather than seen as something done as an add-on. This includes training, mentorship, and protected time and support to put that training into practice.

We know we need to make things better for patients, but we need support to enable us to understand how to do that in the very complex healthcare systems and processes within which we work. In return, this makes us feel better as professionals; moving from audit (data collection) to using data to drive improvement can feel transformational, can reenergise and motivate us, especially when working and learning as a multi-professional team. We respond to the chance to be creative and innovative in the way we care for our patients.

We value our trainees, and we wish to value their training, and their ability to make a difference to their patients. These recommendations are practical ways of making this happen, and I trust that you will take the steps within your power to put them into action.



Professor Dame Sue Bailey, Chair of the Academy of Medical Royal Colleges

Definitions

Quality

‘Patient care that focuses on safety, effectiveness and patient experience’

NHS Constitution for England 2015 ¹

These dimensions of quality are echoed in ‘The Healthcare Quality Strategy for Scotland 2010’ ², ‘Our Quality Strategy for 2015-2018’ in Wales ³, and ‘Quality 2020’ in Northern Ireland ⁴

Quality improvement

- Using understanding of our complex healthcare environment
- Applying a systematic approach
- Designing, testing, and implementing changes using real-time measurement for improvement
- To make a difference to patients by improving safety, effectiveness and experience of care.

Quality improvement education

Develops our capability and resilience to put quality improvement into action through acquisition, assimilation and application of:

- Knowledge in improvement science, systems and measurement
- Skills in managing complexity, leading change, learning and reflection, and ensuring sustainability
- Training in human factors that impacts those capabilities
- Involvement of patients throughout the process

Introduction

“It is a fundamental duty of all doctors to contribute to systems of quality assurance and quality improvement. Promoting patient safety and the medical workforce in training is of particular importance.”

Patrick Mitchell, Director of National Programmes, Health Education England.

Almost a decade ago, the improvement science experts Paul Batalden and Frank Davidoff, argued that if healthcare was to achieve its full potential, ‘change making’ had to become an ‘intrinsic part of everyone’s job, every day, in all parts of the system’.⁹

In the years since their now widely quoted editorial was published, the profile and stock of quality improvement in the UK has undoubtedly risen. But there is still much more to be done. There are plenty of organisations in which quality improvement remains a marginal activity, undertaken by a few isolated enthusiasts with scant support. Elsewhere, a greater familiarity with common quality improvement tools and techniques has not been accompanied by a clear understanding of how to drive and sustain change in a complex system.

This Health Education England and Health Foundation sponsored work led by the Academy of Medical Royal Colleges aims to provide a robust structured framework to embed improvement methodology as a core competence in all doctors. By looking at four themes required to produce this framework (quality improvement curriculum development, quality improvement education and learning, strategic and supporting infrastructure at multiple levels, and resources (Figure 1)), it has identified key requirements for building reflective and enthusiastic improvers, and professional and personal resilience in doctors in training. The overall aim is to increase capability and capacity across the workforce for healthcare teams to make a positive difference to delivering safe and effective patient care.

“We should start with the patient. It is important that quality improvement starts with what is important and not with what is easy to address”

Patricia Peattie, Chair Academy Patient Lay Group

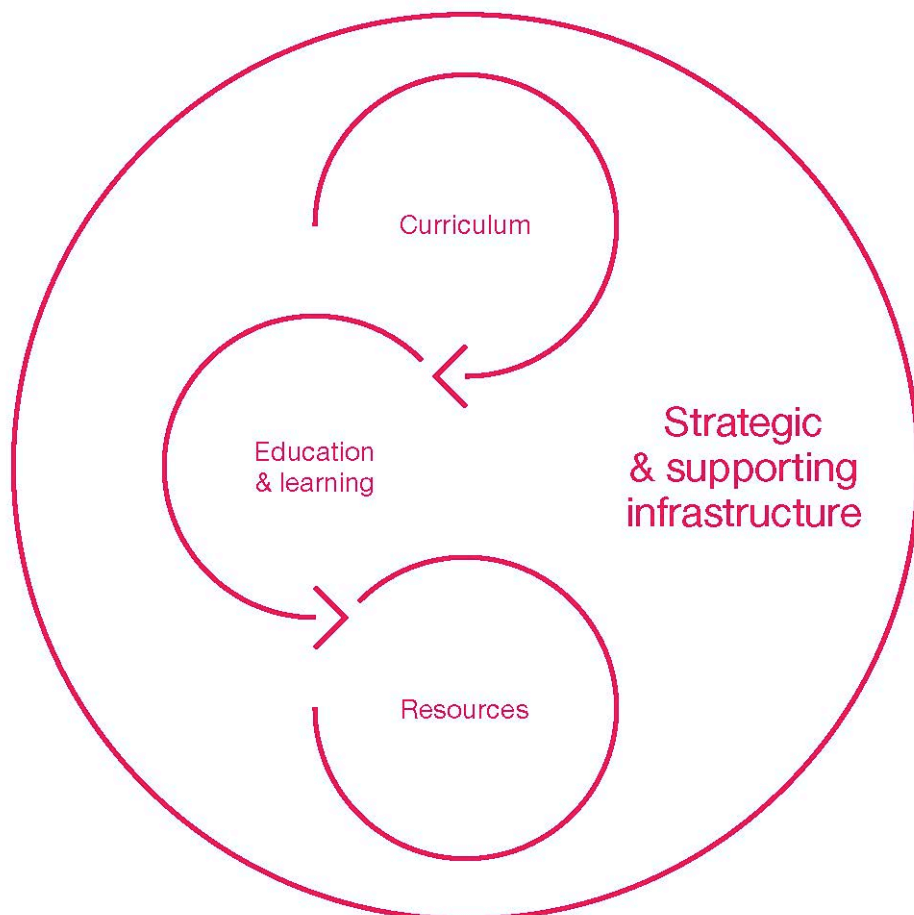


Figure 1. The four work stream topic areas

Talking point: Clinical audit or quality improvement – the debate

The way we use the terminology of ‘clinical audit’ and ‘quality improvement’ has resulted in a debate where the two terms appear to be in competition with each other, leading to an ‘either’/‘or’ dichotomy. This debate and confusion continues. If we take the concept of research as answering the question “*what is the right thing to do*”, then audit can be seen as providing answers to questions such as “*are we doing the right thing*” and “*how well are we doing*” (i.e. providing a baseline position to find out whether an aim, standard, or best practice has been met), and where improvements are needed. Quality improvement methodology then provides us with a dynamic testing and measuring approach to implementing changes, in order to ensure that the right thing takes place, and so closing the gaps we have identified. In complex systems built from multi-professional teams the audit cycle is effectively completed by using improvement methodologies.

Why did you get involved in quality improvement?
“For me it was from audit and frustration that nothing ever seemed to change! #agents4c”

Faculty of Medical Leadership and Management Twitter chat 22/10/2015
https://storify.com/Angelika_Za/agents4c

Audit and quality improvement lie on the same continuum. However, there are many challenges to this premise:

- In many of our hands, clinical audit has become too static and does not go beyond the first step of data collection. The intention of clinical audit should be much more dynamic, leading to active use of the data to drive improvement
- By only doing one audit cycle, a single measurement of the impact of a change, often measured four to six months after that change, means that the richness of learning can be lost, and conclusions are based upon many assumptions as to the reason for the observed change. A single measurement of a change does not give us enough information about that change. Looking at blocks of time and aggregated data does not disentangle the components of the change, and what is working and what is not (Figure 2)
- When we decorate a room and paint a wall, we would not wait four to six months to get feedback. It is also likely that painting a wall is one of many repeated changes to get the effect we are looking for. Introducing a change will likely have a knock-on effect and cause us to look at other things. In the same way, when introducing new evidence-based practice, just telling staff to follow a new guideline is unlikely to achieve success, and may in some cases introduce resentment, something identified with the introduction of the WHO surgical checklist.¹⁰ Context, adaptation, engagement and sustainability all need attention and involve many different steps. There is a need for repeated review of how change is implemented and the reliability of any new way of working and its impact
- An obstacle to the evolution of audit into improvement change is that data collection is reasonably straightforward and perhaps the easier option for trainees. Enabling, supporting and facilitating change is much more challenging as it involves change of others’ behaviours and ways of working.

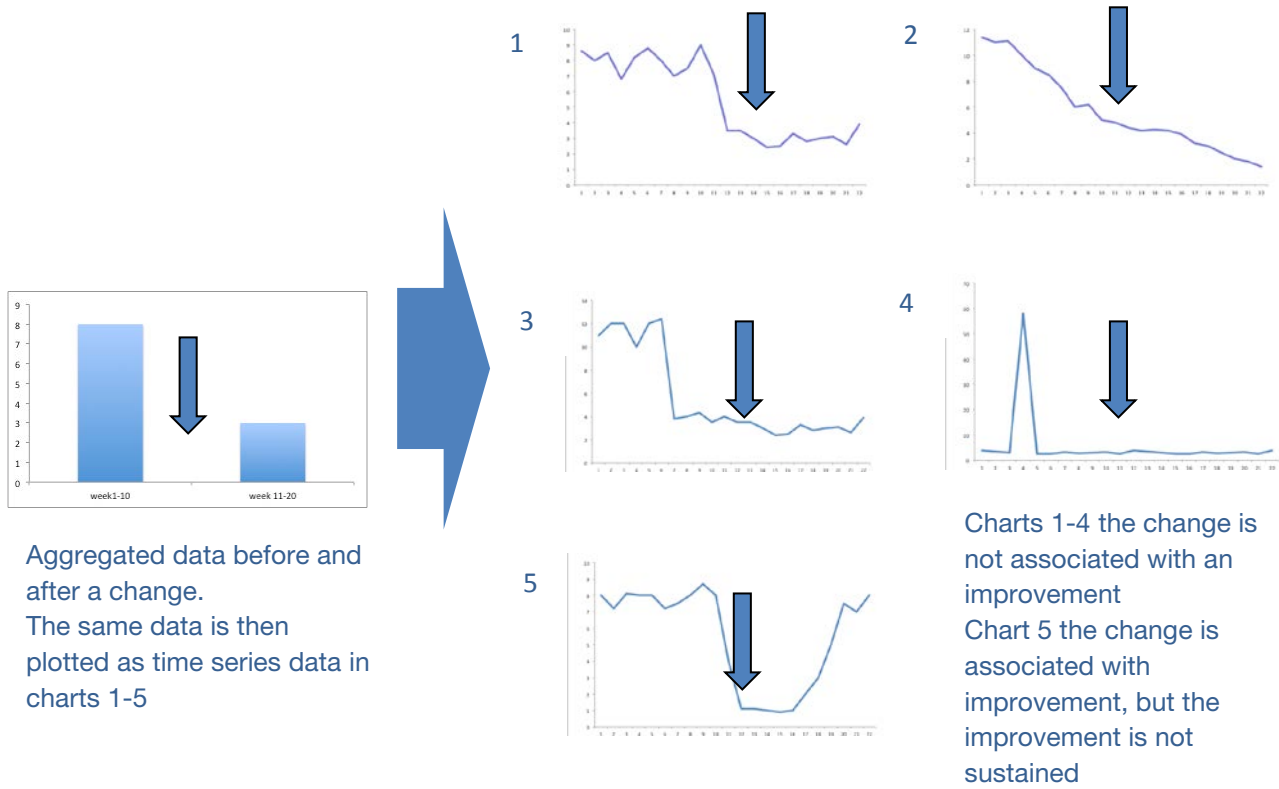


Figure 2. Use of aggregated data versus time series data to understand the impact of change.

“The other thing that junior trainees may not have sight of is that there are indeed many ongoing ‘clinical audits’ that are probably already quality improvement but in their short time in a department they only see one cycle when in actual fact data is gathered for and changes attempted every few months through departmental clinical governance. By way of example the easiest way I found of establishing continuity of a quality improvement project at a previous trust was to get it in to their clinical governance meeting thus forcing the department to continue to monitor change and respond if standards slipped (this took the surgical VTE prophylaxis compliance from 67% to 96%).”

FY2 trainee

Quality improvement methodology gives us the capability to respond to these challenges. Quality improvement should be seen as applying well-used methods for delivering change in complex systems to the so-called 'make change' part in the audit cycle. By systematically reviewing any changes found, quality improvement of any sort can be measured at each test. One of the strengths of quality improvement methodology is that it provides real-time measurement of what is working and what is not. The time-series data enable us to harness the learning in a real time and dynamic way, thus allowing us to develop, embed and sustain any change that is an improvement and detect any change that is not. At its most simple, each audit cycle should be seen as a Plan-Do-Act-Study (PDSA) cycle. Iterative PDSA/audit cycles, and repeated measurement of their impact, then provide a framework for planning, testing, experimental learning and informed actions leading to improvement (see Figure 3).

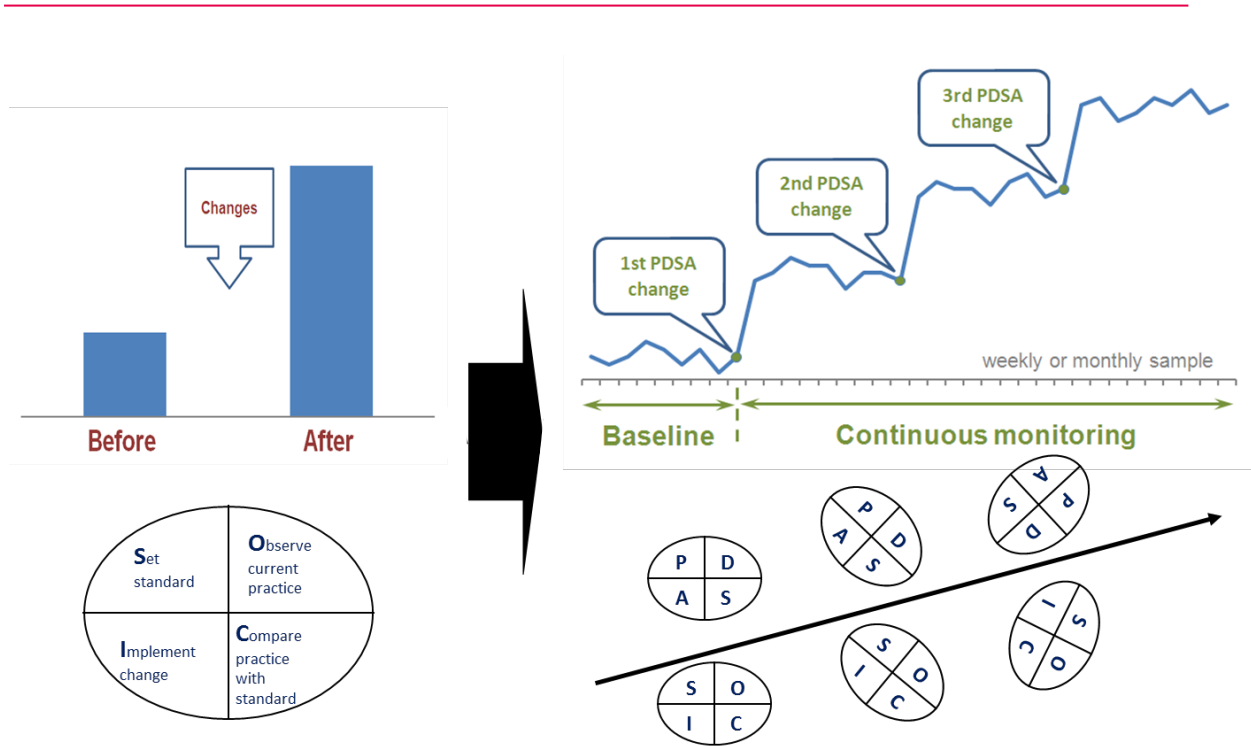


Figure 3. Moving from audit to quality improvement and time series data

Work stream 1: Quality improvement curriculum

The aim was to develop an approach to quality improvement learning that would start at undergraduate level, and then be developed and enhanced as an individual moves into postgraduate education and practice in the workplace. Whilst the primary focus of this work has been on medical education and training, the intention is that this can easily be applied to the training of other health and social care professionals.


Recommendations

Development of quality improvement curricula

The knowledge, skills, and values & behaviours required within a quality improvement curriculum at all levels of training are described in Figure 4.

*“It’s very exciting; I think it’s just a beginning of the platform for where we go next - consistent quality improvement delivery through specialist curricula and beyond into consultant practice. One of the key things for me is the power of an alliance between GMC moving towards mandating quality improvement training as part of the generic curriculum, and the Colleges working together through the Academy to develop and mutually support consistent quality improvement training. In the Royal College of Anaesthetists we have an active programme of training days to support trainers. In this the emphasis is to build knowledge, confidence and enthusiasm; including the challenge; ‘when the GMC mandate our QI module, *how* will you deliver it? Not, why we can’t do it, or the difficulties with it.”*

John Colvin, Consultant in Anaesthesia and Intensive Care Medicine and Associate Medical Director for Quality Improvement in NHS Tayside and Hon. Senior Lecturer at the University of Dundee



	Knowledge	Skills	Values and Behaviours
Undergraduate	<p>Can compare and contrast quality assurance and quality improvement, and describe the relationship of audit and quality improvement to clinical governance.</p> <p>Understands the principles of, and differences between, quality improvement, audit and research. Can describe PDSA cycles, human factors and reporting error.</p>	<p>Has actively contributed to a quality improvement activity (this does not necessarily need to be in a clinical setting)</p>	<p>Has actively contributed to a quality improvement activity (this does not necessarily need to be in a clinical setting)</p>
Foundation		<p>Has taken part in systems of quality assurance and quality improvement, in the clinical environment, and actively contributes to a clinical quality improvement project</p>	<p>Recognises the need for continuous improvement in the quality of care, and for audit to promote standard setting and quality assurance</p>
Core / Basic Training	<p>Describes tools available for planning quality improvement interventions.</p> <p>Explains process mapping, stakeholder analysis, goal and aim setting, implementing change and sustaining improvement.</p> <p>Understands and describes statistical methods of assessing variation.</p>	<p>Designs, implements, completes and evaluates a simple quality improvement project using improvement methodology as part of a multidisciplinary team</p> <p>Supports improvement projects to address issues around the quality of care undertaken by other trainees and within the multidisciplinary team</p> <p>Demonstrates how critical reflection on the planning, implementation, measurement and response to data in a quality improvement project have influenced planning for future projects</p>	<p>Demonstrates the values and actively supports quality improvement in the clinical environment</p>
Higher Training	<p>Compares and contrasts improvement tools and methodologies</p> <p>Compares and contrasts the principles of measurement for improvement, judgement and research. Describes types of measures, and methods of assessing variation</p>	<p>Proactively identifies opportunities for quality improvement and leads multidisciplinary quality improvement project teams with minimal supervision</p> <p>Supervises a quality improvement project involving junior trainees and other members of the multidisciplinary team using improvement methodology involving junior trainees</p> <p>Leads and facilitates team-based reflective evaluation of a project</p>	<p>Demonstrates advocacy for clinical quality improvement</p>

Figure 4: Knowledge, skills, and values & behaviours required within a quality improvement curriculum at all levels of training

Recommendations

In forming its recommendations for curriculum development, the task and finish group has identified a number of areas for consideration and potential action by key stakeholders.

To the General Medical Council (GMC):

- The GMC should use the quality improvement curriculum to help inform and be taken into account as part of its:
 - Development of a framework for generic professional capabilities
 - Approval of curricula produced by royal colleges and the UK Foundation Programme Office
 - Quality assurance processes: The development of exploratory questions for quality assurance teams could be a helpful way forward. This would enable teams to investigate and collect data on whether medical students and doctors in training are receiving education on quality improvement.

To the GMC and medical schools:

- The GMC and medical schools should work together to explore whether these recommendations could feed into any updating of the curriculum for undergraduate medical education and training.

To medical schools:

- Medical schools should consider whether they can design their curricula and assessment systems so that their students can meet the recommendations set out in this report.

To the medical royal colleges:

- Royal colleges should use the recommendations contained in this report to inform the quality improvement elements within the curricula they submit to the GMC for approval.

To those responsible for the provision of the foundation programme and specialty, including GP, training:

- The relevant bodies should investigate how they can provide training that will allow their trainees to meet the recommendations set out in this report

- Trainers and teachers will need to develop skills in delivering quality improvement education and therefore there is a need to develop competences for quality improvement trainers. Those agencies responsible for embedding quality improvement and leadership within the health system and across the UK could be tasked with developing these
- These bodies should also consider how patients might be able to contribute to the development of quality improvement projects and education.

To those involved in developing assessment systems in both undergraduate and postgraduate medical education and training:

- Those involved should continue to develop robust ways of assessing proficiency in quality improvement, for example, through supervised learning events and professional exams.

The rationale for the recommendations

Our approach to developing quality improvement curriculum requirements

In order to develop an approach that will work for quality improvement across the continuum of medical education and training, a largely outcomes-based approach was chosen (Figure 4). Medical schools are already familiar with this approach and it works well as schools are in charge of their own curricula. Furthermore, by using an outcomes and activities based approach there is a degree of flexibility that will allow individual schools, royal colleges and faculties to implement this work in a way that fits with the requirements of their school or specialty. One size does not fit all in medical education and therefore there need to be high level descriptors of the minimum knowledge and experience a doctor should have in respect of quality improvement as they move through education and training. This approach will also foster innovation as schools and specialities develop unique approaches to implementing this report.

It was determined that a simple grid setting out the knowledge, skills, values and behaviours required at each stage of training would be the most appropriate way for setting out the outcomes and activities that were developed (Figure 4). The outcomes and activities themselves are drawn from the following sources:

- The Foundation Programme Curriculum 2016 (FP2016)
- Royal college curricula that currently cover quality improvement
- Generic professional capabilities.

There was a deliberate move of some items from the Foundation Programme 2016 into the undergraduate section of the grid, as it was felt that this might be a more appropriate place for doctors to learn knowledge-based outcomes and activities relating to quality improvement. However, it is important to note that as this grid is not compulsory the knowledge competencies

will remain in the Foundation Programme Curriculum as this will ensure that all doctors learn about quality improvement.

As this work developed, there was an acknowledgement that a wide range of skills, knowledge and behaviours are essential in delivering effective quality improvement projects – for example, teamwork, communication, multi-disciplinary working and research and audit skills. However, these elements, which although relevant in the context of quality improvement – and which will be strengthened with the introduction of Generic Professional Capabilities - are outside the scope of this project.

The policy agenda

Quality improvement is frequently couched in terms of safety, and this is a powerful driver for all clinicians, governments and organisations with an interest in medical and healthcare education. However, quality improvement is about more than simply preventing avoidable harm – it is about enhancing patient experience and clinical effectiveness as well.

International developments

Internationally, there has been a focus on developing the use of quality improvement within health services. The establishment in 1991 of the Institute for Healthcare Improvement (IHI) in the US has been a key driver, with the provision of quality improvement education and training to increase awareness of how quality improvement can be used in health systems. In the US, there is a series of large-scale initiatives underway to incorporate quality improvement into medical education, such as at postgraduate level by the Accreditation Council for Graduate Medical Education (ACGME), and at undergraduate level by the Association of American Medical Colleges.

These initiatives have heavily influenced the outcomes and activities that have been produced as part of this project. In particular, the Paediatrics Milestone Project¹¹ run by the ACGME and the American Board of Paediatrics has influenced our work as it sets out a clear progression of learning through levels of expertise in quality improvement. This approach maps well to our aim of producing outcomes and activities for different stages of medical education and training. However, our version links undergraduate learning to postgraduate learning in addition to mapping the progression of learning post medical school.

Leadership

For those who wish to lead healthcare delivery the ability to understand, carry out and direct projects to improve the quality of the service they run is an essential skill. In order to ensure that future healthcare leaders have these skills, effective quality improvement education embedded throughout training is critical. In addition, the outcomes and activities outlined in this chapter will allow individuals to practise and develop leadership skills as they are required to undertake multi-professional team working and lead and manage a quality improvement project.

Current coverage of quality improvement in UK curricula

It is important to note that the way curricula are developed and regulated differs depending on the stage of education and training being considered. This section sets out the ways in which different stages of medical education and training are regulated and the current coverage of quality improvement within curricula and outcomes and activities.

Undergraduate medical education and training

Medical schools are quality-assured by the General Medical Council (GMC). The GMC has a statutory duty to set standards for medical education. In July 2015, it published a single set of standards – *Promoting Excellence*¹² for all stages of education and training, including

undergraduate medical education and how this should be provided within medical schools. The GMC also sets outcomes for undergraduate medical education outlining what a student should be able to do by the time of graduation. Medical schools set their own curricula, which are designed to ensure that their students meet the GMC's standards and outcomes. Whilst there are a large number of core items that medical students are taught, curricula differ across medical schools. The current *Outcomes for graduates*¹³ specify the activities relating to quality improvement as follows:

- Reflect, learn and teach others
- Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately for example, by critically appraising the prescribing of others
- Protect patients and improve care
- Understand and have experience of the principles and methods of improvement, including audit, adverse incident reporting and quality improvement, and how to use the results of audit to improve practice
- Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the use and prioritisation of resources.

Postgraduate medical education and training

The GMC's standards also set out the requirements for the provision of postgraduate medical education – covering both Foundation and specialty training. This training is provided in hospitals, GP surgeries and in other healthcare settings. It is overseen by a number of bodies including Health Education England local teams and Deaneries who ensure the training meets the standards set by the GMC.

In addition to the Foundation curriculum, there are different curricula for the 66 medical specialities and 36 sub-specialties. These curricula and the related assessment systems are developed by the royal colleges and faculties and approved by the GMC. Curricula differ between specialities and quality improvement is not currently covered in all speciality curricula. However, there is good coverage in curricula produced, for example, by the Royal College of Physicians, and this has influenced our work on throughout the project.

Generic Professional Capabilities (GPC)

The GMC has developed, jointly with the Academy of Medical Royal Colleges, a draft framework for generic professional capabilities (GPCs). This sets out the high level educational outcomes including the core professional values, behaviours, knowledge, insights, skills that all doctors should possess and be able to apply and adapt to a range of clinical and non-clinical contexts by the time they complete specialty training.¹⁴ It is the GMCs and Academy's intention that quality improvement will be embedded in the framework.

At the time of preparing this report, GPCs have been developed and consulted upon but the final version has yet to be confirmed. However, it is clear that the GMC intends to implement GPC and that all postgraduate curricula will need to be designed to deliver education and training that allows doctors to develop and demonstrate they have the GPCs necessary to deliver safe and effective care.

The following are the draft outcomes as they appeared in the GMC's and Academy's draft consultation on the GPCs framework.

Design and implement quality improvement projects that improve clinical effectiveness and patient safety and experience by:

- Using data to identify areas for improvement
- Employing quality improvement methods such as 'plan, do, study, act' cycles
- Engaging with stakeholders, including patients, doctors and managers to plan and implement change
- Measuring and evaluating the impact of improvement.

Although the focus of the GPC framework is currently on postgraduate specialty education and training, the GMC believe that GPCs could be applied to the earlier stages of training. The GMC will be exploring with the Medical Schools Council and the Academy of Medical Royal Colleges Foundation Programme Committee the scope for schools' curricula to be mapped to GPCs in the future.

Revalidation

Even after finishing postgraduate medical education, all doctors must take part in continuous professional development, as part of revalidation. Although appraisal is employer-based, the GMC sets the supporting information doctors must provide for their appraisals, and includes quality improvement in this.

Trainers

One concern that has been flagged throughout the course of this project is that there may not be a good enough understanding of quality improvement amongst teachers, trainers and assessors to allow the delivery of the level of quality improvement education set out in the grid. It is therefore proposed that this capacity is considered and that ‘train-the-trainer’ courses on quality improvement education are developed. This is explored further in work stream 2.

Analysis

By looking at what is currently set out in terms of curricula on quality improvement it is clear that coverage varies dramatically both across training bodies and stages of education and training. This project provides an opportunity to develop training on quality improvement which runs through the continuum of medical education and training. Such an approach allows knowledge of quality improvement to be developed in stages appropriate to the point of a doctor’s career development. It also allows skills to be developed in line with knowledge, and enables doctors to put these skills into action. By requiring doctors to carry out quality improvement activities, the health service will benefit from the findings of these individual projects.

Assessing quality improvement outcomes

Assessment drives learning; therefore to properly embed quality improvement within education and training it must be capable of being robustly assessed. In order to address this issue, assessment experts from both the postgraduate and undergraduate fields were asked to consider how the outcomes and activities set out in the grid might be assessed. It should be noted that assessment methods vary depending on the doctor’s stage of training. At postgraduate level much more emphasis is placed on assessment in the workplace, as this is where the vast majority of education and training takes place. Undergraduate medical assessment it is more likely to take the form of formal knowledge or practical assessments. This is particularly the case if the assessment is linked to progression through the course.

The majority of experts from across the continuum agreed that workplace-based assessments or assessed projects would be the best methods for assessing quality improvement. This makes sense as it is essentially a practical skill. However, the risk is that without quality improvement forming part of more formal assessment such as knowledge or practical exams for progression through medical school or stages of training (such as royal college exams) it will not become fully embedded and valued by trainees and students. From discussions with assessment experts it is clear that further work needs to be done to develop more formal ways of assessing quality improvement. Encouragingly there is some evidence from the US that quality improvement can be assessed by Objective Structure Clinical Examination (OSCE)-type assessments.

Summary

It is clear that there is a pressing need to develop quality improvement learning across the continuum of medical education and training. It is an area that is recognised as important both globally and in the UK. At present, approaches vary both across stages of training and specialties. The intention is for this work to enable education bodies to embed quality improvement education into their current curricula. This will allow them to demonstrate that their curricula will be able to deliver the generic professional capabilities that relate to quality improvement.

Talking point: Patient involvement in quality improvement

In order to have responsive services that provide good patient experiences, patients' needs must be at the centre of service design, reconfiguration and improvement. Patients have a tremendous contribution to make to every part of quality improvement. They are able to bring their own particular knowledge and experience to the conversation, ensuring that the patient perspective is kept at the forefront of discussions, when clinical staff are trained to focus on, and may get distracted by, the detail. Patient involvement in quality improvement may encompass wide-ranging participation. The patient is an expert on the experience of being a patient and in some cases may be already, or can become, an expert in their illness. As healthcare professionals we have much to learn from them and their ideas to improve the quality of their care. It is impossible to improve patient experience, a key component of healthcare quality without listening in detail to what service users want, and cross-checking at every stage of a project that this is being achieved.

Some patients may wish to collaborate further. The purpose of enabling learning about how quality improvement is done is to harvest that contribution wherever possible in a compassionate and respectful way. NHS England's *Improving Experience of Care Through People Who Use Services* report¹⁵ recognised that there is a critical role for 'patient leadership' and this should be seen as 'a core and essential component of a 21st century health and care system'. Ten building blocks for developing patient leadership were recognised which included involving patient leaders in the experience of care, shaping, co-designing and leading proposals and investing in their task-specific training and development. Gaining an understanding through the experience of quality improvement in action expands the breadth of settings a patient may wish to influence.

'I am a firm advocate of any available training to enable and/or develop patients to ensure that they are able to 'sit at the table' with health professionals as equals understanding as much as possible of the way the NHS works.

I don't think you can really teach someone to be a Patient Leader but you can give that person with a passion to make change a tool kit to help them do it. That's what we do on our Leading Together programme."

Carol Munt, HSJ 50 Patient Leaders List, 2015

Co-design and co-production leading to transformation of care are examples where patients have been key members of the team, confident to challenge the team view (if there is one) and able to describe the impact of suggested ideas from the patients' viewpoint so that this balances the perspective of the clinician.¹⁶ The key element is the continuing involvement of patients in the change working groups as equal partners in bringing about the changes.

“One of the great lessons about quality improvement is that it isn’t only about patient benefit. Good patient services lead to happier and more contented staff – it’s an all-round win situation.”

Derek Prentice, Academy Patient Lay Group

“If we pay taxes that keep our healthcare system free at the point of delivery, open to all and based on clinical need, then it stands to reason that we have a responsibility to be intimately involved in and better understand what we pay for.”

Douglas Findlay, patient

The focus should not be so much on the technicalities of quality improvement methodology but rather for patients to have an understanding of what good quality care looks like, the context of change, the challenge of change and the time scale over which change can happen. Patients can help healthcare professionals by being honest about their experience, help staff to understand their needs and their ideas on what should go, stay and/or change. Patients have a critical role in prioritising next steps and helping to engage clinical staff in the purpose of their work when it has become tainted with bureaucracy and systems failures. Patient involvement in quality improvement may therefore be in variety of ways, and presents different and diverse opportunities and layers for the active contribution and investment of precious time by patients in making a difference. The framework. Figure 5 outlines a helpful starting point for patient and family engagement.

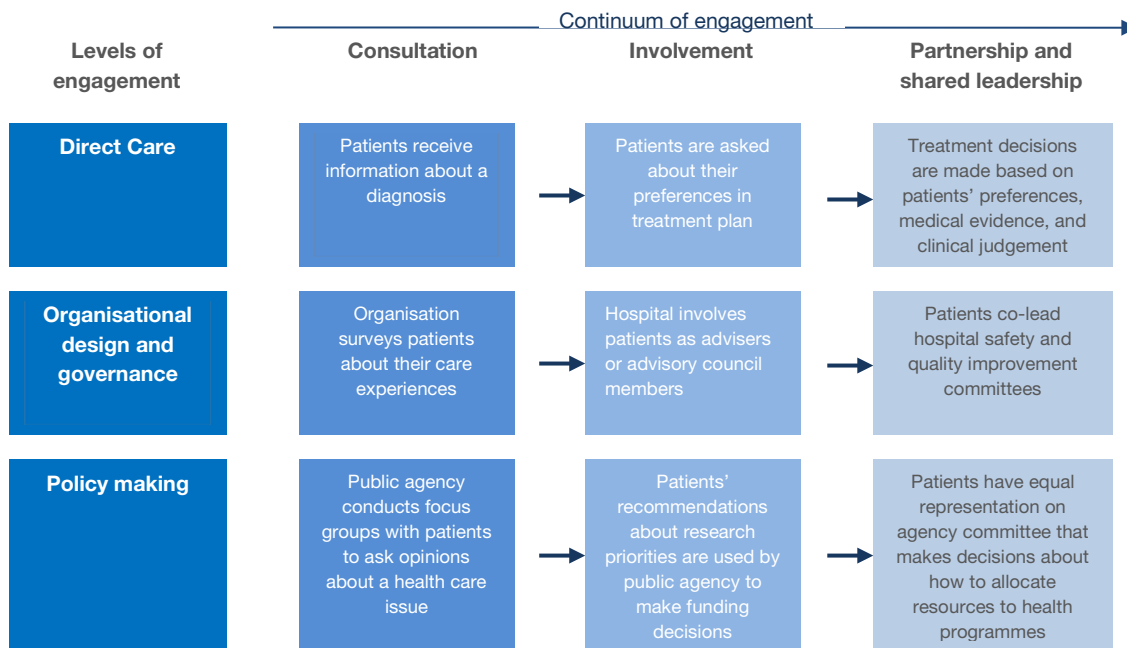


Figure 5. A multidimensional framework for patient and family engagement in health and health care.¹⁷ Copyrighted and published with permission by Project HOPE/Health Affairs.

Work stream 2: Education, learning and development

“No country has produced so many excellent analyses of the present defects of medical education as has Britain, and no country has done less to implement them.”

George Pickering, 1956¹⁸

This work stream looked at the key principles for effective delivery of quality improvement training, barriers and facilitators to achieving this, different quality improvement methodologies and learning methods, and examples of quality improvement training from across the UK. There was a particular focus on inter-professional education and patient involvement.

The aim was to identify the best methods for providing quality improvement education in a multi-professional environment that has a specific NHS context, is deliverable, inclusive and aspirational.

Recommendations

1. National policy needs to be clear and loudly stated

Everybody needs to understand what quality improvement is, who owns it and what its brand values are. From this we need clear, simple, unified national guidance on how to engage with quality improvement.

2. Local action needs to be supported, decisive and effective

There should be an empowered and adequately resourced local leader responsible for setting the direction of quality improvement education and training. This person should be actively translating national policy into local policy, and vice versa. They should ensure that really robust nationally synthesised data is understood locally, and that crowdsourced solutions are seen and evaluated nationally.

3. Building capability and capacity

Rather than taking quality improvement out of training, existing learning opportunities should be adapted to include an element of quality improvement training, with oversight from the local quality improvement education lead. Identification of individuals trained in human factors and quality improvement to collaborate and develop opportunities for education and training is essential supported by a community of quality improvement mentors who are willing to share ideas, experience and learning.

4. Modern workplace learning

There is no ‘one size fits all’ approach to quality improvement training and no evidence that one method is superior to another. Pragmatic, integrated teaching and learning practices should be determined locally. There should be no training without evaluation of the methodology.

5. Innovative learning practices

The developing field of inter-professional learning presents opportunities to share tested, and explore new, methods of inter-professional education applied to quality improvement and human factors education.

6. Quality improvement education needs a research agenda

A call to research funding bodies for further work that evaluates the impact of teaching methods and their impact on building individual and team capacity and patient outcomes. The development of core outcome sets (similar to the CROWN¹⁹ (Core Outcomes in Women’s Health) initiative or COMET²⁰ (Core Outcome Measures in Effectiveness Trials Initiative) for quality improvement training, building upon the work of the Institute of Medicine would allow broader analysis of outcomes in quality improvement.

7. Patients have significant and diverse contributions to make

The patient’s voice and experience should be involved at all stages of quality improvement activities, including quality improvement education.

The rationale for the recommendations

Quality improvement, despite being a common aspiration at policy level, is yet to be embedded as common practice and knowledge at the coal-face of the NHS. Many workers in the NHS are uncertain what quality improvement is. The hard currency of change management for doctors is evidence of patient benefit. For managers it is the hard currency of hard currency, be it savings in agency staff time or the ability to increase clinical activity. Quality improvement has the potential to speak both these languages, but this has remained a potential for the last twenty years in the NHS. Cynical clinicians are able to point to quality improvement “evangelists”, and managers to the lack of any hard outcomes for many projects. They may also point out the fragmented and sometimes tribal nature of quality improvement itself.

To persuade clinicians and the wider NHS of the value of adopting and investing in quality improvement education, there is a need to navigate this terrain with caution. Overstating the evidence of cost-savings, or drawn-out comparisons with manufacturing are often unhelpful. The

research community has risen to the challenges of promoting negative results in the same way as positive results, in the context of sound organisational memory, as well as good practice in project design and results dissemination; quality improvement must now engage in and promote these same challenges. Training must embrace these aspects from the outset, as well as attempting to engender the co-operative, trans-disciplinary ways of working that those involved in improvement find so rewarding and are probably key to effecting real change.

In the same way that landmark projects, like *Learning To Make A Difference*²¹, showed how innovators can adapt quality improvement techniques from other industries, not in blind transcription, but with a more nuanced adaptation to add value to healthcare, so we must make the argument for healthcare quality improvement training.

The context in which quality improvement training occurs

Quality improvement training is currently delivered to a variable extent across undergraduate and postgraduate medical training curricula and to other multi-professional groups across a number of settings.

There is a wide range of institutions involved in quality improvement training, including the medical royal colleges, Health Education England, NHS Education Scotland, Health Improvement Scotland, NHS Wales 'Improving Quality Together', regulatory bodies e.g. GMC, Care Quality Commission (CQC), nursing and midwifery council, charities, LETBs, individual trusts and health boards, deaneries and foundation schools. This is in addition to medical schools and universities offering taught postgraduate quality improvement courses.

There is a lack of a unified definition of what a quality improvement curriculum should include, so it is hoped that the quality improvement curriculum section of this report will go some way towards correcting this.

Understanding the clinical learning environment, the complex, often high-pressured 'ecosystem' where patient care happens, and the challenges it poses, are essential in order to design and deliver effective quality improvement training. Quality improvement training cannot be divorced from the context in which it sits.

Key principles of quality improvement training

Quality improvement training occurs in a variety of educational environments. Delivery of knowledge in improvement science, systems and measurement can occur in a classroom setting, real or virtual, but the ultimate aim of quality improvement training is to deliver improvements in patient care at the point of delivery.

The key elements determining the development and delivery of quality improvement training are illustrated in Figure 6. The elements in the outer circle set the context within which quality improvement training occurs and provide the agency and resources for it to happen. It is a useful visual tool as it enables every element to be tested against the core element of adding value to patient care. Quality improvement training is as useful as the outcomes for patients that it generates, or does not generate.

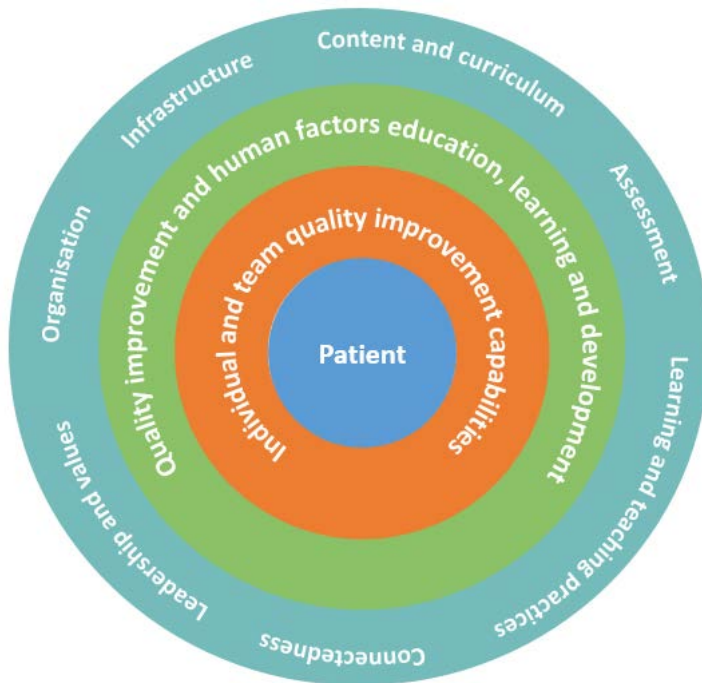


Figure 6 The key elements determining the development and delivery of quality improvement training

Quality improvement education should be delivered inter-professionally

A ‘vertical integrated thread’ of Inter-Professional Education (IPE) teaching and learning related to quality improvement and human factors in all curricula is required.

Human factors is integral to quality improvement education

Learning and teaching practices that develop a ‘safety imagination’, giving learners the opportunity to understand and experience how to deal with risks in practice should be promoted. Curricula must be explicit about the extent of exposure to preventable harms and the importance of safety practices in mitigating their effects.

Normalising quality improvement in the NHS will require innovative learning and teaching methods as well as change of culture

The reorientation of quality and safety as a workplace practice will depend upon testing innovative learning and teaching practices that share common attributes:

- Quality improvement as an integral part of all clinical encounters
- Respecting expertise and innovation regardless of job roles or titles, harnessing youthful enthusiasm as well as senior clinicians’ wealth of experience outside specific quality improvement training and/or activity
- Viewing improvement work as an interdependent collaboration of a set of professionals optimising work processes for the benefit of patients

- Widening the focus of assessment to include how care team's patients fared and how systems of care improved.

Learning and the modern workplace

Learning is predominantly conceived and organised as a separate activity, disconnected from the flow of daily work. Current work-based learning models emphasise the value that is released through exploiting learning opportunities beyond the 'course and curriculum mindset'.^{22, 23, 24} Work-based learning extends beyond learning events to embrace learning as a process, close to, if not part of the daily workflow. The forms of interactive learning described in the Google document (see page 45) share other characteristics of work-based learning: they foster reflection on work practices, not exclusively on the acquisition of technical skills; they view learning as arising from the working environment and centre on live projects and challenges; they can also approach learning as a shared and collective activity where problems are considered and solutions are developed.²²

However, there is a disconnect between this ideal and everyday reality. Quality improvement is still viewed by many as an accessory rather than an integral part of what they do. The challenge is to integrate formal and informal learning and embed them as part of a coherent approach to quality and safety improvement. For example, when holding a meeting about diabetes, it is possible to use the final ten minutes about the department's metrics, and how they can be improved, or the net promoter scores and the key drivers staff feel underpin good or bad results. In every domain, with every educational encounter that seeks to improve patient's wellbeing (that means every piece of education which is happening in the healthcare organisation) the question should be: *"Where does quality improvement fit into this, and how can we teach it?"*

Enablers for the development of delivery and quality improvement training

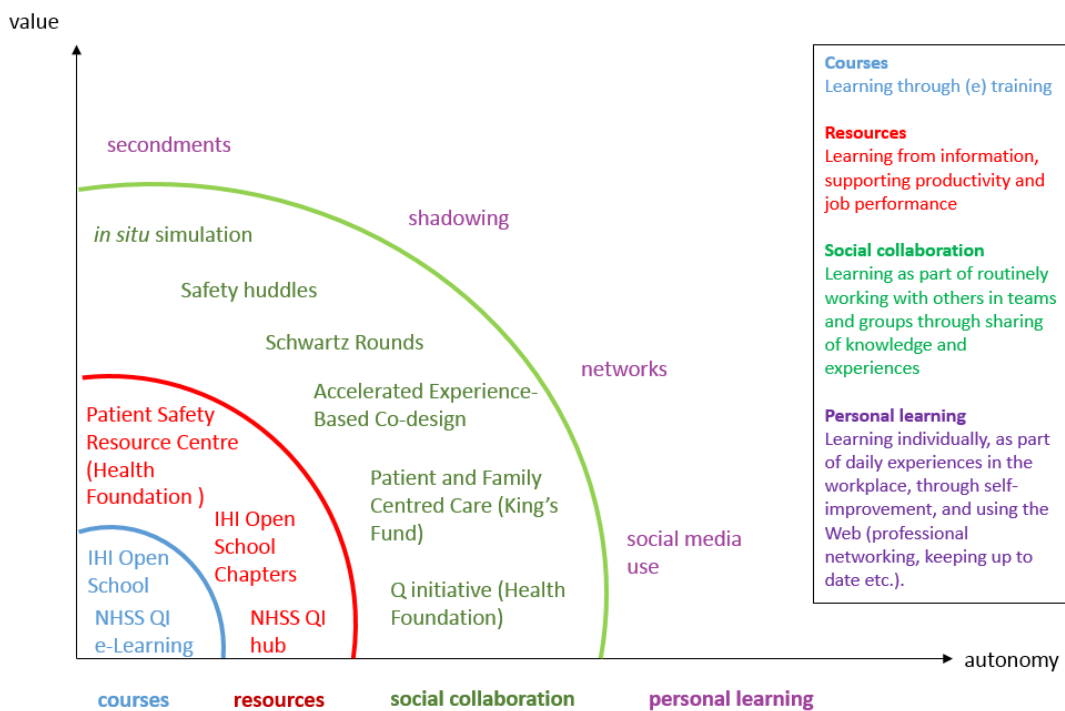


Figure 7. Learning in the modern workplace – based on Jane Hart's model²⁵, reproduced with permission

Figure 7, can be used to identify enablers to effective quality improvement education.

National policy requirements:

- Quality improvement training must be an integral part of training for all those involved in providing health and social care, and this should be explicit in the mission statements of national bodies who are concerned with healthcare education
- Training must be consistent with the statements of the regulatory bodies
- Effective quality improvement training requires dedicated time and resources for both trainee and trainer. Training is most effectively delivered locally, with local trainers. National bodies need to consider how the capacity to train the trainers can be created and advertise their services
- Local organisations need to invest in high quality improvement education and leadership to ensure that national policy is translated to a local level
- Financial resources to support quality improvement training need to be released where justified.

Local governance requirements:

- Provision of facilitation and support for individuals and teams to carry out quality improvement projects in their own workplace with real life experiential learning
- Provision of local champions working as or with educational supervisors and Directors of Medical Education to support quality improvement work
- Audit departments ready and willing to support quality improvement training and activity
- Local workshops and engagement of professionals in wider systems improvement (e.g. via Academic Health Science Network (AHSN) workshops on patient safety or other regional initiatives such as deanery quality improvement hubs/faculties)
- Time and resources provided and protected to conduct a quality improvement project
- Quality improvement skills should be seen as a positive attribute in the selection of individuals for employment and promoted posts.

Organisation and infrastructure requirements:

- Time for training, training for trainers is essential
- Methods and ethos embedded in the system must be seen as ‘the norm,’ not an add on
- Improvement activity must be aligned with the organisation’s strategic objectives to facilitate management buy-in and support
- Improvement training and activity must be aligned with the trainees’, and others’, local and regional education programmes.

Building capacity and capability initiatives

- National capability and excellence promoting initiatives are invaluable. Agents for Change²⁶, the ‘Q’ initiative²⁷ and NHS Change Day²⁸ are examples of these.

Leadership and values requirements:

- Strong, national leadership that speaks to a defined ‘brand quality improvement’ which is supported and valued
- Local leadership that is connected to the board, ward and local professional educational establishments
- Development of individual leadership skills to drive improvement work^{29,30}
- Celebration of success: processes to facilitate sharing of results and learning achieved spread throughout the organisation and more widely
- Celebration of ‘failure’: Understand that ‘negative’ findings are of great value to an organisation, and well-run projects with good data often provide the platform for understanding the way forward

- Embedded in all staff activity, not simply a one-off project, to cultivate and maintain the ‘habits of an improver’.³¹

Content and curriculum

- Avoid use of multiple tools and jargon, which can be off-putting. Relating the methods to what people know may be less off-putting e.g. differential diagnosis in terms of diagnosing a patient is similar to the approach to diagnosing a system. Essentially both are PDSA cycles
- Provide training in quality improvement from the outset of training, job induction
- Link quality improvement knowledge to professional competencies.

“Part of the challenge is to present topics like statistical process control in ways that are perhaps more familiar, and to help people realise that they have seen an SPC chart before at the end of every patient’s bed – we just call it a temperature chart.”

Philip Pearson, Consultant Respiratory Physician, Northampton General Hospital NHS Trust

Assessment requirements:

- Linked to individual appraisal and revalidation
- Consideration of ways in which team performance can be developed and evaluated, as well as individual learning³²
- Aiding fulfilment of the requirements for appraisal and revalidation.

Learning and teaching practices requirements:

- Training programmes that give knowledge and enable skills development by doing projects
- Recognition of quality improvement achievements e.g. showcase events, e-portfolio
- Multi-professional training, including for corporate and management teams
- Facilitation of knowledge sharing and ‘collective intelligence.’ Need for continued support and mentoring e.g. peer support groups or learning groups to aid sustainability
- Access to a range of training modalities and various sources of data
- Patient care is delivered by multi-professional teams; therefore training to improve patient care should also be delivered in teams
- Involvement of management in quality improvement training e.g. paired learning between clinicians and managers³³

- Immediate feedback from quality improvement and ‘small wins’ provides drivers for change on the ‘shop floor’ and buy-in and enthusiasm from staff.

Connecting people to people:

- Social media are providing ways to connect with improvers and explore informal learning. They also offer ways to collaborate on projects, share experiences, learn from peers and play a role in mainstreaming quality improvement
- Effective learning networks can help people solve problems, but there is often a lack of awareness of available resources and time to use them
- Networking of people trained within an organisation, within an area, within a discipline or nationally can re-inforce the learning and provide continued support
- There is a need for a community of quality improvement mentors who are willing to share ideas, experience and learning and include through community and support initiatives that have similar goals e.g. the Q Initiative.

Patients

- Identifying areas for improvement, participating and assessing outcome of interventions.

A research agenda for quality improvement education

There are gaps in the evidence linking quality improvement education to patient, population and system outcomes, and it is important that these are acknowledged. The weaknesses in the knowledge base prevent informed choice about which approaches work in particular contexts and there is an urgent need for rigorous studies that provide the evidence of impact of inter-professional education (IPE) and enhance performance and collaborative behaviour.³⁴ The Inter-professional Learning Curriculum Model³⁴ from the Institute of Medicine (IOM) can help focus further research on these linkages (Figure 8). This model was developed for the purpose of guiding study designs, producing a consistent taxonomy and building a framework for a stronger evidence base linking IPE with health and systems outcomes. This is similar to the COMET initiative which aims to identify core outcome measures in clinical trials.²⁰

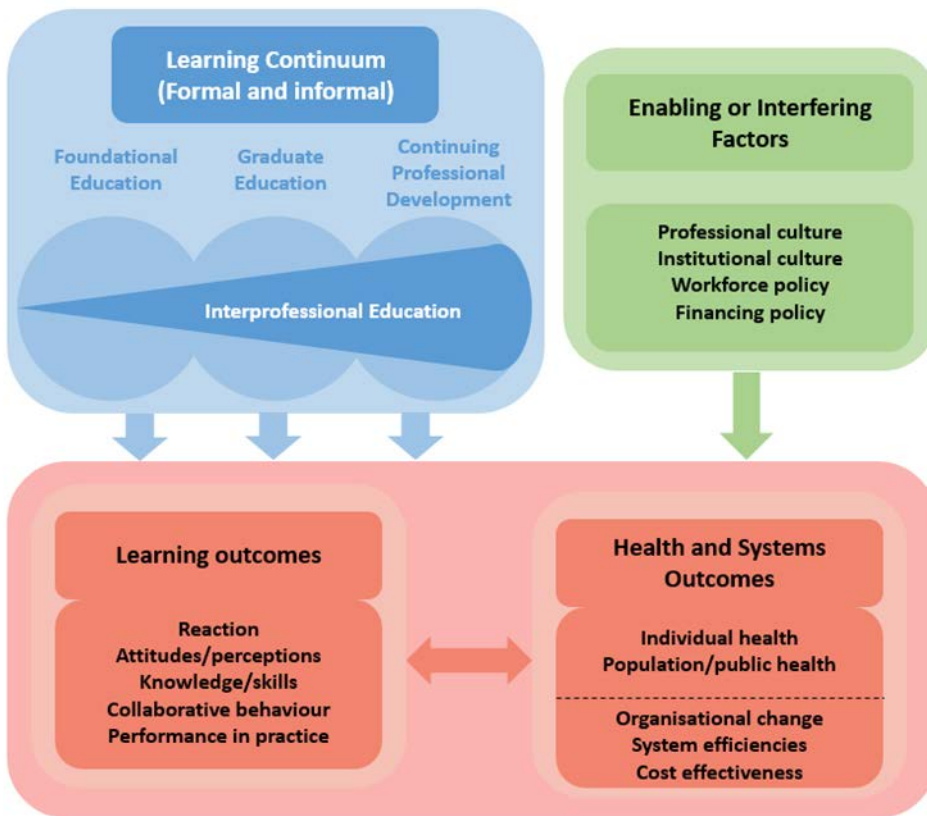


Figure 8. Inter-professional Learning Curriculum model (IOM 2015)³⁴

Reprinted with permission from *Measuring the impact of interprofessional education on collaborative practice and outcomes*, (2015) by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

Summary

Quality improvement training needs to become the new cardio-pulmonary resuscitation (CPR). CPR training is universal for health workers, easily learnt and experienced through simulation and experiential learning, usually working as a multi-professional team. Even if not performing CPR, the basic principles can be understood and any worker may be called upon to help if needed. Quality improvement training has as much potential (or perhaps even more) to improve outcomes for patients, as well as deliver greater efficiency and improve experience for patients.

Quality improvement does not happen in a vacuum, it is practical and the way it is taught should reflect this. The learning environment should reflect the real one, despite the inconvenience to our current silo systems.

The value of completing a project must be taught, as well as sustainability and how to disseminate learning. Culturally we should learn to acknowledge the importance of learning what has not worked, as well as what has. We must embrace technology and new ways of learning, where this enhances the experience.

All of this will only be possible with clear national policy, strong local leadership and an infrastructure of support to put both training and quality improvement into action. Those who take the reins of responsibility for quality improvement must deliver a clear vision, which is understandable, digestible and practical for healthcare professionals much more widely than just doctors. Once we have this, the panoply of educational tactics and resources can be brought to bear by local leaders, to ensure that their local and regional quality improvement training and education is suited to their workforce, and more importantly, benefits patients.

Talking point: I don't have time to improve!

“I don't have time to improve” is a not uncommon mantra. It is often stated that someone is either too busy or has no time in their job plan to give attention to quality improvement. However, time is often found for large, and on occasion unfocused, data collections that are not used to drive improvement, as best intentions are lost through unwieldy, over ambitious plans or done merely as a requirement to tick a box on an Annual Review of Competence Progression (ARCP)/appraisal form. This is precious time wasted. Instead we should value our time and plan how we can use it most productively.

Time for improvement, amongst our many competing demands, is about making this a journey of small steps so it is doable. It is about building any measurement into the path of the work itself, rather than adding to it. Working as a multidisciplinary team makes for effective use of all our time incorporating essential planning on how we can do just enough, little and often data collection together and/or use data that may already be routinely collected. The value of working as a team cannot be overestimated. It changes the conversations and inspires innovation and creativity in how we might use opportunities of coming together, such as handover, ward/board rounds and clinical governance meetings for brief improvement updates and continued momentum. It is about designing the changes that add most value and reduce workload, and, at least at the end if not in the beginning, of learning a new way to work.

All change takes effort and one job of change leaders is to make it clear that work soon becomes easier not harder. This is where lean³⁵ as an improvement methodology has an edge over Model for Improvement³⁶ as it is about reducing waste, which everyone can see early on in the process.

“There is no timetabled time for research and audit; we are expected to do it in our spare time”

ST3 trainee

Faculty of Medical Leadership and Management Twitter chat 22/10/2015

https://storify.com/Angelika_Za/agents4c

“As for professionalising curricula and tools and the exams, I don't want to lose that raw enthusiasm and power of swift change, but in order to include it in people's portfolios we have to look at an outcome measure as well. So measuring knowledge and skills is very easy but measuring attitudes is always in the “too difficult” box – we call it a soft skill but I think it's one of the hardest skills we have, so I think working on how we can have some measurables is going to be the most difficult thing.”

Claire Mallinson, Director Postgraduate Medical Education, Guy's and St Thomas' Hospital

Making room in the timetable of our trainee's and in our own job plans can be (should be) mandated locally and might be included through the consultant appraisal/revalidation process by setting clear expectations of the output of Supporting Professional Activities (SPA) time, e.g. 0.5 out of total 1.5 SPAs set aside for demonstrating 'added value' to the organisation through local quality improvement initiatives.

What would make life better to do quality improvement? *“Quality improvement workshops for all doctors, not just the self-selected few who have been on a management/leadership course”*

ST8 trainee

Faculty of Medical Leadership and Management Twitter chat 22/10/2015

https://storify.com/Angelika_Za/agents4c

Work stream 3: Mapping examples of quality improvement

This work stream looked at the resource architecture available across the UK, in particular to highlight examples of quality improvement working in practice. The intention is to enable shared learning, foster collaborative practice, stimulate innovation, highlight expertise and enhance opportunities for quality improvement learning.

The aim was to identify and signpost the resources available to support quality improvement education across the UK, and bring them together in an accessible format.

Recommendation

Promotion of valuable learning and resources on quality improvement that already exist for healthcare professionals through an interactive resource map.

The Academy should consider developing an area of its own website to curate these resources.

The interactive resource map is a useful, but not exhaustive, tool to explore and learn about areas of good practice across the UK, connect people to people, explore informal learning and innovative learning practices and maximise use of resources available. Many valuable resources on quality improvement already exist for healthcare professionals but many people remain unaware of them.

<http://bit.ly/1QqOXYm>

A selection of quality improvement training case studies are available here <http://bit.ly/217PxiT>, together with fuller details of the inter-professional education methods listed on the interactive resource map.



“I think mapping where supportive resources are, particularly people, helps others in getting confidence in quality improvement – if you’re running a training school of whatever specialty to know there’s some quality improvement expertise in other specialties in your deanery or region, to know within your own college that there’s a network of people who have volunteered to be a faculty for advice and information – that’s hugely valuable over and above the easy signposting of on-line resources, for example.”

John Colvin, Consultant in Anaesthesia and Intensive Care Medicine and Associate Medical Director for Quality Improvement in NHS Tayside and Hon Senior Lecturer at the University of Dundee

The rationale for the recommendations

This was approached in the following ways:

- Exploring current inter-professional modes of quality and safety education (described in more detail under education, learning and development)
- Capturing the current experience of quality improvement education (using a process called value proposition design) and determining options for support
- Identifying current working examples of quality improvement in practice through recognised quality improvement networks, peer reviewed publication or conference presentation and/or experiential recommendation.

Current experience of quality and safety improvement education

A process called Value Proposition Design was used to understand the lived experience of quality improvement education and determine what would be the best way to support people as they learn.

The process had two components. First the views of medical staff were gathered to identify a) what are the tasks associated with quality and safety education, b) what are the ‘pains’ – bad outcomes, risks and obstacles related to this, and, finally c) what do they want to achieve.³⁷ Secondly, the goal of the process was to identify what support needs to be provided for staff by focusing on what is important to the users.

Feedback from medical staff – tasks, pains and gains

Feedback from a workshop of doctors in training (Zarkali and Chatfield, personal communication, Agents 4 Change Quality Improvement workshop 2015) helped inform the user requirements. When asked to identify barriers to doing quality improvement work, the highest-ranked barriers were listed as a lack of time, a lack of empowerment, and a lack of local support. Their highest requests for top-down support were mentoring, integration of quality improvement into their

curricula and job plans, and engagement of their senior colleagues and managers. The doctors felt that the gains from undertaking quality improvement work were twofold. Firstly they expressed a sense of empowerment in their ability to make a difference for patients. Secondly they felt they could acquire kudos among senior staff for undertaking quality improvement projects.

Junior and senior staff shared the same perception that the current system of incentives for quality improvement (ARCP, career advancement etc.) had inadvertently created a ‘tick-box’ culture. Projects were often difficult to sustain due to frequent rotations, time pressures and managing multi-professional team involvement. Junior staff also pointed to limited senior buy-in and lack of knowledge about quality improvement methodologies.

“While helpful to have incentives from an early stage in the medical career, what would be more important is to ensure that undertaking quality improvement projects do not disadvantage trainees (by offering no career reward for a substantial time investment).”

Arrash Yassaee, FY1

Key learning points

- Access to skilled and experienced mentors is important and still an issue
- Palpable frustration with current state of participation in quality improvement
- Quality improvement is still not a ‘daily mind-set’ and not properly supported with time/resources (e.g. people with expertise, access to information about projects etc.)
- It is too easy to make false assumptions about the level of understanding of fundamental quality improvement principles and shared understanding of terminology
- Low digital competence is inhibiting growth of networks that can thrive with social media
- Any prototype for resource sharing will need to address these issues
- Healthcare can draw on key developments in education and workplace learning that promotes opportunities to learn in the workplace as part of the daily work flow rather than as something disconnected from it.

Examples of quality improvement training, education, expertise and support from across the UK

There are a wide range of quality improvement education and training resources available throughout the UK. Some of these are available to all staff who work in the NHS, whereas others are specifically targeted at undergraduate or postgraduate medical staff.

An initial review of the literature indicated that there was limited published evidence base describing either the content of such training or evidencing its impact. The clear conclusion was that there is no ‘one path’ or ‘right way’ to teach quality improvement; there needs to be a

pluralistic approach to quality improvement education, which defines a successful method as one that focuses on demonstrating improvements for patients.

We contacted individual institutions asking if they could provide us with information about the quality improvement training currently available. A selection of case studies is available with exemplars of inter-professional education methods <http://bit.ly/217PxiT>.

Summary

There is a burgeoning of examples of quality improvement in action at the frontline, of quality improvement training and how learning is spread. The intention of the interactive map has been to capture good practice and share this whilst also illustrating the current networks in place across the UK. These examples are not exhaustive but intended to demonstrate what is possible to implement.

“Organisations can do an enormous amount on very little extra money. We need to engage everyone...there is no point doing all this great work in silos. It is spiral learning in action and we have been remorselessly stealing from others’ great work so that we don’t reinvent the wheel.”

Claire Mallinson, Director Postgraduate Medical Education, Guy’s and St Thomas’s hospital

Talking point: Senior clinician engagement

Barriers to doing quality improvement: *“No help and seniors often clueless”*

ST3 trainee Faculty of Medical Leadership and Management Twitter chat 22/10/2015
https://storify.com/Angelika_Za/agents4c

If there is currently a missing ingredient in our ability to undertake effective quality improvement, it is that many senior doctors are new to the idea of improvement as a methodology and are hesitant to engage. Unfamiliarity with the concepts, methodology and language of quality improvement, and the experience of a tick-box exercise of traditional clinical audit with many trainees, and for some now with revalidation, has not encouraged their engagement. Improving their practice is not a foreign concept to consultants or GPs but there is a need to grasp that their own practice is not the only source of the excellence that they seek in a complex system.

“There is a need to have a cross-specialty and cross-professional look at [quality improvement education], so that we can share resources, particularly the supportive resources to allow trainers to have confidence and enthusiasm and knowledge to deliver quality improvement training. I think that’s where the gap is in consultants and senior doctors, and that the enthusiasts are developing among the young ones.”

John Colvin, Consultant in Anaesthesia and Intensive Care Medicine and Associate Medical Director for Quality Improvement in NHS Tayside and Hon Senior Lecturer at the University of Dundee

Senior clinician engagement is about working out with them the purpose of clinical practice and the mechanism of delivery of that purpose at all times. It is about giving people hope that change is possible, will be better for them as well as patients, and is achievable without overturning too many traditions that give comfort.

To achieve this, it is important to provide a well-supported local programme of coaching and the facilitation to develop their own improvement skills. When senior doctors then listen to the ideas of trainees and get involved in planning and supporting their improvement work there is a fusing of aims and objectives and a new sense of common purpose in the team. The relentless focus becomes one of shared purpose and energy, and changes and augments conversations on how it is possible to deliver best patient care and outcomes. A problem shared is a problem on the way to being solved. With this momentum the baseline audit becomes the starting point for continuous innovation and improvement and instills a culture of on-going, team delivered excellence.

Quotes from Agents4Change Quality Improvement online survey, October 2015:

It was felt that senior colleagues were not aware of quality improvement principles, and were therefore unable to provide support or supervision.

One respondent reported he felt he “basically wasted my time”, and another was seen as a “troublemaker”. Without support from senior colleagues and management, some respondents had difficulty overcoming “bureaucracy”, “stakeholder relationship issues”, or “resistance to change”.

One respondent found the “political challenge of addressing poor practice insurmountable”.

Faculty of Medical Leadership and Management Twitter chat 22/10/2015
https://storify.com/Angelika_Za/agents4c

This is why steps in a journey, seeing the patient’s perspective, seeing the enthusiasm, and building the morale of younger team members as they make a difference is critical medicine for those brought up on a slower pace of change and less complexity in delivering their work. Supporting, or simply not obstructing, their trainees makes all the difference. Alongside this, paying particular attention to providing a sound evidence-base for change, examples that bring the methodology to life, shared experience from other senior clinicians, use of credible data and visibility of outcomes, all hook the senior doctor into getting the continuous improvement habit.

“As a consultant histopathologist for 20 years I have been a core member of multiple multidisciplinary teams (MDT) in three NHS Trusts. In none of these teams have we ever undertaken a multidisciplinary quality improvement project for systematic evaluation of a patient pathway. The nearest I have experienced was the formation of an MDT taskforce to implement NICE Improving Outcomes Guidance for Haematological Cancers in 2004-5; however, even this did not involve any systematic measurement of ‘pre’ and ‘post’ outcomes related to patient benefit/experience to assess success of the implemented plan. Lack of such measures has limited the effectiveness of subsequent cycles of peer review, which focus of performance against internal process metrics rather

than metrics reflecting the overall pathway quality for patients. Within histopathology, numerous internal projects are undertaken to achieve process improvements, mainly to meet targets relating to specimen turnaround time and occasionally to improve quality or reduce risk. The endpoint is typically the point at which a specimen report is completed in the laboratory; rarely, the point at which it is received by a ward, GP surgery or member of healthcare staff. We have almost no knowledge at all of the impact of our 'improvements' on patient outcomes or experience."

Bridget S Wilkins, Consultant Histopathologist, Guy's and St Thomas' Hospitals NHS Foundation Trust

"Quality improvement needs to be at ground level rather than vague statements or plans from the top down. Furthermore, quality improvement isn't the sort of thing that needs randomised controlled trials. It's about making sure that people respond to a need to do something differently in the way that they work. It is not so much about a treatment as about improving the process."

Ian K Ritchie, Immediate Past President, Royal College of Surgeons of Edinburgh

Work stream 4: Strategic and supporting infrastructure

It is recognised that there are already excellent pockets of quality improvement and capability building, but the widely held belief echoed in all of the discussions that shaped this work is that the formation of these ‘improvement islands’ is accomplished *in spite of* the strategic infrastructure rather than *because of* it. The aim of this work stream was to investigate what strategic infrastructure (defined as encompassing policies, people and strategic perspectives) was required for quality improvement education from bodies involved at multiple levels:

- Trust/Health Board (HB): e.g. connecting clinical audit teams to service improvement teams
- Medical schools /LETB /Deanery: e.g. supportive policies and commissioning
- National level: e.g. supportive policies by royal colleges, national guidance etc.

The recommendations have been made to support and grow a receptive environment for quality improvement. Many of these echo and reinforce the recommendations from the Berwick⁵ and Francis³⁸ reports, as well as the recent report from think tank *Reform* which examines the issue of clinical leadership in the NHS.³⁹

Recommendations

1. Building capability in quality improvement

- The most successful approach to quality improvement will be as a unified and multi-professional activity which also includes patients
- Establish a stakeholder group under the auspices of a national body such as the Academy of Medical Royal Colleges to align planning in quality improvement activity by key stakeholders and topic experts for the long-term, that is applicable to everybody, and to contribute to improving patient outcomes through education, training, research and collaboration
- This think tank should look at patient involvement as a specific work stream to establish the ways of best enacting this.

2. Training and education

- Quality improvement needs to be in everyone’s job description and appraisal
- Quality improvement must be included in undergraduate and postgraduate training to ensure that everyone acquires at least a basic understanding and awareness
- A critical mass of clinical and non-clinical staff should have advanced quality improvement expertise

- A national quality improvement library should be created as a repository of knowledge staff can turn to
- Champion mentorship and coaching schemes should be the norm to support quality improvement in action
- Develop a programme of education and training to assist regulatory/national bodies in understanding the power of using data for improvement
- Develop skills and knowledge to co-design true outcome-based commissioning approaches and align incentives with quality improvement.

3. Leadership and culture recommendations

- For quality improvement to become normalised, executive and non-executive commitment, role-modelling and mentoring is core
- Executives should champion a multi-professional approach and release resource (time) to support quality improvement activity
- Role model best practice quality improvement approaches (e.g. using statistical process control (SPC) in board reports)
- Create an open culture with the focus on learning, ownership and accountability rather than reprimand
- All NHS and social care organisations should have credible quality improvement support in the form of an enabling 'core' quality improvement support team
- Local and national bodies including NHS Improvement, HEE and its equivalents, royal colleges and specialist societies should support quality improvement activity and provide opportunities for staff to showcase their work from examples across the NHS
- Patient involvement may be diverse and should be appreciated through opportunities to contribute, collaborate, learn together and lead.

4. Communication

- All NHS staff should share and understand a common language when discussing improvement
- Health and social care and its stakeholders should look towards a more positive approach to communicating their achievements, challenges and learning.

The rationale for the recommendations

A variety of approaches were used to determine our recommendations:

1. Initial meetings of the strategic infrastructure subgroup
2. Learning from an *accelerated learning event* led by the NHS Advancing Change Team which explored the strategic infrastructure needed to support quality improvement action – with over 60 key stakeholders in attendance
3. Consultation with topic experts who have experience in the development of quality improvement skills in doctors.

Further detail behind these recommendations is given below.

Building capability in quality improvement

“The literature is also clear that the days of the solitary hero are gone – the challenges are simply too complex”.

Sir Bruce Keogh, Medical Director NHS England, in foreword³⁹

- The most successful approach to quality improvement will be as a unified and multi-disciplinary activity which also includes patients
- Align planning by key stakeholders and topic experts for the long-term (e.g. workforce development and the inclusion of quality improvement in undergraduate curricula for all professions) alongside a number of short-term actions (e.g. awareness-raising among professionals of basic improvement skills) through a think tank / steering group of key stakeholders from every layer e.g. Health Education England and equivalent bodies, NHS Improvement, royal colleges, specialist societies, trusts/health boards and patients. Extending the analogy that quality improvement should become the new CPR (see page 41), an example of a successful UK professional body is The Resuscitation Council (UK) (which exists to promote high-quality, scientific, resuscitation guidelines that are applicable to everybody, and to contribute to saving life through education, training, research and collaboration)
- This think tank should look at patient involvement as a specific work stream to establish the ways of best enacting this.

Training and education

“Mastery of quality and patient safety sciences and practices should be part of initial preparation and lifelong education of all healthcare professionals.”

Recommendation in The Berwick Report⁵

- Quality improvement needs to be in everyone’s job description, recruitment, induction and appraisal. For quality improvement to be considered an integral part of a consultant’s/GP’s role, it would need to be part of the consultant/GP contract. For quality improvement to be sustained there needs to be an alignment of incentives and rewards, such as the need to recognise its worth. An approach is developed where the challenge is connected to the potential solver, e.g. a consultant knows his out-patient clinic may not be running well, but is too busy to address the problem. Yet, by linking with a trainee – perhaps working in another area – the trainee is offered the opportunity to work on a meaningful quality improvement project. This helps both the consultant and the trainee – as trainees do not always find good projects in their current work areas, in addition to patients benefiting. Training the trainer is equally as important as training the trainee
- Quality improvement must be included in undergraduate and postgraduate training and needs to be tiered and progressive to ensure that everyone acquires at least a basic understanding and awareness. For this to be realised to its full potential, medical schools and royal colleges should provide facilitated support and guidance alongside the quality improvement curricula that connects to regional and local support for trainees and trainers
- A basic awareness and understanding of the use of time-series charts in measurement for improvement should be included in under-graduate training. The approach to do so should build on the *Improving Service Improvement* evaluation report commissioned by the NHS Institute for Innovation and Improvement in 2012.⁴⁰ How professional bodies might unite to embed quality improvement into the curricula with a consistent approach has been recommended through the curriculum work stream
- A critical mass of clinical and non-clinical staff should have advanced quality improvement expertise. Theory by itself will not be sufficient; this approach will prove most effective if healthcare professionals and managerial students (including General Management Trainee Scheme participants) are asked to lead/join a quality improvement project as part of their studies while supported with the theory, tools and resources so that learning is consolidated via practise
- Quality improvement expertise includes measurement for improvement and learning the differences between and appropriate uses for measurement for improvement, judgement and research⁴¹
- A national quality improvement library should be created as a repository of knowledge staff can turn to. This is a role the new NHS Improvement body could assume and indeed there is already talk of a knowledge portal. In addition, all quality improvement projects

should be evaluated (an integral part of good quality improvement) so that lessons learned are shared to help future projects become more effective

- Championing mentorship and coaching schemes for quality improvement is crucial. Trainees should be supported to access a programme of quality improvement education and mentoring to reach those professionals already experienced in their fields, but who perhaps lack the language or resources to help them in their improvement efforts and enable them to effectively support more junior staff and colleagues. There are already some established programmes that have proven to be effective (e.g. the Building Safety Improvement Skills (BaSIS) programme run by East Midlands LETB⁴², the Quality, Service Improvement and Redesign Programme (QSIR)⁴³ run by the NHS Advancing Change Team and Improving Quality Together⁴⁴ run by NHS Wales)
- A basic online programme could be developed for awareness-raising in consultation with NHS Improvement
- Specialist societies are an important resource for greater engagement and support for quality improvement as many doctors turn primarily to their own specialty for support
- A programme of education and training should be developed to assist regulatory/national bodies in understanding the power of using data for improvement. There is a belief that quality improvement has not yet been embraced by all regulatory/national bodies; that data are collected and presented for judgement rather than improvement. This is a role the new NHS Improvement body could adopt
- Skills and knowledge to co-design true outcome-based commissioning approaches and align incentives with quality improvement are needed.

Leadership and culture recommendations

“There is a new generation of clinical leaders who are eager to take up leadership opportunities and act as agents for change. We must now support them”.

Sir Bruce Keogh, Medical Director NHS England, in foreword³⁹

Quality improvement should become normalised. We all should have two aspects to our jobs: *“everyone in healthcare really has two jobs when they come to work every day: to do their work and to improve it”*.³ Executive and non-executive commitment, role-modelling and mentoring is core to this. Recognising that quality improvement will not be an existing knowledge base for all senior NHS staff, all senior NHS staff should have access to quality improvement training and support. Basic quality improvement skills should be included in induction and development of new executive and non-executive staff.

- Executives should champion a multi-professional approach and release resources to support quality improvement activity. All executives should lead/participate in quality

improvement. Boards should have oversight of all quality improvement projects and programmes and ensure the coordination and prioritisation of these

- Boards should role model best practice quality improvement approaches. All boards should move to using time-series charts (e.g. SPC) to review performance rather than the Red Amber Green reports that are often ineffective and misleading. NHS Improvement and the CQC should champion this. There have been some inaccurate beliefs regarding quality improvement. National organisations need to clearly articulate that the science of systems design and improvement does meet the rigorous statistical rules on which all medical science is based and high quality does not correlate with high cost⁴⁵
- Health and social care need to create an open culture with the focus on learning, ownership and accountability rather than reprimand, as this facilitates a quality improvement culture
- All NHS and social care organisations should have credible quality improvement support in the form of an enabling ‘core’ quality improvement support team. The core support could be an integral part of the organisation and/or a shared resource with other organisations in the system. It is believed that this should be independent of the usual structure, to allow it to support everyone within the organisation/system. It should align and collaborate with existing educational structures locally through Directors of Medical Education and regionally through the deaneries/local teams. Another potential resource is through enabling the networks such as working with AHSNs and clinical networks
- Key roles of the core quality improvement team would be around quality improvement data, setting up and facilitation of quality improvement projects and the ability to teach quality improvement skills. Individuals in these roles should be sufficiently senior and empowered ‘enablers’ to break down barriers and engage others to incorporate other perspectives e.g. financial planning and budgeting. It is recommended that alongside a core quality improvement support team in organisations, there is attention given to quality improvement champions, coaching and how quality improvement language is used. It was championed that there should be a move from audit to quality improvement and that audit departments become familiar with quality improvement approaches
- The core improvement team should work closely with the Director of Medical Education at trusts, health boards and deaneries to enable activation of the education network of support of specialty, clinical and college tutors. This would enable a synergy of improvement expertise and medical education to come together to further support and facilitate both trainees and consultants/GPs in their improvement activity
- Local and national bodies including NHS Improvement, HEE and its equivalents, royal colleges and specialist societies should support the showcasing of good quality improvement activity across the NHS
- Patient involvement may be diverse and should be appreciated through opportunities to contribute, collaborate, learn together, participate in and lead quality improvement activity.

Communication

“We need to remain productively paranoid, asking ourselves constantly how we can improve and turning bad into a force for good”

Jonathan Fielden, Medical Director UCLH

- All NHS staff should share and understand a common language when discussing improvement. Language has meaning and there is a need to ensure quality improvement is communicated in a way that everyone can understand. There is also a need to be mindful of the impact of both language and communication on morale and perceptions of health and care services
- Health and social care and its stakeholders should look towards a more positive approach to communicating their achievements, challenges and learning. The messages about quality improvement can be the news stories of improving patient outcomes. Executives and NHS Improvement could both pay a part in championing this.

Summary

“We need, as they say, to stimulate, develop and benefit from the latent, untapped talent of clinicians to become ‘agents for change’ in our system and to take responsibility for making change happen. Most of them will always be clinicians first and foremost, but they should be encouraged and supported to become clinicians able to champion and lead improvement”

Sir Hugh Taylor KCB, Chair, Guy’s and St Thomas’ NHS Foundation Trust in ³⁹

For these recommendations to be implemented there is a requirement for substantial and co-ordinated leadership from both quality improvement experts and the leaders of national and local bodies, in particular NHS Improvement, the Academy of Medical Royal Colleges, HEE and its equivalents, GMC, royal colleges, specialist societies, deaneries, trusts and hospital boards. There has been a repeated urging from the authors of and contributors to the referenced reports^{5,38} and from the numerous stakeholders engaged with this process that, in order to improve the care we give patients, we need our clinicians to be supported and given the opportunity to develop their quality improvement and leadership skills. Key decision makers need to agree the course together to make quality improvement an individual, local and national priority, to provide strategic direction, to embed quality improvement in professional education and training, and to lead in making continuous improvement part of our organisational cultures. Only by this means will we attain an enabling infrastructure for staff, involving and collaborating with their patients, to lead and succeed in quality improvement.

Talking point: Parity of esteem of quality improvement with research

Parity of esteem means that, when compared with research, quality improvement activity undertaken by a trainee would be recognised by all parties as of equal value, i.e. by trainees themselves, by others, by the organisation and/or the patient. The tension that research holds the highest hierarchy in science and quality improvement possibly the lowest has certainly lessened and evolved with time. Quality improvement provides a methodology for translation of research findings into practice, and quality improvement itself is underpinned by disciplined, rigorous methodologies.

However, it has long been recognised that research can take time, a lot of time. As a result, integrated academic training or out of programme (OOP) training for research are well recognised and established career routes for trainees to follow. There is value for their career development in the list of publications in the *curriculum vitae* that results from such work. Quality improvement, on the other hand, does not have equal recognition. Quality improvement needs to be seen as an integral activity to our everyday frontline practice. The challenge is how to devote enough quality time in the day job to do this properly. In complex systems, where risk is ever present, high reliability and high levels of safety are only achieved through continuous attention to hazards and potential risk and individuals with the skills and motivation to address these at the front line and with urgency.^{5,46,47} It is certainly possible to enable improvement change with careful planning, support and facilitation, and incorporating this into our everyday practice to make small-scale tests of change. However, for complex system-wide change investment in time, effort and resources on a basis commensurate with research is also needed. OOP as a clinical fellow in quality improvement is gaining recognition and kudos but the opportunities for this are far fewer than in research.

“There are regional trainee research collaboratives, why not trainee #QI collaboratives?”

Faculty of Medical Leadership and Management Twitter chat 22/10/2015
https://storify.com/Angelika_Za/agents4c

There is recognised training in the science of improvement available but it is often a single day or short courses, and there is a long way to go for ease of access for all. Recent developments of masters programmes indicate the desire for this knowledge and an ability to teach it at a high level (Oxford, Leicester and Plymouth are recent examples). The opportunities to gain qualifications in quality improvement, and related areas, to publish in peer reviewed journals and present at regional, national and international conferences are also increasing. Providing more opportunities to showcase quality improvement work, sharing learning from both successful and less successful quality improvement activity, is much needed, not just for the trainee themselves but to accelerate the learning for all.

“Current points-based ranking systems to get to interview for competitive specialties create perverse incentives. They still use old idea of simple 2-step audits and they don’t give clear credit for projects that are potentially more impressive compared to ones that “tick the box”. I see the need for having clear and objective standards but it is ultimately damaging to create a situation where so many talented people are working very hard to tick said boxes rather than just following their interests or the opportunities available. Competition for specialty training is perceived as so fierce that there often appears to be no space for genuinely following your passion. This is also clearly true in research with publications and with posters/presentations at conferences. People are effectively being asked to do lots of low quality work rather than making it meaningful.”

FY1 trainee

Parity of esteem of quality improvement and research within healthcare education and practice would mean more joined up efforts in these areas to improve the quality of care and outcomes. It would help distance quality improvement activity from what many see as a tick box exercise. Inclusion of quality improvement capability, alongside research, in national recruitment in medicine has been another starting point in enabling the recognition of the importance and value of quality improvement in the work of the doctor.

Discussion

“To make improvements in front-line clinical care systematically across the NHS, two elements are needed: a greater level of national and local commitment to quality improvement, and resolution of the underlying issues limiting ‘poorly’ performing organisations.”

The Health Foundation Shaping the Future (2015)⁴⁸

This is a much anticipated report which sets out recommendations for quality improvement education and training. There is a wish, a will and a want to enable undergraduate and postgraduate trainees to learn, develop and embed skills in quality improvement in action, whilst being supported and facilitated to do so, but an uncertainty about how this could be done together. Collaboration between a group of influential bodies, organisations and stakeholders has culminated in the development of these recommendations that outline the fundamental strategic direction and key building blocks needed to make this happen at pace. The intention has been to ensure that the recommendations are pragmatic, meaningful, and practical, and once implemented will make a difference.

There was a need to build on existing good practice and the current medical education and improvement landscape, allowing sufficient freedom to enable adaptation and implementation of recommendations to local context. The focus has been the doctor as they progress through their undergraduate and postgraduate training, but always acknowledging that all quality improvement work needs to be multi-professional and encompass other healthcare professionals, managers and executives, and, not least, patients. The strength of the group has been its diversity and ability to reflect the holistic approach needed.

The ambition was to bring to life and into action the recommendations from recent seminal reports which include Berwick⁵ and Keogh⁴⁹. To do so, the foundations outlined in the curriculum recommendations need to be put in place. Capability and resilience needs to be developed through training and experiential learning to get into the improvement habit^{50,31} as outlined in the education, learning and development recommendations. Strategic direction and the supporting infrastructure is both the blueprint and the glue to make this happen in a coherent way at a scale and pace that is not achievable when we try to do this alone. Examples have illustrated where organisations and/or individuals have achieved success and helps to make sense and give a flavour of what is possible.

The ‘Talking points’ have addressed some particularly challenging areas that divide opinion, and cause frustration and confusion. The intention of these thought pieces is to try and tackle these issues head on and provide some clarity to frequently expressed concerns. Exploring how patients may be involved in partnership with healthcare teams is a particular highlight.

These recommendations are the starting point and it is now up to the relevant bodies, organisations and stakeholders to rise to the call to put them into practice. The recommendations are relevant to so many different layers of our health (and social) care and education that the challenge is how to implement them in a meaningful way to bring about the desired outcomes. In addition, further debate is needed in other areas such as exploring how quality improvement could be enacted as part of revalidation, and how quality improvement activity could be assessed. The Academy of Medical Royal Colleges intends to be a very active partner in enabling this to happen.

Talking point: Quality improvement and sustainability

In seeking to benefit patients, it is a legitimate goal of quality improvement to improve *value*, i.e. achieve the best possible outcomes from minimum costs or inputs. This includes ensuring that the right care is provided to the right patients at the right time (to achieve the outcomes that *they* value), and that waste is minimised across the system. A culture of resource stewardship is needed.

What is sustainability?


Within quality improvement, the term ‘sustainability’ is often applied to the improvement effort, i.e. its capacity to be maintained. However, improvements are of limited benefit if the service in question cannot be sustained due to resource constraints.

The major threat to NHS sustainability is often identified as financial. But healthcare, as all human activities, takes place within not just economic, but also social and environmental contexts. To be sustainable, it must be able to respond to changes, and manage its impacts, across all three spheres. This could have interesting implications for the calculation of *return on investment* in quality improvement.

Sustainable value in healthcare⁵¹

$$\text{Value} = \frac{\text{outcomes}}{\text{environmental} + \text{social} + \text{financial costs} \text{ (the "triple bottom line")}}$$

Informed by
patient values



The Academy’s 2014 report, *Protecting resources, promoting value: a doctor’s guide to cutting waste in clinical care*⁵² highlights examples of improvement projects with savings quantified in both financial and environmental (carbon) terms.

New perspectives

Including the concept of sustainability and resource stewardship as part of quality improvement can motivate new people and provide a new energy for change

I really think [sustainability] is a valuable addition as it gives us an alternative to just finance as a driver for change - excellent for the idealists amongst us!”

“Leadership for sustainability” seminar feedback, Darzi Leadership Fellow 2010-11

A sustainability lens can also highlight wastes and opportunities that may be overlooked, encouraging whole-systems thinking and directing projects systematically towards the highest value improvements.

“Sustainability should be viewed as a characteristic of healthcare which must run through and moderates other domains [of quality]. Healthcare should be considered not only in terms of what can be delivered to an individual today, but also to the population in general and the patients of the future.”⁵³

Building sustainability into quality improvement

There is an opportunity to consider how sustainability might be built into quality improvement in practice and this is described below in terms of possible content and the intended benefits as a result.

Table 1 Benefits of building sustainability into quality improvement⁵¹

<i>QI element</i>	<i>Sustainability content</i>	<i>Benefits</i>
1. Setting goals	Sustainability as a domain of quality; relationship to other domains	New motivation to contribute to quality improvement, energy for change
2. Studying the system	Understanding environmental & social resource use/ impacts; carbon hotspots in the NHS; “seven capitals” matrix	Highlights wastes and opportunities which are often overlooked; stimulates radical thinking
3. Designing the improvement effort	Four principles of sustainable clinical practice (prevention, patient empowerment and self-care, lean systems, low carbon alternatives) – drivers & process changes	Directs towards highest value improvements, future proofing
4. Measuring impact/ return on investment	Triple bottom line/ sustainable value equation; measuring carbon	Allows benefits to be communicated to broader audience, not exclusively re financial cost-benefit

"When we started, our practice had a quality improvement team and a sustainability team. Eventually our two teams merged as there was so much overlap between the principles and aims of both processes, i.e. to reduce waste (time, money, materials), improve patient care and increase the societal value of what we do."

GP ST3 trainee, and Severn GP Sustainability Scholar 2014-15

Limitations

- This has been a piece of work with huge ambition. The danger is then not to achieve a meaningful outcome. There has been a maintained focus on the doctor whilst realising the need for inter-professional learning as well as working
- This has been a significant commitment from the Task and Finish Group stakeholders with no protected time or funding to contribute, and has highlighted the challenges of gaining active support from busy people
- The recommendations do not yet include working in social care. It is acknowledged that this needs to be done, but it is important that it is first established what works. This report is necessarily about what is possible within the resources available, but this is the starting point, and next steps need to determine how to extend the work further and evaluate its impact.

Appendix 1

Recommendations

In forming its recommendations, the task and finish group has identified a number of areas for consideration and potential action by key stakeholders.

Recommendation to:	Topic	Recommendation
NATIONAL POLICY		
GMC	Curriculum	The GMC should use the quality improvement curriculum to help inform and be taken into account as part of its: <ul style="list-style-type: none"> • Development of a framework for generic professional capabilities • Approval of curricula produced by royal colleges and the UKFPO • Quality assurance processes: The development of exploratory questions for quality assurance teams could be a helpful way forward. This would enable teams to investigate and collect data on whether medical students and doctors in training are receiving education on quality improvement.
GMC and medical schools	Curriculum	The GMC and medical schools should work together to explore whether the recommendations could feed into any updating of the curriculum for undergraduate medical education and training
Medical schools	Curriculum	Medical schools should consider whether they can design their curricula and assessment systems so that their students can meet the recommendations set out in this report.
Medical royal colleges	Curriculum	Royal colleges use the recommendations contained in this report to inform the quality improvement elements within the curricula they submit to the GMC for approval.
National policy bodies	Training	National policy needs to be clear and loudly stated – Everybody needs to understand what quality improvement is, who owns it and what its brand values are. From this we need clear, simple, unified national guidance on how to engage with quality improvement.
Research funding bodies	Training	Quality improvement education needs a research agenda: <ul style="list-style-type: none"> • Call to research funding bodies for further work that evaluates the impact of teaching methods and their impact on building individual and team capacity and patient outcomes. • The development of core outcome sets (similar to the CROWN¹⁹ or COMET²⁰ initiatives) for quality improvement training, building upon the work of the IOM would allow broader analysis of outcomes in quality improvement.
National bodies*	Infrastructure	The most successful approach to quality improvement

Recommendation to:	Topic	Recommendation
		will be as a unified and multi-professional activity which also includes patients
National bodies	Infrastructure	Align planning by key stakeholders for the long-term through a think tank/steering group of key stakeholders from every layer e.g. Health Education England and equivalent bodies, NHS Improvement, royal colleges, specialist societies, trusts/health boards and patients
National bodies	Infrastructure	The think tank should look at patient involvement as a specific work stream to establish the ways of best enacting this
National bodies	Infrastructure	A national quality improvement library should be created as a repository of knowledge staff can turn to.
National bodies	Infrastructure	Develop a programme of education and training to assist regulatory/financial bodies in understanding the power of using data for improvement.
National bodies	Infrastructure	Develop skills and knowledge to co-design true outcome-based commissioning approaches and align incentives with quality improvement.
National bodies	Infrastructure	Local and national bodies including NHS Improvement, HEE and its equivalents, royal colleges and specialist societies should support quality improvement activity and provide opportunities for staff to showcase their work from examples across the NHS.
National bodies	Infrastructure	All NHS staff should share and understand a common language when discussing improvement.
National bodies	Infrastructure	Health and social care and its stakeholders should look towards a more positive approach to communicating their achievements, challenges and learning.

TRAINING PROGRAMMES

Foundation programme and specialty, including GP, training	Curriculum	<ul style="list-style-type: none"> The relevant bodies should investigate how they can provide training that will allow their trainees to meet the recommendations set out in this report Trainers and teachers will need to develop skills in delivering quality improvement education and therefore there is a need to develop competences for quality improvement trainers. Those agencies responsible for embedding quality improvement and leadership within the health system and across the UK could be tasked with developing these These bodies should also consider how patients might be able to contribute to the development of quality improvement projects and education
--	------------	--

Recommendation to:	Topic	Recommendation
National bodies	Inter-professional education	Innovative learning practices. The developing field of inter-professional learning presents opportunities to share tested, and explore new, methods of inter-professional education applied to quality improvement and human factors education.
National bodies	Infrastructure	Quality improvement needs to be in everyone's job description and appraisal.
National bodies	Infrastructure	Quality improvement must be included in undergraduate and postgraduate training and needs to be tiered and progressive to ensure that everyone acquires at least a basic understanding and awareness
National bodies	Infrastructure	A critical mass of clinical and non-clinical staff should have advanced quality improvement expertise
National bodies	Infrastructure	Champion mentorship and coaching schemes should be the norm to support quality improvement in action
LOCAL GOVERNANCE AND CULTURE		
Local bodies**	Training	Local action needs to be supported, decisive and effective. There should be an empowered and adequately resourced local leader responsible for setting the direction of quality improvement education and training. This person should be actively translating national policy into local, and vice versa. They should ensure that really robust nationally synthesised data is understood locally, and that crowdsourced solutions are seen and evaluated nationally.
Local bodies	Training	Building capacity and capability. Rather than taking quality improvement out of training, existing learning opportunities should be adapted to include an element of quality improvement training, with oversight from the local quality improvement education lead. Identification of individuals trained in human factors and quality improvement to collaborate and develop opportunities for education and training is essential, supported by a community of quality improvement mentors who are willing to share ideas, experience and learning.
Local bodies	Training	Modern workplace learning There is no 'one size fits all' approach to quality improvement training and no evidence that one method is superior to another. Pragmatic, integrated teaching and

Recommendation to:	Topic	Recommendation
		learning practices should be determined locally. There should be no training without evaluation of the methodology.
Organisations	Infrastructure	Create an open culture with the focus on learning, ownership and accountability rather than reprimand
Organisations	Infrastructure	For quality improvement to become normalised, executive and non-executive commitment, role-modelling and mentoring is core
Executives and boards	Infrastructure	Executives should champion a multi-professional approach and release resource (time) to support quality improvement activity
Organisations	Infrastructure	Role-model best practice quality improvement approaches (e.g. using statistical process control (SPC) in board reports)
Organisations	Infrastructure	All NHS and social care organisations should have credible quality improvement support in the form of an enabling 'core' quality improvement support team
ASSESSMENT		
Developers of undergraduate and postgraduate medical education and training assessment systems	Curriculum	Those involved should continue to develop robust ways of assessing proficiency in quality improvement, for example, through supervised learning events and professional exams
PATIENTS		
National and local bodies	Training	Patients have significant expertise and diverse contributions to make. The patient's voice and expertise should be involved at all stages of quality improvement activities, including quality improvement education
Leadership and culture	Infrastructure	Patient involvement may be diverse and should be appreciated through opportunities to contribute, collaborate, learn together and lead

*National bodies include:

- Department of Health, NHS Scotland, NHS Wales, Department of Health, Social Services and Public Safety Northern Ireland
- Health Education England, NHS Education for Scotland (NES), Workforce, Education and Development Services in Wales, Northern Ireland Medical & Dental Training Agency.

**Local bodies include:

- Trusts
- Health Boards
- GP practices
- Clinical Commissioning Groups
- Other providers of clinical placements.

Both national and regional bodies could also include regional bodies such as:

- Deaneries and Health Education England local teams
- Academic Health Science Networks.

Appendix 2

Task and finish group members and affiliations

Member	Affiliation
Nigel Acheson	NHS England
Richard Berrisford	Royal College of Surgeons of England
Stuart Carney	Medical Schools Council
Jennifer Cleland	Association for the Study of Medical Education (ASME)
John Colvin	Royal College of Anaesthetists
Mark Dexter	General Medical Council
Kim Hinshaw	Royal College of Obstetricians and Gynaecologists
Rosemary Hollick	Academy Trainee Doctors' Group Representative
Rose Jarvis	Academy of Medical Royal Colleges
Elizabeth Jelfs	Council of Deans of Health
Bryan Jones	The Health Foundation
Peeyush Kumar	Royal College of Anaesthetists
Gavin Lavery	Health and Social Care Northern Ireland
Carmel Lloyd	Royal College of Midwives
Dave McKean	Scottish Deans' Medical Education Group and Scottish Government
Patrick Mitchell	Health Education England
Stephen Monaghan	Public Health Wales
Hadjer Nacer	The Health Foundation
Simon Newell	Academy of Medical Royal Colleges
Clare Owen	Medical Schools Council
Philip Pearson	Faculty of Medical Leadership and Management
Patricia Peattie	Academy Patient Lay Group Representative
Johanne Penney	Academy of Medical Royal Colleges
Derek Prentice	Academy Patient Lay Group Representative
Ed Prosser-Snelling	Royal College of Obstetricians and Gynaecologists
Peter Rees	Academy Patient Lay Group Representative
Lesley Page	Royal College of Midwives
Stephen Powis	NHS Employers
Stephanie Reid	NHS Improvement
Toby Reynolds	General Medical Council
David Richmond	Royal College of Obstetricians and Gynaecologists
Howard Ryland	Academy Trainee Doctors' Group Representative
Ross Scrivener	Royal College of Nursing
Amar Shah	Academy Quality Improvement Representative

Member	Affiliation
Lesley Anne Smith	NHS Education for Scotland (NES)
Tim Swanwick	Conference of Postgraduate Medical Deans (UK)
Julia R A Taylor	NHS Improvement
William Taylor	Royal College of GPs
Clare van Hamel	UK Foundation Programme
Emma Vaux, Chair	Joint Royal Colleges of Physicians Training Board
Salman Waqar	Health Education England
Helen Winslow	Health Education England
Suzanne Wood	The Health Foundation
Arrash Arya Yassaee	Medical Student representative
Tim Yates	BMA Junior Doctors Committee

Glossary

ACGME	Accreditation Council for Graduate Medical Education
AoMRC	Academy of Medical Royal Colleges
ARCP	Annual Review of Competence Progression
Audit	A process used by health professionals to assess, evaluate and improve care of patients in a systematic way. Audit measures current practice against a defined (desired) standard. It forms part of clinical governance, which aims to safeguard a high quality of clinical care for patients
AHSN	Academic Health Science Network
CQC	Care Quality Commission
CROWN	Core Outcomes in Women’s Health initiative
COMET	Core Outcome Measures in Effectiveness Trials Initiative
FY1	Foundation Year 1 doctor
GMTS	General Management Trainee Scheme
GMC	General Medical Council
GPC	Generic Professional Capabilities for doctors
Health Board	The Scottish and Welsh providers of healthcare
HEE	Health Education England
HSJ	Health Services Journal
IHI	Institute of Healthcare Improvement, based in Boston, MA
IOM	Institute of Medicine, based in Washington, DC
IPE	Inter-professional education
LETBs	Local Education and Training Boards responsible for the training and education of NHS staff in England
MDT	Multidisciplinary team
NHS England	An executive non-departmental public body of the Department of Health that oversees budget, planning, delivery and day-to-day operation of the commissioning side of the NHS in England
NES	NHS Education for Scotland, an education and training body and a special health board within NHS Scotland

NICE	National Institute for Health and Care Excellence
PDSA	Plan-Do-Study-Act cycles, part of the Model for Improvement established by the IHI
'Q'	The 'Q' initiative, sponsored by the Health Foundation and NHS England connecting people skilled in improvement across the UK
SPAs	Supporting Professional Activities
SPC	Statistical Process Control
ST	Specialist Trainee
WHO	World Health Organisation

References

1. Øvretveit J. (2009) Does improving quality save money? A review of evidence of which improvements to quality reduce costs to health service providers. *The Health Foundation* <http://www.health.org.uk/publication/does-improving-quality-save-money#sthash.GOfneTO.dpuf> [accessed 11Feb16]
2. Jones B, Woodhead T. (2015) Building the foundations for improvement - How five UK trusts built quality improvement capability at scale within their organisations *The Health Foundation* <http://www.health.org.uk/publication/building-foundations-improvement#sthash.FVxB2ghl.dpuf> [accessed 11Feb16]
3. Batalden P, Davidoff F. (2007) What is 'quality improvement' and how can it transform healthcare? *Quality and safety in health care* 16 (1) 2–3
4. Department of Health (2015) *NHS Constitution for England* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/480482/NHS_Constitution_WEB.pdf [accessed 25Feb16]
5. The Berwick Report: *A promise to learn – a commitment to act. Improving the Safety of Patients in England* (2013) National Advisory Group on the Safety of Patients in England, HMSO
6. Scottish Government (2010) *Quality Strategy* <http://www.gov.scot/Topics/Health/Policy/Quality-Strategy> [accessed 25Feb16]
7. NHS Wales University Health Board (2015) *Our Quality Strategy for 2015-2018* <http://www.wales.nhs.uk/sitesplus/documents/863/Final%20Quality%20Strategy%20-%20%2019%20January.pdf> [accessed 25Feb16]
8. Department of Health, Social Services and Public Safety (2011) *Quality 2020* <https://www.dhsspsni.gov.uk/sites/default/files/publications/dhssps/q2020-strategy.pdf> [accessed 25Feb16]
9. Batalden P, Davidoff F. (2007) What is 'quality improvement' and how can it transform healthcare? *Quality and safety in health care* 16 (1) 2–3
10. Aveling E-L, McCulloch P, Dixon-Woods M. (2013) A qualitative study comparing experiences of the surgical safety checklist in hospitals in high-income and low-income countries *BMJ Open*;3:e003039 doi:10.1136/bmjopen-2013-003039 <http://bmjopen.bmj.com/content/3/8/e003039.short> [accessed 25Feb16]
11. The American Board of Paediatrics and The Accreditation Council for Graduate Medical Education (2012) *The Paediatric Milestones Project* <https://www.abp.org/sites/abp/files/pdf/milestones.pdf> [accessed 03Feb16]
12. GMC (2015) *Promoting excellence: standards for medical education and training* <http://www.gmc-uk.org/education/standards.asp> [accessed 25Feb16]
13. GMC (2015) *Outcomes for graduates* http://www.gmc-uk.org/education/undergraduate/undergrad_outcomes.asp [accessed 25Feb16]

14. General Medical Council (2015) *Development of Generic Professional Capabilities* <http://www.gmc-uk.org/education/23581.asp> [accessed 07 December 2015]
15. NHS England (2015) *Improving Experience of Care Through People Who Use Services*
16. The King's Fund *Experience-based co-design toolkit* <http://www.kingsfund.org.uk/projects/ebcd> [accessed 09Feb16]
17. Carman K, Dardess P, Maurer M, Sofaer S, Adams K, Bechtel C, Sweeney J. (2013) Patient And Family Engagement: A Framework For Understanding The Elements And Developing Interventions And Policies *Health Affairs*, 32 (2):223-231 The published article is archived and available online at www.healthaffairs.org. <https://www.communitycarenc.org/media/files/health-affairs-feb-2013-patient-and-family-engagement-framework-unders.pdf> [accessed 09Feb16]
18. Pickering G. (1956) The Purpose Of Medical Education *BMJ* 2 (4985) 113-116
19. CROWN initiative <http://www.crown-initiative.org> [accessed 21Jan16]
20. COMET initiative <http://www.comet-initiative.org> [accessed 21Jan16]
21. Royal College of Physicians *Learning to Make a Difference* <https://www.rcplondon.ac.uk/projects/learning-make-difference-ltmd> [accessed 03Feb16]
22. Raelin J (2008) *Work-Based Learning: Bridging Knowledge and Action in the Workplace* Wiley
23. Hart J (2015). Modern workplace learning: a resource book for L&D <http://modernworkplacelearning.com/book> [accessed 08Feb16]
24. Jennings J (2015). 70:20:10 – Above All Else It's a Change Agent. Workplace performance blog. 20th January 2015. <http://goo.gl/i0YfpG> [accessed 08Feb16]
25. Hart J (2015) Centre for Learning and Performance Technologies, *Modern Workplace Learning: a resource book for L&D* <http://modernworkplacelearning.com/book> [accessed 12Jan16]
26. Agents for Change <http://www.agents-for-change.com/index.htm> [accessed 03Feb16]
27. The Health Foundation and NHS England *The Q Initiative* <http://www.health.org.uk/programmes/q-initiative> [accessed 03Feb16]
28. NHS Change Day <http://changeday.nhs.uk> [accessed 03Feb16]
29. Gamble J, Vaux E. (2014) Learning leadership skills in practice through quality improvement *Clinical Medicine* 14 (1): 12-15

30. Leadership and Leadership Development in Health Care: The Evidence Base (2015) *The King's Fund*
http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/leadership-leadership-development-health-care-feb-2015.pdf [accessed 11Feb16]
31. Lucas B, Nacer H. (2015) *The Habits of an Improver* *The Health Foundation*
<http://www.health.org.uk/publication/habits-improver> [accessed 03Feb16]
32. North West London NIHR CLAHRC *QI4U* <http://qi4u.ocbmedia.com> [accessed 05Feb16]
33. Imperial College Healthcare NHS Trust *Paired Learning*
<http://www.imperial.nhs.uk/pairedlearning> [accessed 03Feb16]
34. Institute Of Medicine (2015) *Measuring the impact of interprofessional education on collaborative practice and outcomes*. National Academy of Sciences
35. NHS Institute for Innovation and Improvement *Lean*
http://www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/lean.html [accessed 03Feb16]
36. Institute for Healthcare Improvement *Model for Improvement*
<http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx> [accessed 03Feb16]
37. Osterwalder A, Pigneur Y, Bernarda G. (2014). *Value Proposition Design: How to Create Products and Services Customers Want*. Wiley.
38. Francis Report: Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry (2013) <https://www.gov.uk/government/publications/report-of-the-mid-staffordshire-nhs-foundation-trust-public-inquiry> [accessed 07Dec15]
39. Ahmed N, Ahmed F, Anis H, Carr P, Gauher S, Rahman F. (2015) An NHS leadership team for the future. Reform Research Trust http://www.reform.uk/wp-content/uploads/2015/11/NHS-Leadership-team-A5-report_WEB.pdf [accessed 07Dec15]
40. NHS Institute for Innovation and Improvement (2012) *Introducing service improvement into pre-registration education of healthcare professionals – for better, safer care*
http://www.institute.nhs.uk/building_capability/building_improvement_capability/building_improvement_capability_into_pre-registration_training.html [accessed 03Feb16]
41. Solberg, L.I., Mosser, G. and McDonald, S. (1997) The Three Faces of Performance Measurement: Improvement, Accountability and Research, *Journal on Quality Improvement*, Vol.23 No.3 p135-147
42. NHS Institute for Innovation and Improvement *BaSIS Building Safety Improvement Skills*
http://www.institute.nhs.uk/safer_care/safer_care/basis%3A_building_safety_improvement_skills.html [accessed 03Feb16]

43. NHS Improving Quality *Quality, Service Improvement and Redesign* <http://www.nhs.uk/news-events/news/sign-up-now-to-register-for-nhs-iq%E2%80%99s-new-quality,-service-improvement-and-redesign-programme.aspx> [accessed 03Feb16]
44. NHS Wales *Improving Quality Together* <http://www.iqt.wales.nhs.uk/home> [accessed 03Feb16]
45. Cosgrove D, Fisher M, Gabow P, Gottlieb G, Halvorson G, James B, Kaplan G, Perlin J, Petzel R, Steele G, Toussaint J. (2013) Ten strategies to lower costs, improve quality, and engage patients: the view from leading health system CEOs *Health Aff (Millwood)* 32(2):321-7
46. Vincent C, Burnett S, Carthey J (2013) The measurement and monitoring of safety – Drawing together academic evidence and practical experience to produce a framework for safety measurement and monitoring *The Health Foundation* <http://www.health.org.uk/publication/measurement-and-monitoring-safety> [accessed 19Jan2016]
47. Weick K, Sutcliffe K (2007) *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*, 2nd Edition, Wiley, West Sussex
48. The Health Foundation (2015) Shaping the Future: A strategic framework for a successful NHS <http://www.health.org.uk/sites/default/files/ShapingTheFuture.pdf> [accessed 07Dec2015]
49. Keogh B. (2013) Review into the quality of care and treatment provided by 14 hospital trusts in England: overview report *NHS England* <http://www.nhs.uk/NHSEngland/bruce-keogh-review/Documents/outcomes/keogh-review-final-report.pdf> [accessed 03Feb16]
50. The Health Foundation Webinar: Getting into the improvement habit 16th Jan2016 <http://www.health.org.uk/webinar-getting-improvement-habit> [accessed 03Feb16]
51. Mortimer F (2016) *Quality, Value and Sustainability* *in press*
52. The Academy of Medical Royal Colleges (2014) *Protecting resources, promoting value: a doctor's guide to cutting waste in clinical care* <http://www.aomrc.org.uk/general-news/protecting-resources-promoting-value.html> [accessed 05Feb16]
53. Royal College of Physicians (2013) *Future hospital: Caring for medical patients – recommendations*

Academy of Medical Royal Colleges
10 Dallington Street
London
EC1V 0DB
United Kingdom

Telephone
+44 (0)20 7490 6810

Facsimile
+44 (0)20 7470 6811

Email
academy@aomrc.org.uk

Website
www.aomrc.org.uk

Registered Charity Number
1056565

©2016