Evidence scan:

Involving junior doctors in quality improvement

September 2011
Health Foundation evidence scans provide information to help those involved in improving the quality of healthcare understand what research is available on particular topics.

Evidence scans provide a rapid collation of empirical research about a topic relevant to the Health Foundation’s work. Although all of the evidence is sourced and compiled systematically, they are not systematic reviews. They do not seek to summarise theoretical literature or to explore in any depth the concepts covered by the scan or those arising from it.

This evidence scan was prepared by The Evidence Centre on behalf of the Health Foundation.

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Originally published as Research scan: Involving junior doctors in quality improvement

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Introduction

In the UK and the Republic of Ireland, the term ‘junior doctors’ refers to newly qualified doctors who have taken up posts after leaving medical school. These doctors provide care for patients in hospital or general practice under the broad supervision of more senior doctors. This role is somewhat equivalent to the first three years of a ‘resident’ post in North America.

The years immediately after leaving medical school may be a prime time for supporting practitioners to develop an interest and expertise in improving the quality of healthcare.

This research scan summarises some published literature about the involvement of junior doctors in quality improvement in the UK and internationally. Ten databases were searched for material available as at July 2011 and 78 articles have been included.

Engagement approaches

The three most common approaches to engaging junior doctors in quality improvement include:

- formal training
- quality improvement projects and initiatives led by junior doctors
- projects designed by others to improve the quality of care provided by junior doctors.

Educational approaches have included formal courses, simulation, problem-based learning and practical projects.

There is mixed evidence of impact, with most studies finding short-term improvements in junior doctors’ skills.

Quality improvement projects led by junior doctors are generally associated with improved care processes but the impacts on junior doctors’ skills and interest in quality improvement and the longer term impacts on patient outcomes remain uncertain.

Initiatives designed to improve the quality of care provided by junior doctors tend to have short-term benefits but few studies have examined how this impacts on the attitudes, skills and perceptions of doctors as their careers develop.

Helpful and hindering factors

Factors that may help or hinder the degree to which junior doctors are involved in quality improvement include:

- transitions to new roles
- organisational culture
- support and supervision
- working conditions and hours
- ongoing learning opportunities.

In the UK, a range of initiatives are currently underway to involve junior doctors in quality improvement and these should be fully evaluated.
1 Scope

Junior doctors have an important role in providing health services and may have an equally important role in improving the quality of care available, enhancing organisational systems and developing medical professionalism.

1.1 Purpose

Every year in the UK, more than 6,000 doctors make the transition from being a medical student to becoming a junior member of healthcare teams in hospital or general practice.¹

There is an increasing focus on junior doctors’ potential to transform healthcare. A number of initiatives have been tested to engage junior doctors in quality improvement, including programmes by royal colleges, workforce deaneries and health departments.²⁴

The Health Foundation was interested in understanding approaches to involving junior doctors in quality improvement that have been empirically tested and the factors that may help or hinder such involvement. Underpinning this interest is the assumption that newly qualified doctors may be able to identify and act on areas for improvement that more experienced doctors take for granted.⁵

It may therefore be worthwhile to support junior doctors to become champions of quality improvement, working to positively affect outcomes for service users, staff and systems.⁶

This research scan addresses the following questions:

- How have junior doctors been involved in quality improvement and what are the impacts?
- What helps and hinders junior doctors being involved in improving the quality of healthcare?

This scan focuses on empirical research about involving junior doctors in quality improvement. It does not include theoretical articles or descriptive narratives.

All of the evidence has been sourced and compiled systematically, but the scan is not a systematic review and does not seek to summarise every study on this topic. Instead, the purpose is to provide a rapid overview of readily available information to help consider the potential for more detailed work to engage junior doctors in improving the quality of healthcare.

This section outlines the methods used to collate information. The following sections address the questions above in turn.
1.2 Methods

To collate evidence, two reviewers searched bibliographic databases, reference lists of identified articles and the websites of relevant agencies for information available as at July 2011.

The databases included MEDLINE, Ovid, Embase, the Cochrane Library and Controlled Trials Register, PsychLit, ERIC, Google Scholar, DARE, the WHO library and the Health Management Information Consortium. All databases were searched from 2000 until July 2011.

Search terms included combinations of words and similes such as junior doctor, resident, medical intern, prequalification doctor, quality improvement, improvement initiative, healthcare improvement, informal curricula, hidden curricula, status quo culture, learned adaptations, resilience, champions, active citizens and education.

To be eligible for inclusion, studies had to:

- be empirical research or reviews
- be focused on junior doctors in the UK or equivalent roles elsewhere
- be published online or in print form
- be available in abstract, journal article, or full report form
- address one or more of the core questions listed on page 4
- be available in English.

More than 20,000 pieces of potentially relevant research were scanned. Those that were most relevant for addressing the questions of interest were examined in detail.

Data were extracted from all relevant publications using a structured template and studies were grouped according to key questions and outcomes to provide a narrative summary of trends.

No formal quality weighting was undertaken, apart from the selection process outlined above. In total, 78 studies were included in the synthesis.

1.3 Definitions

Research was eligible for inclusion in the scan if it focused on junior doctors or equivalent roles. This section briefly outlines these roles. The aim is not to provide a detailed overview, but rather to contextualise the types of research included.

In the UK, all doctors working clinically in the NHS or in private practice must be registered and have a license to practice. Doctors begin their careers as medical students and continue training until they become a consultant or GP.

In the UK and the Republic of Ireland, the term ‘junior doctor’ is used to describe those who have graduated with a medical degree and are continuing their practical training to become a GP, consultant or other specialist. Junior doctors are registered but are not yet trained to a level which allows them to work completely independently. As junior doctors gain experience, their responsibilities increase, but they are always under the supervision of a senior doctor, though not necessarily directly.

The junior doctor grades are foundation year 1, foundation year 2, and GP registrar or specialty registrar. After three years of ongoing practical experience, junior doctors gain a certificate of completion and appear on the specialist register or the GP register.7

In North America and other parts of the world, the term ‘resident’ is more commonly used to describe roles similar to junior doctors. Other terms used include ‘resident physician’, ‘house officer’ or ‘intern’. In some countries a residency may follow an internship year whereas in other places the internship year is included in the first year of residency.

These terms are not necessarily interchangeable and can have specific meanings in different contexts, but relate to broadly similar roles for the purpose of the research scan.8
The focus is on practitioners who have completed a medical degree and who practice medicine under the supervision of fully licensed doctors in hospitals or primary care.

The UK foundation year 1, foundation year 2 and speciality trainee 1 (ST1) grades are broadly equivalent to the US three-year residency period. For this reason, the research scan includes material focused on residents as well as junior doctors. It is important to note that the duration of residencies can range from three years to seven years for a specialised field such as neurosurgery.

**Quality improvement was broadly defined as...**

any initiative aiming to improve the processes or outcomes of care. This scan does not solely focus on named or formal quality improvement approaches such as continuous quality improvement or total quality management.

**1.4 Caveats**

When interpreting the findings of the scan it is important to consider several caveats.

First, the scan is not exhaustive. It presents examples of relevant research but does not represent every study published about involving junior doctors in quality improvement.

Second, the focus is on published empirical research. An online search found a wide variety of initiatives in the UK to involve junior doctors in quality improvement are either being planned, planned or underway. These initiatives are not included in the scan because their evaluations or studies about them are not yet available.

Much of the research available about helpful and hindering factors was generic rather than focused explicitly on quality improvement.

Much of the available evidence comes from North America and it is important to recognise the variations in healthcare systems as well as how junior doctor roles are defined. This may impact on the generalisability of the findings. To emphasise this point, throughout the scan the term ‘resident’ is used as appropriate.

Studies about involving junior doctors and equivalent roles in improving the quality of healthcare have been included, regardless of whether they explicitly used the term ‘quality improvement.’ The scan aimed to describe approaches for engaging junior doctors in any improvement initiatives, rather than taking a narrow view based on formal theories of quality improvement.

This means that a wide range of initiatives are included and it is difficult to make comparisons between the approaches.

Difficulties making comparisons are further compounded because most studies are observational, small scale and focus on describing the outcome of one technique rather than comparing various approaches. The studies available tended to be of limited quality.

There is a lack of evidence about the strengths and weaknesses of various approaches and about the practical implications of using them in different settings. This lack of evidence does not mean that specific approaches to involving junior doctors are ineffective or unhelpful, rather that little research is available about them.
We also found a lack of evidence comparing the value of techniques for junior doctors versus other roles, and a paucity of research about the value of targeting junior doctors at this stage of their career versus medical students or more experienced doctors.

Much of the research available about helpful and hindering factors was generic rather than focused explicitly on quality improvement.

Despite these caveats, the scan identified a number of studies describing how junior doctors have been involved in improving the quality of healthcare, and these may spark ideas about approaches that could be tested more fully in the UK.
2 Involving junior doctors

Research describes how junior doctors have been involved in quality improvement through formal education, leading practical initiatives and taking part in projects developed by others. Based on the 78 studies available in July 2011, the research scan suggests that the three most commonly researched ways of involving junior doctors in quality improvement are: training and education about quality improvement; improvement projects led by junior doctors; and initiatives developed by others to improve the care provided by junior doctors. This section explores each of these approaches.

2.1 Education

A number of studies suggest that formal courses or training can be useful for increasing junior doctors’ knowledge and skills regarding quality improvement. This training may take the form of classroom sessions, simulations, problem-based learning or practical projects.

Formal courses

A number of studies have tested the value of formal sessions to help junior doctors learn about quality improvement principles. For instance, in Australia, a self-directed learning programme was developed for hospital interns, one component of which included quality improvement. Over a two-year period, doctors were required to accrue a minimum of 100 continuing medical education points.

Evaluation found that interns adhered to the system, liked the flexible learning options of the points system, and thought that they had developed better knowledge and skills as a result. Self-directed learning during continuing medical education may therefore be a useful way to give junior doctors access to quality improvement concepts and skills.

Elsewhere in Australia, researchers have examined the value of encouraging junior doctors to practice in a range of areas, including general practice. The rationale is that by gaining detailed experience in a range of clinical environments, during their ongoing training, doctors will not only have better clinical skills, but will also have more knowledge of how services interlink, and the importance of transitions.
Practical intern training was associated with perceived improvements in procedural skills, clinical tasks and clinical responsibility

Similarly, researchers in New Zealand examined perceptions of the trainee intern year. A survey of 457 trainee interns and medical students was conducted. Practical intern training was associated with perceived improvements in procedural skills, clinical tasks and clinical responsibility. The authors concluded that an intern year is important in preparing graduates for practice. This includes building up skills in quality improvement.¹¹

A great deal of research has been undertaken in the USA about educational approaches for quality improvement. Much of this relates to medical students, but studies about residents are also emerging. For example, researchers tested a four-week practice-based learning and improvement elective for internal medicine residents. Residents took part in structured sessions and completed a project to improve patient care. Compared with a group that did not take part in the learning programme, the elective was associated with improved self-reported quality improvement knowledge and skills. These improvements remained six months later.¹²

Another US hospital developed a three-week elective in quality improvement for medical house officers. Learners took part in three seminars, joined hospital-based improvement activities, conducted a root cause analysis and completed a practical project. A total of 63% of residents said the elective increased their understanding of quality improvement in healthcare and 88% better understood quality improvement in their institution.¹³

A systematic review of quality improvement curricula in the USA found that such formal learning opportunities could be improved. Four bibliographic databases were searched for material published between 1980 and April 2008. Eighteen quality improvement curricula were assessed.

Five curricula involved medical students and 13 targeted residents. Three curricula measured healthcare outcomes. The review found curricula varied widely in the quality of reporting, teaching strategies and evaluation instruments used. Generally curricula were associated with improvements in attitudes towards quality improvement, behaviour and patient outcomes. However, the authors concluded that many quality improvement curricula inadequately addressed educational objectives and the studies were weak methodologically.¹⁴

Problem-based learning

The overall finding is that formal courses may increase junior doctors’ knowledge about quality improvement, but the impact on practical skills and longer term implementation remains unclear.

As well as lecture style training and seminars, researchers have tested the value of novel educational approaches for up-skilling junior doctors in quality improvement. Problem-based learning is one such approach, whereby participants are asked to apply their knowledge to solve practical problems or scenarios.

Researchers in England examined the value of problem-based learning for junior doctors taking part in postgraduate medical studies. Learning outcomes were compared in traditional lecture style versus problem-based learning courses. There was no significant difference in learning outcomes between the traditional and problem-based learning courses.
Participants liked the varied teaching programme in the problem-based learning course.

The authors concluded that problem-based learning adds variety to junior doctors’ protected teaching programmes and can be useful for doctors working shift patterns. This approach may be particularly useful for encouraging creativity and focusing doctors on the potential for improving the delivery of care.\textsuperscript{15}

Other researchers surveyed 2,062 newly qualified doctors about whether they felt prepared for starting work as a junior doctor in the UK. Of these, 15% said they felt medical school had poorly prepared them for starting work. Those who had shadowed other professionals felt more prepared, as did those who had taken problem-based learning courses.\textsuperscript{16}

It appears that problem-based learning is not necessarily better than traditional approaches, but may a useful component of strategies to support and inform junior doctors about quality improvement. This approach may also help doctors feel more confident in the transition period.

**Practical projects**

The most common type of research about training junior doctors about quality improvement focuses on the use of practical projects.

There is a body of literature suggesting that experiential learning and practical projects can help junior doctors feel more confident about their role and abilities, and thus perhaps more likely to focus on areas for improvement.

For instance, researchers in England compared the perceptions of junior doctors graduating from different medical schools regarding how their education had helped them feel ready to practice. A survey of 146 junior doctors was carried out.

The authors concluded that providing medical students and junior doctors with an opportunity for structured, work-based experimental learning helps smooth the transition to clinical work and improve quality.\textsuperscript{17}

**Literature suggests that experiential learning and practical projects can help junior doctors feel more confident about their role and abilities, and more likely to focus on areas for improvement.**

More specific examples that are linked to quality improvement are also available.

Researchers in the USA examined whether instructing internal medicine residents in quality improvement methods could improve patient care. Using quality improvement techniques, the residents aimed to improve obesity screening.

They streamlined body mass index (BMI) documentation, created educational materials about obesity and launched an obesity screening initiative in a residency clinic. Residents designed plan-do-study-act (PDSA) cycles to increase awareness and maintain improvements in screening over a one year period.

The residents’ quality improvement initiative was associated with a significant increase in documentation about body mass index (43% versus 4% at baseline) and more provision of lifestyle counselling for overweight people (34% versus 14% at baseline). The authors concluded that a quality improvement initiative developed by internal medicine residents as part of their training can improve patient care.\textsuperscript{18}

Other researchers in the USA developed a structured curriculum to help surgery residents learn about quality improvement. Fifteen residents from various hospitals took part in the course, which focused on devising a quality improvement project. Residents reported improved knowledge and self-efficacy regarding continuous quality improvement and were eager to make improvements to clinical practice.
The authors concluded that giving residents the tools to critically investigate systems and an ear to hear their concerns and suggestions for improvement was beneficial. This also helped encourage buy-in from residents and may lead to a longer term focus on quality improvement.  

There are numerous similar examples from the USA suggesting that practical projects can improve junior doctors’ quality improvement knowledge and skills. For example, 44 medicine and paediatrics residents participated in a course about continuous quality improvement. Projects designed by residents were scored and knowledge, interest and self-efficacy were measured before and after the course. There were improvements in knowledge and self-efficacy. The authors concluded that resident education in continuous quality improvement produced innovative and creative improvement projects.

Another study described how residents completed chart reviews and patient and system surveys, reflected on the data and undertook a PDSA cycle group project. The projects led to improvements in care. Residents’ confidence in quality improvement skills and using PDSA cycles also improved.

An evaluation of another US programme found that factors associated with successful interventions included focusing on topics common in clinical practice, examining ways to change the system of patient care (such as using group visits), using electronic medical records to provide clinical information during office visits, and interdisciplinary team participation in the project.

From 2002 onwards, residents in the USA have been required to demonstrate competency in practice-based learning and improvement. A number of organisations have therefore developed specific training about quality improvement. Most evaluations of such site specific training find that residents report gaining knowledge and an ability to apply new skills.

Most practical projects result in suggestions for change that are implemented and sustained beyond residents’ project periods. The sustainability of improvements made during practical work is gaining increasing focus. It has been suggested that without continuing support and reinforcement, any gains in quality improvement skills and knowledge will be lost.

One study assessed the sustainability of residents’ quality improvement initiatives in an ambulatory university-based clinic. All second year internal medicine residents completed chart reviews, patient surveys and a system survey. Residents then developed group quality improvement projects and collected data about immediate outcomes. Third year residents returned to evaluate their original project two to six months later and completed four PDSA cycles on each project. Over a three year period, half of all projects demonstrated sustainable improvement.

The authors concluded that when residents are taught about sustainability and spread, and complete multiple PDSA cycles, they identify themes that may contribute to the success of quality improvement projects over time.

Research in Canada also supports the value of practical projects and experiential learning. One study described a course for psychiatry residents involving a quality improvement workshop and longitudinal improvement projects. Data were collected using focus groups and surveys with residents at one university in Canada. The authors suggested that the experiential format worked well and should be tested further as a model for teaching about quality improvement.

Quality improvement initiatives that are developed by junior doctors, as part of their training, can help improve patient care.
Not all research has found benefits from practical quality improvement projects. For instance, one US study compared the benefits of workshops and practical projects. All residents at one organisation were invited to attend a workshop. Residents in an ambulatory block rotation were required to complete a project. Those who chose not to take part in either initiative served as a comparison group. Six to eight months later there was no difference in performance in those who completed a practical project and those who did not. Similarly there was no difference between those who attended the workshop and those who did not.

The authors concluded that workshops and practical projects alone will not improve residents’ ability to apply knowledge about quality improvement.²⁹

Other researchers have emphasised that just because junior doctors are taught to reflect on quality improvement does not mean that they can apply theory in practice or develop high quality improvement initiatives. For instance, one US study explored associations between 86 residents’ reflections on quality improvement opportunities and the quality of their proposals for practical projects. There were no significant associations.

The authors suggested that this indicates a distinction between residents’ knowledge about quality improvement principles and their ability to use these skills in practice.³⁰

### Simulation

Simulated exercises with assessment and feedback have been used to encourage junior doctors to become interested in improving the quality of care. Such simulations are usually part of formal training approaches.

For instance, in Scotland a ward simulation exercise has been tested to provide a safe and authentic setting to support junior doctors to practice improvement skills and gain feedback.

### Practical simulations

Evidence is emerging that practical simulations can encourage junior doctors to think about ways to improve the delivery of care.

Researchers found that realism is important in recreating the complex climate in which junior doctors have to work as part of a broader team.³¹

A number of US studies have found that simulation-based educational programmes can improve residents’ performance in clinical practice. They can also help them focus on the potential to improve their practical skills and communication.³²

### 2.2 Initiatives led by junior doctors

In addition to formal education initiatives, researchers have explored the impact of improvement programmes developed and led by junior doctors during clinical practice.

### Practical changes

Many of the practical changes residents implement in the USA fall under the auspices of improvement projects conducted as part of formal learning.³³
These were described in the previous section but further examples are given here to emphasise the impact of resident-led initiatives. For example, third year internal medicine residents, at a hospital in the USA, identified gaps between guidelines and clinical practices for the inpatient management of heart failure.

In this case, residents used quality improvement techniques to enhance patient care, focusing on documenting counselling for smoking cessation, ejection fraction assessment and prescriptions. They created an admissions template and a discharge sheet.

After the admissions template was implemented, 100% of people with heart failure who smoked received documented smoking cessation counselling, compared with 59% before the intervention.

The researchers concluded:

‘by strengthening residents’ learning and commitment to quality improvement, the hospital created a foundation for future changes in the systems that affect patient care.’

Other researchers in the USA examined the use of a standardised handover process in a general surgery residency programme. The process involved a sign out template, implementation method and continuous quality improvement approach.

All elements were designed by general surgery residents, after instruction in quality improvement. There was 73% compliance in the initial implementation phase.

Real time feedback allowed residents to modify the process and gain 100% compliance and acceptance by residents. Encouraging residents to participate in the development process was essential in sustaining outcomes.

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**Practical results**

There is not a great deal of evidence about practical changes led by junior doctors, and the research that is available tends to be from the US. However, emerging findings suggest that giving junior doctors responsibility for making changes can result in better patient care.

**Engagement**

Other studies have looked at different forms of active engagement in quality improvement. For instance, in the USA, junior doctors took part in discussion groups with the express aim of improving care at their organisation.

At a paediatric urgent care centre, patients requiring management by subspecialty consultants had to wait an average of two hours. Paediatric residents took part in discussion groups to identify problems and propose solutions.

Residents defined four dimensions of quality: waiting time, teaching, courtesy and overall quality of care. An intervention was developed and tested to improve these components.

The authors concluded that at minimal or no cost to the organisation, resident discussion groups can generate solutions to problems and help improve the quality of care.

Another way to engage junior doctors in improvement is to encourage them to pass on their skills and knowledge to others.

Researchers in Scotland tested a ‘near-peer’ teaching scheme, devised and delivered by junior doctors for final year medical students. Junior doctor-led sessions were provided about clinical examination and practical prescribing.
A randomised trial assessed the effect of attending a tutorial on prescribing. Participants at various teaching sessions also completed feedback forms. Students who attended a tutorial made fewer dosing errors and most trainees attending various sessions thought they were useful.

The authors concluded that ‘near-peer’ teaching may be a worthwhile addition to the undergraduate programme and may assist junior doctors’ professional development and focus on improvement.38

Another approach is to encourage junior doctors to keep journals or diaries of their experiences and to use these as a source of reflection to improve care. A number of studies suggest that this can enhance junior doctors’ confidence in identifying issues in need of improvement and direct patient benefits have been observed regarding enhanced safety.40,41

Tools have been designed to assess the degree to which junior doctors reflect on the quality of their practice.42 It has been suggested that junior doctors are more likely to reflect on process issues than personal or systems areas for improvement.43

Team-based projects are gaining popularity in the USA to help residents gain quality improvement skills. This may span several organisations or be more local.

For instance, to improve training for residents who provide care for people with long-term conditions, 41 US teaching hospitals participated in a 'Breakthrough Series Collaborative' to implement the Chronic Care Model. Faculty, residents and staff attended monthly telephone calls and two-day face-to-face meetings with other teams. Each team used PDSA quality improvement cycles to implement the Chronic Care Model and curricula changes. Teams reported improvements in learning about long-term conditions and practice redesign.44

Elsewhere, one US organisation implemented a quality improvement collaborative focused on medication safety across eight residency training programmes with 219 residents. Over a six-month period, faculty participated in three half-day learning sessions. Each residency programme developed an implementation and measurement plan for individual action learning projects using PDSA cycles. Residency programmes then implemented improvement projects and faculty provided mentoring between learning sessions. Several projects resulted in permanent changes in medication reconciliation processes.45

Simple measures

Encouraging junior doctors to create solutions to issues or pass on their skills to others may be a useful form of active engagement.

2.3 Improving the care provided by junior doctors

A number of initiatives have been set up to improve the quality of care provided by junior doctors. These initiatives engage junior doctors in quality improvement by making them the subjects of the initiatives. A range of approaches have been tested, including methods to support ongoing learning, specific improvement tools and engaging junior doctors in making practical changes to their care.

Ongoing learning

In the USA, journal clubs have been tested as a way to promote quality improvement among residents. A number of studies suggest that informal peer discussion groups focused on reading and critiquing research can improve knowledge and motivation regarding quality improvement.39
Examples of more localised team development are also available. For instance, at one US organisation seven learners worked together on a four-week quality improvement project. The team included two preventive medicine fellows, two family medicine residents, one internal medicine resident and two masters-level nursing students. Before and after analysis found that working together on a quality improvement project improved medication reconciliation and increased knowledge and confidence.46

Another US study described how teams of residents, faculty and office staff completed clinical improvement projects at three ambulatory care training sites. Residents were given academic credit for participation in team meetings. After six months, residents presented their results.

The programme enhanced quality improvement skills. Chart audits indicated improvement in clinical projects. The authors concluded that improvement activities that affect patient care can be successfully incorporated into the daily work of family medicine residents.47

An important component of such team-based projects is that quality improvement is embedded as part of the regular day-to-day routine.48 This is also important in organisations that hold improvement meetings, safety briefings or mortality and morbidity conferences that draw team members together to discuss quality and safety issues.

For example, a number of case studies have been published describing how morbidity and mortality conferences that highlight adverse events can be used to teach residents quality improvement skills.49

Providing an opportunity to share research and improvement initiatives with others is also important. One US state set up a resident symposium in order to support ongoing learning about quality improvement. Residents were invited to submit abstracts to the symposium focused on case presentation, quality improvement or clinical research. Two half days were then allocated for residents to present their research which was evaluated by a panel of three judges, and awards were given in each category.

This approach succeeded in engaging large numbers of residents and fostering an interest in publication.50

**Sharing experiences**

Providing junior doctors with opportunities to reflect on and share their experiences of improving quality has been found to improve awareness of quality improvement approaches. The long-term impact on junior doctors’ attitudes and behaviours is uncertain.

**Feedback**

A number of studies have examined the benefits of providing feedback to junior doctors, with the aim of improving the delivery of care.51

For instance, researchers in England examined the impact of educating junior doctors about documenting drug allergies in hospital. An initial audit found that 20% of patient notes and 24% of drug charts contained inaccurate drug allergy documentation.

Following education and feedback, a second audit found that the documentation of drug allergies was accurate in 100% of notes and drug charts. This is an example of how involving junior doctors as the subject of quality improvement initiatives may help them see the benefits first hand.52

Novel methods of gaining feedback have been tested. For instance in the USA, trauma video review has been used for quality improvement and education.
Interviews with representatives from 107 adult and paediatric trauma centres and related organisations found that those using video review reported that it improves processes and is worthwhile for resident education.\(^53\)

Not all studies about educating junior doctors to improve their practice have had positive outcomes.

Researchers in the USA examined a quality improvement programme to enhance a resident pharmacology clinic for people with major depressive disorder. Administrative processes were changed and residents took part in education and feedback.

Reengineering the system to improve flow was beneficial but residents did not make significant changes to their practice patterns based on feedback. Patient outcomes did not improve as a result of feedback to residents.\(^54\)

This suggests that merely providing feedback about ways to improve practice is insufficient to encourage junior doctors to make practical changes.

This approach is unlikely to have longer lasting impacts on quality improvement knowledge and behaviours.

### Supporting practical change

Numerous studies have tested ways to improve the quality of care by supporting junior doctors to change their attitudes and behaviours.\(^55\) Examples of these are provided here to give a flavour of the wide variety of initiatives.

The summary is not exhaustive. The aim is to illustrate how junior doctors have been engaged as the ‘subjects’ of quality improvement initiatives, because such engagement may also lead to a greater understanding of the potential for improvement and the benefits possible.

A number of studies have illustrated how tools and protocols can support junior doctors to improve their care.\(^56\)

For instance, researchers in Australia examined whether using a sticker and teaching manikin could improve how junior doctors perform lumbar punctures in children. Before the new protocol was implemented, there was almost no documentation of parental consent, patient complications and analgesia. After the proforma was introduced the quality of care improved significantly.

The authors concluded that using a proforma and formal teaching sessions improved how junior doctors delivered care.\(^57\)

Decision support tools have also been used to improve the quality of care provided by junior doctors.

For example, one US hospital implemented a clinical decision support system with an electronic checklist to improve the quality of cardiac care by residents and others. Compliance with evidence-based practice when discharging people with acute heart attacks and heart failure improved as did compliance with prescription of appropriate medications.

### Giving feedback

There is mixed evidence about providing junior doctors with feedback about their performance in order to improve the quality of care. This may be useful as one component of a broader strategy but used alone, it is unlikely to engage junior doctors as champions for quality improvement.
The authors suggested that it was important for quality improvement decision support tools to incorporate educational missions in their design so that tools routinely educate junior doctors and others.\textsuperscript{58}

Giving junior doctors an opportunity to apply quality improvement skills in clinical practice is important. One US organisation restructured the inpatient medical service to create clinical microsystems in which residents practice. Residents also took part in a quality improvement curriculum. Over an 18-month period, such changes increased the number of residents participating in quality improvement projects, improved house officer engagement in quality improvement work, enhanced the safety culture perceived by residents, improved work flow and improved the overall educational experience for residents. The changes required few resources and the authors suggested they could be rolled out to other settings.\textsuperscript{59}

Other researchers in the USA assessed the impact of a quality improvement project to enhance preventive healthcare for women and cervical cancer screening provided by residents. A multidisciplinary weekly clinic focused on preventive services for women with long-term conditions. Alternating didactic and clinic sessions were used to teach internal medicine residents about ways to improve practice.

In this case, before and after data, with 63 residents, showed an improvement in general knowledge, residents’ comfort level discussing women’s health topics and performing gynaecological exams and cervical cancer screening rates. The authors concluded that a focused programme with practical experience can meet educational gaps and improve patient care.\textsuperscript{60}

Financial incentives have also been tested as a way of involving junior doctors in improving the quality and safety of care. One organisation in the USA measured participation in adverse event reporting by 680 residents before and after implementing a financial incentive (retirement benefit) and multifaceted educational campaign. The average number of adverse events reported by residents increased from 2% to 9% of the institution’s overall event reports equating to a six-fold increase.\textsuperscript{61}

\textbf{Impact}

There are many examples of initiatives designed to help junior doctors improve the quality of care they provide. While these are often successful, the effect on junior doctors’ attitudes and long-term behaviours regarding quality improvement is unclear.
3 Helpful and hindering factors

Supervision, support, working conditions, organisational culture and resources all influence the degree to which junior doctors are engaged in quality improvement.

3.1 Factors

Junior doctors have been involved in quality improvement through education, ad hoc projects, formal improvement projects and initiatives designed to enhance reflection and best practice. Research suggests that there are a number of factors that help and hinder the degree to which junior doctors engage in quality improvement activities. This section briefly explores these factors.

It is important to note that research specifically about helpful and hindering factors is sparse. There are likely to be a range of other factors that influence junior doctors’ involvement that have yet to be researched empirically.

3.2 Transitions

It is important for junior doctors to feel safe, supported and confident as they make the transition from being a medical student to a full member of the healthcare team. A number of studies have suggested that whether junior doctors feel fully prepared for practice can impact on the degree to which they engage in or are open to quality improvement.

Researchers in England examined junior doctors’ views about the degree to which their medical school prepared them for their work in clinical practice. Doctors from all UK medical schools were surveyed one or three years after graduation.

Around half of junior doctors thought that their medical school had prepared them well. But around one-third of junior doctors said that feeling unprepared had been a problem and had inhibited their practice.

Other research in the UK explored junior doctors’ experiences during their first year of clinical practice. Despite recent curriculum reforms, most junior doctors still found the transition from student to practice stressful. Hindering factors included:

- learning to deal with new responsibilities
- managing uncertainty
- working in multi-professional teams
- experiencing the sudden death of patients
- feeling unsupported.

Gaining more clinical experience during undergraduate training helped reduce the stress during the transition period.
In England, junior doctor applicants seek to take part in postgraduate training and placements using the Modernising Medical Careers (MMC) system. A survey of 1,002 trainees found that 70% reported four or more depressive symptoms including:

- increased suicidal thinking (23%)
- increased stress (93%)
- increased worry (85%)
- increased consumption of alcohol (37%).

The survey found 94% of respondents attributed increased stress to the Modernising Medical Careers system. This is important because it may be difficult for junior doctors to engage and become champions for quality improvement when they feel stressed about the transition, workload and work environment.

The trend is similar in other countries. In Australia, researchers explored junior doctors’ perspectives about the transition from student to doctor roles and their preparation as medical students. Junior doctors who spent undergraduate years training at smaller, non-traditional medical schools felt more confident and better prepared during their internship.

Factors that helped to build confidence included more hands on experience as students, more patient contact and a better grounding in basic sciences. There was a perceived lack of career guidance to help with the transition from being a student to the junior doctor role.

A number of studies have examined the degree to which junior doctors provide safe and effective care. Most conclude that junior doctors are valuable members of the healthcare team.

It is important that junior doctors receive ongoing training and support during their transition period because studies have found that their skills do not necessarily automatically improve with time. Most of the available research in this area focuses on clinical skills, but this may also apply to quality improvement skills.

Research suggests that there are a number of factors that help and hinder the degree to which junior doctors engage in quality improvement activities. It is important to note that research specifically about helpful and hindering factors is sparse. There are likely to be a range of other factors that influence junior doctors’ involvement that have yet to be researched empirically.

3.3 Organisational culture

The ingrained attitudes and ‘ways of doing things’ in organisations are likely to influence the degree to which junior doctors feel comfortable and confident engaging in quality improvement initiatives and communicating with others.

We found little empirical evidence suggesting that there is a hidden curriculum or status quo culture which inhibits participation by junior doctors in quality improvement. Hidden or informal curricula are acknowledged by some writers, but explicit links to participation in quality improvement are not drawn empirically. Research does suggest that organisational and system factors have an impact on how junior doctors learn and practice.

Researchers in Scotland undertook focus groups exploring the views of junior and senior doctors, and night nurse practitioners regarding training junior doctors about patient handover.

The study found that new doctors feel unprepared for handover and are seen as poor at handing over. Specific skills are required for effective handover, but professional attitudes are also important. Poor systems are a barrier to effective learning and practice.
The authors concluded that handover is not solely a skills-based task. There are complex interactions between individual and systems factors. This is likely to apply to many other facets of junior doctors’ practice.

US research shows that effectively involving junior doctors in quality improvement can be restricted by their lack of buy-in, insufficient institutional support and issues concerning discontinuity of care.

Junior doctors themselves may be more likely to focus on some aspects of quality improvement than others. Researchers in the USA examined residents’ views about quality improvement opportunities using the Mayo Evaluation of Reflection on Improvement Tool (MERIT).

Forty-eight internal medicine residents completed twice-yearly reflections over a three-year period, with a focus on the prevention of adverse events. Residents’ reflections about adverse events and opportunities for quality improvement remained constant over time and were associated with the preventability of events.

There was a focus on systems aspects of quality improvement. This was linked to an organisational focus on tangible systems improvements and suggests that the focus of junior doctors is likely to be influenced by the organisational context in which they work.

Researchers in the USA examined the facilitators and barriers of teaching quality improvement to residents. After taking part in formal teaching, residents reported increased knowledge and confidence, particularly regarding the value of quality improvement.

Taking part in practical aspects of quality improvement such as chart audit and decision-making led to greater awareness of the patient and systems perspectives. Barriers included a lack of resident buy-in, discontinuity of care and a lack of institutional support.

Whether the residents’ organisation was perceived to support them in their quality improvement endeavours impacted on how much residents valued improvement approaches.

3.4 Team support

Research suggests that it is important for junior doctors to be well supported when taking part in initiatives to improve the quality of care. The people that junior doctors work with can significantly influence their practice style and the degree to which they engage in quality improvement.

For instance, one US study described the importance of residents working with other team members to implement quality improvement initiatives. Residents worked together to develop a practice guideline then worked with nurses and allied health professionals to implement the guideline and review its effectiveness. This approach helped residents improve their quality improvement skills, interpersonal and communication skills and system-based practices. Evaluation over a two-year period found increased confidence in quality improvement skills.

Interviews with junior doctors in Scotland examined the factors that help and hinder development. Trainees were dissatisfied with formal and informal teaching and learning opportunities.

Factors that enhanced the learning environment included feeling supported, feeling like a valued member of the team, being stretched but not over-stretched, having a broad range of experiences, knowing the system, having a clear remit and being well organised.
Factors inhibiting the learning environment included fractured working patterns, insufficient time with patients and senior staff, and not feeling well valued or supported.\textsuperscript{79}

A case study in the USA described how a family practice residency programme implemented improvement projects in community oriented primary care.

The authors found that a physician champion working jointly with a non-physician staff member increased the success of projects. Resident involvement was enhanced when residents were given concrete tasks and asked to forge community connections.

The study suggests that clinics should select a topic or problem that creates a passion within their clinic and among residents. Projects can start small and expand outward into larger portions of the community.

Partnerships with other organisations were essential, as was ongoing evaluation using clinic based data.\textsuperscript{80}

3.5 Supervision

Supervision and mentoring can also help or hinder the degree to which junior doctors are motivated to take part in quality improvement initiatives.\textsuperscript{81} There is some evidence to suggest that supervision could be improved, both generally and specifically related to quality improvement.\textsuperscript{82}

Researchers in Australia examined supervision of junior doctors at a rural hospital. Junior doctors completed diary sheets about the nature, focus and quality of supervision over a two-week period.

The study found that supervision occurs mainly as part of ongoing patient care rather than as a targeted practice.

Junior doctors said they valued supervisory support of two kinds: assistance from more senior clinicians who are experts in areas where trainees need help; and trust to act independently, without feeling abandoned.

The authors concluded that supervision must be both structured and dynamic. This reassures junior doctors they are in a place of ‘safe learning’ with adequate and flexible support.\textsuperscript{83}

3.6 Work environment

The physical work environment and the work demands placed on junior doctors may influence the degree to which they are involved in quality improvement.

In the UK, Europe and North America there has been a reduction in the maximum number of hours per week that junior doctors can work.

Most studies suggest that this has not impacted negatively on patient outcomes, but some believe that this leaves less time for training and development in areas such as quality improvement.\textsuperscript{84-86}

Debts and financial demands may also influence decisions about where and how to practice.\textsuperscript{87}

Barriers to quality improvement

Research suggests that factors that may most help or hinder junior doctors’ involvement in quality improvement include:

- transitions to new roles
- organisational culture
- team and leadership support
- supervision
- working environment and hours
- opportunities for ongoing learning.
4 Summary

This research scan has explored readily accessible published research about how junior doctors have been involved in quality improvement and the factors that help or hinder engagement.

4.1 Key points

The three most commonly researched initiatives to involve junior doctors in quality improvement are:

- specific teaching about quality improvement principles
- practical projects developed by junior doctors themselves
- participation in quality improvement initiatives developed by others to improve the care provided by junior doctors, which, in turn, may build awareness of the principles and benefits of quality improvement.

Although there is some evidence that taking part in courses, participating in practical projects and being given responsibility for making changes improves junior doctors’ knowledge and skills regarding quality improvement, the long-term impacts are less clear.

It remains uncertain how to best engage junior doctors so that they are more likely to identify areas for improvement and become champions for quality improvement.

Factors that may help (or hinder if they are absent) participation in quality improvement include:

- a supportive educational environment and time to learn
- support from senior clinicians and leaders who make it clear that quality improvement is important
- an organisational culture that values improvement and supports change
- a working environment that allows space and time for improvement
- appropriate resources and use of data to examine areas for development.

While it is possible to make general statements about approaches to involvement and factors that support further engagement, the quantity of empirical evidence is sparse. Most evidence is of medium to low methodological quality.

Evidence summary

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4.2 Challenging assumptions

A number of innovations are underway in the UK to test the value of involving junior doctors in quality improvement. These include Beyond Audit – Junior Doctors Leading for Quality developed by the London Deanery, North Bristol’s NICE Junior Doctor Electronic Toolbox, Doctors Enhancing Patient Safety (DAPS), the East Midlands Junior Doctor and Patient Safety Engagement initiative and many others. Full evaluation evidence from these initiatives is not yet available.88,89

There is a lack of research to support some of the assumptions underpinning the focus on junior doctors as potential champions of change.

It could be suggested that newly qualified doctors are able to recognise gaps in service provision, but there is a constraining status quo culture, and junior doctors soon adapt to fit within the status quo. Thus the initial period after graduation may be a key time to support junior doctors to become champions of change, before they become fully embedded into the status quo.90-92 While there is some descriptive support for such assumptions, there is little empirical evidence about this.93,94

A number of descriptive articles mention a ‘hidden curricula’ or status quo culture which places constraints and frustrations on junior doctors working within the healthcare system, but there is little empirical research examining this in detail.95 Nor is there a body of tangible evidence suggesting that newly qualified doctors navigating the healthcare system are able to recognise its deficiencies.96

However, there is evidence that junior doctors can be trained and supported to increase their skills in quality improvement, and that this can result in real changes in the quality of processes and the care provided to patients.97 This suggests that there is merit in exploring approaches to engage junior doctors in quality improvement and, perhaps more importantly, the factors that will ensure that such engagement has long-lasting impacts on junior doctors’ focus on quality improvement throughout their careers.

Giving junior doctors an opportunity to make practical changes and to see the benefits of their actions may make a difference to not only their ongoing professional development, but also the degree to which they prioritise quality improvement in future.
References


Involving junior doctors in quality improvement


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The Health Foundation is an independent charity working to continuously improve the quality of healthcare in the UK.

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