Best practice in clinical quality assurance

April 2009
Key themes

The West Midlands Quality Review Service has been established by NHS organisations to support the continuing improvement of health services. A review of published evidence was completed over a three week period to help the service understand the variety of approaches to quality assurance in healthcare and the characteristics of the most effective strategies.

The reviewers screened more than 4000 studies, identifying 121 of greatest relevance and quality. The most commonly reported types of quality assurance systems include:

- Peer review
- Audit and feedback
- Checklists and logs
- Computerised monitoring systems
- Communication and education strategies
- Guidelines, protocols and registries

Although evidence is mixed and sometimes inconsistent, overall the evidence suggests that the most effective quality assurance systems include peer review, computerised monitoring systems and communication and education strategies. There is less good quality evidence available about checklists, logs and registries. Research suggests that it is unlikely that guidelines or audit and feedback, used alone, will have a significant effect on the quality of healthcare.

Regardless of the exact quality assurance methods used, the most effective systems shared some common characteristics, including:

- A structured approach
- Regularity of review
- Proactive feedback and education
- Stakeholder buy-in and involvement
- Well trained reviewers
- Adequate resourcing
- A collaborative approach
- Adequate IT and infrastructure
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About the authors

The Evidence Centre is an independent organisation specialising in turning information into intelligence. It supports health, social care and other public services to make decisions and put research into practice by undertaking rapid reviews, supporting stakeholder and service user consultation and engagement, conducting research and service evaluations and working with teams to apply best practice.

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Background
Background

“Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilful execution; it represents the wise choice of many alternatives.” (William A Foster)

The aim of improving and assuring the quality of healthcare is not new. The founding charter of the Royal College of Physicians (1517) refers to the need for members to set and maintain standards of practice ‘for their own honour and the public benefit.’ But over the past 20 years improving the quality and safety of healthcare has taken on new importance in the UK. With the focus on patient-centred care, whole systems approaches and providing value for money, there is an increasing need to ensure that clinical professionals, allied teams and managers have the knowledge and skills to monitor and develop quality. Tools such as clinical guidelines, evidence-based medicine and continuous quality improvement cycles have all gained popularity in the UK over the past decade, but there remains a need to ensure that quality is built and maintained and to support clinicians and managers to learn about and apply methods to improve quality in healthcare.

The West Midlands Quality Review Service has been established by NHS organisations as part of a drive to improve the quality of health services. The service is using a collaborative approach, building on the tradition of successful peer review in the West Midlands. The service will undertake a programme of ongoing and ‘one-off’ clinical quality assurance to support organisations’ own clinical governance arrangements. This will include providing quality standards, training and development for reviewers, peer review visits and other assurance methods, comparative performance information and sharing good practice. Programmes for renal services, critical care and care of critically ill children are underway and a programme of other annual reviews is being developed.

In order to inform decisions about the principles guiding the service and to learn from experience in the UK and internationally, the West Midlands Quality Review Service commissioned an evidence review about different approaches to quality assurance in healthcare. The aim of the review is to identify approaches to quality assurance that have been found to be most effective in the UK and internationally and any underpinning principles or characteristics of these approaches.
Methods

Quality assurance is any systematic process of checking to see whether a product or service is meeting specific requirements. Quality assurance was initially introduced in World War II when munitions were inspected and tested for defects. Today, quality assurance systems are applied in many different fields including education, manufacturing, aviation and healthcare.

To collate evidence about clinical quality assurance systems, The Evidence Centre team searched the Medline electronic database and supplemented this with targeted searches of the Science Citation Index, PsychLit, the Cochrane Library, relevant journals and websites. The review was completed over a three week period so the focus was on easily accessible material published between 1980 and 2009. Articles from any country and in any language were eligible for inclusion.

Any study that examined processes for checking healthcare systems or services was eligible for inclusion if it incorporated information about the assurance process and outcomes. The US National Quality Measures Clearinghouse defines quality measures in terms of access (attaining timely and appropriate health care), health outcomes, patient experience, processes (including adherence to guidelines and good practice), and structure (capacity or organisational issues). The review searched for assurance systems targeting any of these aspects. Most of the studies we identified concentrated on process issues.

Although the West Midlands Quality Review Service is focusing on peer review, we also included studies about other quality assurance methods to ensure that the team can incorporate a wide range of methods as part of the peer review process and to draw out the characteristics of the most successful approaches. Articles about quality assurance outside healthcare were not collated.

To ensure consistency, one reviewer scanned the abstracts of articles for relevance and selected those that outlined quality assurance approaches in enough detail to describe processes and outcomes or effectiveness. A second reviewer scanned additional databases and journals and analysed all abstracts. In total more than 4000 studies were screened. The full text of selected articles was reviewed in more depth.

In total 121 studies are summarised in the review. These studies were drawn predominantly from the UK, US, Canada, Australia, France, Germany, the Netherlands, Belgium, Portugal, Spain, Italy, Korea, Sweden, Norway and Denmark.

Clinical areas covered included critical care, children’s services, dementia, asthma, heart disease, stroke, diabetes, diagnostics, renal, mammography, mental health, radiotherapy, primary care, pharmacy, accident and emergency services, and ambulance services, amongst others.

The main study types included were systematic reviews, randomised trials, large observational cross sectional studies and before and after comparisons.
Evidence of good practice
Peer review and committees

We identified a wide range of studies about peer review and oversight committees as a form of quality assurance. The teams and committees varied significantly in their focus, make up and approach.\textsuperscript{3,4} Overall, the evidence suggests that peer review teams can have a positive effect on quality, especially when using collaborative partnership approaches and where the reviewers are part of the clinical team.

Peer review methods have been found to be effective in many different clinical areas and in countries throughout the world.\textsuperscript{5} For example, in the US a peer review team was set up to oversee trauma treatment and admissions. The team introduced more effective hospital coding and documentation and helped to ensure that patients were treated appropriately. This team review approach increased system efficiency and resulted in significant decreases in hospital costs per patient and shorter hospital lengths of stay despite increased patient volume.\textsuperscript{6}

A randomised trial in the Netherlands with 255 midwives found that forming small peer review groups increased learning and overall quality of care.\textsuperscript{7}

Similarly, a community mental health centre in the US improved the quality of documentation by engaging clinical staff in a review process. Treatment team clinicians used a 30-item checklist to measure the quality of documentation by peers. Each treatment team at the mental health centre’s six clinics had a quality improvement work group composed of the team psychiatrist and at least one other team clinician. Each month the group met to review two randomly selected medical records from another treatment team and arrive at a consensus score. An administrative oversight team met regularly with clinician-reviewers to encourage uniform scoring. A time series analysis over a 21-month long period found that peer review improved the quality of the documentation in patients’ records.\textsuperscript{8}

A randomised trial with 185 GPs in the Netherlands found that feedback and support from trained non-physicians can improve GPs’ clinical decision-making in cardiovascular care.\textsuperscript{9} However, another randomised trial of 90 GPs in the Netherlands found that behaviour change was more likely following mutual practice visits and feedback from peers rather than visits and feedback from a non-physician observer.\textsuperscript{10}

In Canada a comprehensive quality assurance and peer review programme has been developed to assess the competencies of pharmacists. Key programme components include a detailed registration process, a learning portfolio to demonstrate lifelong learning, and a practice review.\textsuperscript{11}
Peer review can take place on a regional or national level as well as on a more localised basis. It can involve reviews by individual clinical peers or practices right through to quality assurance from national committees or colleges. In Belgium the health services have built a number of ‘care programs’ monitored by Colleges formed by delegates of professional organisations. This is a more formal type of peer review, whereby Colleges seek to improve quality by developing guidelines, assessing the extent to which they are implemented and formally reviewing the range and quality of care provided. Surveys suggest that this approach can work well because responsibility for evaluating care remains in the hands of clinical professionals. Studies suggest that cooperation between governmental and physicians’ organisations ensures buy-in from practitioners.

Importantly for the West Midlands, research suggests that peer review approaches work best when combined with other quality assurance strategies.

Much of the research about peer review quality assurance systems involves ‘before and after’ designs but a small number of rigorous randomised trials are also available. For instance a six month randomised controlled trial examined different quality assurance methods in 24 US primary care practices. One group of practices received performance feedback, peer-to-peer education, a practice peer facilitator and computer support. The other group of practices received standard benchmarking and auditing. The trial found that those receiving peer review and other support were more likely to implement good practice. The authors concluded that multi-component quality assurance strategies are more effective than feedback alone.

One of the key issues with using peer assessments to judge the quality of care is poor inter-rater reliability – or differences between peer reviewers. A meta-analysis of 13 studies examining the inter-rater reliability within peer assessments of quality of care found that reliability was poor and that there was significant variation in the reviews and feedback provided by different people.

One US study found that peer assessments can play an important role in characterising the quality of care for complex patients with multiple interrelated chronic conditions, but reliability can be poor. Strategies to improve reliability include:

- emphasising outcomes measurement
- providing more structured assessment criteria and forms to help identify true differences
- accounting for biases from individual reviewers and their professional background
- averaging scores across multiple reviewers

Other key success factors include setting clear criteria and standards in advance and ensuring a collaborative approach within peer reviews.

Although not a great deal has been published about peer review methods for quality assurance, the evidence that does exist tends to be positive. To further knowledge in this area the West Midlands Quality Review Service may wish to evaluate their work well and to publish or report on the processes used to help others develop similar services. The team may also wish to consider how to deal with issues about variation between peer reviewers and the quantity and scope of training required.
Communication and education

Another well researched strategy for quality assurance is communication and education. Research suggests that structured learning and a focus on communication, human factors and systematised ways of interacting can improve quality in healthcare.

It is outside the scope of this review to examine all the different methods for team building, communication and education. However it is worthwhile signalling that these strategies have been used specifically as quality assurance systems. For instance, in the US there has been a particular focus on ways to improve patient transfers from one caregiver to another. One hospital made measurable improvements in a patient handoff process by using an approach called ‘appreciative inquiry.’ Rather than identifying the root causes of ineffective handoffs, appreciative inquiry was used to engage staff in identifying and building on their most effective handoff experiences. Communication of success factors was found to be an effective quality assurance method.

Another US study found that quality in primary care improved following the use of structured protocols for care delivery and regular feedback and communication about quality indicators. Team work and communication of quality standards was found to be particularly important in the primary care setting.

A number of studies have emphasised the importance of informal communication and team meetings as a quality assurance mechanism. More formal education sessions have also been trialled. For instance, in Canada, a study examined methods to ensure that x-rays are performed consistently and adhere to established technological quality standards. The study found that an audit approach coupled with structured, collaborative educational sessions for staff was a successful and sustainable method to effect overall improvement.

Some have advocated joint training between different groups of workers, including nurses, doctors, and those in professions allied to medicine as a way to build quality and improve quality assurance. A UK review suggested that there is little high quality evidence to support training different types of workers side by side. The reviewers concluded that while many studies have evaluated inter-professional education, these studies generally lack the methodological quality needed to assess the impact of such initiatives on professional practice and clinical outcomes.
We identified more than 2000 published articles about education and training specific to quality improvement in healthcare, though this was outside the main focus of the review. Approximately half of the articles focused on training provided by higher educational institutions or supported by regulatory or supervisory clinical bodies such as Royal Colleges, and half focused on training provided by other organisations including the commercial sector, in-house training and other continuing professional development opportunities. The most common techniques included classroom or small group based training methods, conducting practical activities and work based learning. Most of these had some relevance to quality assurance but were not a quality assurance system in themselves.

Other ‘on the job’ training and communication approaches have been implemented throughout the world. In 1995 the US Institute for Healthcare Improvement developed the ‘Breakthrough Series’ concept, based on continuous quality improvement ‘plan, do, study, act’ cycles. The Breakthrough Series aimed to bring together groups of healthcare organisations (collaboratives) that share a commitment to making system changes within their organisations. Collaboratives work together to improve a specific clinical or operational area over a 6 to 13 month period. In the US, trials suggest that the Breakthrough model of sharing practice between professionals can improve clinical outcomes and act as a form of quality assurance.

Mentoring is another educational or communication-orientated approach trialled for quality assurance. Literature suggests that the qualities of a good mentor mirror the qualities of helpful peer reviewers. These include honesty, congruence, self-sufficiency and patience. Good mentors and peer reviewers need to have a positive regard for those being reviewed, a focus on establishing rapport, demonstrating warmth and empathy, and giving constructive feedback. Importantly, to be most effective mentors and peer reviewers should be seen as a source of support and new ideas, rather than as monitors or quality checkers.

To summarise, there is extensive evidence about different strategies for education and building communication in healthcare. A limited amount of research has explicitly explored the value of such approaches as a quality assurance system. The existing evidence suggests that educational and communication-focused strategies have a key role to play in enhancing quality in healthcare.
Audit and monitoring

Audit and feedback involves assessing how well healthcare professionals are meeting accepted guidelines or standard practice, often by reviewing patients’ charts or other documentation. There is evidence that audit may be beneficial, but only if combined with a broader strategy of education and quality improvement.

A Cochrane review of 85 studies with over 350 health professionals compared audit and feedback versus no intervention. Effects varied between a 9% absolute increase in non-compliance with guidelines to a 71% increase in compliance. The reviewers concluded that audit and feedback can improve professional practice, but the effects tend to be moderate. The effects are likely to be greater among professionals who do not adhere well to recommended practice.

Another systematic review of audit strategies included 93 studies, most of low quality. Audit was associated with improved patient care, satisfaction, and patient feedback. Benefits to clinicians included improved communication between professional groups and increased professional satisfaction and knowledge. Perceived disadvantages of audit among health professionals were diminished clinical ownership, fear of litigation, suspicion of reviewers, and professional isolation. Perceived barriers to implementing audit were lack of resources, lack of expertise or advice in design and analysis, and organisational impediments. The reviewers concluded that key factors to promote successful audit include a supportive organisational environment, sound leadership of audit programmes, strategy and planning, resources and support, monitoring and reporting of audit activity, and being involving and relevant to participants.

Audit and monitoring is relatively common in UK emergency departments and other critical care areas. Clinical incident reporting has been used as a tool for detecting safety issues and identifying solutions, learning from error and enhancing patient safety. A Trust in London found that auditing historical A&E information helped to encourage internal review and the staff feedback system. The team found that there were some problems in the accuracy and consistency of the hospital codes used and that the month long time lag in getting data had an impact on quality assurance. It was recommended that an electronic reporting system should be introduced, the number of staff who categorise incidents should be limited, and clear definitions for classifications should be used.

Other examples of effective audit methodologies have been implemented in radiology. In one US organisation there are 80 radiologic technologists and 30 radiologists who rotate through film reading. The large number of people involved means there is scope for error therefore two full-time quality assurance technologists have been employed. On a monthly or bimonthly basis, a quality assurance technologist randomly selects 50 exams performed by each technologist. Copies of the review sheet go to each technologist’s supervisor who forwards a copy to the technologist. Technologists can request help to understand why certain films meet or fail to meet quality standards. The quality assurance technologists are available to give one-on-one help, and they also offer classes and demonstrations. This is an example of auditing combined with peer review and education.
In Germany a hospital used a quarterly rotating surveillance programme for infections in four intensive care units. The levels of infection in each unit were made clear to the clinical staff by interpretive feedback of the surveillance data. The audit surveillance process lead to increased communication and changes to behaviour which ultimately improved infection control.38

Similar successes have been reported using audit with structured feedback in the fields of surgery, pathology, muscular conditions and allergies.39,40,41,42 Audits have also been undertaken based on patient registries from general practice, on a regional basis and on a national basis.43 Audit methods include chart review, incident reporting, cumulative summation, proficiency testing, focused review and random sampling, amongst others.44,45

One assessment found that higher data quality may be achieved from a series of small audits rather than a single large database audit.46

Regardless of the audit method used, structured and positive feedback appears to be a critical success factor. One meta-analysis of 19 studies found that audit is most effective when feedback is delivered with specific suggestions for improvement, in writing, and frequently.47

There is varying evidence about the best way to provide audit feedback to practitioners. A randomised trial with 185 GPs in the Netherlands found that feedback reports for GPs improved some decision-making in diabetes care.48 However, a randomised trial in the US found that feedback using report cards may not improve the quality of care provided by hospital staff.49

Although there are examples of beneficial audit processes, the wider impact of these methods remains questionable.50 A systematic review of quality assurance methods in 18 countries found that audit and feedback strategies may have the potential to change the practice of healthcare professionals at a local level, but there is little evidence of system-related impact and little evidence of clinical benefit in the sense of better patient outcomes. The review highlighted that there is very little information about the cost of various quality assurance methods and little is known about cost effectiveness or value for money.51

The totality of evidence suggests that audit and feedback may have a place within quality assurance systems, but should not be the sole methods used.
Checklists and logs

There is emerging literature about the benefits of checklists, prompts and log sheets as tools for quality assurance in healthcare. Such methods have long been used in fields such as aviation and research is now beginning to suggest that simple checklists could be an important component of the healthcare toolkit.

Intensive care units have often been the target of quality assurance techniques because they have been identified as a significant source of potential safety issues. A review found that successful quality assurance methods in intensive care include using communication tools such as daily goal sheets and team building.

A US study with eight primary care practices found that successful quality assurance systems typically involved some combination of chart screening, risk assessment forms, post-it prompts, flow-sheets, reminder/recall systems, and patient education materials. Office systems also often involved redistributing responsibilities among office staff. These changes resulted in improved primary prevention strategies and increased quality of care.

Another example is checklists or log sheets for equipment maintenance. Studies suggest that assuring the performance of these maintenance tasks can be laborious if records are merged with other analysis records. Routine maintenance check-off logs have been found to work well in laboratories and hospital settings.

While not all of the evidence is positive, the trend is for checklists and logs to be seen as a useful component of quality assurance systems, but not a tool that should be used alone.

Computer checking systems

“...computerised hospital information systems, and of inexpensive computing power, has led to an unprecedented opportunity to use electronic data for quality improvement projects and for research.”

Computerised monitoring systems are increasingly popular on both a local and much broader scale. For example, in Scotland, a national information management and technology solution automatically collects data daily about diabetes from routinely used systems both in primary and secondary care. This data is used to estimate the prevalence of reported diabetes in Scotland and develop potential services and systems to address this.

A variety of systems have been developed specifically as quality assurance tools. For instance, in Denmark an online record-keeping system has been developed for the ambulance service. The system was installed and tested in ambulances for 21 months. Data was entered using a computer with touch-enabled screen. Communication between the ambulance and the hospital was established through a special secured network. The system allowed the team to track what skills and resources were needed during each call out. This information was then used to help the ambulance crew maintain their skills.
The London Ambulance Service uses a computerised support system to help identify people having a heart attack and ensure the appropriate care is despatched. The computer system and protocol resulted in a 200% increase in the number of patients accurately identified as suffering from cardiac arrest. Other ambulance services throughout the world have implemented similar quality assurance protocols and tools.

One hospital in the US found that maintaining high standards in a large CT imaging department with multiple scanners, a large technical and clerical staff, and a rotating staff of radiologists is an ongoing challenge. The team developed a simple, rapidly performed computer-assisted system of quality assurance for use in abdominal CT scanning. 1810 abdominal CT scans done in a 50-week period were ranked using a three-point scale to indicate the technical quality. A commercially available spreadsheet and database software program was tailored to allow rapid data entry and analysis. Tables and graphs showing performance of technologists and film library and clerical staff were generated. This customised program was made available on the radiology department computer network. The hospital found that using this system lead to improved technical quality.

In Sweden electronic medical records have been implemented as a quality assurance tool. In one large Swedish hospital an electronic medical record was implemented within one year and at half the cost compared to US equivalents. Key success factors included using an intuitive system, requiring little training, allowing flexibility for development, involving clinicians in selection and in modification for their department needs, using a realistic timetable and having good leadership and technical support.

Similarly, in Portugal, data from hospital information systems and electronic medical records has been used effectively to trigger alerts about malfunctions and inconsistencies in order to improve data quality and ensure better healthcare.

In the US a tool provides quick computerised feedback to nurses when documentation of trauma cases needs further attention. The feedback is provided in written form and uses peer mentoring to improve accountability in documentation. This quality assurance programme has reduced documentation omissions and mistakes by 21%.

There are numerous other studies from Europe, North America and Australasia about the potential for using electronic medical records or other hospital information systems to monitor quality and act as a proactive quality assurance system.
Others have suggested the benefits of laboratory computer systems, electronic wristband monitoring, electronic medicine monitoring, continuously monitoring over 1-2 years, electronic prompts in primary care, clinical decision support systems, and many other technological applications in quality assurance.\textsuperscript{72,73,74,75,76,77,78} Electronic reminders and prompts have been found to work particularly well to improve quality and consistency,\textsuperscript{79,80,81,82,83,84,85} though not all studies have favourable findings.\textsuperscript{86}

Although computerised quality assurance systems can be effective, especially for improving clinical processes, studies suggest that these can be time consuming and problematic to install. The main barriers include the need for more precise and accurate documentation, the need for a clear definition of quality and parameters to assess it, and fears from teams about being ‘checked on.’\textsuperscript{87}

One review found that two main types of databases are used to assess quality of care: administrative databases used primarily for purposes other than medical care and electronic medical record databases collected specifically for clinical purposes. The review found several problems with using computerised medical databases to measure and improve quality of care particularly because many factors are not captured in routine administrative databases. There may also be ethical issues with the use of databases for quality assurance.\textsuperscript{88} A UK Health Technology Assessment concluded:

“The growing potential for automated linkage of data from different sources (including primary care, the private sector and death registers) needs to be explored as a means of improving the ascertainment of surgical complications, including death. This linkage needs to be within the terms of data protection, privacy and human rights legislation.”\textsuperscript{89}

This emphasises that using computerised systems is not without challenges, however the majority of evidence suggests the computerised monitoring tools can be a useful addition to quality assurance systems.
Guidelines and pathways

Guidelines and evidence-based care pathways are tools to help provide more integrated and continuous care. Care pathways and protocol aim to provide guidelines about how patients should progress through healthcare systems, and what services and medications they should be accessing at various times. Such guidelines and protocols are often a core part of quality assurance methods, yet when used alone they have questionable value.

We explore evidence about care pathways first, followed by guidelines as a method for quality assurance.

Perhaps surprisingly, apart from in critical or trauma care, there is little consistent evidence about the impact of care pathways on quality of care. A randomised trial of integrated care pathways following stroke included 152 people in the UK. The care pathway was a goal-orientated time-managed plan that aimed to facilitate interdisciplinary coordination, improve discharge planning, and reduce length of hospital stay. However, the care pathway had no benefits over usual multidisciplinary care in a stroke rehabilitation unit.90,91

There is also inconsistent evidence about the effects of care pathways on clinical outcomes. A Cochrane review of ten studies assessed the effects of care pathways compared to standard medical care among 2013 participants. There was no difference between care pathway and control groups in death, dependency, or discharge destination. There was some evidence that patient satisfaction and quality of life may be lower in the care pathway group.92

A trial with 312 people with diabetes assessed a quality assurance programme consisting of care pathways, postgraduate education, audit and feedback, templates to register diabetes care, and a recall system. The intervention group received care more in accordance with guidelines, but there were no effects on clinical outcomes.93

On the other hand, in New York, the Palliative Care for Advanced Disease pathway was developed by an interdisciplinary team. It includes a care pathway, a daily flow-sheet, and a physician order sheet with standard orders for symptom control. An evaluation at three hospital units found that using these tools helped to educate teams about end of life care and improve the quality of care.94 The key success factors may be that this programme used a combination of approaches and had good clinical buy-in. the focus was not on using a care pathway alone.

There is limited information about the cost effectiveness of care pathways, although there are some positive trends. A randomised trial assessed care pathways for 110 children hospitalised with asthma in the US. The care pathway group had shorter hospital stay and less medication use. There were no differences in health service use following discharge.95

Another cost-effectiveness analysis of a critical pathway approach to treating diabetics was conducted in the US, using a multidisciplinary team and written protocols to progress patients between departments. The authors concluded that, over an 18-month period, the critical pathway decreased length of hospital stay, rates of amputation above the ankle, and costs compared to usual care.96
There is also conflicting evidence about the value of guidelines as a quality assurance method. A Cochrane review in nursing included 18 studies with 467 healthcare professionals. Three out of five studies found that clinical guidelines improved processes of care. Six out of eight studies found that guidelines improved clinical outcomes. Six studies suggested that there was no difference between care given by nurses using guidelines and physician care. This suggests that guidelines can have some favourable results. This finding is supported by various other studies in other healthcare fields.

A systematic review by the NHS Centre for Reviews and Dissemination examined whether practice guidelines can change the behaviour of health professionals and, if so, how best to introduce them into clinical practice. The reviewers concluded that introducing guidelines can change clinical practice and improve patient outcomes. The reviewers found that guidelines are more likely to be effective if they take into account local circumstances, are linked explicitly to evidence, are disseminated by an active educational intervention, and use patient-specific reminders.

An evidence review conducted for the American College of Cardiology and American Heart Association found strong evidence that the following interventions improve adherence to guidelines:

- multifactorial interventions that address different barriers to behavioural change
- multidisciplinary care for people at high risk
- academic detailing or educational outreach

The reviewers found some evidence that the following improve adherence to guidelines:

- chart audit and feedback of results
- reminder systems
- local opinion leaders

However, they found little evidence to support:

- disease management for people at low risk
- dissemination of guidelines alone
- basic provider education alone

Involving clinicians and other stakeholders in the development of guidelines and measurement strategies has also been found to be effective. These findings may be important for the West Midlands Quality Review Service because guidelines and protocols have been proposed as a key tool to be implemented by the service.

One study found that strategies to enhance use of guidelines included clarification of expectations from care providers, education of staff, use of visual cues to indicate the status of patients with respect to a particular guideline, development of tools that provide an overview of information critical for guideline compliance, use of standardised orders, clarification of roles of care providers and use of decision-support tools.
Various strategies have been tested to enhance the use of guidelines for quality assurance, including computerised techniques. In Norway, a randomised trial found that a computer-based clinical decision support system did not improve implementation of guidelines among GPs. Nor did computer systems change doctors' behaviour or in outcomes for people with diabetes.

Sixty general practices in north-east England participated in a randomised trial of computerised evidence-based clinical guidelines for managing asthma and angina in primary care. The computerised decision support system had no significant effect on consultation rates, process of care, prescribing, or any patient reported outcomes. Use of the software was limited.

On the other hand, a before and after study in the US assessed whether a computer system providing data related to clinical guidelines and reminders effected adherence to clinical guidelines in primary care. Over an 18 month period the authors found that the availability of practice-based data and computerised clinical guidelines was associated with significant improvements in physician adherence to guidelines.

Non computerised methods have also been tested. A before and after study in the US found that inserting an asthma guidelines flow sheet into patient notes improved physicians' adherence to guidelines. But another before and after study found that a diabetes management flow-sheet inserted into patient charts with or without quarterly provider feedback about compliance levels had limited impact on physicians' behaviours. Health professionals believed that using the flow-sheet and feedback increased their awareness of diabetes management guidelines, even if it did not alter their behaviours.

A randomised trial in the US found that training primary care practice staff in asthma care guidelines and providing tools and templates for practice-level systems change such as asthma flow sheets and standing orders improved care significantly compared to practices receiving guidelines alone.

On the other hand, another US trial found that giving a heart failure guideline to physicians and following up with written and verbal reminders about recommended actions did not change how heart failure was treated in the intensive care unit.

Another randomised trial in the US included 169 people with heart failure receiving provider education only; a group where both providers and patients were notified of care guidelines; and a group where a nurse facilitated the use of appropriate medication. People in the nurse-facilitated group were more likely to receive appropriate medication compared to other groups. There were no significant differences between groups in adverse events. The authors concluded that using provider education, clinical reminders and guidelines, and patient education was of limited value in ensuring that people received appropriate medication. However this study also demonstrates that some sort of facilitation or peer support can be beneficial. Other studies have also emphasised the value of co-ordinators, peer support or facilitators to support implementing guidelines.
Key success factors
Quality assurance is a formal system that can be used to strengthen organisations, services and teams. Such systems aim to raise standards and make sure things are done consistently. The bulk of this review has described the quality assurance methods that have been most commonly researched and published about in healthcare. While each method has unique characteristics, our review found that there are some key characteristics shared by the most successful models. Typically, organisations implementing a quality assurance system follow several stages:

- **Agree standards.** Quality standards focus on the performance that staff, service users and stakeholders can expect from the organisation. They may be formulated as guidelines, quality indicators, care pathways, checklists or other standardised formats.

- **Assessment.** The next phase of quality assurance involves comparing how an organisation, team or service is doing against these expectations or standards. Assessment can be done using computerised monitoring, peer review, self assessment, audit or other evaluation methods.

- **Action plan.** The most effective quality assurance processes build in some feedback and action plan as a direct result of assessment. The plans should include what needs to be done, who will do it, how it will be done, and when.

- **Appraise.** Once changes have been made, quality assurance systems check implementation and whether the changes have made a difference. At this stage the process of agreeing standards and assessing begins again. The cyclical nature of good quality assurance systems is one of the key success factors.

International reviews suggest that approaches which actively mesh clinical and administrative approaches at both system and local levels are more likely to be effective in improving quality of care,117

Studies investigating the key ingredients in successful approaches and analysis of themes from our review suggest that quality assurance programmes should include:118,119

**Structure**
- a clear implementation plan
- a structured way of working
- based on evidence where possible
- regularity of review

**Engagement**
- stakeholder and user involvement and buy-in
- clinical engagement and credibility
- leadership
- a ‘quality champion’
- continuous feedback
- prompt feedback

**Team**
- skilled assessment / reviewing team
- team with empathy
- adequate reviewer training and preparation

**Infrastructure**
- integration with other processes
- adequate resources
- appropriate IT resources

“Effective ... quality and safety programmes capitalise on institutional resources and have multidisciplinary input with clear leadership, input from quality improvement initiatives, a responsible yet non-punitive culture, and data-driven assessment and monitoring to reduce medical errors.”120
Empirical studies have found that factors at individual, organisational and environmental levels are all important in developing quality assurance systems. Facilitators for high quality assurance systems include learning through group interaction, positive staff attitudes and beliefs, leadership support, champions, teamwork and collaboration, professional association support, and inter-organisational collaboration and networks.

Barriers to developing high performing quality assurance systems include negative staff attitudes and beliefs, limited integration of quality assurance systems and recommendations into organisational structures and processes, time and resource constraints, and organisational and system level change.

Research suggests that in order to be successful, the West Midlands Quality Review Services should proactively address barriers related to individual practitioners, the social context, and organisational and environmental contexts. The services should be tailored to different groups of stakeholders (including commissioners, nursing and clinical staff and managerial teams).

Furthermore, commissioners and healthcare managers need to recognise the real costs and complexity associated with successfully implementing quality assurance systems and ensure corporate commitment at the onset.

Summary

To conclude, this review has examined the clinical quality assurance systems that have been found to work best in the UK and internationally and the characteristics of the most successful approaches.

The review found little comparative evidence about whether one type of quality assurance system is more effective than another. The most positive evidence is available about peer review systems, computerised monitoring systems and communication and education strategies. Even so, evidence about these techniques is sometimes inconsistent.

Where quality assurance systems work well, they are based on strong leadership and organisational, clinical and stakeholder buy-in; integration into day to day care; and a focus on improvement rather than monitoring or ‘punishment.’

There is little evidence that financial rewards are linked to successful quality assurance systems. Nor is there evidence that some clinical fields or staff groups benefit most or are more accepting of quality assurance processes.

The implication for the West Midlands Quality Review Service is that peer review may be a beneficial process but is unlikely to be effective if used alone. Peer review is much more likely to be effective when coupled with computerised systems, audit and regular feedback, clear clinical buy-in and adequate infrastructure and resourcing. The evidence is clear that one specific quality assurance method alone is unlikely to improve the quality of care in the West Midlands or be sustainable, but when developed as an integrated process there is potential for widespread gains for staff, systems and service users.
References


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