Using data to support change in clinical practice

A GUIDE TO GOOD PRACTICE

Supports Good Surgical Practice

Domain 2: Safety and quality

Royal College of Surgeons

ADVANCING SURGICAL CARE

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1. Introduction

The aim of this guidance is to provide practical information for surgeons and surgical services to improve the effectiveness of the collection and interpretation of healthcare data at individual, team or organisational level and support change in clinical practice.

Recommendations within this document do not replace other publications or processes such as appraisal, revalidation, quality improvement and change management, but build on these to ensure that the considerable time and effort invested in improving healthcare practice is used in the most effective manner.

The content has been laid out into four main aspects of assessing any healthcare practice, to ensure continuous improvement in quality and experience:

- Quantifying practice (including choosing the right data and data collection methods)
- Receiving and giving feedback
- Using data to reflect on practice
- Supporting learning and change

There is no single methodology that is effective in all situations and so a variety of methods and resources are presented.

All aspects of this guidance can be used at both individual and service level, unless explicitly stated.

Background to achieving quality in healthcare

The emphasis on improving quality and outcomes of healthcare is not new and started in the 1960s. Currently, considerable resources, including personnel, organisational and financial resources, are focused on collecting and analysing data and using these to improve practice and assure relevant bodies such as the Care Quality Commission that care is delivered to an appropriate standard. Despite these efforts change and improvement often remain slow or can be impacted by competing requirements to meet other organisational or individual targets.

Alongside the requirements for improvement in outcomes and patient experience, there has also been considerable emphasis on increasing the availability and transparency of data on individual- and service-level practice to inform choice and improve patient involvement in all aspects of care.

The ever-growing need for more data for multiple requirements can potentially deflect focus from the required end point of continuous improvement. In addition, widespread implementation of monitoring and change methodologies, which may lack reliable evidence for their effective use in different situations, can occasionally overburden health services and demotivate professionals, who find they have ever-decreasing time and resources to discuss and reflect on their practice.

The implementation of a formal revalidation process for hospital doctors has seen a renewed focus on appraisal and requirement for clinicians to obtain meaningful data about their practice. Initial review has seen positive changes, with increasing numbers of clinicians having appraisal, continuous professional development (CPD) and increased engagement with data collection. However, there is little evidence that these changes are having a significant impact on practice at an organisational or patient outcome level. In addition revalidation has focused efforts on identifying and remediating poor practice, rather than sharing and learning from good practice.

Learning from the outcome of events at Mid-Staffordshire Hospital and the subsequent Francis Report (DH, 2015) centred on four key aspects of organisational processes:

- detecting potential problems early
- preventing problems from happening
- taking prompt action when events do happen, and
- accountability and ensuring staff are trained and motivated to continuously improve.

2. Choosing the right data to measure performance

Whether at individual or service level, there are broadly three main aspects of healthcare performance that can be used to measure quality:

- Outcomes, eg the results of healthcare delivery
- Process, eg how healthcare is delivered
- Structure, eg the context or setting in which healthcare was delivered

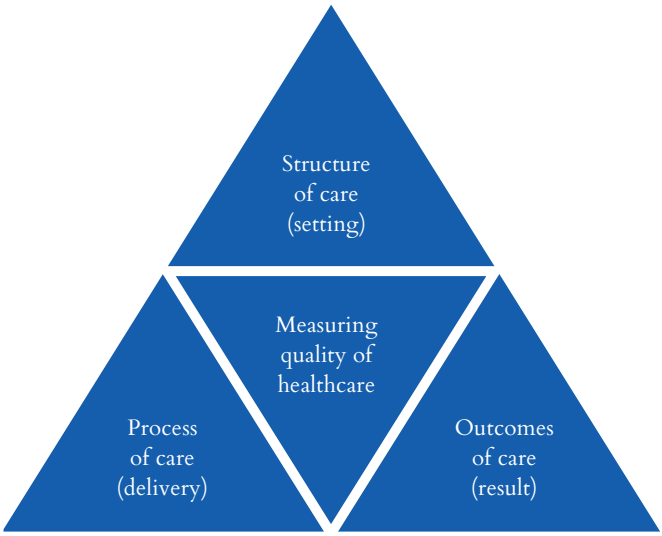

Figure 1: *Three aspects of quality of care*

In combination, these factors can provide a useful picture of performance, although each alone is likely to miss other aspects of quality. For many years, quality was measured purely on process, partly because it can be one of the easier measures to collect. In recent

years, there has been a move away from process towards outcome-based measures of care, especially patient-reported outcomes. However, focus on outcomes alone can miss key positive and negative aspects of the patient journey. To ensure meaningful measurement, some aspects of all three forms of quality measurement should be incorporated into individual and service reviews.

The following questions can help assess whether a chosen measure of performance and quality is appropriate:

- Is it outcomes-focused?
- Is it patient-focused?
- Is it clinically credible?
- Is it based on local need?
- Is it based on the performance of the whole system?

3. Data collection methods

3.1 Audit

Audit normally focuses on the structure or process of care delivery, measured against an agreed set of standards. This is a very well-established form of measurement and has some of the best evidence base for facilitating improvement. This chapter addresses issues around effectiveness of audit, rather than providing any particular focus on national- or local-level audit. The following points should be taken into account to ensure that audit has a meaningful impact on performance:

- Audit can only be effective when the complete audit cycle is carried out.
- Audit must benchmark care against agreed standards of care. If you do not have agreed standards – whether service, clinical or professional – audit cannot be carried out.
- Sampling should take into account the risk of the potential bias, particularly when auditing small numbers.
- Improvement from audit has been shown to be inversely proportional to the quality of baseline care, eg if care is already 'good' then audit is unlikely to effect change.
- The most common source of data for audit remains clinical records, which can make data collection burdensome. Consider other sources of data, eg from Electronic Health Record Systems, Hospital Episode Statistics (HES) data, Theatre Management Systems.
- The impact of feedback from audit on individual behaviour is highly variable and is likely to be most effective when linked to relatively simple behaviour change, eg change to prescribing.
- Complex behaviours – eg assessment and diagnosis of a patient – are unlikely to be changed as a result of audit feedback.

- The most effective change is achieved by a combination of audit, plus feedback, plus additional interventions, eg seminars or goal-setting.

Key tips

- Choose an area of practice with lowest baseline of performance to audit.
- Audit against benchmarked standards of care.
- Feedback the results of audit to individuals and teams.
- Focus feedback on simpler goals or behaviours.
- Try to combine feedback with an additional intervention, eg newsletter, meeting, workshop.

Useful resources

- Useful guides have been developed by Healthcare Quality Improvement Partnership (HQIP) that include criteria and indicators for best practice, introduction to statistics for audit and many more (http://www.hqip.org.uk/).
- The National Quality Improvement and Clinical Audit Network (NQICAN) brings together the regional clinical audit and effectiveness networks from across England and also has involvement by Wales and Northern Ireland (http://www.nqican.org.uk/).
- The National Clinical Audit Programme is made up of 30 clinical audits. More details on this programme and the individual audits can be found on their webpages (http://www.hqip.org.uk/national-programmes/).
- Outlier policies for what services should do when a performance outlier is identified through national audit are available at HQIP and also at the national clinical audit websites. Further information can be found on the RCS website (https://www.rcseng.ac.uk/standards-and-research/support-for-surgeons-and-services/audit/national-audit/).
- The Clinical Audit Support Centre provides healthcare staff and clinical audit professionals with resources to assist with of clinical audit (http://www.clinicalaudittools.com/).
- National Institute for Health and Care Excellence (NICE) have a wide array of audit tools to support implementation of NICE quality standards (https://www.nice.org.uk/about/what-we-do/into-practice/audit-and-service-improvement/audit-tools).

3.2 Outcomes

Outcomes measure the result of a healthcare process and can either be classed as clinical or patient outcomes.

Clinical outcomes often focus on identified adverse results – eg re-operation or postoperative infection, whereas patient outcomes measure the experience of the healthcare process or a change in the health of patient as a result of an intervention. Outcome measures will often provide an overall measure of a result of an intervention, rather than positive and negative aspects of the process.

There is a growing emphasis nationally on use of outcomes of care as the means of individual- and service-level performance. Although the move away from only measuring process is a positive change, the following points should be taken into account when choosing an outcome measure:

- Is it validated with an evidence base for use within the situation you wish to review?
- Is it specific and sensitive enough to identify true performance?
- Is it reliable enough for the measure to be used by all clinicians within an area of practice?
- Is it responsive enough to ensure that the results of any change or improvements will be identified?
- Is the data up to date?
- Is it easy to measure?

3.3 Quantifying practice volumes

The first stage of any review of performance, whether at an individual or service level, is an estimation of total activity. This allows for interpretation of performance outcomes, especially negative events. In addition, in some surgical specialties there is a positive relationship between levels of performance and activity, both at an individual and service level.

Hospital Episode Statistics (HES)

There are a number of advantages and disadvantages in using routinely collected data from Hospital Episode Statistics:

Disadvantages

- HES was originally designed as an administrative tool and has often been criticised by clinicians for insufficient accuracy when used for purposes other than administration and payment.
- There has often been a lack of clinical engagement in collection and validation of this data at a local level.
- Clinicians can find it difficult to engage with coders and IT departments to review their data.
- Currently HES represents primarily inpatient activity data. There is a paucity of detailed data from outpatient and emergency department activity.
- It is difficult to separate out healthcare 'need' from healthcare 'delivery' by just using HES data.
- There are well-known 'glitches' in the system that reduce its usability – eg current reporting of a patient's admission is linked to 'admitting' rather than 'operating' surgeon and no data is currently collected about anaesthetists.

Advantages

- All secondary and tertiary care organisations collect these data and a large number of relevant guidance documents are published at national and organisational level.
- Many other organisations use this source of data for further analysis, eg Dr Foster.
- The requirement from the revalidation process for more detailed clinician-level data has increased clinicians' engagement with local quality assurance processes of routine activity data. As a consequence, confidence in the accuracy of HES data is gradually increasing as more and more clinicians participate in local review and validation of coding and data collection.

Minimum numbers

Applying a minimum number of surgical procedures that should be carried out by an individual or service as a measure of quality is a blunt tool and not always accurate. Postgraduate surgical training does specify minimum numbers to establish competence, but setting target numbers for consultants for all surgical procedures has not taken place. This is largely in recognition that although there is a large body of evidence that suggests in some specialties low volumes can result in poorer outcomes, repetition by itself does not prove quality.

Some work was carried out in 2010 to clarify minimum numbers for cancer surgery and some surgical specialties continue to update this guidance. This setting of clear standards can be carried out in this case because of the extensive, risk-adjusted data available for surgical cancer practice obtained by national audits. It is not feasible to collect this level of data about every procedure and so it is unlikely that minimum number for practice will ever be set for all surgical procedures.

Surgical outliers

Review of outcome data often focuses on identification of those who are 'outliers' in performance against an agreed benchmark, especially negative outliers. Any identified performance outliers, whether at an individual or service level, and whether identified through national clinical audit or through routine activity data, should trigger a local investigation that closely examines the data for anomalies and looks at the environment and structure of the team/unit and case mix, particularly before considering someone individually. Other points that should be taken into account are:

- To what extent can data or cases that have been reviewed be generalised? (This is especially important when reviewing individual performance).
- When comparing data between providers, is there an understanding of the underlying organisational processes and quality of data provided?
- Has appropriate risk adjustment been carried out?
- Is the result based on incomplete or inaccurate?
- Were the data complete?

Key tips

- Routine activity data can be used as part of individual and service performance measures, but should not be relied on as the sole source of data.
- Any outliers in terms of performance identified from routine activity data should be verified through audit or use of other measures.
- Local engagement of clinicians with quality-assuring coding of their practice can improve the quality of resultant HES data and payment.

Useful resources

- For further information on service data for hospitals within England visit NHS Digital (https://digital.nhs.uk).
- For further information on service data for hospitals within Wales visit NHS Wales Informatics Services (http://www.wales.nhs.uk).
- For further information on service data for hospitals within Northern Ireland visit Department of Health, Social services and Public Safety (https://www.health-ni.gov.uk/).
- For further information on service data for hospitals within Scotland visit Information Services Division (http://www.isdscotland.org/).
- Ireland and Northern Ireland's Population Health Observatory provides health intelligence to strengthen research and information infrastructure in Ireland (http://www.apho.org.uk).
- Healthcare Intelligence is part of Population Health service within the Health Service Executive (http://hci-llc.com/).
- Association of Public Health Observatories (APHO) represents a network of 12 public health observatories (PHOs) working across all devolved nations. They produce information, data and intelligence on people's health and health care for practitioners, policy makers and the wider community (http://www.apho.org.uk/).
- Welsh Health Analysts Network (WHAN) shares knowledge in the health information and intelligence community across Wales (http://www.wales.nhs.uk/welshhealthanalystsnetworkwhan).

3.4 Clinical outcomes

There is already considerable guidance on specialty-specific outcome measures for revalidation and also many publications on outcomes to measure service quality. The use of generic outcome measures, eg readmission rates, can provide some overview across surgical specialties but individuals and services should also consider additional measures that may allow for more detailed analysis. In doing this the following should be considered:

Does the chosen outcome measure reflect the main benefits or risks of a procedure or process?

The outcome measure should represent either the anticipated positive impact or potential risks of a specific healthcare intervention. The outcome measures used will differ depending on the type and complexity of treatment as well as issues such as potential health gain for an individual. For example, use of mortality as an outcome measure for simple, elective surgery on patients who have good general preoperative health is unlikely to capture any meaningful information on quality. In addition, a patient who has little functional impact from a chronic illness may be less likely to report significant improvements in outcomes as a result of a surgical intervention.

How will you compare your outcomes? Will this be locally, regionally or nationally?

Any comparison of outcomes between different healthcare providers, either at individual or service level, requires moderation to account for differences in process and structure of healthcare delivery.

If part of your practice is reviewed within a national clinical audit or registry, then detailed service- and individual-level data will be available. National audits carry out detailed case risk adjustment that is unlikely to be feasible at an individual and local level. Risk adjustment for evaluating performance on an outcome involves comparing

the observed outcome rate to the expected outcome rate, taking into account the patient (case) mix and service delivery processes.

For those areas of practice not covered by national audit, collection of accurate and risk-adjusted data is likely to be considerably more difficult. Hospitals should support individual clinicians by providing details of activity and basic outcome measures, such as mortality, postoperative complication rates, and readmission rates. It is unlikely that locally provided data will have been risk-adjusted and so caution should be taken when using this data to compare between hospital providers. In addition, outcomes measurement and risk adjustment rely on large numbers so data ideally should be collected continuously to develop year-on-year analysis.

Actions that hospital providers could use to support a limited risk adjustment at a local level could include:

- Additional case-mix information alongside activity or outcome data, such as age of patients, disease severity and comorbidity or preoperative risk scores.
- Differentiate between emergency and elective procedures.
- Review data for all clinicians within a service over several years.

These types of modifications will only allow limited analysis owing to poor risk adjustment and low numbers, therefore care should be taken on how these data are used. It should not be made publicly available outside individuals and services, without quality assurance through statistical risk adjustment.

Actions that could support limited risk adjustment between different services providers include:

- Comparison with the national mean.

- Comparison with the matched 'peers' by adjusting for variations, eg in age between providers.

Routinely collected hospital data can be used to compare individual consultants, but will only be meaningful when comparing between colleagues within the same healthcare provider. There are difficulties of comparing data for individual consultants outside hospital owing to differences in case mix, admission and discharge practice.

Issues underlying hospital comparisons

There are two areas of uncertainty in the reliability of data collection when comparing performance between organisations: First, there is 'Within-hospital' reliability of data. Smaller organisations or rarer presentations are more likely to show high variability in data collection. There are also 'Between-hospital' differences that result from the differences in the processes of healthcare delivery. Without appropriate risk adjustment, much of the variability between hospitals has been found to be due to chance alone or has been very small.

Link between individual- and service-level performance

There is no clear method for assessing individual practice based on unit-level data. It may be feasible to extrapolate individual performance from unit-level outcomes, if balanced with good patient and colleague feedback and audit.

Team-level data can be used as part of individual appraisal and revalidation, but must also be presented with a comparison of the clinician's own data alongside those of colleagues. This should be more than just differences in volume, but rather some evidence should be presented of case characteristics that could allow a reasonable interpretation of how outcomes might be risk-adjusted.

Useful resources

- Consultant level outcome data (https://www.nhs.uk/service-search/performance/).
- NHS Digital clinical indicator portal (https://indicators.hscic.gov.uk/webview/).
- Royal College of Surgeons has a wide range of guidance for revalidation (https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/revalidation/).
- National Surgical Commissioning Centre NICE-accredited commissioning guidance and HES-based data tools, which are freely available to download (http://www.rcseng.ac.uk/healthcare-bodies/nscc).
- Perioperative Quality Improvement Programme (PQIP) started in 2016 and will measure complications, mortality, and patient-reported outcome from major non-cardiac surgery (http://www.niaa-hsrc.org.uk/PQIP).
- NHS Benchmarking is a benchmarking service and network of more than 350 NHS providers exists to identify and share good practice across the Health and Social Care sector (http://www.nhsbenchmarking.nhs.uk/index.php).
- Intelligent monitoring by Care Quality Commission (http://www.cqc.org.uk/content/monitoring-nhs-acute-hospitals).
- My Hospital Guide by Dr Foster Intelligence (http://myhospitalguide.drfosterintelligence.co.uk/).
- Quality Watch by Health Foundation and Nuffield Trust provides data on more than 300 indicators over time (http://www.qualitywatch.org.uk/).
- NHS Evidence have links to many published surgical indicators, including metanalyses of effectiveness and research on best practice in development (https://www.evidence.nhs.uk/).

Key tips

- Clinical outcome measures should not be the sole measure of individual- or service-level performance.
- There are positive and negative effects of using performance data, including conflict between meaningful accountability and the difficulty in being open.
- Risk adjustment is extremely important and can limit the use of routine data collection for comparison between clinicians or services.
- HES data can be used for comparison between clinicians in a service, where organisational processes are the same, as long as there is some evidence for the differences in case mix or technique.
- Service-level data can be used to inform individual-level performance, if provided with comparator data to look at volumes of cases and some aspect of complexity of cases. Additional data, such as audit and feedback should also be used to support this type of comparison.

3.5 Patient-Reported Outcome Measures (PROMS)

Data from pre- and postoperative PROMS collection are available nationally at service level for four elective surgical procedures (hip and knee replacement, varicose vein and groin hernia surgery) and it should be possible for this data to be made available to individual clinicians at a local level. It is important to ensure that adequate volumes of data for each procedure are available to provide a reliable measure of impact from care. Despite this limitation, valuable information can be obtained from even simple analysis that can indicate areas of practice requiring further investigation or review.

Where there is no nationally collected PROM, local collection can be used. The

following should be considered when using PROMS locally:

Choosing a PROM

It is best practice to include a generic PROM that generally looks at overall function, as well as a procedure-specific tool, when looking at patient outcomes.

Preparing for data collection

Implementing collection of PROMS can be resource intensive for services. It is important that, prior to starting any new collection, only tools that have been appropriately validated and have sufficient evidence for validity, specificity and reliability are used. Collection of PROM data can be facilitated through electronic tools.

Ways of using data

The majority of services and individuals collecting PROM data about a particular procedure rely on the measurement of gain or positive change in scores between pre- and postoperative assessment.

Showing evidence of gain in PROMS scores can be used to:

- Measure the benefit of a particular treatment. This is of particular significance within chronic conditions, where planned care may involve more than one treatment option.
- Measure benefit of one technique or implant over another, eg in some orthopaedic practice, overview of PROM scores has been used to identify those implants associated with worst outcomes.
- Measure patient groups most likely to benefit (or not) from particular treatments.
- Assess improvement if procedures or pathways are changed.

- Identify potential performance outliers. Care must be taken, of course, to avoid the assumption that this is the result of any one individual clinician, as opposed to organisational processes or other aspects of the care pathway.

- Support your case for change: engaging managers in discussions about improvements to services can be difficult for clinicians, and having data that show the direct impact of an intervention on the patient can be a powerful lever.

- Support patient choice: publishing data from outcome measurements allows patients to decide where and from whom to receive treatment and also allow them to judge the likely benefits of treatment in their own case.

- Support shared decision-making and consent: analysis of outputs from PROMs at a local level is a powerful tool to enable discussion between patients and clinicians about likely benefits at the initial consultation. Essentially, this information becomes a patient decision aid.

- Manage patients' expectations about the outcome of treatment: completion of preoperative PROMs can provide the patient and clinician with valuable information about perceptions of health status and can inform discussions on realistic benefits from surgery.

- Form part of the intelligent monitoring for CQC inspection.

Barriers to the use and implementation of PROMS

Collecting PROMS can be burdensome for both services and clinicians and this in turn can affect the attitude of clinicians to the data. In addition, unless procedures are common, data collection may have to be lengthy to ensure that sufficient data have been collected to inform meaningful analysis. Appropriate analysis and interpretation of the data collected can be difficult without analytical support, which would have to be provided at organisational level.

Key tips

- Data from PROMS can be valuable, when they are used to support clinical decision-making.
- Most value appears to come from analysis of the change in PROM scores before and after a procedure.
- Prior to implementing a new PROMS collection, ensure there is the available infrastructure to collect the data without impacting heavily on individual working practices.

Useful resources

- Oxford University has a bibliography of research related to Patient-Reported Outcome Measures (PROMs) and Patient-Reported Experience Measures (PREMs). Included in this website are several meta-analyses of PROMS tools that are available for use within surgical practice (http://phi.uhce.ox.ac.uk/home.php).
- NHS Digital website has national- and service-level reporting on the national PROMS programme (http://content.digital.nhs.uk/proms).

3.6 Patient experience measures

Positive patient experience usually correlates with patient safety and clinical effectiveness. However, patient experience depends on more than just care delivery and is often impacted by things beyond the immediate care process – for example, by patient expectations or by past experience.

Evidence suggests that the quality of individual patient and clinician communication is the single best predictor of positive patient experience, so capturing this data provides information that cannot be effectively captured through other aspects of data collection. There is less evidence that improved patient experience is linked with improvements in processes of care delivery.

Key tips

- Patient experience feedback can provide important information about the patient and clinician communication.
- This type of information can be the some of the most useful for supporting individual and service level change.

3.7 Data from incidents, complaints and compliments

Incidents

Incident reporting is an established organisational process that has long been used to improve safety. Information gained from low-grade incidents and near-misses can provide information that can support change and prevent more serious incidents in the future. Incidents related to surgery and surgical practice remain an important area of risk for healthcare organisations.

A recent evaluation by National Reporting and Learning System (NRLS) has shown that hospital reporting rates do not correlate with size of hospital, number of staff, mortality measures or patient satisfaction. Therefore, rates of incident reporting cannot themselves be used as a measure of hospital safety. The same evaluation showed there was a positive correlation between the rate of incident reporting and the number of claims a hospital received.

Useful resources

- Friends and family test information is available quarterly at an organisational level (http://www.nhs.uk/NHSEngland/AboutNHSservices/Pages/nhs-friends-and-family-test.aspx).
- The Picker Institute (http://www.pickereurope.org/) have done a wide array of national patient surveys to capture patient experience, including inpatient and outpatient surveys, emergency services surveys and many others.
- The patient experience portal (http://patientexperienceportal.org/) is an online resource of research and best practice with regards to measuring patient experience.
- Seven Step Measurement Process (http://www.institute.nhs.uk/patient_experience/guide/the_7_step_measurement_process.html) outlines a seven-step process that links data collection, analysis, finding and reporting patterns and communicating both the decisions and the process to patients and the public.
- Transforming the patient experience: the essential guide by NHS Institute provides information and examples of ways to capture patient experience and how to use this data to support change (http://www.institute.nhs.uk/patient_experience/guide/Quick_Guide_-_the_why_and_how.html).
- The Health Foundation (http://www.health.org.uk/) have developed the Person-Centred Care Resource Centre including information on health literacy, self-management, shared decision-making and other topics.

Nursing staff are significantly more likely to report incidents than doctors. One study showed that barriers to doctors reporting incidents included a lack of understanding about when to report incidents/near-misses, lack of feedback, lack of understanding of process, negative experience/worry about blame.

Increasingly the focus of using information from incidents is placed on how organisations are learning from incidents, rather than the reporting processes themselves.

Complaints

Data from complaints may be an underused resource that could possibly act as a predictor of safety issues. Complaints have been shown to reveal problems in patient care not captured through other service-level monitoring. Patients and family have unique experiences across whole care pathways, and can provide useful information about issues such as continuity of care, communication and dignity. In addition, once they have finished treatment, they may feel more able than staff to raise issues.

Using complaint data to infer the quality of overall practice may be difficult as often there is poor overall coding and analysis of complaints. Appendix 2 shows a tool that has been validated and allows for classification of issues within complaints.

Compliments

Little has been published regarding the use of information from compliments as a performance measure. This is often an under-reported area and its potential to inform services and individuals is unknown.

Key tips

- Review of incidents and complaints are key sources of safety data.
- High incident-reporting rates are not by themselves indicative of safety issues.

- The organisational culture and transparency in feeding back learning from incidents and complaints is important and lack of feedback may limit clinical engagement with the processes.
- It is important that learning should be seen as being blame-free.

Useful resources

- Root cause analysis toolkit, NHS Patient Safety (http://www.nrls.npsa.nhs.uk/resources/).
- Canadian Patient Safety Institute incident management tools (http://www.patientsafetyinstitute.ca/).
- Dutch questionnaire to analysis quality of adverse event reporting (see ref. 80).
- Healthcare Complaint Analysis Tool (see ref. 59 and Appendix 2).
- Patient opinion (https://www.patientopinion.org.uk/) is an independent, non-profit forum for feedback forum for health services.

3.8 Data from other sources

Review of organisational processes

An understanding of healthcare delivery processes is required to correctly identify the underlying reasons for a health service issue, prior to implementing change. Various tools can be used to understand healthcare processes:

- Process mapping
- Observation or shadowing
- Run or time charts
- Driver diagrams

Case reviews/studies

Case studies allow the exploration of an event in detail and in its natural context. Within appraisal and revalidation it is expected that a case study may be completed to learn from a unique event (intrinsic case study). Other uses of case studies are:

- Instrumental: Uses a particular case to get an appreciation of an issue.
- Collective: Studying multiple case studies to get wider understanding of an issue or to look at the impact from new initiative/pathway.

The following points should be considered when planning your case study (adapted from advice for use of case studies in research):

- Defining the case: It is relatively easy to identify a case when reviewing an event, but is less easy when attempting to review 'typical' care.

- The boundaries: Be clear about the scope of the case review at the start.

- Rigour of data collection: Consider collecting data from several sources, both qualitative and quantitative. Techniques that could be used are questionnaires, audits, interviews, observations of multiple sources of data, data triangulation, maybe qualitative and quantitative measures.

- Analysing and interpreting: It can be difficult to align disparate forms of data, indexing and thematic ordering to identify key issues.

- Generalisation from results.

Data on costs of services

Despite a prescribed national tariff system, there is a large amount of variation in the costs of services. Using local 'Payment by Result' data alongside other quality measures can allow services to look at areas for possible efficiencies.

Key tips

- Prior to implementing change carry out a baseline assessment to quantify practice, understand organisational processes, gaps in knowledge or training and potential barriers to change.

- Case studies can be a useful way of reviewing care after an event or can be used to assess typical practice.

- Carefully consider the questions you wish to answer within your case study and how you will collect and analyse any supporting data.

- Use local or other data sources that can provide an understanding of costs, alongside activity.

Useful resources

- Process mapping: Process mapping the patient journey: an introduction. *BMJ* 2010; **341:** c4078 (http://www.bmj.com/content/341/bmj.c4078).
- Kings Fund Patient and Family-Centred Care Toolkit has information on a wide range of tools such as process mapping, driver diagrams, patient shadowing (https://www.kingsfund.org.uk/projects/pfcc).
- A Simple Guide to Payment by Results, 2013 Department of Health (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213150/PbR-Simple-Guide-FINAL.pdf).
- Spend and outcome tool (SPOT): An online tool that compares acute hospital activity, clinical coding and payment by results data. Free to all in NHS. (http://www.yhpho.org.uk/spot).

3.9 Data governance

Any collection of data that could contain possible patient identifiable information must have appropriate storage that complies with current law as outlined in the Data Protection Act 1998. This can be especially challenging within revalidation, where hospitals are required to share information on the performance of individual clinicians for the purposes of a whole practice appraisal.

Any information within an individual clinician's portfolio should be confidential and access limited to doctor, appraiser and responsible officer. Supporting information should be anonymised or pseudo-anonymised for both patients and staff or consent should be sought. Any digital solution for collecting supporting information must be password-

protected and access only available to named individuals approved or verified by the responsible officer RO.

Key tips

- Any time data are being collected, stored and shared, whether for individual revalidation or for service review, be aware of requirements for safe storage and transfer of information that may possibly be identifiable.
- Consider the risks of any possible identification, especially when reviewing rare events, where even anonymous data may be easily identifiable.
- Ensure that supporting information for revalidation is only shared through a password-protected digital solution and is held within the appraisee's organisation.

Useful resources

- Information Governance Toolkit, NHS Digital (https://www.igt.hscic.gov.uk/).

4. Information from feedback

4.1 How does feedback work?

There is strong evidence that feedback, if given effectively, can change an individual by changing their awareness and beliefs, changing what is perceived as the 'norm' and is much more effective if linked with goals.

Feedback works by raising awareness of issues and tackling beliefs about clinical practice and their consequences. It is known that perceived social and professional norms are important predictors of behaviour change and feedback can influence change in ways that other more quantitative data collections fail.

There also appears to be a positive correlation between outcomes feedback to clinicians and improved population outcomes.

4.2 Effective feedback

Patient feedback

Several forms of patient feedback have already been discussed, including complaints and compliments and other patient experience measures. A recent review of revalidation showed that despite often being difficult to obtain, patient feedback often has the greatest impact on behaviour and can be the most useful for highlighting areas of practice to change.

Peer-to-peer feedback

The importance of colleague feedback is the wider understanding of performance within the organisation and the depth of experience. A single face-to-face appraiser is unlikely to make a valid or reliable judgement, as opposed to an anonymous measurement of practice by colleagues. This can be difficult, but is often important in terms of improving safety, as peers are usually the ones witnessing any potentially or actually unsafe behaviour. When giving a peer feedback, the following is important:

- Feedback is most effective when given as soon after the event as possible.
- Sometimes immediate feedback from a colleague who is within the same hierarchal level is easier to absorb.
- Your feedback must be objective and non-judgemental.
- Use impact statements – these can be positive and suggest future changes 'if… then' or negative and point out potential outcomes 'when… then'.
- Use of 'I feel' statements are an important way of being heard. In addition, it is difficult to dispute emotions.
- Listen to the response.
- Even if the message is heard you may not be thanked and the individual may be angry, but it is still every healthcare individual's responsibility to address safety.

Service-level feedback and behavioural change

Feedback at service level is often insufficient and prevents learning and change. Lack of feedback about the service also inhibits involvement in organisational processes such as incident reporting and demotivates staff.

Evidence shows that once audit or outcomes are known and have been reflected on, there are five key characteristics of feedback that are likely to influence an individual to change practice:

- It is received from a senior colleague.
- It is regularly received.

- It is received in both verbal and written format.
- It focuses on decreasing rather than increasing behaviours.
- It includes explicit instructions, with tasks or goals.

Key tips

- Feedback changes practice by raising awareness and tackling beliefs about clinical practice and the consequences.
- Perceived social and professional norms are important predictors of behaviour change – this is the organisational culture.
- It is important that there is consequence for good and bad performance.

Useful resources

- Mind Tools (https://www.mindtools.com/) provide useful resources to support your learning.
- NHS Leadership Academy has a Healthcare Leadership Model 360-degree feedback tool (http://www.leadershipacademy.nhs.uk/).

5. Reflecting on data

Reflection is an essential step of the process of continuous learning but it is often carried out poorly, both at individual and at service level. Reflection can enhance development by leading to self-awareness, but there is a lack of evidence about what makes good and impactful reflection within medical practice. Productive reflection combined with action can measure areas of professionalism not covered by feedback and audit.

It is important for individuals and teams to learn from routine practice, as well as from adverse events. Organisations need to support individuals and teams by providing space and time to carry out reflection as part of their day-to-day practice.

One of the best resources for best practice on reflection comes from Gibbs, who in 1988 outlined key questions that seek to ask the 'why' of something that happened and 'how' practice could be done differently. Using this methodology can increase learning from experience, clarify strengths and weaknesses, promote deeper understanding of assumptions, beliefs, values and attitudes and promote personal development. It is, however, also time-consuming and can be difficult to institute as it requires the formation of peer groups to facilitate discussion.

There are many ways to carry out reflection including journal-writing, group discussions, and blogs.

Key tips

- Reflection is an active process that requires time to be allocated at both an individual and organisational level.
- Lack of reflection makes meaningful change unlikely.
- Clinicians may find carrying out reflection difficult without using a framework of questions (see Appendix 3).

Useful resources

- Appendix 3 outlines key questions that can inform reflection.
- John Dewey's 'How we think. A restatement of the relation of reflective thinking to the educative process' (1933) ISBN 0-486-29895-7.
- Donald Schön's 'The reflective practitioner: How professionals think in action'. Basic Books ISBN 0-465-06878-2.
- Graham Gibbs' 'Learning by doing: a guide to teaching and learning methods' (http://www2.glos.ac.uk/gdn/gibbs/index.htm).
- Sue and Neil Thompson 'The critically reflective practitioner'. 2008 Palgrave Macmillan ISBN-10:0-230-57318-5.

6. Changing practice

6.1 How do we learn?

It is important to consider the process through which individuals and organisations learn and change. Despite an increasing focus on the importance of continuous improvement and change in healthcare, it is often extremely slow and difficult to implement. This may be due to lack of understanding of the processes through which individuals and organisations change.

The cycle of learning has four stages: an experience which can be an event, behaviour, ideas or feelings (a), which leads to reflection (b), and then to considering possible scenarios for mitigating the experience in the future (c), followed by testing out new processes (d).

Evidence from postgraduate training shows that surgeons are able to self-assess skills accurately and this ability can be improved by increased experience, level of training and age. It indicates that self-assessment may be better for less advanced competences. There is also lack of evidence for how stressful environments, eg theatres, impact on self-assessment of skills.

Organisational learning, especially when within a complex system is much more complex and is affected by other factors (see Sections 6.3–6.5 in this document).

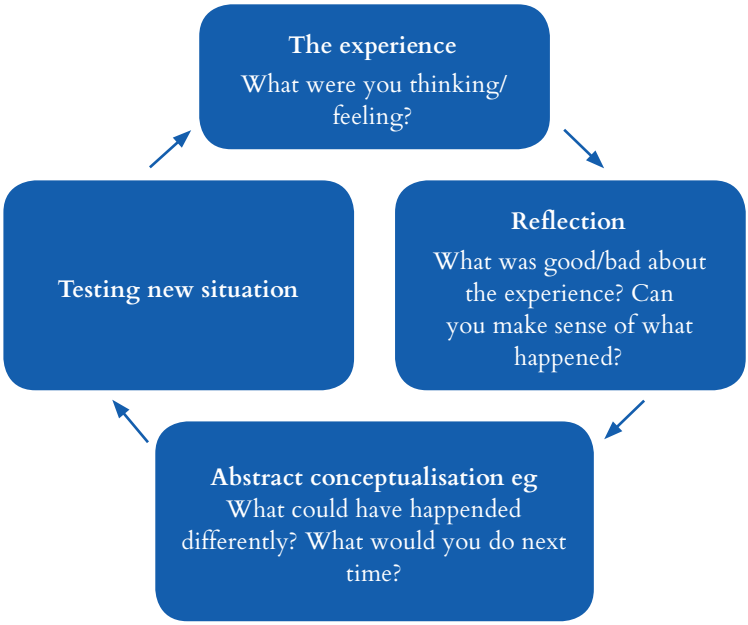

Figure 2: *Four stages of the learning cycle (Kolb, 1983)*

6.2 Continuous professional development and learning

Within appraisal and revalidation, continuing professional development (CPD) activities must span the whole breadth of an individual's role, as well as including a summary of reflection and how the learning may have influenced practice.

There is lack of reliable evidence as to which aspects of CPD support learning and change, although several factors can be of benefit. Inclusion of some CPD outside the

employing organisation can support peer-based discussion and provide access to new ideas and ways of working. Skilled facilitation and debriefing is also an important factor. Viewing video playback of performance greatly increased the ability to self-assess skills.

There is a lack of high-quality evidence about the role of inter-professional training, as opposed to profession-specific training. In certain clinical areas, eg emergency departments, it has been shown to have a positive effect on team collaboration and communication, but it is unclear how transferrable this to other practice areas.

Simulation training

Overcoming the learning curve required for competence in new surgical techniques can be difficult outside of service delivery. One method to overcome this barrier is simulation training, which allows for experiential learning, as well as some understanding of organisational processes. Simulation training can also support improved communication, teamworking skills, professionalism, management and leadership.

6.3 Quality improvement methods

Types of quality improvement methodology that are used in service initiatives can provide useful context for learning at organisational level. Some of the most well-known methodologies are the following:

- Experience based co-design: Patients and staff working together to design pathways, by identifying 'touch points' – aspects of the service that are emotionally significant.
- Lean: Used to look at processes, manage flow and demand, waste and efficiency to manage 'actual' rather than anticipated demand within a service.
- Model for improvement (including PDSA): An approach to continuous improvement that links three key questions: What are you trying to accomplish? How will we know it has changed? What changes can be made to result in improvement?

- Six Sigma: Improving processes through understanding of how 'defects' within the service are perceived by the service users.
- Statistical process control: Monitoring and controlling quality in processes by using statistical methods.
- Theory of constraints: Assessing movement along a process and identifying bottlenecks or constraints and activity or demand along the process.
- Total quality management (TQM): This is continuous quality improvement at a systematic organisational level.
- Health service accreditation: Provides assurance of compliance with standards or care and encourages improvement. There is evidence that service accreditation supports service change and professional development, but less evidence for any impact on patient outcomes or experience.
- Clinical decision support systems: These support improved standardisation of service delivery.

6.4 Barriers to change

Healthcare systems tend to be highly complex and often it is difficult for any individual to have an understanding of all possible interdependencies. It also means that you cannot assume that scaling up the behaviour of an individual component of a service; the same effect will be had in other areas. Past experience shows that despite attempting change, alongside any positive results there may be unexpected negative results elsewhere in the system. It is important to recognise this risk and to ensure that any change is monitored and, if necessary, adjusted.

Organisational factors and culture often confound change. Change can be perceived as threatening to individuals and organisations. It is important that organisations allow a

level of risk-taking and awareness that change relies on learning from mistakes as well as successes.

6.5 Effective and sustained organisational change

Organisations evidence their learning through adoption of new or modified routines and changes to values and behaviours. Often there is a delay between awareness of evidence and implementation of change at an organisational level. It requires the organisational values and theories that guide behaviour to be changed. It is expected that information is shared between individuals, when in fact this is not always the case and behaviour can only change once information is made explicit and shared. This is called the 'knowing–doing gap' and is usually the reason that new practice does not get implemented.

Healthcare organisations are complex and it is often difficult for individual clinicians to have an understanding of wider systems outside their area that may have an impact on change. Initial data on care processes can allow some understanding of the interdependencies and detection of issues that were not immediately obvious. There are three main building blocks required for organisational learning:

Learning processes

These include the ability to experiment and improvise, transfer and use information gained from audit and benchmarking. Sharing of learning requires active and explicit knowledge transfer to enable organisational learning. Consider how you will spread the learning and any new ways of working or change in processes.

Supportive environment

This includes the team characteristics and hierarchy, time available for discussion and reflection, access to external support for data and skills, the organisational culture and maturity with successfully managing change.

Leadership

This includes the ability to deliver feedback, sharing of common understanding and values.

Effective change and translation of learning is unlikely to be successfully managed by just one action. Multifaceted strategies combining actions and measures linked to specific goals are usually more successful than single interventions. Linking change with strategic priorities makes it significantly more likely that it will receive management and executive-level support.

Issues that may confound the implementation of change should be considered – eg times of day or week, or complexity of individual cases – as this may mean that resources such as guidance or protocols are not followed.

People are more likely to believe and use ideas that they have helped create, so involving the targeted professionals in the change development is essential. Individuals are more likely to incorporate change that they have been integral in developing. They also may have a better understanding of local processes.

Key tips

- An initial understanding of your organisational processes is vital to planning improvement.
- It is important to choose the appropriate methodology for the change required. The context in which quality improvement tools are used is important and may limit effectiveness.
- Use all the resources available to you to support your change. This may include meeting and gaining support from service managers, and patient groups.

- It may be helpful to assess the organisational culture to learning and change prior to starting improvement. This is one of the biggest barriers to improvement and often inhibits effective change.
- Local improvements that do not fit with overall strategic objectives are less likely to be sustainable.
- It may be helpful to assess the organisational culture to learning and change prior to starting improvement. This is one of the biggest barriers to improvement and often inhibits effective change.

Useful resources

- Assess your organisation's ability to learn (See Appendices).
- How to change practice: understand, identify and overcome barriers to change. 2007. National Institute for Health and Clinical Excellence (https://www.nice.org.uk/Media/Default/About/what-we-do/Into-practice/Support-for-service-improvement-and-audit/How-to-change-practice-barriers-to-change.pdf).
- Experience based co-design: Experience based co-design toolkit, Kings Fund (https://www.kingsfund.org.uk/projects/ebcd).
- The Point of Care Foundation (https://www.pointofcarefoundation.org.uk/our-work/experience-based-co-design/).

- Lean: Going Lean in healthcare, Institute for Healthcare Improvement (IHI) (http://www.ihi.org/resources/Pages/IHIWhitePapers/GoingLeaninHealthCare.aspx).
- The Lean Enterprise Academy (http://www.leanuk.org/article-pages/sector/healthcare.aspx).
- Model for improvement (including PDSA): How to improve, IHI (http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx_How to improve).
- Six Sigma: What is Six Sigma, ASQ (http://asq.org/learn-about-quality/six-sigma/overview/overview.html).
- Statistical process control: Monitoring change in health care through statistical process control methods. The Nuffield Trust. (http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/spc_for_monitoring_change_in_health_care_web.pdf).
- Manchester Patient Safety Framework (http://patientsafety.health.org.uk/resources/manchester-patient-safety-framework-mapsaf).
- Health Foundation resources: Checklist for Safety Improvement (http://www.health.org.uk/sites/health/files/SafetyChecklist.pdf).
- Spotlight on culture and leadership (http://www.health.org.uk/sites/health/files/Organisational%20checklist.pdf).

7. Reducing the burden in the future

Collecting healthcare data can be very time- and resource-intensive, and this issue is compounded by unnecessary duplication of collection for different systems and purposes. In fact, it is often the methods of collecting data that are seen as most burdensome to staff. In addition, many clinicians and organisations are often unaware of where data can be found and find it difficult to access support from IT services to allow for data extraction from digital systems.

The government has clearly outlined their plans to support increased availability and transparency of data and have called on all healthcare services to move towards electronic health record systems and improved interoperability between digital systems within healthcare services and across service boundaries. Each trust will need to appoint Chief Clinical information officers to lead this implementation. This calls for extensive local change, which is not helped by the historic proliferation and fragmentation of digital systems that do not work together or procurement of systems that do not meet local need. The recent Wachter report (2016) suggests a phased approach to digital implementation, where central funding is required with targets for regional and national interoperability.

There is a long way to go in achieving the government's aim. In late 2015 40% of all acute trusts had less than 20% of all their notes available digitally and many hospitals find the procurement of digital solutions to reduce reliance on paper notes to be a difficult, expensive and slow process.

Some common points organisations should take into account when implementing new digital systems are the following:

- Are frontline staff who will be using the system involved?
- Have you ensured you are not requesting unnecessary/too much information to be entered? Doing so may slow down clinics or ward rounds and frustrate staff.
- Are digital systems linking with other systems in the organisation?

- Is data migration between two systems flowing smoothly?
- Are there quality assurance processes in place?
- Have you considered what type of training will be required and whether there will be adequate computers in all clinical spaces?
- Is there capacity to adapt and change configuration after installation? Negotiating further changes to configuration after installation should be considered within the contract with the provider.

Useful resources

- Advice on choosing the right electronic health record systems by NHS Digital
- Case studies of introducing new digital technology are available (https://www.nhsengland.nhs.uk/digitaltechnology/case-studies)

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Appendix 1

Organisational self-assessment for ability to learn and change:

Individuals

- Do you ask questions about practice and find external knowledge, experience or guidance that could suggest changes to practice?
- Do you assess decisions through audit and reflection of their own experiences and can consider other potential actions that could have been taken?

Teams

- Are all staff, whatever their role or grade, able to be open and discuss issues? Is there tolerance to discussion and experimentation?
- Do different staff within the team make suggestions for change that could improve care delivery and outcomes?
- Are teams on different shifts made up of all disciplines and do they have regular discussions with input from all?
- Does your team have a discussion when expected outcomes are not achieved?
- Do you share any learning or new knowledge with other teams?

Organisations

- Does your organisation provide the resources (time, people, and information) to encourage discussion and learning?

CLINICAL PROBLEMS Issues relating to quality and safety of clinical and nursing care provided by healthcare staff (i.e., doctors, nurses, radiologists, and allied health professionals)	**Quality:** *Clinical standards of healthcare staff behaviour*
	Safety: *Errors, incidents, and staff competencies*
MANAGEMENT PROBLEMS Issues relating to the environment and organisation within which healthcare is provided (for which administrative, technical, facilities and management staff are usually responsible)	**Environment:** *Problems in the facilities, services, clinical equipment, and staffing levels*
	Institutional Processes: *Problems in bureaucracy, waiting times, and accessing care*
RELATIONSHIP PROBLEMS Issues relating to the behaviour of any specific member of staff towards the patient or their family/friends	**Listening:** *Healthcare staff disregard or do not acknowledge information from patients*
	Communication: *Absent or incorrect communication from healthcare staff to patients*
	Respect and patient rights: *Disrespect or violations of patient rights by staff*

Safety: *Errors, incidents, and staff competencies*

- Sub-categories: Error-diagnosis; Error-medication; Error-general; Failure to respond; Clinician skills; Teamwork.
- Keywords: "incorrect", "medication error", "did not notice", "mistake", "failed to act", "wrong", "poor coordination", "unaware", "missed the signs", "diagnosis".

1. Low severity	2. Medium severity	3. High severity
Slight delay in making diagnosis	Clinician failed to diagnose a fracture	Clinician misdiagnosed critical illness
Slight delay administering medication	Staff forgot to administer medication	Incorrect medication was administered
Minor error in recording patient progress	Delay noticing deteriorating condition	Onset of severe sepsis was not identified
Not responding to bell (isolated)	Not responding to bell (multiple)	Not responding to heart attack
A minor error filling-out the patient notes	Clinician overlooked information (e.g. previous experience of an illness)	Clinician overlooked critical information (e.g. serious drug allergy)
Minor misunderstanding among clinicians	Test results not shared with clinicians	Failure to coordinate time-critical decision

Communication: *Absent or incorrect communication from healthcare staff to patients*

- Sub-categories: Delayed communication; Incorrect communication; Absent communication.
- Keywords: "no-one said", "I was not informed", "he/she said 'X'", "they told me", "no-one explained", "contradictory", "unanswered questions", "confused" "incorrect".

1. Low severity	2. Medium severity	3. High severity
Short delay in communicating test results	Long delay in communicating test results	Urgent test results delayed
Patient received incorrect directions	Patient received conflicting diagnoses	Patient given wrong test results
Staff did not communicate a ward change	Staff did not communicate care plan	Dementia patient discharged without the family being informed

Appendix 3

Key questions for effective reflection of an event or episode of care:

What happened?
Describe the event and context in which it occurred

Feelings
What were you thinking and feeling at the time this happened? (Try to elicit the whole range of emotions.) How did you react?
Do not analyse – save that for later. Do not evaluate – save that for later.

Evaluation
What was good and or bad about my approach? What might have influenced this action? What alternative action could I have taken? Think about the various value systems – personal, professional, organisational, cultural, societal.

Analysis
What were you trying to achieve at the time? How might other staff and the patient have been feeling? Use the reflections of others from discussion.

Conclusion
What have you learnt? What general conclusions can you make? (Conclusions that are broadly applicable.) What specific conclusions can you make? (Conclusions about your own specific way of working.) What was unique about this situation? How do you feel now?

Personal action plans
How might I approach a similar situation next time? What actions do you need to take in order to ensure that you are able to do things differently?
Training/supervision/changing policies etc.

Appendix 4: Additional resources and organisations to support change

The following organisations can provide additional assistance at an organisational level:

- Catalysis, Centre for Healthcare Value, Theda Care. Work with hospitals through visits and peer networks to share best practice (https://createvalue.org/)
- KPMG provide support for service change and wider learning (https://home.kpmg.com/xx/en/home/industries/healthcare.html)
- Health Foundation:
    - The Q Initiative is a UK improvement community, connecting people and sharing learning (http://www.health.org.uk/programmes/the-q-initiative)
    - Generation Q fellowship scheme.
- NHS Improvement (https://improvement.nhs.uk/)
- Virginia Mason Institute specialises in healthcare transformation, with a particular emphasis on safety and patient experience (https://www.virginiamasoninstitute.org/)
- ASQ is a global community providing resources, training and networking for healthcare organisations (http://asq.org/healthcare-use/why-quality/overview.html)

Case studies of healthcare transformation:
- Salford Royal Hospitals NHS Foundation Trust,
- Western Sussex NHS Foundation Trust

Other resources:

- Training and Action for Patient Safety, Bradford Institute for Health Research (http://taps.improvementacademy.org/resources/tools/)
- Academic Health Science Network North East and North Cumbria & North East Quality Observatory Measurement Programme (http://ahsn-nenc.org.uk/project_type/measurement/)

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