

## Quality Improvement: origins, purpose and the future for veterinary practice

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## INTRODUCTION

Providing the highest quality veterinary care can often be a delicate balancing act: the client/owner's wishes, financial parameters and emotional needs have to be considered, whilst also meeting the animal's clinical needs. But what actually defines quality care? It is a term frequently used in both the human and veterinary healthcare literature, but often has little explanation or definition attached to it. 'Quality' in relation to care delivered is not a static concept and will hold different meanings to different individuals within a healthcare service. John Ruskin, a Victorian writer and critic of art and society observed: 'Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution' (1,2).

## WHAT IS QUALITY CARE?

It is easiest to describe quality care within the context of human medicine, as it is in this sector where the majority of the literature is based. The Institute of Medicine (IOM), a non-profit organisation that provides evidence-based research and recommendations for public health and science policy, currently defines quality care as, 'The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge' (3). This definition, however, places quality care in a very one-dimensional space, with a heavy focus on the clinical outcomes of care which results in a limited explanation of quality care. Categorising in this way solely on positive versus negative outcomes means that the IOM definition falls short in describing a holistic all-encompassing quality care experience.

The Royal College of Physicians (RCP), a British professional body dedicated to improving the practice of medicine chiefly through advocacy, education and research, takes a broader approach to defining and measuring quality care. The RCP describes quality care as involving five factors, 'creating a delicate balance between health and wellbeing of the population, sustainable finance, environment and resources alongside providing the best possible care for the individual' (4,5). This description is also more representative of the multidimensional nature of providing care as well as recognising the pressures exerted on the industry in the 21<sup>st</sup> century.

There is an ongoing shift in the ideology of human healthcare providers, particularly within the National Healthcare Service (NHS), looking to create a model of care more akin to a business model (6,7). Bowers (6) and Singh (7) discussed the perception of quality and user-experience by the patients and clients, this experience presented itself as the key focus and core of the NHS strategy instead of the service providers. This was more akin to business models that measure the impact of company structure and service on customer 'delight' and behavioural intentions. In short this can be summarised as how the experience of the customer had impacted their future behaviour and likelihood to return as a customer (8). In order to develop strategies to achieve this goal within the NHS it is necessary to understand the cause, variations, definitions and drivers of quality care; it is not possible to effectively measure quality of care without defining what formulates a quality care experience (9,10). The transformation in attitude within the human healthcare sector is supported by changes in policy which encourages the widespread adoption of quality measuring and improvement methods. Patient surveys have also been used to benchmark performance by measuring satisfaction with the care provided (7).

Defining quality care within veterinary services is complicated by the fact that the receiver of care, the animal, is not able to articulate their experience. Instead it is a third party, often the owner, who employs the service and may pay the bill without personally receiving clinical care. Reported client satisfaction or analysis of complaints made against practices and practitioners is the common focus when defining quality care within organisations (11–13). Although this method does give some insight into the success and any potential

problems with care being delivered, it will not provide a truly representative description on the quality of care delivered by a particular practice or practitioner. A much broader approach to quality monitoring and effective utilisation of a variety of quality improvement (QI) methods is required (13).

## WHAT IS QUALITY IMPROVEMENT AND HOW HAS IT BEEN USED?

Quality improvement methods comprise a series of generally iterative tests that are used to measure the quality of a current practice and to provide focus on any issues arising, as well as highlighting excellent practice to benchmark for others. These methods are successfully utilised in many different industries including aviation, education, manufacturing and healthcare (14–17). Quality improvement in its most basic form hypothesises that the quality of goods and services is ultimately determined by the processes of design and delivery. Due to this ethos, the key focus of any QI method is understanding, managing and improving work processes rather than correcting individual's mistakes after the event (18,19). When the description of quality care is constructed in this manner the balance and association held between providing the best possible care for the individual and the five factors named by the RCP, namely the health and wellbeing of the population, sustainable finance, environment and resources can be identified. These can then be measured serially using a variety of methods in an approach collectively termed QI.

There are multiple definitions of QI, and like quality care, it is not a static concept (20). Within the manufacturing industry where the QI methodology was originally developed, there exists many terms used to describe the process of improving the quality of a product or service, for example, Continuous Quality Improvement (CQI), Quality Management (QM) and Total Quality Control (TQC) (21). Despite the different names used, all of these methods follow the same basic principles: using a scientific, methodical and regulated series of actions to continually improve a work process, the end goal being to offer an improved standard of goods or services for the customer (22,23).

The introduction of QI methods into the healthcare setting can be linked to a need to gather data and measure the quality of care being delivered to patients. Within the medical healthcare sector, it was hoped that comparing performance amongst care providers and organisations would consequently encourage better performance and result in higher quality care for all patients (10).

The Healthcare Quality Improvement Partnership (HQIP) is an independent organisation led by the Academy of Medical Royal Colleges, The Royal College of Nursing, and National Voices, an organisation which represents doctors, nurses and patients within the NHS. Established in April 2008, its goal is to promote quality in the medical profession and increase the impact that QI has on healthcare (24). The HQIP QI handbook identifies twelve key QI methods (Table 1) best suited to utilisation within the healthcare setting.

Table 1. List of the different QI methods recommended by the HQIP in human healthcare (25).

| QI Method                                     | Used To                                                                                                                                                                     |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Clinical Audit                                | Check that clinical care delivered meets quality standards                                                                                                                  |
| Plan Do Study Act cycle (PDSA)                | Introduce and test potential QI on a small scale and assess its impact, building upon the learning from previous cycles in a structured way before wholesale implementation |
| Model for Improvement                         | Decide upon, test and re-define the QI method best suited to the system being improved                                                                                      |
| Lean / Six Sigma                              | Eliminate waste and redirect resources for QI ensuring utmost efficiency                                                                                                    |
| Performance Benchmarking                      | Drive QI through setting and achieving performance targets                                                                                                                  |
| Healthcare Failure Models and Effect Analysis | Systematically evaluate the entire healthcare process to identify areas that could benefit from QI                                                                          |
| Process Mapping                               | Map the patient journey to identify opportunities for improvement along the patients journey of care                                                                        |
| Statistical Percentage Control                | Measure and control process of care qualities against predetermined parameters                                                                                              |
| Root Cause Analysis                           | Systematically uncover the cause of events effecting quality to then be improved upon / eliminated                                                                          |
| Communication Tools                           | Improve quality of care through structured information exchange between practitioners / team members                                                                        |
| Technological Innovations                     | Automate processes and systems to ensure continuity of care to patients                                                                                                     |
| Decision Trees                                | Improve the quality and consistency of processes in healthcare through a systematic information organisation system                                                         |

The HQIP has produced clear guidance, information and training for QI which is evidence-based and utilises the findings of an international review of literature on the use of QI in healthcare to inform their recommendations. The list of methods is not exhaustive or prescriptive, however, it is one of the most comprehensive summaries of QI methods currently applicable to the medical field. The HQIP has produced 20 publications dedicated to QI methods' utilisation, however the rigid categorisation and definition could be detrimental to increasing uptake from staff. Using technical and complex terms could potentially be viewed as jargon, leaving people unwilling to implement methodologies that seem intricate and lengthy (26). Conversely, the rigid definition creates a solid base of training and information available to all. Multiple investigations into what constitutes an effective QI intervention in the healthcare setting have found that success is often determined by the amount of 'buy in' and investment you can garner from the team carrying out the method (27–29). The reality of any QI method applied to healthcare is that by nature it needs to be flexible, adaptive and easy to carry out. Additionally, attention needs to be paid to the particular features of the process or system being evaluated, whilst also considering the practitioner who will be using the QI methods (30). Skill sets of the staff, work-load and data analysis requirements are all key aspects that affect the success of a method (4).

The veterinary industry is complex and diverse, comprised of many sectors which in turn are organised into micro and meso systems of management with their own protocols and guidelines (31). The veterinary industry is behind the human healthcare sector as far as defining and adopting QI methods into everyday practice. Examples of many, although not all, can also be found in published veterinary research literature and conference proceedings and include clinical audit (32), checklists (33), morbidity and mortality rounds (34), benchmarking (35), communication tools (36), six sigma (37) and significant event audit (38). Interestingly, some of these QI methods evidenced in veterinary literature do not feature specifically in the HQIP literature,

for example checklists which are not clearly and singularly identified but instead their use is encouraged to ensure staff are correctly following each step of other QI methods identified.

Most QI methods are not an alien concept to the veterinary sector and its practitioners; however, more work needs to be done to improve uptake of terminology to ensure a unified approach like the NHS has achieved. These activities were not routinely recognised as QI but recently the charitable entity of the Royal College of Veterinary Surgeons (RCVS), RCVS Knowledge, has encouraged awareness and uptake of some aspects of the QI methods through practice guidelines and their information hub (39). In 2019 RCVS Knowledge commissioned RAND Europe to investigate current use of QI methods within UK veterinary practice (39,40). The report published in January 2020 comprised of data gathered from a national survey, focus groups, interviews with animal caregivers and an in-depth literature review. A summarisation of the report stated that, 'Though the veterinary professions have made progress in establishing some form of clinical governance, full-cycle quality improvement (QI) is not yet embedded in day-to-day work across the sector' (40). RAND also made recommendations on how to firmly cement QI ideology within veterinary practice including the need for better definitions of QI terms that specifically relate to veterinary practice which would reduce the current confusion within the profession surrounding terminology. Detailed interviews and/or focus groups with key workers within the veterinary industry was also suggested as these could help determine exactly how QI could be effectively utilised in practice and what allowances would need to be made to give professionals time to carry out QI activities.

With time and support from relevant governing bodies the veterinary sector could look to achieve similar widespread adoption of QI as in the NHS.

## QI WITHIN UK HEALTHCARE

Ever increasing demands on both funds and staff along with greater standards of care expected from patients and management have pushed forward the adaptation of several QI methods to meet the specific needs and challenges of healthcare work (41). These methods are both formally and informally being executed in multiple hospital trusts across the health service, and have frequently been used as a key component of healthcare legislation set forward by various governments over the past two decades (42,43).

The rationale for measuring quality and the improvement of quality in healthcare is simple: good practice and in turn, good performance when measured and reported, encourages similar behaviours within the industry (26). By directly comparing the care provided to established guidelines and benchmarks, NHS Trusts are provided with a baseline measure of performance and the ability to track progress in quality of care delivered forwards and backwards over time, through cycles of QI analysis.

QI methods have now been recognised and utilised within the NHS for over two decades. They have been instigated to address a wide variety of issues, from resource management of facilities and equipment, financial management through to adaptations to the delivery of care and clinical innovations (43). The motivation behind the compulsory implementation of these methods was to establish a culture of self-reflective adjustment and continual improvement ultimately leading to improvements in the quality of care delivered to patients (44,45). Overall, this end-goal of changing the culture of healthcare seems to have been achieved, and the Care Quality Commission (CQC) has noted a gradual increase in the uptake of true QI programmes across the UK NHS Trusts over the last decade (46–48). Moreover, in a 2017 report from the CQC, the value of established programmes of QI methods was recognised, stating 'it feels confident about the 'long-term sustainability of the quality of care' at those NHS Trusts where it finds 'an established QI culture' across the organisation' (48).

Reflective practice has become embedded within education and training programmes for both doctors and nurses who are training in the UK. This method is designed to aid practitioners to solve their daily problematic situations. Participants are encouraged to use a continuous cycle of conscious thought processes to examine actions and experiences. Through this they can develop their decision-making in practice and enhance clinical knowledge which can then be shared amongst colleagues (49,50). This reflective practice is essential when looking to improve the quality of care as it is a key aspect of proactive change to prevent errors and gives a better understanding of personal actions, which in return develops professional skills (51).

## BARRIERS TO QI IMPLEMENTATION

Despite a sustained commitment to continual improvement of quality of care delivered within the NHS over the past 25 years (52–54), reviews examining the use of QI in the healthcare sector as a whole often report mixed levels of success. Ultimately the success or failure of QI models in published healthcare literature seems to be primarily based on a trial and error system to find the best improvement methods for the specific context of the problems identified (27). Despite the recommended infrastructure needed for success laid out by numerous reviews and published papers, the level of organisation regarding implementation and subsequent accomplishment of QI has varied across Trusts within the NHS (4). This in part could be due to the historically chaotic nature of the ever-changing structure of the governing bodies and organisations involved. In many ways the veterinary sector has an advantage over the NHS here; although the ‘supervisory structures’ and governing bodies are much more numerous within the veterinary sector, their powers are far more limited, which allows the scope for a much more individualised approach to QI implementation and widespread adoption. This is contrary and potentially more successful than the one size fits all approach taken by the NHS.

Two early reviews of QI in the NHS both raised concerns over the apparent deficiency in the sustainability of changes introduced through QI analysis to upper-level management practices (55,56). At the time the reviews took place however, there was a lack of published large-scale projects that may have contributed to this assertion. Young and McClean (57) conducted a wide-ranging review of the use of the ‘Lean process’ in healthcare. Their study identified, ‘the strong evidence of the activity of champions’, acknowledging the individuals within a department that consistently made the concerted effort to measure and improve the quality of service delivered. Similar to findings in the two preceding reviews, significantly lower success rates were seen in larger scale, organisational level changes that were attempted (55,56). Subsequent reviews across the last decade have suggested that lower-level changes made by an individual or a small group are sustainable and often successful (29,58–60). In contrast, bigger projects have less than a 30% success rate in either initial implementation or achieving sustained improvements across different services or NHS Trusts (29,58–60).

This deficiency in uptake and sustained change is often put down to one or more of the following factors: structural issues, human issues and environmental context. The NHS is a combination of several complex organisations all with different goals, ethea, occupational groups, patients and technological utilisation (57,61,62). The Department of Health’s report ‘The NHS Plan’ delivered in 2000, aimed to improve quality of care through two strands of change:

1. Emphasising the use of a centralised command and control approach whereby the Department of Health will have the ultimate say over approach to reform through national standards, league tables, inspection and regulation;
2. Empowerment of frontline staff and organisations to give them ownership of their work and make them the driving force behind reform.

This slightly confused and contradictory approach is retrospectively viewed as largely counterproductive in the development of QI methods within the NHS (63,64). By putting emphasis on accountability to a higher power

whilst simultaneously trying to give the freedom to staff to direct and lead change resulted in policy taking precedence over innovation and left staff disempowered.

The setting of national standards, targets and benchmarking as performance indicators has become a dominant paradigm applied to the NHS to address QI (65). The efficacy of implementing such measures is debated amongst academics and healthcare professionals alike. It is possible to find articles to both support and discourage the use of benchmarking and target achievement exercises from a higher governing power within the healthcare sector. One study went so far as to suggest that the regimented implementation and enforcement of rigorous national standards, targets and benchmarking was encouraging 'systemic psychopathy' at the highest levels of management within the NHS (66). The paper suggests the climate of fear, bullying and target-orientated management style was directly correlated to declining standards of patient care (66). Undoubtedly this is an extreme point of view on this subject; however, Boddy et al. (66) is not alone in their concerns over the effect such measures have on patient care and employee wellbeing within healthcare (67,68). The specific challenges of benchmarking strategies utilised in healthcare systems include case-mix fallacy<sup>1</sup>, under-reporting of figures, comparison of noncomparable hospitals, selection bias, and possible implementation of inappropriate strategies for the development of quality care from incorrect benchmarking analyses (67,69). An example of the large-scale benchmarking strategies utilised in human healthcare is the Performance Assessment Framework (PAF) in the NHS. The PAF is a custom designed measuring and monitoring system employed by the Department of Health. It is designed to assist local NHS organisations keep track and maintain accountability for the service delivered by their trust whilst still meeting central government's long-term objectives and targets (70). This resulted in a paradigm being created where-by managers were attempting to conform to the social norms and expectations of the patients treated by their service, whilst simultaneously attempting to meet the imposed performance indicators, which were at times incompatible with each other (71). This provides another example where a one-size fits all approach was attempted and found to be insufficient to meet the variable nature of healthcare services. The Performance Assessment Framework was however successfully used as a communication tool between central government and local trusts, as well as providing a strategic management mechanism to generate performance information and highlight areas for change or those examples of excellent practice.

Benchmarking within veterinary medicine is certainly not as established as in human medicine, and the same level of information about the pitfalls and successes is not available. The lack of overarching government policy that collects and collates the benchmarking data and produces league tables in the NHS could be a reason for this. Many audit projects will occur internally within individual veterinary practices and corporate groups with the information not shared beyond those organisations. Larger scale projects do exist within the industry, however nowhere near the scale that exists within the NHS. The Royal Veterinary College (RVC) operates a central database called 'the VetCompass programme' collecting anonymised clinical records from practices across the country for epidemiological research purposes (72). The University of Liverpool runs a similar scheme called the Small Animal Veterinary Surveillance Network (SAVSNET). Originally this was run in partnership with the British Small Animal Veterinary Association (BSAVA), however now it is managed totally by the University. The aim of the project is to produce a system that could be utilised to improve companion animal disease surveillance at local, regional and national levels (73). This is achieved through using electronic health records (EHR) from veterinary practices and diagnostic laboratories across the UK that volunteer to submit their data. RCVS Knowledge also run 'vetAUDIT', another anonymised central database, collecting data on small animal neutering, canine cruciate procedures and antimicrobial resistance, the latter in collaboration with SAVSNET, which allows practices to assess their current standards with those reported by others (74). There is evidence in veterinary practice that there is good engagement in these projects when data are intended to be used for overall surveillance such as the SAVSNET database. When the data could potentially

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<sup>1</sup> Observational studies evaluating healthcare services or interventions that compare groups or populations within a healthcare system often undergo a 'case-mix adjustment' which accounts for any imbalances between the groups being compared. Studies examining this adjustment have, however, shown that case-mix adjustment can make any present bias worse. The belief that this case-mix adjustment has to be made is referred to as a case-mix fallacy (26,69,80).

be used, to influence client decisions about where to have their pet treated, however, the desire to share data may be reduced as competition for clients is likely to be high between practices and corporations. Ultimately the decision on whether to share data, particularly regarding clinical outcomes, is based on the final intended use of that data. It can be very easy to draw incorrect conclusions from a set of benchmarks without context, and for this reason benchmarking needs to be used carefully. That is not to assume that benchmarking cannot be successfully utilised in veterinary systems; benchmarking has been used successfully to encourage better performance within teams, and subsequently a higher quality of care or product delivered to patients (75).

## WHICH WAY FORWARDS FOR QI IN VETERINARY PRACTICE?

As described for human healthcare, QI in veterinary care with its multifaceted work systems incorporating multiple actors such as: veterinary staff, veterinary paraprofessionals including physios', dentists, hydrotherapist's, owners and trainers, requires the systematic application of scientific evidence and knowledge, and a wide variety of tools and methods applied in a personalised approach to each task (76). There are undoubtedly lessons to be learned and tools to be utilised from the experiences of implementing QI into the NHS. Parallels can be drawn from the human healthcare literature, however there are notable differences identified between the two sectors. For this reason, it would undoubtedly benefit the veterinary industry to have all available research collated into one place as the HQIP and other organisations have done for the NHS. RCVS Knowledge has taken steps to produce this central database of information regarding QI methods (39); however, more QI specific research needs to be conducted. This gap in research has perhaps slowed the uptake of QI within the veterinary sector, for example confusion around the terminology used (77) and not recognising aspects of their current practices as fitting within the definition of QI (78,79).

Conducting more research studies would provide comparable evidence of implementation and execution of a variety of QI methods in veterinary practice which would help to identify methods that will be the most beneficial. When utilised correctly, QI methods can assist to bridge the gap between practice and research by providing the implementation of evidence-based medicine into clinical practice. This assists veterinary practices to maintain and improve the standards of care delivered to their patients. Empowerment of frontline staff in the NHS has been suggested to be a key aspect regarding the success or failure of a QI intervention. For this to happen, staff need to have received training and be given time to undertake these activities. Furthermore, there needs to be acceptance that QI processes may be best implemented by veterinary nurses or the client care team rather than solely by veterinary surgeons. Encouragement should be given for individuals to utilise these methods within all job roles across the practice to be able to generate benefits for patients and clients.

## CONFLICT OF INTEREST

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