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Quality Indicators as Tools for Clinical Governance in Healthcare: A Narrative Review

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Abstract

Quality indicators are widely used to assess healthcare performance, yet their contribution to clinical governance depends on how measurement is translated into action. Clinical governance provides a framework through which healthcare organizations are accountable for continuously improving the quality of their services and safeguarding high standards of care. This narrative review examines the conceptual foundations, methodological requirements, organizational applications, and evidence of effectiveness of quality indicators within clinical governance.

PubMed and Scopus records published from January 2022 through June 2026 were searched and supplemented with foundational literature on clinical governance, indicator development, and performance measurement. Sources were selected purposively and synthesized thematically. The Donabedian structure-process-outcome framework remains a useful basis for classifying indicators, but no single domain adequately captures quality. Meaningful indicators require validity, reliability, relevance to clinicians and patients, feasibility, actionability, and interpretability with appropriate comparability.

Within clinical governance, indicators can support accountability, clinical audit, risk management, benchmarking, and continuous quality improvement when they are linked to contextual review, designated responsibility, corrective action, and remeasurement. Evidence of effectiveness is mixed. Audit and feedback produce small to moderate improvements in professional practice; public reporting has been associated with lower mortality in heterogeneous studies; and pay-for-performance has shown limited effects on patient outcomes. Target-driven use of indicators can also produce gaming and unintended consequences.

Effectiveness further depends on leadership, workforce engagement, patient participation, and trustworthy data infrastructure, which may be limited in health systems with low digital maturity. Quality indicators should therefore be treated as signals for investigation and learning rather than as stand-alone judgments of care quality.

Categories: Health Policy, Medical Education, Quality Improvement
Keywords: clinical governance, continuous quality improvement, donabedian framework, healthcare quality, patient safety, quality indicators

Introduction And Background

Healthcare quality is a multidimensional concept. The Institute of Medicine defined six aims for high-quality care: care should be safe, effective, patient-centered, timely, efficient, and equitable [1]. Quality indicators operationalize these aims. They are measurable elements of practice performance, supported by evidence or consensus, that can be used to assess and change the quality of care [2,3]. By converting broad concepts into defined variables, indicators allow performance to be monitored, compared, and interpreted within clinical and organizational contexts [4].

Clinical governance provides the organizational framework in which such information is used. The concept was introduced in the English National Health Service in the late 1990s, where Scally and Donaldson defined it as "a framework through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish" [5]. Its core elements include clear lines of responsibility and accountability for quality; a programme of quality improvement activities, such as clinical audit and evidence-based practice; policies for managing risk; and procedures for identifying and remedying poor performance [5]. Similar principles now underpin quality and accreditation frameworks in many health systems [4]. Each of these elements depends on reliable information about the quality of care, and quality indicators are the principal means of providing it.

The usefulness of quality indicators depends both on their methodological quality and on the organizational

processes surrounding their use. Poorly defined measures, inadequate data quality, inappropriate comparisons, or measurement without a subsequent organizational response may generate misleading conclusions and administrative burden rather than improvement [6,7]. Conversely, when indicators are used for high-stakes external judgments, they may distort the behavior they are intended to measure [8].

This narrative review examines quality indicators as tools for clinical governance. Although quality indicators are widely used across healthcare settings, the literature often addresses their methodological properties, performance-measurement functions, quality-improvement applications, and governance implications separately. A practical synthesis linking indicator quality with the organizational processes required to translate measurement into governance action remains less clearly articulated. This review therefore addresses their conceptual basis and classification; the characteristics and development of meaningful indicators; their governance functions; their role in continuous quality improvement and patient safety; the organizational and digital conditions required for their effective use; and the evidence on whether indicator-based interventions improve care. The review aims to integrate these strands into a practical account of the conditions under which quality indicators can function as actionable instruments of clinical governance rather than as isolated performance metrics.

Review

Methodology

This article is a narrative review. The manuscript was developed and critically appraised with reference to the six domains of the Scale for the Assessment of Narrative Review Articles (SANRA) [9]. It was not designed as a systematic review and does not aim to identify every relevant publication.

The literature search was completed on June 30, 2026. The contemporary publication window covered January 1, 2022, to June 30, 2026, based on the earliest publication date, including online-first publications. The PubMed search strings did not include an explicit publication-date filter; therefore, the predefined publication window was applied during screening rather than within the search query itself. The searches combined terms related to quality indicators with terms addressing clinical governance, patient safety, the Donabedian structure-process-outcome framework, and quality improvement. The exact search strings, filters, and raw record counts are presented in Table *1*. The searches were designed to establish a structured pool of sources for thematic narrative synthesis rather than a PRISMA-style systematic-review cohort.

Search	Database	Search string and filters	Records
P1	PubMed	"quality indicators" AND "clinical governance" AND healthcare	1*
P2	PubMed	"quality indicators" AND "patient safety" AND healthcare	159
P3	PubMed	"structure process outcome" AND Donabedian AND "healthcare quality"	75
P4	PubMed	"quality indicators" AND "quality improvement" AND "healthcare organizations"	244
S1	Scopus	TITLE-ABS-KEY("quality indicators" AND "clinical governance" AND healthcare) AND PUBYEAR > 2021 AND PUBYEAR < 2027	3
S2	Scopus	TITLE-ABS-KEY("quality indicators" AND "patient safety" AND healthcare) AND LIMIT-TO(DOCTYPE,"ar") AND LIMIT-TO(LANGUAGE,"English") AND PUBYEAR > 2021 AND PUBYEAR < 2027	108
S3	Scopus	TITLE-ABS-KEY("structure process outcome" AND Donabedian AND "healthcare quality") AND LIMIT-TO(DOCTYPE,"ar") AND LIMIT-TO(LANGUAGE,"English") AND PUBYEAR > 2021 AND PUBYEAR < 2027	9
S4	Scopus	TITLE-ABS-KEY("quality indicators" AND "quality improvement" AND "healthcare organizations") AND LIMIT-TO(DOCTYPE,"ar") AND LIMIT-TO(LANGUAGE,"English") AND PUBYEAR > 2021 AND PUBYEAR < 2027	8

TABLE 1: Literature Search Strategy and Records Identified

Counts are raw search results and are provided for transparency rather than as a systematic-review selection flow. *The single P1 record was reviewed but not exported. S1 was restricted by publication year only; non-English records were excluded during screening. S2-S4 were additionally limited to English-language articles. For all searches, the June 30, 2026, cutoff was applied to each record's first publication date.

Eligible sources were English-language original studies, reviews, and methodological or indicator-validation studies addressing the definition, development, validity, implementation, interpretation, or governance use

of healthcare quality indicators. Specialty-specific studies were eligible when they offered transferable methodological or organizational insights. Studies focused on treatment efficacy or diagnostic accuracy without a quality-measurement component were excluded. Non-English records retrieved by the unfiltered Scopus search (S1) were excluded at screening.

Titles and abstracts were screened independently by Anthoula Lagiou and Argyro Maria Agkavanaki. Disagreements were resolved through discussion and, when necessary, by consultation with Maria Bourazani. Contemporary references selected for the narrative synthesis were drawn from the records identified through the database searches.

Sources were selected purposively for conceptual importance, methodological relevance, and transferable insights into clinical governance. Because the exact-phrase searches retrieved few records specifically addressing clinical governance (Table *1*), foundational publications were additionally identified through citation tracking and targeted source identification. These sources covered the definition of clinical governance, indicator-development methods, risk adjustment, unintended consequences of performance measurement, and evidence on audit and feedback, public reporting, and pay-for-performance. Reports from recognized international organizations were included for policy and data-governance context.

Selected sources were grouped thematically according to indicator development and measurement properties, governance functions, continuous quality improvement, effectiveness of indicator-based interventions, patient safety, organizational conditions, digitalization, and methodological limitations. Evidence within these domains was compared narratively to identify recurring principles, areas of agreement, contextual differences, and limitations. No meta-analysis or formal risk-of-bias assessment was performed.

Conceptual foundations of healthcare quality measurement

No single outcome or performance measure can represent healthcare quality. Quality reflects the interaction of clinical effectiveness, patient safety, access, equity, efficiency, continuity, and patient experience with the organizational conditions under which care is delivered [1,10]. Favorable performance in one area may coexist with deficiencies in another, so balanced indicator sets are preferable to reliance on isolated measures [10].

International programmes reflect this multidimensional view. The Organisation for Economic Co-operation and Development (OECD) Health Care Quality Indicators project, for example, developed a conceptual framework to guide internationally comparable measurement, with effectiveness, safety, and patient-centeredness as its core quality dimensions [11].

Patient-centered measurement has further broadened the scope of quality assessment. Patient-reported outcome measures (PROMs) capture outcomes reported directly by patients, while patient-reported experience measures (PREMs) capture how patients experience care. The OECD Patient-Reported Indicator Surveys (PaRIS) framework illustrates how these measures can complement clinical and administrative indicators by incorporating outcomes and experiences that routine organizational data do not reflect [12].

The Donabedian framework and classification of quality indicators

The Donabedian framework classifies quality measures into three interrelated domains: structure, process, and outcome [13]. Structure indicators describe the conditions under which care is delivered, such as staffing, qualifications, equipment, information systems, and organizational policies. Process indicators describe what is done during care, such as guideline adherence, medication-safety practices, infection prevention, and documentation; because they often represent modifiable aspects of practice, they are particularly relevant to improvement. Outcome indicators describe the effects of care on patients or populations, including mortality, complications, readmissions, functional status, and patient-reported outcomes [12,13]. Mainz further distinguished rate-based indicators, which express the frequency of an event as a proportion or rate, from sentinel indicators, which identify individual serious events that warrant investigation in every case [2].

The three domains should not be read as a simple linear chain in which adequate structure necessarily produces appropriate processes and favorable outcomes. Outcomes are also shaped by organizational culture, socioeconomic conditions, patient characteristics, and interactions across the care pathway. For this reason, the framework is most useful as an organizing model within a broader complex-systems perspective [14]. Equity-oriented adaptations have also been proposed that treat equity as a defining criterion of quality across all three domains [15]. Table *2* summarizes the classification.

Domain	What it assesses	Examples	Interpretive consideration
Structure	Conditions and organizational capacity for care	Staffing, equipment, service availability, EHR infrastructure	Adequate resources do not guarantee appropriate care
Process	Activities performed during care delivery	Medication safety checks, infection prevention, guideline adherence	Often modifiable, but dependent on documentation quality
Outcome	Consequences of care for patients or populations	Complications, mortality, function, health-related quality of life, PROMs	Sensitive to patient risk, case mix, chance, and follow-up

TABLE 2: Donabedian Classification of Healthcare Quality Indicators

PREMs (patient-reported experience measures) describe experience across the care pathway and are not a fourth Donabedian domain.

EHR: electronic health record; PROMs: patient-reported outcome measures

Characteristics and development of meaningful quality indicators

Not every measurable variable is a meaningful quality indicator. To support governance and improvement, an indicator must be scientifically credible, operationally feasible, relevant, and capable of informing action [3,6]. The main characteristics are summarized below and in Table *3*.

Characteristic	Operational requirement	Governance implication
Validity	Measures the intended quality construct, with supporting evidence	Reduces misleading quality judgments
Reliability	Produces reproducible results under comparable conditions	Enables monitoring over time
Clinical and patient relevance	Addresses important aspects of care, safety, and patient-reported priorities	Supports prioritization and broadens accountability beyond administrative measures
Feasibility	Data can be collected with sustainable effort, ideally from routine sources	Limits reporting burden
Actionability	Linked to a modifiable care process or organizational response	Connects measurement with intervention
Interpretability and comparability	Explicit numerator, denominator, scope, and period; standardized definitions and appropriate risk adjustment	Enables defensible review and cautious benchmarking

TABLE 3: Core Characteristics of Meaningful Quality Indicators

The six characteristics correspond to those listed in the Abstract and summarize criteria from the indicator-development and implementation literature cited in the text.

Validity refers to whether an indicator measures the aspect of quality it is intended to measure. A valid indicator has a clear conceptual relationship with the quality domain being assessed and, where possible, evidence linking the measured structure or process to outcomes. A systematic review of perioperative structure and process indicators found that many available indicator sets had limited formal validation [16].

Reliability concerns the reproducibility of measurement across time, settings, and assessors. It depends on the indicator definition and also on standardized data collection, coding practices, documentation quality, and the consistency of the underlying information systems [17].

Relevance refers to the importance of the measured aspect of care to patients, professionals, organizations, and health systems. Indicators should address areas where variation matters and where improvement could affect safety, effectiveness, equity, patient experience, or resource use. Involving clinicians, managers, patients, and caregivers in indicator selection can improve relevance and acceptability [18].

Feasibility determines whether an indicator can be measured routinely without disproportionate effort, preferably from existing clinical or administrative data. Indicators that depend on extensive manual data collection are unlikely to be sustained [7,18].

Actionability means that the indicator reflects an aspect of care that professionals or organizations can reasonably influence. Measurement has limited governance value when poor performance cannot be linked to a modifiable process or organizational factor. Recent indicator-development studies therefore include actionability among the core selection criteria [6].

Interpretability and comparability require explicit specification of the numerator, denominator, population, data source, measurement period, and exclusions. When indicators are used for comparison, differences in case mix, data completeness, and random variation must be considered. Lilford et al. showed that outcome-based comparisons between hospitals are strongly affected by case mix, data quality, and chance, and argued that such comparisons should prompt investigation rather than judgment [19].

Where direct evidence is incomplete, indicators are usually developed by combining the available evidence with structured expert consensus, for example through Delphi techniques or the RAND/UCLA appropriateness method [3]. Recent examples include a multinational modified Delphi study of cancer-care indicators for low- and middle-income settings, which reduced a large candidate set to a smaller group of high-priority, feasible measures [20], and an evidence-informed set of pediatric trauma indicators developed with explicit criteria for importance, evidence, measurability, and actionability [6]. Professional bodies have also issued guidance on developing and endorsing quality measures that support learning health systems [21].

Before implementation, candidate indicators should undergo an operational appraisal. This should confirm the validity of the underlying construct and supporting evidence, reproducibility of measurement, availability and quality of the required data, feasibility of routine collection, and the identification of a clinically or organizationally modifiable target for improvement. Where outcomes are compared across populations or institutions, the need for risk adjustment and the adequacy of available case-mix variables should be assessed. Stakeholder review, including clinical, managerial, and patient perspectives where relevant, can help confirm relevance, acceptability, and feasibility. Indicator sets should subsequently be reassessed periodically to determine whether their definitions, data quality, actionability, and comparability remain appropriate and whether unintended effects have emerged.

Quality indicators as tools for clinical governance

Quality indicators acquire governance value when they are built into formal processes of accountability, clinical audit, risk management, benchmarking, priority setting, and strategic decision-making [4,5]. They show whether care is aligned with agreed standards, identify areas that need clinical or managerial attention, and provide a basis for assigning responsibility for improvement.

Accountability

Indicator data can inform performance review at the level of clinical teams, departments, organizations, and health systems. Internally, they inform management review and clinical governance meetings; externally, they may contribute to accreditation, regulatory reporting, and public transparency. Accountability based on indicators requires contextual interpretation, because case mix, service configuration, workforce capacity, and referral patterns influence observed performance [4,19].

Clinical Audit

Audit compares observed practice with an explicit standard. Indicators make this comparison operational by quantifying whether predefined clinical or organizational requirements have been met. Where gaps are found, audit findings determine whether further investigation or corrective action is needed [5,22].

Priority Setting

Organizations cannot address every quality problem at once. Public health quality indicators can function as tools for prioritization and leadership when methodological rigor, contextual relevance, and adequate data infrastructure are present [23]. Indicators can help governance bodies focus on areas of substantial variation, safety risk, or high improvement potential.

Benchmarking

Comparison across time, units, or organizations can reveal unwarranted variation and support learning from higher-performing services, but only when indicators have standardized definitions, comparable populations, adequate data quality, and appropriate adjustment. Without these conditions, rankings may reflect measurement or context rather than quality [17,19].

Risk Management

Indicators of adverse events, healthcare-associated infections, medication safety, complications, or failure to rescue can identify areas that need investigation. A risk-based approach prioritizes indicators according to patient risk, feasibility, actionability, and their capacity to support corrective and preventive action [17].

In each of these functions, governance value depends on the indicator and also on whether a named person or body is responsible for reviewing the result and deciding on an organizational response. Quality indicators are therefore best regarded as part of a governance architecture rather than as isolated performance statistics.

From measurement to continuous quality improvement

Clinical governance determines how quality information is reviewed and acted on; continuous quality improvement is the operational process through which identified gaps are converted into change. The central question is whether the organization can use indicator information to modify practice and then determine whether improvement has occurred.

Based on the literature reviewed, we propose a staged improvement cycle (Table *4*). A performance gap is first identified through measurement and compared with a standard, target, historical baseline, or credible benchmark. The finding is then interpreted in its clinical and organizational context, including patient characteristics, workflow, staffing, resources, and data quality. Only after this interpretive step should the organization decide whether an intervention is justified. The intervention should be explicitly linked to the identified deficit and may include protocol revision, targeted education, workflow redesign, reallocation of staff or resources, improved documentation, or digital support tools. Remeasurement is essential; without it, an organization cannot determine whether an intervention changed performance or whether any improvement was sustained [17,24].

Stage	Use of indicators	Required governance response
Measurement	Establish baseline performance	Approve definitions and data-quality checks
Comparison	Identify variation from targets or credible benchmarks	Examine clinical and organizational context
Interpretation	Investigate signals, uncertainty, and root causes	Use audit, professional review, and patient input
Intervention	Track selected changes in clinical workflow	Assign ownership and implementation resources
Remeasurement	Assess changes after intervention	Review effects and unintended consequences
Feedback and learning	Share results across teams and oversight bodies	Revise priorities, standards, and action plans

TABLE 4: Quality Indicators Across the Clinical Governance and Improvement Cycle

Conceptual synthesis by the authors of an indicator-guided improvement cycle, informed by the audit-and-feedback literature.

Audit and feedback, considered as a combined quality-improvement intervention, is one of the most established mechanisms for translating performance measurement into changes in professional practice. In the Italian EASY-NET programme, hospitals received periodic reports on process and outcome indicators for acute myocardial infarction care, compared with regional averages, targets, and hospitals of similar volume. Clinical and managerial teams reviewed the findings, identified critical areas, implemented improvement actions, and examined subsequent reports to evaluate progress [25]. A scoping review of 279 studies of feedback on healthcare outcomes found that most feedback interventions were combined with co-interventions such as education, post-feedback consultation, reminders, or action toolboxes, and concluded that feedback may be slightly more effective when combined with interventions that facilitate behavior change and when it targets process measures, alone or with outcome measures [24].

Continuous improvement also requires prioritization. Monitoring large numbers of indicators at once dilutes attention and increases administrative burden. In a multicentre intervention study in Dutch intensive care units, replacing an extensive indicator set with a core set reduced administrative burden [7]. Similarly, a Belgian consensus process for inflammatory bowel disease agreed on 199 indicators but selected a focused subset of 18 for improvement [26].

Does indicator-based governance improve care?

Whether measurement leads to better care is the central empirical question for indicator-based governance. The evidence differs according to how indicators are used.

Audit and Feedback

An updated Cochrane review including 292 studies found that audit and feedback can improve professional practice, although effect sizes vary considerably. Across 177 studies comparing audit and feedback with control for dichotomous professional-practice outcomes, the median absolute improvement in desired practice was 2.7% (interquartile range 0.0% to 8.6%), while meta-analysis estimated a mean absolute improvement of 6.2% (95% confidence interval 4.1% to 8.2%; moderate-certainty evidence) [22]. Effects tended to be greater when there was meaningful room for improvement, when feedback used individual-level data, compared performance with top peers or a benchmark, involved a local champion, used interactive delivery, facilitated engagement, and included an actionable improvement plan [22]. These features correspond closely to the governance conditions emphasized in this review: relevant measurement, credible comparison, structured feedback, and clear support for action.

Public Reporting

A systematic review and meta-analysis of public reporting identified 27 studies. A meta-analysis of 10 of them found that public reporting was associated with lower overall mortality (relative risk 0.85, 95% confidence interval 0.79-0.92), although heterogeneity was high [27]. Public reporting may therefore stimulate improvement, but the estimate should be interpreted with caution.

Financial Incentives

A systematic review of 69 studies of pay-for-performance programmes found low-strength evidence that incentives in ambulatory care may improve processes of care over two to three years, but insufficient evidence of an effect on patient health outcomes. In hospital settings, programmes had little or no effect on health outcomes, although they were associated with fewer readmissions [28].

Unintended Consequences

When indicators are used as high-stakes targets, organizations may improve measured performance without improving care. Bevan and Hood described how targets in the English health system led to gaming, including threshold effects and opportunistic distortion of reported output [8]. Mannion and Braithwaite catalogued further dysfunctional consequences of performance measurement, such as tunnel vision, gaming, and misrepresentation of data [29]. Lilford et al. warned that ranking institutions on outcome data can stigmatize providers whose apparent underperformance reflects case mix or chance [19].

Taken together, the evidence suggests that indicator-based interventions are more likely to improve professional practice when measurement is linked to repeated feedback, explicit targets, actionable improvement plans, and organizational support. The available evidence does not demonstrate that quality indicators or measurement alone improve clinical outcomes. High-stakes external strategies, including rankings and financial incentives, have shown less consistent effects on patient outcomes and may introduce risks of distortion or gaming. For clinical governance, this supports the use of indicators primarily as structured signals that trigger investigation, feedback, and improvement, while external applications should incorporate safeguards such as risk adjustment, balancing measures, and data validation.

Quality indicators and patient safety

Patient safety is a core dimension of quality and a major application of indicators within clinical governance. Safety indicators help organizations identify patterns of harm, monitor safety-related outcomes, and assess whether safety interventions produce measurable improvement. They may capture outcomes such as healthcare-associated infections, medication-related harm, falls, pressure injuries, unplanned readmissions, and failure to rescue, as well as processes associated with safer care, such as compliance with medication and infection-prevention protocols and escalation procedures [17].

Sentinel indicators illustrate how indicator systems can support clinical risk management. In an Austrian hospital study, routinely collected inpatient quality indicators were evaluated for their ability to detect serious adverse events. The combined sentinel indicators had a positive predictive value of 78.5% for detecting at least one adverse event, and 63.5% of the adverse events identified were considered potentially preventable [30].

An abnormal value is a signal for investigation rather than proof of poor care, and favorable results do not guarantee the absence of harm. Patient risk, coding practices, reporting behavior, and data completeness all influence observed values [17,19]. Composite safety measures should be interpreted alongside their constituent indicators, because aggregation can obscure differences across domains [10]. From a governance perspective, the most important step is the link between the safety signal and the organizational response: review of the underlying event or process, identification of contributory factors, assessment of preventability, corrective or preventive action, and subsequent monitoring [17].

Organizational culture and total quality management (TQM)

Measurement systems alone cannot sustain improvement. TQM regards quality as an organization-wide responsibility supported by continuous improvement, workforce participation, leadership commitment, and patient orientation [31]. Within this philosophy, indicators provide the measurement component, showing whether changes in structures, processes, or practices are associated with measurable improvement.

Leadership commitment is a central requirement. Ntais and Talias reported that the effectiveness of healthcare quality systems depends on leadership commitment, workforce engagement, appropriate data infrastructure, patient involvement, and alignment with the organizational environment, and that quality systems have less consistent effects on patient outcomes when they become primarily compliance-driven [4]. Leadership therefore has two roles: establishing quality as an organizational priority, and creating conditions in which performance data can be reviewed openly and translated into improvement.

Organizational readiness further determines whether technically sound indicators can be implemented. In a Canadian study of person-centered quality indicators, reported barriers included insufficient resources, limited staff capacity for quality improvement, healthcare professionals' motivation, and a shift in focus to COVID-19. Facilitators included leadership and champion engagement, alignment with strategic priorities, and appropriate technology for data collection and reporting [32].

Safety culture also shapes whether indicator information is used constructively. A systems-focused, non-punitive approach allows potential harm to be investigated without treating an indicator signal as proof of individual error. Structural arrangements may influence specific dimensions of safety culture: in a 2024 study, greater hospital physician integration was associated with more positive perceptions of management support for patient safety, but not with communication openness or organizational learning [33]. This association does not establish causation, but it illustrates that safety culture cannot be reduced to a single structural factor.

Finally, indicator systems should incorporate outcomes and experiences that matter to patients rather than relying exclusively on professional or administrative measures. This supports the use of PROMs and PREMs and the participation of patients in the design and interpretation of quality measurement [12]. Table *5* summarizes the organizational conditions for effective indicator-based governance.

Condition	Operational requirement	Failure mode if absent
Leadership and accountability	Named responsibility for reviewing indicators and acting on them	Reporting without decisions
Clinical and nursing engagement	Co-design, interpretation, and ownership of improvement	Administrative compliance without practice change
Learning culture	Open reporting and systems-focused response	Blame, underreporting, and weak feedback
Patient participation	PROMs, PREMs, and patient input into prioritization	Measures that overlook patient priorities
Data infrastructure	Validated, interoperable datasets and focused dashboards	Inconsistent or delayed signals
Implementation capacity	Staff time, training, and improvement resources	Actions not completed or reassessed
Strategic alignment	A focused indicator portfolio linked to patient risk	Measurement overload and fragmented priorities

TABLE 5: Organizational Conditions for Effective Indicator-Based Governance

Conceptual synthesis of reported implementation facilitators and constraints.

PROMs: patient-reported outcome measures; PREMs: patient-reported experience measures

Digitalization and data-driven clinical governance

Electronic health records, automated data extraction, clinical dashboards, wearable technologies, and artificial intelligence can reduce reliance on manual data collection and make quality information available more quickly [34]. A scoping review of digital technology in nursing quality management, organized according to the Donabedian framework, identified electronic health records, wearable devices, and artificial intelligence among the technologies in use [34].

The Swedish Primary Care Quality system is a mature example. It extracts data automatically from primary

care electronic records, provides real-time graphical feedback and benchmarking, and is used by more than 97% of primary care centers in Sweden [35]. Dashboards can also be tailored to different governance roles: an American ambulatory programme developed separate provider-facing dashboards, allowing clinicians to compare their performance with institutional standards, and leadership dashboards presenting overall and provider-level performance [36].

Greater data availability does not in itself ensure better governance. Automated extraction depends on the quality of documentation, coding, indicator definitions, and information systems, and interoperability, completeness, and data validity remain prerequisites for meaningful comparison [34]. The capacity to collect many variables can also encourage indicator proliferation without improving decision-making [7]. The OECD Recommendation on Health Data Governance sets out principles for data access, quality, interoperability, privacy, security, and accountability that apply equally at the organizational level [37].

Artificial intelligence introduces both opportunities and governance requirements. In one evaluation, 12 healthcare specialists used risk-stratified quality indicators to rate a single large language model's responses to 200 simulated clinical scenarios; ratings ranged from 89.2% in routine care to 65.4% in acute care [38]. The main relevance of this study to clinical governance is methodological. It shows that quality indicators can be adapted to evaluate AI tools, and that performance may vary with clinical risk. Its results should not be generalized to other models or to clinical deployment.

Many health systems cannot yet rely on automated, interoperable data. Where digital maturity is low, indicator-based governance may be better served by a small set of feasible indicators drawn from existing administrative data, explicit data-validation procedures, and clearly assigned responsibility for review, rather than by extensive dashboards [20,23]. Building governance structures and data-quality processes in parallel with digital infrastructure may prevent the automation of unreliable measurement.

Challenges and limitations of indicator-based governance

Indicators represent selected dimensions of performance rather than the totality of care, and several limitations follow from this.

Data Quality

An indicator may be conceptually appropriate but still misleading if definitions, coding, or data collection are inconsistent. The completeness, accuracy, consistency, and timeliness of the underlying data directly determine the credibility of indicator results [7,16].

Comparability

Organizations differ in patient characteristics, clinical complexity, referral patterns, resources, and service configuration. Risk adjustment and stratification reduce but cannot eliminate these differences, and random variation can produce apparent outliers, particularly for low-volume outcome measures [19]. Benchmarking should therefore identify variation for investigation rather than provide definitive evidence of better or worse care.

Context Dependence

Measures that are relevant and feasible in one setting may be inappropriate in another. A scoping review of palliative care service capability identified assessment and care provision, transitions between services, availability of care, and interservice collaboration as core domains that shape quality assessment and benchmarking [39].

Imbalance Across Domains

An umbrella review of palliative care for older people identified 658 unique indicators, of which 61% were process indicators, 27% outcome indicators, and only 12% structure indicators; psychological, social, cultural, and spiritual aspects of care were underrepresented [40]. An extensive indicator set may therefore still represent care quality incompletely.

Causation

Indicators can show variation or deviation from standards, but they cannot explain why the variation occurred or which intervention will correct it. Indicator findings should initiate inquiry through clinical audit, incident analysis, qualitative review, professional judgment, and patient perspectives rather than serve as a substitute for such investigation [17,24].

Incomplete Patient Involvement

Indicator systems have traditionally been shaped by professional and administrative priorities. A scoping review of chiropractic care indicators, for example, found that none of the included sources developed indicators from patients' perspectives [18].

Organizational Capacity

Even a valid, timely, and relevant indicator has limited value if the organization lacks leadership support, staff capacity, analytical expertise, or authority to implement change [32]. The limitation may lie not in measurement itself but in the absence of a functioning governance pathway that converts findings into action.

Future directions for indicator-based clinical governance

Future development should focus less on expanding the number of measures and more on relevance, usability, and integration into decision-making. Parsimonious core sets can concentrate attention on measures with clear clinical importance and improvement potential while limiting documentation burden [7,26].

Patient and caregiver involvement should become a consistent part of indicator development, with systematic integration of PROMs and PREMs [12]. Equity should be addressed explicitly. Frameworks that link quality measurement with disparities [10] and equity-oriented adaptations of the Donabedian model [15] support stratifying indicators by relevant population characteristics, such as age, sex, socioeconomic position, or place of residence, where data allow, to reveal disparities that aggregate figures conceal.

Digital infrastructure should support harmonized definitions, registries, and automated extraction, reducing parallel reporting structures, provided that indicators remain valid, interpretable, and linked to clear responsibility for action [35,37]. The use of artificial intelligence in quality monitoring will require validation, transparency, privacy safeguards, and professional oversight [37,38].

Research should evaluate whether indicator-based governance, as distinct from single feedback interventions, produces sustained changes in care processes, patient outcomes, and organizational learning. Longitudinal and interventional designs, including stepped-wedge and interrupted time-series studies, could help separate the effects of governance interventions from secular trends. Evidence from health systems with developing governance and data infrastructure is particularly needed. Ultimately, quality measurement should support a learning health system in which routinely generated data inform decisions, improvement actions, and reassessment [21].

Limitations

This review has several limitations. First, it is a narrative rather than a systematic review; source selection was purposive, and relevant publications may have been missed. Second, the database searches used exact-phrase combinations that retrieved few records specifically addressing clinical governance, so the review relied on citation tracking for foundational governance literature. Third, no formal risk-of-bias assessment was performed, and the included literature was heterogeneous in design, setting, and quality. Fourth, several illustrative findings come from specialty-specific or single-center studies whose generalizability is limited. Finally, the search was restricted to English-language publications and, for contemporary evidence, to January 2022 through June 2026.

Conclusions

Quality indicators are essential to healthcare quality assessment, but their value lies in how they are used. When they are valid, reliable, relevant, feasible, actionable, and interpretable, and when they are embedded in clinical governance structures with clear responsibility for action, they can support accountability, clinical audit, patient safety, and continuous improvement. The Donabedian framework remains a useful foundation, but contemporary governance must also take account of patient experience, equity, organizational culture, and system complexity.

The available evidence suggests that indicator-based interventions are more likely to improve professional practice when measurement is linked to repeated feedback, explicit targets, actionable improvement plans, and organizational support; this should not be interpreted as evidence that quality indicators or measurement alone improve patient outcomes. Effective governance therefore requires clearly assigned responsibility for reviewing indicator results, investigation and contextual interpretation of performance gaps, appropriate corrective action, remeasurement, and monitoring for unintended consequences. Given the heterogeneous evidence base and the narrative nature of this review, implementation should remain proportionate to local context, organizational capacity, data quality, and the strength of the supporting evidence. The effectiveness of quality indicators should be judged not by how much organizations measure, but by whether measurement contributes to safer care and better outcomes.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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