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Canadian Rheumatology Association Guidance for Developing & Endorsing Quality Measures to Support Learning Health Systems

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Abstract (max 250 words, n=198)

Objective: To review methods for developing and endorsing quality measures to inform a national quality measurement framework for rheumatology care in Canada.

Methods: We conducted a rapid environmental scan of measure development organizations from Canada, the United Kingdom, the United States and Australia. Major phases in the development of quality measures were abstracted. The results were reviewed and synthesized with members of the Canadian Rheumatology Association's Digital Quality Measurement Subcommittee.

Results: Five key steps in the measure development cycle are proposed including: conceptualization and prioritization, measure specification development, testing and validation, implementation and reporting, continuous evaluation and maintenance. Foundational to all phases is the engagement of individuals from diverse backgrounds with lived experience of disease, healthcare providers, quality measurement scientists, and partner organizations. Measures should be aligned with domains of quality (effectiveness, efficiency, equity, patient-centeredness, safety and timeliness of care delivery) and be developed transparently. Endorsement of future quality measures should, at minimum, prioritize validity, feasibility and acceptability or use/usability.

Conclusions: This paper establishes a comprehensive and relevant framework for the development and/or endorsement of quality measures in Canadian rheumatology care. This framework will permit streamlining of future quality improvement efforts at the national level.

Introduction

The Canadian healthcare system is a complex patchwork of thirteen provincial and territorial systems for delivery of health services, alongside federal responsibility for a limited suite of health services.¹ Each system strives to provide comprehensive and efficient care to meet population needs. While there have been national efforts to measure health system performance and population health, including indicators promoted by the Canadian Institute for Health Information, none of the over 100 endorsed measures relate specifically to rheumatology care.²

Learning health systems apply various inputs and sources of evidence and evaluation with the aim to improve health system performance and optimize population health outcomes³. Quality measurement plays a key role in developing learning health systems that leverage real-world data on care provided, patient and provider experiences and patient outcomes. Quality measurement is necessary to inform quality improvement activities to sustainably advance the Sextuple Aims of Healthcare⁴⁻⁶ - improving population health, improving patient experience, improving value (reducing costs), improving care team well-being, improving equity and inclusion, and the sustainability of healthcare (Figure 1).

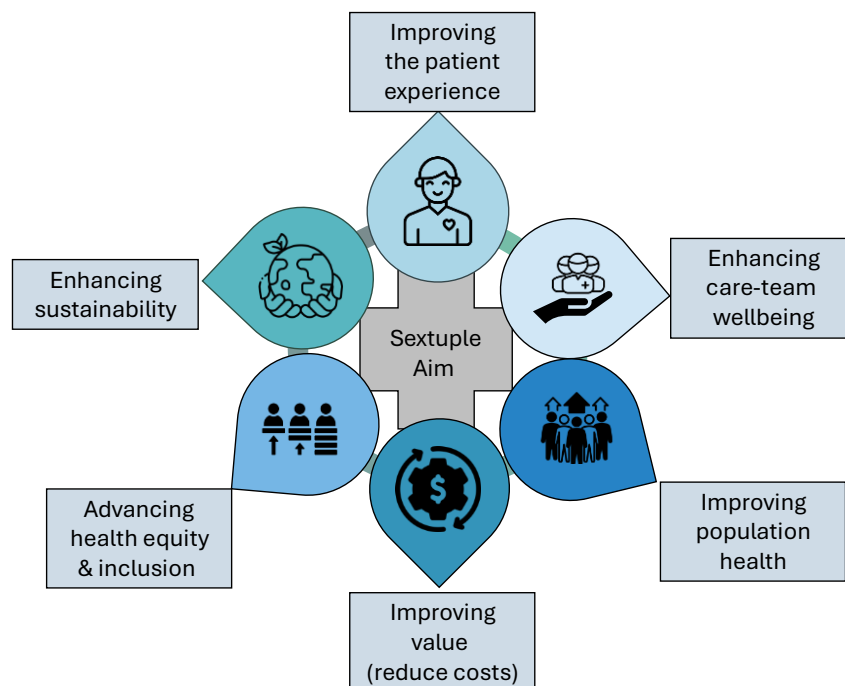


Figure 1. The Six Aims of Healthcare.

Quality of care is defined as “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.⁷ Healthcare quality has multiple domains initially defined by the Institute of Medicine (IOM)⁸ (now the National Academy of Medicine) as relating to effectiveness, efficiency, equity, patient-centeredness, safety and timeliness of care delivery. In Canada, organizations and provincial bodies have also defined similar quality domains, with some minor variations (Appendix Table 1).

Quality measures are well-defined metrics that use quantitative methods to evaluate the receipt of care/care processes and patient outcomes along the domains of quality defined above to ensure care is concordant with best practices, guidelines and/or standards of care and that patient outcomes are optimal.⁹⁻¹¹ Additionally, structures supporting the provision of care are also sometimes included as measurable elements that can help enable certain processes of care and support health system accountability.⁹ Quality measures may be applied at a health system level (i.e., zonal or provincial level) to report on health system performance and in this context may be referred to as a system-level performance measure.¹² These may also be applied at a hospital, clinic, or individual physician level.

In some jurisdictions internationally (e.g., United Kingdom, UK, and the United States, US), quality measures are used to adjust physician payments for services rendered, or for accreditation, and thus are systematically collected as part of routine practice.^{13,14} In rheumatology in Canada, to date, quality measures have been developed, tested, and implemented largely for research and local quality improvement projects.¹⁵⁻¹⁹ Individually, physicians in Canada have long been encouraged to conduct practice audits to support practice optimization as part of maintenance of certification;²⁰ however, the use of established and routinely reported/monitored quality metrics has been limited.

The landscape for quality-of-care accountability in Canada is evolving. This varies by province given the provincial administration of health services.¹ While the quality and safety of healthcare service delivery is evaluated for healthcare systems, hospitals, and some specialty service areas through accreditation and monitoring and reporting of data, more recently physician quality reporting is being mandated as well. For example, in Alberta recent legislation ensuring physician medical competency was developed under the Health Professions Act. Participation in Physician Practice Improvement Program was launched in 2021 as a mandatory program with 5-year improvement cycles.²¹ Central to meeting this legislated requirement is conducting a quality improvement activity using objective data. Similar programs are ongoing across Canadian provinces.^{22,23} While an individualized, physician-specific approach has been endorsed for quality improvement efforts given the “unique learning needs of physicians,”^{21,24} developing standardized and endorsed specialty-specific quality metrics can support physician individual improvement efforts as well as learning health systems to facilitate optimal care, resource allocation, and patient outcomes.

Historical context of Canadian Quality Measures for Rheumatology Care

Canadian rheumatologists have a long history of participating in national and international clinical guideline development panels, and as leaders in outcome measurement.²⁵ The Canadian Rheumatology Association (CRA) has a robust and active Guidelines Committee with clearly defined processes for developing and endorsing guideline recommendations.²⁶ Currently, there is no established mechanism for the CRA to endorse or approve quality measures for rheumatology.

The first set of national quality measures in rheumatology was developed in partnership with the Arthritis Alliance of Canada²⁷ and published in 2016.¹² The initial set of performance measures was designed to be measured at a system-level and defined access to care and treatment/process measures, as well as the rheumatology workforce (structure measure).¹² This work was aligned with national efforts to monitor wait times for care, and incorporated measures from other organizations²⁸ to enable benchmarking across jurisdictions. The set was tested in multiple provinces across Canada using different data sources including patient registry data,²⁹ health administrative data,³⁰⁻³² and clinic-level data.³³ The initial set of measures

did not include patient outcomes nor processes of care beyond receipt of disease modifying treatment. In collaboration with the CRA Quality Care committee, along with further engagement with patients, rheumatology healthcare providers and health system leaders, priorities for improving the quality of care for patients living with RA were identified including timely access to rheumatology care, evidenced-informed RA care practices and comorbidity management, patient education/access to information, access to multidisciplinary care, improved patient outcomes and patient experience with care, and an overarching theme of equity in care delivery.³⁴ These priorities were then used to develop a framework for measuring care quality and to identify and endorse a set of 21 quality measures for Canadian rheumatologists.^{35,36} Similar methodologies have been used by Canadian research groups and institutes to develop quality measures for childhood arthritis,³⁷ osteoarthritis,^{38,39} and to measure central triage processes access speciality arthritis care.⁴⁰ None of these measure sets have been formally endorsed by the CRA, as the organization lacked a mechanism for this. This report provides a review of quality measure development methods and outlines guidance to support the CRA in establishing a process for developing and/or endorsing quality measures for rheumatology that can be applied nationally.

Methods

The Digital Quality Improvement Subcommittee was convened by the CRA in 2023 with the aim of developing a standardized process for developing and/or endorsing quality measures in rheumatology and supporting regional and national efforts for measure implementation and quality improvement. The 10 members from 5 provinces were selected based on their experience in quality measure development, and/or implementation, and to ensure representation across provinces, as well as across adult and pediatric rheumatology. The committee members included both adult (n=2) and pediatric (n=3) rheumatologists, primary researchers (n=3), and trainees (n=2). Two patient partners and an additional clinician researcher with expertise in health equity were also engaged to contribute to this work.

We embarked upon a strategy to develop guidance for the CRA to inform future quality measure development and/or endorsement of existing measures. We first conducted a rapid environmental scan⁴¹ of measure development methods focusing on the following organizations with publicly available and well documented methods including: the US Center for Medicaid and Medicare,^{42,43} Agency for Health Research & Quality (AHRQ),⁴⁴ Canadian Institute for Health Information (CIHI),⁴⁵ the American College of Rheumatology (ACR),⁴⁶ American Academy of Orthopedic Surgeons,⁴⁷ National Institute for Health and Care Excellence (NICE)⁴⁸⁻⁵⁰ in the UK, the Australian Commission on Safety and Quality in Health Care and Australian Rheumatology Association (ARA).⁵¹ We leveraged our collective experience in rheumatology measure development and testing. We presented the results of the rapid review to the committee, and collectively refined and proposed recommendations for measure development and endorsement.

Results

A comparison of quality measure development approaches across organizations is provided in Appendix Table 2. Five phases for quality measure development were identified: conceptualization and prioritization, specification development, testing and validation, implementation and reporting, continuous evaluation and maintenance. Each phase has been shown to be critically dependent on the expertise of multiple interest holders including persons

with lived experience, providers, health quality researchers/ methodologists and partner organizations.

Measure development process

The measure development process requires an **iterative and cyclical approach (Figure 2) with engagement of multiple parties representing structures, systems, services and individuals intersecting for health service provision**

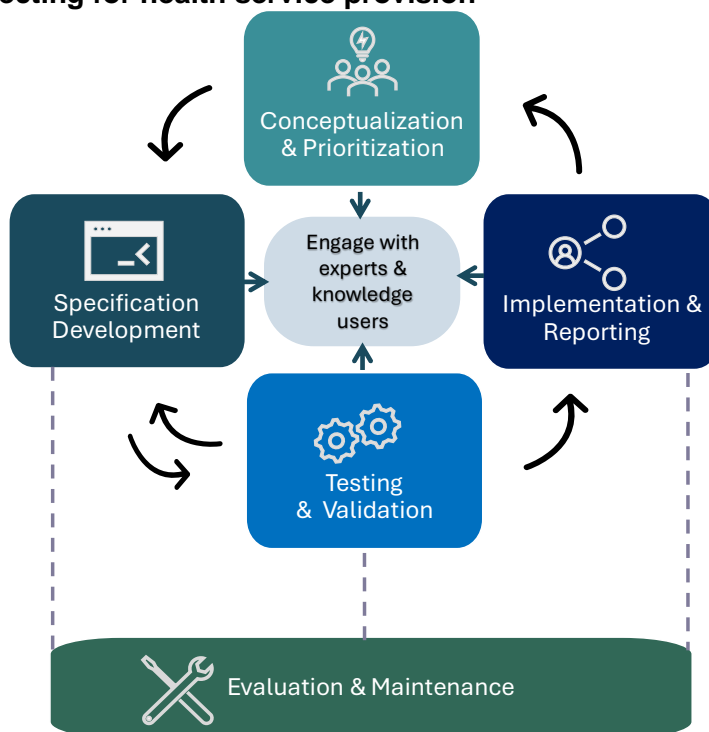


Figure 2: Overview of Measure Development process

Composition of quality measurement development teams

Development teams must be composed of multiple knowledge users and experts across all phases of the quality measure development process to support an integrated knowledge mobilization approach.^{52,53} This includes experts in measure development and testing, clinical topic experts (clinicians and/or researchers), persons with experiential knowledge of the disease of interest, and data scientists and individuals with analytic expertise in operationalizing measures. Ideally, teams should also include clinic administrators, clinical leaders and/or public health and public policy experts to support meaningful use and policy impact of the measures. Additionally, engaging with other relevant parties such as patient organizations, professional associations, regulatory bodies, and the broader public can further enrich the development process, ensuring the measures are well-rounded, transparent, and aligned with broader community needs and expectations. During the measure development phases, different team members may take on different roles as outlined below in Table 1.

Team composition should be strategic and purposeful in incorporating principles of equity, diversity, and inclusion⁵⁴⁻⁵⁶ as they relate to represent various voices across a spectrum of knowledges and experiences. Examples for health team knowledge users may include

reviewing gender balance of teams, representation from equity deserving groups, area of expertise, geographic representation, representation from community/academic practice, and years in practice. To practically address these considerations, we recommend using resources and guides developed by experts and organizations in this field.⁵⁴⁻⁵⁶

Table 1. Proposed parties to engage in the quality measure development process

Role/Expertise	Value in Measure Development Process
Recipients of healthcare services	Provide perspectives (lived experience) on the need, importance impact and relevance of the measure. Explicit forms of patient experiential knowledge should be considered. This includes embodied, monitoring, navigation, medical, relational and cultural knowledge. ⁵⁷
Clinical Topic Experts (Clinicians and/or Researchers)	Determine clinical priorities. Offer insights into the clinical aspects and relevance of the measure.
Health IT Scientists/Analysts	Evaluate the feasibility of the proposed measures for implementation using Health IT resources. Operationalize and maintain electronic specifications and reporting mechanisms.
Knowledge Mobilization Experts & Implementation Scientists	Plan, tailor and assess implementation strategies and their outcomes.
Administrators	Guide on implementation, practicality, utility, and administration of measures.
Clinical Leaders/Champions	Support clinical relevance, integration into practice, and leadership buy-in.
Policy Experts	Ensure measures align with current policies and potential policy impacts.
Other (external) relevant parties	This may include patient organizations, regulators, professional associations, and the broader public. Useful to ensure measures are well-rounded, transparent, and aligned with broader community needs and expectations.

Notably, patient partners should be included on measure development teams, and a strategy for meaningfully engaging and incorporating patient views should be described.

This is critical, as patient-centered care is contingent upon authentically incorporating patient experiential knowledge. System-level evaluative efforts have yet to establish this as a standard practice. As such, we recommend following guidance on patient engagement in research developed by the Strategy for Patient-Oriented Research,⁵⁸ including the following guiding principles: inclusiveness, support, mutual respect and co-building. Some practical steps to incorporate these principles might include, discussing the use of labels and their implicit values,

one-on-one check-ins with partners, regrouping in smaller groups and communicating post wrap-up results/impact with patient partners.⁵⁹

Involving patient partners in the development process should be supported by documentation that includes a clear description of the patient partner role, how they were recruited to the team, how they are trained/prepared/supported for the role, how they contributed to the measure development, and how they were remunerated and/or compensated^{60,61} for their time and expertise. Ideally patient partners are included in all phases of measure development, including at the team governance level.⁶² We strongly encourage that more than one patient partner be included in the measure-development team to reduce unfair burden of one patient 'representing' all patients, feeling obliged to attend all meetings and not having a relatable supporter. We note that some recent measure development efforts have held entire prioritization processes with patient panels to inform measure development.⁶³ Measuring and reporting patient engagement in the measure development process is currently uncommon in the literature. However, it should be considered as a method of increasing the transparency of reporting on patient engagement. Various formalized scales or frameworks can/have been used to measure and report on patient engagement in rheumatology research including the Patient Engagement in Research Description (PED) Framework,⁶⁴ Patient Engagement in Research Scale (PEIRS)⁶⁵ and the Guidance for Reporting Involvement of Patients and the Public (GRIPP2).⁶⁶

Teams should have a strategy for identifying and managing conflicts of interest. At a minimum all team members should complete conflict of interest forms⁶⁷ to highlight potential conflicts of interest. The CRA has guidance on conflict of interest that has been used in the guideline development process. We recommend that that this should also be applied to quality measure development.⁶⁸ Transparent policies should be described to disclose and address conflicts (or perceived conflicts) during the measure development process.⁶⁹ Of note, teams should ensure that non-financial conflicts of interests that may exert undue influence are well-documented to ensure that potential sources of bias are addressed (e.g., conflicts of commitment, professional/research interests, affiliations with organizations - Institutions, advocacy/political groups).

Measure Conceptualization and Prioritization:

The goal of measuring a structure, process or an outcome of care is to be able to use this information meaningfully to optimize healthcare delivery and patient outcomes. It sets a goal or desirable level of service, against which measurable improvement can be made. As such, it is important to consider the types of measures (their intended focus) at the outset of their development. It is worth mentioning that beyond structure-process-outcome, measure types vary in label or classification depending on the field of study and organizational or jurisdictional dictates. Table 2 highlights examples of commonly developed measure types in rheumatology. Access measures, address timely access to healthcare and may not always be within the control of individual physicians. Intermediate outcomes⁴³ (such as meeting a urate level target) may also be used when an outcome may be more challenging to capture (e.g., gout flare). Patient outcomes may be derived from patient-reported outcome measures (PROM; e.g., a physical function assessment measure or other validated PROM), or they can be another measurable outcome of care (e.g., hospitalization, mortality, disease activity). Overuse/misuse measures can also be specified to discourage inefficient or non-evidenced-based practices. Balancing measures may be defined to ensure there are no unintended consequences to care delivery models. Patient experience with care is an additional emerging domain measured by Patient Reported Experience Measures (PREMs).

Table 2. Examples of Quality Measures

Type	Example
Access Measure	Waiting times for rheumatologist consultation. ¹²
Process Measure	Percentage of RA patients prescribed or dispensed a disease modifying anti-rheumatic drug during the measurement year. ³⁵
Intermediate Outcome Measure	Percentage of patients with gout at target for serum urate.
Outcome Measure	Percentage of RA patients with active RA who have low disease activity achieved 6 months after treatment has been initiated. ³⁵
Structure Measure	Rheumatologists per capita (benchmark 1/75,000 population). ¹²

Priorities for defining what is important to measure (concepts) may come from many sources including practice guideline recommendations, topic suggestions from assembled internal panels, medical societies, or externally,⁴⁷ overuse measures may be aligned with Choosing Wisely recommendations,⁷⁰ research documenting deficits or gaps in care or patient outcomes, or qualitative work defining care priorities for patients and providers.⁴⁹ To minimize development and measurement burden and enable comparison of performance across jurisdictions, measures should be harmonized (if appropriate) with existing measures capturing similar concepts. This can be accomplished by conducting a review or environmental scan of similar measures in other provinces or jurisdictions or leveraging existing published reviews.⁷¹ However, recognizing that evidence and quality standards evolve over time, harmonizing with historical quality measures may not be appropriate in all contexts.

Once candidate measures have been outlined, several frameworks and criteria exist that can be used for measure development groups to consider when prioritizing measure development efforts or for evaluating/endorsing measures (Appendix Table 3).^{10,48,72-76} We suggest that candidate measures should be evaluated for the following attributes: **relevance/importance, validity, feasibility, acceptability, use/usability** at a minimum (Table 3).

Table 3: Essential attributes of a Quality Measure

	Attribute	Description

1	Relevance/Importance	Assesses whether the measure address an important care gap representing an opportunity for improvement that is relevant to patients and providers.
2	Clinical Evidence-Base	Ensures that the measure is aligned with current best practices and the latest evidence.
3	Evaluated as Feasible	Ensures that there are data available to accurately report on the measure with minimal burden/cost to provider, patient, or health system.
4	Psychometric Performance ¹	<p>Encompasses three domains:</p> <ul style="list-style-type: none"> a. Validity: does the measure capture what it is supposed to measure. b. Reliability: is it repeatable, precise. c. Responsiveness: is it sensitive to change when care is improved.
5	Acceptability	Assesses whether the measure is acceptable to providers and patients.
6	Use and Usability	Assesses whether the measure results can be applied by individuals or systems to improve care.
7	Equity	Assess whether the measure has an impact on health equity. This is considered during development and implementation.
¹ Sometimes referred to as scientific validity or scientific acceptability by other measure developers		

Importance of the candidate measure can be evaluated from a clinical and patient perspective in relation to existing guidelines and/or best practice standards. The psychometric testing of the measure includes whether the measure reports credible results (validity) and is reproducible (reliability).⁷² The measures should be responsive to change. The measures should also be feasible to implement through existing data or readily collectable information. In particular given rising rates of burnout,⁷⁷ measures should ideally not increase administrative burden for physicians or clinic staff unless the metric reflects an evidence-based practice that is not adequately incorporated into clinical practice (i.e., collection of disease activity or physical function measures). Additional early considerations may also include the acceptability of the measure to patients and physicians, as well as the potential for measure adoption and use for quality improvement.⁴³

Various strategies are used to ensure that measures contain these attributes. Literature reviews can support a case for the importance of the quality measure regarding known gaps in care, prevalence of condition, or impact on morbidity/mortality/quality of life of the patient population of interest. Consensus panels including clinicians, patients, allied health providers, health system leaders/planners and other knowledge users are often assembled to help prioritize candidate measures. This is often accomplished through a modified-Delphi process⁷⁸ or other consensus building process whereby the working group has multiple rounds of voting and discussion (which can be virtual) on the set of candidate measures to establish priorities for measurement and early measure specifications. Measure development teams may consider holding patient-specific panels to ensure that patient perspectives and priorities are effectively incorporated.⁶³ This requires a clear and transparent process for incorporating patient views into

the final measure prioritization. Early testing⁷⁹ of the measures is necessary to properly inform feasibility (i.e., is the data readily available and/or could be routinely collected) validity, reliability, and accuracy of the measure.

Measures should align, when possible, with existing domains of quality from quality frameworks provincially or nationally (i.e. accessibility, patient-centeredness, effectiveness etc., see Appendix Table 2). While some quality frameworks consider equity as a separate domain, equity should be considered as an underlying/overarching construct in all measure development efforts.⁵⁶ This includes considering the impact of measurement on different equity-deserving groups to ensure cultural relevance and that ethical and appropriate research and analytics are done in a thoughtful manner that avoids harm and further stigmatization, ensuring members of the equity deserving group/population/community of interest been included in the research team as co-developers or consultants, and addressing bias due to the cultural and/or institutional contexts in which the data were generated.⁸⁰⁻⁸² Careful guidance is needed to inform when it is appropriate to disaggregate quality measures by diversity factors and if relevant diversity factors are not incorporated, that appropriate acknowledgements on limitations and the implications of the lack of such analyses on the interpretation of the results.

In addition to defining what should be measured, the individual or organization accountable to the measure should be considered during conceptualization (i.e., is this a measure that is reported at a system, clinic, or physician-level). This should then be clearly articulated in measure specification and in implementation. The intended purpose of the measure should also be considered and articulated during conceptualization. Measures intended for “high-stakes” uses such as adjustments of physician payment, resource allocation, and/or accreditation need additional careful review to determine if risk-adjustment strategies need to be incorporated.^{10,83}

Measure Specifications

Quality measures are relevant for clearly defined populations (often the denominator for the measure). How this population is defined may depend on the data used (i.e., billing codes for health administrative data, disease groupers or problem list diagnoses for electronic medical records). Using a validated method for defining the population and/or assessing the validity of population definition is a critical first step.

Quality measures are often expressed as a numerator and denominator and reported as a percentage (Figure 2). The denominator represents the target population to which the measure could reasonably be applied, and the numerator represents the number of people who met the measure criteria. To address access to care, quality measures may also address waiting times. Hence, the period of measurement should also be specified. For example, it should be clear whether the measure is applied over a one-year period, “ever” since diagnosis, or after a particular event.

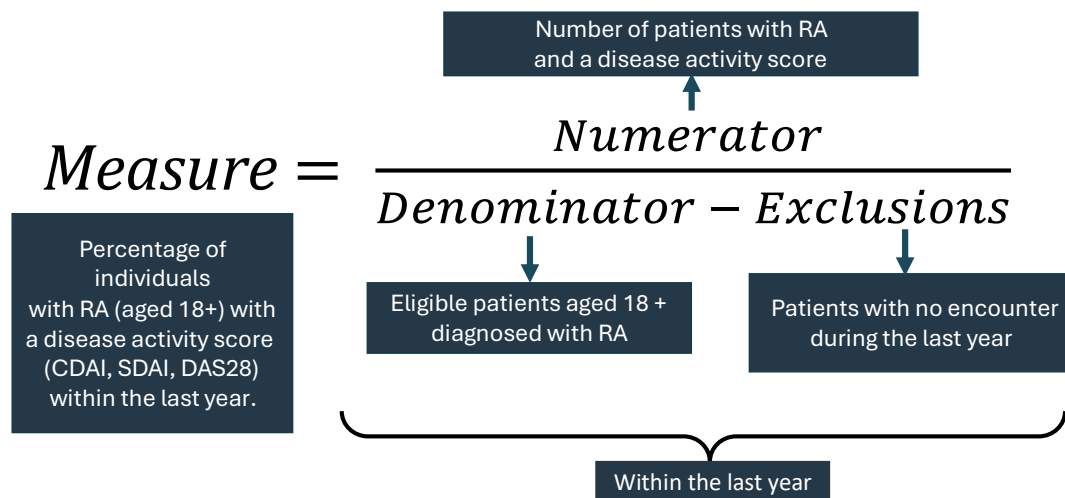


Figure 1: Anatomy of a measure

For some measures it may be appropriate to specify **exclusions** to denote scenarios where a measure may not be appropriate to apply. Exclusions should be clearly defined with an appropriate rationale for why an individual was not appropriate to include in the numerator or denominator. While exclusions are removed from the denominator prior to evaluating the numerator, sometimes individuals may be removed from the denominator after the numerator has been evaluated for an “exception”. For example, if a patient declines a care process which was offered, and the receipt of the care process was being evaluated by the measure, the patient would be excluded from the denominator. Measurement reporting design should be considered as representation of the data may influence behaviour change in those receiving quality reports; for example, are measures framed as a positive or negative attribute [e.g., the percentage of patients in low disease activity or remission (at target) versus the percentage of patients with moderate or high disease activity (not at target)]

There is increasing standardization internationally in the specifications of electronic quality measures including clinical concepts, and a complete discussion of data standardization processes is beyond the scope of the present work. In brief, standardized measure specification formats^{47,84} can be used to describe data and measure logic to enhance their interoperability for information sharing. Data models or matrices (e.g. Quality Data Model-QDM) define information on the data source (EHR, registry, claims etc.), data category (high level patient characteristic, encounter, medication etc.), data type (i.e. medication dispensed, medication ordered), code system (e.g. International Classification of Disease, SNOMED etc.) and value set in a standardized format. Centralized web-based tools such as the Measures Authoring Tool (MAT) or Measure Authoring Development Integrated Environment (MADiE)⁸⁵ assist electronic measure developers in building and testing measures in a variety of standardized data and logic formats.

Measure specifications may be subjected to consensus procedures or feedback from multiple partners and knowledge users. Feasibility testing is critical to inform final measure specification

and is often accomplished iteratively and can be helpful to inform consensus procedures during measure finalization. A public comment period on the measures can also provide additional opportunity for input on the measures from knowledge users prior to final endorsement and implementation but may come after initial testing in some instances.^{43,47} This is particularly important for high stakes measures with financial implications for providers, clinics, and/or health systems.

Measure Testing and Validation

Measure testing and validation steps may depend on the source of abstracted data used to calculate a quality measure. To start, a measure testing plan should be prepared a priori with details on formative and field-testing procedures. During this pre-implementation period, measures should be assessed across several domains. Depending on the data source, various data quality frameworks may be used to systematically assess the quality of data used prior to measure specification to ensure accuracy and completeness of the data.⁸⁶

Typically, during measurement testing, feasibility is assessed first to understand data availability, quality, and ability to generate timely reports to reduce measurement burden. Validity is essential to establish whether the measure is accurate, precise, and indicative of true quality. Reliability is tested to ensure that differences in performance observed can be understood to be differences in quality and not due to measurement error. Measure use/useability by teams to improve care as well as implementation cost and sustainability should be considered before final spread and scale of measurement. Penetration of measurement, and fidelity to measurement should be tested and can be reviewed during continuous evaluation.

For digital quality measures of health records, chart reviews may be required on a random sample of charts to ascertain the validity of the measure.⁴⁶ Teams should consider sensitivity analysis to examine how measures may change with different specifications. This information is helpful to inform final specification and can be reviewed with the measure development team when endorsing final measure specifications. Measure reporting processes should be automated wherever possible to minimize administrative burden. If measures require collection of new patient-reported outcome measures, processes for collection should be tested to minimize patient and provider burden.

Measure Implementation and Reporting

Strategies for implementation of measures need to consider the target audience(s) for the results. For example, tailored evidence-based approaches may be needed for physicians, clinics, health system leaders, and the public. Toolkits to support implementation can support practice optimization and messaging for patients, providers, and health systems about best practices and quality improvement efforts. An example is osteoarthritis care in both Ontario³⁹ and Alberta³⁸ where quality measurement frameworks have been implemented alongside quality standards or pathways with patient-facing information to support optimal practice. The American

College of Rheumatology has recently released the RA Measures Toolkit to support quality measure implementation.⁸⁷

Physician-level reporting strategies are effective at improving practice including practice reports and in-system dashboards;⁸⁸ however, effect sizes vary depending on how feedback is implemented.⁸⁹ Facilitated peer review is an effective strategy for identifying areas for quality improvement,⁹⁰ and has been incorporated into provincial programs for quality improvement.⁹¹ A further strategy is the positive deviance approach which focuses on learning from high-performers.⁹²⁻⁹⁴ This approach creates a more positive learning environment and avoids harming low-performers. It also presumes that solutions to address quality deficits may already exist amongst high performing providers that can be shared and generalized to improve the performance of others, which can increase their adoption and sustained use.^{92,95-97} Integration of quality reporting to meet physician maintenance of certification and/or provincial accreditation plans can be leveraged by health leaders and systems to help drive and incentivize practice improvement.

During implementation, quality measures may be tracked over time to measure improvements in processes and/or outcomes. They may also be compared to a standard or target (often set by an organization), or may be benchmarked against other clinics, health systems or individual clinicians.

Continuous Evaluation & Maintenance

Review of endorsed measures by measure development and/or endorsing teams is necessary, and while user feedback may occur continuously, a formal review is often done on a regular basis. Reviewing quality performance data, measure use/uptake, and literature related to the measure are all sources of information for evaluating and contextualizing measure use.⁴³ Considerations for de-implementation or retiring and/or updating measures may include a change in the standard of care or guidelines resulting in a measure that is no longer relevant. As quality improvement efforts are realized, important quality gaps may no longer exist and new priorities for quality of care may emerge. During implementation and sustainment, challenges with feasibility and/or validity may arise that were not initially apparent. The data sources available and/or processes of care may change, leading to a need to respecify existing measures. Importantly a review of potential unintended consequences of measurement is critical to ensure that by measuring and attending to one clinical process or outcome, it does not occur at a detriment to other areas. The inclusion of balancing measures in an initial set is helpful in identifying future unintended consequences in a timely manner.

Discussion

This article provides guidance for organizations/team developing and/or endorsing quality measures. As there is increasing legislative pressure in many Canadian provinces to measure care quality, an approach for defining national quality measures across rheumatologic conditions is urgently needed. This work will provide a pathway for appraising existing measures, as well as for key considerations when developing new quality measures.

This work was informed by a review of existing large organizations, government and not for profit agencies, and initiatives with well-established quality measurement development methods. It is expected that as technology accelerates, and health information systems become increasingly sophisticated, that data to measure care quality may become more readily accessible and automated and point of care displays of quality metrics more feasible. For example, the routine collection of patient-reported outcomes through patient portals at a provincial level is now possible in some Canadian jurisdictions,⁹⁸ although barriers exist currently in implementation. The methods for defining and validating quality measures is expected to evolve in the next few years as sophisticated natural language processing methods are used for evaluating care processes and/or outcomes.^{99,100}

The development and implementation of quality measures is only one part of learning health systems. Other critical aspects are incorporation of other types of knowledge beyond quality measures into learning health systems. While these may be collected as patient or provider experience measures (PREMs) and incorporated into measurement frameworks as process (i.e., was the PREM collected?) or outcome measures (i.e., was the PROM optimal?), additional qualitative enquiry with patients and providers may be necessary to completely understand opportunities for optimizing patient and/or provider experiences with the health system. For endorsed quality measures, if a gap in care or outcomes is identified, additional research (qualitative or quantitative) is usually necessary to determine the best approaches to optimize care. Furthermore, there has been an increasing emphasis of evidenced-informed approaches to improving care quality through use of implementation science models, theories and frameworks.¹⁰¹ Health systems should invest in embedded implementation scientists to support clinicians, patients and researchers in designing, implementing and evaluating innovations to address quality gaps identified through measurement.¹⁰²

While our findings were informed by a review of organizations with highly established quality measurement programs, there are some limitations to our process. We did not conduct a formal scoping review of the literature, which could have limited the breadth of our findings. The objective of our work was not to exhaustively review all measurement development and endorsement methods but to understand the most relevant and essential aspects of measure development and selection for organization endorsement. While we also considered a prioritization consensus exercise as part of our process, this was felt to be less relevant given the consistency of messaging of the essential elements to measure development across organizations which we have synthesized here.

Lastly, we would like to highlight that beyond selecting and implementing quality measures additional competencies have been identified to support learning health systems including institutional and leadership support for measurement and practice change and optimization, as well as adequate data infrastructure to support quality measurement and improvement efforts; training, support, time and adequate remuneration to help clinicians and teams participate meaningfully in improvement efforts is required.¹⁰³ In parallel, supports to meaningfully engage patients in learning health systems are needed.^{103,104}

Appendix Table 1: Dimensions of care quality as defined by provincial agencies across Canada.

Province/Organization	Safe	Patient-Centered	Accessibility and Timeliness	Continuity	Equity	Effectiveness	Appropriateness	Efficient
Institute of Medicine (IOM) ⁸	✓	✓	✓	✓ (care coordination) ¹⁰⁵	✓	✓	-	✓
Alberta Health Quality Council of Alberta ⁸⁵	✓	✓ (acceptability)	✓	-	-	✓	✓	✓
British Columbia Health Quality British Columbia ⁸⁶	✓	✓ (respect)	✓	-	✓	✓	✓	✓
Ontario Health Quality Ontario ⁸⁷	✓	✓	✓	-	✓	✓	-	✓
Saskatchewan Saskatchewan Health Quality Council ¹⁰⁶	✓	✓	✓	-	✓	✓	✓	✓
New Brunswick New Brunswick Health Council ⁸⁸	✓	-	✓	-	✓	✓	✓	✓
Manitoba Shared Health Manitoba ¹⁰⁷ (formerly Manitoba Institute of Patient Safety)	✓	✓	✓	✓	✓	✓	-	✓
Nova Scotia Nova Scotia Quality and Safety Branch ¹⁰⁸	✓	✓	✓	✓	✓	✓	✓	✓
Newfoundland and Labrador * Ministry of Health	✓	✓	✓	✓	-	✓	-	✓
Prince Edward Island* Health PEI								
Nunavut* Iqaluit Health Services (IHS)								
Yukon* Yukon Hospitals								
Northwest Territories* Northwest Territories Health and Social Authority								
Quebec¹⁰⁹ Unité de soutien au système de santé apprenant (SSA)	✓ (security)	-	✓	✓	✓	✓	-	✓

"√" Clearly and explicitly addressed.

"(text)" descriptor used in the referenced source.

"**" Adopted or evaluated healthcare quality using Accreditation Canada's (qmentum) framework¹¹⁰

"_" Not found to explicitly stated. This does not rule out the possibility that it has been described or implied elsewhere. E.g., Equity by some organizations has been described under accessibility.

Appendix Table 2: Measure development strategies of other organizations

Stage	National Organizations					Field- specific organizations		
	Center for Medicaid and Medicare (CMS) ^{42,43,74}	Canadian Institute for Health Information (CIHI) ⁴⁵	National Institute for Health and Care Excellence (NICE) ⁴⁸⁻⁵⁰	Australian Commission on Safety and Quality in Health Care	Agency for Health Research & Quality (AHRQ) ⁴⁴	American College of Rheumatology (ACR) ⁴⁶	Australian Rheumatology Association (ARA) ⁵¹	American Academy of Orthopedic Surgeons (AAOS) ⁴⁷
Conceptualization & Prioritization	Concepts developed from information gathering processes (literature & environment scans, input from experts, related measures, gap analysis) to prioritize. Measures should be supported by a business case	Titled as the “initiate/evaluate” stage. Ideas are generated and evaluated based on a needs assessment, literature reviews, environmental scans and consultation with experts.	Topics/suggestions generated from the NICE library of new publications, and updates to quality standards ^a , public policy & national performance reports. Topics are published for comment then prioritized by the quality standards committee.	Topic-specific work groups generate candidate topics based on guidelines, gaps, experience & consumer considerations.	Within specific topic areas, a list of candidate indicators is compiled based in the available evidence (literature review) and in consultation with field experts.	Measure topics abstracted from literature reviews & updated practice guidelines related measures. Concepts prioritized via consensus ratings by interdisciplinary experts.	Ideas first generated from a workshop with consumers that reviews current standards of care. Feedback compiled & presented to multi-disciplinary work group of providers to prioritize.	Topics generated from a public call for suggestions on AAOS communication channels & an environment scan to identify gaps & opportunities. A technical expert panel develops & prioritizes topics based on a given set of criteria. (e.g. National Quality Forum Criteria Matrix)
Specification Development	Involves developing technical details for consistent implementation. Measures abstracted from electronic sources should be detailed in a standardized format (e.g. Quality Data Model (QDM), Clinical Query Language (CQL), Bonnie)	Designated as the “develop” stage. Involves the fleshing out the indicator methodology, defining inclusion/exclusion criteria, and refining the detail based on expert led feedback.	Drafts indicators through iterative process. Drafted statements/measures released for a 4-week strategic partner comment period. Other experts consulted as needed. Decisions to revise drafted statements made by the quality standards committee.	Details on specification methodology does not outline but emphasis is placed on early strategic partners engagement to maximize on opportunities for feedback throughout the drafting and revision of clinical standard statements.	Initial specifications are drafted and informed by relevance and data availability. Drafted indicators are reviewed by a panel for face validity. Where applicable factors relevant to risk adjustments are included.	Utilizes standardized electronic specification formats indicated by CMS (e.g., QDM, CQL) for feasible and reliable measure construction.	High-priority areas are drafted in into quality statements ^a then reviewed at a 2 nd multi-disciplinary group workshop. Drafted statements are then assessed for broad consensus via a national online survey. A 3 rd multi-disciplinary workshop is convened to remove or modify quality statements, measures, indicators.	Adopt the same technical specification format recommended by the CMS (QDM) to facilitate measure harmonization, interoperability, and information sharing.

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Testing & Validation	Require formative (alpha) and field (beta) testing to assess feasibility, strengths & weaknesses of the constructed measure.	The “calculate” stage. Conducts post-methodology refinement by applying the developed metric to a broader dataset. Conduct safety checks to ensure that the metric is standardized, repeatable & free from error.	Tests for feasibility & acceptability based on use (quality improvement or pay-for-performance). All measures are vetted for validity as defined by the NICE. Cost-effectiveness, resource impact & threshold testing only conducted for pay-for-performance measures. Qualify that general practice level indicators should be tested at about 30 pilot sites	Available details do not outline a specific process for this stage.	An analytical plan to test & validate the indicators is drafted and executed. Measure specifications are refined post-analysis. A summary of evidence is included the finalized draft of the indicator specifications.	Field testing at minimum 3 sites for data capture feasibility & measure validity.	Available details do not outline a specific process for this stage	Adopts CMS testing methodology (alpha & beta). Highlight the importance of assessing for intended use & unintended consequences.
Implementation & Reporting	Transitions measures to active state, solicits strategic partner’s input.	Labelled the “release” stage. Results report released internally then publicly. Strategic partners are consulted before public release.	Final approval given the NICE Guidance Executive. Standards released for online publication.	Drafted statements distributed for public consultation before final publication. Commission prescribes a pathway for endorsement of statements by non-commercial organizations.	As part of the Implementation Phase, Indicator specifications are coded and tested for accuracy and consistency. User documentation is developed as part of this process.	Submits measures for national quality endorsement and contributes to a coherent performance measurement strategy.	Quality statement ^a reviewed by consumers for the development of “consumer focussed care guide” prior to their public release.	Public comment period. If no revisions, approved by AAOS board & pursued for endorsement by a national consensus-based entity .
Continuous Evaluation & Maintenance	Describe detailed protocols for ongoing monitoring, data collection, annual updates & re-evaluations.	State that indicators/measures are regularly evaluated for usability and reviewed for redevelopment or retirement.	Measure reviewed at thier scheduled date, when guidance is updated, or risks identified.	Periodically reviewed (every 4 years) for relevance.	Evidence of use is evaluated. Technical specifications are updated, and indicators undergo periodic review by clinical panels. Measures are retired if there is a loss of use and/or unintended consequences. Indicator coding is removed. Documentation is updated.	Available details do not outline a specific process for this stage.	Available details do not outline a specific process for this stag.	includes an annual update to ensure that measures comply with maintenance review outcomes outlined by CMS. Also follow the required maintenance procedures to retain or update the endorsement status of a measure.

^a Quality standards is an overarching term, used in the UK and Australia, that encompasses both of quality statements (indicators) and quality measures (metrics).

Appendix Table 3: Summary of attributes of a High-quality measure identified by various organizations.

Source	Attribute (Verbatim)	Description (Verbatim) Described as statements, questions, or bullet points
1. Relevance/Important		
ACR	Clinical and public health importance	<p>Measure/results are relevant to strategic partners (clinicians, patients, or purchasers)</p> <p>Measure addresses a condition with a high prevalence or incidence and/or with significant morbidity or mortality.</p> <p>Measure assesses the equitable distribution of health care</p> <p>Results demonstrate potential for improvement.</p> <p>Measure/results have potential to inform interventions that improve quality</p>
ACP	Importance	<p>Meaningful clinical impact: Implementation of the measure will lead to a measurable and meaningful improvement in clinical outcomes.</p> <p>High impact: Measure addresses a clinical condition that is high impact (e.g., high prevalence, high morbidity, or mortality, high severity of illness, and major patient or societal consequences).</p> <p>Performance gap: Current performance does not meet best practices, and there is opportunity for improvement.</p>
NICE	Importance	The indicator reflects a specific priority area identified by NHS England or Public Health England. The indicator relates to an area where there is known variation in practice. The indicator will lead to a meaningful improvement in outcomes. The indicator addresses under or over-treatment.
PQM	Importance	<p>Attach a logic model depicting the relationship between structures and processes and the desired outcome.</p> <p>Summarize evidence of measure importance from the literature linking the structure/process/intermediate outcome to the outcome</p> <p>What is the measure’s anticipated impact on important outcomes? [For initial endorsement]</p> <p>Provide evidence of performance gap or measurement gap by providing performance scores on the measure as specified (current and over time) at the specified level of analysis [For maintenance]</p> <p>Explain why existing measures/quality improvement programs are insufficient for addressing this health care need?</p> <p>Provide evidence the target population (e.g., patients) values the measured outcome, process, or structure, and finds it meaningful. Describe how and from whom you obtained input.</p>
HQO	Important/ Relevant	The indicator reflects an issue that is important to the general population of Ontario and to relevant strategic partners in the health system and is consistent with the mandate of Health Quality Ontario.
OECD	Relevance	<p>Impact of disease or risk on health and health expenditures. What is the impact on health and on health expenditure associated with each disease, risk or patient group?</p> <p>Importance. Are relevant strategic partners concerned about the quality problem and have they endorsed the indicator?</p> <p>Potential for improvement. Does evidence exist that there is less-than-optimal performance, for example, variation across providers?</p> <p>Clarity of purpose and context. Are the purpose of the indicator and the organizational and healthcare contexts clearly described?</p>
2.Evidence based		
CMS	Evidence and Performance Gap- Importance	<p>evaluates the extent to which specific measure focus is evidence-based and important to making significant gains in health care quality where there is variation in or overall, less-than-optimal performance.</p> <p>Sub Criteria Under this Category include:</p> <p>Evidence to Support the Measure Focus/Measure Intent- The measure focus is evidence-based demonstrated as: Outcome, Process, Structure, Patient-reported evidence, and Efficiency- combine the concepts of resource use and quality.</p> <p>Performance Gap, including disparities - It is insufficient to only state the measure is related to an important, broad topic area. Evaluate whether the measure focus is a quality problem, an</p>

Source	Attribute (Verbatim)	Description (Verbatim) Described as statements, questions, or bullet points
		<p>opportunity for improvement with data showing considerable variation, overall, less-than-optimal performance in the quality of care across measured entities, or disparities in care across population groups.</p> <p>Explicit Logic -Provide a logic model (diagram) with a description of the relationships between structures and processes and the desired outcome.</p> <p>Harmonization- Consider harmonization from the beginning of development of the measure. The expectation is for CMS measure developers to consider harmonization throughout the Measure Lifecycle. Either harmonize the measure specifications with related measures so that they are compatible or justify the differences.</p>
ACP	Clinical Evidence base	<p>Source: Evidence forming the basis of the measure is clearly defined with appropriate references.</p> <p>Evidence: Evidence is high-quality, high-quantity, and consistent and represents current clinical knowledge.</p>
NICE	Evidence base	The indicator is derived from a high-quality evidence base. The indicator aligns with the evidence base.
HQO	Evidence-Based	There is good evidence to support the process, or evidence of the importance of the outcome of measuring and reporting on the indicator.
3. Feasible		
ACR	Feasibility	<p>Data elements required for the numerator, denominator, and exclusions are available.</p> <p>Potential inaccuracies or errors of the measure (often due to data source limitations) are identified.</p> <p>Issues related to the timing and frequency of data collection, patient confidentiality, and other feasibility or implementation issues are noted.</p> <p>Information related to cost and burden of data collection is available</p>
OECD	Feasibility	<p>Previous experience. Is the measure in use in pilot programmes or in other countries?</p> <p>Availability of required data across the system. Can information needed for the measure be collected in the scale and timeframe required?</p> <p>Cost or burden of measurement. How much will it cost to collect the data needed for the measure?</p> <p>Capacity of data and measure to support subgroup analyses. Can the measure be used to compare different groups of the population (for example, by socioeconomic status to assess disparities)?</p>
ACP	Measure Feasibility and Applicability	<p>Attribution: Level of attribution specified in the measure is appropriate (measure ties the outcomes to the appropriate unit of analysis) and is clearly stated.</p> <p>Physician's control: Performance measure addresses an intervention that is under the influence of the physician being assessed.</p> <p>Usability: Results of the measure provide information that will help the physician to improve care.</p> <p>Burden: Data collection is feasible, and burden is acceptable (low, moderate, high)</p>
CMS	Feasibility	<p>This criterion evaluates the extent to which required data are readily available, captured without undue burden, and implemented for performance measurement. Feasibility is important to the adoption and ultimate impact of the measure. Assess feasibility through testing or actual operational use of the measures.</p> <p>Sub Criteria Under this Category include:</p> <p>Byproduct of care (clinical measures only) - For clinical measures, use routinely generated data used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order) for the required data elements.</p> <p>Data Elements are available in EHRs or other electronic sources- The required data elements are available in EHRs or other electronic sources. If required data are not in EHRs or existing electronic sources, specify a credible, near-term path to electronic collection.</p>

Source	Attribute (Verbatim)	Description (Verbatim) Described as statements, questions, or bullet points
		Data Collection Strategy can be implemented - Demonstrate how the measure developer can implement (i.e., already in operational use or testing demonstrates the strategy is ready to put into operational use) the data collection strategy (e.g., data source/availability, timing, frequency, sampling, patient-reported data, patient confidentiality).
HQO	Feasible	The indicator is calculable; data is timely.
NICE	Feasibility	The indicator is repeatable. The indicator is measuring what it is designed to measure. The indicator uses existing data fields, or the burden of additional data collection is acceptable.
PQM	Feasibility	<p>Describe the feasibility assessment showing you considered the people, tools, tasks, and technologies necessary to implement this measure. If an eCQM, please attach your completed eCQM Feasibility Scorecard. [For Initial Endorsement]</p> <p>Describe how the feasibility assessment informed the final measure, indicating any decisions made to adjust the measure in response to data availability.</p> <p>Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).</p>
4. Psychometric Performance (Scientific Reliability and Validity)		
ACR	Scientific validity	<p>Measure is valid, i.e., assesses what it purports to measure.</p> <p>Measure is reliable, i.e., results are reproducible and not subject to significant random variation.</p> <p>Measure includes risk adjustment when relevant, i.e., for factors outside the control of the provider or the health care practice (e.g., health insurance status, socioeconomic factors, or significant medical comorbidities)</p>
OECD	Scientific soundness	<p>Validity. Does the indicator measure what it is intended to measure? The indicator should make sense logically and clinically (face validity); it should correlate well with other indicators of the same aspects of the quality of care (construct validity) and should capture meaningful (i.e., evidence-based) aspects of the quality of care (content validity).</p> <p>Sensitivity and specificity. Does the indicator detect only a few false positives and false negatives?</p> <p>Reliability. Does the measure provide stable results across various populations and circumstances?</p> <p>Explicitness of the evidence base. Is scientific evidence available to support the measure (for example, systematic reviews, guidelines, etc.)?</p> <p>Adequacy of the appraisal concept. Are reference values fit for purpose, and do they allow identification of good and bad providers?</p>
ACP	Measure Specifications	<p>Clarity - numerator and denominator clearly defined: For process measures, numerator includes a specific action that will benefit the patient, and denominator includes well specified exclusions; For outcome measures, numerators detail an outcome that is meaningful to the patient and under the influence of medical care.; Denominator includes well-specified and clinically appropriate exceptions to eligibility for the measure.</p> <p>Clarity - all components necessary to implement measure clearly defined</p> <p>Validity: The measure is correctly assessing what it is designed to measure, adequately distinguishing good and poor quality.</p> <p>Reliability: Measurement is repeatable and precise, including when data are extracted by different people.</p> <p>Risk adjustment: Risk adjustment is adequately specified for outcome measures.</p>

Source	Attribute (Verbatim)	Description (Verbatim) Described as statements, questions, or bullet points
CMS	Reliability & Acceptability - Scientific Acceptability	<p>Scientific acceptability is the extent to which the measure, as specified, produces consistent (i.e., reliable) and credible (i.e., valid) results about the quality of care when implemented.</p> <p>Sub Criteria under this attribute.</p> <p>Reliability- The measure is well-defined and precisely specified for consistent implementation within and across organizations and allow for comparability. This can be done through reliability testing where measure developers demonstrate that data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population, at the same time, and/or the measure score is precise. more info here</p> <p>Validity - Evaluation of a measure’s validity involves an assessment of consistency between measure specifications and a correct, credible reflection of the quality of care provided adequately identifying differences in quality. Therefore, evaluation of a measure’s validity requires:</p> <ol style="list-style-type: none"> 1. Data Elements Correct 2. Testing Exclusions and Exceptions 3. Risk Adjustment/ Stratification 4. Evaluating meaningful differences - performance. 5. Showing Comparable Results 6. Frequency of Missing data and Distribution <p>CMS Types of validity - Construct validity, Convergent validity, Criterion validity, Discriminant/contrasted groups, Face validity, Predictive validity</p> <p>Empirical Analysis (Composite Measures Only) - For composite measures, empirical analyses support the composite construction approach and demonstrate 1) Component measures fit the quality construct and add value to the overall composite while achieving the related objective of parsimony to the extent possible. 2) Aggregation and weighting rules are consistent with the quality construct and rationale while achieving the related objective of simplicity to the extent possible.</p>
HQO	Interpretable	The indicator is clear and can be easily interpreted by a range of audiences; the results of the indicator are comparable and easy to understand, including what constitutes improved performance, such as clear directionality (i.e. a lower number is better).
HQO	Measurable	There are data sources that can be used to measure the indicator.
HQO	Data Quality	The indicator includes data quality such as technical definition, calculation methodology, validity and reliability of measurement, and timeliness of data.
NICE	Specification	The indicator has defined components necessary to construct the indicator, including numerator, denominator and exclusions. The indicator has a minimum population level.
NICE	Risk	The indicator has an acceptable risk of unintended consequences.
PQM	Scientific Acceptability	Defined similarly to CMS but operationalized as a 19 Item questionnaire. See PQM Measure Evaluation Rubric (Appendix D) for more details
5. Use and Usability		
OECD	Meaningfulness	<p>Comparability: does the indicator permit meaningful comparisons across providers, regions, and/or countries?</p> <p>User-friendliness: is the indicator easily understood and does it relate to things that are important for the target audience?</p> <p>Discriminatory power: does the indicator distinguish clearly between good and bad performers?</p>
CMS	Usability and Use	Evaluation of a measure’s usability and use involves an assessment of the extent to which intended audiences (e.g., consumers, purchasers, measured entities, policy makers) could use or are using performance results for both accountability and performance improvement to achieve the goal of high-quality and efficient health care for individuals or populations

Source	Attribute (Verbatim)	Description (Verbatim) Described as statements, questions, or bullet points
PQM	Usability and Use	<p>What are the planned and/or current uses? What are the actions measured entities can take to improve performance on this measure?</p> <p>Describe and summarize the feedback on measure performance and implementation from the measured entities and others. (For maintenance only)</p> <p>Describe how you considered the feedback when developing or revising the measure specifications or implementation, including whether you modified the measure and why or why not. (6. For maintenance only)</p> <p>Discuss any progress on improvement (trends in performance results). If use of the measure demonstrated no improvement, provide an explanation.</p>
HQO	Actionable	The indicator is likely to inform and influence public policy or funding, alter behaviour of health care providers, and/or increase general understanding by the public to improve quality of care and population health.
ACP	Appropriate Care	<p>Overuse: Measure will promote stopping use of a test or treatment in general population or individuals where the potential harms outweigh the potential benefits.</p> <p>Underuse: Measure will encourage use of a test or treatment in general population or individuals in whom the potential benefits outweigh the potential harms.</p> <p>Time interval: Time interval to measure the intervention is evidence-based.</p>
6. Acceptability		
NICE	Acceptability	The indicator assesses performance that is attributable to or within the control of the audience. The results of the indicator can be used to improve practice.
7. Equity		
PQM	Equity	Describe how this measure contributes to efforts to address inequities in health care. Provide a description of your methodology and approach to empirical testing of differences in performance scores across multiple social contextual variables (e.g., race, ethnicity, urbanicity/rurality, SES, gender, gender identity, sexual orientation, age). Provide an interpretation of the results, including interpretation of any identified differences and consideration of negative impact or unintended consequences on subgroups.)
<p>Abbreviations: ACR- American College of Rheumatology; ACP- American College of Physicians; CMS - Center for Medicaid and Medicare; HQO- Health Quality Ontario; NICE- National institute for Health and Care Excellence; OECD - Organisation for Economic Co-operation and Development; PQM – Partnership for quality Measurement</p>		

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