Although the definition used for this strategy is consistent with prior reviews,[52] the authors recognized the potential heterogeneity of included interventions and accordingly planned to analyze this strategy with respect to the aforementioned substrategies.

9. **Financial, regulatory or legislative incentives—**this strategy encompassed any intervention having features consistent with at least one of the following descriptions:
   a) Positive or negative financial incentives directed at providers (e.g., regarding adherence to some process of care or achievement of target patient outcome).
   b) Positive or negative financial incentives directed at patients.
   c) System-wide changes in reimbursement (e.g., capitation, prospective payment, shift from fee-for-service to salary).
   d) Changes to provider licensure requirements.
   e) Changes to institutional accreditation requirements.

The authors further abstracted information about the use of clinical information systems, including their role in identifying eligible study participants for QI interventions, for generating clinical reminders, for enabling decision support, and their ability to cultivate data for audit and feedback.

Table 1 presents the major types of QI strategies in the first column, with examples of corresponding substrategies in the second column. The table illustrates the manner in which some QI strategies and substrategies target a single audience, while others attempt to influence multiple audiences, such as patients and health care delivery systems. Many QI strategies evaluated in the literature combine substrategies and audience targets, a situation that makes for challenging analyses of effectiveness. Such combinations often limit the ability of researchers to interpret the active component(s) of a particular intervention.

Table 1. Taxonomy of QI strategies with examples of substrategies

QI strategy	Examples
Provider reminder systems	• Reminders in charts for providers • Computer-based reminders for providers • Computer-based decision support
Facilitated relay of clinical data to providers	• Transmission of clinical data from outpatient specialty clinic to primary care provider by means other than medical record, e.g., phone call or fax
Audit and feedback	• Feedback of performance to individual providers • Quality indicators and reports • National/State quality report cards • Publicly released performance data • Benchmarking – provision of outcomes data from top performers for comparison with provider's own data

QI strategy	Examples
Provider education	• Workshops and conferences • Educational outreach visits (e.g., academic detailing) • Distributed educational materials
Patient education	• Classes • Parent and family education • Patient pamphlets • Intensive education strategies promoting self-management of chronic conditions
Promotion of self-management	• Materials and devices promoting self-management
Patient reminder systems	• Postcards or calls to patients
Organizational change	• Case Management, Disease Management • TQM, CQI techniques • Multidisciplinary teams • Change from paper to computer-based records • Increased staffing • Skill mix changes
Financial incentives, regulation, and policy	*Provider-Directed:* • Financial incentives based on achievement of performance goals • Alternative reimbursement systems (e.g., fee-for-service, capitated payments) • Licensure requirements *Patient-Directed:* • Co-payments for certain visit types • Health insurance premiums, user fees *Health System-Directed:* • Initiatives by accreditation bodies (e.g., residency work hour limits) • Changes in reimbursement schemes (e.g., capitation, prospective payment, salaried providers)

studies that make interpretation difficult, despite any insights they might provide with regard to applicability (e.g., external validity). Level 4 evidence was excluded; as such, no uncontrolled studies were considered. The studies also were catagorized by types of outcomes measured. Studies that did not report any of the outcome types specified in Table 3 also were excluded.

Table 2. Hierarchy of study designs

Level 1. Randomized controlled trials

Level 2. Controlled Before–After (CBA)—contemporaneous observation periods for control and intervention groups before and after an intervention

Interrupted time series (ITS)—well-defined time period for intervention implementation and at least three time points both before and after intervention

Quasi-randomized trials—contained at least two cohorts of patients assembled prospectively based on an allocation procedure that was non-random, but arbitrary, in the sense of bearing no apparent connection to patient or provider factors that might affect intervention outcome (e.g. alternation, date of birth, even/odd character of provider or patient identification)

Level 3. Observational studies with controls—includes before-after and time series not meeting strict definitions of CBA and ITS (above), case–control studies, cohort studies with controls.

Level 4. Observational studies without controls (e.g., cohort studies without controls and case series)

Table 3. Outcomes relevant to inclusion criteria*

	Measures of Disease Identification	Measures of Disease Control	Measures of Provider Adherence	Measures of Patient Adherence
Included studies reported one of more of the outcomes presented here	Proportion of eligible patients receiving appropriate screening (i.e., blood pressure measurements, cancer screening)	Clinical outcomes Intermediate outcomes with established connections to clinical outcomes (e.g., HbA_{1c}, blood pressure, lipid levels)	Performance of specific processes of care with established connections to patient outcomes Adherence to well-recognized practice guidelines (e.g., from professional societies)	Biochemical assays (e.g., blood or urine drug levels, urine cotinine for smoking cessation) Pharmacy data (e.g., refilled prescriptions) Home or office pill counts Patient interviews

*Measures of provider knowledge, patient understanding, self-efficacy, or other intermediate outcomes were included only when they accompanied outcomes listed in the above table. For instance, a study reporting a measure of patient adherence with care as well as changes in patient understanding, self-efficacy, or empowerment would be included. Similarly, articles reporting only measures of satisfaction with care or resource use were not included unless they also reported measures of disease identification, disease control, or provider or patient adherence.

Evaluation of Quality Improvement Strategies

Most of the reported information addressed QI strategy effectiveness. There was a paucity of available data on the safety, equity, and applicability of the various approaches.

A number of factors may influence the success of a QI strategy. Table 4 summarizes many of these factors and organizes them into three categories. Relatively little information on the features of the QI target was obtainable, due to time restrictions. This is a potential limitation of the analysis. The authors have noted in the table those factors for which information was obtained, as well as those factors included in the synthesis.

Table 4. Features that may affect success of QI interventions

Features of the Study	Features of the QI Intervention	Features of the QI Target
Study setting √ Study period √ Country (√√ US vs. non-US) __ Financial/organizational structure of health care system √ Type of clinical setting (e.g., general vs. specialty clinic, community-based, work site intervention) √ patient population (e.g., specific disease being studied (diabetes vs. hypertension vs. asthma, etc.), early vs. advanced illness, significant comorbid conditions, underserved, poor adherence) √ magnitude of local quality gap *Study methodology* √√ Trial design (e.g., RCT, quasi-RCT, CBA, ITS)† √√ Concealment of allocation √√ Blinding (patients, providers) √√ Agreement in unit of randomization and unit of analysis	*Type of QI strategy* √√ Broad category of QI strategy (e.g., patient education, provide education, audit & feedback, etc.) √√ Number of QI strategies employed in the intervention * Intensity of QI strategy (e.g., number of educational sessions, frequency of audit & feedback cycles, extent of case management) __ Involvement of top management and other forms of institutional support * Format in which QI strategy delivered (e.g., face-to-face, dissemination of printed materials) √√ Use of an information system	*Content* __ Attitude of clinicians toward target (driven in turn by guideline complexity, evidence base, concordance with existing practice) __ Complexity of action required by provider (e.g., making a referral, ordering a test, adjustment of medication regimen, performing specific aspects of history or physical) __ Baseline level of adherence with target __ Difficulty in achieving target (e.g., achieving a specific goal such as blood pressure below a certain value vs. process performance irrespective of outcome)

† RCT = randomized controlled trial; CBA = controlled before–after study; ITS = interrupted time series.
__ Indicates no information collected
* Indicates information captured in text answers by reviewers rather than structured format
√ Indicates data collected relevant to this feature
√√ Indicates data collected and included in summary analysis, when feasible for a given topic