​​​​​​​**​​​​​​​RAPID RESPONSE TEAM**

Busy hospitals often experience delays in recognizing and responding to acute deterioration in patients' clinical status.   
Rapid response teams (RRTs) can provide early intervention in case of clinical decline, and their use is associated with improved patient outcomes (reduced incidence of cardiac arrest and associated mortality).  RRTs are characterized by the following:

* **Multidisciplinary team:**   include practitioners from multiple health professions, including nurses, physicians, and respiratory therapists.
* **Patient assessment:** support primary care teams by regularly monitoring patients who are at high risk of clinical decline.   can assess and immediately treat patients when signs of clinical deterioration appear, preventing serious sequelae.
* **Activation criteria:**  are typically activated based on early clinical warning signs manifested by the patient (sustained tachypnea, arrhythmia, uncontrolled pain

**Psychological safety** refers to team members' **comfort** in taking necessary and appropriate actions for safety (openly expressing concerns, recruiting help).   
Psychological safety promotes effective **teamwork** and is an essential feature of **high reliability organizations  
  
​​​​​​​**

|  |  |
| --- | --- |
| **Pay-for-performance systems** | |
| **Description** | * Incentive payments to providers (physicians) are based on clinical performance * Payment is conditional on meeting predefined quality metrics |
| **Benefits** | * Optimizes health care spending while improving quality of care * Rewards improved outcomes & evidence-based use of resources |
| **Examples** | * Accountable care organization: network providers coordinate care & receive bonuses based on achievement of patient metrics (goal A1c%) |

P4P systems are intended to improve health care outcomes by linking physician financial incentives to delivery of evidence-based care.   
However, for such systems to improve overall quality of care, they must address equity (delivery of high-quality care regardless of demographic attributes, such as geography or socioeconomic status), which is one of the dimensions of high-quality care.  
Evidence suggests that practices serving affluent(wealthy) populations are more likely to achieve P4P quality metrics (patients have more resources to afford recommended medications or follow-up tests).   
As a result, this large (national) P4P network may preferentially reward more physicians in affluent regions, increasing gaps in resources and health outcomes between poor and high-income settings and failing to improve quality of health care for the overall population.  
Therefore, P4P systems are recommended to consider demographic characteristics of the patient (insurance type, income level) and surrounding community (status as a health professions shortage area) when determining amounts of incentive payments (higher payments for quality achievements to practices located in a health professions shortage area).

Interprofessional teamwork, participation in continuous quality improvement projects, and prevention of burnout are all components that can indicate high quality of care.  However, each of these items describes characteristics restricted to clinical practice and do not consider external characteristics (patient demographic factors, resources of the community), which fundamentally influence care patterns.  This P4P network covers a wide (national) geographic area; therefore, accounting for patient and location characteristics when distributing incentive payments is more important to prevent inadvertent widening of health disparities (which would lower overall quality of care).

P4P encourages providers to:

* Engage in resource stewardship (evidence-based use of health care resources), reducing spending on unnecessary services
* Deliver timely care (offering cancer screening at recommended intervals)
* Promote improved health outcomes (better diabetic control)

​​​​​​​

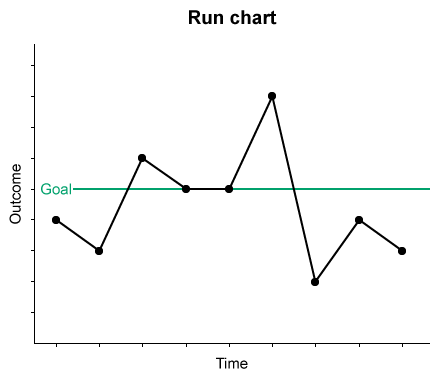
Accountable care organizations (ACOs) are an example of a health system incorporating P4P structures.  brings groups of providers (primary care clinicians, pharmacists, hospitalists) and healthcare facilities (hospitals, nursing homes) to coordinate care, with the goal of improving quality and reducing costs.  Providers receive bonus reimbursements based on the proportion of patients achieving targeted quality metrics and health outcomes.

​​​​​​​​​​​​​​

|  |  |
| --- | --- |
| Indicators used in quality measurement | |
| Structural indicators | * Measure organizational structures, including human resources * Examples: nurse-to-patient ratio, clinician knowledge |
| Process indicators | * Measure health care worker compliance with a process, assess performance, detect variations * Example: percentage of eligible patients screened for colon cancer |
| Outcome indicators | * Measure changes in health status or outcomes * Examples: blood pressure, mortality rate, nosocomial infection rate |
| Balancing indicators | * Measure tradeoffs incurred as a result of systems change * Example: increased documentation time after implementing a new safety protocol |

​​​​​​​Comprehensive measurement is necessary to understand the impact of a quality improvement intervention or systems change.  
  
​​​​​​​

|  |  |
| --- | --- |
| **Quality improvement processes** | |
| **Model for Improvement** | * Incremental cycles of planning, piloting, assessing & refining an intervention to achieve a specific goal (ie, PDSA cycle) * Example: testing a new check-in procedure with weekly tabulation of patient satisfaction surveys |
| **Lean** | * optimise quality and value * Identification & removal of inefficiency & waste in a workflow - one care team has patients admitted to multiple hospital units, wait times, transportation, and activities associated with processing (excessive documentation requirements) * Example: streamlining scheduling to reduce excess waiting time |
| **Six Sigma** | * Near-elimination of defects through statistically driven process improvement * Example: controlling annual incidence of wrong-site surgery to <0.00001% through enhanced safety measures |
| **Change Management** | * Engaging personnel to adopt innovation & implement organizational changes * Example: identifying frontline early adopters to lead implementation of a new EHR system |

​​​​​​​​​​​​​​​​​​​​​

A run chart is a longitudinal graph that tracks a process performance outcome (eg, patient no-show rates, a metric of patient follow-up and scheduling efficiency) over time.  Run charts are frequently used to:

* Visually identify performance variations, including trends, defined as a consistent directional change (eg, increase or decrease) for ≥5 consecutive points
* Assess effectiveness of a quality improvement intervention by comparing changes in process outcomes pre- and post-intervention

​​​​​​​

|  |  |
| --- | --- |
| Clinical decision support systems | |
| Purpose | * Assist providers in making clinical decisions based on patient data (laboratory data, diagnosis) * Usually integrated into computerized provider order systems * Recommend actions to providers based on patient clinical information |
| Potential benefits | * Increase reliability of medical decision-making (limiting potentially harmful variations of care) * Detect and intervene in cases of human error (entering incorrect drug dose) * Reduce medication prescription errors |
| Examples | * Tool suggesting default drug dose and frequency based on patient weight * Prompt recommending specific DVT prophylaxis in a patient following high-risk surgery * Prompt recommending specific diagnostic tests in a patient with suspected pulmonary embolism |

​​​​​​​​​​​​​​**HAND HYGINE**

Hand hygiene (cleansing and disinfecting hands with soap or antiseptic hand rub) can reduce incidence of preventable, hospital-associated infections (HAI) by up to 70%.  However, despite the significant evidence base supporting this intervention, physician adherence to recommended hand hygiene protocols often remains low.

Low adherence to well-established, evidence-based protocols can arise from suboptimal organizational and systems factors.  Systems interventions are often prioritized as first steps.

|  |  |
| --- | --- |
| **Improving hand hygiene compliance in health care settings** | |
| **Reason for noncompliance** | **Example solution** |
| Ineffective placement of sinks and dispensers | Place sinks/dispensers outside each patient's room |
| Lack of accountability | Build hand hygiene into provider evaluations |
| Lack of safety culture | Create safety teams, provide real-time feedback on compliance |
| Forgetfulness or lack of time | Visual cues (eg, signs, red arrows) near doorways |

In certain situations where systems changes are insufficient, strengthening the organizational culture to promote individual accountability (known as "just culture") is useful.  Examples of accountability-building interventions include incorporating hand hygiene compliance into physician evaluations and enforcing disciplinary measures when repeated hand hygiene transgressions occur (ie, warning note, remedial training).  Such measures should be pursued only after a sustained, comprehensive systems reform that incorporates staff input.

\*\*\*\*The prevention of health care-associated transmission of *C difficile* and other diarrheal infections requires the following:

* Implementation of uniform (standardized) cleaning and disinfection procedures that include the use of sporicidal agents (bleach).  Cleaning of all surfaces should be performed by a dedicated team (environmental services staff) to minimize confusion regarding cleaning responsibilities.
* Adherence to hand hygiene for all patients and contact isolation precautions, including use of gowns and gloves in patient rooms, for persons suspected to have *C difficile*.  Soap and water are preferred for hand hygiene for prevention of diarrheal illnesses when hands have direct contact with soiled material and in outbreak settings.

​​​​​​​**SWISS CHEESE MODE**L

SCM is a strategy often used in health care organizations to increase safety.  SCM recommends overlapping multiple barriers (visualized as slices of cheese) within a process to block hazards.  Targeted hazards include both internal human error (eg, mistakes resulting from fatigue) and external threats (eg, infectious agents).

SCM is based on the following principles:

* No single defensive barrier (eg, handwashing) is fully error proof; each intervention contains "holes" or vulnerabilities (eg, forgetting to wash hands, incorrect handwashing technique) that can enable an adverse outcome (eg, transmission of infection).
* Harm occurs when hazards pass unchecked through holes in defensive barriers.
* Stacking multiple, overlapping "slices" or defensive barriers increases the likelihood that hazards will be detected early and downstream harm (ie, adverse patient outcome) will be blocked.

Barrier in combination are more effective than individual alone

|  |  |  |
| --- | --- | --- |
| Human factors engineering strategies | | |
| Reliability | Strategy | Description & examples |
| Highest | Forcing functions (Hard stops) | * Hard stops in physical design or process to eliminate risk of incorrect use * Example: each anesthesia gas fits only one compatible socket & is not interchangeable |
| Computerized automation | * Automated processes to remove human effort & variations that cause error * Example: automated vital signs monitoring |
| Environment & physical layout | * Workspace design to facilitate correct action & minimize error * Example: look-alike drugs stocked in different locations |
| High | Standardization & simplification | * Uniform processes to minimize variation, complexity & learning curve * Example: every hospital unit follows the same process for heparin administration |
| Human-machine redundancy | * Repetitive step to confirm correct action in an error-prone process * Example: barcode scanning of medications in addition to visual inspection |
| Medium | Reminders, alerts & double-checks | * Processes prompting providers to check actions to reduce errors * Examples: drug-drug interaction alerts; time-out before procedures |

Human factors engineering seeks to reduce error risk by designing systems based on expected human behaviors.  Less reliable HFE strategies include trainings, policy changes & education. ​​​​​​​  
​​​​​​​  
​​​​​​​

|  |  |  |
| --- | --- | --- |
| **Strategies to improve health care communication** | | |
| **Strategy** | **Description** | **Benefits** |
| **Standardized handoff** | Checklist or other systematic process frames provider-to-provider discussion during sign-out | Ensures consistency and reliability, reduces errors of omission |
| **Closed-loop communication/ "read-backs"** | Sender relays message to receiver, receiver repeats information back to sender; sender confirms message is correct | Minimizes errors of misinterpretation and misunderstanding |
| **Interdisciplinary rounds** | Team members represent multiple disciplines (nursing, pharmacy) | Increases continuous learning and collaborative oversight of patient's condition |
| **Team huddles & debriefing** | Brief, interdisciplinary discussions of patient concerns and risks; held prior to, during, and/or after clinical event | Reduces hierarchical barriers, encourages speaking up, promotes shared team safety goals |
| **Team-based training** | Train team members together via interactive formats (simulation) | Improves communication & collaboration, promotes group learning, reduces hierarchical barriers |

​​​​​​​​​​​​​​