Key Performance Indicators for Measuring and Improving Radiology Department Performance

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Quality In Healthcare!

- Intense interest in healthcare quality has been raised worldwide by alarming reports of quality deficiencies in the practice of medicine.
- In 1999, the Institute of Medicine published a book entitled *To Err Is Human*, which brought the extent and severity of errors in medical care to the attention of the public, healthcare providers, and policy makers.

“Crossing the Quality Chasm”
Institute of Medicine (2001)

- Six goals for healthcare quality improvement efforts:
  1. Safe
  2. Effective
  3. Patient centered
  4. Timely
  5. Efficient
  6. Equitable

Achievement of an optimal quality of care

- Needs solid information
- Accurate problem identification
- Rigorous analysis
- Ability to measure and re-measure performance.
- Recurring measurement of healthcare quality is important for determining whether an action has led to improvement of care.

Quality in Imaging Services

- Measuring the quality of imaging services is inherently difficult.
- Scientifically sound metrics are lacking.
- The review of patient records to document the effect of diagnostic imaging on the care outcome is costly in staff time and labor.

Key performance indicators (KPIs)

- KPIs are measures that may be used to assess the health of an organization and define and quantitatively measure progress toward organizational goals.
- KPIs also may be linked to an organization’s strategy for success.

KPI is “a measurement tool used to monitor and evaluate the quality of important governance, management, clinical, and support functions” (JCAHO)
Development of Radiology-Specific KPIs

- Each may seem important in its own right;
- However, there is a lack of focus needed to select those, most in need of monitoring;
- In contrast, a properly targeted and organized set of KPIs will help a leadership team to identify the most important problems or opportunities to be addressed;
- The best way to create the most valuable set of KPIs is to derive them from the strategic planning process.

Kaplan-Norton Balanced Scorecard

- Management of patient safety and quality of care.
- Stakeholder management (management of the interests of internal & external stakeholders).
- Operations management (management of core operations and enabling functions).
- Financial management.

Administration has to allocate resources—human, financial as well as technological; to help the radiology department collect and analyze the data.
Strategic areas for the development of Radiology-Specific KPIs

- Patient safety and quality of care
- Customer service
- Operations management
- Utilization
- Information technology
- Innovation
- Education
- Research
- Financial management

Accommodate all aspects of performance
Provide a common baseline for communicating results

Quality Process Can Never be STATIC.

The list should be reviewed annually. If areas were under or overrepresented, the metrics should be adjusted accordingly.

Radiology-Specific KPIs

Core Functions of Operations Management

- Clinical performance
  - Success rates
  - Communication with referring physicians
- Patient experience (service level)
  - Safety
  - Outpatient service
  - Outpatient access
  - Inpatient service
- Utilization & productivity
  - Equipment idle time
  - Equipment utilization
  - Equipment staffing level
  - Radiologist productivity
  - Technical staff productivity
- Research Funding and Publications

Enabling Functions of Operations Management

- Employee development
  - Licensing and certification
  - Application and transfer of knowledge
  - Employee empowerment
- Informatics support
  - Downtime
  - Data integrity
  - Resources used
  - Technology replacement and project management
- Demand generation
  - Total no. of referrers
  - Demand generated
  - Effort expended
- Analyses and forecasts
  - Effort expended
  - Quality

Radiology-Specific KPIs

Financial Management

- Net income
  - Revenue
  - Expense
- Variance from budget
  - Revenue
  - Expense
- Fiscal efficiency
  - Efficient use of labor
  - Efficient use of assets
- Billing effectiveness
  - Total rejections, partial or discounted payments, non-payments
  - Effectiveness of precertification process

Patient Safety and Quality of Care

- Patient safety
  - Compliance with directives
  - Policy formulation
  - Incident reporting
- Patient experience (Ranked 0–10)
Radiology-Specific KPIs
Management of External Stakeholders
- Referring physicians and their staff
  - Satisfaction (Ranked 0–10)
  - Report turnaround time - outpatient and inpatient
  - Comments- No. of complaints, requests, and compliments received by telephone or e-mail
- Patients
  - Satisfaction (Ranked 0–10)
  - Outpatient access
  - Comments-No of complaints, requests, and compliments received by telephone or e-mail

Radiology-Specific KPIs
Management of Internal Stakeholders
- Diversity
  - Function Number of teams or projects
  - Age / Ethnicity
  - Level of education
- Harassment-free work environment
- Compensation and recognition
  - Recognition of performance excellence
  - Actual and relative pay scales
- Resources
  - Equipment quality
  - Equipment availability
  - Equipment diversity
  - Equipment staffing levels

Radiology-Specific KPIs
Development of Metrics
- One or more specific metrics, defined for measurement of each KPI.
- Assigning the KPIs and metrics a particular rank or weight in accordance with the organizational values, strategy, and goals.
- Each KPI can be assigned a specific numeric value to define a benchmark for performance success.
- The results of the KPI-based performance assessment then can be aggregated into a composite score for each of the strategic areas of measurement.
- Dashboards can be used to “roll up” the results, providing a quick overview of overall performance. The viewer also has the ability to “drill down” to obtain further detail.

Radiology-Specific KPIs
Development of Metrics
Clinical performance
Success rates –
  - Peer review of image interpretation.
  - Correlation of radiologic with pathologic findings.
  - False-positive and false-negative rates.
  - Peer review agreement rate.
  - Percentage of examinations with unnecessary recommendations.
  - Complications rate.

Patient experience (service level) –
Outpatient service
- Patients receiving pre-appointment examination information and education.
- Patient arrival delay.
- Waiting time from patient arrival to beginning of examination.
- Appointment delay from scheduled examination time to beginning of examination.
- Outpatient report turn-around time.
**Radiology-Specific KPIs**

**Development of Metrics**

**Resource utilization and productivity**

- **Equipment idle time**: Percentage of time when equipment is unavailable because of unscheduled downtime.
- **Equipment utilization**: Ratio of number of hours available to number of hours in use.
- **Equipment staffing level**: Ratio of number of imaging staff (technologists) to number of machines.
- **Radiologist productivity**: No. of reports generated (relative value units) per radiologist.
- **Technologist productivity**: No. of examinations performed (relative value units) per technologist.

**Patient safety**

- **Compliance with directives**: Number of new quality and safety projects completed.
- **Policy formulation**: Rate of compliance with institutional policies.
- **Incident reporting**: Total No. of incident reports = preventative reports + adverse outcome reports.

**Management of External Stakeholders**

- **Referring physicians and their staff**
  - **Satisfaction**: Survey of referring physicians (numeric rating on a scale of 0–10).
  - **Physician Comments**: Numbers of complaints. Numbers of requests. Numbers of compliments received by telephone or e-mail.

**Resources**

- **Equipment quality**: Average age of major imaging and information technology systems.
- **Equipment availability**: Number of late-generation imaging devices.
- **Variance in number of hours of scheduled maintenance from manufacturer recommendations**.
- **Equipment diversity**: Number of machine manufacturers represented.
- **Equipment staffing levels**: Ratio of imaging technologists to imaging machines.

**Strategy**

- Use of technology
- Automation of data collection from
  - EMR
  - HIS
  - RIS
  - PACS
  - DICOM tags

**Data Collection and analysis**
Screen shot illustrates the Reporting module Web interface, which provides optional reporting of productivity metrics, including examination duration, table utilization, interpatient time, appointment interval time, and interseries time.

Hu M et al. Radiographics 2011;115:11562553230179

Figure 2. The scorecard.


Quality Intelligence and Communication Systems need to be developed and implemented