Linking Outcomes of Care and the ACGME Core Competencies: A Matrix Solution

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The Healthcare Matrix

Note from the Authors:

- **This slide presentation was created to assist learners in completing the Matrix. This tool helps teach the competencies while identifying opportunities for improvements in care and education. It is our best thinking thus far, but with more organizations using the Matrix, we learn better and easier ways to complete it. We hope you will assist us in the improvement of our tool.**

- **The second part of the presentation demonstrates how users can utilize data from the Matrix to improve care.**

- **To learn the competencies, it is best to have individuals complete the Matrix for a patient, especially in preparation for a case presentation or M&M conference.**

Introduction to the Matrix

- **The Matrix was inspired by the IOM report, *Crossing the Quality Chasm*, which states that there is a chasm between the healthcare that healthcare providers *now provide* and the healthcare that they *are capable of providing.* In the Matrix, the resulting IOM Aims for Improvement are linked with the ACGME Core Competencies to form the Healthcare Matrix.**

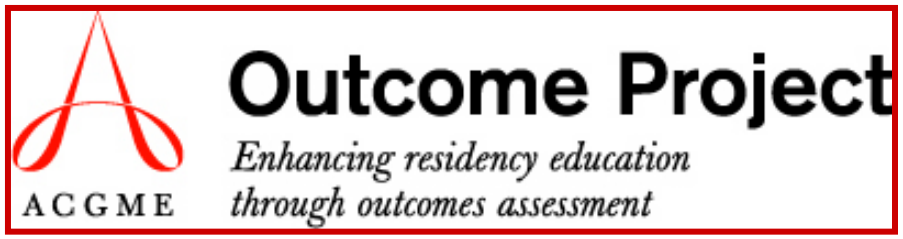
- **The Matrix provides a way for users to examine their patient care through every facet of the Aims and Competencies, thus identifying improvement opportunities.**

Introduction cont'd

- **As medical students, residents and faculty work with the Matrix, they begin to identify the facilitators and barriers to quality education and quality of care.**

- **For example, unsafe care is often attributed to individuals but it is more often a result of the interaction of people and systems.**

- **This tool makes these interdependencies explicit, and more importantly, forces the users to identify what was learned and what might be improved from completing the Matrix.**



7/2001 — 6/2002 7/2002 — 6/2006 7/2006 — 6/2011 7/2011 — *Beyond*

Phase I

- Define specific objectives for residents to demonstrate learning of the competencies.
- Begin integrating the teaching and learning of competencies into residents' didactic and clinical experiences.

Phase II

- Improve the evaluation processes for all six competencies.
- Provide aggregated resident performance data for internal review process.

Phase III

- Use resident performance data as the basis for improvement.
- Begin to use external quality measures to verify resident and program performance levels.

Phase IV

- Involve community in building knowledge about good GME
- Identify benchmark programs

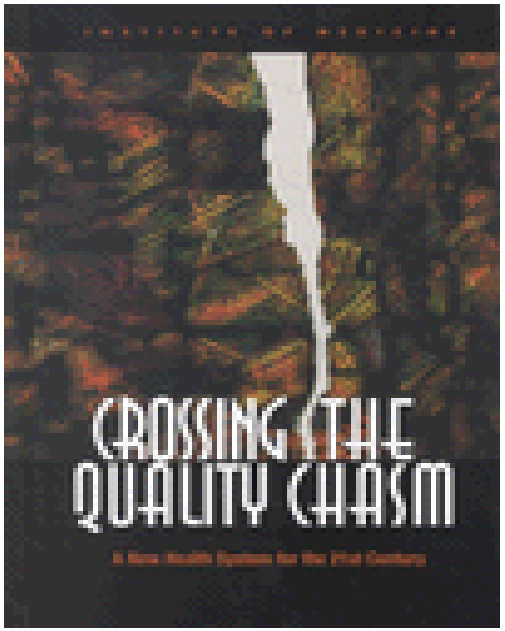
Note: ACGME states that in 7/06 we should have :

Begun to use external quality measures to verify resident and program performance levels.

- **Each of the IOM aims has external measures of quality.**
- **For instance, if an organization wants to focus on "safety" they could begin to engage the residents in actively looking at completing a Matrix for many safety issues, not just sentinel events. This is equally true for the other aims.**

Public Reporting of Quality:

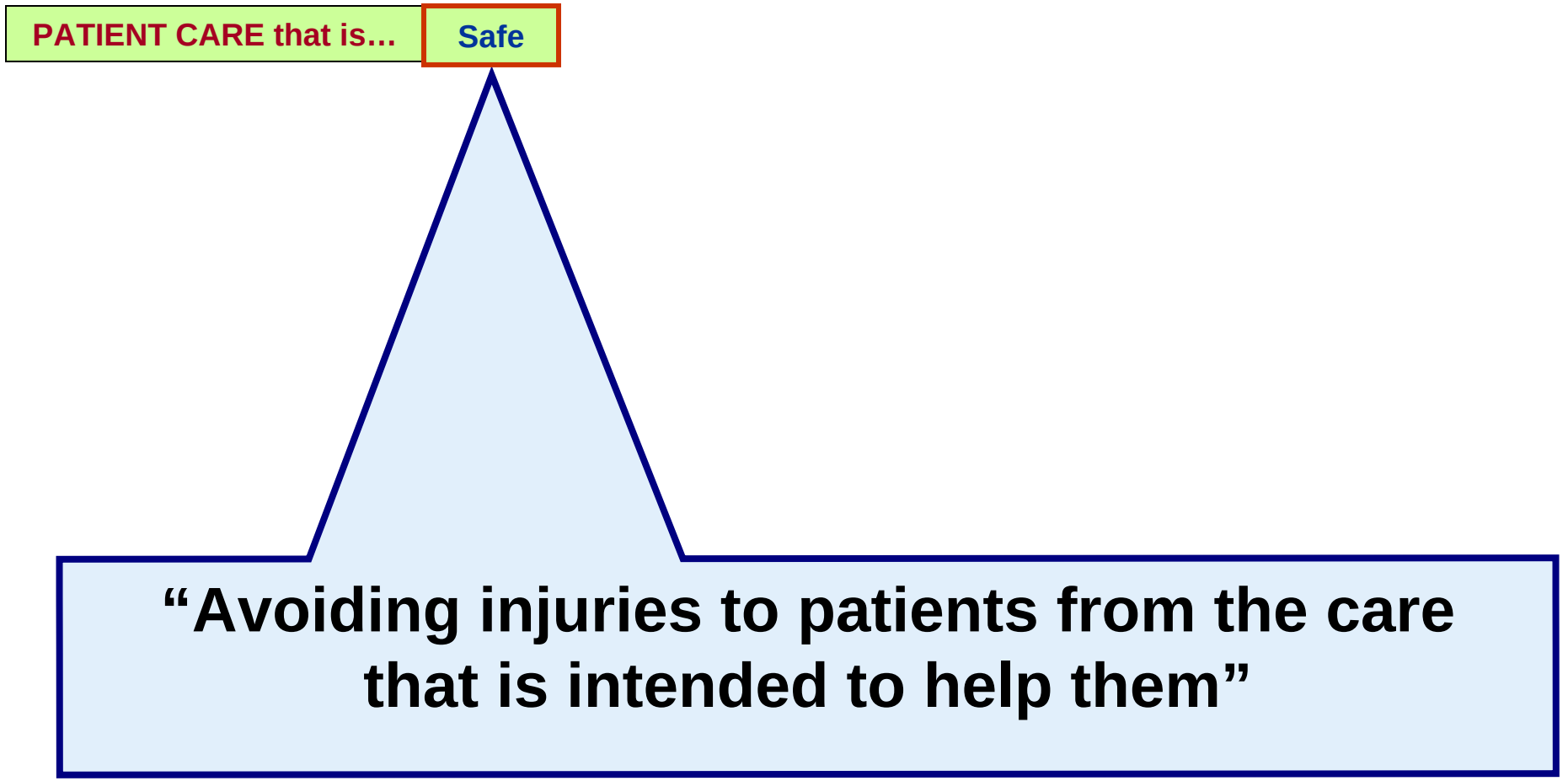
- CMS Quality Measures (“CMS Compare”)
- Accrediting Bodies (JCAHO)
- Statewide Organizations (QIOs)
- Business Coalitions (Leapfrog)
- Employers (Annual enrollment process)
- Commercial Health Care Scorecards
  - (www.healthgrades.com)

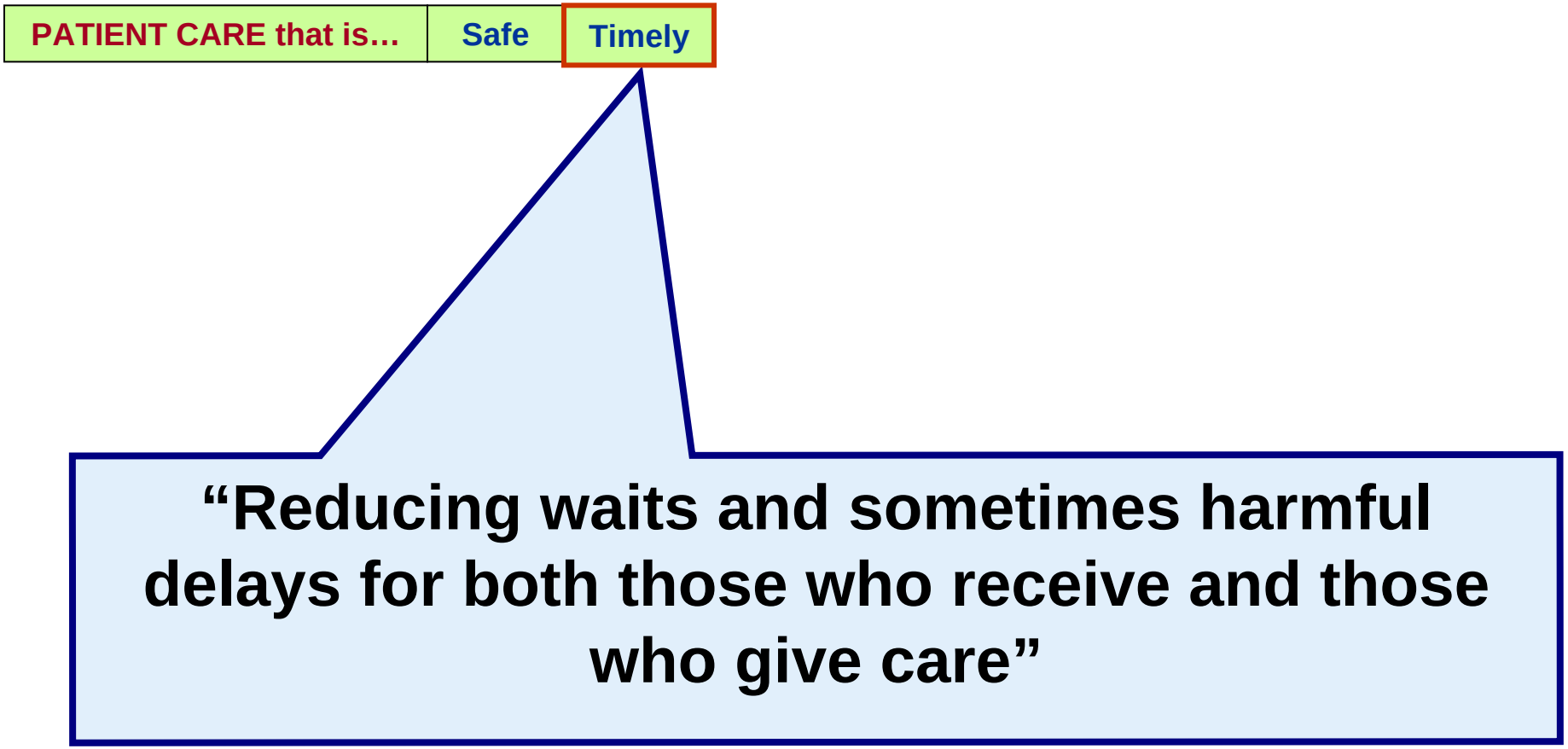


Patient Care (the first competency) should be:

Safe, Timely, Effective,
Efficient, Equitable, Patient-Centered

(STEEEP)


PATIENT CARE that is…
Safe
“Avoiding injuries to patients from the care that is intended to help them”


PATIENT CARE that is…
Safe
Timely
“Reducing waits and sometimes harmful delays for both those who receive and those who give care”

PATIENT CARE that is…	Safe	Timely	Effective

“Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit”


PATIENT CARE that is…
Safe
Timely
Effective
Efficient
“Avoiding waste, including waste of equipment, supplies, ideas, and energy”

PATIENT CARE that is…	Safe	Timely	Effective	Efficient	Equitable

“Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socio-economic status”

PATIENT CARE that is…	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered

“Providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions.”

The ACGME Competencies

What must we know?

EDUCATION focuses on..	Safe	Timely	Effective	Efficient	Equitable	Patient Centered
Medical Knowledge						

"…about established and evolving biomedical, clinical, and cognate sciences, (e.g. epidemiological and social-behavior) and the application of this knowledge to patient care"

What must we <u>say</u>?

EDUCATION focuses on..	Safe	Timely	Effective	Efficient	Equitable	Patient Centered
Medical Knowledge						
Interpersonal and Communication Skills						

"…that result in effective information exchange and teaming with patients, their families, and other health professionals."

How must we behave?

EDUCATION focuses on..	Safe	Timely	Effective	Efficient	Equitable	Patient Centered
Medical Knowledge						
Interpersonal and Communication Skills						
Professionalism						

"…as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population."

What is the Process?
On whom do we depend?
Who depends on us?

EDUCATION focuses on..	Safe	Timely	Effective	Efficient	Equitable	Patient Centered
Medical Knowledge						
Interpersonal and Communication Skills						
Professionalism						
System-Based Practice						

"…as manifested by actions that demonstrate an awareness of, and responsiveness to, a larger context and system of healthcare and the ability to effectively call on system resources to provide care that is of optimal value."

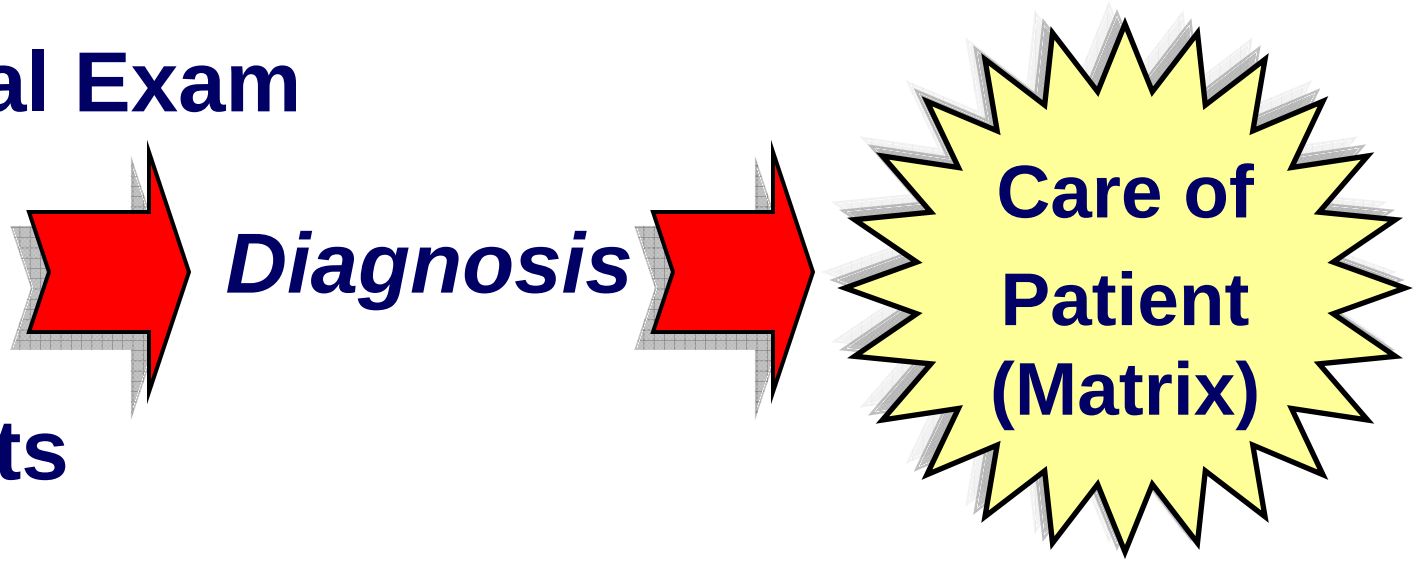
What have we learned?
What will we improve?

EDUCATION focuses on..	Safe	Timely	Effective	Efficient	Equitable	Patient Centered
Medical Knowledge						
Interpersonal and Communication Skills						
Professionalism						
System-Based Practice						
Practice-Based Learning & Improvement						

"…involves investigation and evaluation of residents' own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care."

Preparation for Matrix

- History
- Physical Exam
- Labs
- Tests
- Consults
- Etc.



Matrices can be relatively simple…

Care of Patients with Constrictive Pericarditis
Department of Internal Medicine

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) Yes/No	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**
Medical Knowledge & Skills (What must we know?)				Disagreement over evaluation of constrictive pericarditis.		
Interpersonal & Communication Skills (What must we say?)		Decision re: surgery was not properly communicated to patient or primary team because of poor communication between surgery and primary service.		Only LH cath was performed despite request for RH cath and LH cath.		
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)		Records from outside hospital were not readily available.Primary team did not review outside data thoroughly.				
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)		Have direct contact with referring physician from outside hospital. If outside records arrive, primary team should be paged or information should be flagged in the chart.		Direct communication between teams if questions re: proposed procedure.		
Information Technology						

Or complex…

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**	**No**	**No**	**No**	**No**	**?**
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)	Delay in obtaining flexible bronchoscope during oral attempts at intubation	Airway obtained through tracheotomy site with apparent distal obstruction, oral intubation unlikely to bypass obstruction	Time delay due to oral intubation attempts that predictably would not be successful in restoring airway	Approach to tracheotomy care and airway emergencies differ depending on experience, training, and hospital ward	Patients may receive different levels of tracheotomy care depending on nursing staff, hospital ward, and managing service
Interpersonal & Communication Skills (What must we say?)	Better way to communicate likelihood of obstruction and difficult airway	Patient with poor lung reserve, time wasted during oral attempts at intubation – patient unable to tolerate prolonged apnea	Poor communication about steps required to secure airway	Inefficient attempts at oral intubation = time lost for patient		Contacted family after death – both MICU and ENT present for discussion
Professionalism (How must we behave?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	MICU responsive to code initially				
System-Based Practice (On whom do we depend and who depends on us?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	Knowledge of where bronchoscopes are located for each ICU	Determine role of nurses, respiratory therapists, and physician in managing tracheotomy patients	Inefficient system for tracheotomy care (i.e. supplies, specified nursing instructions)	Trach care may vary depending on patient floor	
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need variety of suction catheters available .Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments.	Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway. Know where broncboscopes are for each unit	Method to succinctly communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway. Define clear roles for trach cases.	Create order set to specify supplies necessary, as well as initial steps if airway lost.	Have standard order set available for all ICU's and floors. Make order set easy to use so many different services may implement.	
Information Technology						

Complex Matrices such as these are often the result of an M&M conference. They are the result of much thought and collaboration, and often result in department-wide or even system-wide improvements.

Using the Matrix

- **When care is suboptimal – no matter how small – there are many lessons to learn when care is analyzed using the Matrix.**

- **However when care is optimal, the Matrix allows the team to see what went well and find ways to make that part of the system.**

Example Case

- A patient with multiple comorbidities presented to the ER with trouble swallowing, shortness of breath, and fever for two days. An exam was performed and several oral problems were identified, including a mouth infection that can cause difficulty breathing. She underwent a tracheotomy.
- She was transferred to the MICU where treatment for sepsis was begun. She slowly improved over the following seven days and by day ten she was breathing on her own. After a scheduled trach tube change, the patient went into respiratory arrest. Mask ventilation was unsuccessful. A code was called, and the MICU team responded. The airway was suctioned and a blockage was detected.
- Although the MICU and anesthesia teams had been informed that she was a difficult intubation and that the tracheotomy site had a distal obstruction, they both attempted to intubate orally and proved unsuccessful.
- Despite undergoing a bronchoscopy which identified and broke up a hard mucous crust, the patient could not be revived.

Care of Patient(s) with…

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**						
Medical Knowledge & Skills (What must we know?)						
Interpersonal & Communication Skills (What must we say?)						
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Fill in diagnosis or event

"respiratory distress Otolaryngology: Head and Neck Surgery"

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) Yes/No						
Medical Knowledge & Skills (What must we know?)						
Interpersonal & Communication Skills (What must we say?)						
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

The first ACGME competencies is Patient Care. How do we measure this? The IOM defines it as care that is: safe, timely, effective, efficient, equitable, and patient-centered..

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No/?**						
Medical Knowledge & Skills (What must we know?)						
Interpersonal & Communication Skills (What must we say?)						
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Safe: Avoiding injuries to patients from the care that is intended to help them.

In this case the answer is "No"

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**					
Medical Knowledge & Skills (What must we know?)						
Interpersonal & Communication Skills (What must we say?)						
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Definition: Medical knowledge about established and evolving biomedical, clinical and cognate sciences and the application of this knowledge to patient care.

"Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)"

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**					
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)					
Interpersonal & Communication Skills (What must we say?)						
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Definition: Skills that result in effective information exchange and teaming with patients, their families and other health professionals.

"Better way to communicate likelihood of obstruction and difficult airway anatomy."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**					
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)					
Interpersonal & Communication Skills (What must we say?)	Better way to communicate likelihood of obstruction and difficult airway					
Professionalism (How must we behave?)						
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Definition: A commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

"MICU/anesthesia did not see otolaryngology's advice about securing airway."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**					
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)					
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Professionalism (How must we behave?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.					
System-Based Practice (On whom do we depend and who depends on us?)						
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Definition: Actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

(This information was the same as the last comment.)

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

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Professionalism (How must we behave?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.					
System-Based Practice (On whom do we depend and who depends on us?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.					
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Definition: Involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvement of patient care.

(This is a synthesis of the cells above, however, it is best to finish the rest of the Matrix and complete this last.)

Completing the Matrix

- **Each of the IOM Aims are reviewed in order. If the answer is “yes” then there may not be a need to complete the column.**
- **Timely and Efficiency are often confused. Timely involves a clock! Were meds given on time, were antibiotics given 1 hours before surgery? Efficiency is resource utilization. Patient stayed in ICU because of a problem, return to surgery after a missed sponge, etc.**

Practice-Based Learning and Improvement

- **To determine what should be in the practice-based learning and improvement box, examine all the boxes above.**
- **What has been learned from the analysis? What needs to be improved?**
- **Identify these problems and propose solutions.**

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

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System-Based Practice (On whom do we depend and who depends on us?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	Knowledge bronchos locate			may vary on patient	
Practice-Based Learning & Improvement (What have we learned? What will we improve?)						
Information Technology						

Safe: Avoiding injuries to patients from the care that is intended to help them

"Need variety of suction catheters available. Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
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Improvem						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need variety of suction catheters available .Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments.					
Information Technology						

Timely: Reducing waits and sometimes harmful delays for both those who receive and those who give care

"Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway.

Know location of bronchoscope/light source in units."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
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Information Technology						

Effective: Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit

"Method to succinctly communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway.

Define clear roles for trach cases."

Care of Patients with respiratory distress
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System-Based Practice (On whom do we depend and who depends on us?)			…e of …ory …g	Inefficient system for tracheotomy care (i.e. supplies, specified nursing instructions)	Trach care may vary depending on patient floor	
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need … catheters available .Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments.	Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway. Know where broncboscopes are for each unit	…to succinctly communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway. Define clear roles for trach cases.			
Information Technology						

Efficient: Avoiding waste, including waste of equipment, supplies, ideas, and energy

"Create order set to specify supplies necessary, as well as initial steps if airway lost."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

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Information Technology						

Equitable: Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socio-economic status

"Have standard order set available for all ICU's and floors.
Make order set easy to use so different services may implement."

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) Yes/No	**No**	**No**	**No**	**No**	**No**	**?**
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)	Delay in obtaining flexible bronchoscope during oral attempts at intubation	Airway obtained through tracheotomy site with apparent distal obstruction, oral intubation unlikely to bypass obstruction	Time delay due to oral intubation attempts that predictably would not be successful in restoring airway	Approach to tracheotomy care and airway emergencies differ depending on experience, training, and hospital ward	Patients may receive different levels of tracheotomy care depending on nursing staff, hospital ward, and managing service
Interpersonal & Communication Skills (What must we say?)	Better way to communicate likelihood of obstruction and difficult airway	Patient with poor lung reserve, time wasted during oral attempts at intubation – patient unable to tolerate prolonged apnea	Poor communication about steps required to secure airway	Inefficient attempts at oral intubation = time lost for patient		Contacted family after death – both MICU and ENT present for discussion
Professionalism (How must we behave?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	MIC co				
System-Based Practice (On whom do we depend and who depends on us?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	Kn bro loc			y vary atient	
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need variety of suction catheters available .Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments.	Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway. Know where broncboscopes are for each unit	communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway. Define clear roles for trach cases.	Create order set to specify supplies necessary, as well as initial steps if airway lost.	Have standard order set available for all ICU's and floors. Make order set easy to use so many different services may implement.	
Information Technology						

Patient-Centered: Providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions.

(No information here)

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall Assessment) **Yes/No**	**No**	**No**	**No**	**No**	**No**	**?**
Medical Knowledge & Skills (What must we know?)	Red rubber catheters too flexible and can bend easily – may be hard to remove or suction hardened secretions (unknown frequency of suctioning and use of saline to loosen secretions)	Delay in obtaining flexible bronchoscope during oral attempts at intubation	Airway obtained through tracheotomy site with apparent distal obstruction, oral intubation unlikely to bypass obstruction	Time delay due to oral intubation attempts that predictably would not be successful in restoring airway	Approach to tracheotomy care and airway emergencies differ depending on experience, training, and hospital ward	Patients may receive different levels of tracheotomy care depending on nursing staff, hospital ward, and managing service
Interpersonal & Communication Skills (What must we say?)	Better way to communicate likelihood of obstruction and difficult airway	Patient with poor lung reserve, time wasted during oral attempts at intubation – patient unable to tolerate prolonged apnea	Poor communication about steps required to secure airway	Inefficient attempts at oral intubation = time lost for patient		Contacted family after death – both MICU and ENT present for discussion
Professionalism (How must we behave?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	MICU responsive to code initially				
System-Based Practice (On whom do we depend and who depends on us?)	MICU/Anesthesia ignore otolaryngology advice about securing airway.	Knowledge of where bronchoscopes are located for each ICU	Determine role of nurses, respiratory therapists, and physician in managing tracheotomy patients	Inefficient system for tracheotomy care (i.e. supplies, specified nursing instructions)	Trach care may vary depending on patient floor	
Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need variety of suction catheters available .Determine the essential equipment for tracheotomy care. Improve ENT communication with other departments.	Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway. Know where broncboscopes are for each unit	Method to succinctly communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway. Define clear roles for trach cases.	Create order set to specify supplies necessary, as well as initial steps if airway lost.	Have standard order set available for all ICU's and floors. Make order set easy to use so many different services may implement.	
Information Technology						

Care of Patients with respiratory distress
Otolaryngology: Head and Neck Surgery

Competencies \ Aims	Safe	Timely	Effective	Efficient	Equitable	Patient-Centered
Assessment of Care						
Patient Care (Overall						
M Know S (What m						y receive els of y care on nursing al ward, ng service
Interp Comm S (What n						amily after n MICU esent for
Profes (How mu						
Syste Pr (On whom and who d						
Practi Lea Impr (What have we learned? What will we improve?)	Improve ENT communication with other departments.	Know where broncboscopes are for each unit	securing airway. Define clear roles for trach cases.	initial steps if airway lost.	use so many different services may implement.	
Information Technology						

- **After collaborating to create the complex Matrix described above, the ENT resident was prompted to ask if there were standardized trach orders already in place throughout the hospital.**
- **There were, but the orders were out of date and few staff were aware they existed.**
- **It was also determined that the red rubber catheters used for suction are too flexible and thus insufficient for the task.**
- **As you can see, he found major problems with communication, supplies, and protocol.**

Closing the Patient Care Loop

1. **Identify issues of care related to Aims and Competencies via the Matrix**

2. **Identify lessons learned and improvement needed**

3. **Complete action plan for improvements with accountabilities and timeline**

4. **Use quality improvement tools and methods to improve care**

The following slides give examples of various ways to use data from the Matrix

Using data from a single Matrix…

Improvement						
Practice-Based Learning & Improvement (What have we learned? What will we improve?)	Need variety of suction catheters available. Determine the essential equipment for tracheotomy care. Know location of bronchoscope/light source.	Need clear steps to be taken for airway emergency in patients with tracheostomy with poor pulmonary reserve and difficult anatomic airway.	Method to succinctly communicate whether patient can be orally intubated to minimize unsuccessful attempts at securing airway.	Create order set to specify supplies necessary, as well as initial steps if airway lost.	Have standard order set available for all ICU's and floors. Make order set easy to use so many different services may implement.	
Information Technology						

Questions to ask when creating an action plan:

(M&M example)

A. Refer to the Practice-Based Learning and Improvement row. (above)

B. What is the procedure/system/issue you want to improve?

C. How are you going to improve it?

D. Who is involved with this issue? Who *should be* involved?

E. In what time frame will the change take place?

Action Plan for Tracheotomy After-care

Item #	What needs to be done?	By whom?	Time frame	Comments	Completion Date
1	Create a new set of standardized trach orders	ENT Service	2005		

- The Matrix encourages users **analyze** and **identifying gaps** in care, as well as **plan improvements**.

ACTION PLAN					
Item #	**What needs to be done?**	**By whom?**	**Timeline**	**Comments**	**Completion Date**
1	**Determine what materials are best for trach tube change**	**ENT**	**2005**		**10/05**
2	**Create new set of trach orders**	**ENT**	**2005**		**10/05**
3	**Ensure that orders are known throughout all depts**	**ENT**	**2005**		**10/05**
4	**Ensure effective communication between ENT and other depts**	**ENT**	**2005**		**ongoing**
Notes:					

Improvement Model*

What are we trying to accomplish?
(The Aim)

How will we know that a change is an improvement?

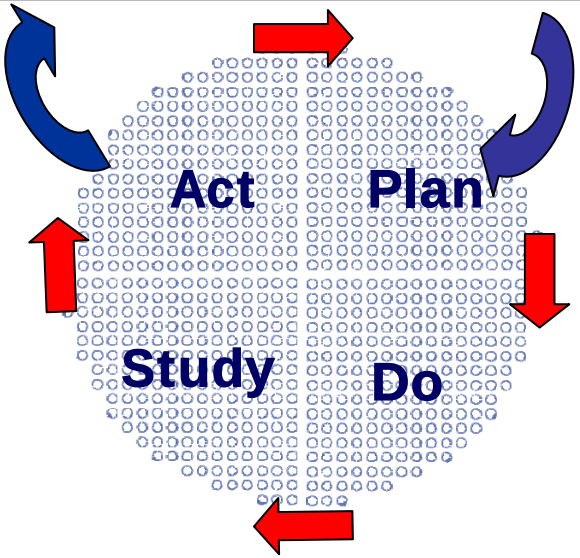
- Data Over Time –

(Tools: Run Charts, Control Charts*)

What changes can we make that will result in an improvement?

- Process Analysis –

(Tools: Flowchart, Cause & Effect Diagram, Pareto Chart, etc.*)

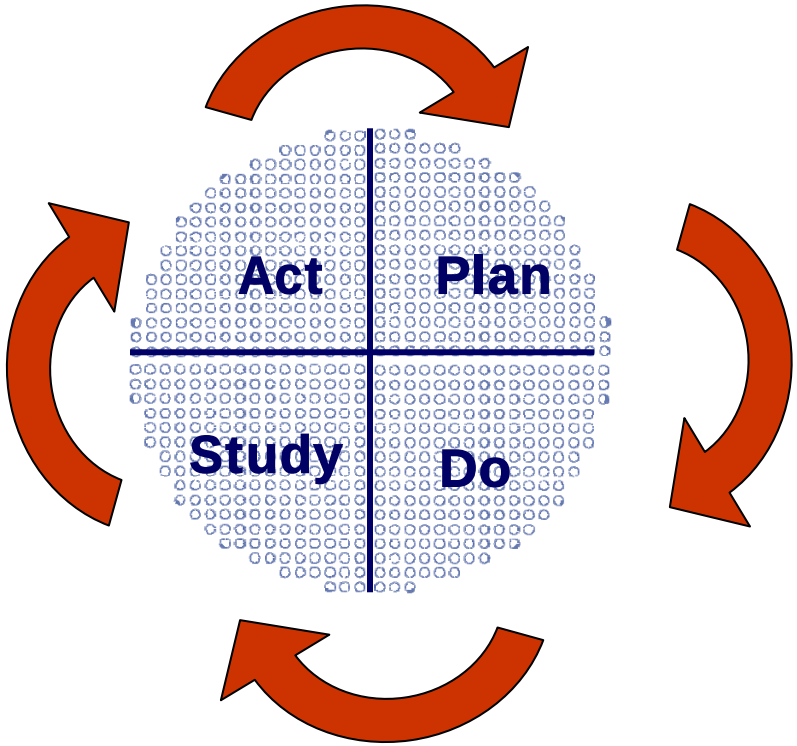


PDSA Model

*Langley, Nolan, et al. The Improvement Guide. San Francisco: Jossey-Bass Pub. 1996.

The Improvement Model guides the team in their quality improvement effort.

Once the three questions are answered, the **Plan-Do-Study-Act (PDSA)** cycle (scientific method) completes the improvement.



- 1. The Resident completed the ***plan*** with a his team to create order sets.

  2. He led the implementation of the new orders ***(do)***.

  3. Once the orders were implemented, a sample of cases were identified and the team ***studied*** the result

  4. The final questions are: Should we ***act*** the to keep the new procedures and implement them on a wider scale? Or, if the new measures failed to improve care, what else can be done?

New ENT Trach Orders

- ## Treatment

1. Ambu bag and identical replacement trach tube or #6 endotracheal tube to be at hob at all times.
2. Have suction kits with #14 French suction cathaters, yankauer, and red rubber catheters at bedside.
3. Do not change trach tape or trach holders, even if soiled.
4. Suction trach tube with/ns instillation every 2 hours and prn for 48 hours, then every 4 hours and prn.
5. Stoma care every 8 hours post-op with hydrogen peroxide and bacitracin ointment.
6. Remove and clean inner cannula with brushes every 2 to 4 hours for 24 hours and then every 4 to 8.
7. If trach falls out, call a code and doctor, and replace tube if possible; if not possible, bag per mask and intubate (if patient is intubateable).
8. If trach falls out call a code and a doctor, replace tube if possible or place #6 ET tube through trach site (if patient is not intubateable).
9. Notify house officer if problem passing suction catheter, cuff deflating, bleeding, sob. or low sats.

- ## Patient/Family Teaching by nursing

10. Instruct patient how to communicate as directed.
11. Nursing: Prior to discharge patient must demonstrate adequate trach suction with and without saline flush, remove inner cannula and clean or replace with new inner cannula, communicate verbally or written as directed.
12. Print out and review home trach instructions with patient/significant other prior to discharge.
13. Patient must have suction machine and humidifier at home or delivery scheduled for discharge day.
14. Return to previous list

Using the Data from Many Matrices

- **Another use of the Matrix is that data from many Matrices can be aggregated in a database (a web application is currently in development) and sorted by ACGME Competency, IOM Aim, diagnosis, and positive or negative outcome.**
- **Thus problems can be realized in areas of patient care, education, teamwork, handoffs, diagnoses, and hospital processes, etc.**

Matrix Data

The following slides include:

- **Example of a page from Excel database (Table 1)**
- **Example of a report on care of patients with stroke diagnoses (Table 2)**
- **Explanation of stroke report**

The Stroke Report

- **Twenty-eight Vanderbilt medical students on their neurology rotation observed neurology patients.**
- **When analyzed, their data revealed that the process for caring for stroke patients seemed better than other diagnoses.**

Example of Excel Database for Matrix Analysis

Table 1

ID	Aim	Competency	Content	Diagnosis	Primary Code (+positive, -negative, improvement)	Secondary Code
3	Safe	Professionalism	Decisions were made based on accepted algorithms and consensuses within the team.	Stroke	+Positive	EBM
19	Timely	Interpersonal Communication Skills	Delays in communication increased the time it took to get an initial head CT and begin treatment.	Pregnancy & Intercerebral Hemorrhage	-Negative	Teamwork
4	Effective	Practice-Based Learning & Improvement	We could have taken the time to do a better initial H&P to better discern what patient's condition was like at initial presentation to compare it to discharge condition.	Stroke	^Improve-ment	Care Plan
18	Efficient	Systems-Based Practice	Repeated imaging and brain biopses were unneccessary. Reduce switching primary neurologists to avoid repeat testing.	Celiac Sprue	-Negative	EBM
12	Equitable	Interpersonal Communication Skills	The patient spoke Spanish. Skilled interpreters were not available. Medical students and amily were used often as interpreters, which was not ideal.	Hydrocephalus	-Negative	translators
2	Patient-Centered	Medical Knowledge	Team took the time to know the patient and her desire for treatment	Lung cancer with brain metastases	+Positive	Patient/ Physician Commun-ication

Using the Data from the Matrix

- **The story behind the stroke data:**
  - **When 28 matrices were analyzed for Neurology, we saw positive and negative trends.**
  - **Care of stroke pts (n=6) had very few communication or professional issues, care was deemed effective and efficient and comments about systems-based practice were often positive.**
  - **When we explored the reasons for these positive outcomes, we found that they had a "stroke team" with clear protocols and guidelines which made the care much better.**
  - **We found that when the care crossed departments and there were not "teams", the care was significantly more problematic.**

Conclusion

- **Use of the Matrix teaches learners a broader view of quality patient care and safety and makes clear opportunities for improvement.**

- **It helps analyze gaps in resident education around the ACGME core competencies, and facilitates improvements in education.**

- **It can be used to study any facet of care: aim, competency, diagnosis, service, etc. and is useful as a means of teaching quality improvement.**

- **In conjunction with quality improvement techniques, the Matrix is a powerful analysis and improvement tool.**