Innovation in Data for Improvement: Holistic Mortality Review

Rationale for the approach

As one of their first activities together, guiding coalitions from LSL hospitals embarked upon a holistic root cause analysis, aiming to integrate perspectives and evidence from across the care continuum to identify opportunities to improve outcomes for patients with AMI.

In many LSL sites, providers felt that there was little room for improvement in mortality rates. Further, traditional approaches to mortality review provided little data to inform them otherwise, due to several limitations:

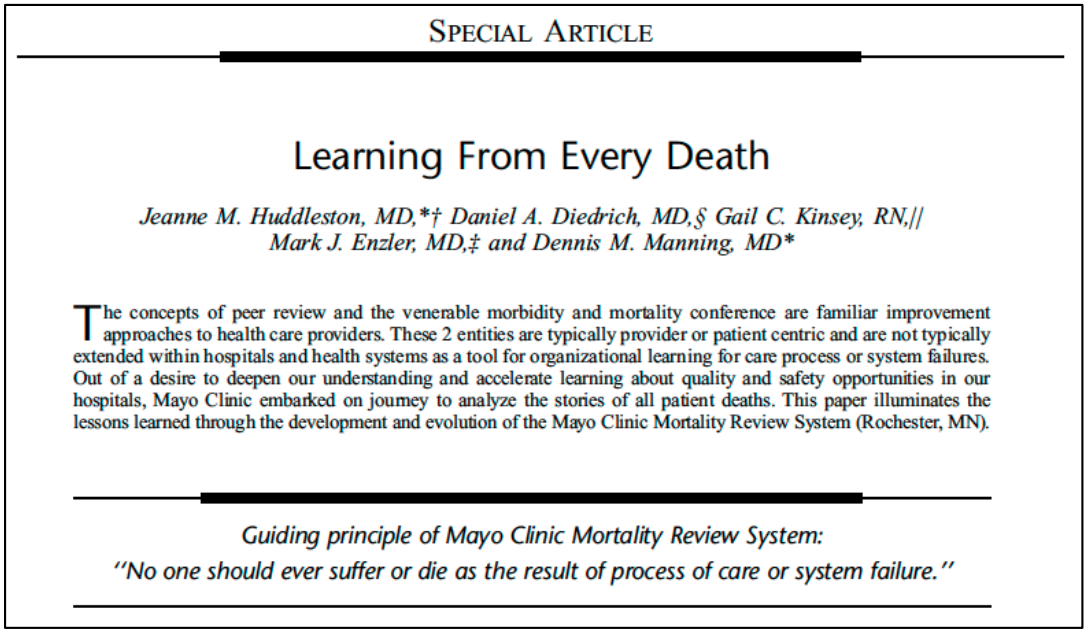
1. In many settings, mortality reviews were completed only for cases in which something 'went wrong'

2. In many settings, reviews focused on finding the most proximal preventable reason for a person's death, rather than identifying all systems opportunities for improvement

3. Few review processes allowed for drawing of patterns ACROSS patient experiences to identify opportunities to improve.

The innovation

One LSL hospital set out to better capture opportunities for improvement, adapting the Mayo Clinic Mortality Review System for their context.



SPECIAL ARTICLE

Learning From Every Death

Jeanne M. Huddleston, MD,† Daniel A. Diedrich, MD,§ Gail C. Kinsey, RN,‖ Mark J. Enzler, MD,‡ and Dennis M. Manning, MD**

The concepts of peer review and the venerable morbidity and mortality conference are familiar improvement approaches to health care providers. These 2 entities are typically provider or patient centric and are not typically extended within hospitals and health systems as a tool for organizational learning for care process or system failures. Out of a desire to deepen our understanding and accelerate learning about quality and safety opportunities in our hospitals, Mayo Clinic embarked on journey to analyze the stories of all patient deaths. This paper illuminates the lessons learned through the development and evolution of the Mayo Clinic Mortality Review System (Rochester, MN).

Guiding principle of Mayo Clinic Mortality Review System:
"No one should ever suffer or die as the result of process of care or system failure."

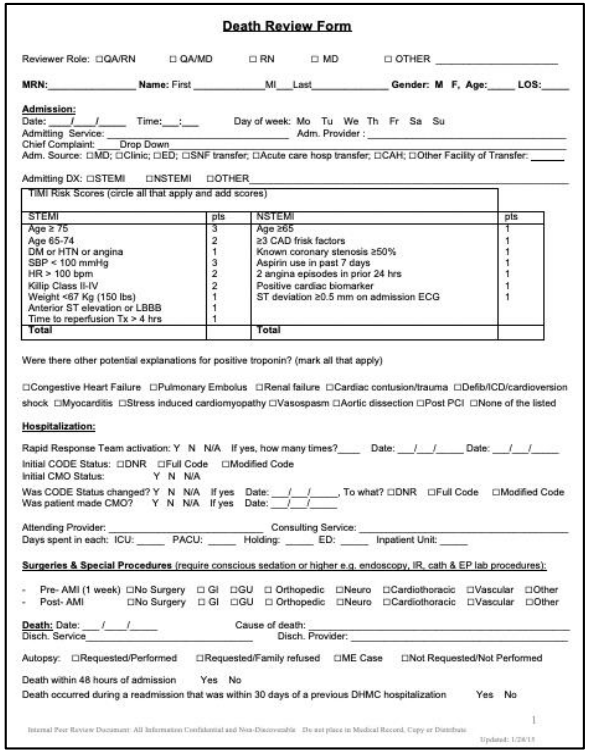
Huddleston J, Diedrich D, Kinsey G, Enzler M, Manning D. **Learning From Every Death**. *Journal of Patient Safety*. 10(1):6–12, MAR 2014

Perspectives from the front line

"We were almost a top performing hospital. The question then became, "What do you do then? How do you improve?" We were at a loss not knowing what we could do. Our LSL facilitator heard all of this. She said, "I think you need to come up with your own strategies for X." That was a good idea. Then she said, "Well, you'll have to do a root cause analysis, a mortality chart review, and you have to find an instrument that records X." ***I was just saying, "No, I don't wanna do any of this stuff. This is down the rabbit hole." But we did.***

--- Guiding Coalition Member

3-page review form



Death Review Form

Reviewer Role: ☐QA/RN ☐ QA/MD ☐ RN ☐ MD ☐ OTHER _____

MRN:_____ **Name:** First _____MI___Last_____ **Gender: M F, Age:**____ **LOS:**____

Admission:
Date: ___/___/____ Time:___:___ Day of week: Mo Tu We Th Fr Sa Su
Admitting Service: _____ Adm. Provider : _____
Chief Complaint: ___Drop Down_____
Adm. Source: ☐MD; ☐Clinic; ☐ED; ☐SNF transfer; ☐Acute care hosp transfer; ☐CAH; ☐Other Facility of Transfer: ____

Admitting DX: ☐STEMI ☐NSTEMI ☐OTHER_____

TIMI Risk Scores (circle all that apply and add scores)

STEMI	pts	NSTEMI	pts
Age ≥ 75	3	Age ≥65	1
Age 65-74	2	≥3 CAD frisk factors	1
DM or HTN or angina	1	Known coronary stenosis ≥50%	1
SBP < 100 mmHg	3	Aspirin use in past 7 days	1
HR > 100 bpm	2	2 angina episodes in prior 24 hrs	1
Killip Class II-IV	2	Positive cardiac biomarker	1
Weight <67 Kg (150 lbs)	1	ST deviation ≥0.5 mm on admission ECG	1
Anterior ST elevation or LBBB	1		
Time to reperfusion Tx > 4 hrs	1		
Total		**Total**	

Were there other potential explanations for positive troponin? (mark all that apply)

☐Congestive Heart Failure ☐Pulmonary Embolus ☐Renal failure ☐Cardiac contusion/trauma ☐Defib/ICD/cardioversion shock ☐Myocarditis ☐Stress induced cardiomyopathy ☐Vasospasm ☐Aortic dissection ☐Post PCI ☐None of the listed

Hospitalization:

Rapid Response Team activation: Y N N/A If yes, how many times?____ Date: ___/___/____ Date: ___/___/____
Initial CODE Status: ☐DNR ☐Full Code ☐Modified Code
Initial CMO Status: Y N N/A
Was CODE Status changed? Y N N/A If yes Date: ___/___/____, To what? ☐DNR ☐Full Code ☐Modified Code
Was patient made CMO? Y N N/A If yes Date: ___/___/____

Attending Provider: _____ Consulting Service: _____
Days spent in each: ICU: _____ PACU: _____ Holding: _____ ED: _____ Inpatient Unit: _____

Surgeries & Special Procedures (require conscious sedation or higher e.g. endoscopy, IR, cath & EP lab procedures):

- Pre- AMI (1 week) ☐No Surgery ☐ GI ☐GU ☐ Orthopedic ☐Neuro ☐Cardiothoracic ☐Vascular ☐Other
- Post- AMI ☐No Surgery ☐ GI ☐GU ☐ Orthopedic ☐Neuro ☐Cardiothoracic ☐Vascular ☐Other

Death: Date: ___/___/____ Cause of death: _____
Disch. Service_____ Disch. Provider: _____

Autopsy: ☐Requested/Performed ☐Requested/Family refused ☐ME Case ☐Not Requested/Not Performed

Death within 48 hours of admission Yes No
Death occurred during a readmission that was within 30 days of a previous DHMC hospitalization Yes No

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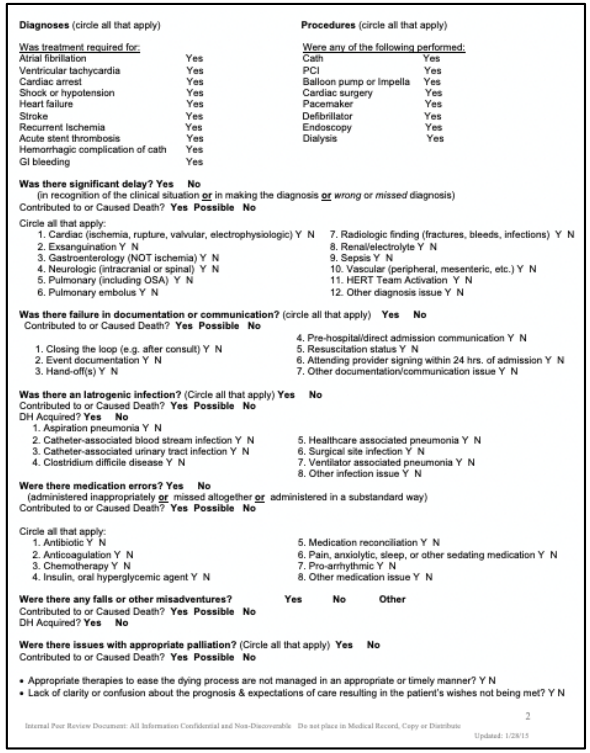

Diagnoses (circle all that apply)

Was treatment required for:

Atrial fibrillation	Yes
Ventricular tachycardia	Yes
Cardiac arrest	Yes
Shock or hypotension	Yes
Heart failure	Yes
Stroke	Yes
Recurrent Ischemia	Yes
Acute stent thrombosis	Yes
Hemorrhagic complication of cath	Yes
GI bleeding	Yes

Procedures (circle all that apply)

Were any of the following performed:

Cath	Yes
PCI	Yes
Balloon pump or Impella	Yes
Cardiac surgery	Yes
Pacemaker	Yes
Defibrillator	Yes
Endoscopy	Yes
Dialysis	Yes

Was there significant delay? Yes No
(in recognition of the clinical situation **or** in making the diagnosis **or** *wrong* or *missed* diagnosis)
Contributed to or Caused Death? **Yes Possible No**

Circle all that apply:
1. Cardiac (ischemia, rupture, valvular, electrophysiologic) Y N
2. Exsanguination Y N
3. Gastroenterology (NOT ischemia) Y N
4. Neurologic (intracranial or spinal) Y N
5. Pulmonary (including OSA) Y N
6. Pulmonary embolus Y N
7. Radiologic finding (fractures, bleeds, infections) Y N
8. Renal/electrolyte Y N
9. Sepsis Y N
10. Vascular (peripheral, mesenteric, etc.) Y N
11. HERT Team Activation Y N
12. Other diagnosis issue Y N

Was there failure in documentation or communication? (circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Closing the loop (e.g. after consult) Y N
2. Event documentation Y N
3. Hand-off(s) Y N
4. Pre-hospital/direct admission communication Y N
5. Resuscitation status Y N
6. Attending provider signing within 24 hrs. of admission Y N
7. Other documentation/communication issue Y N

Was there an Iatrogenic infection? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**
DH Acquired? **Yes No**

1. Aspiration pneumonia Y N
2. Catheter-associated blood stream infection Y N
3. Catheter-associated urinary tract infection Y N
4. Clostridium difficile disease Y N
5. Healthcare associated pneumonia Y N
6. Surgical site infection Y N
7. Ventilator associated pneumonia Y N
8. Other infection issue Y N

Were there medication errors? Yes No
(administered inappropriately **or** missed altogether **or** administered in a substandard way)
Contributed to or Caused Death? **Yes Possible No**

Circle all that apply:
1. Antibiotic Y N
2. Anticoagulation Y N
3. Chemotherapy Y N
4. Insulin, oral hyperglycemic agent Y N
5. Medication reconciliation Y N
6. Pain, anxiolytic, sleep, or other sedating medication Y N
7. Pro-arrhythmic Y N
8. Other medication issue Y N

Were there any falls or other misadventures? Yes No Other
Contributed to or Caused Death? **Yes Possible No**
DH Acquired? **Yes No**

Were there issues with appropriate palliation? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

- Appropriate therapies to ease the dying process are not managed in an appropriate or timely manner? Y N
- Lack of clarity or confusion about the prognosis & expectations of care resulting in the patient's wishes not being met? Y N

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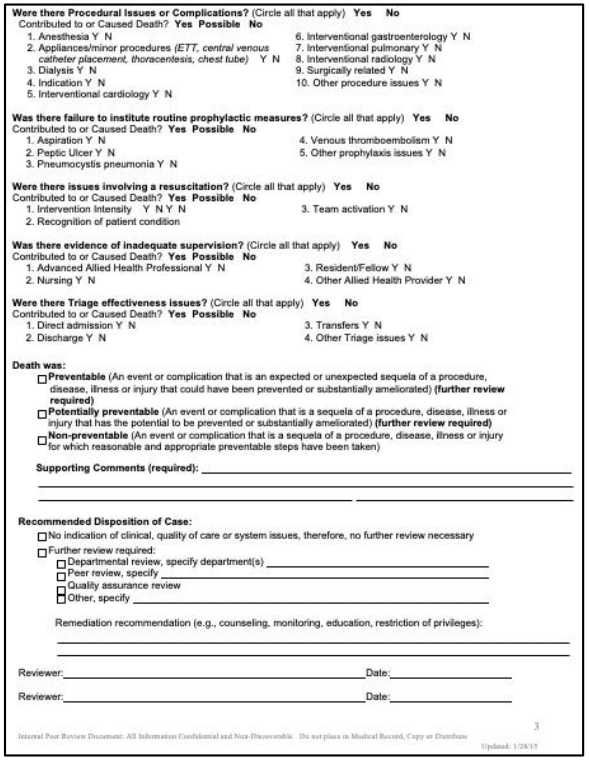

Were there Procedural Issues or Complications? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Anesthesia Y N
2. Appliances/minor procedures *(ETT, central venous catheter placement, thoracentesis, chest tube)* Y N
3. Dialysis Y N
4. Indication Y N
5. Interventional cardiology Y N
6. Interventional gastroenterology Y N
7. Interventional pulmonary Y N
8. Interventional radiology Y N
9. Surgically related Y N
10. Other procedure issues Y N

Was there failure to institute routine prophylactic measures? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Aspiration Y N
2. Peptic Ulcer Y N
3. Pneumocystis pneumonia Y N
4. Venous thromboembolism Y N
5. Other prophylaxis issues Y N

Were there issues involving a resuscitation? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Intervention Intensity Y N Y N
2. Recognition of patient condition
3. Team activation Y N

Was there evidence of inadequate supervision? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Advanced Allied Health Professional Y N
2. Nursing Y N
3. Resident/Fellow Y N
4. Other Allied Health Provider Y N

Were there Triage effectiveness issues? (Circle all that apply) **Yes No**
Contributed to or Caused Death? **Yes Possible No**

1. Direct admission Y N
2. Discharge Y N
3. Transfers Y N
4. Other Triage issues Y N

Death was:

☐ **Preventable** (An event or complication that is an expected or unexpected sequela of a procedure, disease, illness or injury that could have been prevented or substantially ameliorated) **(further review required)**
☐ **Potentially preventable** (An event or complication that is a sequela of a procedure, disease, illness or injury that has the potential to be prevented or substantially ameliorated) **(further review required)**
☐ **Non-preventable** (An event or complication that is a sequela of a procedure, disease, illness or injury for which reasonable and appropriate preventable steps have been taken)

Supporting Comments (required): _____

Recommended Disposition of Case:

☐ No indication of clinical, quality of care or system issues, therefore, no further review necessary
☐ Further review required:
- ☐ Departmental review, specify department(s) _____
- ☐ Peer review, specify _____
- ☐ Quality assurance review
- ☐ Other, specify _____

Remediation recommendation (e.g., counseling, monitoring, education, restriction of privileges):

Reviewer:_____ Date:_____

Reviewer:_____ Date:_____

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For a larger and fully editable version of the form, please refer back to the LSL Toolkit

Shifting to more proactive communication

*"The idea was, as deaths occur, let's not only review the record, but let's **talk to folks face to face** and see what kind of insights we might get. And as we go along, we'll track this information and determine if there are any negative trends occurring.*

The objective was within three days to have (physician) and one of the nurse managers interview the folks directly involved with that case and ultimately determine, "Hey, what could we have done differently? What could we have done better here?"

--- Guiding Coalition Member

Embedding data management tools

"Frankly nobody had really spent much time figuring out how to do a mortality chart review. I think we were the first group in the institution to figure this out. For our own convenience, we ***put it on this piece of software called REDCap*** *that allowed the reviewers to just enter the stuff in and then allowed us to spreadsheet it and take a look at it. That became the base product that now is going forward institution-wide for mortality chart reviews. Now, all of sudden, that's become very popular."*

-- Guiding Coalition Member

Resistance to the process

Frankly, you can do all the mortality chart reviews you want. People are going to be very resistant to actually saying, "This caused this death." No one is going to. If you look at the published data on it, the incidents of some screw-up or some delay or deficiency causing a death is generally one percent or less…It's partly because it's very hard to tell for sure just from reviewing a chart. It's partly probably because nobody wants to actually go there because it's a bag of worms."

The reaction was mixed. There was a lot of resistance that we weren't acting on data that was comprehensive. If you're only looking at deaths, you're looking at small numbers, and you're looking at a select group. You don't really know whether you have a deficiency somewhere or whether it just happened in the group that died and it actually isn't deficient at all."

--- Guiding Coalition Members

The payoff

*"Then we get a bunch of data, didn't really know what it meant. I sat down with it and I plugged through it, **and I started noticing things**. These were only people that died, but I started noticing things…*

We had 11 different domains of things that could go wrong. One of the big ones was delay. Never any delays in STEMI's, but in NSTEMI's delays. Then I started looking at, "Okay, what happens to the NSTEMI's?" These NSTEMI's that die, why do they die? Where do they die? … Basically we centered everything around those observations."

--- Guiding Coalition Member

Disclaimer

The example templates in this Practice Brief were generously shared by the Dartmouth-Hitchcock Medical Center.

They are intended to serve as a starting point for conversations about how to improve use of data to improve care for patients with AMI, and should not be interpreted as an endorsed clinical guideline.

We encourage hospital teams to adapt these approaches to their own needs and local context.