Trajectories

The Path to Reach Gerry
Objectives

- Demonstrate the use of the evidence cycle in direct patient care
- Demonstrate the use of PICO(T) to direct clinical question formation
- Propose a path to kick off the week
Teaching Goals

- Demonstrate interactive methods
- Deliberate attention to detail
- Focus on relevance
- EBM as a clinical skill that is in the best interest of our patients
What is this?
A path followed by an object moving through space

Reflection

Light

Movement

Direction

Cape Canaveral: Shuttle launch

An Arc
What is this?
And how do you know?
What is this?
What is this?
And how do you know?
How Often Does it Fall*?

• From what you know, calculate ‘falls’ rate

• EVERYONE: come up with a number

• How confident are you in this as a reliable or true rate?

*Fall Definition: doesn’t reach intended spot
Can We Do Better?

• Exercise #1: 4 Volunteers please

• From what you know, calculate ‘falls’ rate

• EVERYONE: come up with a number

• How confident are you in this as a reliable rate?
Can We Do Better?

- Exercise #2: 4 Volunteers please
- From what you know, calculate ‘falls’ rate
- EVERYONE: come up with a number
- And what if it mattered?
Two Fundamental Principles

• Ex #1: How you know things matters
  A Hierarchy of evidence helps us differentiate information more likely to be valid or true

• Ex #2: Context is everything
  Decisions are informed and guided by patient values and preferences.
Two Fundamental Principles

• Not all evidence is created equal
  A Hierarchy of evidence helps us differentiate information more likely to be valid or true

• Evidence alone is never enough
  Decisions are informed and guided by patient values and preferences.
Trajectories

The Path to Reach Gerry
Ask

Acquire

Appraise

Evidence-based medicine cycle

Hierarchy of Evidence

Apply

Values & Preferences

Act

Patient dilemma
Ask
Act
Acquire
Appraise
Apply
Gerry (Mr. S) and Anne

Written informed consent was obtained to share this story…
Mr. S: Presentation & Past History

• 91 year old nursing home resident with SOB, fever, dementia, ischemic CM, CHF (EF 10%), myelodysplastic syndr.

• Past history
  • Atrial fibrillation, not on coumadin, s/p CVA
  • Chronic indwelling catheter with recurrent urinary tract infection and h/o urosepsis
  • Major depression, past suicidal ideation
Mr. S: Physical Examination

• General: wasted, cachectic, no acute distress, awake, responds to painful stimuli, does not follow commands

• Vital Signs
  • Blood pressure: 95/53 (baseline 140/80)
  • Pulse: 104 (baseline 70)
  • Respiration variable from 18 to 30
  • Temperature: 102° F
Mr. S: Physical Examination

- Lungs clear, decr breath sounds left base
- CV: rate ~100, regular S1, S2 +S3
- Abdomen: scaphoid, soft, nontender
- Extr: no edema, cords or tenderness
- Neurologic: does not comply with testing, but moved all extremities without obvious focal deficit
Mr. S: Laboratory and Data

- Labs
  - WBC baseline 3.9 → 7.5 → **19.7**
  - Hematocrit baseline ~30 → **26**
  - Platelets baseline 36 → **30**
  - BUN/ Creatinine: 41/1.6 → **60/2.6**

- CXR: clear with small left pleural effusion
- Rapid Flu: negative
- u/a: leuk +, nitrate +, 21 WBC, + bacteria
Mr. S: One More Thing

- DNR/DNI s/p multiple recent hospital admissions; reviewing the chart you note prior hospice referrals
Mr. S: Summary

• Your intern’s summary as you walk away from the room is a single word “Grim”. You return to the team room to discuss.

• BUZZ GROUPS of 3 or 4 people:
  • What is this?
  • How do you know?
  • What do you do?
What is this? How Do You Know?

- 91 year old patient with dementia, SOB, severe CHF (EF 10%), MDS, anemia, thrombocytopenia
- Urosepsis with hypotension, worsening renal function
- Chart review, physical examination, labs
Mr. S: What do you do?

Immediate actions
- Fluid resuscitation
- Antibiotics

Larger picture
- Hospice referral
- Morpine for symptomatic shortness of breath
Mr. S: hospital course

- Response to fluids and antibiotics
  - Blood pressure stabilizes
  - Lungs immediately fill with fluid → rales ½ way up both lung fields, acute worsening of SOB
  - Renal function does not improve (creat 2.5)
Mr. S: Stepdaughter left a note

• Will he require:
  • Blood transfusion?
  • Dialysis?
  • Feeding tube placement?

• What do you do now?
Mr. S: What do you do?

- Antibiotics
- Fluid resuscitation
- Blood transfusion
- Dialysis
- Feeding tube placement
- Hospice referral
- Morphine

Audience Response

- Raise your hand if you would...
Mr. S: What do you do?

- Antibiotics
- Fluid resuscitation
- Blood transfusion
- Dialysis
- Feeding tube placement
- Hospice referral
- Morphine

What we did...

What we thought...
On the your file card: draw a graph or picture of how you project the functional decline for Mr. S toward the end of life

Example

- Y-Axis: function
  - Perfect function = 1.0
  - Death = 0
- X-Axis: time
On the your file card: draw a graph or picture of how you project the functional decline for Mr. S toward the end of life.

Example:

- **Y-Axis**: function
  - Perfect function = 1.0
  - Death = 0
- **X-Axis**: time
AS: Health Care Proxy

- Continue Antibiotics
- Hold fluids
- Blood transfusion
- Diuresis
- Dialysis
- Feeding tube placement
- Hospice referral
- Morphine
And then we went in together...
Go to Audio…
Ask
Acquire
Appraise
Apply
Act
Ask | Acquire | Appraise

Evidence-based medicine cycle

Patient dilemma

Hierarchy of Evidence | Values & Preferences

Act | Apply
Evidence-based medicine cycle

Ask

Acquire

Appraise

Hierarchy of Evidence

Apply

Patient dilemma

Values & Preferences
Clinical Question Formation

• **P**: Patient, population, problem
• **I**: Intervention, exposure, prognostic factor
• **C**: Comparison
• **O**: Outcome
• **T**: Type of question
• **T**: Type of study design
Clinical Question Formation

- **P:** Terminal illness / palliative care
- **I:** Followed over time
- **C:**
- **O:** Disease progression
- **T:** Prognosis
- **T:** Prospective cohort study
• Terminally ill
• Disease Progression
• Palliative Care

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Evidence-based medicine cycle

Patient dilemma

Act

Hierarchy of Evidence

Apply

Values & Preferences
Described trajectories:

Being aware of these can help clinicians plan to meet the multidisciplinary needs of patients and their care-givers and help them cope with their situation.
Theoretical Trajectories of Dying

Sudden Death
Cardiac
Infectious
Accidental

Terminal illness (cancer)

Organ failure
COPD, CHF

Frailty
Nursing home

Patterns of Functional Decline at the End of Life

June R. Lunney, PhD, RN
Joanne Lynn, MD, MA, MS
Daniel J. Foley, MS
Steven Lipson, MD
Jack M. Guralnik, MD, PhD

Context Clinicians have observed various patterns of life, but few empirical data have tested these patterns.

Objective To determine if functional decline differs in functional decline before dying. Although these differences were unevenly distributed in 12 cohorts based on the final interview and death.
Prospective Study Cohort

Study Cohort
• 4,190 decedents interviewed within 1 year of death
• Self /proxy-reported physical function
• 12 cohorts based on #of months between final interview & death

Categories: ICD-9
• Sudden death
• Terminal illness
• Organ failure
• Frailty
Prospective Study Cohort

- Compared demographic characteristics of groups
- Plotted decline in physical function as cohort interval approached death
- Predicted likelihood of being disabled before dying, adjusting for demographic and time variables
- Sudden death was the reference group
Prospective Study Cohort

- Cancer: youngest peaked before 80 yr
- Organ failure: older
- Frailty: oldest; less married; more women

- Functional decline defined as level of dependency
- 0 = no dependent ADL
- Higher number of dependent ADL = more disability
Dependent Activities of Daily Living (ADLs) for Each Month Cohort, by Trajectory Group

Individual variability in function declined erratically.

Go to Audio…
But does it matter?
Anne’s view of Gerry’s Trajectory

- Seizure
- Pneumonia
- Renal Failure / hypotension
- Stevens-Johnson
- Urosepsis
- MI

Our view of Gerry’s Trajectory
Gerry’s Trajectory

- Seizure
- Pneumonia
- Renal Failure / hypotension
- Stevens-Johnson
- Urosepsis
- MI

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A chosen or taken course
Two Fundamental Principles of EBM

• Not all evidence is created equal
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