

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

Light

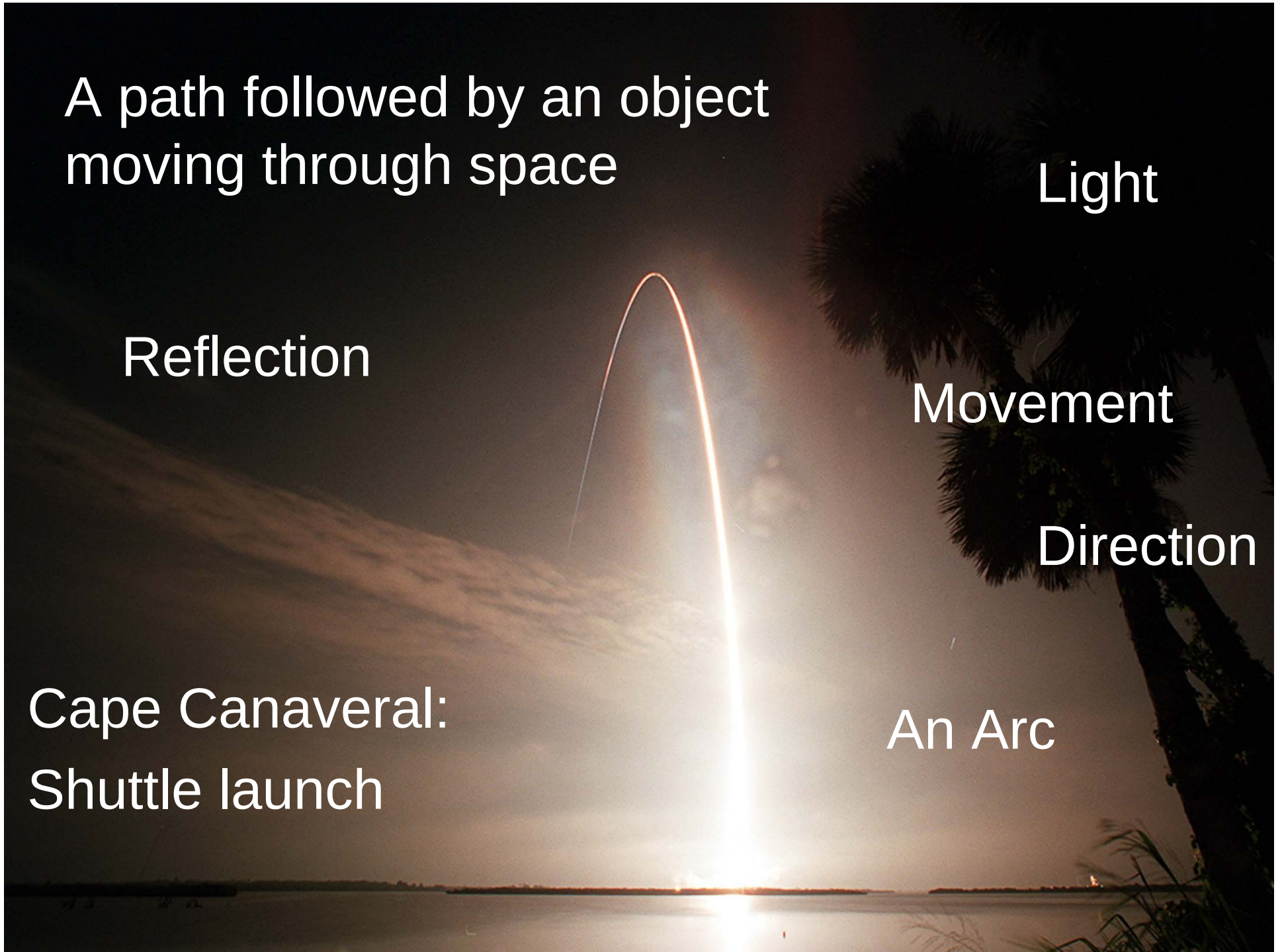
Reflection

Movement

Direction

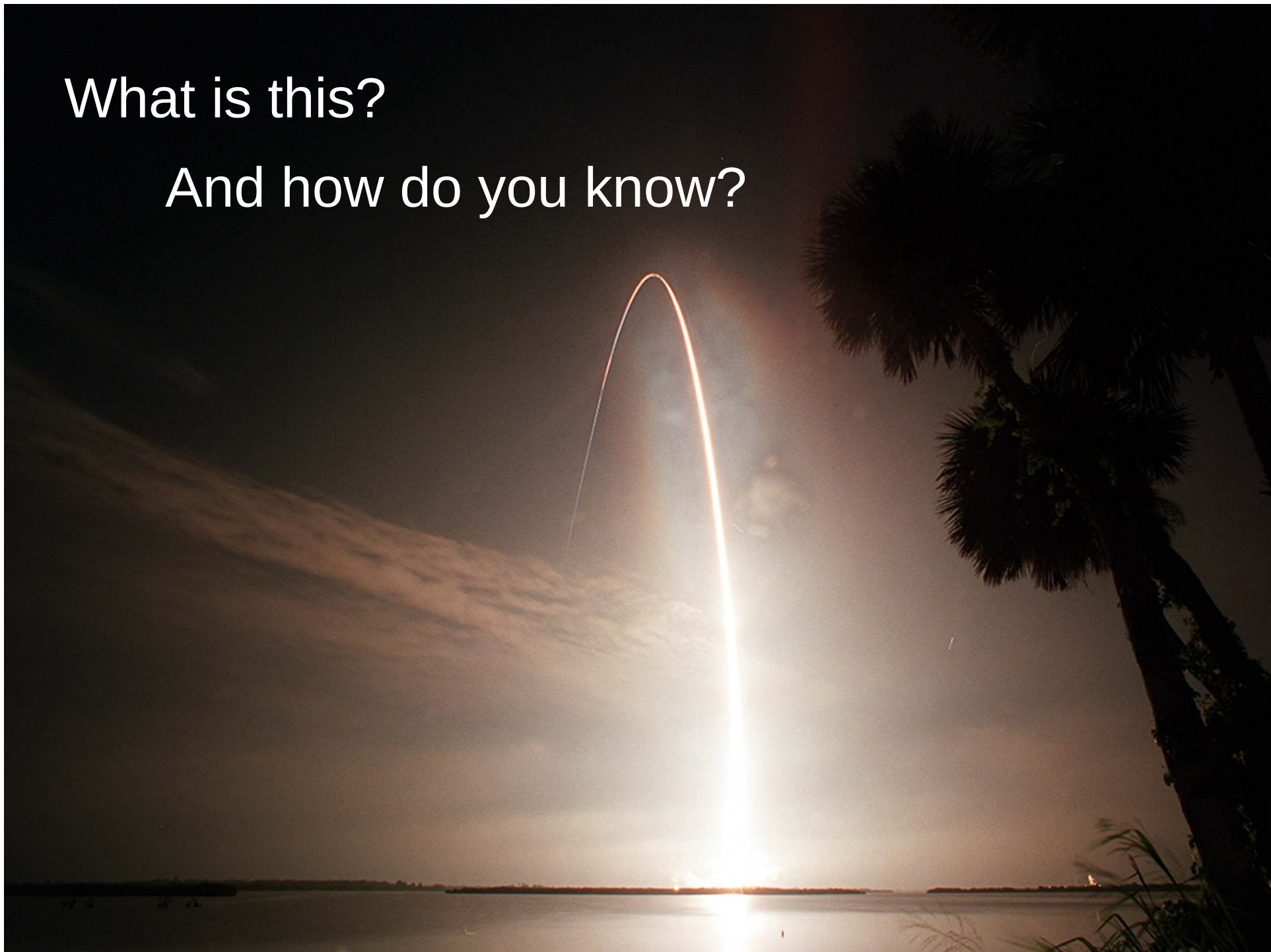
Cape Canaveral:
Shuttle launch

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?

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

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

**Patient
dilemma** 

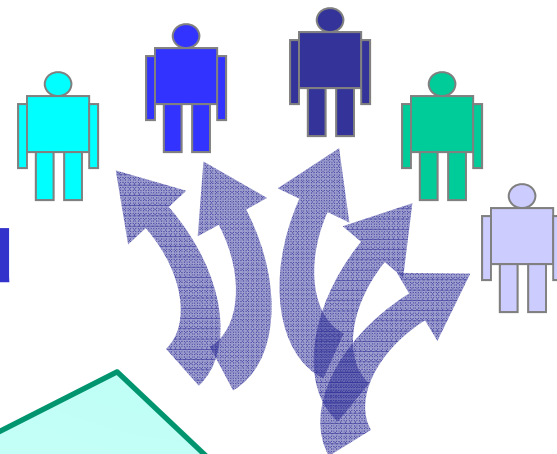
Ask

Act

Acquire

**Evidence-based
medicine
cycle**

Appraise



**Hierarchy of
Evidence**

Apply

**Values &
Preferences**



Ask

Act

Acquire

Appraise

Apply

Ask

Act

Acquire

Gerry (Mr. S) and Anne

Written informed consent was
obtained to share this story...

Appraise

Apply

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?

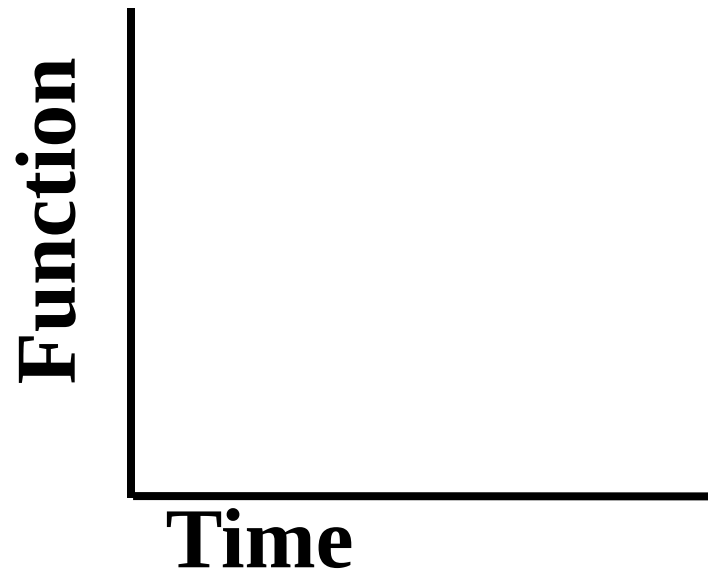
- Antibiotics
- Fluid resuscitation
- Blood transfusion
- Dialysis
- Feeding tube placement
- Hospice referral
- Morphine

What we did...

What we thought...

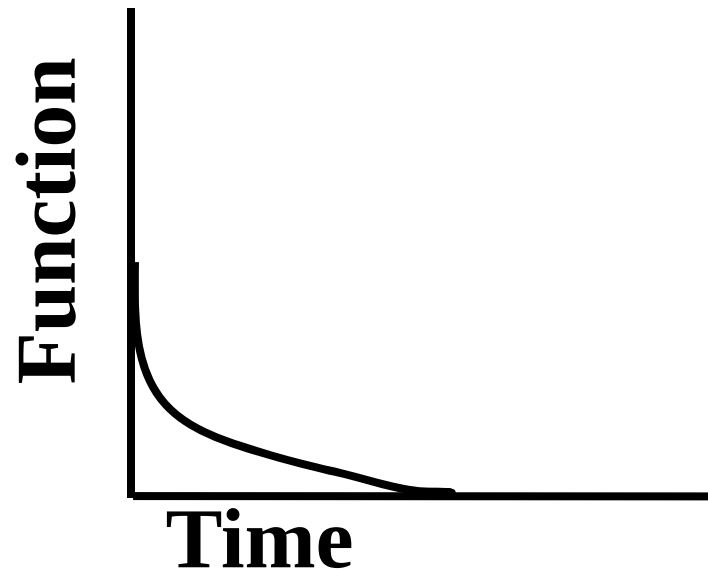
Pictionary

- 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



Pictionary

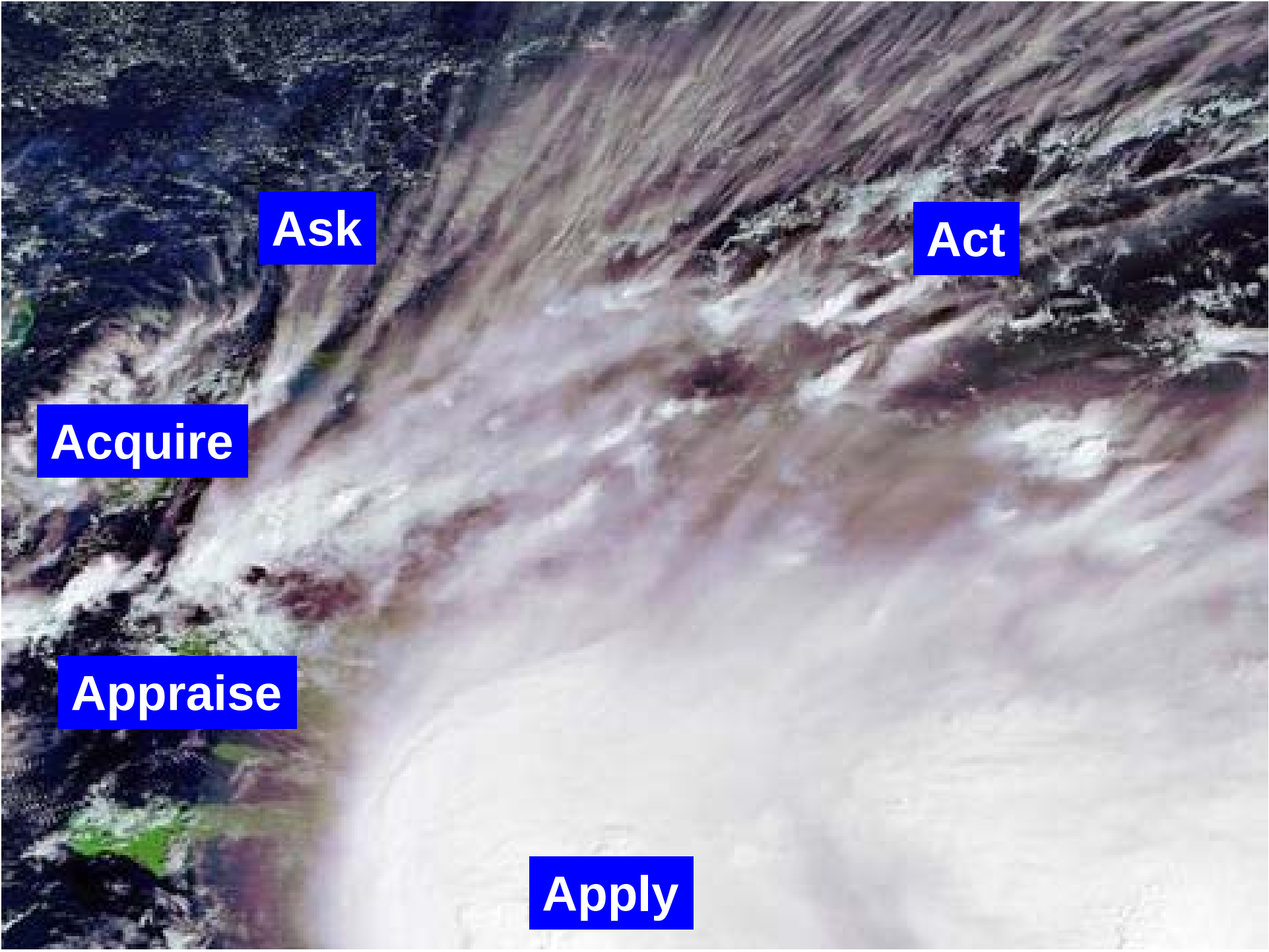
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- Example
 - Y-Axis: function
 - Perfect function = 1.0
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 - X-Axis: time



AS: Health Care Proxy

- Continue Antibiotics
- Hold fluids
- Blood transfusion
- Diuresis
- Dialysis
- Feeding tube placement
- Home care referral
- Morphine





Ask

Act

Acquire

Appraise

Apply

And then we went in together...

Go to Audio...

Gerry: Past Medical History

SK:

I wonder if you could just begin by giving us a little background history about his medical condition and the time when he was with you and he was much more active and able to do things.

Gerry: Past Medical History

AS:

Gerry was highly functional for his chronological age until his 90th birthday. On his 90th birthday he was able to put on a suit, go out to a lovely dinner, he went to a surprise party at 10 pm.

Gerry: Past Medical History

AS:

I noticed a little bit of a decline in his cognitive abilities and a little bit of decline in his physical abilities, but not so much as to really seriously impact the quality of life.

Gerry: Past Medical History

AS:

The previous year, I recommended strongly (by taking his car keys) that he give up driving but other than that he was able to cook for himself and pretty much do the activities of daily living.

Gerry: Past Medical History

AS:

Three days after his 90th birthday, Gerry tripped in the house on an uneven surface that was being repaired and he broke his hip and that is what really ultimately led to the spiral and to the decline that we are currently witnessing now.

Gerry: Past Medical History

AS:

At first, his cognitive abilities were still unchanged, but as he remained longer in an institutional setting, the decline of his cognitive abilities really fell off a plateau and dramatically dropped.

Gerry: Past Medical History

AS:

And when he came to the VA it was precipitated from renal insufficiency due to malnutrition because his mind at that point was pretty bad and he had been suffering from suicidal depression.

Gerry: Past Medical History

AS:

Had he had the ability to kill himself he might have.

His kidneys failed and we did bring him here for that issue, pulling him literally from the clutches of the great beyond.

Gerry: Past Medical History

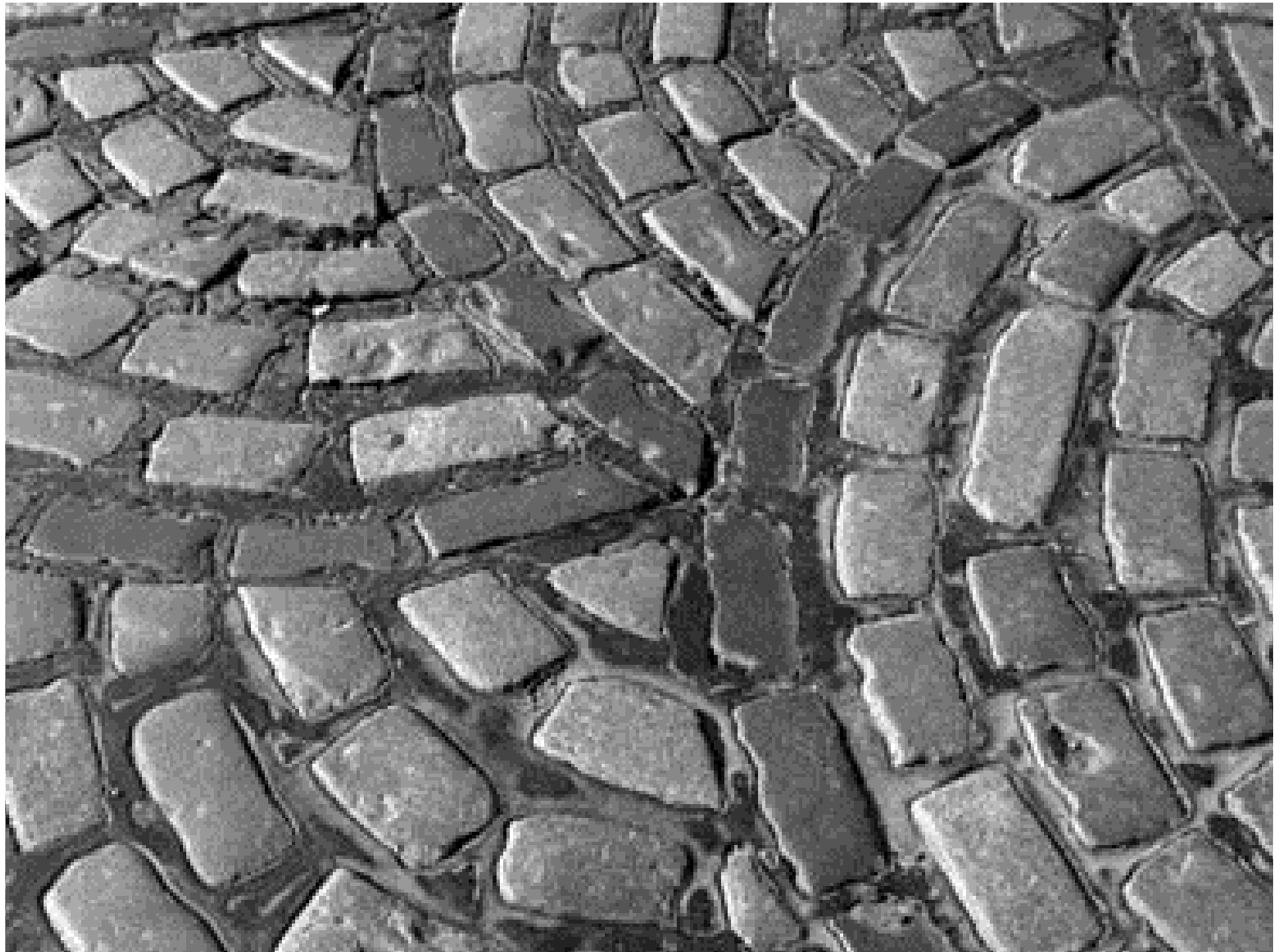
AS:

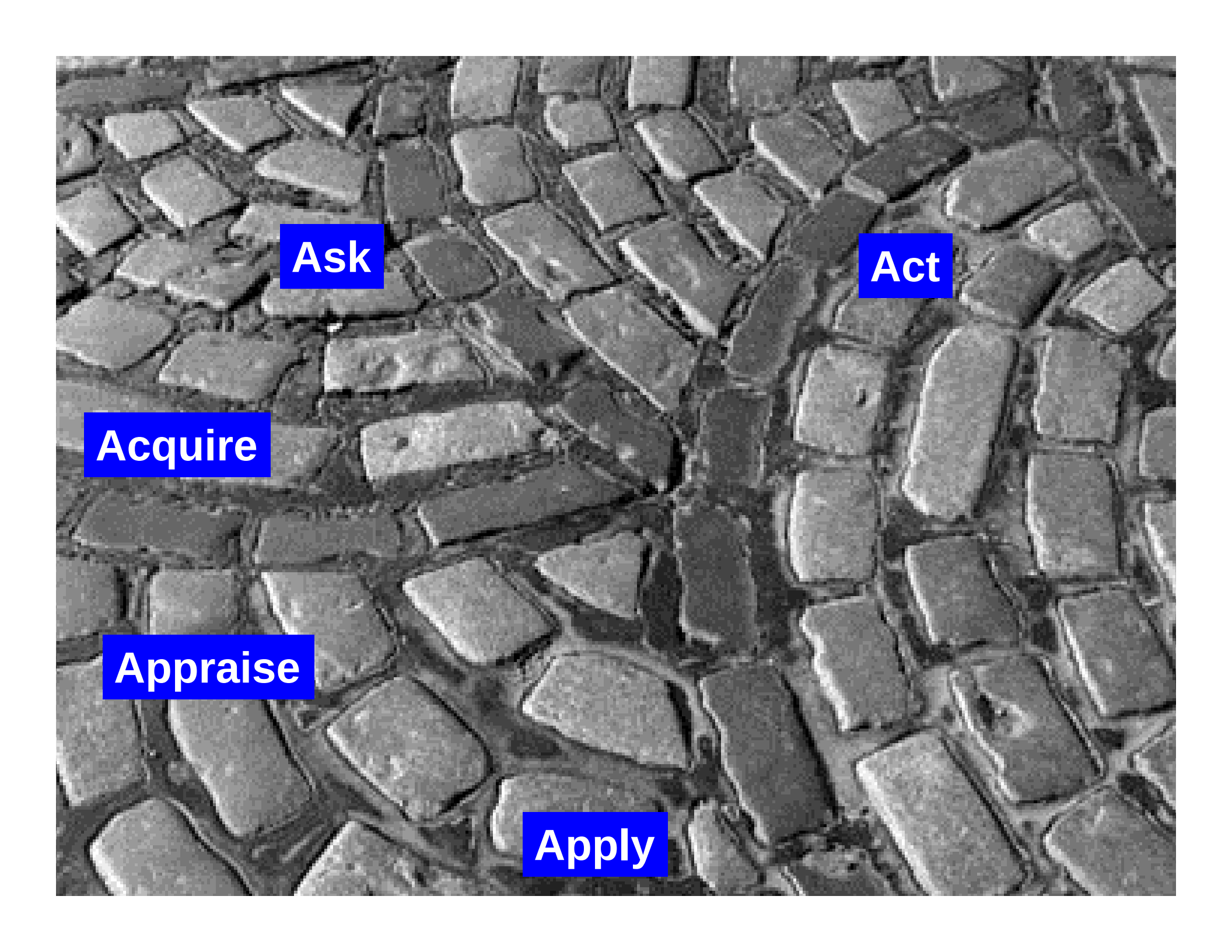
Even though his ejection fraction was incredibly low, the emergency room doctor gave us a choice, he said he is likely to die tonight. His ejection fraction is very low it is unlikely he will be able to survive the amount of fluid required to salvage his kidneys.

Gerry: Past Medical History

AS:

He said, but, and his blood pressure was incredibly low it was 70-something over 32, very low. He said, but, the only chance we have of attempting to save his life is by giving a large bolus of fluid, so Gerry actually survived at age 90, a 3 and a half liter bolus of fluids in 3 and a half hours, a liter an hour.





Ask

Act

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Appraise

Apply

**Patient
dilemma** 

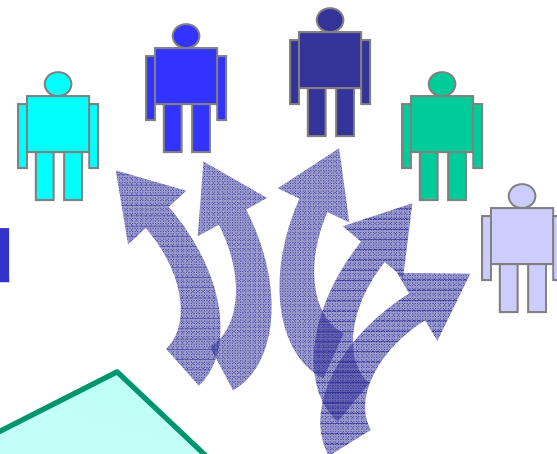
Ask

Act

Acquire

**Evidence-based
medicine
cycle**

Appraise



**Hierarchy of
Evidence**

Apply

**Values &
Preferences**

**Patient
dilemma** 

Ask

Act

Acquire

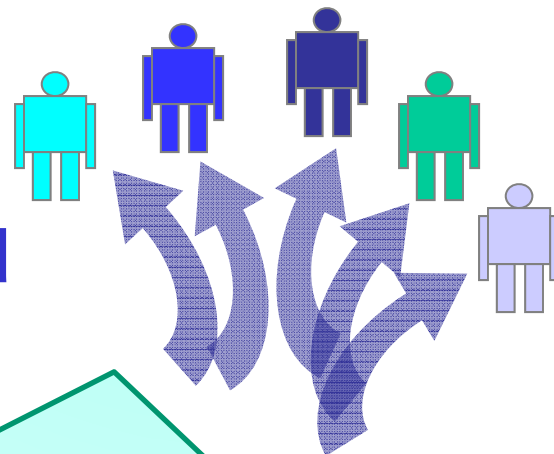
**Evidence-based
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Appraise

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Apply

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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



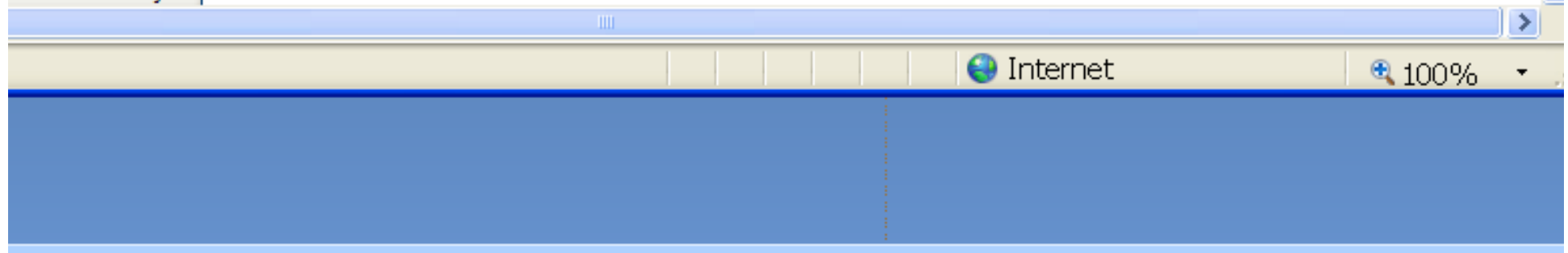
▼ for #3 AND #4 Preview Go Clear [Advanced Search](#)

[Limits](#) [Preview/Index](#) [History](#) [Clipboard](#) [Details](#)

- Terminally ill
 - Disease Progression
 - Palliative Care
- } 29

Search	Most Recent Queries	Time	Result
#5	Search #3 AND #4	15:46:04	29
#4	Search palliative care	15:45:37	35217
#3	Search #1 AND #2	15:43:14	61
#2	Search disease progression	15:42:57	141218
#1	Search terminally ill	15:42:36	6925

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**Patient
dilemma** 

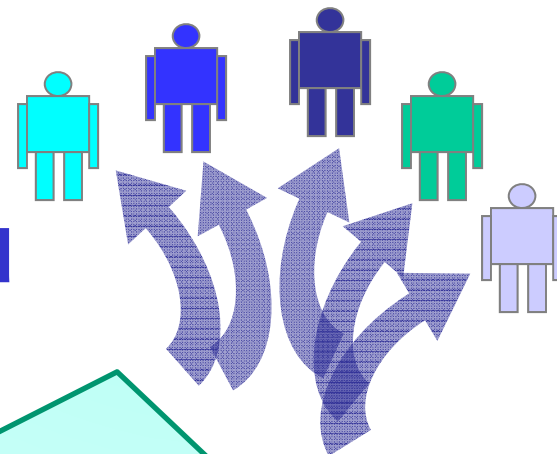
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medicine
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Appraise



**Hierarchy of
Evidence**

Apply

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Clinical review

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.

that can, conceptually at least, be mapped out towards death.

Such frameworks may help clinicians plan and

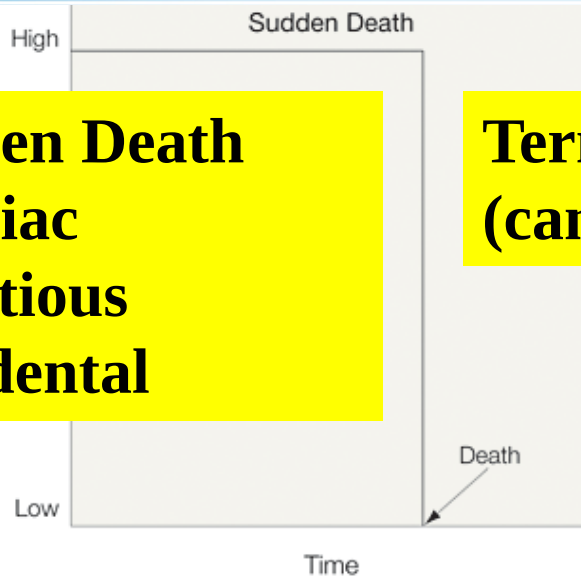
of patients and their carers are likely to vary according to the trajectory they are following

Being aware of these trajectories may help

development:
Marilyn Kendall
research fellow
Kirsty Boyd

Theoretical Trajectories of Dying

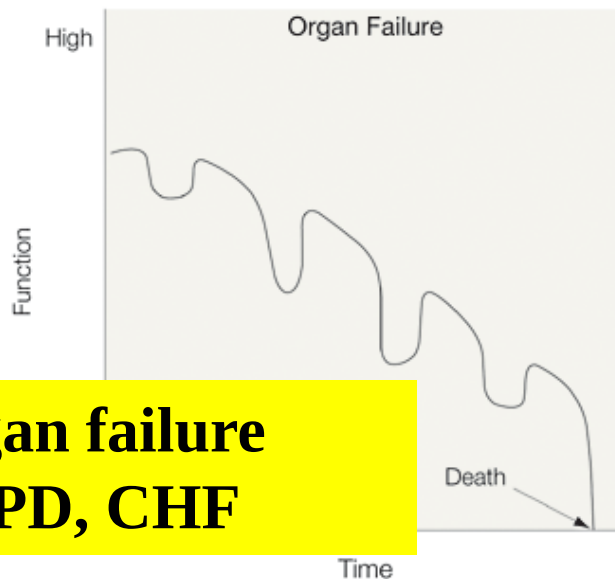
Sudden Death
Cardiac
Infectious
Accidental



Terminal illness
(cancer)



Organ failure
COPD, CHF



Frailty
Nursing home



Lunney, J. R. et al. JAMA 2003;289:2387-2392.

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

CLINICAL OBSERVATION SUPPORTS the existence of differences in functional decline before dying. Although these

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

Objective To determine if functional decline differs by cause of death: sudden death, cancer death, death from organ failure, or death from other causes.

Design, Setting, and Participants Cohort analysis of the prospective, longitudinal Established Populations for the Epidemiologic Study of the Elderly (EPESE) study. Of the 14 456 participants aged 65 and older who were interviewed at baseline (1981-1987), 4871 died during the study. Of these, 4190 (86%) of these provided interviews within 1 year of death. Participants were evenly distributed in 12 cohorts based on age and sex at 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

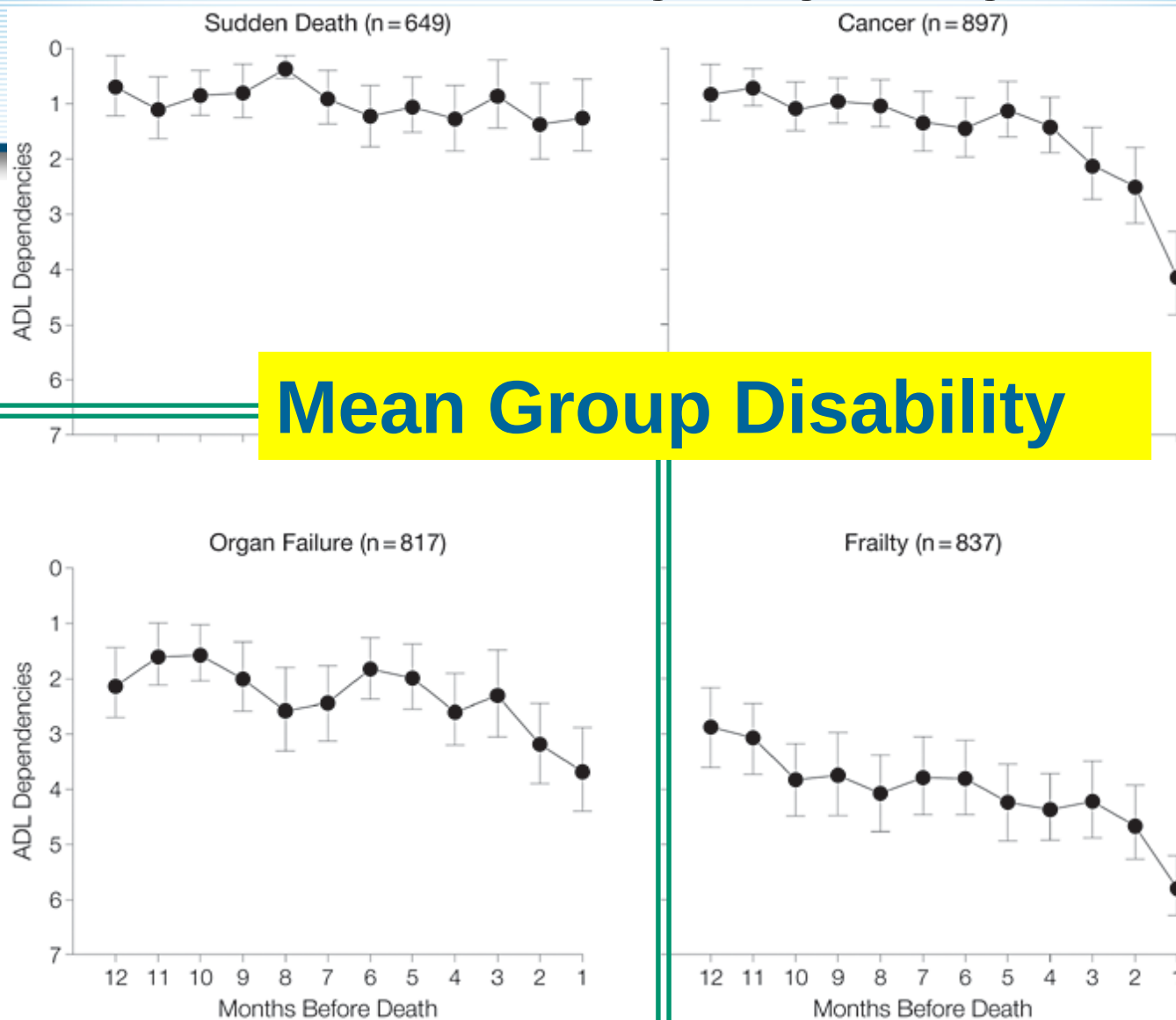
Prospective Study Cohort

- 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



Lunney, J. R. et al. JAMA 2003;289:2387-2392.



**Individual variability in
function declined erratically**

Lunney, J. R. et al. *CRNA* 2003;289:2387-2392.

**Patient
dilemma** 

Ask

Act

Acquire

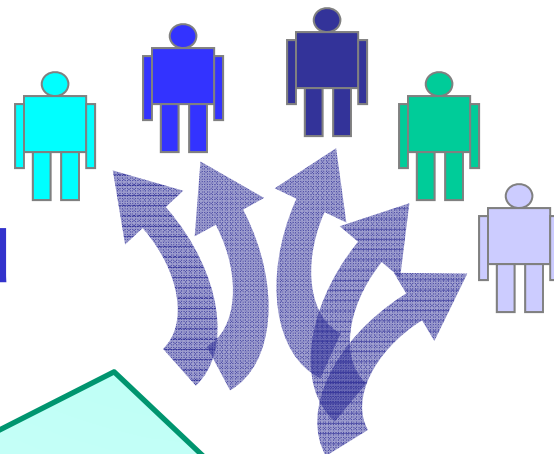
**Evidence-based
medicine
cycle**

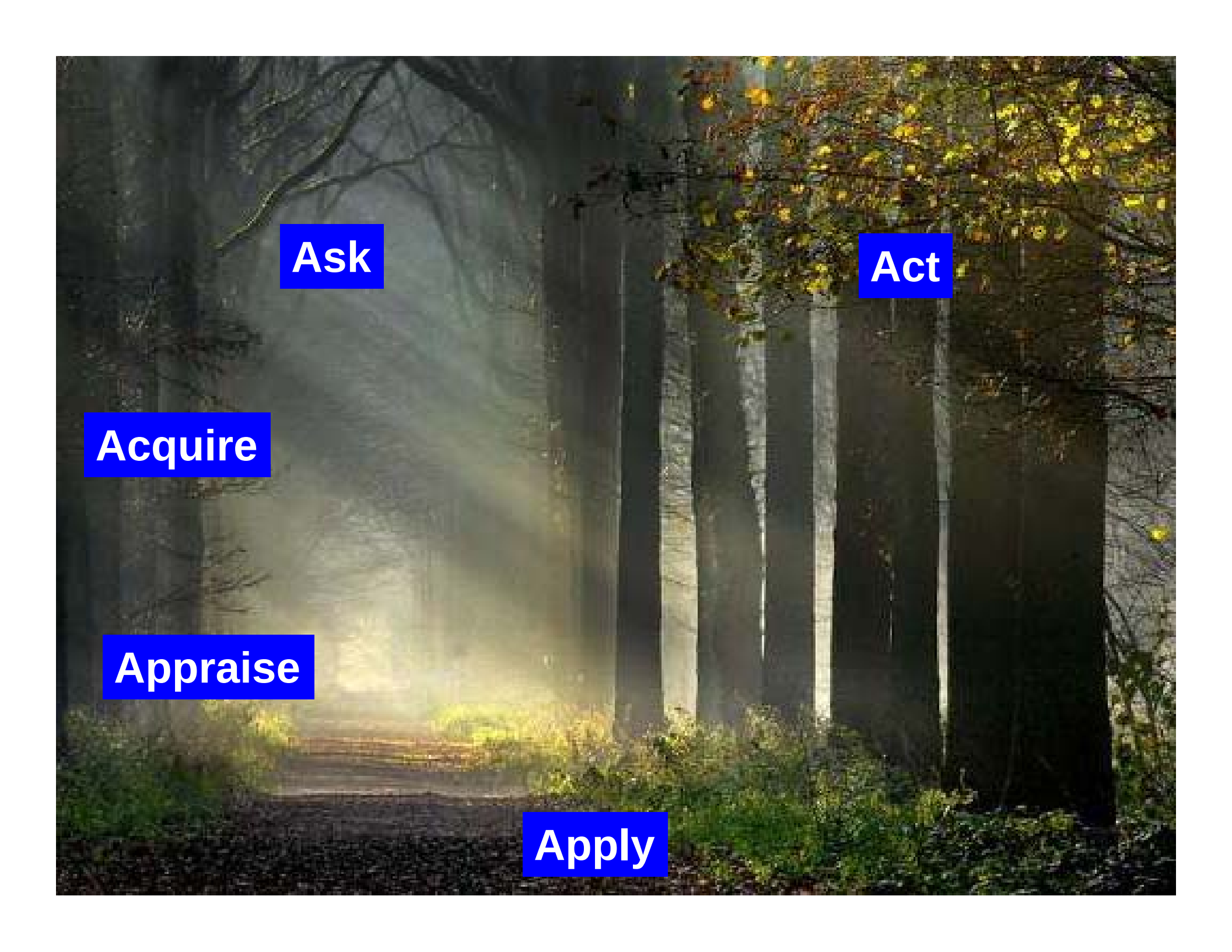
Appraise

**Hierarchy of
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Apply

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A photograph of a misty forest path. The path is dark and leads into the distance. The trees are tall and thin, with some foliage visible on the right. The atmosphere is misty and ethereal. Five blue text boxes with white text are overlaid on the image. The word 'Ask' is in the upper left, 'Act' is in the upper right, 'Acquire' is in the middle left, 'Appraise' is in the lower left, and 'Apply' is at the bottom center.

Ask

Act

Acquire

Appraise

Apply

Go to Audio...

Gerry: Trajectories

SK:

So , one of the things we have talked a lot about is this process that you have been through where multiple times, people have said to you he may not live out the night.

How many times would you say that people have said that to you?

Gerry: Trajectories

AS:

When he was admitted for what ended up being a seizure but what we thought was a stroke, that was being looked at as a possible terminal event.

Gerry: Trajectories

AS:

He had a pneumonia hospitalization after that and, given his status, that was sort of unlikely that he would actually pull through this.

Gerry: Trajectories

AS:

In this hospital that night, again, with the comorbidities of renal insufficiency and then the incredibly low blood pressure, you know, that was another case.

Beyond that he had urosepsis in this hospital once before in July of last year.

Gerry: Trajectories

AS:

And then after that he had Stevens Johnson Syndrome related to the Bactrim, given for urosepsis. So, when he got through the urosepsis, he developed Stevens Johnson Syndrome.

There might have been another time out there; it's actually starting to blur.

Gerry: Trajectories

AS:

In addition to that, in years past, the stroke that he had was minor, but Gerry has survived a myocardial infarction. He has survived a CVA and a TIA two years apart.

And, you know he has been living with an incredibly low ejection fraction for a very long period of time.

Gerry: Trajectories

AS:

So, given all of that, it has been very hard for me as the family to have a sense of stopping, because every time I've sort of pushed through, Gerry has responded and gotten better.

Gerry: Trajectories

SK:

Each of these incidents where you were told that he was going to die was a different team of doctors.

AS: Yes

Gerry: Trajectories

SK:

So now all of the sudden there is a new team and, once again, your doctors are telling you, we really are concerned about him. We are worried that he is in the end of his life; we are worried that we can't get the fluid out of his lungs and also protect his kidneys.

Gerry: Trajectories

SK:

Tell me how that felt to you. Here you are again, with people telling you the same thing, again, and let's say six prior times people told you he was going to die, he didn't and he came on back.

Can you share what you might have been thinking or how that felt to you? Was it frustrating or confusing?

Gerry: Trajectories

AS:

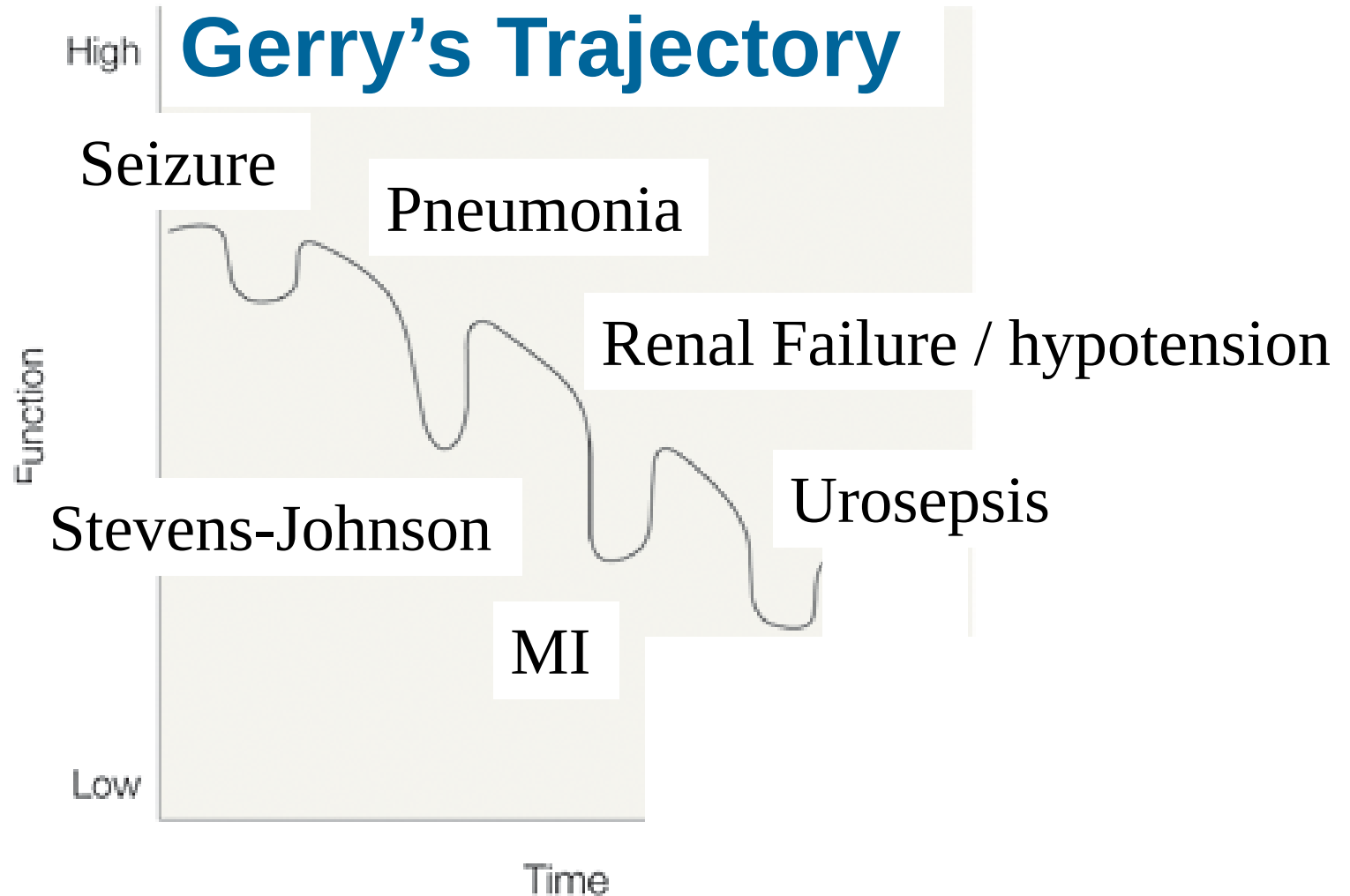
It wasn't confusing, it was frustrating because I wasn't convinced that every avenue was being done to save his life because he was being looked at as a hopeless case and his age was always brought up, Oh, he is 91.

Gerry: Trajectories

AS:

I guess my belief is that, yes he is 91, so things of course are not working as well. But that is not germane to still doing everything you can do to try to save the life before you.

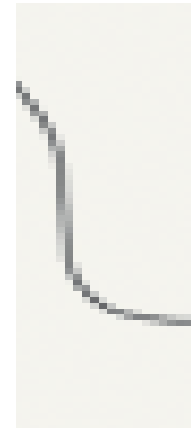
Anne's view of Gerry's Trajectory



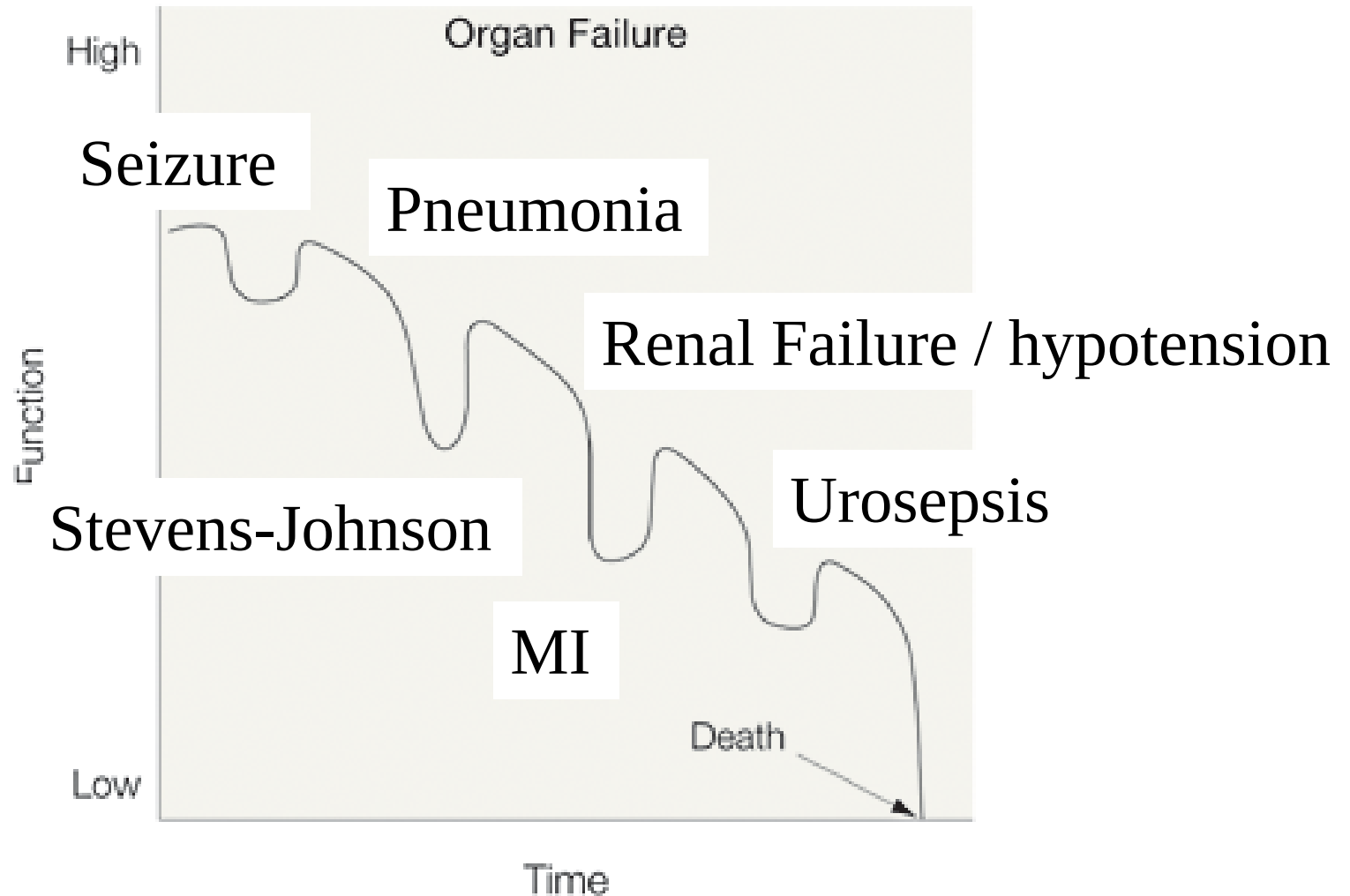
Lunney, J. R. et al. JAMA 2003;289:2387-2392.

Our view of Gerry's Trajectory

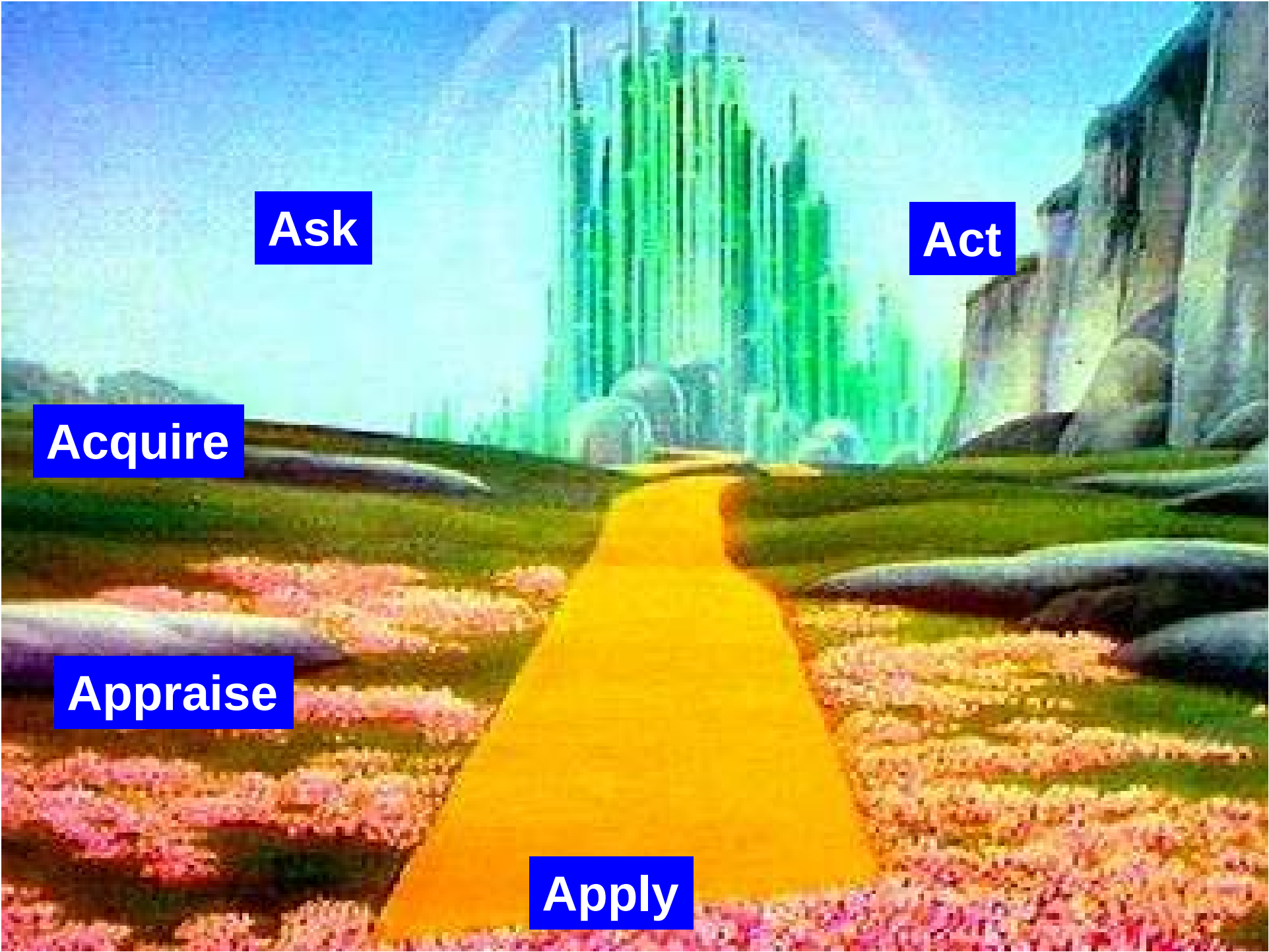
Urosepsis



Gerry's Trajectory



Lunney, J. R. et al. JAMA 2003;289:2387-2392.



Ask

Act

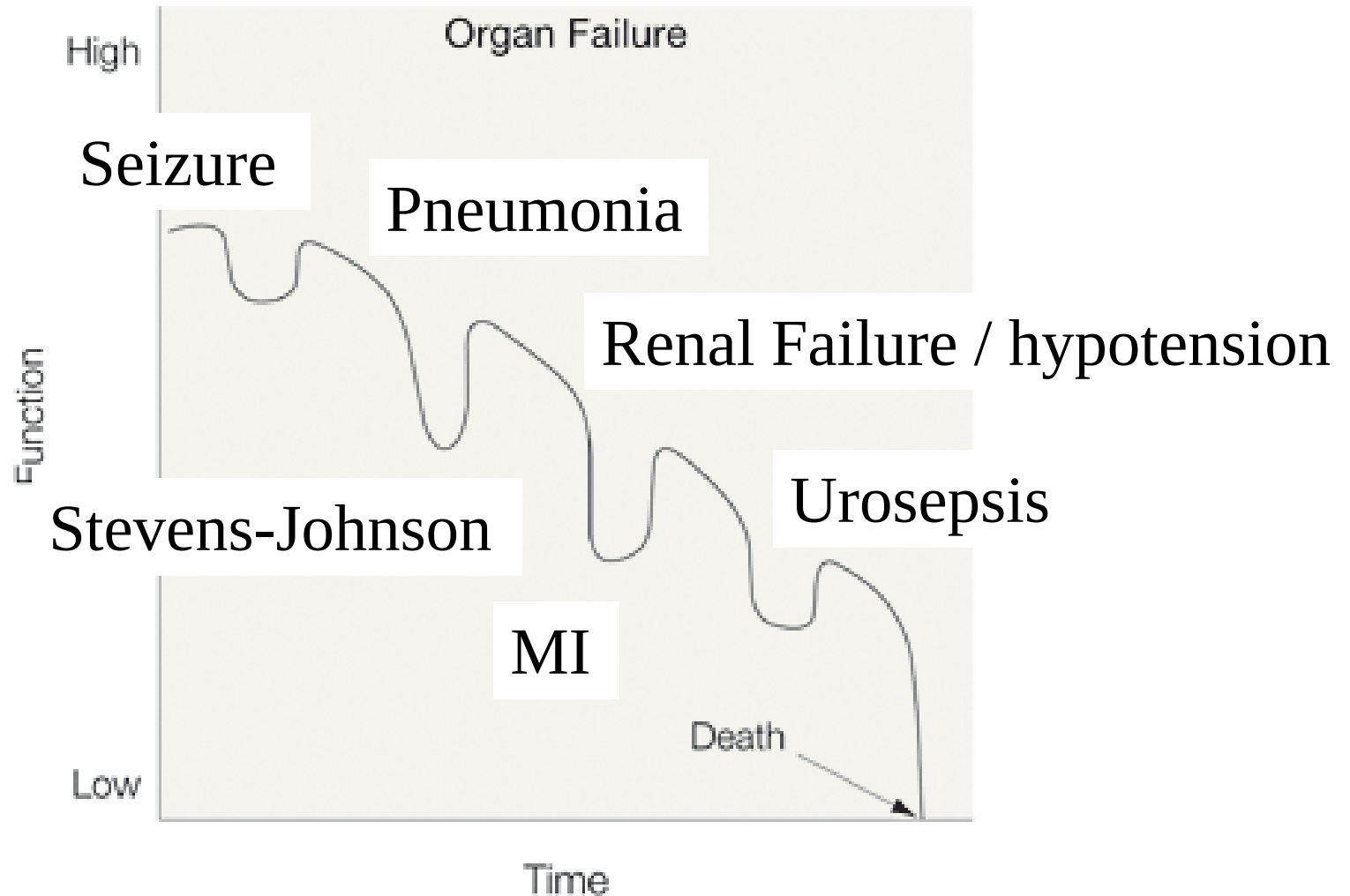
Acquire

Appraise

Apply

But does it matter?

Gerry's Trajectory



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Go to Audio...

What do you want to teach us?

AS: I know we talked yesterday about the opportunity to have a voice to a larger group of physicians and physicians in training. Are there particular messages that you want to give to them?

What do you want to teach us?

AS: The most important thing would be to really truly communicate and listen to what the family has to say because they have a longer perspective on the patient.

What do you want to teach us?

AS: At some level I almost even for a while thought that they would be somewhat relieved if he passed so that this whole problem could go away for them. He's old, he has a very slim chance of making it. He is 91, he is probably not going to make it.

What do you want to teach us?

I almost felt like we were a really bad inconvenience and that is not a good feeling. Because, end of life is stressful enough, but the stress I was feeling was not end of life stress; it was medical team induced stress.

What do you want to teach us?

And are two distinct stresses; it's better if a family can feel just end of life stress, not medical team stress. And when someone is actually listening and you feel that they are communicating, it relieves that stress.

Gerry: Pass It Forward

AS:

If I have to pass anything forward, I think what I would like medical personnel to understand is that even though someone is terminal, the family might be hoping for Thursday instead of Tuesday because we are looking at each day as a precious gift.

Gerry: Pass It Forward

AS:

I would really be reluctant to have him die depressed, miserable and angry. I don't feel that's a good conclusion to a life well lived.

Gerry: Pass It Forward

AS:

I am very grateful that god has granted him this extra year because now I feel his passing is going to be where he is no longer angry, bitter, depressed and where he is really feeling loved.

Gerry: Pass It Forward

AS:

For the whole last cycle in the trajectory has been an amazing experience for Gerry to experience extreme care and love because it has been a much longer cycle than any of the others.

Gerry: Pass It Forward

AS:

So, in this cycle which has been going on for over 2 weeks Gerry has gotten to feel more love than he has probably felt for most of his life and I think he is responding in kind.



Trajectories

A chosen or taken course

Two Fundamental Principles of EBM

- 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.

**Patient
dilemma** 

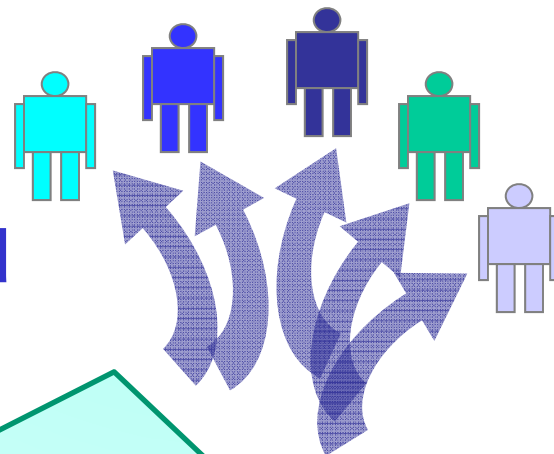
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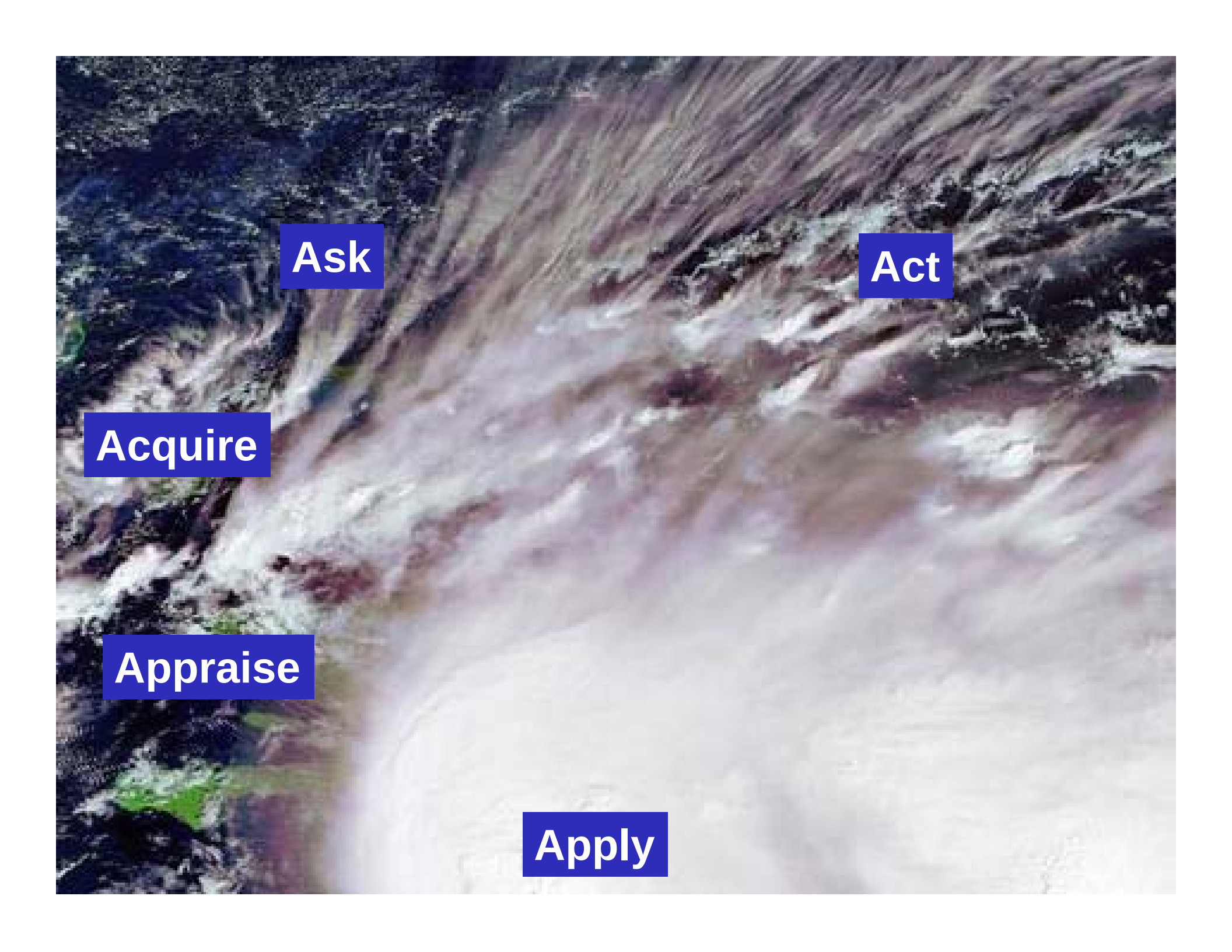
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The background image is a photograph of a waterfall. The water is white and turbulent as it falls over dark, rocky ledges. The surrounding area is covered in green moss and small plants. Five blue rectangular boxes with white text are overlaid on the image. The boxes are arranged in a way that suggests a flow or a cycle, with 'Ask' at the top left, 'Act' at the top right, 'Acquire' on the middle left, 'Appraise' on the bottom left, and 'Apply' at the bottom center.

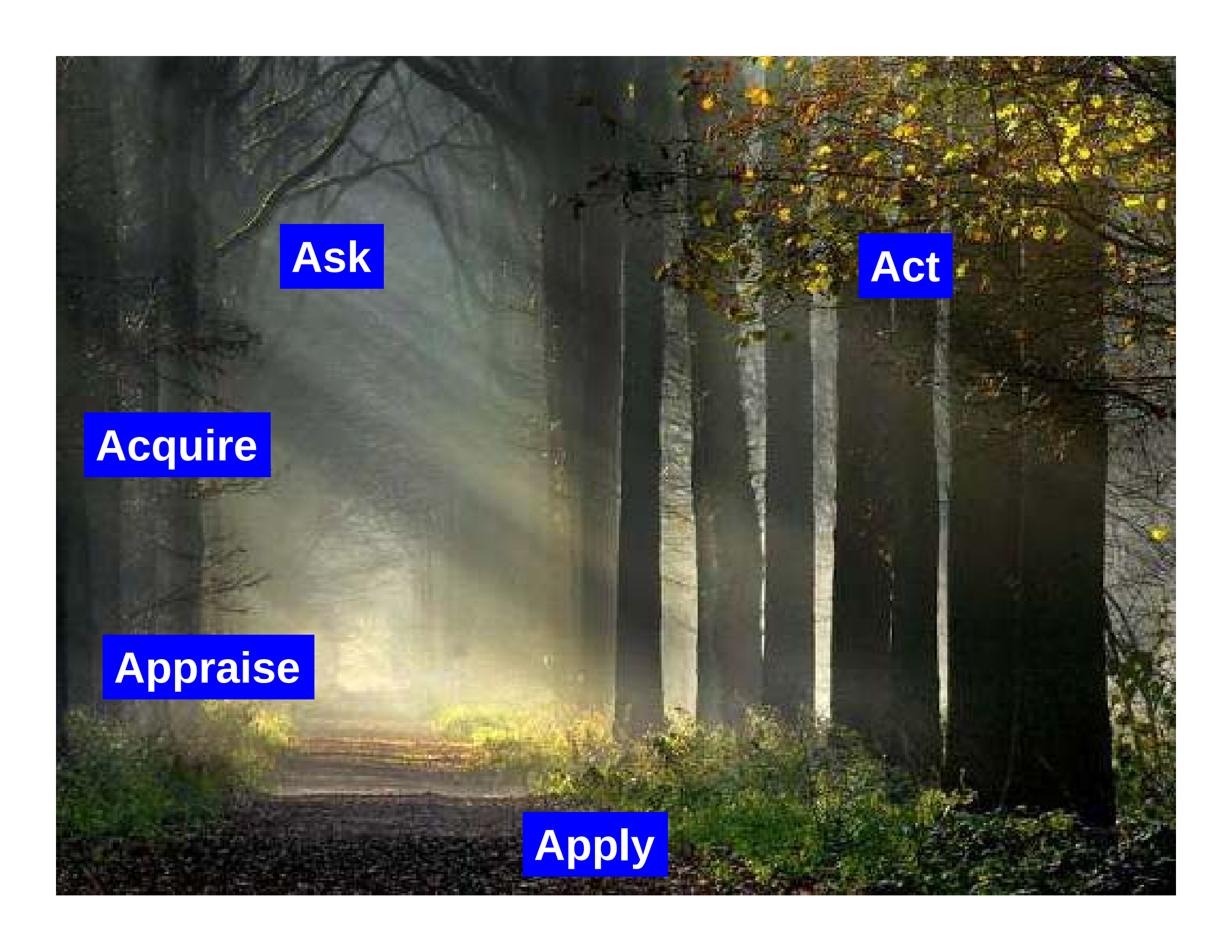
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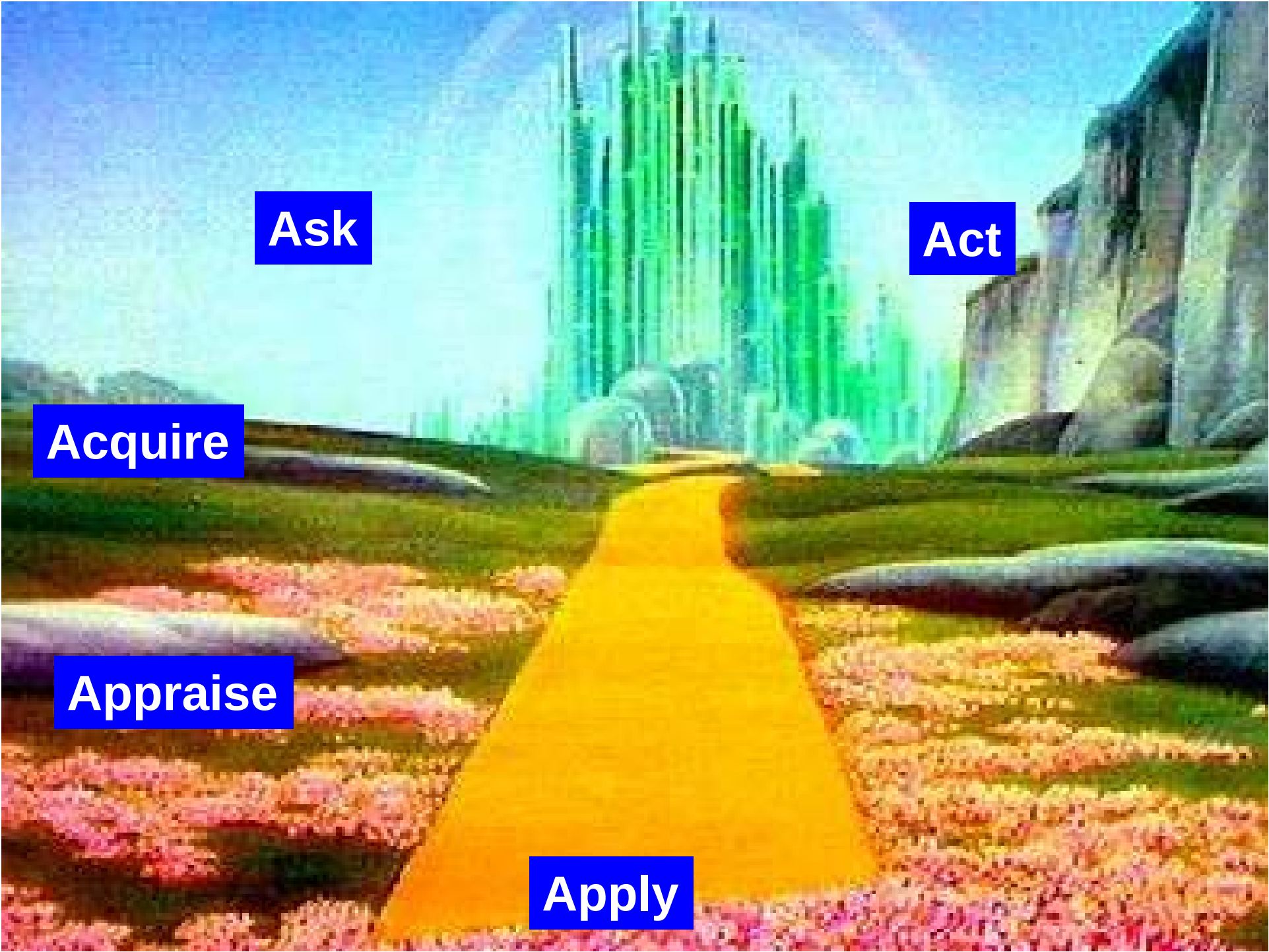
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