

# Can Decision Support Improve Medical Decision Making?

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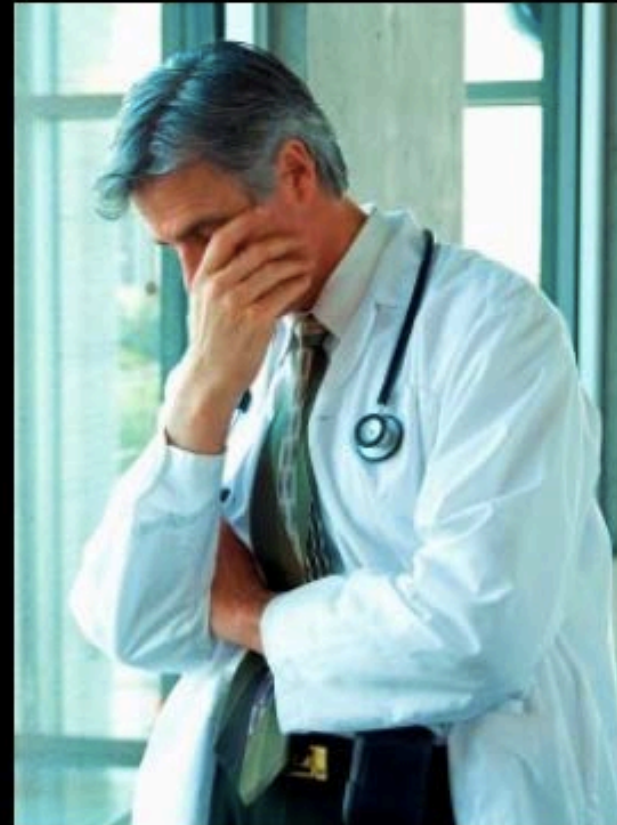
University of North Carolina at Chapel Hill

# Would decision support have helped?

"I remember vividly the morning our medical examiner walked into my office to tell me...

*She was a long-time patient of mine; I knew her well. She had come to me for her usual - 'just another migraine.'*

Less than 24 hours later, **she was dead.**"



# Would decision support have helped?

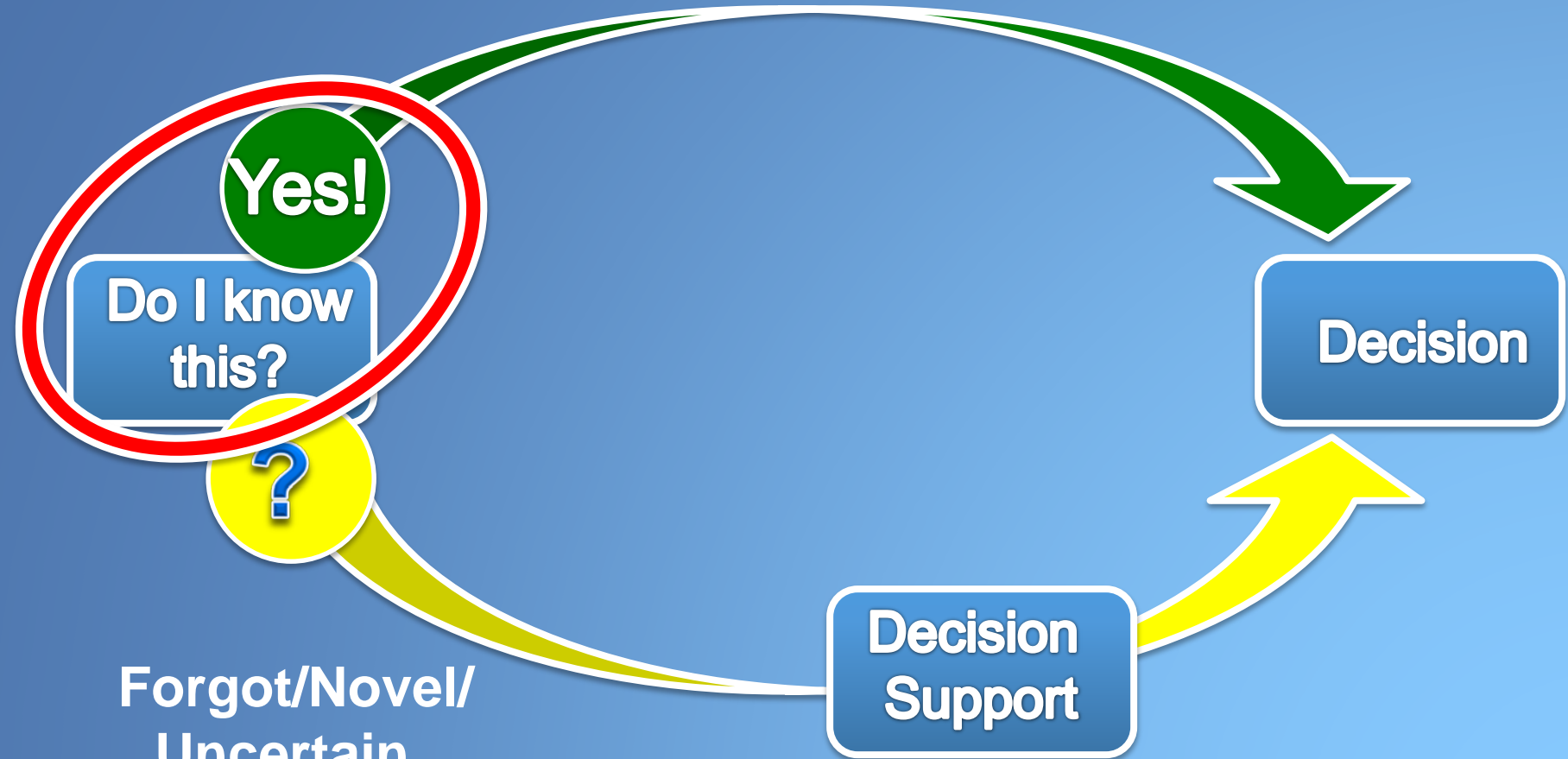


OR...Feels right  
but actually **wrong!**

Right



Forgot/Novel/  
Uncertain



# Two Part System of Reasoning

**Intuitive**



**Analytical**





**Effective decision support requires:**

- 1. uncertainty**
- 2. healthy skepticism even when confident**

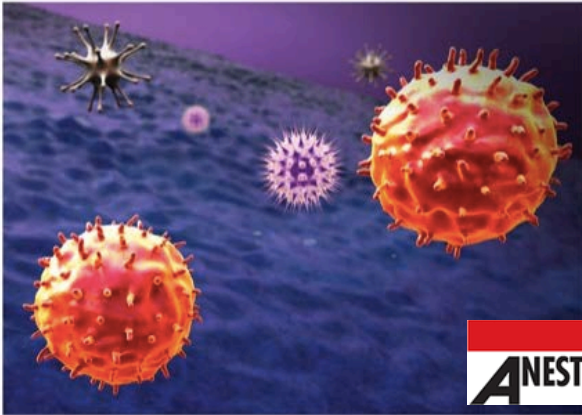
# “No News is Good News!”



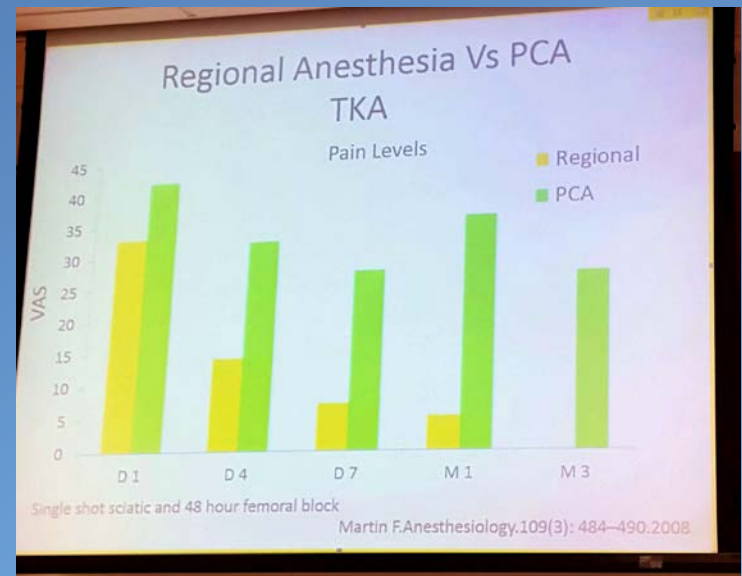




## Link Between Anesthetic Agents, Technique And Cancer Outcomes Needs Research



**ANESTHESIOLOGY NEWS**



Dr. Brian Ginsberg, Duke University

Perioperative Medicine | May 2013 **ANESTHESIOLOGY**  
The Journal of the American Society of Anesthesiologists, Inc.

## Perioperative Comparative Effectiveness of Anesthetic Technique in Orthopedic Patients

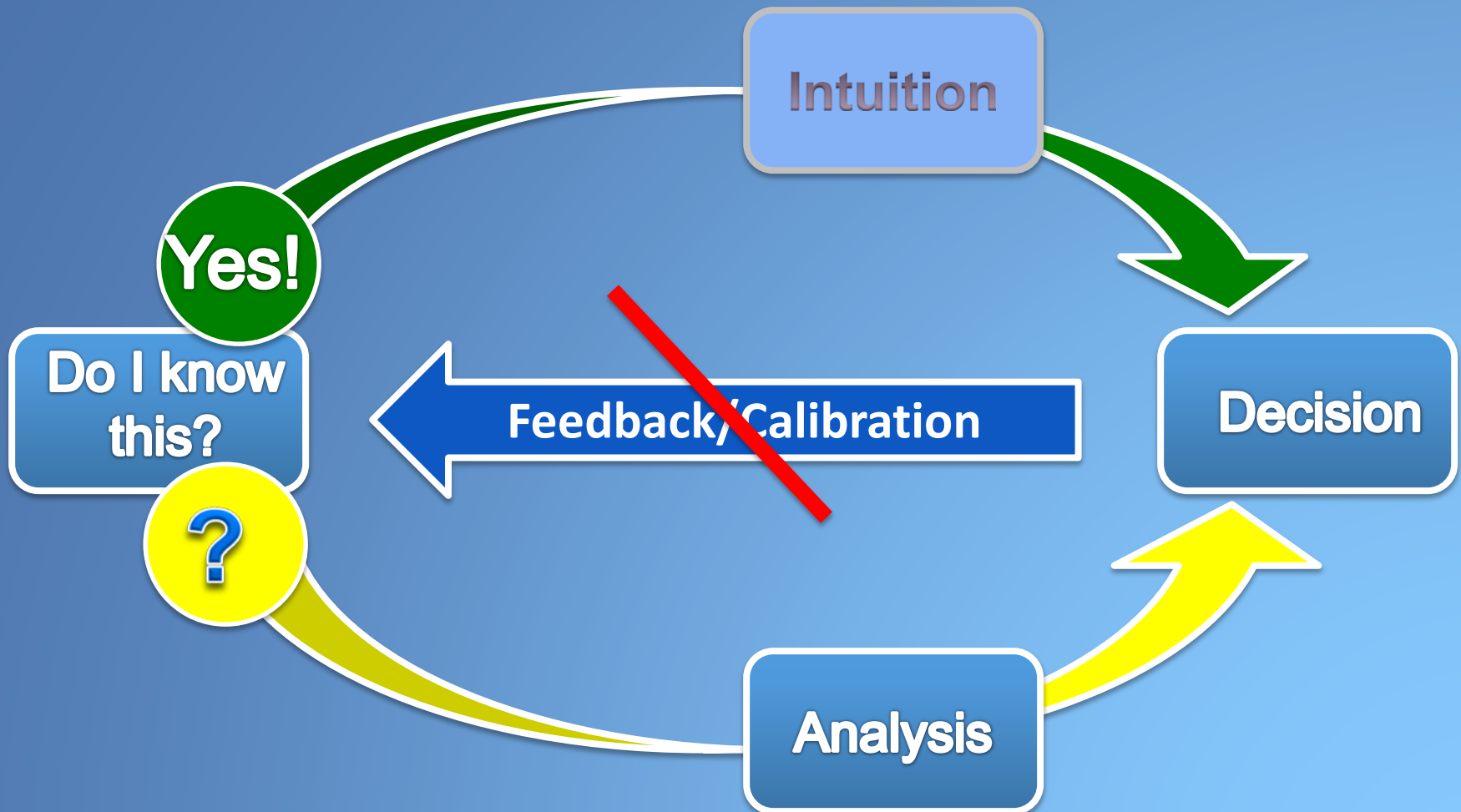
LOS, \$, complications and 30 day mortality!

Stavros G. Memtsoudis, M.D., Ph.D., F.C.C.P., F.A.S.A.; Ya-Lin Chiu, M.S.; Ottokar Stundner, M.D.; Spencer S. Liu, M.D.; Anil Banerjee, Ph.D., M.Stat.; Madhu Mazumdar, Ph.D., M.A., M.S.; Nigel E. Sharrock, M.B., Ch.B.



@drmstieglar

# Lack of feedback promotes confidence and automaticity



# Improve Timeliness and Quality → Better Decisions



# Case #1

Elderly woman for hip fracture s/p fall

History: aortic stenosis, carotid stenosis, strokes, seizures

Surgeon delayed...waiting on OR table for an hour...

Vitals signs normal but verbally  
unresponsive

# Case #2

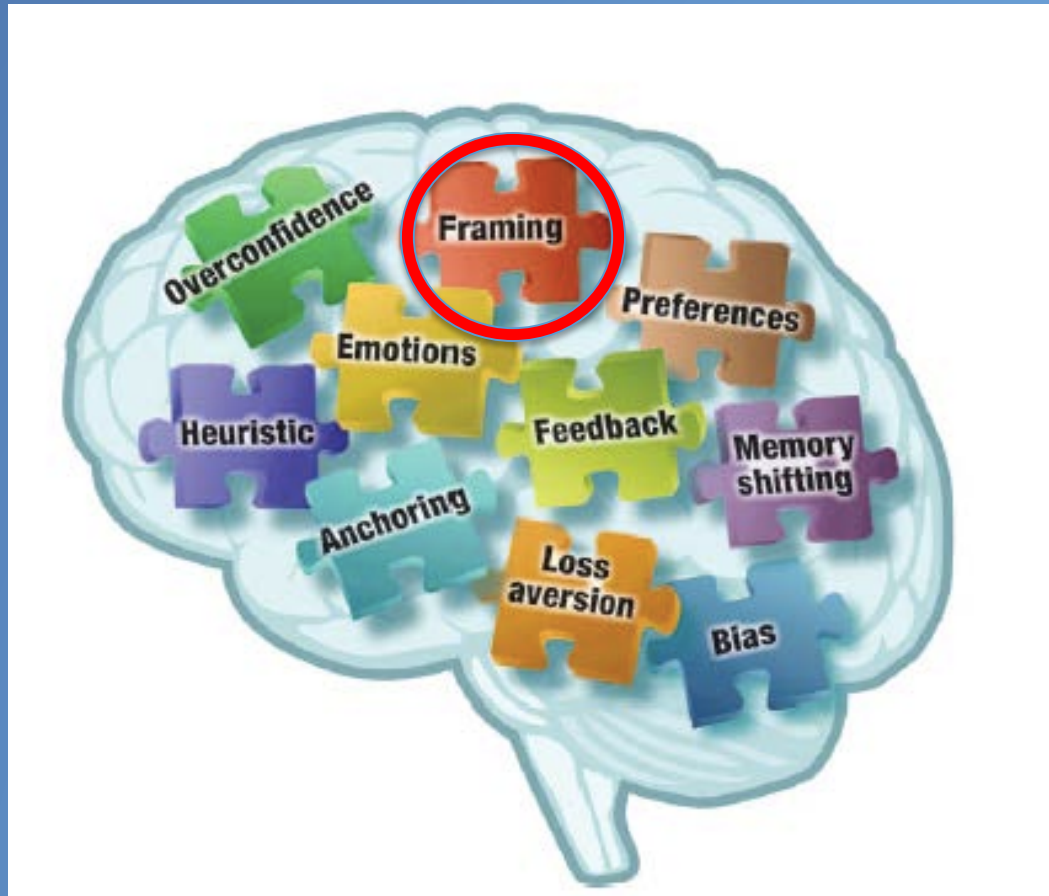
Female for hip fracture

Large volume LA for regional

Apparent LOC before surgery started

Then, cardiovascular collapse...

# How do you see it?



## EDUCATION

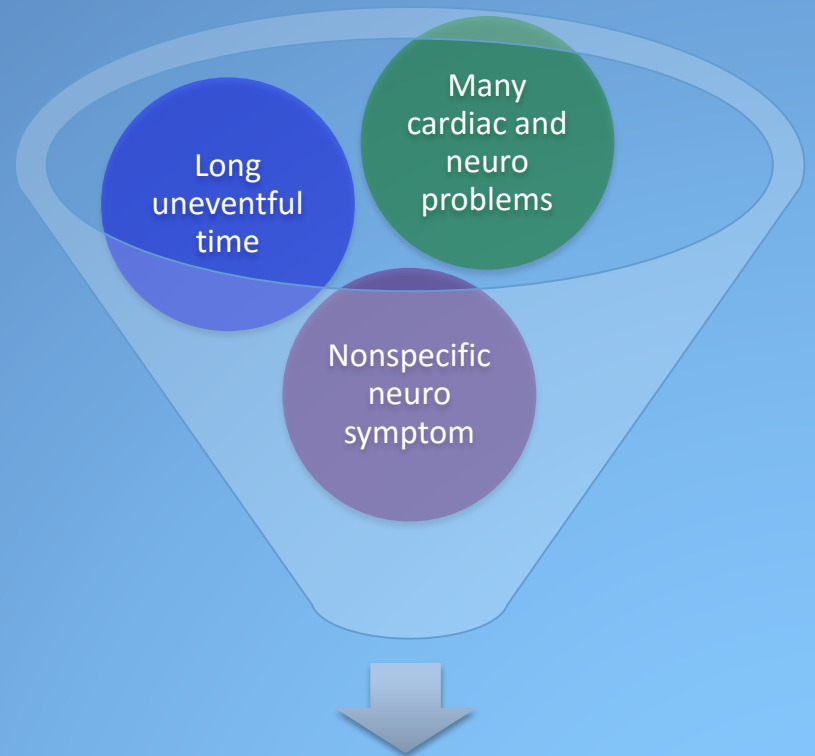
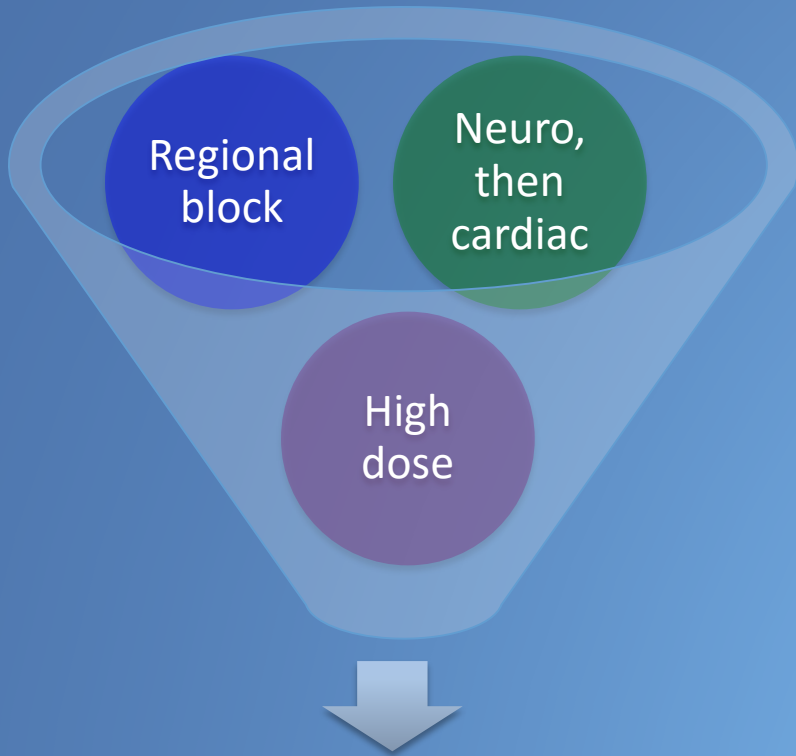
*Jerrold H. Levy, M.D., FA.H.A., F.C.C.M., Editor*

### **Case Scenario: Local Anesthetic Systemic Toxicity after Combined Psoas Compartment–Sciatic Nerve Block**

*Analysis of Decision Factors and Diagnostic Delay*

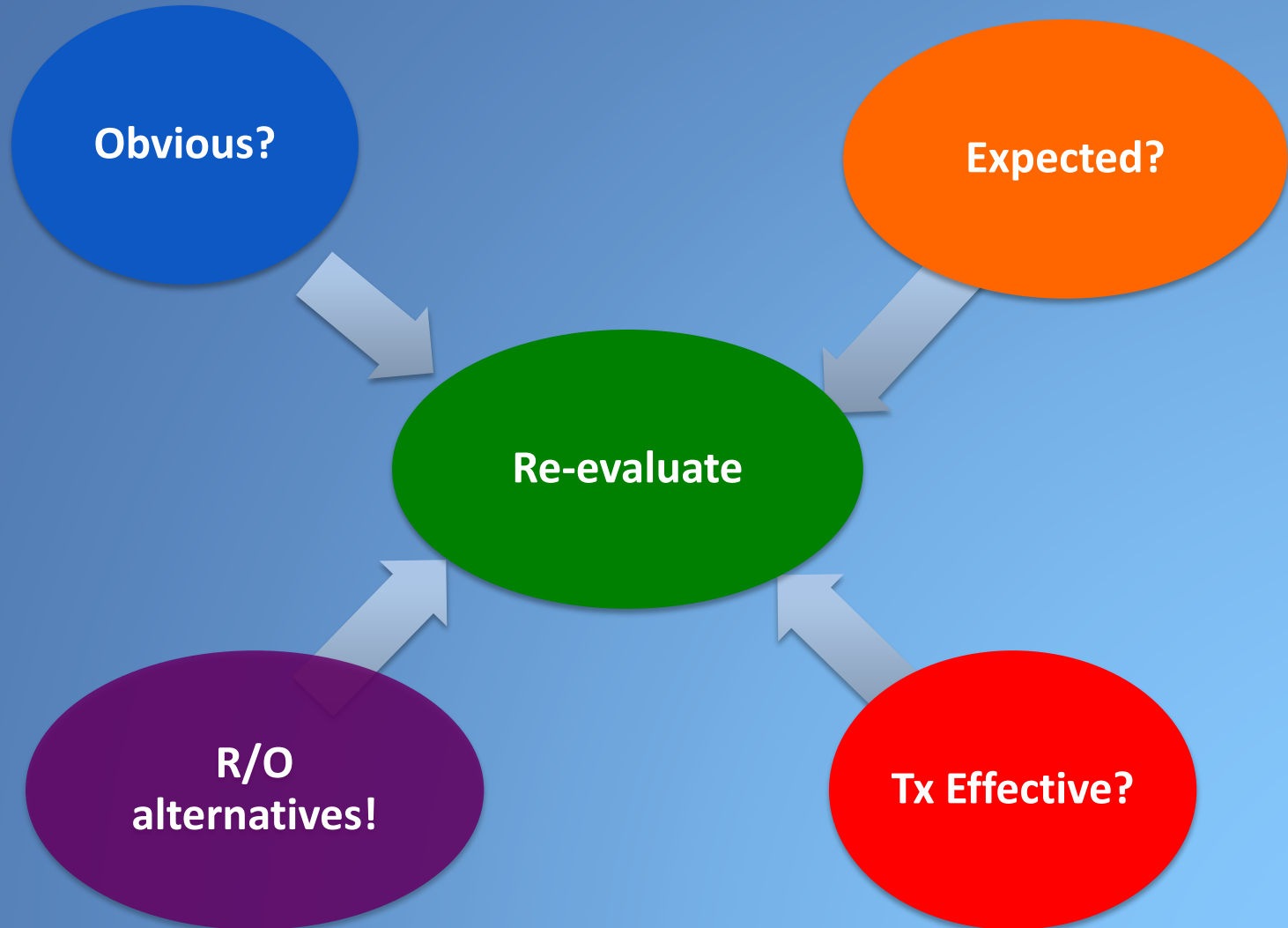
Marissa G. Vadi, M.D., M.P.H., Neesa Patel, M.D., Marjorie Podraza Stiegler, M.D.

Anesthesiology 2014; 120:987–96





# Avoid “Premature Closure”



# “Prospective Hindsight”



# Counterbalancing Strategies: Algorithms

Effective May 2008

## EMERGENCY THERAPY FOR MALIGNANT HYPERTHERMIA

**DIAGNOSIS vs. ASSOCIATED PROBLEMS**

**Signs of MH:**

- Increasing ETCO<sub>2</sub>
- Tach or total body rigidity
- Muscle pain or spasm
- Tachycardia/tachypnea
- Mixed respiratory and metabolic acidosis
- Increased temperature (may be late sign)
- Myoglobinuria

**Sudden/Unexpected Cardiac Arrest in Young Patients:**

- Postural hypotension and nitrous treatment (see #1)
- Mexican CK, myoglobin, EKG, until normalized
- Consider dantrolene
- Usually secondary to occult myopathy (e.g., muscular dystrophy)
- Brachycaemia may be difficult and prolonged

**Trismus or Masseter Spasm with Succinylcholine**

- Early signs of MH in many patients
- If trismus develops, begin treatment with dantrolene
- For emergent procedures, continue with non depolarizing muscle relaxants
- Follow CK and urine myoglobin for 24 hours
- Check CK immediately and at 4-hour intervals until not normal. Observe for dark or cola-colored urine. If present, fluid intake and rest for myoglobin
- Observe in PACU or ICU for at least 12 hours

### ACUTE PHASE TREATMENT

**1 GET HELP, GET DANTROLENE - Notify Surgeon**

- Discontinue volatile agents and succinylcholine
- Hyperventilate with 100% oxygen at flow of 10 L/min, or more
- Halt the procedure as soon as possible if emergent, continue with non-obligating anesthetic technique
- Don't waste time changing the circle system until it's abundant

**2 Dantrolene 2.5 mg/kg rapidly IV through large bore IV, if possible**

- To convert to 2.5 mg/kg approximate 1 mg/kg
- Divide the 2.5mg in 20ml and add 20ml of sterile, preservative-free water for injection. Pharmacy must exceed 30°C the dantrolene will not expel solubilization of dantrolene. However, in fact, there is no evidence that such warming improves clinical outcome.
- Repeat until signs of MH are reversed.
- Sometimes more than 10 mg/kg up to 30 mg/kg is necessary.

**3 Bicarbonate for metabolic acidosis**

- 1-2 mEq/kg if blood gas values are not yet available.

**4 Cool the patient with core temperature >39°C. Lavage open body cavities, stomach, bladder, or rectum. Apply ice to surface. Use ice saline intravenously. Stop cooling if temp <38°C and falling to prevent shivering >39°C.**

**5 Dysrhythmias usually respond to treatment of acidosis and hyperkalemia.**

- Use slowest drug that may except calcium channel blockers, which may cause hyperkalemia or cardiac arrest in the presence of dantrolene.

**6 Hyperkalemia - Treat with hypercalcemia, glucose/insulin, calcium.**

- Bicarbonate 1-2 mEq/kg IV
- For pediatric, 0.1 units insulin/kg and 1 glucose or for adult, 10 units regular insulin and 50% glucose
- Calcium chloride 10 mg/kg or calcium chloride 10-20 mg/kg for life-threatening hyperkalemia
- Check glucose levels hourly

**7 Follow ETCO<sub>2</sub>, electrolytes, blood gas, temperature, urine output and color, coag studies. If CK and/or Rr rise more than 1 unit output falls below 0.5 L/kg/hr, diuretic to >1 ml/kg/hr and give bicarbonate alkaline urine to prevent myoglobinuria renal failure. (See 2 below)**

- Normal ventricular rhythm hyperkalemia is better than no rhythm
- Central access or I&L monitoring as needed
- Second airway ventilates
- Place Foley catheter and monitor urine output

**POST ACUTE PHASE**

**CAUTION:** This protocol may not apply to all patients; alter for specific needs.

KEEP CALM AND PUSH EPI

The image shows a stack of ACLS (Advanced Cardiac Life Support) algorithms from the American Heart Association and American Association of Critical-Care Nurses. The visible algorithms include:

- Arrest Algorithms:** Bradycardia with a Pulse Algorithm, Asystole Algorithm, and Pulseless Electrical Activity (PEA) Algorithm.
- Suspected Stroke Algorithm:** Includes a checklist for STEMI (ST-Elevation Myocardial Infarction).
- Acute Coronary Syndromes Algorithm:** For Acute Coronary Syndromes and Stroke.
- Arrest Circular Algorithm:** A circular flowchart for help/activate emergency response, starting with CPR and monitoring for Return of Spontaneous Circulation (ROSC).

# Why Decision Support Fails

We are bad at knowing when we need it

We DON'T know what we don't know!



Early impressions *bias* our interaction

We've made up YOUR mind too!



We don't change our minds

We've already made up our minds!

# Everyone Makes Mistakes

We can be  
wrong,  
OR...

We can  
know we  
were wrong

But not at the same time.

# Thank you!

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THE UNIVERSITY  
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