

**American Society of Critical Care Anesthesiologists  
Future Shocks Alternatively Session**

- 3:20 p.m.            *Private Practice Critical Care by Anesthesiologists*  
**Gerald A. Maccioli, M.D.**
- 3:50 p.m.            *Ventricular Assist Devices*  
**Andrew L. Rosenberg, M.D.**  
University of Michigan Health System  
Ann Arbor, Michigan
- 4:20 p.m.            *Infusion Devices and Safety*  
**Mark E. Nunnally, M.D.**  
University of Chicago  
Chicago, Illinois
- 4:50 p.m.            *Reacting to Accidents in the ICU: Trying to Learn While Trying to Recover*  
**Richard I. Cook, M.D.**  
University of Chicago  
Chicago, Illinois
- 5:20 p.m.            ASCCA Business Meeting
- 7:00 p.m.            Annual Meeting Reception

## Future Shocks!

Private Practice Critical Care -  
*Thinking Out of the Box*

Gerald A. Maccioli, MD, FCCM  
ASCCA October 2004

**My name is Jerry Maccioli**

*And I approved this message.*

## The Future

- The future doesn't exist...  
Unless "You" make it!
- The unavoidable, absolute fact is ... The future is becoming more unpredictable...and yet we must act.

## Scenario Planning

- **Alternative descriptions** or stories of how the future might unfold

## This talk will not be about:

- COMPACCS - you know it!
- FOCCUS - you also know it!

*Even if you're on the right track,  
you'll get run over if you  
just sit there.*

Will Rogers

## The Spotlight on Intensivists

- Sutton's (modified) Law:
  - "follow the money!"
  - The sudden interest in "Intensivists" has been driven by big business, our friends 'The Leapfrog Group'

## Critique of Leapfrog Measures

Mike Finch, PhD – Center for Health Care Policy and Evaluation:

- Mortality is a poor measure – the best and worst hospitals may differ by one or two percent
- Isn't time to return to work a better measure both from patient and employer perspective?

## Finch Critique – Part Two

- Institution volume is less important than practitioner volume
- Volume by institution for procedure is not the key - volume by individual provider is a much better indicator of quality outcomes

## Eventual Impact of Leapfrog

- Leapfrog will have a minor positive impact on safety and quality – much of what Leapfrog supports is already in process
- Leapfrog methodology needs refinement

Spartz' Speculation : The Leapfrog financial "carrot" will turn out to be a stick painted orange - OR The 'Baptist' Corollary,

*be careful what you ask for, you may get it!*

## Remember

- Maccioli's 3rd Law - the search for someone to blame is always successful! It is the only job always completed early and under budget!
- When your institution is not 'Leapfrog Compliant' - you will be on the list of usual suspects!

## We all Agree on Intensivists - Benefits for Patients

Availability  
Expertise  
Consistency



## Our Problem

- A growing demand for OR Anesthesiology services coupled with an even greater demand for Critical Care services coupled with a massive shortage of physicians qualified to deliver optimal/quality/'best' care in both venues!

## Future Shocks!

### 4 Scenarios to consider

## Future Shock Scenario 1

- 'The Prielipp Doctrine' -
  - We are dinosaurs, and will soon become extinct as a species, e.g. *'the anesthesiology-based intensivist'* will disappear just like T. Rex and Doug Coursin will be in the Smithsonian!

## Future Shock 1 - Posit

- 'The Prielipp Doctrine' may be correct - if we can not find a way to entice/encourage young anesthesiologists to pursue a career as either full or part-time intensivists

## Scenario 1 Queries

- How do we entice/encourage young anesthesiologists to pursue fellowship training in critical care?
- What is it about what we do or how we do it that makes it relatively undesirable [based on the number of fellows we attract] as a career choice?
- Can we fix what the residents think is wrong?

## Future Shock Scenario 2

- Transition the concept of the Anesthesia Care Team [ACT] from the OR to the ICU -
- *Intensivist-directed Critical Care Team - [IdCCT] or some more clever name for the same idea*  
*Holy acronyms Batman, this guy needs some help!*

## Future Shock 2 - Posit

- Much like the ACT concept, Intensivist-directed APN's will allow us to leverage our knowledge ['Knowledge workers' - Peter Drucker] across multiple patients in the face of an intensivist-anesthesiologist manpower crisis

## Future Shock 2 - Posit

- Consider either the CCNS [Critical Care Nurse Specialist] or ACNP [Acute Care Nurse Practitioner] in the Physician-based practice model, e.g. employed and medically-directed like CRNA's in the OR

## CCNS Educational Preparation

- ❖ Masters / Post Masters Program with 500 hours in direct clinical CNS practice
- ❖ Certification through the American Association of Critical Care Nurses (AACN)
- ❖ AACN re-certification requirements:
  - ❖ Minimum of 500 clinical hours as a CCNS in the care of acutely- and/or critically ill pts within last four years PLUS
    - ❖ Performed a minimum number of activities within the last four years associated with the following eight nurse characteristics: clinical judgment, clinical inquiry, facilitator of learning, collaboration, systems thinking, advocacy/moral agency, caring practices and response to diversity
    - ❖ Vignette of 300-500 words to describe activities performed during the four year period that contributed to optimal outcomes for pts/families, nurses, or organization
    - ❖ OR retaking and passing the CCNS certification exam

## ACNP Educational Preparation

- Very similar to the CCNS content outlined on the previous slide

## Scenario 2 - Queries

- Will it work?
- Can it work?
- Will we get the same results as the 'high intensity physician staffing studies' have shown?
- Who knows? NO ONE. (Not even Todd or Peter!) - But we need to consider it and measure the results!

## Future Shock Scenario 3

- 'Hello Computer' [Not the album by Radiohead] - or 'I'm just a Doc in a computer box!' -
- *Telemedical Critical Care* -
  - Paging Dr. Breslow, Dr. Mike Breslow

## Future Shock 3 - Posit

- ICU Daytime Staffing with CCM Trained M.D. live or via tele-monitoring, or risk-adjusted outcomes comparison

29% mortality reduction (JAMA, 11/02)

## What is Telemedicine?

- Brings expert opinion to bear in a local situation where this is not available to help teaching, diagnosis, and management:
  - Computerized decision support systems (Smart systems) and knowledge tools
  - Voice
  - Image capture alone (radiology, pathology, retinal images, dermatology, etc.)
  - Video-conferencing
- Improve monitoring by allowing remote site access or notification
- Actual intervention:
  - On-site directed personnel

Effect of a multiple-site intensive care unit telemedicine program on clinical and economic outcomes: An alternative paradigm for intensivists staffing.  
*CCM 2004;32:31-8.*

- **Objective:** To examine whether a supplemental remote intensive care unit (ICU) care program, implemented by an integrated delivery network using a commercial telemedicine & information technology system, can improve clinical and economic performance across multiple ICUs.
- **Interventions:** The remote care program used intensivists & physician extenders to provide supplemental monitoring and management of ICU patients for 19 hrs/day (noon to 7 am) from a centralized, off-site facility (eICU). Supporting software, including electronic data display, physician note & order-writing applications, & a computer-based decision-support tool, were available both in the ICU & at the remote site.
- **Conclusions:** The addition of a supplemental, telemedicine-based, remote intensivist program was associated with improved clinical outcomes and hospital financial performance. The magnitude of the improvements was similar to those reported in studies examining the impact of implementing on-site dedicated intensivist staffing models.

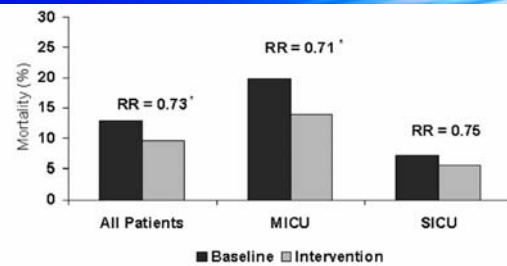


Figure 2. Hospital mortality data for all patients (medical intensive care unit [MICU] and surgical intensive care unit [SICU] patients) during the baseline period and the intervention period. RR, relative risk; \* $p < .05$  compared with baseline period.

## Scenario 3 Queries

- Will a significant number of physicians be willing to work either full or part-time in this type of practice?
- Will a significant number of hospitals & medical staff's be comfortable with this type of patient care?

## Future Shock Scenario 4

- Back to the Future:
  - We partner with other specialty-based intensivists and form multi-specialty groups

## Future Shock 4 Posits

- The concept failed before primarily due to the differential in 'base salary' of the separate 'intensivist tribes', e.g. the base salary for anesthesiologists is higher than it is for pulmonologists.
- This is not a formula for a successful business relationship

## Scenario 4 Posits

- Can we design a financial model of reimbursement which makes 'partner members' of different intensivist 'tribes' work together in an acceptable but in all likelihood a financially different fashion?

## The Continuing Intensivist Crisis!

Leapfrog December 2003 Data

### IPS (Intensivist Physician Staffing)

- Final Version 2.0
  - 24% of responding hospitals have fully implemented IPS
- Final Version 1.0
  - 21% of responding hospitals had fully implemented IPS
  - another 15% said would implement by 2004

## What will happen?

- Who know? Certainly not me (ask Cliff - he's a lot smarter!) but my best guess is a combination of Scenarios 2 & 3 whereby we utilize intensivists-extendors on-site in the day-time with telemedicine at night

**The Future is ours to either  
make or loose!**



## Patient Safety- Infusion pumps

### Mark Nunnally, M.D.

#### Key Points

- Infusion devices are **complex**.
- Devices **conceal their complexity** within a computer shell.
- Device complexity foils investigation of device-related accidents.
- Users gain the high precision and flexibility of infusion pumps at the cost of having to cope with this complexity
- Users compose **mental models** of device function.
- Operating ability varies widely **between** and **within** users.
- Users are **not well calibrated** about their operating ability.
- *Users usually cope with complexity successfully.*

Much has been made of the need for an increase in “patient safety” in medicine. Initiatives to minimize adverse outcomes related to error include development of reporting systems, educational programs, including simulations, and new technologies to detect and avert complex system failures.

Given the expertise and flexibility of the physician in dealing with complex and dynamic systems, it seems plausible that a sound approach to research in patient safety failures would focus on the human operator’s abilities to cope with complexities. Moreover, the modern healthcare environment is an increasingly complex domain; technology plays a substantial role in the complexity.

Infusion devices are one example of technology in medicine. The intimate association of the devices to patient care (the delivery of medications in precise doses) makes them likely accomplices in medication misadministration. Indeed, this is the case. In studying reports of device-related incidents, we can come to a few simple conclusions:

- *Problems are usually attributed to ‘user error’.*
- *Problems with infusion devices are common.*
- *Incident reports don’t point to specific causes.*

In a search for more specific cases of adverse events related to the infusion pumps, we have systematically programmed and mapped the software structure of several devices to serve as groundwork for further study. This task revealed a level of complexity that would exceed the abilities of any user to master it; we refer to the programming structure as **MENUSPACE**.

**“Menuspace”**: Large complexity hidden beneath layered, nested menus with irregular branching

Using the knowledge of Menuspace, it is possible to study actual users in the lab as well as in the field, observing their ways of coping with the programming complexity. Our work has so far demonstrated variability between and within users for various tasks, the observation of exploratory behaviors during programming, and resilience in the face of complexities.

The goals of this work are to increase awareness of hidden complexities in common technologies, heighten the vigilance of the user to their own use patterns and possibilities for failures, to describe characteristics of Menuspace design that may increase or decrease the likelihood of programming failure, and, ultimately, contribute to the design of new devices.

#### References:

1. Hunt-Smith J, et al. *Anaesth Intensive Care* 27: 260-4, 1999.
2. Cook RI, et al. *J Cardiothorac Vasc Anesth.* 6:238-44, 1992.
3. Cook RI, Woods DD. *J Clin Anesth.* 8:29S-37S, 1996.

