

Fellowship training in the PICU

Does it affect outcome?

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Of course!

Next speaker?

Does it affect outcome?

- Do intensivists make a difference?
- Does the presence of fellows in an ICU affect outcome?
- Does fellowship training alter practice and quality of care?
- What should good fellowship training include to advance our specialty and improve outcome?
- Can it all be taught?

Do intensivists make a difference?

- Less of a debate than in adult medicine, although very limited data
- Improved outcomes from 3^o center PICU vs non-tertiary facilities, progressively greater with increased risk of mortality Pollack, CCM '91; 19:150
- 27% non-neonatal pediatric hospital deaths in NYS occurred in hospitals without a board-certified pediatric intensivist on staff. Kanter CCM 2002

Impact of training on outcome: Technical proficiency

■ Ureteroneocystostomy:

- Lower complication rate and hospital charges

Snow, Pediatrics '96

■ Pyloromyotomy:

- Pediatric surgeons vs. general surgeons
- Fewer complications, shorter length of stay, lower charges

Pranikoff, J Pediatr Surg '02

■ Intussusception:

- Lower need for operative care, shorter length of stay, lower charges

Bratton, Pediatrics '01 107:299-10

Impact of training on outcome: Cognitive proficiency

- Anesthetic risk in children lower when anesthesiologist has special training
 - Keenan *J Clin Anesth* '91 34:433-7
 - Keenan *Anesthesiology* '94 80:976-82

Impact of quality-of-care factors on PICU mortality

Pollack JAMA '94;272:941-6

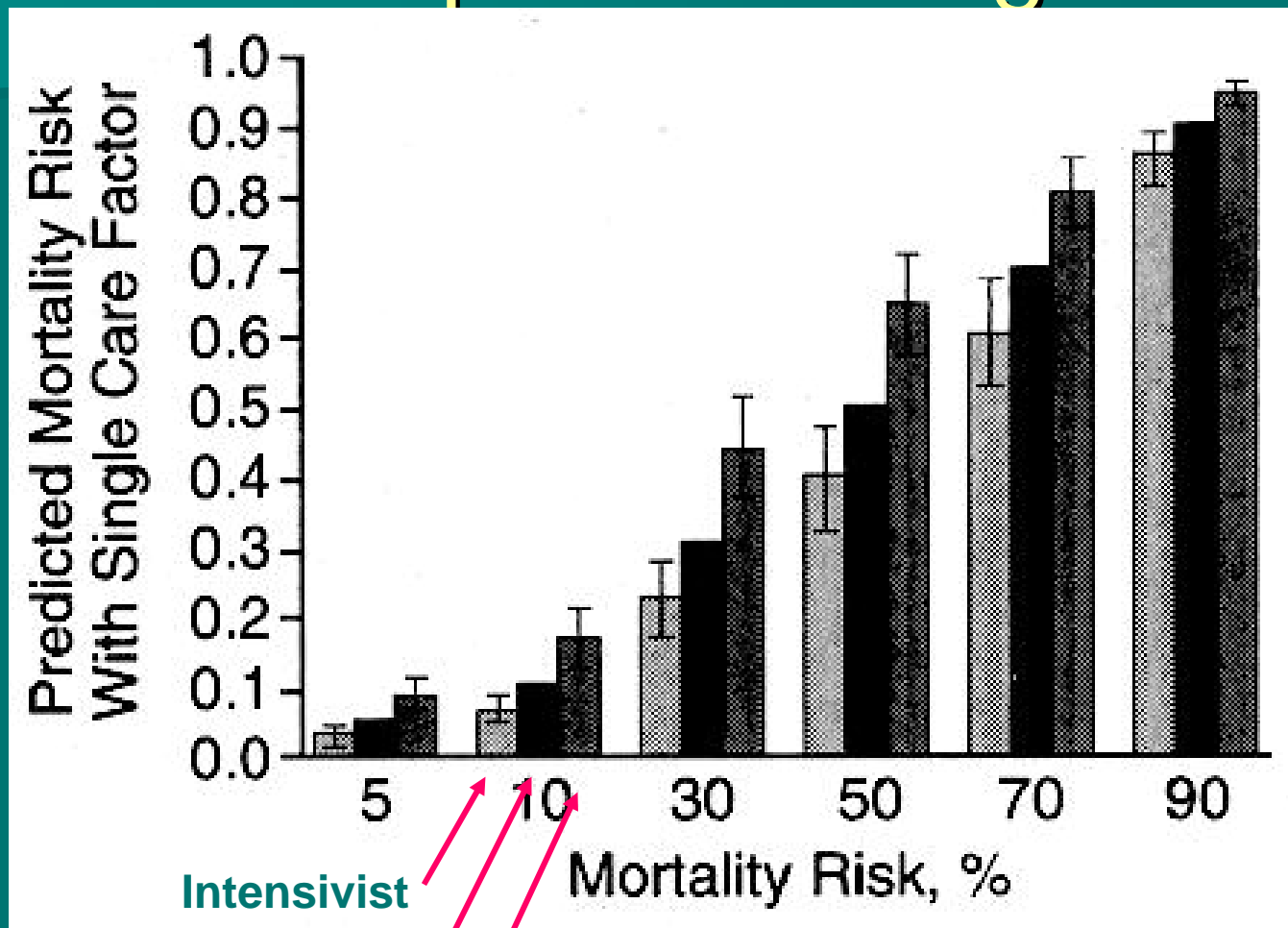
- 16 pediatric ICUs
 - ICU size (large/small)
 - ✓ – Teaching hospital (yes/no)
 - ✓ – Intensivist (yes/no)
 - Unit coordination by ICU medical staff:
intensivist involved in >90% pts' care
(yes/no)
- 5415 ICU admissions (248 deaths)

Impact of quality-of-care factors on PICU mortality

Table 3.—Maximum Likelihood Estimates of Outcome Predictor*

Variable	Regression Coefficient	SE	Probability†	Adjusted OR (95% CI)‡
Intercept	-6.734	0.347	.0001	...
PRISM	0.298	0.035	.0001	1.35§ (1.26-1.44)
PRISM ²	-0.002	0.001	.038	0.99§ (0.99-1.00)
Endocrine disease	-2.536	0.875	.004	0.08 (0.01-0.44)
Postoperative	-0.705	0.240	.003	0.49 (0.31-0.79)
Intensivist hospital	-0.431	0.195	.027	0.65 (0.44-0.95)
Teaching hospital	0.584	0.192	.002	1.79 (1.23-2.61)
Pre-ICU care area	0.577	0.220	.009	1.78 (1.16-2.74)
Multisystem disease	0.795	0.317	.012	2.21 (1.19-4.12)
Oncologic disease	1.098	0.388	.005	3.00 (1.40-6.42)
Prehospital CPR	1.287	0.326	.0001	3.62 (1.01-6.86)
Chromosomal anomaly	1.319	0.376	.0004	3.74 (1.79-7.81)

Outcome: Impact of an intensivist and hospital teaching status



Predicted risk of mortality

Teaching hospital

■ Impact of residents

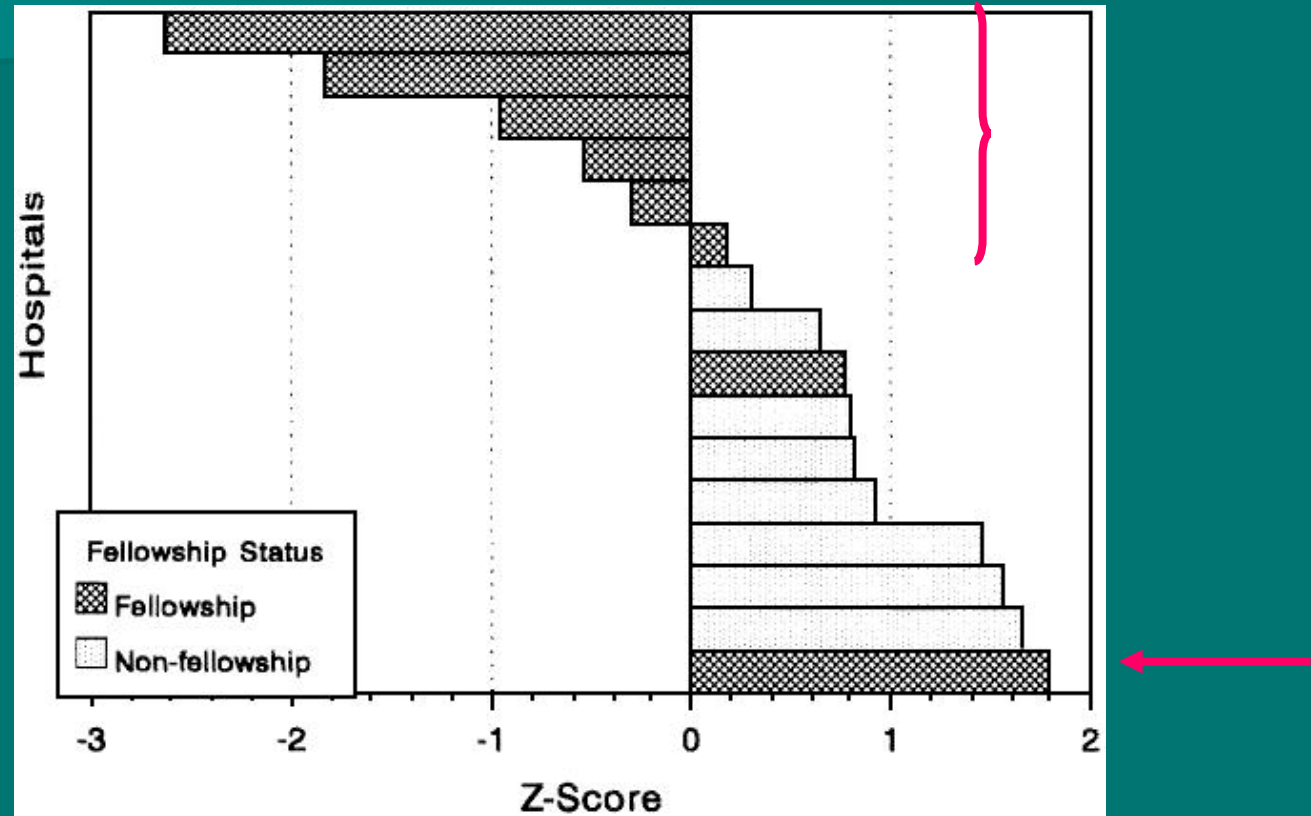
- While *not* our strongest training programs,
- Less experienced residents → Greater risk of mortality (79%)
- Greater risk early in academic year (July-September) than late (April-June)



- Experience and training matter

Positive effect of critical care training program on mortality

Pollack, CCM'97;25:1627-42



- 6 best units had fellowship programs
- *Worst* unit had fellowship program

Impact of training program / fellows

- Odds of a patient dying reduced 30-40%
- Training and experience of MDs at bedside influence outcomes (even when the training of the senior staff is equivalent)
- More invasive monitoring and therapeutic modalities

Impact of training program / fellows

- Steep learning curve
- Better ability to recognize when they need help
- Fellows may rapidly reach skill comparable to faculty with respect to critical recognition and life-saving skills
- Role models for residents
- Better supervision of residents

But,

- Presence of a fellowship does not guarantee good outcomes
- Optimal outcomes depend on quality of the program

International comparisons: Variability in outcome

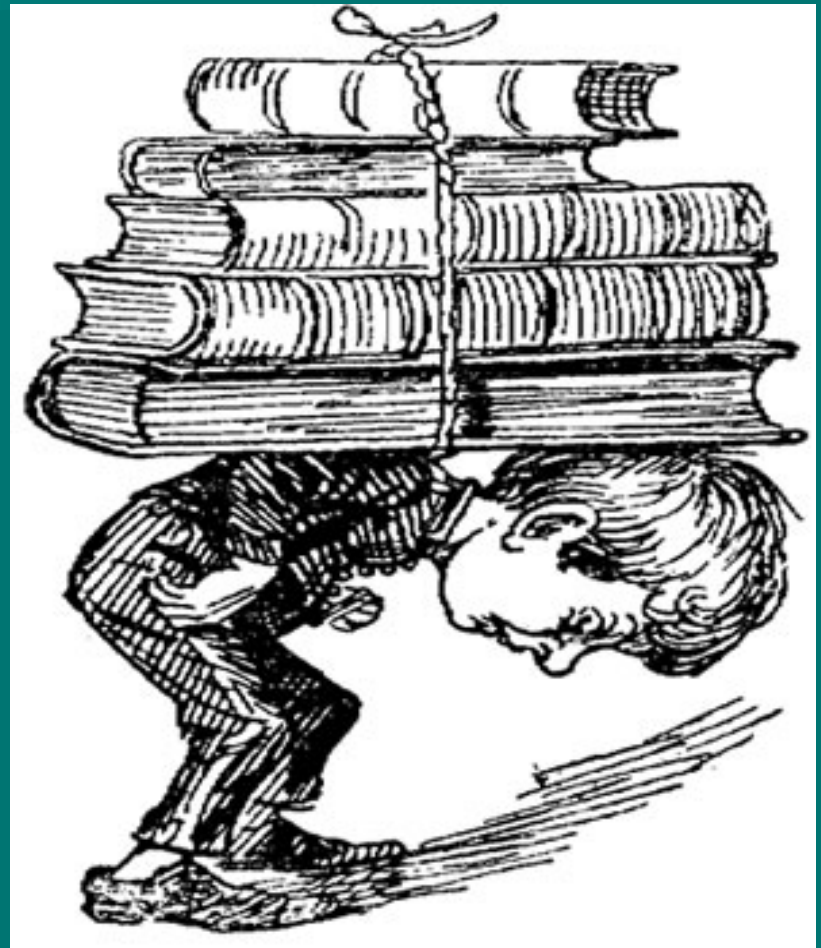
- Different populations
- Available resources
- Most notable in low and moderate mortality risk groups where patients most likely to benefit from intensive care
- Differences in care practices
- Complications of technology
- We lack institutional comparisons in specific disease outcomes
- Virtually no data on most effective fellowship organization

Impact of training on outcome: Cognitive proficiency—Performance on certifying examination

- Knowledge obtained in prior training
 - Extensive, well-integrated basic knowledge
 - Personal characteristics of trainee
- Characteristics of fellowship training that make a bigger difference in fellows' knowledge than average programs
 - Performance during training
 - Higher faculty : fellow ratio
 - Other subspecialty programs
 - Longer training: greater clinical experience and more structured educational exercises

Medical knowledge

- Critical care/intensive care scope very broad
 - All organ systems
 - Physiology, pharmacology
 - Multiple modes of life support
 - Cell and molecular biology
- Content of the specialty
 - American Board of Pediatrics (www.abp.org)
 - Joint Faculty of Intensive Care Medicine (Australia/New Zealand)



What do intensivists (our fellows) need?

- Technical skills
- Cognitive skills
- Quality evaluation and improvement
- Scholarship/research
- Ethics
- Leadership
- Communication



Difficulty teaching
Difficulty evaluating

What are the characteristics of a good training program?

- Little data
- Reliance on expert opinion
- Adequate clinical experience
 - Exposure to a broad range of critical illness
 - Progressive responsibility
- Excellent teaching and supervision
- What we teach and how we supervise and evaluate needs to encompass more

Criteria for training programs

- ACGME program requirements for pediatric subspecialties
 - www.acgme.org
 - Review committees → Pediatrics → Pediatric CCM
- Joint Faculty of Intensive Care Medicine (Australia/New Zealand)

Desired outcome of training

- Six competencies: ACGME Outcome Project (www.acgme.org/outcome/)
 - Medical knowledge
 - Patient care
 - Practice based learning and improvement
 - Systems based practice
 - Professionalism
 - Interpersonal and communications skills

Patient care: Appropriate application of knowledge

- Technical skills
- Medical crisis management

- Lecture
- Practice
- Do



Patient at high risk



Practice

Simulation

Practice-based learning and improvement

- Self-reflection
- Teach access to, and evaluation of, medical literature
- Evaluation of quality of care and constant re-assessment and improvement
 - Study design
 - Statistics
- Teach them to teach

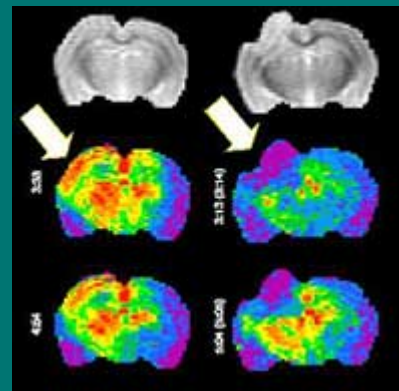
Practice-based learning and improvement

Scholarly contribution to the field

Local patient observations

or

Basic science



Enormous progress can be made by
doing (and teaching our fellows)
what we already know how to do,

BETTER

Systems-based practice

- Understand the health care system they work in
- Wise use of resources to benefit the patient without waste
- Advocate for improvement or change to benefit the patients

Interpersonal and communication skills

- Critical care is the most “political” of specialties
 - Negotiation between needs of organ systems
 - Negotiation between physician groups
 - Negotiation between professional groups
 - Negotiation with families

Effective communication

Interpersonal and communication skills

- Leadership skill training
 - Negotiation
 - Conflict resolution
 - Organizational strategy
 - Budgeting
 - Dealing with administrators

Interpersonal and communication skills

- Rich communication with families
 - Clarity
 - Empathy
 - Respect for individuals
 - Recognition of differing cultures and values

- Families *take for granted* that we know the latest literature and best practice
- *Trust* that we will employ all of it, that we truly practice evidence-based medicine
- *Take for granted* an intensive effort to advance the science behind practice

- But we commonly fall short in meeting their needs for information and support

Interpersonal and communication skills

- Fellowship training needs to encompass time for and attention to developing fellows' listening and empathic, compassionate, "connection" skills, just as we teach them to titrate ventilation and circulatory support

Interpersonal and communication skills

- Our fellows will not always be able to restore their patients to good health
- They will not always be able even to keep them alive
- But they should *always* be able to provide care for the children and their families that is kind, consistent with their values, and responsive to their needs
- It is our responsibility to teach them these skills as well

- Clinical Teaching
- Lectures/Seminars/Conferences
- Board review courses or formalized group study experiences
- Journal Club
- Procedural workshops
- Simulations
- Role modeling
- Self directed learning through case based modules
- Role plays and clinical vignettes
- Quality improvement project
- Research project/scholarly project
- Practice management curriculum
- Conducting a root cause analysis

- We have a giant task



- But it's a grand one!



Thank you

