

Resilience and Simulation Redux

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Preface

**We are not
talking about**

- Task training
- Procedural competence
- ACLS and PALS

**We are
talking about**

- Interdisciplinary training
- In situ training
- Focus on high risk and challenging clinical situations

Premise

- Simulation creates a foundation for resilient behavior:
 - Tests margins
 - Makes margins and constraints visible to the team
 - Practices “team behaviors”
 - Exposures to small failures increases capacity to deal with large failures
- Point of Simulation is to get to the debriefing:
 - Improves margins
 - Reinforces “unplanned” good actions (safety-II)—especially actions that aren’t preconceived

Example



Debriefing is Essential

- Guided reflection
 - Response
 - Teamwork, systems
 - Medical management
- Addresses Safety I and Safety II
 - Participants understand how and why events occur
 - Able to internalize these results and learn from them
 - Understand risk and develop solutions



Develops Team and Individual Capacity

- Recognition of Risk
- Situation Awareness
- Common Language
- Shared Mental Model
- Self-Organization
- Response to Threats
 - Regular
 - Irregular
 - Unexampled?



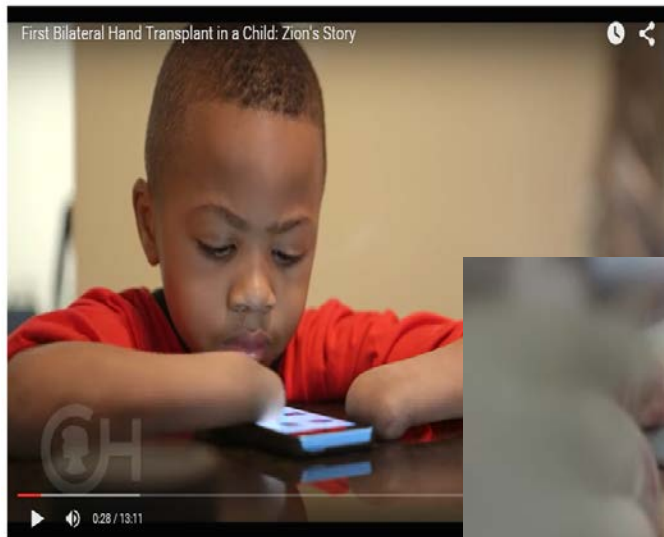
Situation I: Regular threat Emergency Intubation

- Individual & team learning opportunity: response to unplanned events
- Organizational learning: Safety II- solutions emerge
- **Promotes learning from a crisis before an actual crisis occurs**



Situation II: Irregular threat Unexpected but not impossible or unimaginable; Requires improvisation

- First Bilateral Hand Transplant in a Child

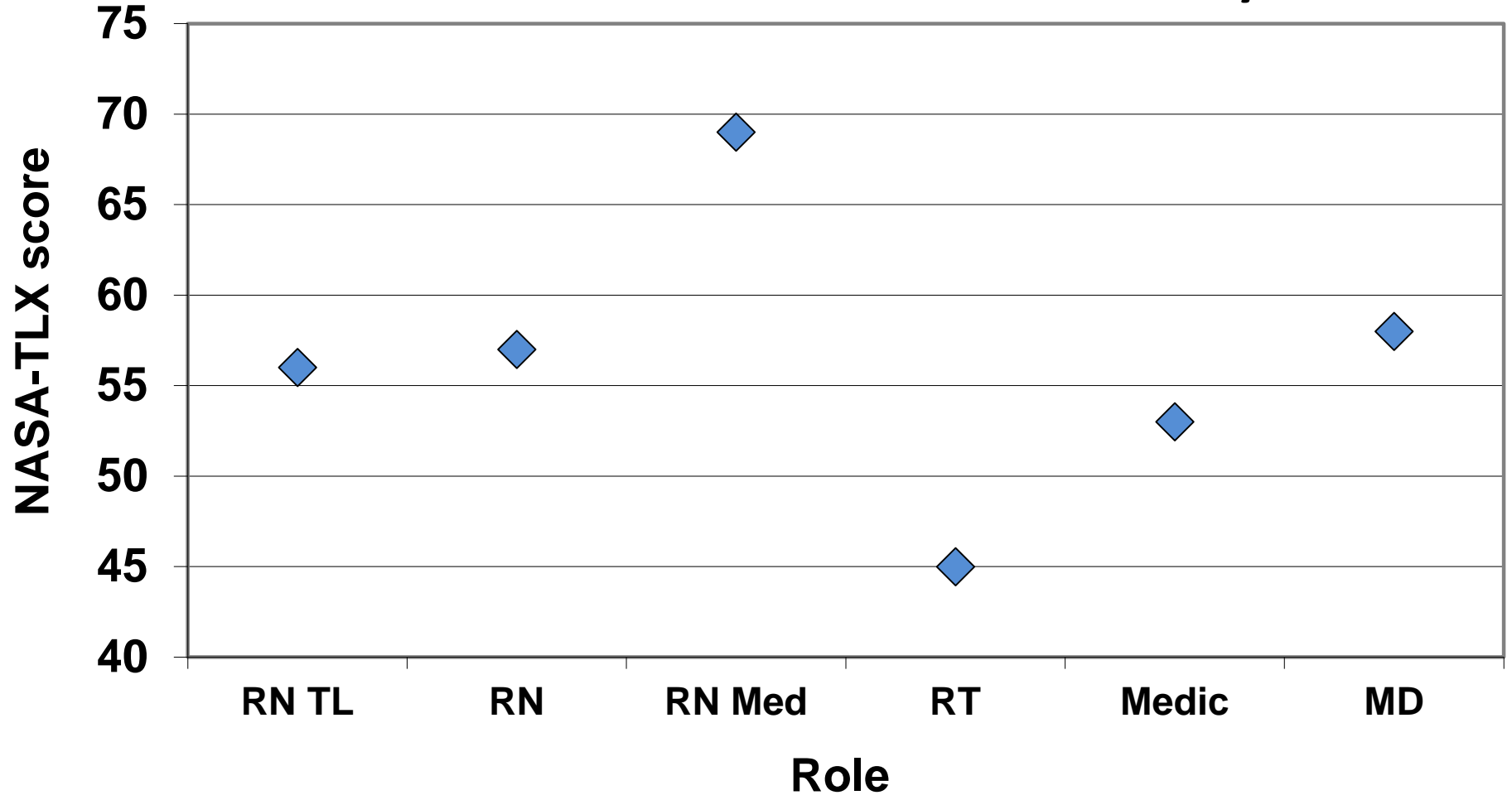


Identify hazards in new environments

- Evaluate team roles/responsibilities
 - NASA TLX workload scale
- Understand margin, adaptive capacity



NASA-TLX overall mean scores by role



Geis GL, Pio B, Pendergrass TL, Moyer MR, Patterson MD. Simulation to assess the safety of new healthcare teams and new facilities. *Simul Healthc.* 2011 Jun;6(3):125-33.

...investigate serious events or incidents

- Reenactment of a medication error using actual equipment revealed
 - The infusion pump duplicated a keystroke, delivering 44.4 mg, rather than 4.5 mg, of a medication

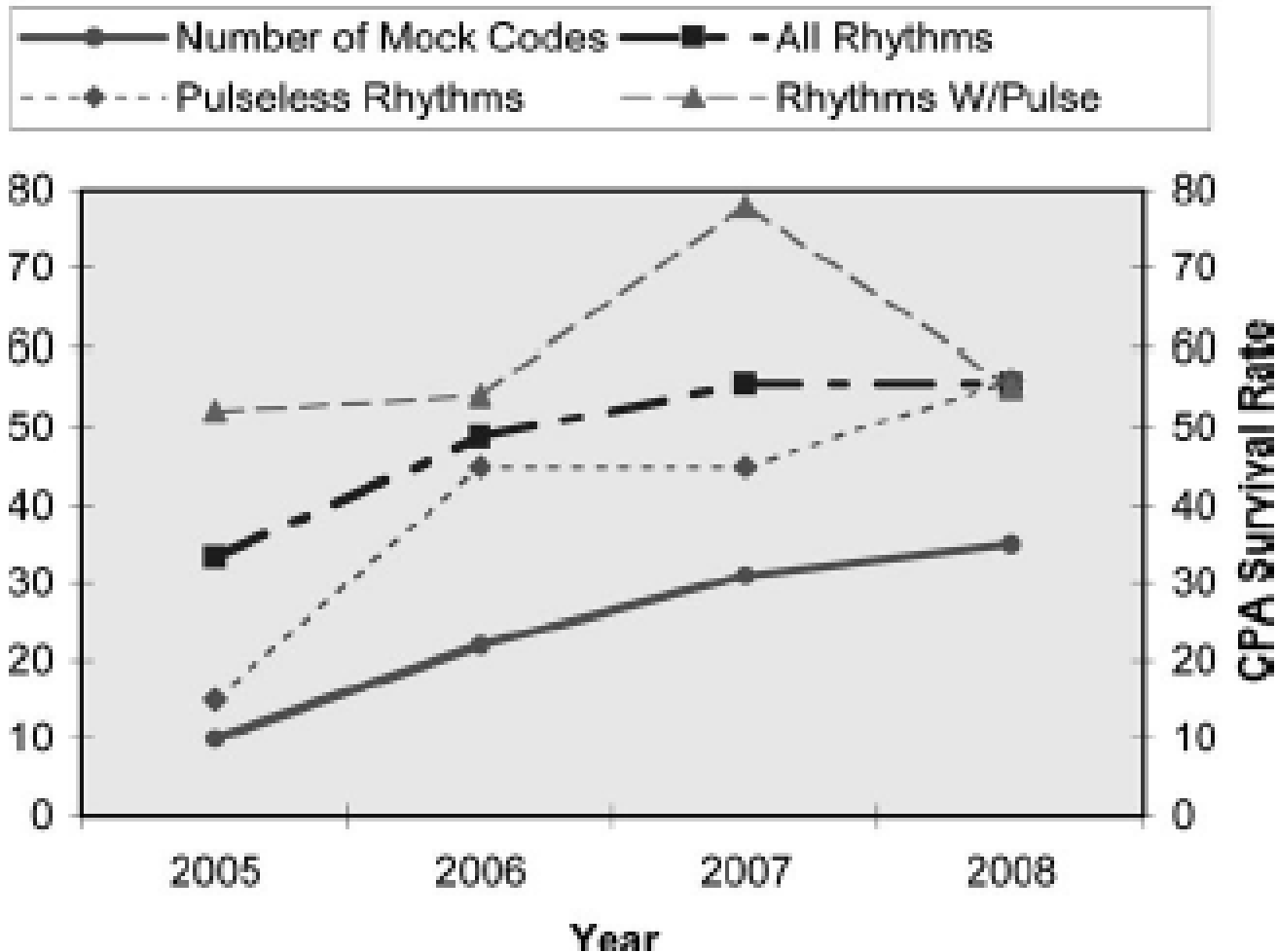


Mobilizing Resilience

- Evidence
 - Simulation based training and debriefing associated with improved outcomes during crises

Pediatrics and Neonatal

CPA Survival Rates Related to Mock Codes



Obstetrics

- Cluster randomized trial -3 hospitals
- Baseline perceptions of safety as measured by SAQ
 - high at all 3 hospitals
- In hospital using simulation-37% improvement in perinatal morbidity between pre and post as measured by weighted adverse outcomes scale
- No changes in control or didactic only hospital



<http://pregnant.sg/articles/who-can-deliver-a-baby-benefits-of-gyneacologist/>

CPR Resuscitation Learning Laboratory

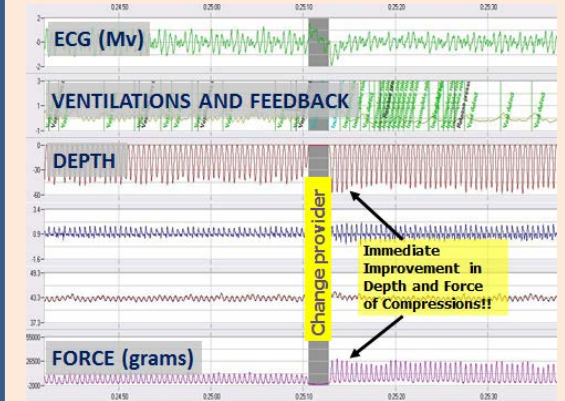
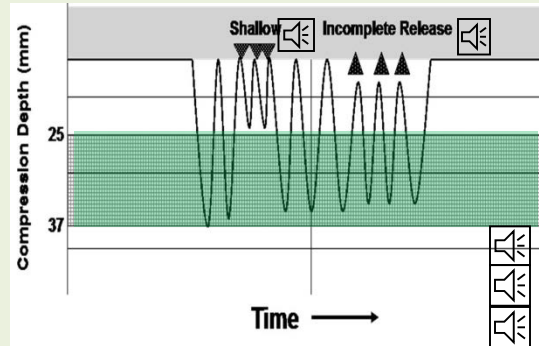
High Risk Screening for Just-in-Time Training



Real-Time Feedback

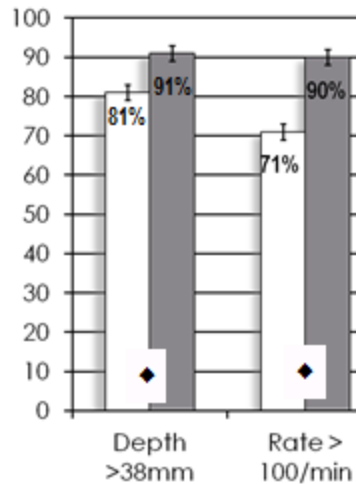


Performance Debriefing

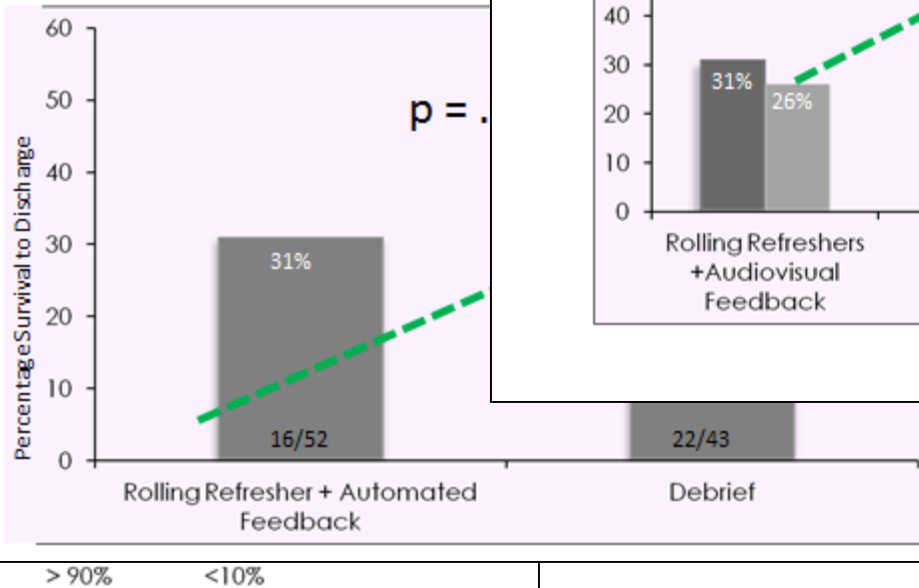


...associated with improvement in:

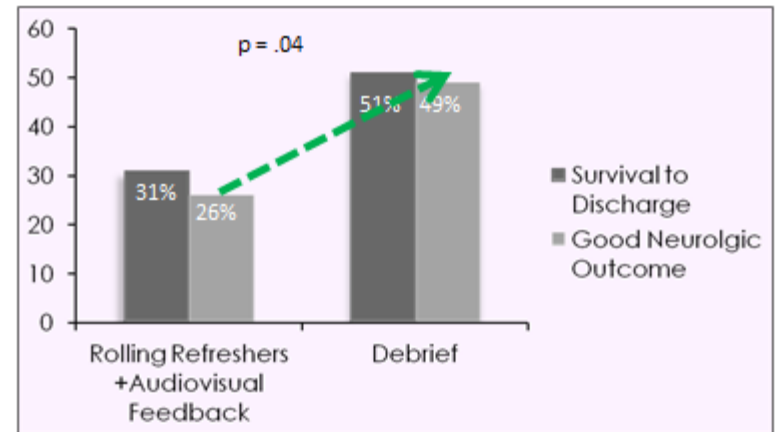
Single CPR



Survival to Discharge

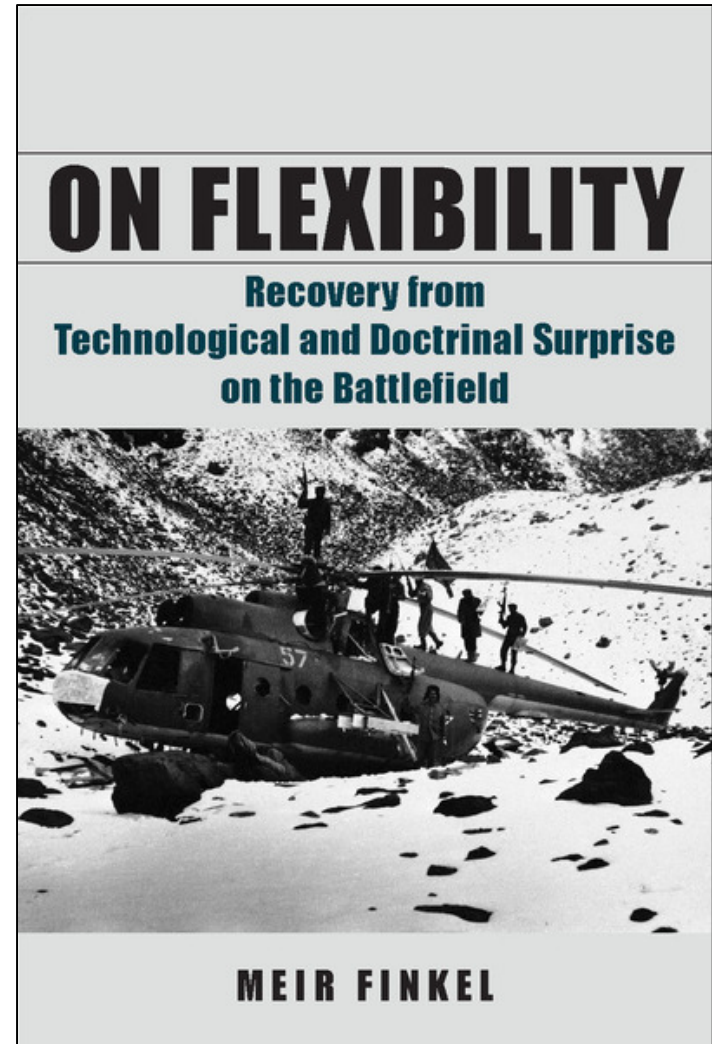


Neurologic Outcome





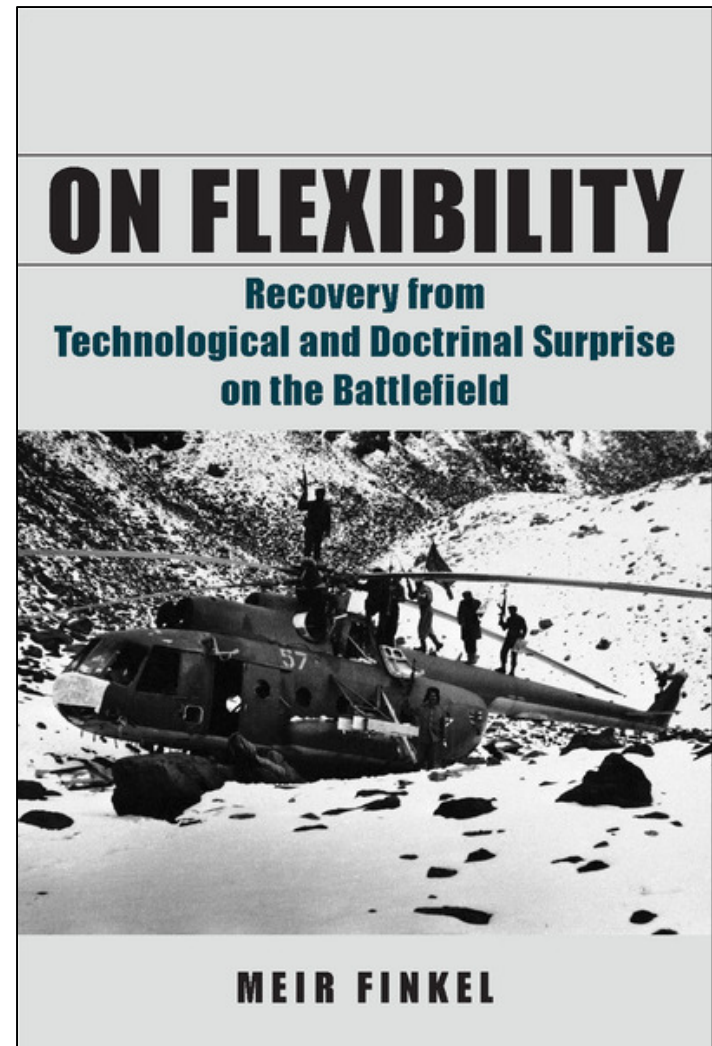
- “Main Solution to problem of surprise is in recovering from surprise by employing the range of abilities that fall under the heading of flexibility”
- We should “train” for surprises and how to respond and adapt to surprise



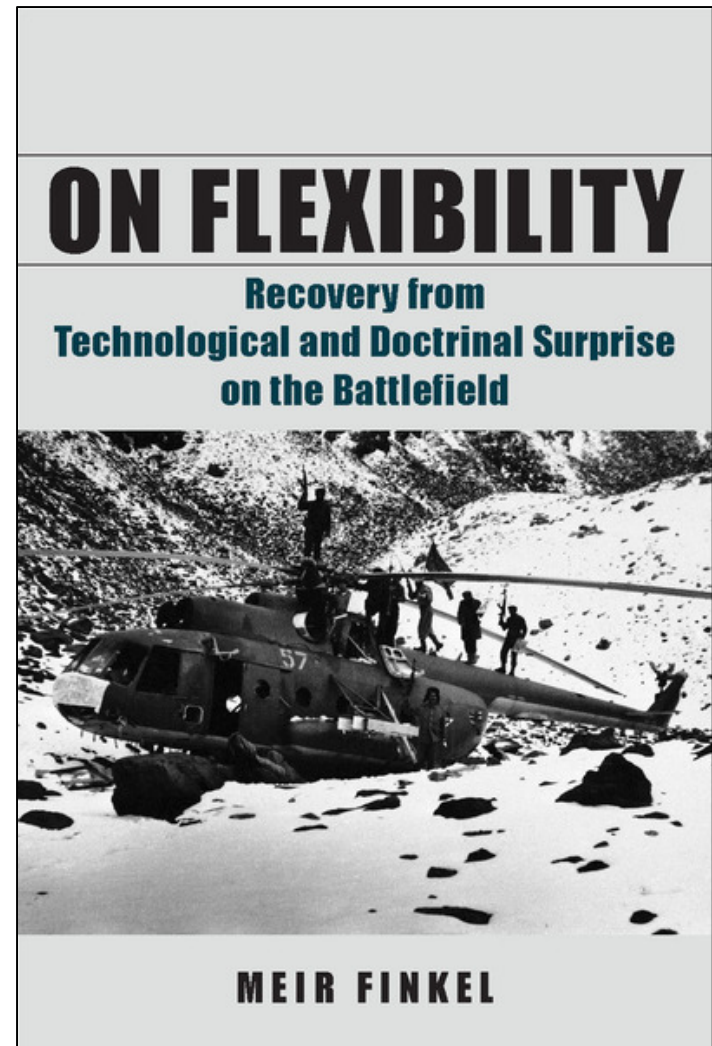
Discussion



- To square training with the reality of war, it becomes a necessary part of ...training to install in him the full realization that ...many things will go wrong without it being anyone's fault in particular. It therefore follows that the far object of a training system is to prepare the officer mentally so that he can cope with the unusual and the unexpected as if it were altogether normal and give him poise in a situation where all else is in disequilibrium.
- SLA Marshall. Men Against Fire. 1947



- It is not within the ingenuity of man to fully close the gap between training and combat. We have no choice but to incorporate its meaning into the working philosophy of training.
- Thus by a rough approximation: 60 percent of the art of command is the ability to anticipate.
- 40 percent...is the ability to improvise, to reject the preconceived idea that has been tested and proved wrong ... and to rule by action instead of acting by rules.
- SLA Marshall, Men Against Fire 1947



Obstetrics

- Individual and team training in obstetric emergencies
- Infants with 5 minute Apgars <6
 - 86.6 to 44.6 /10000 births
- HIE
 - 27.3 to 13.6/10000 births



<http://www.newkidscenter.com/Newborn-Baby-Pictures.html>