



# **Surge Capacity**

## **A Conceptual Framework**

### **Overview of the Science of Surge**

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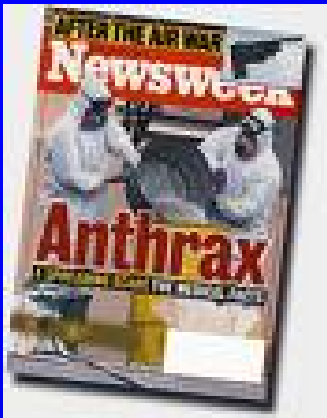
**Orange, California, USA**

# Surge Capacity

## ☞ What is it?

- **New terminology**
  - ◆ **A concept**
  - ◆ **No standardized definition**
  - ◆ **Difficult to describe**
- **State of California 2007**
- **Our simple approach**
  - ◆ **Three components**
    - **The 3 S's**





# Surge Capacity

## 9 May 2007



- ☞ Ability of the *emergency-care system* to mobilize additional resources and personnel quickly to deal with a sudden influx of *patients*



# **A New Concept for Surge Capacity**

## **Co-Authors**

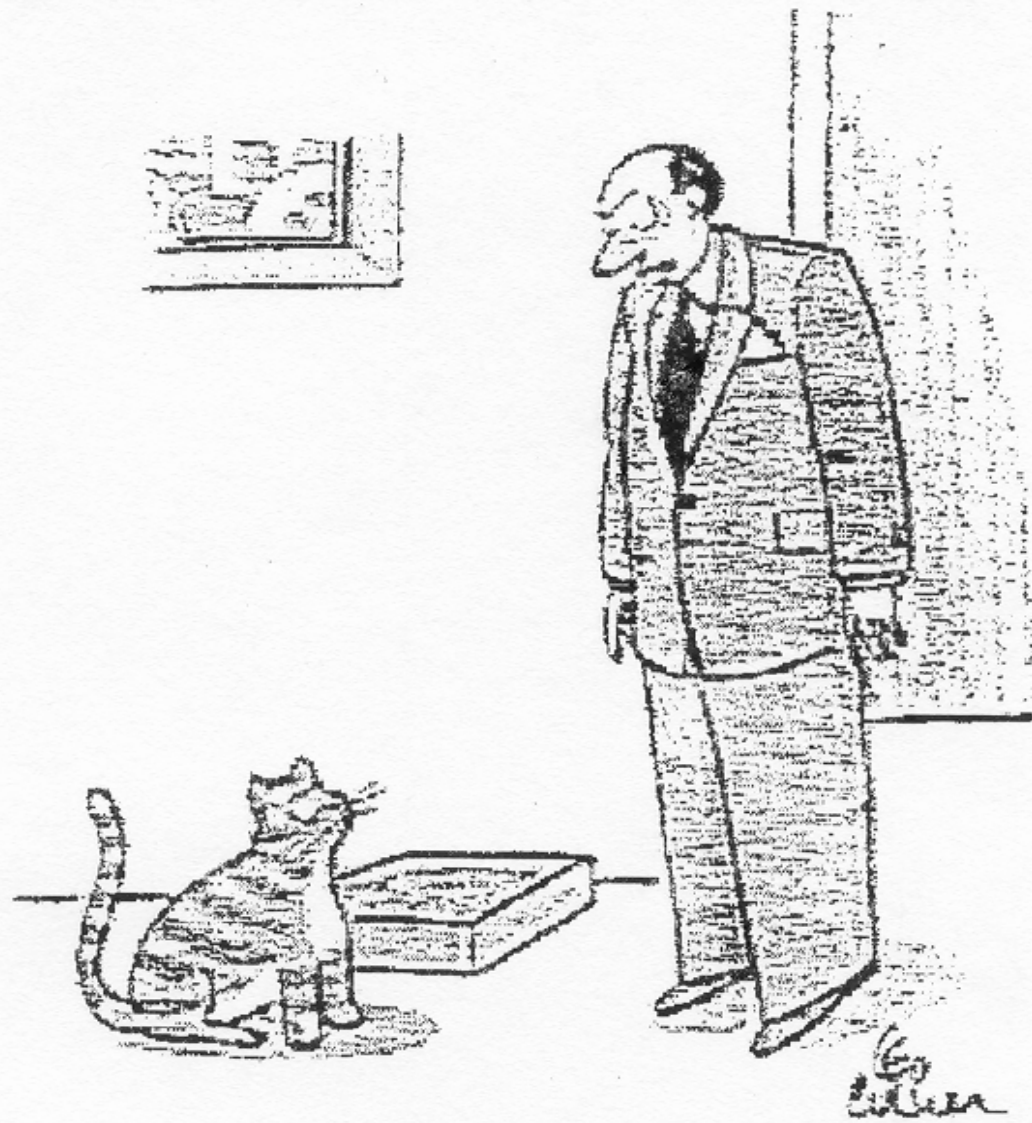
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*"Never, ever, think outside the box."*

# Surge Capacity

## When do you need it?

- ➡ **Required when**
  - *Patient* care needs exceed **resources**
  - At a given point in time
- ➡ **Uncommon to exceed health and medical resources within the United States**





# 1918 Influenza Pandemic



**550,000 deaths in US in less than 10 months**  
**4,000 deaths per day in the month of October**









# Modern Times

## Lack of Resources?

- ☞ **29 disasters in the United States**
  - 6% supply shortages
  - 2% personnel shortages
- ☞ **Lack of a *management system* to organize available resources**
- ☞ **Hurricane Katrina**
  - An exception?



# Surge Capacity

- ☞ **Traditional focus has been on “stuff”**
  - **“Dr. Koenig, how many ventilators should we buy for the State of California?”**
  - **Purchasing pharmaceuticals and supplies**
    - ◆ **Ventilators**
    - ◆ **Antiviral Medications**
    - ◆ **Decontamination Equipment**
    - ◆ **Personal Protective Equipment**



# Preventing spread of the bird flu

Buying “stuff” is not enough!





# Surge Capacity

## Background Considerations

- **Managed Care and other cost-containment strategies have increased efficiency, however**
  - “Just-in-time” systems lack excess capacity
  - Crowding in emergency health care systems
  - Barely effective for day-to-day operations
- **Need a *Surge System* for catastrophic events**



# Catastrophic Event

- ➡ When medical and health needs **exceed resources** *at a given point in time*
- ➡ Not the absolute number of patients
- ➡ Key point is whether system resources are adequate



# Surge System

## 3 Key Components



☞ **Stuff** (supplies and equipment)



# Surge System

## Key Components



☞ **Stuff** (supplies and equipment)

☞ **Staff** (personnel)

– Behavioral issues

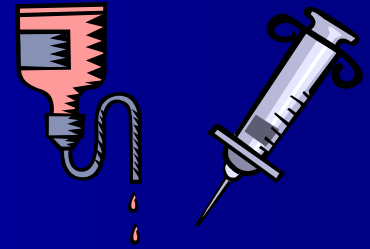
– Will staff come to work?





# Surge System

## Key Components



☞ **Stuff** (supplies and equipment)

☞ **Staff** (personnel)

- Behavioral issues
- Will staff come to work?



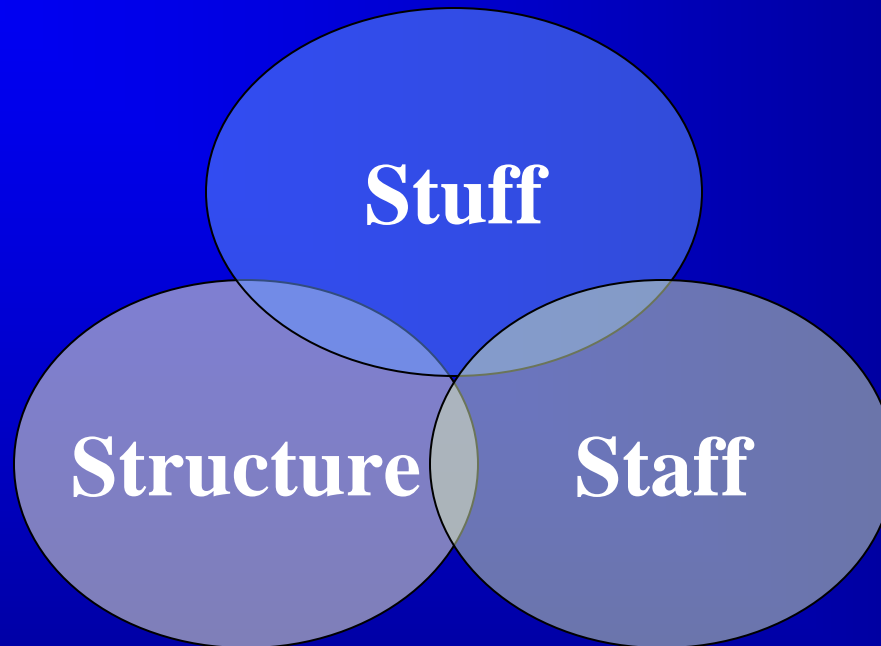
☞ **Structure** (2 components)

- Physical space
- Management infrastructure
  - ◆ Incident Command System



# Surge System

## 3 Components



# Surge System Goal

- ☞ “Do the most good for the most people”
  - Shift from *individual* care to *population* care
    - ◆ Cardiopulmonary Resuscitation?
  - “Triggers” to shift to a “*Crisis Standard of Care*”



# Surge System

## Standard of Care

### ☞ Standard of Care\*

- **Do not “alter” THE standard of care!**
- Goal to optimize *population* outcomes rather than individual outcomes

\*Koenig KL, Cone DC, Burstein JL, Camargo CA. **Surging to the Right Standard of Care.** *Acad Emerg Med* 2006 Feb;13(2):195-8.





# Science of Surge

- ☞ **Academic Emergency Medicine**
  - **May 2006 Consensus Conference**
  - **Proceedings published November 2006**

[www.aemj.org/content/vol13/issue11](http://www.aemj.org/content/vol13/issue11)



# Surge Capacity Research Future Directions

- **Create, evaluate, improve protocols**
- **Develop readiness benchmarks**
- **Metrics to determine *triggers* to implement**
  - **Simple, all-hazard**
  - **Fiscally viable**



# Surge Capacity Conclusions

## ☞ Goals

- Augment patient treatment capacity
- Improve *population* health outcomes

## ☞ Surge System

- **Staff**
- **Stuff**
- **Structure**
  - ◆ Physical Infrastructure
  - ◆ Incident Command System



# Selected References

- ☞ **Kaji A, Koenig KL, Bey T. Surge Capacity for Healthcare Systems: A Conceptual Framework. *Acad Emerg Med* 2006 Nov;13(11):1157-59**
- ☞ **Barbisch D, Koenig KL. Understanding Surge Capacity: Essential Elements. *Acad Emerg Med* 2006 Nov;13(11):1098-1102**
- ☞ **Schultz C, Koenig KL. State of Research in High Consequence Hospital Surge Capacity. *Acad Emerg Med* 2006 Nov;13(11):1153-56**
- ☞ **Kaji AH, Koenig KL, Lewis RJ. Current Hospital Disaster Preparedness. *JAMA* 2007 Nov 14.**

