More the Merrier

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- Thanks Dr. Winchell and the COT for the Invitation

- All comments made under “The Name of the Rose”

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- **Question re: trauma system development**
- **More the Merrier**
  - vs
- **Pull up the ladder Jack, I'm here**

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- **What's driving decision making?**
  - **Physiology**
    - Vs
  - **Economics**

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- More the Merrier / Physiologic point of view
  - Trauma care is a time sensitive, physiology based surgical practice
  - As injury severity increases, the significance of time becomes more evident
  - Even a relatively minor trauma can become deadly if time is against you

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- Pull up the ladder Jack, I'm here / Economic point of view
  - Providers have to be able to survive
    - Requires a system that values rewards, expertise and commitment
  - Quality requires experience, experience requires volume

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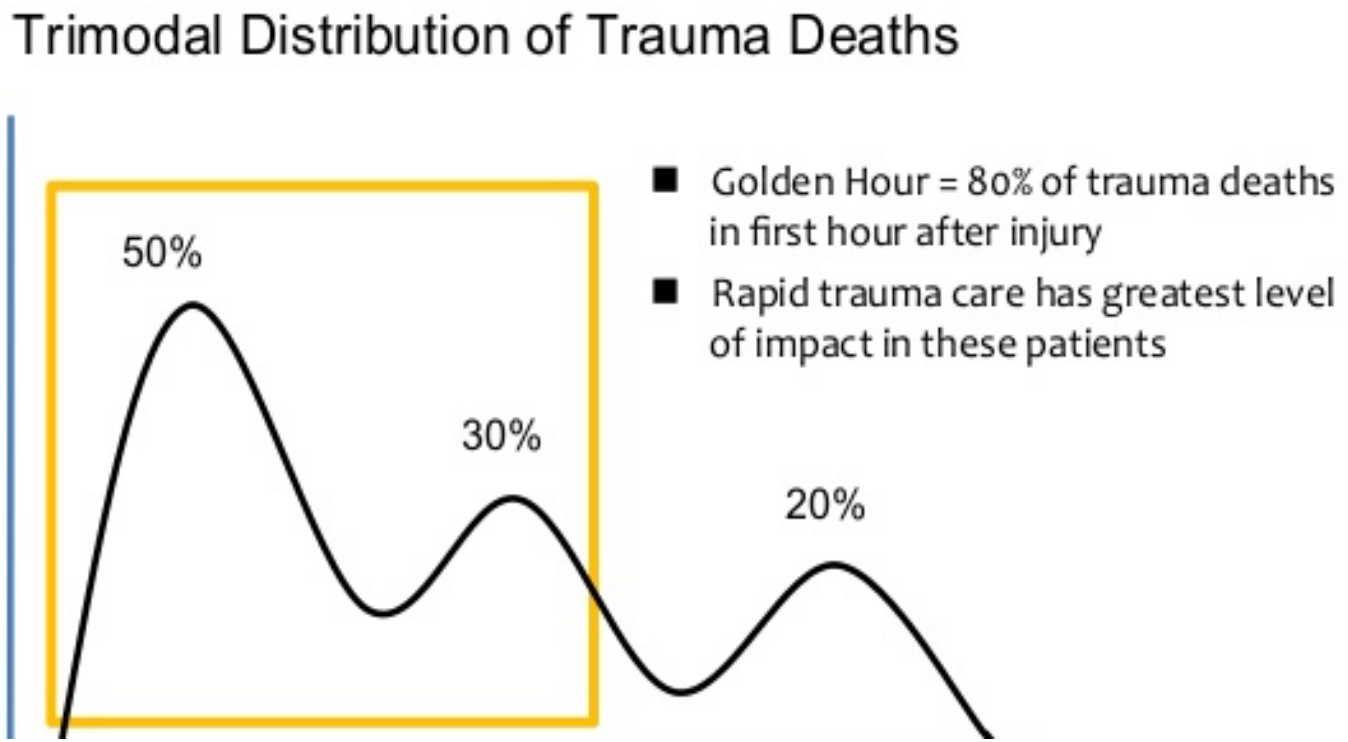
The majority of Trauma deaths happen early



Immediate 50-60%, Early 25-30% and Late 10-20%

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Does getting pt. to care quickly help?

ROC study by Newgard et al. 2009, involved 146 urban, suburban, rural and frontier EMS agencies in the USA and Canada. They found insufficient evidence that severely injured trauma pts. with shorter out of hospital times did better.

Samplis et al. 1994 and 1993, found that severely injured pts. who spent 20 mins at the scene or 1 hour in the field had worse outcomes.

Brand et al. 2011, The Philadelphia Police Department experience of scoop and run for pts. with penetrating injuries had similar outcome to those transported by EMS.

Brown et al. in 2017 In Pennsylvania found that distance from a trauma systems resource mattered for motor vehicular crash fatalities. For every 10 miles from the nearest trauma center fatalities increased by 0.14 per million vehicle miles traveled.

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Does going directly to a trauma center help?

Nathens et al. 2012, population based study showed 30% increase in mortality with a 48 hr. delay in transfer to a trauma center. In earlier studies they saw no difference in mortality between transfer and direct admissions

Nirula et al. 2010, found an increase in the odds of death for severely injured pts initially triaged to a non-trauma facility.

Several meta-analyses in 2013 and 2015 were unable to demonstrate any difference or reach any conclusion that direct admission to a trauma center improved outcomes.

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Does the level of trauma center matter?

Demetriades et al. 2005, showed that for specific injuries with high mortality and poor functional outcomes level 1 centers had better outcomes and trauma volume did not matter.

Cudnik et al. 2009, in an adjusted analysis of pts. taken to a level 1 center had improved survival and better functional outcomes especially for those with severe injuries.

Gomez et al. 2015, showed that pts. with severe injuries taken to a level 3 center had worse outcomes especially for pts. with a TBI.

Kaji et al. 2017, utilizing 2 validated risk adjusted models showed that overall mortality was less at level II centers compare to level I. This improvement was lost on pts. with a penetrating mechanism.

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Has the development of trauma systems helped?

Jurkovich et al. 1999, showed a 14-20% reduced risk of death comparing trauma systems outcomes to major trauma outcome norms.

Moore et al. and Kuimi et al. in 2015, looked at a mature inclusive trauma system in Quebec and showed substantial improvements in mortality, LOS and complications especially for pts. with critical abd/thoracic or TBIs treated within the trauma system.

Moore et al. 2017, looked at all of Canada and showed a 18% relative decrease in risk adjusted mortality and a 8.6% decrease in LOS representing 248 lives and 10,000 hospital days saved in 2012 vs 2006.

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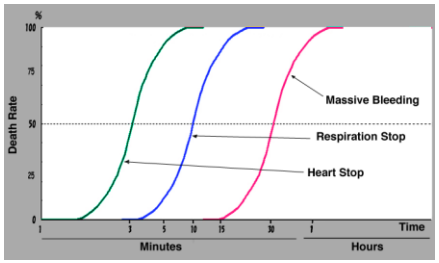
Goal is Zero Preventable Trauma deaths

Trauma is time sensitive

The majority of Trauma deaths happen early



To make a difference pts need to get to expert care quickly which requires a mature, integrated trauma system

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Are we there yet?

Annual Trauma deaths in the USA - 150,000

Too early to Pull up the ladder, Jack and the More the Merrier should remain the motivating force for trauma systems development

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Another consideration:

"Rising tide floats all boats"

The Joint Commission approach, Everyone has to do something

Basic Trauma skills required of any and all who want to provide medical care

Tactical EMS, Hemorrhage control, Advanced airway, Chest decompression, Accelerated transfer process

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- Thanks for your attention