

## Ready or not, Real-time is needed

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### Presentation Description

This ignite presentation advocates that **real-time** analysis of **real-world data** to understand the **dynamics** of complex systems **on short time scales** is a crucial contribution of applied informatics in a learning health system. Informaticsts may not immediately resonate with the term “resilience” because this term is used synonymously with psychological resilience and human coping in healthcare. However, the term “resilience” in the field of Resilience Engineering refers to an organization’s ability to sustain its function across expected and unexpected situations[1, 2]. This systems-focused definition of resilience is consistent with the mission of a learning health systems and should be a primary focus in applied clinical informatics.

### Ignite Talk Outline

- Is it feasible to imagine that a workplace could dynamically sense when patient safety and workload boundaries are being encroached?
- Resilience Engineering describes Decompensation as a primary pattern of failure in adaptive systems.
- Phases of Decompensation:
  - Phase 1 – Compensation. Humans, as the adaptive component of the work system, compensate for growing disturbance, thereby sustaining target performance.
  - Phase 2 – Decompensation. The ability to buffer demand is not infinite, and a loss of target performance eventually occurs as adaptive capacity is exhausted.
- Clinician use of adaptive work strategies is observable in workplace data (examples will be provided) as digital echoes of overload and wellbeing. Finding and surfacing these signals in real-time data streams is an important objective in applied informatics research.
- Actualizing these concepts through a story
  - A woman entered the hospital with the ability to walk.
  - Clinicians appropriately prioritized life-threatening situations, and when these situations absorbed available resources, mobilization did not occur.
  - Ultimately, the patient left in a wheelchair, had a post-hospital fall and entered long term care, dramatically influencing quality of life.
- The future of safety and high quality care lies in real-time analytics
- Dynamic sensing of workplace conditions and presentation of real-time insight to support proactive response to periods of high pressure is a critical priority in applied informatics

### References

1. Hollnagel, E., et al., *Resilience engineering concepts and precepts*, ed. E. Hollnagel, D.D. Woods, and N. Leveson. 2006, Aldershot, England: Ashgate Publishing.
2. Woods, D. and M. Branlat, *Basic patterns in how adaptive systems fail*, in *Resilience Engineering in Practice: A Guidebook* E. Hollnagel, Paries, J., Woods, D., Wreathall, J. , Editor. 2011, Taylor & Francis Group: Boca Raton, FL. p. 127-144.