A Human Systems Integration Framework for Safe Patient Handling and Mobility Outcomes for Patients and Care Providers

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Safe Patient Handling and Mobility

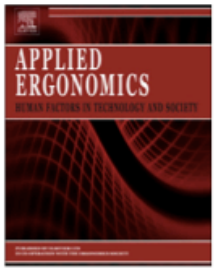
- *We need an HSI approach…*

  …What does that mean?

- Key principles for HSI approach
- Model for HSI approach

Key Principles of HSI Approach
(Wilson, 2014)

"A system is a set of inter-related or coupled activities or entities (hardware, software, buildings, spaces, communities and people), with a joint purpose, links between the entities which may be of state, form, function and causation, and which changes and modifies its state and the interactions within it given circumstances and events, and which is conceptualized as existing within a boundary; it has inputs and outputs which may connect in many-to-many mappings; and with a bow to the Gestalt, the whole is usually greater (more useful, powerful, functional etc) than the sum of the parts." (page 6)



Fundamentals of systems ergonomics/human factors

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System Focus → Context → Interaction → Holism → Emergence

What is the System?

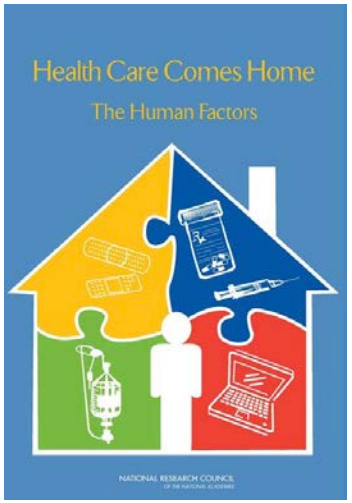
- Sub-systems, system of systems, boundaries:
  - Care transitions and physical transport
- System elements and levels:
  - Across-level influences:
    - Staffing-workload (Carayon & Gurses, 2005)
  - Nested levels:
    - Hospital-unit-individual (Karsh & Brown, 2010; Karsh et al., 2014)

What is the System?

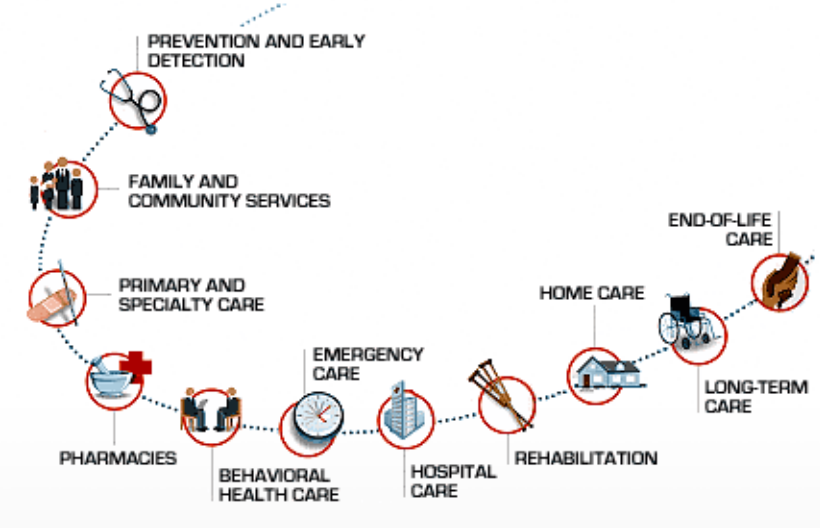
- System goals:
  - Safety for both workers and patients
  - Acute versus chronic goals (Woods, 2006)
  - Other goals?
  - Conflicting goals?
    - Patient dignity and lifting devices (Pellatt, 2005)

Variety in Context

- Care settings:
  - hospital, outpatient, home, long-term care, ambulance, …



(NRC, 2011)



Complex Set of Interactions

- Multi-component, multi-factor, combined or multidimensional interventions; comprehensive programs (Collins et al., 2010; Hignett, 2003; Dawson et al., 2007; Tullar et al., 2010; Nelson et al., 2008)
  - Configuration approach (Holden et al., 2013)

Holistic Approach

- Whole person:
  - Physical, cognitive and psychosocial characteristics
    - Changing characteristics of workers and patients
  - Role of biomechanical, cognitive and psychosocial work factors (Carayon et al., 1999)
- Holistic approach to outcomes:
  - physical, mental, emotional, financial

Safety = Emergent Property

- Can we anticipate everything when designing a system?

Safety = Emergent Property

- System in use:
  - ‘Work-arounds’
  - Nursing decision making for patient ambulation (Doherty-King et al., 2011, 2013)
    - Over 8 hours: 32% elderly inpatients not engaged in mobility events

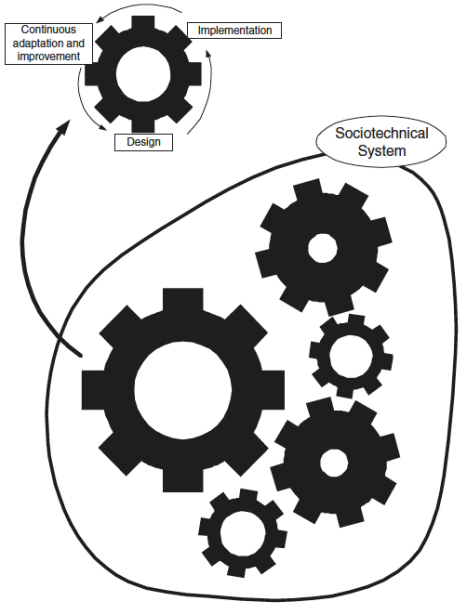


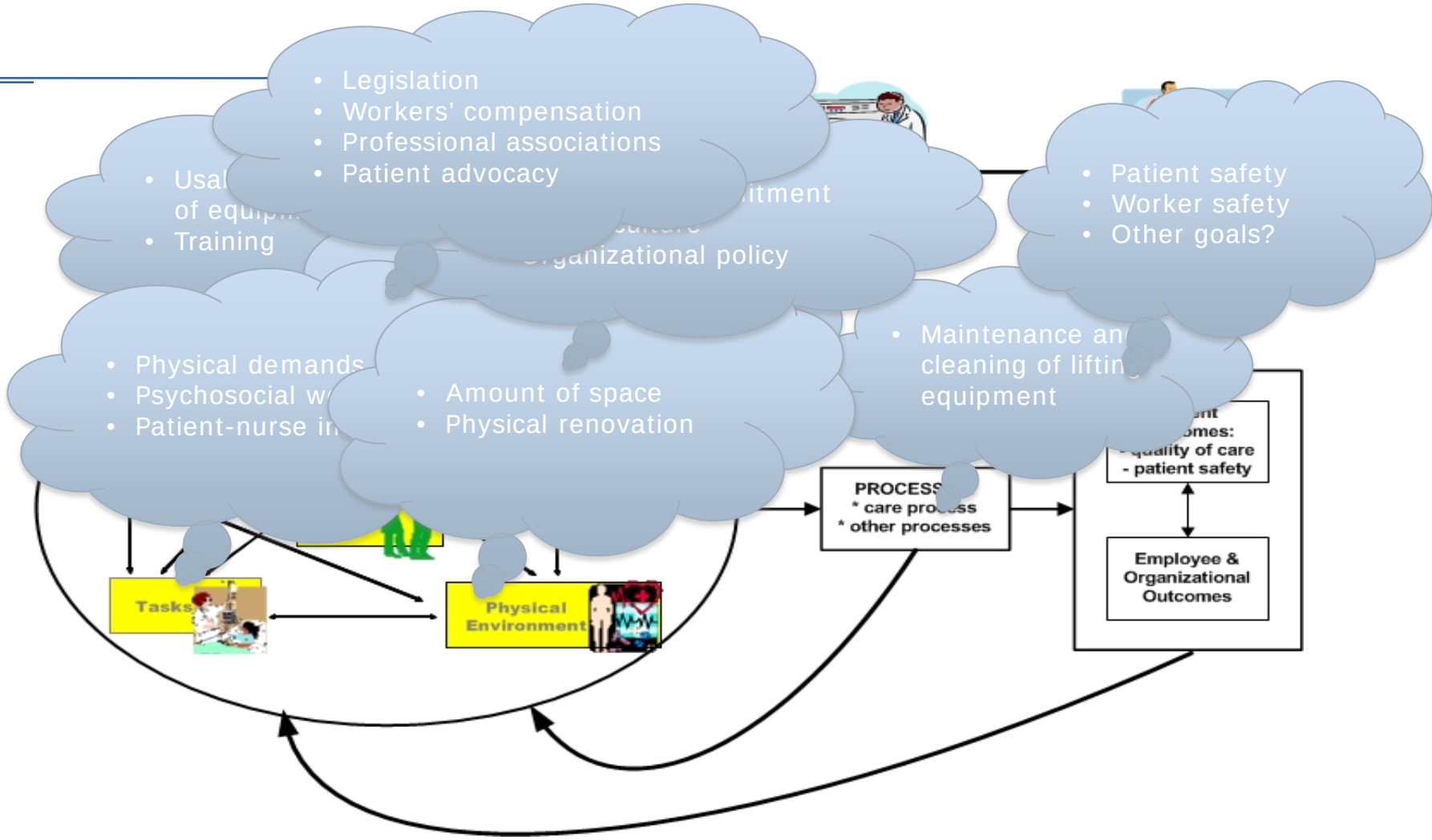
Fig. 1. Cycles of system design, implementation and continuous adaptation/improvement.

(Carayon, 2006)

System Focus | Context | Interaction | Holism | Emergence

HSI Model of Safe Patient Handling and Mobility

SEIPS Model of Work System and Patient Safety



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Thank you

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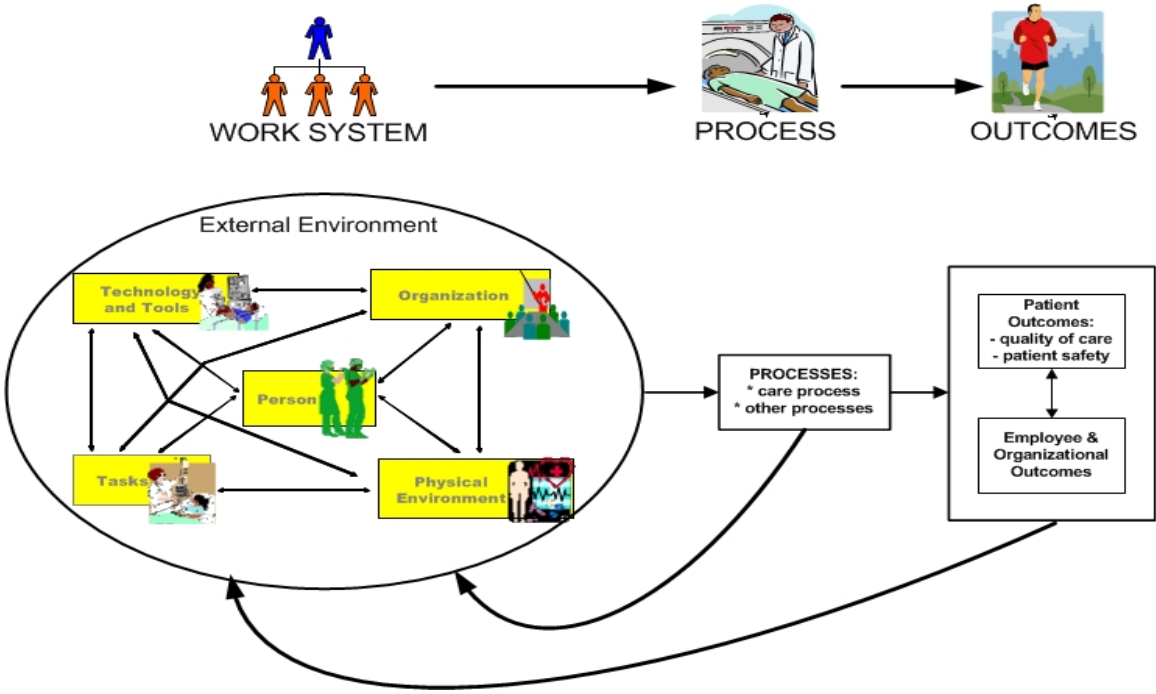

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