

## RESEARCH PAPER

# Examining the effect of interventions in emergency care for older people using a system dynamics decision support tool

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## Abstract

**Background:** Rising demand for Emergency and Urgent Care is a major international issue and outcomes for older people remain sub-optimal. Embarking upon large-scale service development is costly in terms of time, energy and resources with no guarantee of improved outcomes; computer simulation modelling offers an alternative, low risk and lower cost approach to explore possible interventions.

**Method:** A system dynamics computer simulation model was developed as a decision support tool for service planners. The model represents patient flow through the emergency care process from the point of calling for help through ED attendance, possible admission, and discharge or death. The model was validated against five different evidence-based interventions (geriatric emergency medicine, front door frailty, hospital at home, proactive care and acute frailty units) on patient outcomes such as hospital-related mortality, readmission and length of stay.

**Results:** The model output estimations are consistent with empirical evidence. Each intervention has different levels of effect on patient outcomes. Most of the interventions show potential reductions in hospital admissions, readmissions and hospital-related deaths.

**Conclusions:** System dynamics modelling can be used to support decisions on which emergency care interventions to implement to improve outcomes for older people.

**Keywords:** frailty, emergency and urgent care, interventions, system dynamics, older people

## Key Points

- Outcomes for older people attending Emergency and Urgent Care settings are poor.
- A range of emergency care frailty interventions have been shown to improve outcomes, but deciding which intervention to develop is not straightforward.
- System dynamics modelling offers a low-risk approach to exploring and providing evidence-based support to decisions on which emergency care interventions to implement.

# Emergency Care Dynamics

**DJ Losen**



## **Emergency Care Dynamics:**

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