

## Abstract

**Objectives:** Efforts to identify which patients benefit most from Helicopter Emergency Services (HEMS) activation can help guide clinical decisions around employing this costly and often risky resource. This scoping review seeks to identify trends in survival outcomes data comparing helicopter and ground emergency services (GEMS) transports directly from trauma scenes to definitive care, critically assess the quality of existing data, and generate questions for further directed study. **Methods:** Pubmed was the primary database used for this review. Database search was conducted by a matrix approach utilizing MeSH search terms as well as general keyword search criteria. Included studies were published in 2010 or later and directly compared survival in HEMS and GEMS trauma transports from scene. Studies were evaluated by 3 independent reviewers to ensure inclusion criteria were met. **Results:** Forty-one retrospective cohort studies were included for review. HEMS and GEMS survival outcomes were compared overall or based on patient physiologic criteria, injury type, injury severity, and patient age. HEMS activation was associated with improved survival overall in both nation-wide and single-institution studies. When comparing HEMS and GEMS survival based on type of injury, results were mixed with the exception of traumatic brain injury which benefited from HEMS activation across several studies. When patient characteristics were compared, those with unstable vital signs at the trauma scene appeared to benefit from HEMS activation. Patient age (pediatrics patients or those >55 years) was not consistently associated with mortality benefit. **Conclusions:** After controlling for injury severity and patient characteristics, HEMS is associated with improved survival in patients transported from trauma scenes. Several

studies reported that patients with unstable vital signs on scene and those with traumatic brain injuries benefit most from HEMS activation. The quality of the existing evidence is poor, in large part due to methodological limitations and confounding variables that cannot be controlled for on a trauma scene. Further study is needed to elucidate specific factors that lead to the possible survival benefit of HEMS.

**COI:** All authors declare they have no conflicts of interest.