Aeromedical transportation

- Recent Outcomes Research in Helicopter Emergency Medical Services: A Scoping Review of Publication-Year 2024 Additions to the Helicopter Outcomes Assessment Research Database
- Flight Nurses' Experiences With Interhospital Transportation of Critically III Patients
- Cleared to land? A nationwide analysis of emergency care hospital and HEMS infrastructure in Germany
- Improving prediction accuracy of hospital arrival vital signs using a multi-output machine learning model: a retrospective study of JSAS-registry data
- Pathophysiological changes during medical helicopter transport in the Canary Islands and their relationship with meteorological conditions
- Pediatric Endotracheal Tube Cuff Management at Altitude: Implications for Aeromedical Retrieval and Other Austere Environments
- Patient Characteristics to Inform Military Medical Evacuation Decision-Making in Mild Isolated Head Injury
- Association Between Medical Interventions by Doctor Helicopters and Outcomes in Inflammatory Diseases Using a Doctor Helicopter Registry

Aeromedical transportation, also known as medical air transport or medical aviation, is the use of aircraft to transport patients who require medical attention or specialized care. This includes both emergency and non-emergency situations.

Aeromedical transportation can be used for a variety of purposes, including inter-hospital transfers, repatriation of patients from foreign countries, and emergency medical evacuations from disaster areas or war zones. It can also be used for transporting transplant organs or medical supplies.

There are several types of aeromedical transportation, including air ambulances, medical evacuation (medevac) aircraft, and medical transport helicopters. Air ambulances are typically equipped with specialized medical equipment and staffed by a team of medical professionals, such as doctors and nurses, to provide advanced medical care during the flight. Medevac aircraft are used for transporting injured or ill military personnel or civilians from a combat zone or disaster area to a medical facility for treatment. Medical transport helicopters are often used for emergency transport of patients to hospitals or trauma centers in remote or inaccessible areas.

Aeromedical transportation requires specialized training and equipment to ensure the safety and wellbeing of the patient during transport. It is often coordinated by medical transport companies or government agencies, and can involve both domestic and international travel. The medical team on board the aircraft is responsible for monitoring the patient's vital signs, administering medication, and providing other necessary medical interventions during the flight.

Fit to fly

Fit to fly

Donovan et al. conclude that pneumocephalus in head injury and/or craniotomy patient is not likely by itself to be an absolute contraindication to air evacuation. The mechanism causing pneumocephalus,

its time course, progression, and the rate of altitude change are likely more important factors in determining its clinical significance. More clinical experience is required to better assess the safety of aeromedical evacuation of these patients, but this small series suggests that it is not as dangerous as previously thought ¹⁾

Review articles

Tasiou et al. provide a framework of logistical factors which deserve special consideration in the preparation of these patients for transfer.

They searched all relevant medical literature, military reports, and travel industry documents on transfer of neurosurgical patients. This review was combined with a senior author's (MJ) extensive relevant experience, to present important factors for neurosurgeons to consider during planning of aeromedical evacuation, highlighting potential preventable causes of deterioration en-route.

Several criteria must be met for a transfer to be considered. The safe transfer of patients with craniospinal pathology requires efficient collaboration between the referring teams, the receiving units/departments, and the medical transfer service. Clear communication, qualified personnel and appropriate transportation equipment must be available for the transfer. One must consider unique stressors during the air transfer, including the risk of hypoxia on certain types of flights. Vibration, loud noise, acceleration, and changes in barometric pressure en-route may negatively affect the patient during transfer. Patient stabilization before transfer is a priority. Medical conditions which can potentially worsen in-flight should be corrected before transfer. The use of a checklist before departure is highly recommended, and is included in the article. The timing of transfer concerning the postoperative patient deserves special consideration.

Although there is little published information, this review provides useful criteria and parameters needed for safe aeromedical evacuation of neurosurgical patients²⁾

The lack of empirical validation, specificity in recommendations, and consideration of financial constraints limits the practical application of their findings. Despite these limitations, the review is a valuable contribution that lays the groundwork for future research and improved practices in aeromedical evacuation.

1)

Donovan DJ, Iskandar JI, Dunn CJ, King JA. Aeromedical evacuation of patients with pneumocephalus: outcomes in 21 cases. Aviat Space Environ Med. 2008 Jan;79(1):30-5. doi: 10.3357/asem.1893.2008. PMID: 18225775.

2)

Tasiou A, Tzerefos C, Karagianni M, Tsianaka E, Jarratt M, Gazioğlu N, Peramatzis K, Broekman ML, Rodríguez-Hernández A, Ivan DL, Janssen IK, Karampouga M, Lambrianou X, Mihaylova S, Aydin AE, Hernandez-Duran S, Salokorpi N, Rosseau G, Murphy M. The complexities of aeronautical transfer of acutely unwell neurosurgical patients. World Neurosurg. 2025 Jan 17:123692. doi: 10.1016/j.wneu.2025.123692. Epub ahead of print. PMID: 39827952.



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