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## REGIONAL ANESTHESIA IN SPACE

**Abstract**

As technological advances enable longer term interplanetary travel, advance planning and response to emergencies on spaceflight requires more interdisciplinary approaches. In particular, in the event of a survivable medical emergency requiring an interventional procedure or prolonged pain management, it is tantamount to have anesthetic protocols that are straightforward and safe to execute in place. Within a microgravity environment, intravascular fluid shifts cephalad, and redistribution of body fluid that ultimately results in decreased cardiac output in long term space flights which poses unique challenges to safe anesthesia in deep space. Due to the possibility of increased intracranial pressure during long duration spaceflight, neuraxial anesthesia would be relatively contraindicated in space due to concern for herniation. Moreover, given astronauts' baseline vasodilation and altered autonomic receptor sensitivities, the associated block sympathectomy could result in life threatening hypotension. This study will examine the feasibility of various regional analgesic techniques for space travel, especially as it relates to perineuraxial or facial plane blocks that could avoid this sympathectomy—such as paravertebral block or erector spinae block. This study aims to examine current literature existing regarding regional analgesia to assess for safety and feasibility in resource limited settings, as well as provide suggestions for optimization of space mission environment to facilitate the administration of the blocks in prolonged missions.

Keywords: Anesthesia, Regional, Microgravity, Analgesia, Astronaut