

Physiological adaptations affecting drug pharmacokinetics in space: what do we really know? A critical review of the literature.

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Abstract

As human spaceflight continues with extended mission durations, the demand of effective and safe drugs is going to increase. To date, the medications used during missions (for space motion sickness, sleep disturbances, allergies, pain and sinus congestion) are administered under the assumption that they act similarly as on the Earth. During spaceflights however fluid shifts, muscle and bone loss, immune system dysregulation and changes in the gastrointestinal tract and metabolism are documented. These alterations may change the pharmacokinetics (PK) and pharmacodynamics. The information gained from bed-rest studies and from inflight observations is partial and demonstrates variability in drug PK. The objectives of this review are to report: i) the impact of the space environmental stressors on human physiology in relation to PK; ii) the state-of-the-art on experimental data in space and/or in ground-based models; iii) the validation of ground-based models for PK studies; and iv) the identification of possible research gaps.

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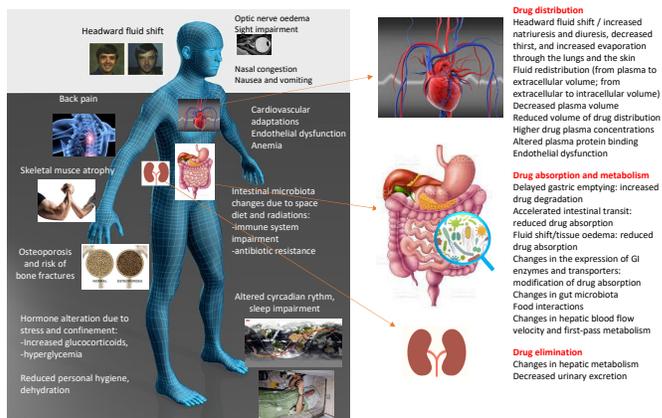


Figure 1

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