National Space Biomedical Research Institute Apprenticeship Exit Presentation

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Pharmacology Discipline
Risk of Clinically Relevant Unpredicted Effects of Medication

- Medication usage
- Medication stability
- Spaceflight and pharmacokinetics
- Spaceflight and pharmacodynamics
- Spaceflight and antimicrobials
Pharmacology Database

- Human Research Program Task

- Contain fundamental information about each medication in the ISS medical kit

- Information collected from terrestrial sources
Pharmacology Database

- Permit pharmacology discipline researchers to quickly search for any drug-related information requested by space medicine or other researchers

- Enable predictions of likely side effects or potential barriers to effective treatment

- Reduce the need for redundant medication stability studies
Additional Applications within HRP

- Risk of performance errors due to fatigue resulting from sleep loss, circadian desynchronization, extended wakefulness, and work overload

- How can individual crew members most effectively and safely use sleep and alertness medications prior to and during spaceflight?
Pharmacology Database

Acetaminophen

Dosage Form Used by NASA: Acetaminophen 325 mg
Documented Use By NASA:

Clintion NM, Parcha L, Vanderploeg JM. In-flight pharmacokinetics of acetaminophen in saliva.

O’Rangers, Eleanor A, PharmD, Clinical Pharmacology of Spaceflight. Medscape. 01/03/2011


Brand Names: U.S.

Acephen™ [OTC]; APAP 500 [OTC]; Aspirin Free Anacin® Extra Strength [OTC]; Cetafen® Extra [OTC]; Cetafen® [OTC]; Excedrin® Tension Headache [OTC]; Feverall® [OTC]; Little Fevers™ [OTC]; Mapap® Arthritis Pain [OTC]; Mapap® Children's [OTC]; Mapap® Extra Strength [OTC]; Mapap® Infant's [OTC]; Mapap® Junior Rapid Tabs [OTC]; Mapap® [OTC]; Non-Aspirin Pain Reliever [OTC]; Nortemp Children's [OTC]; Ofirmev™; Pain & Fever Children's [OTC]; Pain Eze...
## Pharmacology Database

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Brand Name(s)</th>
<th>Pharmacologic Category</th>
<th>Dosing: Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen 325 mg (Tylenol)</td>
<td>Acetaminophen® (OTC)</td>
<td>Analgesic</td>
<td>Oral: Adults: 600 to 1000 mg 8-12 hourly; maximum 4 g daily. Oral: Children: 10-14 mg/kg 8-12 hourly (max 4 g daily). Slow release 1800 mg extended release tablets every 12 hours.</td>
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**Note:** The information provided is intended for educational purposes only and should not replace professional medical advice. Always consult with a healthcare provider before making any changes to your medication regimen.

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HESI-NASA Project MoSAIC

The Health and Environmental Sciences Institute (HESI)
- A nonprofit institution whose mission is to engage scientists from academia, government, and industry to identify and resolve global health and environmental issues

NASA Human Health and Performance Center
- A global convener of government, industry, academic, and non-profit organizations that support the advancement of human health and performance innovations for space flight, commercial aviation, and challenging environments on Earth

Project MoSAIC - Medicines Stability And Innovation Collaboration
Proparacaine

- Topical ocular anesthetic drop

- Used for:
  - Glaucoma testing
  - Foreign object removal
  - Treatment of eye injury

- Storage requires refrigeration
HESI-NASA Project MoSAIC Relevance

If successful, this project will remove the requirement of cold temperatures during transport and storage for this compound.

This will impact:
- Clinics, medics and other caregivers
- Drug companies
- NASA
Evaluating Sex Differences in Sleep and Alertness Medication Side Effects

- Sleep problems are a frequent indication for medication use in spaceflight

- Recent FDA updates to Ambien dosing guidelines are sex-specific

- Potential pharmacologic differences between sexes should be evaluated
Summer Intern Collaboration
Thank You

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