Pharmaceutical Care and the Role of a Pharmacist in Space Medicine

Tina Bayuse, Pharm.D.
Lead Pharmacist, JSC Pharmacy
Wyle Laboratories
NASA
Learning Objectives

• Understand how pharmaceutical care is applied to Space Medicine operations.
• Understand the current involvement of a pharmacist in Space Medicine.
• Understand areas of future pharmacy involvement in space tourism.
Definition

• **Traditional role:**
  – Pharmacists dispense the medication from a physician order to the patient
  – Ensure the safe and effective use of medication
  – Counsel patient
    • proper use
    • adverse effects
Definition

• Developing Role:
  – Include other services related to patient care
  – Pharmaceutical care
• Drug therapy experts
• Primary health professionals
  – optimize medication management = positive health-outcomes
Pharmaceutical Care

- Responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life.
- “The outcomes of traditional pharmaceutical care are: cure of a disease, elimination or reduction of a patient's symptomatology, arresting or slowing of a disease process, or preventing a disease or symptomatology”
- Terrestrially, a pharmacist is a major player in providing this care.
Pharmaceutical Care in Space Medicine

- Space medicine primarily preventative medicine
- Outcomes of space medicine pharmaceutical care are:
  - Elimination or reduction of a patient's symptomatology
  - Arresting or slowing of long term effects from microgravity – or -
  - Preventing long term effects or symptomatology as a result of microgravity
- Space medicine pharmaceutical care is about both the patient and the mission
May 14, 2007 Bayuse

Integration

Commercial Space Travel

Patient Care

Drug Information

Pharmacovigilance

Pharmacist
Pharmacy Integration

• Team member pre-spaceflight
  – Physician, engineer, human factors, biomedical engineer and pharmacist

• Patient care
• Patient safety issues
• Drug information
  – Medication kit design
  – Selection of medications for the International Space Station and Space Shuttle medical kits
    • More bang for your buck
    • Compatibility issues
Pharmacy Integration

• Team member during spaceflight
  – Physician and pharmacist
    • Patient safety issues
    • Drug information

• Team member post-flight
  – Research support
    • Patient safety issues
    • Drug information
Integration

Commercial Space Travel

Drug Information

Pharmacovigilance

Patient Care

Pharmacist
Patient Care

• Preventative care
  – Drug Tolerance Testing
  – Countermeasure support
• Patient specific medication needs
• Patient Safety
• Drug Utilization Reviews
Pharmacovigilance

- Kit inspections
- Storage
  - Transdermal patch
- Patient Safety
  - Drug Tolerance Testing
  - Drug recalls
  - Sound alike/look alike
Drug Information

“Knowledge is power, communication is key”
- unknown

• Pharmacist involvement in medical checklist procedures
• Medication monographs
• Drug recalls
• Pharmaceutical technology update
Commercial Space Travel

- Same challenges as existing system
- New variable added
  - State of civilian health
- Broader population base, all ages
  - Altered pharmacokinetics exist before space travel
  - Gender differences?
  - Alternative medicine consumers?
Commercial Space Travel

• More health issues
  – >50 years of age will present chronic disease states
    • Dyslipidemia
    • Hypertension
    • Diabetes
    • Thyroid disorders
    • Decline in renal function
    • Decline in hepatic function
    • Osteopenia, osteoporosis
  – All require pharmacologic treatment

• More treatments, more consumables
  – Efficiencies can be researched
Commercial Space Travel

• Becomes affordable
  – Physician’s time will be in high demand
  – Pharmacist team member required
• Pharmacist required
  – Terrestrially - first point-of-contact for patients with health inquiries
  – Commercial space travel will be no different
• Plan a lunar trip, see the pharmacist for all of your motion sickness needs.
Closing Statements

• Pharmaceutical care in the area of space medicine is evolving.
• A pharmacist serves a critical role in this care.
• Commercial space travel will require pharmacist involvement.
Questions?
References

• (http://pharmacy.ouhsc.edu/about/information/pharmcare.asp).