Pharmaceutical Care and the Role of a Pharmacist in Space Medicine

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

May 14, 2007
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
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
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).