Telehealth Urgent Care for Extremely Remote Locations
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Conflict of Interest

Dr. Eduardo Cordioli, MD

Has no real or apparent conflicts of interest to report.

Dr. Carlos Pedrotti, MD

Has no real or apparent conflicts of interest to report.
Agenda

- **Dr. Carlos Pedrotti**
  - Review of literature
  - The case of Off-shore Oil & Gas platforms
  - How telemedicine may help offshore workers?

- **Dr. Eduardo Cordioli**
  - How to set-up a telemedicine service on offshore platforms
  - What are the main challenges
  - Best practices protocols
  - Real-world data

- **Q/A**
Learning Objectives

• Define which are the most common urgent illnesses affecting onboard offshore oil & gas platform personnel and quantify effectiveness and safety of urgent care delivery by telemedicine in that environment.

• Explain in detail disembarking due to acute illness protocols and procedures taken by telemedicine physician to assure aircraft and patient safety during transportation.

• Identify which advanced examination tools via telemedicine are used most often, including otoscope, skin/eye/throat examination, heart and lung auscultation, EKG and blood tests.
Telehealth for Extremely Remote Locations
Medical Literature Review

Extreme Remote Locations:
1. Strategic Military Bases
2. Space Program
3. Arctic regions and Antarctica
4. Offshore Environment***
Telehealth for Extremely Remote Locations
Medical Literature Review

1. Strategic Military Bases
2. Space Program
3. Arctic Regions and Antarctica

Most remote military and Antarctic bases have physicians onsite\(^1,2,4\), and telemedicine is mainstream for specialist consultation for decades, considered highly successful and cost-effective\(^4-5\). Space programs use telemedicine since 1957\(^3\).

Telehealth for Extremely Remote Locations

Medical Literature Review

4. Oil & gas Offshore Rigs:

- Reduction of unnecessary Medical Evacuations using video-based healthcare assessment and Digital ECG

<table>
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<tr>
<th>Boultinghouse, OW 2013&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Videoconference</th>
<th>-85%</th>
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<td>Webster, K 2008&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Digital ECG</td>
<td>-80%</td>
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Telehealth for Extremely Remote Locations
Medical Literature Review

4. Oil & gas Offshore Rigs (cont):

- Shorter response times and early initiation of treatment in critical conditions\(^1,2,3,4,5\)
- Increased patient satisfaction and perception of safety by offshore personnel\(^3,6\)
- The petroleum industry recognizes that there are still potentials for improvement \(^7\)

\[7\] K. Reegård, et al. (Eds.), 2014.
Case: Offshore Oil & Gas Platforms

As recently as 1947 no company had ever risked drilling beyond the sight of land.

Circa 1901 photo by G.H. Eldridge courtesy National Oceanic & Atmospheric Administration.
Worldwide Offshore Active Rigs

Source: Baker & Hughes Rig Count Nov 2018
What is life like on an oil rig?

- 50-200 people onboard, many located more than 100 miles offshore
- 2 weeks on / 2 weeks off, commute by helicopter
- 12-hour shifts, intensive training
- Shared bedrooms and bath, self-service style canteen with food prepared by a chef and dedicated staff
- Gym, billiard table, pool, movie theatre, computer room with wi-fi, Skype, telephone (cellphones not allowed)
Telemedicine on offshore rigs

• Telemedicine is practiced using radio communication since early offshore drilling attempts

• All offshore facilities need a trained medic onboard¹.

• Telemedicine-based healthcare assessment is common practice

• Today use of videoconferencing and digital medical devices is increasingly being adopted.

¹. HSE Healthcare and first aid on offshore installations and pipeline works. Regulation 5(1). 1989
Why Videoconferencing?

Source: Mehrabian, 1981
Telemedicine Setup

- Equipped Sickbay
- Trained Onboard Medic
- Broadband Network
- Telemedicine Equipment

Integrated Software Platform
Health Information Management
Revised Care Protocols
Usual Workflow

Acute Health Condition

Telemedicine station at sickbay (onboard trained medic)

Video consultation via telehealth with certified medical doctor

Prescription/orientation

Resolution / Observation
Evacuation

Evacuation

Digital Audio
HD Video
EKG
POCT Tests
Oroscopy
Otoscopy
Skin Camera
Stethoscope
Best Practices

• Health professionals training:
  • ACLS + pHTLS + ATLS
  • Offshore rescue training
  • Contents of medical chest
  • Use of telemedicine equipment and backup plans
Best Practices

• Guidelines and Protocols:
  • International guidelines
  • Adjusted to offshore environment, limitations and air evacuation
  • Attention to detailed reporting
  • Continuous communication to occupational medicine doctors
Best Practices

- Network and technology:
  - HIPAA compliance
  - Network Redundance
  - Backup plans
  - Interoperability
  - Network Proactive Monitoring
Case Report

MPS, 63 yo (2018-03-20)

- Two hours of chest pain
- Medicated under international protocols and monitorized continuously by telemedicine cardiologist.
- Evacuation delayed 4 hours due to climate conditions
- Cath-lab enabled destination hospital selected
- Underwent angioplasty onshore and had a favourable prognosis

ST-Segment Elevation Myocardial Infarction

Mortality Increases 7.5% every 30 minutes of treatment delay

Real World Data

2017

965 video visits

93.2% Discharged

6.8% Evacuations (71.4% Non-Urgent)

Hospital Israelita Albert Einstein – Unpublished Data
Real World Data

Main Diagnosis

- Common Cold: 28.2%
- Headache: 9.3%
- AGE: 6.5%
- Back Pain: 5.8%
- Sore Throat: 4.5%
- Hypertension: 3.4%
- Muscle Soreness: 3.3%
- Conjunctivitis: 3.2%
- Skin Infection: 3.0%
- Stomachache: 2.8%
- Other: 28.5%
Real World Data

Main Evac Diagnosis

- Conjunctivitis: 34.9%
- AGE: 11.1%
- Dental Pain: 9.5%
- Influenza: 7.9%
- Headache: 6.3%
- Anxiety Disorders: 6.3%
- Hypertensive...: 4.8%
- Musculoskeletal...: 4.8%
- Kidney Stones: 4.8%
- Abdominal Pain: 4.8%
- Other: 4.8%
Medical Devices - Mainstream

- **Stethoscopes**
  - Eko
- **Exam Cameras**
- **Otoscopes**
- **Vital Signs**
Medical Devices - Advanced

EKG

Ultrasound
Medical Devices - Example

Hospital Israelita Albert Einstein – Personal Archive
Medical Devices – Real World

Devices Utilization
(other than vitals)

- Throat Camera: 15.4%
- Skin Camera: 5.5%
- Stethoscope: 3.0%
- Otoscopy: 2.2%
- ECG: 2.0%
- Eye Exam: 1.9%
- Glucometer: 0.8%

Hospital Israelita Albert Einstein – Unpublished Data
Medical Devices – The limits

Final Integrated System for Remote Palpation - April 2017
Take Home Messages

- Adequate training of on/offshore health professional is key
- Need for special protocols for evacuation
- Detailed reporting
- Most common reasons for medical visits are common, common colds, headaches and AGEs
- Most common medical device used is the exam camera, and complex devices are rarely used, but may be of great importance
Many thanks for your attention!

Please complete the online session evaluation

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