



SAILING INJURIES AND PREVENTION

John Taussig- Paramedic, 50 Ton Master Mariner



- Discuss common hand injuries and their treatment
- Be familiar with basic splinting of extremity fractures and use of the Sam Splint
- Discuss recognition of shoulder dislocations and various reduction techniques
- Describe the evaluation and management of abdominal pain at sea
- Summarize the management of diarrhea and hypovolemia at sea

OBJECTIVES



SAILING INJURIES



1 YEAR AT SEA



1 YEAR AT SEA



1 YEAR AT SEA



CREW AILMENTS



MCL tear, UTI, cold sore, norovirus (?), epididymitis, hemorrhoid, back spasm, back rash, traveler's diarrhea, rotator cuff strain, outer ear infection, sunburn, elbow pain, jaw pain, unidentified rash, subluxed shoulder, seasickness, heat exhaustion

MECHANISM OF INJURY N = 1,226

Cause of Injury

- Trips/Falls 30%
- Hit by object★ 21%
- Lines /Halyards 22%
- Operating a winch 8%

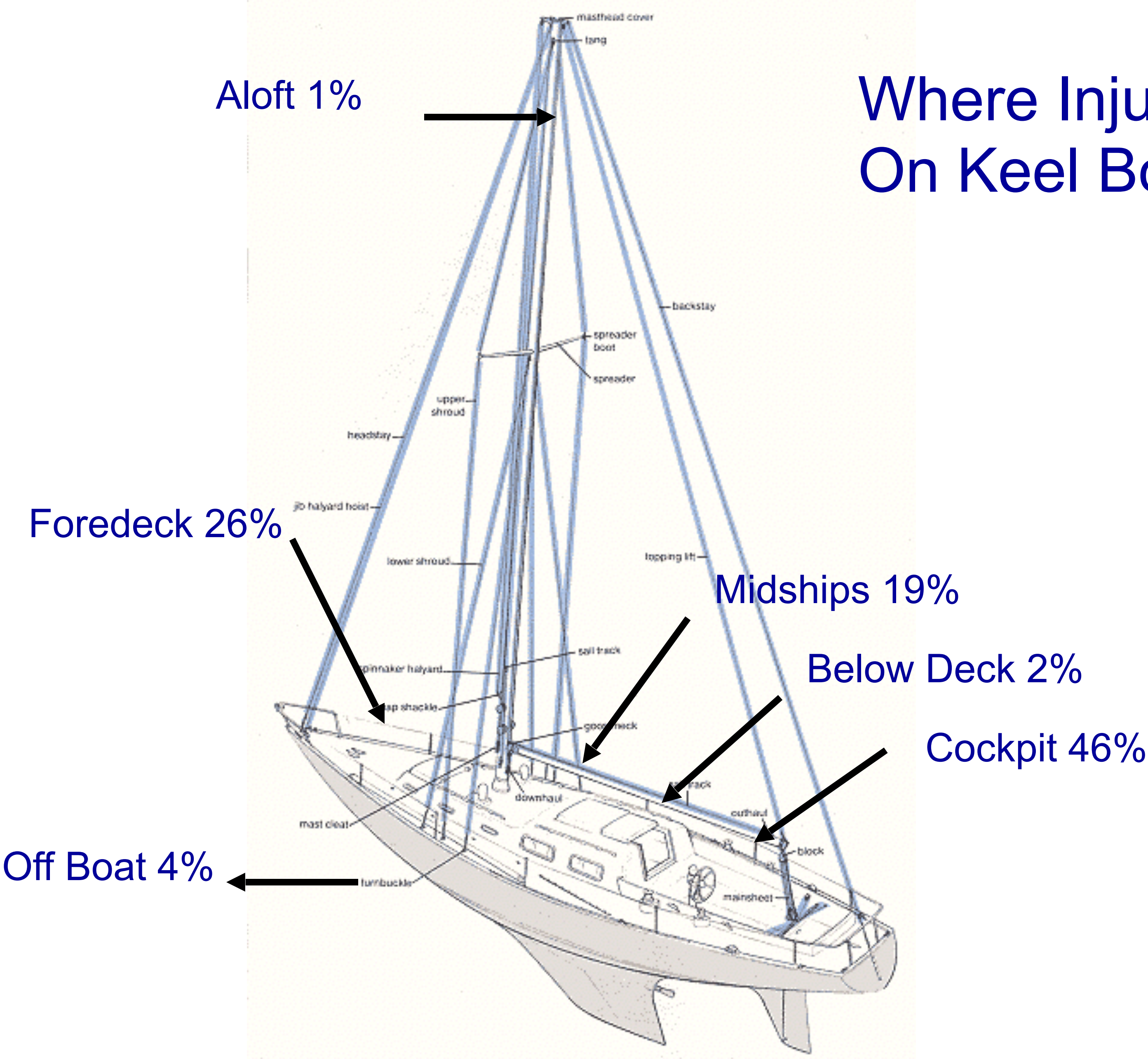
★ Boom, spinnaker pole, sail clew, collisions with fellow crew member

Contributing Factors/Activity

- Heavy Weather 23%
- Tacking* 17%
- Jibing* 13%
- Sail Change* 12%
- Repetitive Stress 7%
- Fatigue /Crew Error 5%
- Equipment Failure 4%



Where Injuries Occur On Keel Boat N = 1,080



PREVENTION

Cause of Injury

- Trips/Falls 30%
- Hit by object★ 21%
- Lines /Halyards 22%
- Operating a winch 8%

★ Boom, spinnaker pole,
sail clew, collisions
with fellow crew
member

- Appropriate Footwear
- Practice With Crew
- Gloves
- Sailing Lessons



Figure 8 Voyage

Figure 8 Voyage Route

- First attempt - Figure 8 Voyage
253 days. 26,453 miles.
- Second attempt - Figure 8 Voyage
384 days. 39,048 miles.
- Positions of disabling knockdowns during Figure 8 Voyage first attempt.

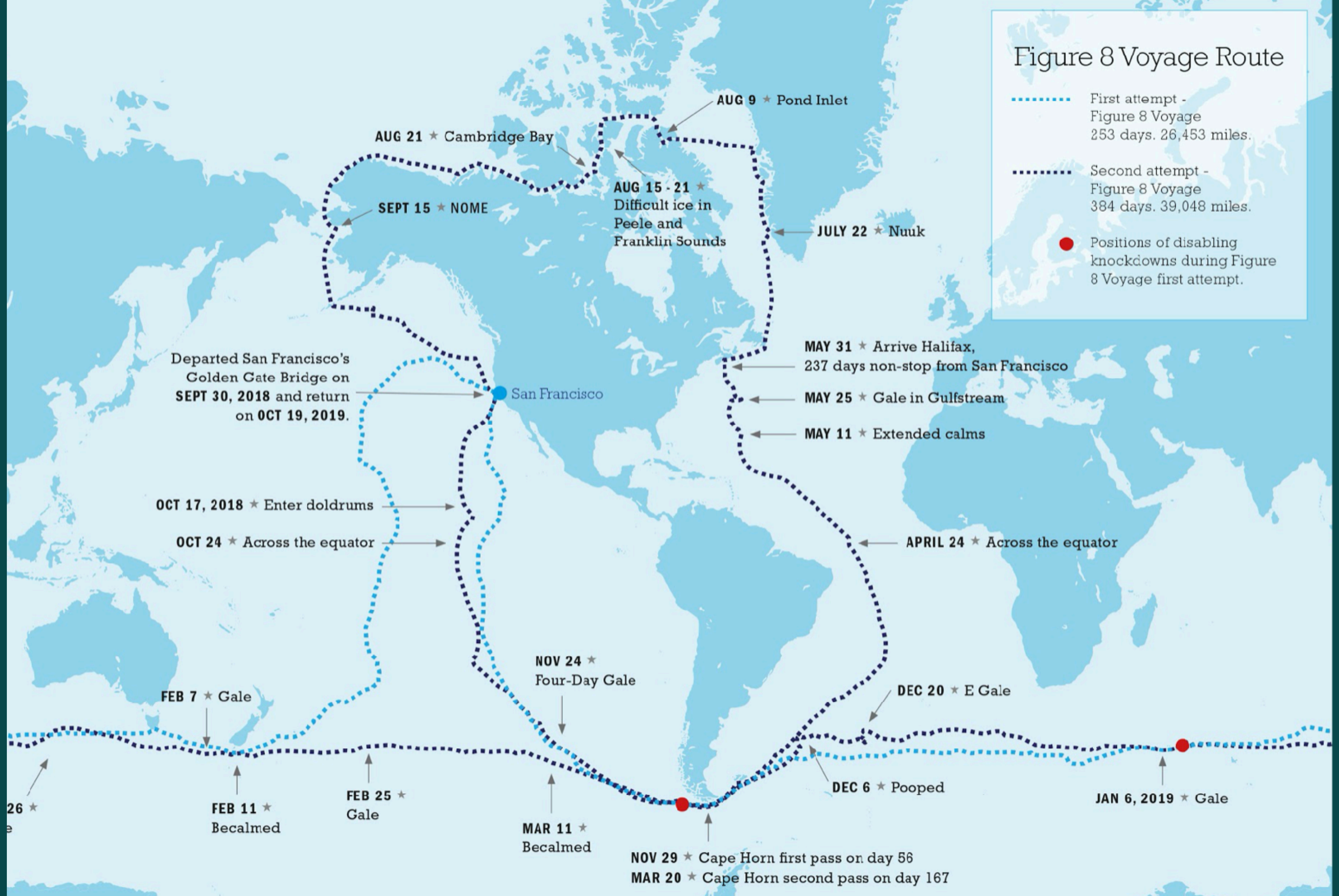




Figure 8 Voyage

300 km
100 mi

kt
0
4
8
12
16
20
24
28
32
36
44
48





MOLI

HARKEN

Diana

COMMON HAND INJURIES

- Soft Tissue Trauma
- Burns
- Fractures
- Dislocations



BURNS AND BLISTERS

- Prevent- gloves, chafe protection, friction reduction
- Leave intact if small and protect
- Drain and protect if:
 - Large >5mm
 - Over a joint

*****Location dependent**



MUSCULOSKELETAL INJURIES

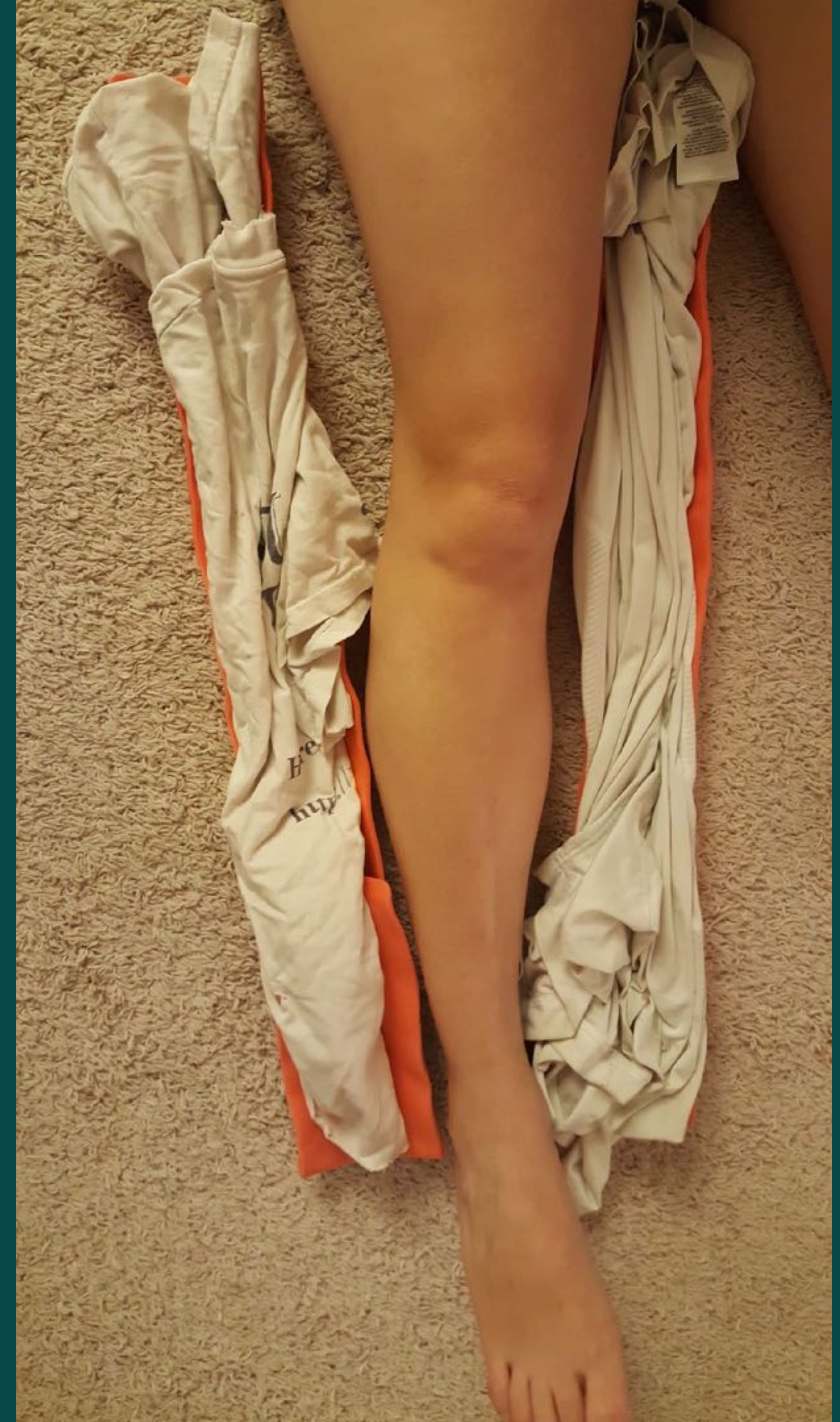


SPRAINS, STRAINS, & SOFT TISSUE INJURY

“Stable injuries”: No immediate loss of function; progress over first 24 hrs.

TREATMENT: PRICE for 3-4 days

- Protect- splint as needed
- Rest- reduce inflammation and pain
- Ice - 15-20 minutes every 4 hours x 24-48hrs, or 10 min intervals day 1
- Compression-elastic bandage
- Elevation above the heart



SPLINT COMPONENTS



SPLINTING PRINCIPLES

1. Manual stabilization
2. Assess distal CMS'S
3. Injury to bone - Stabilize past Joints Proximal and Distal to the injury
4. Injury to joint - Stabilize Bones Proximal and Distal to affected joint
5. Pad well, Fill voids
6. Use rigid or semi-rigid backbone for splint
7. Wrap splint, taking care over site of injury
8. Reassessment of distal CSM'S (before, after, and often)



Restore Anatomical Position If:

- Neurovascular compromise
- Grossly angulated
- Unable to stabilize
- Unable to evacuate

Goal:

Realign fracture

Restore blood flow

Reduce pain



OPEN FRACTURES

- **Cleanse bone ends**
- **Cover with sterile dressing if short transport time**
- **Consider reduction for extended transport**
- **Splint**
- **Antibiotic Therapy**



SHOULDER DISLOCATIONS

Common Reduction
Techniques:

- Cunningham
- Snowbird
- Solo Methods



- Discuss common hand injuries and their treatment
- Be familiar with basic splinting of extremity fractures and use of the Sam Splint
- Discuss recognition of shoulder dislocations and various reduction techniques
- Describe the evaluation and management of abdominal pain at sea
- Summarize the management of diarrhea and hypovolemia at sea

OBJECTIVES



PATTERNS OF ILLNESS AND INJURY

AN ANALYSIS OF THE BRITISH TELECOM ROUND THE WORLD YACHT RACE

1996–1997



PATTERNS OF ILLNESS AND INJURY

365 amateur sailors on 14 identical vessels - 67' Challenger

- 283 male
- 82 female
- Ages 21-60
- 14 crew aboard each boat (1 professional Captain, 13 amateurs)
- Six Legs of Race, Westerly "wrong way" route
- Six months of sea time

PATTERNS OF ILLNESS AND INJURY

- 685 cases of illness/injuries reported
- 300 injuries (44%)
- 385 illnesses (56%)
- 3 illness evacuations at sea by Royal Navy to Falklands(2), St. Helena(1)
- No deaths

ILLNESS AS PROPORTION OF TOTAL

THE “TOP 4” = 80%



#1: Gastrointestinal/abdominal pain/urinary (23%)

*Required 3 surgical emergency evacuations from the boats for a case of bloody urine, a case of acute GI bleeding, and a case of suspected appendicitis.

Treatment: 75% of all GI problems were gastroenteritis or gastritis – managed onboard with appropriate fluids/ranitidine/antacids. 10% of GI issues were constipation.

SOAP NOTE



| | | | |
|---------------------|-----|------------------|------|
| LOCATION: | | GPS COORDINATES: | |
| PATIENT INFORMATION | | | |
| NAME | | | |
| SEX | AGE | DATE | TIME |
| EMERGENCY CONTACT | | | |

SUBJECTIVE (WHAT HAPPENED, CHIEF COMPLAINT)

OBJECTIVE (ASSESSMENT FINDINGS)

FOCUSED SPINE ASSESSMENT

| |
|--|
| 1) Person: Is the Patient Reliable, Alert and Oriented, without significant distracting injuries? |
| 2) Body: Can the patient move and feel all extremities. Are they absent from numbness, tingling, radiating pain, or uncommon sensations? |
| 3) Spine: Is the Spine free from pain? Does the patient voluntarily move? |

| | |
|----------------------|-----------------------------------|
| PHYSICAL EXAM | CIRCLE AREAS OF INJURY |
| HEAT: | |
| NECK | |
| BACK | |
| CHEST | |
| ABDOMEN | |
| PELVIS | |
| LEGS | |
| ARMS | |

MEDICAL HISTORY- SAMPLE

| | |
|------------------------|--|
| SIGNS/ SYMPTOMS | |
| ALLERGIES | |
| MEDICATIONS | |
| PAST PERTINENT HISTORY | |
| LAST INS/OUTS | |
| EVENTS PRIOR | |

PAIN ASSESSMENT- OPQRST

| | |
|--|--|
| ONSET- FAST OR SLOW? | |
| PROVOKES- WHAT MAKES IT BETTER OR WORSE | |
| QUALITY- SHARP/ DULL/ STABBING/ RADIATING? | |
| RADIATION- DOES THE PAIN RADIATE? | |
| SEVERITY- ON A SCALE OF 1-10, HOW BAD IS THE PAIN? | |
| TIME- WHEN DID IT START? | |

ABDOMINAL PAIN ASSESSMENT

EVACUATION CRITERIA

- »Worsening Or Severe Pain
- »Blood In Stool, Vomit, Or Urine
- »Associated Fever
- »Unable To Maintain Hydration/ Nourishment
- »Pain With Pregnancy, Or Suspected Pregnancy



Suggest for abdominal emergencies

**Levaquin 500 mg QD PO and
Flagyl 500mg PO TID X 10 days**

- **Should improve over 24 hours**
- **Time for rupture generally 48-72 hours into illness**

**Note: In JAMA study, IV ertapenem given 3 days,
followed by 7 days of oral regimen**

ANTIBIOTIC NON-SURGICAL TREATMENT OF ACUTE APPENDICITIS (ANST)

The NOTA Study (Non Operative Treatment for Acute Appendicitis): prospective study on the efficacy and safety of antibiotics (amoxicillin and clavulanic acid) for treating patients with right lower quadrant abdominal pain and long-term follow-up of conservatively treated suspected appendicitis. *Ann Surg.* 260(1):109-17, 2014

“Those patients not needing immediate surgery (see inclusion criteria later) were ***treated with a (PO) 5- to 7-day course of amoxicillin and clavulanate at dosage of 1 g orally thrice daily.*** In a small observational study, antibiotics were safe and efficacious but had a short-term failure rate of 12%.”

ANTIBIOTIC NON-SURGICAL TREATMENT OF ACUTE APPENDICITIS (ANST)

Long-term outcomes of patients with nonsurgically managed uncomplicated appendicitis J Am Coll Surg 2014 May; 218:905.

“Of the 3,236 nonsurgically managed **5.9%** *experienced treatment failure*”

CONCLUSIONS: This study suggests that nonoperative management of uncomplicated appendicitis *can be safe and prompts additional investigations*. Comparative effectiveness research using prospective randomized studies can be particularly useful.

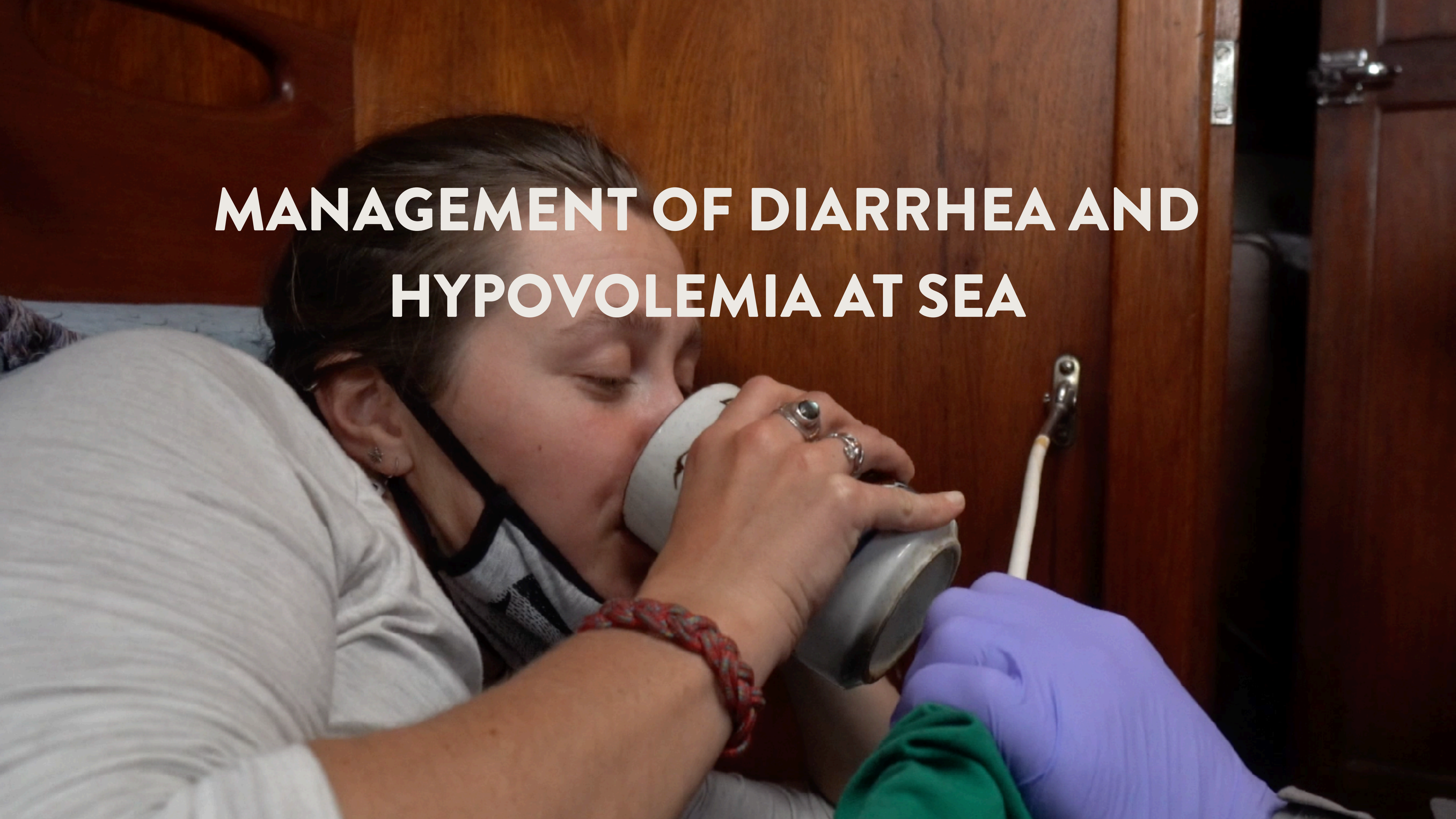
Five-Year Follow-up of Antibiotic Therapy for Uncomplicated Acute Appendicitis in the APPAC Randomized Clinical Trial*

Findings: In this 5-year observational follow-up of 257 patients initially treated with antibiotics for uncomplicated acute appendicitis, **the cumulative incidence** of recurrent appendicitis at 1, 2, 3, 4, and 5 years was 27% at 1 year, 34.0% at 2, 35% at 3, 37% at 4, and 39% at 5 years.

Of the 100 (40% of 257) who eventually had surgery most (70%) had it in the first year

* JAMA, 2018;320(12):1259-1265.

MANAGEMENT OF DIARRRHEA AND HYPOVOLEMIA AT SEA



DIARRHEA

- »Be Mindful Of Infection Control
- »Replace Electrolytes And Fluids With Oral Rehydration Solutions
- »Monitor Urine Output And Volume
- »Antimotility Drugs For Non Infectious Processes
- »Antibiotics With Fever, Pus Or Blood In The Stool

Table 1 Formulas to prepare oral rehydration solution

| World Health Organization | Simple |
|------------------------------------|-------------------|
| 3/8 teaspoon salt | 6 teaspoons sugar |
| 1/4 teaspoon salt substitute (KCl) | 1/2 teaspoon salt |
| 1/2 teaspoon baking soda | 1 L clean water |
| 6 teaspoons sugar | |
| 1 L clean water | |

KCl, potassium chloride.

PREVENTION

- Personal Hygiene
- Boat Disinfection Schedule
- Water Disinfection and System Maintenance
- Travel Precautions

RECAP:

- **Discuss common hand injuries and their treatment**
- **Be familiar with basic splinting of extremity fractures and use of the Sam Splint**
- **Discuss recognition of shoulder dislocations and various reduction techniques**
- **Describe the evaluation and management of abdominal pain at sea**
- **Summarize the management of diarrhea and hypovolemia at sea**



QUESTIONS?

John Taussig

Email: jtaussig@backcountrymedicalguides.org

Phone: 206-412-1613

