

# 20KTS+

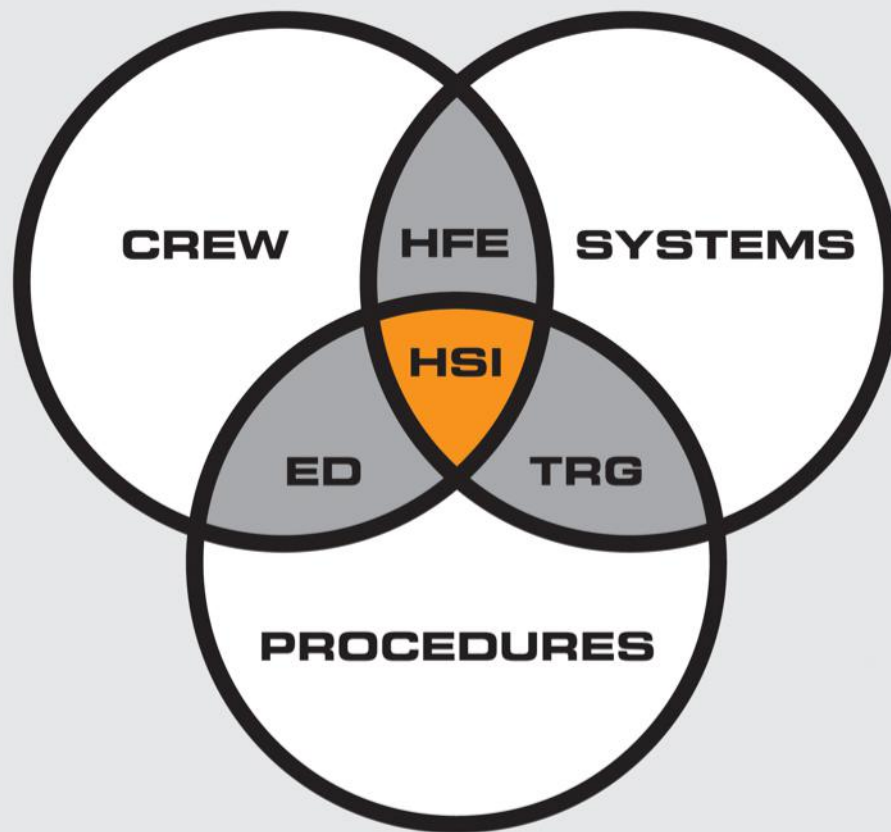


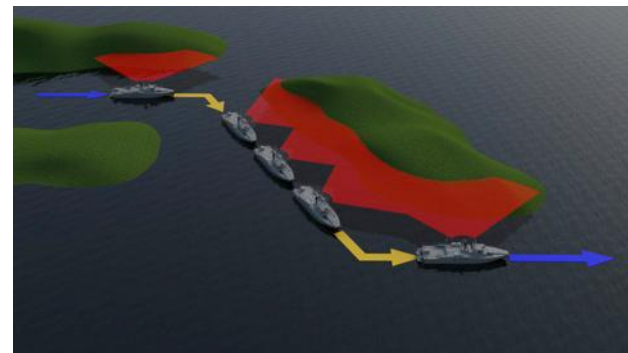
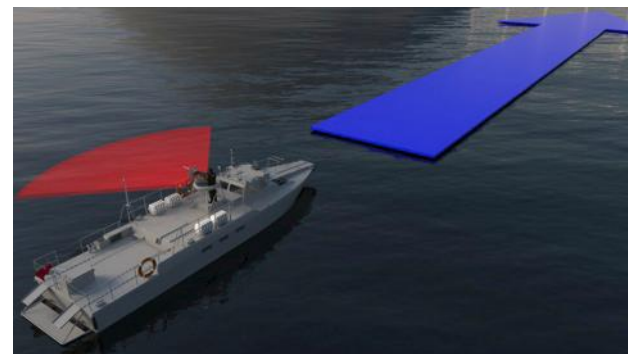
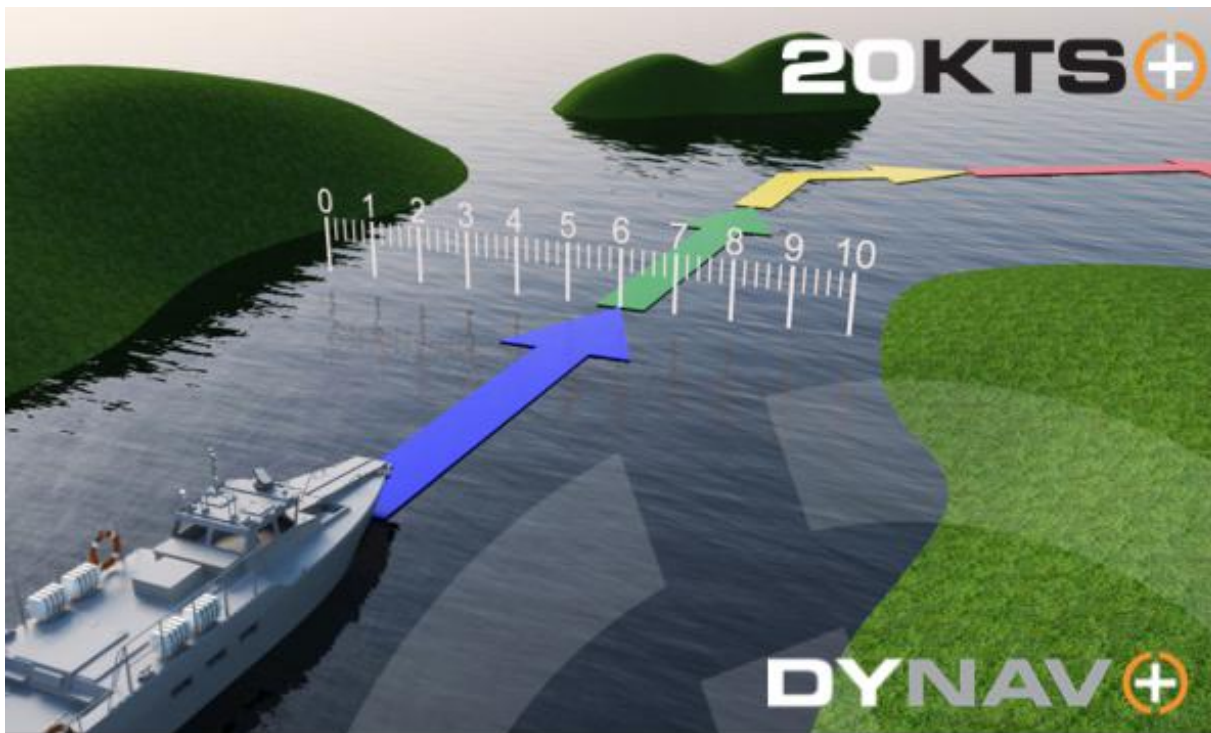
## MARINE EXOSKELETON

## MARINEMOJO

## Dr Trevor Dobbins

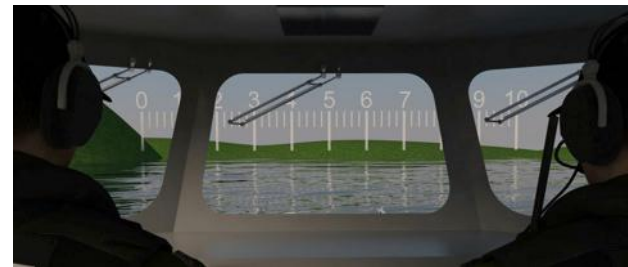
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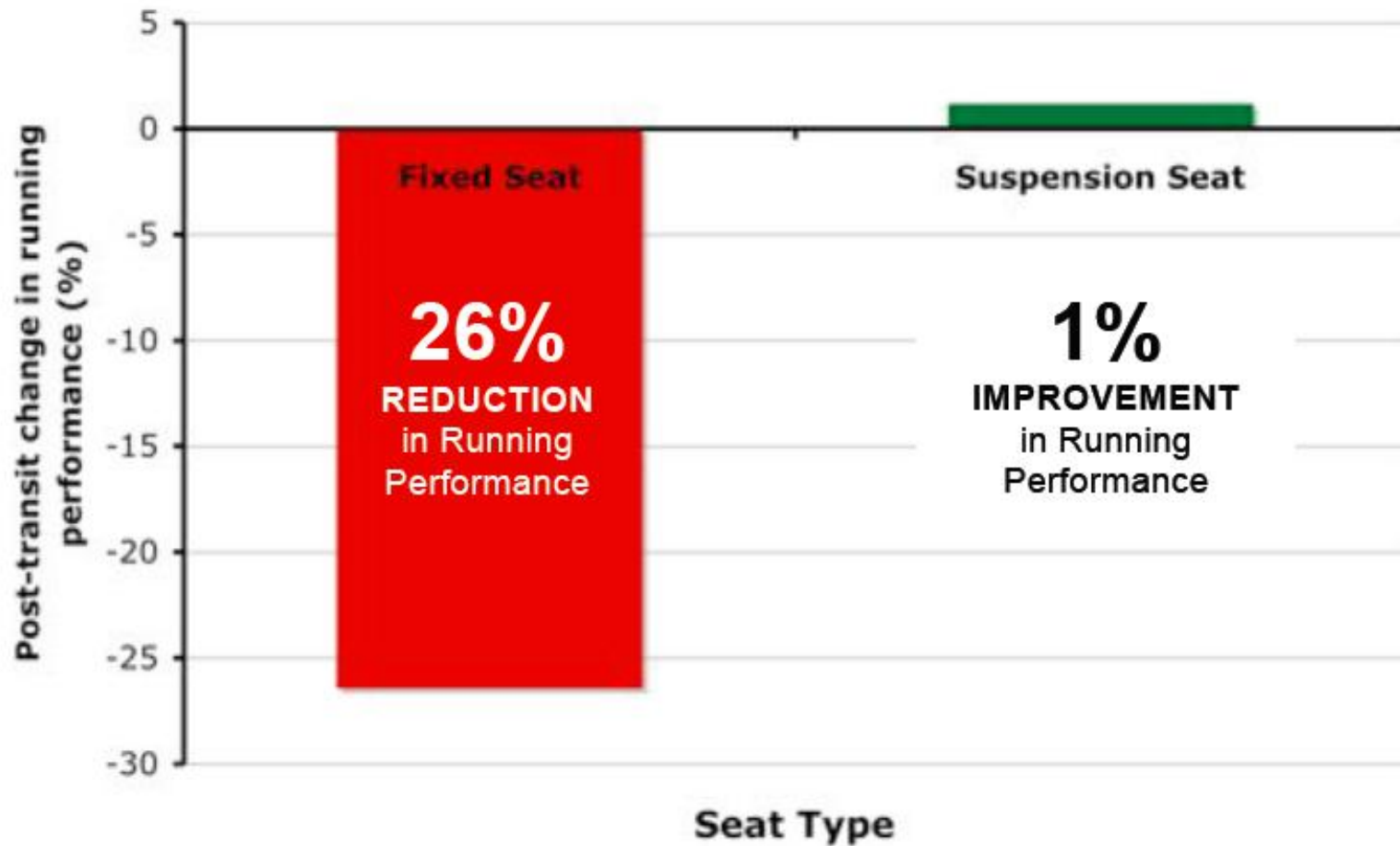


# DYNAMIC NAVIGATION

# Training Manual Version 1

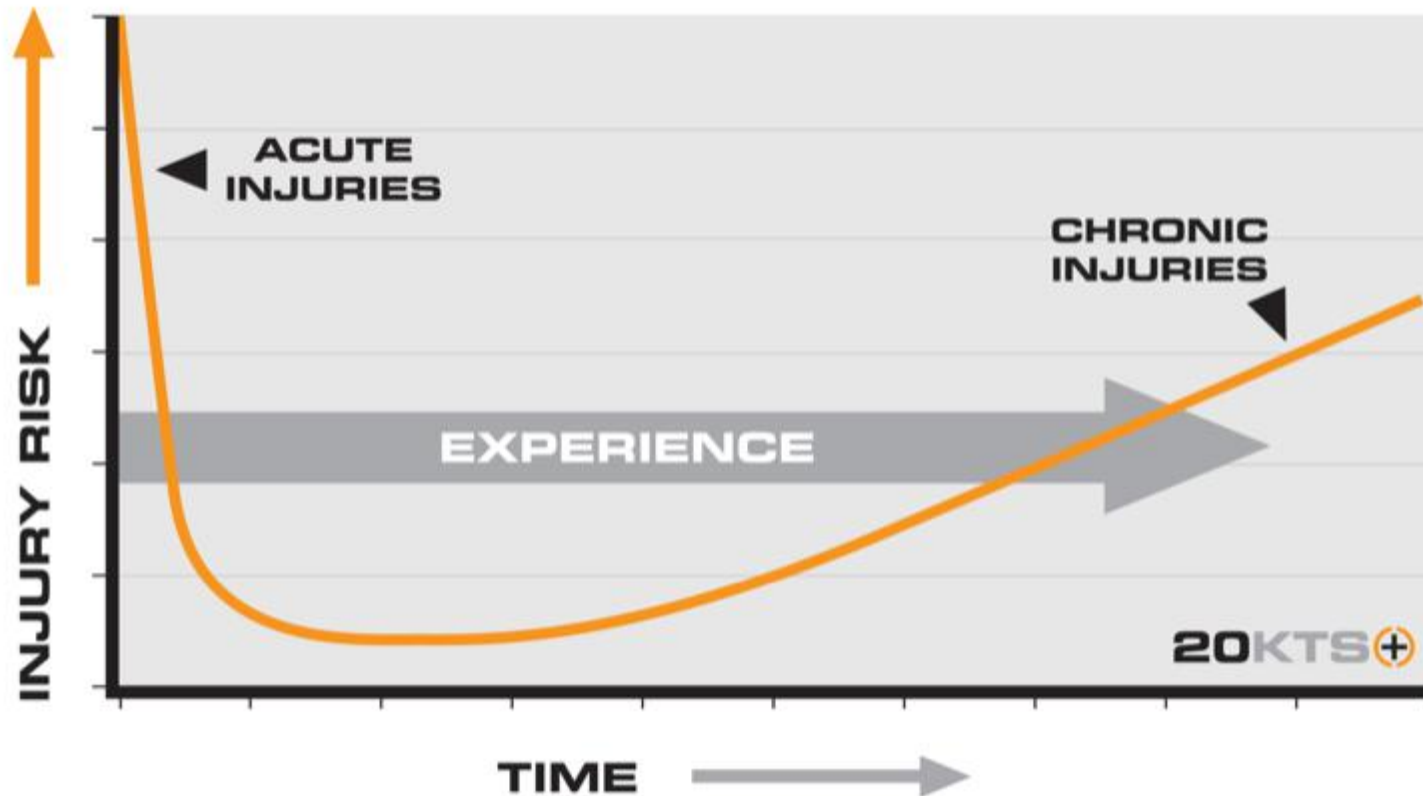


# FATIGUE



# INJURY

## RACI: RISK OF ACUTE & CHRONIC INJURY





## 2013: US Navy, Special Warfare Crewman

### Musculoskeletal Injuries: 31% per year

- Most common = **Spine: 38 %**
- Specific locations:
  - Lower spine = 20%
  - Knee = 18 %
  - Shoulder = 18%
- **69% identified as preventable**



## WBV & RS LEGISLATION




  
Maritime and Coastguard Agency

MARINE GUIDANCE NOTE  
**MGN 353 (M+F)**

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**The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007**

Notice to all Ship and Fishing Vessel Owners, Operators and Managers and other employers of seafarers; Masters, Officers and Ratings of Merchant Ships; and Skippers and Crew of Fishing Vessels, Small Commercially Operated Vessels and Yachts with Paid Crew.

  
Maritime and Coastguard Agency

MARINE GUIDANCE NOTE  
**MGN 436 (M+F)**

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**WHOLE-BODY VIBRATION: Guidance on Mitigating Against the Effects of Shocks and Impacts on Small Vessels.**

Notice to all builders, owners, managers and operators of all small vessels.

## RISK MITIGATION HIERARCHY

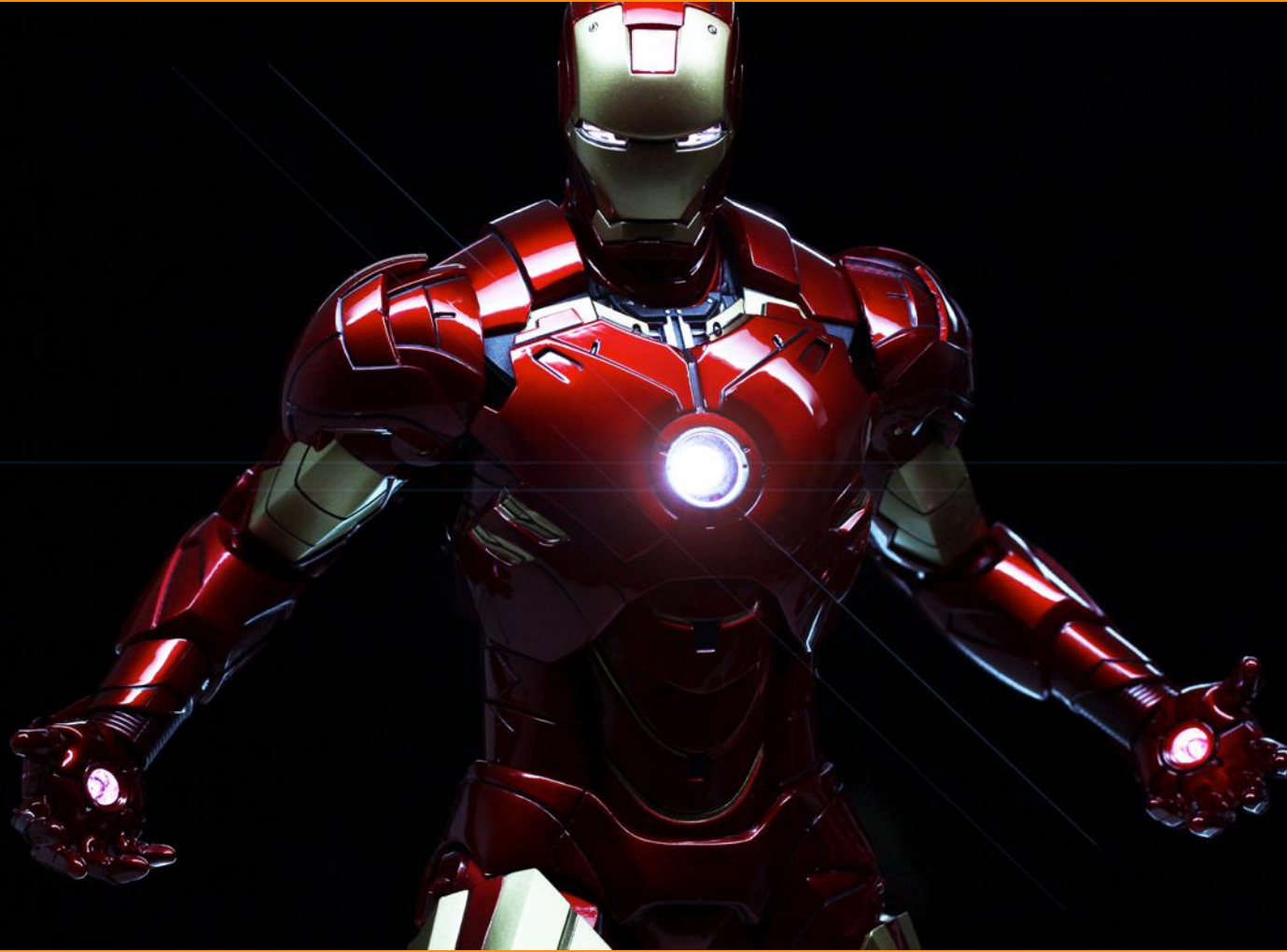


# PPE

**PERSONAL  
PROTECTIVE  
EQUIPMENT**

# PPPE

# *EXO-SKELETON*



# MARINEMOJO





# INNOVATION: TECH-TRANSFER



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REDUCES PAIN & FATIGUE

OLYMPIC MOGUL SKIER  
LAURA DONALDSON



**W  
O  
O**

**HEAD PROTECTION** 

**LIFE JACKET** 

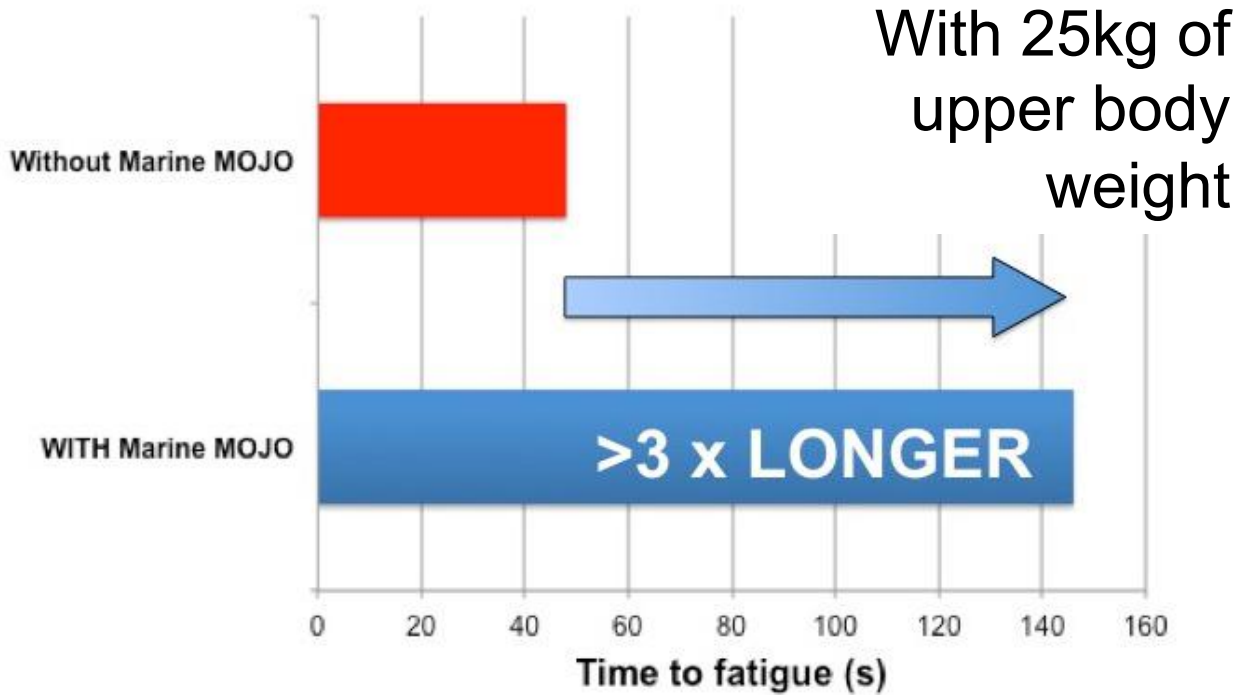
**IMMERSION SUIT** 

**EXO-SKELETON** 

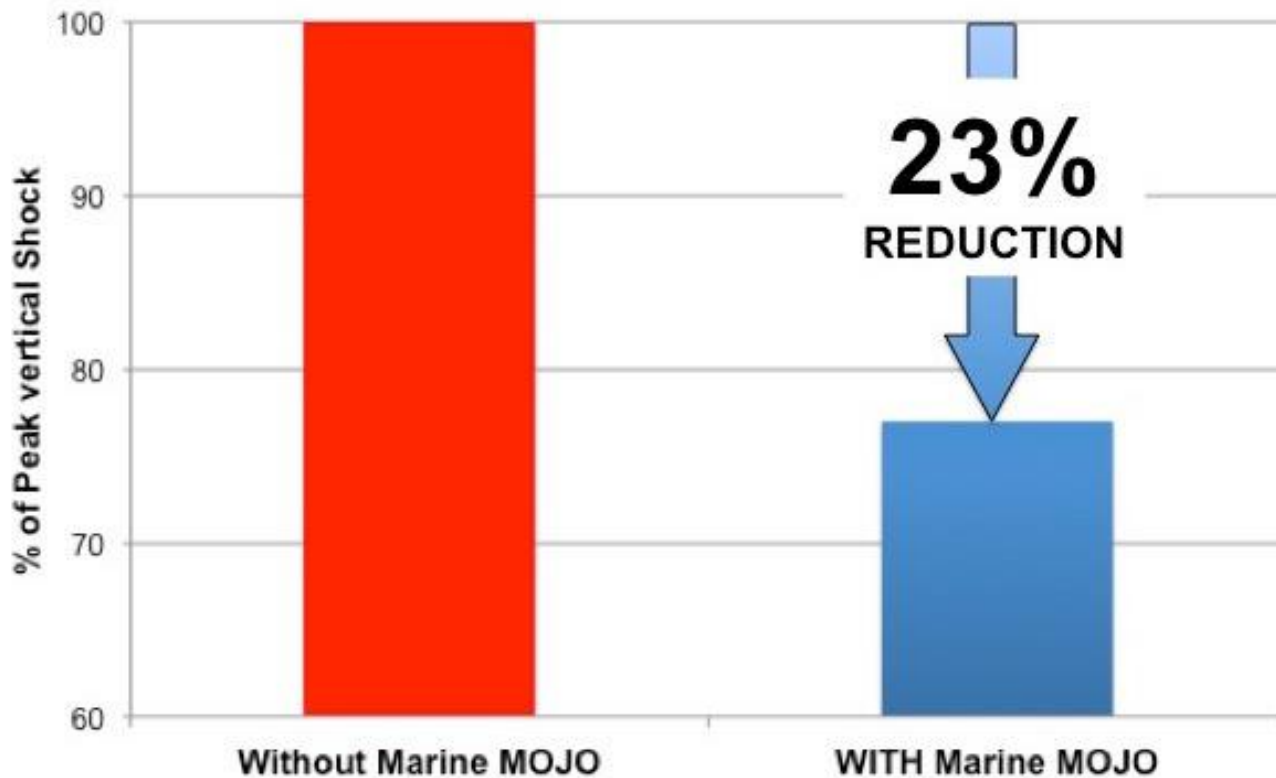


# LABORATORY TESTING

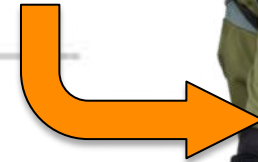
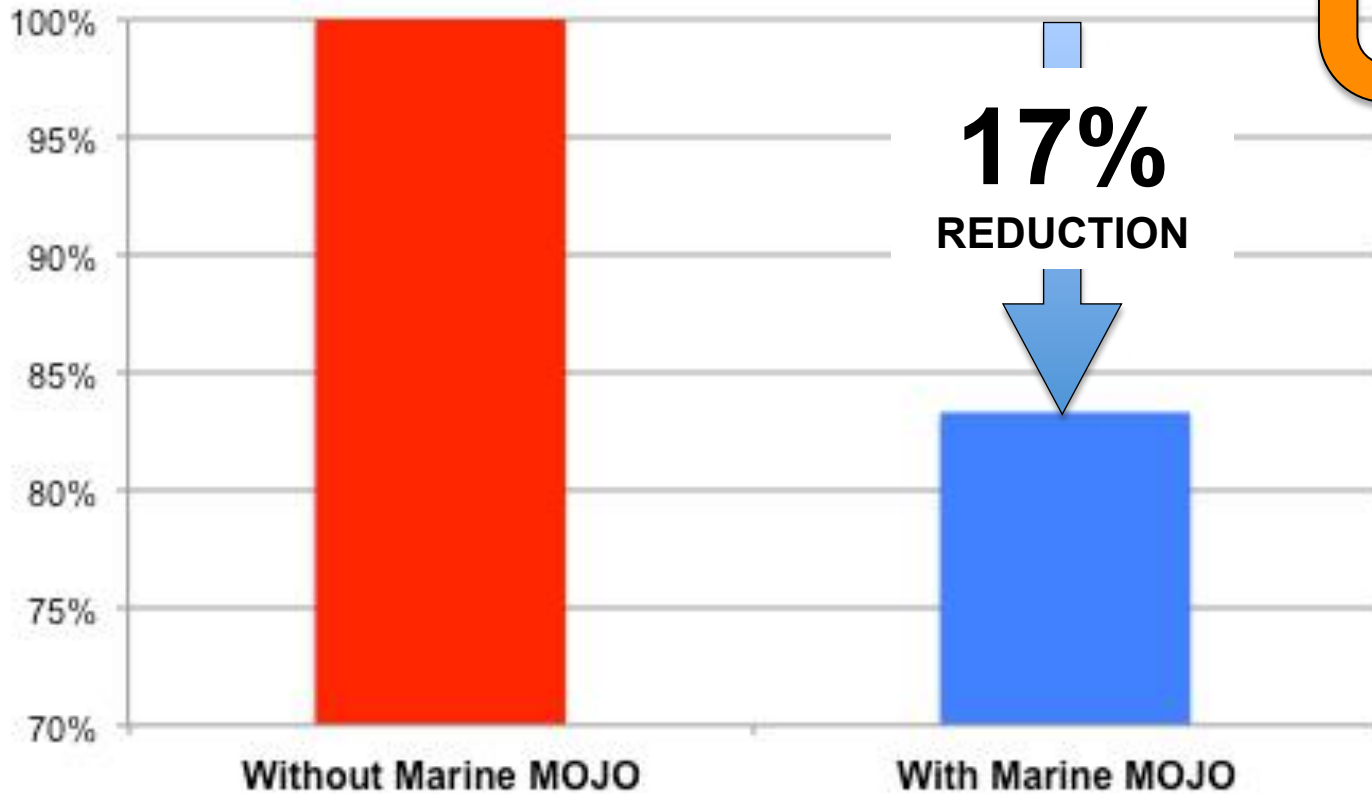
# FATIGUE



## SHOCK & IMPACT



## MUSCLE RECRUITMENT





**TESTING: BALTIC SAREX 2015**

- MULTIPLE MARITIME USES**
- NO POWER REQUIRED**
- LIGHTWEIGHT (1KG)**
- COST EFFECTIVE**
- EASY TO USE**



- **EASY TO WALK WITH**
- **SIZE ADJUSTABLE**
- **ADAPTABLE TO FOOTWEAR**
- **FITS OVER CLOTHING**
- **PROTECTS AROUND THE BOAT**

## REDUCES:

- FATIGUE
- RISK

## SUPPORTS:

- LEGAL COMPLIANCE
- ALARP: **A**s **L**ow **A**s **R**easonably **P**racticable
- DUTY-OF-CARE

# MARINEMOJO

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