

Assessing the Human Health Effects of the Gulf of Mexico Oil Spill

Session: Acute Health Effects Heat Stress and Fatigue

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Assumed Worker Population

Stated Assumption:
Healthy and Acclimated

Unstated Assumptions

- ✓ Generally stable and experienced workforce who understands heat stress
- ✓ Exposure controls evolve through labor and management interactions

Known Acute Health Effects

Exertional Heat Stroke

Heat Exhaustion

Others

- ✓ Syncope
- ✓ Cramps

Less Appreciated Effects

Behaviors

- ✓ Frequency of unsafe behaviors increases
- ✓ Risk taking higher in the unacclimated

Acute Injury

- ✓ Seasonal Relationships Well-Established
- ✓ Low Heat Stress: OR = 1.4 (p = 0.1)
- ✓ High Heat Stress: OR = 1.7

Acute MSDs

- ✓ Low Heat Stress: OR = 1.8
- ✓ High Heat Stress: OR = 2.4

Day-to-Day (Fatigue)

Prior heat exposures over several days predispose military recruits to exertional heat injury.

Work physiology model for metabolically demanding work may apply (equivalent aerobic demands versus capacity).

Some insight to sustained stress from the general population during heat waves.

Occupational Exposure Guidelines to Heat Stress

Goal: Substantially limit the risks for an occupational heat stroke in healthy, acclimatized workers.

Usually manages risks for heat exhaustion.

It does not represent thermal comfort.

What We Have

Nominal 12-h shifts with extended duty (7x12s is common).

Massive recruiting, perhaps with less screening of the worker population including self-selection.

Highly adaptive management/supervision

Knowledge Gaps and Data

Effects of Extended Work

- ✓ Extended Hours
- ✓ Extended Work Weeks (h/wk)

Outcomes

- ✓ Heat-Related Disorders
- ✓ Acute Injury

Data

- ✓ Diagnostic Protocol for Heat Disorders
- ✓ Sufficient Linking Data for Individuals
- ✓ Additional Exposure Characterization
 - Actual Hours Worked and Hours Paid
 - Physiological Monitoring (Spot and Daily)

Risk Communication

Problems

- ✓ Face Validity of OEGs
- ✓ Other Heat Stroke Risk Factors
 - New/probationary workers
 - Language and communications
 - Timely recognition and aggressive first aid

Top-Down Communications – Done Well

- ✓ Incident Command Focus Point
- ✓ Three-way field checks

Bottom-Up Communications – Opportunity?

