FY18 Epi-Tech Surveillance Training

Sunday, October 01, 2017 - Sunday, September 30, 2018
DCS, APG, MD

Provided By
U.S. Army Medical Command

Activity ID  | Course Director   | CME Planner
------------|-------------------|-------------
2017-1636   | John Ambrose      | Mimi C. Eng

Accreditation Statement
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of U.S. Army Medical Command and ARMY PUBLIC HEALTH CENTER. The U.S. Army Medical Command is accredited by the ACCME to provide continuing medical education for physicians.

Credit Designation
The U.S. Army Medical Command designates this Live Activity for a maximum of 5 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.
Statement of Need/Gap Analysis
The purpose of this CME activity is to address the identified gap(s):

1. Surveillance techniques - Surveillance of common communicable diseases continues to be a problem among local MTFs. In fact, cases of campylobacter were not investigated in 2015 for PACOM MTFS, while 2016 cases of salmonella were not investigated. Civilian public health agencies are required to conduct investigations into all reportable medical events. However, DoD facilities often do not take initiative to conduct this investigation.

2. Disease identification - verification of disease by established case definitions have been utilized by the local health departments, Centers for Disease Control and Prevention, World Health Organization, and the Department of Defense. With the every changing list of reportable medical events and new emerging infections, case definitions change rapidly. Army epidemiologist conduct verification studies that monitor the efficiency of reporting by local public health experts and have concluded that completeness percentages for reportable medical events range as low as 35% for select diseases.

3. Outbreak reporting - Recent evidence have demonstrated that outbreak reporting and communication between public health agencies is poor. In fact, the Army failed to report six outbreaks in the DRSi between June 2016 and September 2016.

Learning Objectives
1. Based on case presentation, enhance your ability to improve case finding and surveillance practices within your local MTF.

Target Audience / Scope of Practice

Target Audience: The intended audience for this educational activity includes preventive medicine physicians, community health nurses, public health nurses, and epidemiology technicians.

Scope of Practice: This activity will improve the performance of preventive medicine personnel who conduct surveillance activities in inpatient and outpatient settings.
Disclosure of Faculty/Committee Member Relationships
It is the policy of the U.S. Army Medical Command that all CME planning committee/faculty/authors disclose
relationships with commercial entities upon invitation of participation. Disclosure documents are reviewed for
potential conflicts of interest and, if identified, they are resolved prior to confirmation of participation.

Faculty Members
Brown, Alfonza - No information to disclose.
Gibson, Kelly - No information to disclose.
Holbrook, Victoria - No information to disclose.
Kebisek, Julianna - No information to disclose.
Reynolds, Mark - No information to disclose.
Reynolds, Mark - No information to disclose.
Riegodedios, Asha - No information to disclose.
Walters, Cedric - No information to disclose.

Committee Members
Ambrose, John - No information to disclose.
Eng, Mimi - No information to disclose.
Gibson, Kelly - No information to disclose.
Riegodedios, Asha - No information to disclose.

Acknowledgement of Commercial Support
There is no commercial support associated with this educational activity.
• To Register for the Monthly Disease Surveillance Trainings:
  1. Contact your Service Surveillance HUB to receive monthly updates and reminders
  2. Log-on or Request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
  3. Register at: https://tiny.army.mil/r/MEHsS/EpiTechFY18

• Confirm attendance:
  – Please enter your full name/email into the DCS chat box to the right or email your Service hub
  – You will receive a confirmation email within 48 hours with your attendance record; if you do not receive this email, please contact your Service hub
Heat Illness Reporting

COL Mark Reynolds
Clinical Public Health and Epidemiology
Learning Objectives

At the end of the presentation, the learner will be able to:

**Describe** the clinical spectrum of Heat Illness commonly encountered in a clinical setting to improve diagnosis and reporting of heat illness.

**Identify** key details necessary for accurate reporting of Heat Illness described in the 2017 Armed Forces Reportable Medical Events Guidelines and Case Definitions.

**Adhere** to DoD heat illness reporting guidelines outlined in AR-40-11 as cases are encountered in the clinic.
Heat Illness Background

• A spectrum of disorders that occur when the body is unable to dissipate heat absorbed from the environment and/or heat generated by internal metabolic processes
• Direct operational and readiness impacts across the Army
• Complicated nature of Heat Illness (HI) reflected in clinical and surveillance definitions

Heat Illness Army 2013-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Heat Exhaustion</th>
<th>Heat Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>2.00</td>
<td>0.39</td>
</tr>
<tr>
<td>2014</td>
<td>1.76</td>
<td>0.40</td>
</tr>
<tr>
<td>2015</td>
<td>2.04</td>
<td>0.54</td>
</tr>
<tr>
<td>2016</td>
<td>2.17</td>
<td>0.56</td>
</tr>
<tr>
<td>2017</td>
<td>2.19</td>
<td>0.60</td>
</tr>
</tbody>
</table>
## Estimated Days of Lost or Limited Duty, CY17

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>1 week profile (7 days Limited or Lost Duty)</th>
<th>2 week profile (14 days Limited or Lost Duty)</th>
<th>3 week profile (21 days Limited or Lost Duty)</th>
<th>10 week profile (70 days Limited or Lost Duty)</th>
<th>18 week profile (126 days Limited or Lost Duty)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Exhaustion (n=771)</td>
<td>5,397</td>
<td>10,794</td>
<td>16,191</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Heat Stroke (n=183)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>12,810</td>
<td>23,058</td>
</tr>
</tbody>
</table>

*Heat injury was not an option in DRSi after 15 July 2017

Data Source: DRSi, AR 40-501
Fatalities Associated with HI

- Combat Readiness Center tracks fatalities under Class A Accidents
  - Property damage of $2,000,000.00 or more
  - Army aircraft missing or destroyed
  - Injury or Occupational Illness resulting in fatality or permanent total disability
- Fourteen fatalities determined to be a result of Heat-Related Illness FY10-FY16
  - Case review pending to identify common characteristics and risk factors

Fatalities

<table>
<thead>
<tr>
<th>Year</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1</td>
</tr>
<tr>
<td>2011</td>
<td>4</td>
</tr>
<tr>
<td>2012</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>1</td>
</tr>
<tr>
<td>2015</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>3</td>
</tr>
</tbody>
</table>

Data Source: Combat Readiness Center

Average: 2.3/year  Range 1-4
**Heat Exhaustion (HE):** Syndrome of hyperthermia (core temperature at time of event usually ≤40C or 104F) with physical collapse or debilitation occurring during or immediately following exertion in the heat, with no more than minor central nervous system (CNS) dysfunction (such as headache, dizziness)

**Heat Injury (HI):** HE plus clinical evidence of organ (for example, liver, renal, stomach) and/or muscle (for example, rhabdomyolysis) damage without sufficient neurological symptoms to be diagnosed as heat stroke

**Heat Stroke (HS):** Syndrome of hyperthermia (core temperature at time of event usually ≥ 40C or 104F), physical collapse or debilitation, and encephalopathy as evidenced by delirium, stupor, or coma, occurring during or immediately following exertion or significant heat exposure. The HS can be complicated by organ and/or tissue damage, systemic inflammatory activation, and disseminated intravascular coagulation.
Heat Balance Equation

\[ S = M \pm W \pm (R+C) - E \]

Rate of Body Heat Exchange \( S \) = rate of metabolic energy/heat production \( M \) + mechanical work \( W \) + (rate of radiant and convective energy exchange) \( R+C \) – rate of evaporative loss \( E \)

- Combination of Extrinsic and Intrinsic risk factors
- Combination of Modifiable and non-modifiable
- Effect of determinants will vary by location, activity, and individual
- Known risk factors
  - Environmental Factors (external heat stress)
  - Training burden and type
  - Gender
  - Physical Fitness
  - Uniform
  - Body Composition
  - Acclimatization
HI Pathophysiology

Heat Exhaustion Clinical Description:

- Heat exhaustion (HE) is defined as the inability to continue physical activity due to competing demand for cardiac output between thermoregulation and metabolic requirements. Clinically, HE may present as weakness, fatigue, ataxia, dizziness, headache, nausea, vomiting, malaise in individuals with a core body temperature less than 104°F or 40°C. HE may be accompanied by evidence of end organ damage (Hypo/hyperkalemia, Elevated AST or ALT, Elevated CK, Rhabdomyolysis/myoglobinuria). HE resolves rapidly with minimal cooling intervention.
Heat Exhaustion Case Classification (Confirmed):

- A case that meets the clinical description of HE as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
  - Core body temperature > 100.5°F or 38°C and <104°F or 40°C (or evidence of elevated core body temperature if cooling was initiated in the field) and
  - Short-term physical collapse or debilitation occurring during or shortly after physical exertion that rapidly resolves with minimal cooling intervention and
  - No evidence of CNS dysfunction or only minor CNS symptoms (e.g. headache, dizziness) that rapidly resolves with minimal cooling intervention.
RME Heat Exhaustion is combination of AR40-501 Heat Exhaustion + Heat Injury

\[ HE_{RME} = HE_{AR40-501} + HI_{AR40-501} \]
Heat Stroke Clinical Description

- Heat stroke (HS) is defined as an elevated core body temperature associated with central nervous system (CNS) dysfunction. Clinically, HS presents as hyperthermia, physical collapse or debilitation, and encephalopathy as evidenced by a change in mental status, delirium, stupor, or coma, occurring during or immediately following exertion or significant heat exposure. HS may be complicated by organ and/or tissue damage, systemic inflammatory activation, and disseminated intravascular coagulation. Heat stroke will likely be the working diagnosis for any service member with altered mental status and exposure history consistent with heat illness.
Heat Stroke Case Classification:

- **Probable:**
  - A case that meets the clinical description of HS as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
    - Evidence of elevated core body temperature (even if cooling was initiated in the field) and
    - CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)

- **Confirmed:**
  - A case that meets the clinical description as described above occurring during/immediately after exertion or heat exposure with **ALL** of the following:
    - Core body temperature ≥104°F or 40°C and
    - CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)
When reporting in DRSi, include:

Critical Reporting Elements

– Specify the type of illness.
– Document the circumstances under which the case patient was exposed including duty exposure, occupational activities, environmental exposures, or other high risk activities.

Comments

– Please specify Wet Bulb Globe Temperature (WBGT) if known in degrees Fahrenheit.
• Other conditions with similar presentation in similar environments
  – Exercise Associated Hyponatremia
  – Exertional Rhabdomyolysis
Heat Illness Case Definition Flow Chart

Did event occur during/immediately after exertion or heat exposure and require medical intervention or change in duty status?

- No
  - NOT REPORTABLE

Is there documentation of central nervous system (CNS) dysfunction OTHER THAN HEADACHE OR DIZZINESS
  - Change in mental status, Delirium, Stupor, Loss of consciousness (syncope) or coma

- Yes

Heat Exhaustion (HE):

Confirmed:
- Short-term physical collapse or debilitation occurring during or shortly after physical exertion that rapidly resolves with minimal cooling intervention **and**
- NO EVIDENCE of CNS dysfunction or only minor CNS symptoms (e.g. headache, dizziness) that rapidly resolves with minimal cooling intervention **and**
- Core body temperature > 100.5°F or 38°C and <104°F or 40°C (or evidence of elevated core body temperature if cooling was initiated in the field)

- No

Core body temperature less than 104°F OR evidence of elevated core body temperature (even if cooling was initiated in the field?)

- No

Documented core body temperature greater than or equal to 104°F?

- Yes

Heat stroke (HS):

Confirmed:
- DOCUMENTED Core body temperature ≥104°F or 40°C **and**
- CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)

- No

Navy: report once core body temperature is determined

Additional Data Required:
1. Document activity associated with Heat Illness; common examples
   - Ruck March
   - Unit PT/Running
   - Field exercise/Land Navigation
   - Other
2. Enter wet bulb globe temperature (WBGT) if available
3. Concurrent diagnosis listed
   - Hyponatremia
   - Rhabdomyolysis
   - Acute Kidney Injury

Provable:
- Evidence of elevated core body temperature (even if cooling was initiated in the field) **and**
- CNS dysfunction (change in mental status, delirium, stupor, loss of consciousness or coma)

More information needed. Enter into DRSi as ‘preliminary’ heat stroke until core body temperature can be determined. Update once more information is obtained and a case classification can be assigned.
Questions
Questions/Service POCs

- Army: APHC – Disease Epidemiology Division
  Aberdeen Proving Ground, MD
  COMM: (410) 417-2377 DSN: 584-7605
  Email: usarmy.apg.medcom-aphc.mbx.disease-epidemiologyprogram13@mail.mil

- Navy: NMCPHC Preventive Medicine Programs and Policy Support Department
  COMM: (757) 953-0700; DSN: (312) 377-0700
  Email: usn.hampton-roads.navmcpublthcenpors.list.nmcphc-threatassess@mail.mil

Contact your cognizant NEPMU:
NEPMU2: COMM: (757) 950-6600; DSN: (312) 377-6600
Email: usn.hampton-roads.navhosppsorsva.list.nepму2norfolk-threatassess@mail.mil
NEPMU5: COMM: (619) 556-7070; DSN (312) 526-7070
Email: usn.san-diego.navenpvntmedufive.list.nepму5-health-surveillance@mail.mil
NEPMU6: COMM: (808) 471-0237; DSN: (315) 471-0237
Email: usn.jbphh.navenpvntmedusixhi.list.nepму6@mail.mil
Email: NEPMU7@eu.navy.mil