

Filling the Gap: Insuring Preventive Medicine Competency in Military Medical School Graduates

Mary T. Brueggemeyer, MD, MPH,
Col, USAF, MC, SFS, Assistant Professor

Departments of Preventive Medicine-Biostatistics and Military-Emergency Medicine
Uniformed Services University, Bethesda, MD



Problem Statement

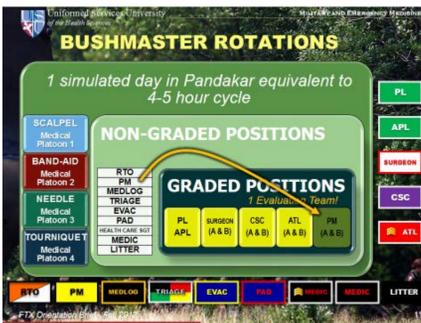
Preventive medicine (PM) is a key component of military medicine, but often takes a backseat in training programs. This gap was identified in Operation BUSHMASTER, the culminating military field exercise for undergraduate medical and graduate students at the Uniformed Services University of the Health Sciences. To fill this gap, a comprehensive simulation-based PM curriculum and dedicated PM observer-controller (OC) faculty were developed and implemented to insure military medical leaders obtain PM competencies critical to force health protection.

Background

Operation BUSHMASTER is a field training exercise and capstone experience for the students at USUHS. It has been a critical part of the curriculum for xx years. The exercise focuses on both development and evaluation of students as medical officers in a military contingency operation providing health services support in austere settings. After a two week didactic and military planning session, the students "deploy" to a fictitious country in support of an infantry battalion. Over 4-days, the students cycle through a series of scenarios and role-play different positions on a health care team in a Role-1 facility. Students are divided into platoons mentored and graded by dedicated faculty Observer-Controller teams of 8 personnel covering two shifts. Each 24-hour period represents 4 exercise days and students rotate to a new position on each exercise day.

Assessment

- There were four graded positions :Platoon Leader, Assistant Platoon Leader, Surgeon and Assistant Surgeon.
- Role of Preventive Medicine Officer (PMO) was filled by a student but not a graded position.
- Multiple preventive medicine scenarios and learning opportunities were not fully realized due to the lack of dedicated PM observer controllers, lack of focus on the PMO role (not graded) and lack of follow up on PM scenarios.



Solution #1

- Elevate PM to a graded position

Solution #2

- Develop cadre of dedicated PM faculty

Solution #3

- Refine PM curriculum and scenarios with specific student outcomes and expected behaviors



Curriculum Development

Problem-Based Learning: 7 Characteristics of Problems

- Common, prototypical problem that graduates would be expected to handle
- Serious outcome if not appropriately managed
- Implications for prevention
- Provide interdisciplinary input
- Lead to an encounter of the faculty member's objectives
- Present a concrete task
- Have a degree of complexity appropriate for students' prior knowledge



MISSION PROBLEMS	EXPECTED ACTION
MSN 1. Initial Site Establishment D+1	Establishes field preventive medicine measures at FOB
MSN 2. GHE: Qasr Village Health Needs Assessment D+2	Assesses environmental health needs of the village
MSN 3. GHE: Qasr Village Roundtable D+3	Advises PL on EH intervention; negotiates with village leader
MSN 18 Convoy Operations D+6	Establishes field preventive medicine measures at CSL
MSN 8. Detainee Healthcare D+8	Assesses for illnesses of public health concern
MSN 11. GHE: Qasr Village Medical Engagement D+9/10	Provides environmental health education and training
MSN 20. Media Engagement D+12	Acts as SME on health risk communication; advises PL on communication plan

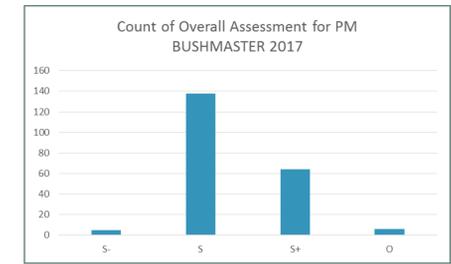
OPERATIONAL PROBLEMS	EXPECTED ACTION
OP 37. Schurma Stand D+2	Advises PL on command policy and safety of utilizing food offered by local vendor
OP 5. Preventive Medicine Action Plan D+3	Analyze trends in DNBI and brief Brigade Surgeon on plans to mitigate them
OP 23. Medical Engagement Plan D+6	Evaluates environmental health concerns at local village and develops plan to reduce diarrheal illness in the village
OP New. DFAC Foodborne Illness Outbreak Investigation D+6	Recognize diarrheal illness outbreak in troops and take appropriate actions to investigate and stop the outbreak
Deployment Surveillance	Record and track DNBI daily and analyze for trends

PATIENT PROBLEMS
<ul style="list-style-type: none"> • Dog bite due to unit mascot • Undifferentiated fever • Heat injury • Katayama Fever • Diarrheal illness cases • Malaria • Scabies • Chickenpox • Crimean Congo Hemorrhagic Fever • Trench foot • Parathion exposure • Sports injuries



UNIT HEALTH & HYGIENE
<ul style="list-style-type: none"> • Ensure all personnel take the notional malaria prophylaxis (Skittles) • Conduct daily camp site survey and water testing (with PM technicians) • Instruct platoon on preventive measures for heat, cold, rest, nutrition, PPE • Monitor health and performance of platoon

	Phase I. Pilot 2015	Phase II. Full 2016
Students	115	213
Average Grade	3.53 +/- 0.76	3.43 +/- 0.68



Student Feedback

- Student feedback overall positive
- 50% of students who did not role-play as PMO during the pilot expressed agreed that they would have liked the opportunity.
- Example Comments:
 - "Emphasizing the PM role and how they must communicate with the leadership was good."
 - "Based on my perspective during the role and working alongside others as the APL and PAD, I felt that the PM role's training scenarios were consistently well thought out;
 - "There were many real life lessons to be had when I was PM concerning placement of the latrine to the tent, to learning about tics and ways to prevent/treat tic bites, and water treatment, heat exposure, cold exposure, etc. I would highly recommend to keep this in Bushmaster. It was very informative and enjoyable to learn about all this!"
 - "Useful to think through the medical issues that can really affect deployments, but that are not at the forefront of our training in dealing with trauma/battle injuries."
 - "Valuable, but I did not have any in-depth PM scenario on my day."
 - "Could use a primer to prepare for this role."

Discussion

Military preventive medicine involves a multidisciplinary team of professionals who integrated well into the platoon faculty-OC team. Other faculty-OCs welcomed the PM-OC's knowledge and experience for both simulated and real world input into the exercise environment. The diversity of the PM-OC team did not hinder development of PM "problem" expertise. PM-OCs found the PM faculty guide to be the most useful tool for preparation. PM scenarios provided additional opportunities for leadership evaluation especially on a team and organizational level.

Conclusions and Recommendations

- PM is a vital component of military medicine and can be effectively taught and evaluated in a complex, high-fidelity, simulated field exercise.
- A four-year military preventive medicine curriculum will be implemented to better prepare medical students for the BUSHMASTER capstone event and ultimately, to function as military medical leaders.
- Consider Investigating if the PM curriculum has any affect on real-world DNBI experienced during the exercise.
- Role play and problem-based learning tools used to implement a PM curriculum in a military field exercise could be utilized to teach PM concepts in other aerospace, military or civilian settings.

References:

Albanese M, Dast L. Problem Based Learning. In Swanick T ed. *Understanding Medical Education: Evidence, Theory and Practice*. 2nd edition. Somerset, NJ: John Wiley & Sons; 2013:63-77.

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Faculty Development

Problem-Based Learning: Characteristics of faculty facilitators

- Start with content expertise
- Develop "problem" expertise
- Have all materials needed for each problem
- Receive guidelines on how to interact with and evaluate students

Unique Multidisciplinary PM Faculty Team Number Trained since 2015	Count
Preventive Medicine Physicians	10
PM/OM Residents	5
Other Physicians	5
Environmental Science Officers	5
Entomologists	1
Veterinarians	0
Public Health Nurses	1
Public Health Officers	0

PM OC FACULTY GUIDE

- Detailed description of PM Problems by exercise day
- List of learning objectives and expected PM behaviors
- Resources for faculty and students

PM TOOL KIT
<ul style="list-style-type: none"> • Special Field Guidance on the Control of DNBI in Pandakar • Table of FBI Incubation Periods • CDC Guide to Confirming an Etiology in FBI Outbreak • Control of Communicable Diseases Handbook • Field Preventive Medicine Checklist

D+4: Plan for Forward Operations	Learning Objectives and Expected PMO actions	Additional Resources
SC007/008 Mixed DNBI Sunday, October 9, Shift B Tuesday, October 18, Shift B Scenario	1. DNBI reporting: mark under injury; PMO should look back at previous reports to see if there is a trend; at this point, no.	
PM006 Undifferentiated Fever Three cases of fever to 101-102 with unclear etiology have presented in members of the battalion staff.	1. Medical officer should report these to the PM-FHP; if not PM-FHP should recognize when doing the DNBI report. 2. Follow recommendations for undifferentiated fever evaluation; interview should focus on exposures, use of PPE to guide differential and testing 3. DNBI Reporting: mark under febrile illness and annotate under significant events if needed; should identify that a case of undifferentiated fever occurred on D+2 and should inquire if this was the same unit or look for other similarities.	Pandakar Country Study; Infectious Disease Risk Assessment; Risk based guide to fever; Special Field Guidance for Control of DNBI in Pandakar 2016
Field Preventive Medicine This is a light day for DNBI cases. PMs should 1. Demonstrate Field Preventive Medicine knowledge and skills focus on camp hygiene, real world safety and and skills monitoring of fellow platoon mates and report any issues to the PL/APL for action. PM-CA can be working on preparations for the medical engagement on D+9		Special Field Guide for the Prevention and Control of DNBI-Pandakar 2016 Field PM checklist

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