Instructor materials

Contents

Goals of the instruction

Instructional Goal #1: Using a personal smartphone connected to the internet, learners will download medical information apps, before deployment to a disaster environment.

Instructional Goal #2: Recalling real and simulated patient care situations that required additional medical information, learners will identify and search smartphone apps for relevant, current, authoritative, medical information that could be applied to the care of individual patients in disasters.

Audience

This instruction was designed to be delivered to a Disaster Medical Assistance Team (DMAT) or a Community Emergency Response Team (CERT).

Pre-instruction activities

Equipment and preparation

For students: The students must be told to bring to class the following equipment:
Ask students to bring to class a charged smartphone, and their Apple ID or phone password so they can download an app in-class.

For the instructor: Bring to class the following equipment:
Print sufficient copies of the pre-class self-assessment and post-class test, 1 for each student.

For the motivational stories contact the DMAT/CERT team commander and ask if he has a good story about how he used a smartphone when treating a patient during a disaster, something specific to that team would be ideal. Otherwise there are two stories provided, but change the second of the two stories each year to represent a recent disaster where a DMAT/CERT team was deployed to keep it current.

For performance objective 1 print sufficient copies of the 3-page handout on pages 6-8, one handout for each student.

For performance objective 2 make and bring to class a powerpoint slide of the scenarios table on page 9.

For performance objective 3 you should bring to class:

- 1 box of 6.5" x 3.25" ziplock snack bags

For the post-instruction discussion exercise make and bring to class a powerpoint slide of the clinical scenario and questions for students on page 12. Bring 4 pads of flip chart paper, flip chart markers, and four rolls of blue painters tape.

When you arrive at the instruction location check the wi-fi is working and turn on the podium computer/projector.

Motivational materials

You will read aloud two brief stories at the beginning of class (see motivational stories on page 5), one will describe how the timely application of information from a smartphone medical app enabled a first responder to treat a patient, the second will describe how a first responder used a

disaster app on their phone to direct a family to the nearest red cross shelter. The stories are given so the learners may comprehend the utility of the knowledge/skills in their performance context.

During the instruction students will be tasked to identify information on their phone to meet patient care needs from a clinical scenario, and appraise the information for relevance, currency, and authority. This provides an opportunity in the low stakes environment of the classroom for the learners to practice evidence-based medicine, make an informed decision about the care of a simulated patient, and have that decision critiqued by their peers.

Performance Objectives

Instructor notes: Read the following aloud to the class.

1. You are going to learn about smartphone apps for medical and disaster information and where to look on the internet for medical & disaster information apps.
2. You will download 1 app to your phone and any offline content. You will perform a keyword search of the app.
3. You will learn procedures for sterilizing your phone.
4. You will discuss information sources for clinical practice.
5. You will take a short test at the end of the instruction. You will not be graded and this test is for the instructor to gauge the effectiveness of the instruction.

Pre-instruction self-assessment

Instructor notes: Distribute a print copy of the table below on page 4 to the students. Read the following aloud to the class:

"Complete the self-assessment, reflecting on your prior experience searching for medical information and using smartphones. You may wish to raise some of the points you identify in your small group during the post-instruction discussion exercise."

Ask learners to recall past experiences using their phone to search for medical information, tell them if they are experienced they should record how many specific occasions they can recall the circumstances and outcome, tell them if they do not have experience they should record their past experiences downloading apps to their phone and their emotions towards the task (e.g. did they find it difficult, have they had the opportunity before now to learn how to do it) and write down as numbered goals exactly what they want to learn from this instruction.

Question	Answer
1. What did you do when the last time you were deployed to a disaster and you needed more information before making a decision about treating a patient?	
2. If you have previously used a phone app to look up medical information, can you recall the circumstances and outcome?	
3. How do you feel about using a phone to look up medical information for patient care?	
4. How do you feel about downloading and using apps on your phone? Did you find the process difficult? Have you had prior opportunity to learn how to download an app to your phone?	

Instructor notes:

The purpose of this self-assessment is for the students to reflect on their experience using phone apps for patient care. You will not review responses, the self-assessment is meant to help each student identify discussion points for the post-instruction small-group exercise.

After students have completed the self-assessment ask if anyone has no prior experience using phone apps to treat patients. Reassure them their colleagues and you will guide them through the part of the instruction where they will download one app to their phone, and you will give them a handout with instructions for how to download other apps after class.

Ask students who completed Question 2 on the self-assessment to identify themselves to you. Select and assign four students to act as small group leaders. Ask each participant who is not a student leader to call out a letter: A, B, C, D and to assemble into one of four groups.

Instruction content

Motivational stories

Instructor notes: Read both of the stories below, or your substitute story, aloud to the class

Story 1	Story 2
A 6 month old is brought in to your temporary Emergency Room with fever and looking unwell. Her appetite is down and she has bilateral otitis media. She weighs 18lbs. You need to look up pediatric dosing for Amoxil for otitis media and calculate the right dose. You need answers to the following questions: 1. What is the dose in mg/kg? 2. What is her 24 hour dose in ml? 3. How much per dose? You could get this sort of medical information for treating patients at the point of care using an app such as Dynamed, which requires a subscription (check your medical library). For effective and timely application of information you would need to have downloaded the app, be familiar with the type of content therein, and have practiced consulting your phone to look up information, before deployment to the disaster.	During Hurricane Sandy last fall, Massachusetts-2 Disaster Medical Assistance Team was deployed to the Park Slope Armory in Brooklyn that filled up quickly with evacuees from Lower Brooklyn and Queens. A first responder used a disaster app on his phone to direct a family to the next red cross shelter with space. The first responder had downloaded the app, and was comfortable consulting his phone to look up information, before deployment to the disaster.

Performance Objective 1

Instructor notes: Distribute the student handout below (3 pages). Tell students the handout is for them to take away and read in their own time. Encourage learners to download any of the apps after class, use the app over the following month, and discuss their experience with their colleagues at the next team meeting.

Student handout

	Type of information	Provider	Cost $
Medical information apps:			
PubMed	Medical journal article abstracts & links to full text. This app would be useful for finding clinical trials, practice guidelines, or reviews of treatment efficacy.	National Library of Medicine	Free
Ebsco-Host	Multi-discplinary journal article abstracts & links to full text. Search several health sciences literature indexes all at one time, including MEDLINE, CINAHL, Academic Search Premier, etc. This app would be useful as an alternative to Google if you wanted to look something up in the peer reviewed journal literature. It has broader scope than PubMed as it searches non-medical subject indexes.	Publisher: Ebsco	Requires subscription. Check with your institution's library.
Lexi-Comp	Drug information, dosage, adverse effects, IV infusion rates, ID drugs by imprint or image. This app is particularly useful for identifying what drugs your patient has on their person, and for calculating dosage.	Publisher: Wolters-Kluwer	Requires subscription. Check with your institution's library.
Dynamed	Evidence-based point of care medical information about diagnosis & treatment. This app would be useful for reading background information about diagnosing and treating a disease.	Publisher: Ebsco	Requires subscription. Check with your institution's library.
Psychological First Aid (PFA)	Helps first responders conduct Psychological First Aid in the immediate aftermath of disaster and terrorism to reduce initial distress and foster short and long-term adaptive functioning. Track survivors needs. How to assess yourself.	Veterans Affairs (DoD) & National Child Traumatic Stress Network	Free
Medical Spanish	Features audio playback of English/Spanish translation, systems, body parts, instructions. This app would be useful in an emergency if you did not have a Spanish speaker present.	Developer: Batoul Apps	Free

Disaster apps:			
ToxNet	Information about toxicology, hazardous chemicals, environmental health, and protective measures. This app provides background information about the effects of toxic agents.	National Library of Medicine	Free
WISER	HazMat incident substance identification, characteristics, human health information, containment and suppression advice. This app would help you manage a HazMat incident. Most of the information does not require an internet connection, however the protective distance Google map overlay does require a connection.	National Library of Medicine	Free
ERG 2012	2012 Emergency Response Guidebook (ERG) provides first responders with a resource to help deal with HazMat accidents during the critical first 30 minutes.	Dept of Transportation Pipeline and Hazardous Materials Safety Administration	Free
Outbreaks near me	Disease outbreak information on interactive maps that require an internet connection.	Boston Children's Hospital	Free
BioAgent Facts	Information about infectious disease agents for bioterrorism including Anthrax, Botulism, Flu, Plague, SARS, Smallpox, Tularemia, and VHF (viral hemorrhagic fevers like Ebola and Marburg). This app would give you advice about how to treat and contain the spread of biological agents.	University of Pittsburgh Medical Center	Free
Reunite	Report & upload photos from your phone about missing and/or found people to the NLM's Lost persons finder website. Includes language support in Spanish & French. The utility of this app is self-evident.	National Library of Medicine	Free
American Red Cross: Shelter View	Find the nearest red cross shelter with available space. Frequent updates from the National Shelter System. The utility of this app is self-evident.	Red Cross	Free

Resources that list smartphone apps and download instructions:

- National Library of Medicine, Disaster Information Management Research Center Website

  http://sis.nlm.nih.gov/dimrc/disasterapps.html

- Homeland security digital library https://www.hsdl.org search for "phone app"
- Professional internet forum e.g. https://communities.firstresponder.gov
- Social media e.g. the sub-Reddit group "Meddit" http://metareddit.com/r/medicine

-------End of student handout-------

Performance Objective 2

Power point slide: Exercise scenarios

Scenario	Phone app
1. In the aftermath of a hurricane you encounter a 45 year old female walking on the street who has lost her apartment in the disaster. What smartphone tools could you use to help direct her to a shelter and inform others of her whereabouts?	American Red Cross: Shelter View
2. In a chemical incident, you are required to identify alkali decontamination procedures. What smartphone tools could you use to identify appropriate procedures?	ToxNet
3. A 31 year old male who has lost his family presents with panic attacks, distressing recollections of the event, anhedonia, and an overgeneralized fear reaction, you suspect he is suffering from PTSD. What smartphone tool could you use to perform a psychiatric assessment for PTSD?	Psychological First Aid (PFA) app
4. You have a 34 year old G0P1 patient whose last monthly period was 10/22/2012 and has developed pre-ecclampsia. Use an OB wheel on your smartphone to calculate estimated gestational age and due date.	Perfect OB Wheel
5. You are tasked to give palliative medication intravenously to an 84 year old woman with terminal cancer. Use MEDCALC on your smartphone to calculate the IV infusion rate of methadone.	MEDCALC

Instructor notes:

Activities: 30-minute group exercise

1. Bring up the five scenarios on a powerpoint slide. Assign one of the five scenarios to each of the four student groups.

2. Ask students to turn on their phone & show the group their smartphone is turned on and charged.

3. Demonstrate how to connect to in-class Wi-Fi internet signal if required, and instruct students to open the app store on their phone.

4. Ask students to locate the corresponding app from the scenario table in the app store and download the app to their phone. Invite students to consult with the person sitting next to them if help is needed or to raise their hand if they need help from the instructor.

5. Ask students to show their small group they have downloaded the app.

6. Ask students to use the general settings on their phone to set the app preferences if required.

7. Ask students to search the phone app for information about treating the patient in their scenario (5 mins).

8. Tell student leaders after all their group members have found information on their phones to begin a group discussion about what they would do in the scenario and compare this with what the app is telling them to do (10 minutes).

9. After 10 minutes reconvene the large group and invite each student group leader to summarise their discussion about the scenario (10 mins).

10. Call on the team commander to respond after each student group leader has spoken to comment on the legality/appropriate use of each app/scenario depending on an individual's occupational role and local/unit protocols e.g. EMT's should not be involved in scenario #5 because only a Paramedic or a Physician may administer drugs. EMT protocols must be followed at the scene so you may only have time to search for background information on a smartphone en-route to an incident, etc.

Discussion points:

1. Encourage students to download the other apps on the handout after class, practice using the phone app to look up clinical information, and discuss their experience with colleagues at the next team meeting.

2. Some apps require a product activation key or personal account be set up to activate the app on their phone. Check with your medical librarian. Links to the NLM DIMRC website with instructions for downloading apps are on the student handout.

3. Ask students if they are familiar with operating procedures for DMAT/CERT issued generator power and secure wi-fi internet equipment? Task students with learning their phone equipment protocols if they do not know how to use them. Emphasize smartphones require power and a working cell phone network to be useful in a disaster. Advize learners they may wish to purchase, or request for the DMAT/CERT cache, a number of portable high capacity battery chargers such as the "MyCharge Peak 6000 Rechargeable Power Bank" ($99 from Amazon) which can connect to a phone to provide up to 135 hours of cell phone battery charging. Emphasize these devices will themselves need to be charged before deployment or en-route to the disaster zone.

4. Some apps are able to function on the phone without an internet connection, this is particularly important and useful if you do not have cell phone reception. Dynamed is one such point of care tool, this type of app requires a subscription for content be downloaded and University or Hospital employees should be encouraged to contact their institution's medical library to find out what apps they make available to employee's. Advise students to download any offline content for their apps after class. Tell them they should hereafter keep all installed app content up to date, and download updates when prompted.

Performance Objective 3

Instructor notes:

Activities:

The instructor should perform the actions below to model good practice.

1. Put phone in a 6.5" x 3.25" ziplock snack bag

Discussion points:

While you are performing this activity describe to students this is how they can sterilize their smartphone before entering the patient care environment. Describe how they must request the DMAT/CERT team cache be stocked with 6.5" x 3.25" ziplock snack bags, suggest these bags form part of their deployment equipment and that they should pack them in their go-bag. Remind students they need to change and dispose of the ziplock bag between patients.

Post-instruction activities

Discussion exercise

Instructor notes:

Distribute to each group a pad of flip chart paper, flip chart markers, and a roll of blue painters tape.

Ask individuals to make personal notes of their answers to the four questions below based on the accompanying scenario, also ask them to note one real-world application for what they have just learned (5 minutes).

Ask student leaders to assign a scribe for the flip chart paper and to begin a 10 minute discussion of student responses using the rubric on page 13 to identify excellent responses, also tell student leaders to ask group members to raise any discussion points from their pre-class assessment they wish to share with their colleagues. The scribe should write down key points on the flip chart paper using the markers. Each group should hang their flip chart paper on a wall using the blue painters tape.

After the 10 minute student discussion, the instructor should reconvene the large group. Begin a large group discussion asking each student group leader in turn to share their group's discussion points with their colleagues.

Clinical scenario power point slide:

> "John is an 11 year old boy who presents with primary enuresis (bedwetting). He is sleeping in a temporary shelter. You have excluded the possibility of urinary tract anomalies and infection as possible causes. A colleague suggests you treat the enuresis with imiprimine or desmopressin. You decide to research the evidence on your smartphone to determine whether these are effective treatments."

Questions for students:

1. Where might clinicians go to find an answer to this question?
2. Name as many types of information sources as you can.
3. Discuss the strengths and weaknesses of information sources in clinical practice.
4. Describe the most important advantages and disadvantages for each type of information source you list.

Instructions for student leaders: In your small groups

- Ask group members to share their responses to each question
- Identify on the rubric below which responses fall into the excellent response category at the top of each of the four columns. Where responses fall into the 'Limited' or 'Not Evident' categories, prompt other members of the group for their responses.
- Ask group members to describe the real-world application they wrote down, discuss.
- Prepare to talk about your group's responses when you return to the large group setting.

Student Leader rubric for evaluating the discussion exercise

	Variety of Sources	Convenience	Clinical Relevance	Validity
Excellent (6 points)	At least four types of sources listed. Types include: • index databases (Medline, CINAHL, etc) • Journals (JAMA, etc) • text books (Harrisons) • Systematic Reviews (Cochrane Library) • Evidence-Based databases (Clinical Evidence, Dynamed, MDConsult, etc) • Consumer website (WebMD, MedlinePlus) • General internet search (Google, Wikipedia) • Clinical Guidelines • Professional Organization (AAFP, NIH website) • People (colleague, consultant, attending)	Discussion includes at least 2 issues related to convenience, may include: • Cost (e.g. "free," "subscription only") • Speed (e.g. "fast," "takes time") • Ease of search (e.g. "must know how to narrow search," "easy to navigate") • Ease of use (e.g. "NNT already calculated")	Discussion includes at least 2 issues related to relevance, may include: • Clinically relevant outcomes • Written for clinical application (e.g. "pertinent" "info on adverse effects") • Appropriate specialty focus (e.g. "directed at EMTs")	Discussion includes at least 2 issues related to validity, may include: • Certainty of validity (e.g. "needs to be critically appraised") • Evidence Based approach (e.g. "Grade 1 Evidence") • Peer reviewed • Standard of care • Up-to-date or outdated?
Strong (4 points)	Three types of sources listed.	Includes 1 issue related to convenience	Includes 1 issue related to relevance	Includes 1 issue related to validity
Limited (2 points)	Two types of sources listed.	Mentions convenience, but without explanation e.g. "easy" or "difficult"	Mentions relevance, but without explanation e.g. "relevant"	Mentions validity, but without explanation e.g. "good, trustworthy"
Not Evident	No variety. Only one source listed, or all same	No mention of convenience	No mention of relevance	No mention of validity

Quiz yourself

Instructor notes: Ask all students to complete the test below and return it to you when they are done. Explain you are not grading them but this is for the instructor to understand how well the instruction met its objectives. This is the last activity for the instruction so tell them after they complete the test they should hand their test papers to you and proceed with their team meeting.

Question	Answer
1. List 3 medical information phone apps.	1. 2. 3.
2. List 3 phone apps for disaster information.	1. 2. 3.
3. Name 2 internet resources that list disaster or medical apps.	1. 2.
4. Name 3 patient care scenarios in which medical information can be retrieved from smartphone apps.	1. 2. 3.

5. Match the phone app that provides best information for a corresponding scenario.

Scenario:	Phone app:
Reuniting families	ToxNet
Toxicology & poisons	REMM
Radiological decontamination procedures	Reunite
Pediatric dosage calculations	Dynamed
Treatment procedures for heat	Medcal

Rubrics for evaluating the post-instruction test

Questions 1-4

Content	**Unacceptable**	**Needs Improvement**	**Needs Improvement**	**Satisfactory**	**Meets Expectations**	**Exceptional**
	Did not answer question.	Question not adequately answered.	Answers are accurate but only a few examples given.	Answers are accurate and more examples given	Answers are accurate and sufficient correct examples are given	Answers are accurate and all correct.

Question 5

Matching	**Needs Improvement**	**Emerging**	**Mastery**
	Student does not match any of the apps to scenarios correctly	Student matches 3/5 of the apps to scenarios	Student matches all apps to the correct scenario