Module 1

Module 1.1: Situation Update

Day 1: 0805 Hours

An individual comes in to a hospital accompanied by a coworker. The individual reports that shortly after arriving to work at a local oil refinery he passed out. Before he passed out he experienced a headache and started feeling dizzy. His coworker says that the individual seemed confused in the moments before passing out. He recovered consciousness and denied the need to call an ambulance. His coworker convinced him that he would drive him to the hospital to get checked out. The individual vomited on the way to the hospital. The patient (labeled Patient 1 in Appendix 1) has a slight blue tint to his lips and blood is drawn. The blood is brown so Met-HB levels are tested (25%). He recounts that his daily morning routine includes getting up, showering, heading to a gas station convenience store for gas and a “to go” breakfast, and then getting to work a few minutes early to read the paper while he eats in the break room before his shift starts. (See Appendix 1 for more details on patient history).

Module 1.1: Discussion Questions

1. [Medical Personnel] What sort of illness does this seem like?
   A) Bacterial
   B) Viral
   C) Fungal
   D) Chemical
   E) Radiological
   F) Other
   And why?

2. [Clinicians] What other questions would you like to ask this patient? How would you narrow down possible sources of his illness?

3. [Clinicians] What would make you decide that this patient’s illness should or shouldn’t be reported to the local public health office?

4. [Public Health/ Epidemiology Personnel] What should health professionals keep in mind when deciding if this should be reported or not to the public health office?

5. [Informatics Personnel] What are issues of the confidentiality and security of patient information?
Module 1.2: Situation Update

Day 1-3

Other patients have come to the hospital complaining of varying levels of numbness, vomiting, nausea, headache, and drowsiness. See Appendix 1 for more details on the patients’ histories and maps of where they started feeling ill, where they ate, and other relevant information.

Day 2: 0127 Hours

Another patient (Labeled Patient 4 in Appendix 1) arrives to the hospital unconscious. She is accompanied by 3 other friends who give the doctor her history. They had all been out that evening drinking at a local bar to celebrate her promotion. They decided to finish the night at a local diner to sober up with coffee and food before heading home. She had been feeling fine until she finished 2 cups of coffee. Right before she passed out, she complained of feeling unwell and was about to head to the restroom when she collapsed. Her lips are blue and she has an elevated heart rate. Blood was drawn and appeared a chocolate brown color so her Met-HB levels were tested (36%). She regains consciousness soon after reaching the hospital. After vomiting, she says that her face feels numb and tingles, and that her lips feel like they are burning. After hearing about another patient the previous day with brown blood, the medical team decides to test for cyanosis-causing agents.

Module 1.2: Discussion Questions

1. [Clinicians] At what point would you start reporting these cases?
   A) After the first patient
   B) After the second patient that you see
   C) After the second or third patient that you hear about/ see
   D) After hearing about/ seeing patients that present on 2 different days
   E) After hearing about/ seeing 3-6 patients with similar symptoms
   F) After hearing about/ seeing patients presenting on 3+ days

   And why?

2. [Public Health/ Epidemiology] At what point would you become possibly engaged in this incident?
   A) After the first patient
   B) After the second patient
   C) After the second or third patient that you here about
   D) After hearing about patients that present on 2 different days
   E) After hearing about 3-6 patients with similar symptoms
   F) After hearing about patients presenting on 3+ days
And why?

3. [Public Health/ Epidemiology] What information would you provide to health personnel at this point?

4. [Public Health/ Epidemiology] How would you go about identifying the source of this incident?

5. [Public Health] Would you use a mapping tool to visualize the locations of the various case

6. [Informatics] What are issues of the confidentiality and security of patient information?

7. [Informatics] What are issues of interoperability and reporting in reporting the case?

Module 1.3: Situation Update

Day 3: 1630 Hours

Lab tests from several patients (Labeled Patients 1, 4, 5, and 7 in Appendix 1) have come back confirming varying levels on p-aminophenol, an aniline metabolite, in the urine. This, along with the patient history and physical exam, is indicative of aniline poisoning via oral ingestion.

Just in Time Training

These patients are exhibiting symptoms of orally ingested aniline contamination. Aniline can cause a range of symptoms depending what contact a person has with the chemical (inhalation, absorption through the skin, or ingestion). Aniline exposure most commonly causes headache, nausea, tachycardia, cyanosis, vomiting, confusion, weakness, numbness and burning sensations at the location of exposure, as well as some more severe symptoms with increased exposure, such as convulsions, loss of consciousness, coma, a series of immunomodulating activities that can activate fibroblasts and cause scleroderma-like hardened skin, and rarely death. Aniline can be found in a number of products including, rubber chemicals, dyes, plastics, drugs, pesticides, and explosives. Because vomiting is a common occurrence with aniline poisoning, this will partially eliminate some of the aniline, making it hard to test how much of the chemical a patient was originally exposed to as well quicken the elimination of the chemical. A treatment that is commonly used is intravenous administration of toluidine blue or methylene blue along with cardiorespiratory support. Alcohol consumption can increase the effects of aniline poisoning. It is highly unlikely that these patients would be able to contaminate other people that were not directly exposed to aniline in this scenario.
Module 1.3: Discussion Questions

1. [Clinicians] What would your next step be once you have confirmed that multiple patients had aniline poisoning?

2. [Public Health/Epidemiology] How should you go about notifying medical personnel that they may be seeing these cases in their clinics and hospitals?

3. [Informatics] Describe how the informaticians would work with clinical personnel and public health?

4. [Everyone] Who is in charge of the response team at this time?

Module 2

Module 2.1: Situation Update

Day 4: 800 Hours [Reporter 1 in station]

“Good Morning, I’m Lydia Bennet with UTH-MR. We could be facing a health crisis here in Houston from a chemical that could be in your morning coffee. A dozen people at this point have reported to local hospitals complaining of nausea, vomiting, and numbness after drinking beverages at several restaurants and gas stations in the Town square area. Now joining us is Cecily Cardew at the scene. Cecily, can you tell us what is happening over there?

[Reporter 2 at the scene]

“Hi Lydia, business today is slower than usual in the Town square area as people start shying away from picking up breakfast here on their way to work. I am here with Jordan Baker, who normally would be getting coffee and a breakfast taco right now. What has this done to your morning routine?

[Bystander]

“Well I usually pick up breakfast at Stop and Go Taco, but when I heard about people getting sick I didn’t want to risk it. I mean I like the coffee here but I don’t think I could trust it right now. I guess I’ll just be getting up a little earlier so I can grab something to eat at home until this is all over.”

[Reporter 2]
“Thank you so much. Jordan isn’t the only one having her routine changed this week. I had a moment this morning to talk to the owner of Quick Dash Gas.”

[Cut scene to Owner]

“Customers are worried that all of our food and drinks are contaminated so I have been getting a lot less business. The health people said they needed to test our coffee so I’m not selling that right now. They said it wasn’t likely that the bottled drinks are contaminated so I am trying to get people to not be worried about those things. This has really concerned my customers and is making their day harder, and it’s really affecting my ability to bring in money to support my family.”

[Reporter 1]

“Thanks Lydia. Health officials are saying that right now the only source of contamination that they have found has been coffee, however they are testing multiple beverages and foods at the locations where people dined before getting sick.”

[Health official]

“Right now we are looking into possible sources of contamination. It is important that people stay vigilant of what they are consuming and that they contact their local physician if they start feeling nauseous, dizzy, or numb after consuming coffee at a local establishment. We will be sending updates every 2 hours as we get more information.”

[Reporter 1]

“For now health officials believe that the contaminated coffee is located largely at some restaurants and gas stations in the Town square area. If you believe you might have drank or ate contaminated food please call your primary physician or contact the following hotline for more information: (713) 555-5555.”

Module 2.1: Discussion Questions

1. [Everyone] Who is charge of your department at this time in the incident?

2. [Everyone] Who is in charge of the EOC at this time?

3. [Everyone] What would be most important to tell the public right now?

4. [Clinicians] What issues do you think you would be dealing with after this broadcast?
5. [Clinicians] How would your departments address a surge in patients who are primarily ‘worried well’?

6. [Clinicians] What additional information would you want to know?

7. [Clinicians/ Public Health/ Epidemiologists] What would an appropriate case definition be for this contamination?

8. [Clinicians/ Public Health/ Epidemiologists] What would be appropriate symptoms for a person to report to an emergency room vs make an appointment with their primary physician vs call the hotline for more information?

9. [Clinicians] What do you think the case definition should be?

10. [Informatics] Should the informatics department be reviewing social media sites such as twitter and facebook?

11. [Informatics] Should an audit be run of all patients treated to verify that only the appropriate people had accessed the EHRs?

12. [Everyone] Should there be concern for a leak of patient information to the media?

Module 2.2: Situation Update

Day 4: 1630 Hours

The following message was delivered anonymously to City Hall and numerous news stations in Houston:

“The oil industry is ruining the environment and tarnishing the beauty of Earth. Houston is at the heart of the problem. Every year the city continues to ignore the destruction it is causing is another year that we suffer from pollution and the death of millions of animals and the decline in our own health as we consume toxic products the oil industry forces on us. Houston must finally be held responsible for what they have done. Until the oil industry is shut down, people will continue to get sick every day. We demand that Houston starts by closing all the oil refineries in the area or next time will be much worse.”

Day 4: 1845 Hours

Evidence is presented to the EOC that an organization called the Global Restoration Organization (GRO) has been passing out pamphlets and giving speeches around town for the
past 8 months. Occasionally they would petition to see city officials to address their concerns but they had not been seen as a major threat to safety.

Day 5: 0900 Hours

Upon further review, it appears that some of the leaders of GRO have connections to other environmental groups that are deemed to be domestic ecoterrorism groups.

Module 2.2: Discussion Questions

1. [Everyone] Who would be in charge of operations at this point?

2. [Public Health/ Epidemiology] How would this information affect the way you investigated the incident?

3. [Health Personnel] Would this information affect the way you treated patients in any way?

Module 2.3: Situation Update

Day 5-9

As more information comes in about GRO and test samples are processed from food and beverages collected at the affected facilities and distribution sites, it becomes clear that aniline is found in liquid sweeteners used to flavor and sweeten coffee. Some of these are found in self-serve coffee bars at a gas station and some are found in the food preparation area of a few fast food and diner restaurants. No new locations appear to have been contaminated after the initial incident. Upon removing these sweeteners from the affected establishments, no new cases of aniline contamination are reported. At this point there have been 11 confirmed cases and 20-30 possible cases of aniline poisoning.

Module 2.3: Discussion Questions

1. [Everyone] Who is in charge of operations at this time?

2. [Public Health/ Epidemiology] How long do you think it would take to determine the source of the aniline contamination?
   A) 1-2 days
   B) 3-5 days
   C) 1-2 weeks
Module 3

Module 3.1: Situation Update

Days 10-20

No other consumable products were contaminated, and the culprits have been identified. Now it is time to address the public and communicate that the threat has been contained, however they should remain vigilant.

Module 3.1: Discussion Questions

1. [Everyone] Who is in charge now?

2. [Everyone] What needs to happen before this emergency incident can be declared over?

3. [Everyone] What will need to happen in your department for before you can go back to normal operation?

4. [Everyone] What do you think will be the long-term effects of this incident on the City?

5. [Everyone] What can be done to speed up and improve the recovery from this incident?
True Story

Today’s scenario discusses how Houston might deal with an intentional chemical contamination in food and is loosely based on an incident that occurred in Spain. In 1981, Spanish doctors started getting large numbers of patients complaining of symptoms that became known as the previously unheard of illness, Toxic Oil Syndrome (TOS). Symptoms included pulmonary pathology, incapacitating myalgia, high eosinophil counts, severe skin itching, rash, persistent dry mouth, neurological pathology, abdominal pain, and other symptoms. It was initially believed that this might be an immunological disorder or that it could be caused by an infectious agent, but this hypothesis was discarded when it became clear that there were no known secondary cases. The source of the illness was aniline-denatured rapeseed oil (similar to canola/vegetable oil) that had been shipped from France. Due to laws meant to protect the Spanish olive oil trade, French rapeseed oil had to contain 2% aniline, making it inedible for human consumption. The contaminated oil was not fully purified, but was still sold as “street oil” in unmarked 5-L containers in street markets. The majority of cases occurred in women, lower socioeconomic individuals, and/or adults. The center of the contaminations was the Madrid province. It wasn’t until June when the link to oil was made that the cases started to significantly drop off, especially after the government agreed to replace possibly contaminated oil with pure olive oil at no charge. It is believed that about 20,000 people became sick. 2,424 deaths can be attributed to Toxic Oil Syndrome, either at the time or from associated complications afterwards.

There is still debate as to what exactly causes Toxic Oil Syndrome, because there are no sufficient animal models that mimic what happens in humans. However because TOS looks similar to aniline poisoning (with some delay in onset), it is believed that aniline and/or its derivatives is the most probable cause of TOS, although it could have been caused by another substance or a combination of other substances.
Hot Wash

Discussion Questions (For Everyone)

1. What strengths does your department have concerning chemical contamination incidents?

2. What strengths does Houston as a whole have concerning chemical contamination incidents?

3. What weaknesses does your department have concerning chemical contamination incidents?

4. What weaknesses does Houston as a whole have concerning chemical contamination incidents?

5. How can your department improve policies concerning chemical contamination incidents?

6. How can Houston as a whole improve policies concerning chemical contamination incidents?

7. What are the top short term priorities that need to be addressed to improve Houston’s response to chemical contamination incidents?

8. What are the top long term priorities that need to be addressed to improve Houston’s response to chemical contamination incidents?
Appendix 1: Patient Log and Map

Patient Emergency Room Log (Does not include every patient/possibly affected person)

<table>
<thead>
<tr>
<th>Patient #</th>
<th>Date</th>
<th>Time In</th>
<th>Sex</th>
<th>Age</th>
<th>Symptoms (Note that most Met-HB levels are measured after patient has vomited)</th>
<th>Food/ Beverages Consumed</th>
<th>Facility where food/beverage came from</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Day 1</td>
<td>0805</td>
<td>M</td>
<td>45</td>
<td>Loss of consciousness, headache, dizziness, vomiting, nausea, cyanosis, Met-HB: 25%</td>
<td>Regular Iced Coffee, Egg sandwich</td>
<td>Quick Dash Gas</td>
</tr>
<tr>
<td>2</td>
<td>Day 1</td>
<td>0840</td>
<td>M</td>
<td>39</td>
<td>Headache, dizziness, tachycardia, nausea, weakness</td>
<td>Vanilla Coffee, hash brown, pancakes</td>
<td>Burger Barn</td>
</tr>
<tr>
<td>3</td>
<td>Day 1</td>
<td>1236</td>
<td>M</td>
<td>51</td>
<td>Headache, nausea, vomiting, weakness</td>
<td>Caramel Iced Coffee, Burger, Fries</td>
<td>Burger Barn</td>
</tr>
<tr>
<td>4**</td>
<td>Day 2</td>
<td>0127</td>
<td>F</td>
<td>26</td>
<td>Loss of consciousness, nausea, vomiting, cyanosis, numb and tingling face, burning sensation on lips, tachycardia, confusion, Met-HB: 36%</td>
<td>2 Margaritas, 1 vodka shot, 2 cups of hazelnut coffee, French toast, sausage</td>
<td>Town Square Bar/ Spears</td>
</tr>
<tr>
<td>5</td>
<td>Day 2</td>
<td>0734</td>
<td>F</td>
<td>37</td>
<td>Drowsiness, nausea, numbness of lips, cyanosis, vomiting, Met-HB: 12%</td>
<td>Regular Iced Coffee, Breakfast Taco</td>
<td>Stop and Go Taco</td>
</tr>
<tr>
<td>6</td>
<td>Day 2</td>
<td>0834</td>
<td>M</td>
<td>29</td>
<td>Headache, nausea</td>
<td>Iced Vanilla Coffee</td>
<td>Quick Dash Gas</td>
</tr>
<tr>
<td>7</td>
<td>Day 2</td>
<td>1156</td>
<td>F</td>
<td>62</td>
<td>Headache, nausea, vomiting, fatigue, cyanosis, Met-HB: 20%</td>
<td>Hazelnut Coffee, Chicken fried steak, mashed potatoes, toast</td>
<td>Spears</td>
</tr>
<tr>
<td>8</td>
<td>Day 3</td>
<td>0657</td>
<td>M</td>
<td>22</td>
<td>Headache, nausea</td>
<td>Iced Mocha Coffee, Breakfast burrito</td>
<td>Stop and Go Taco</td>
</tr>
<tr>
<td>9</td>
<td>Day 3</td>
<td>0913</td>
<td>F</td>
<td>38</td>
<td>Headache, nausea, vomiting, fatigue, tingling and burning of lips and throat, cyanosis, loss of consciousness, Met-HB: 31%</td>
<td>Vanilla Coffee, egg and ham sandwich</td>
<td>Burger Barn</td>
</tr>
<tr>
<td>10</td>
<td>Day 4</td>
<td>0754</td>
<td>M</td>
<td>54</td>
<td>Headache, nausea, vomiting, cyanosis, Met-HB: 11%</td>
<td>Regular Coffee</td>
<td>Stop and Go Taco</td>
</tr>
</tbody>
</table>
11  Day 4  1713  M  28  Headache, nausea, vomiting, cyanosis, fatigue, tachycardia, cyanosis, Met-HB: 24%

Hazelnut Iced Coffee, Burger, Potatoes, Broccoli

Spears

* Patient mentioned in Module 1.1

** Patient mentioned in Module 1.2

1: Quick Dash Gas
2: Burger Barn
3: Spears
4: Stop and Go Taco
Appendix 2: Acronym/Definition List

- **All-hazards preparedness**: Preparation for major disasters, domestic terrorists attacks, and any other emergency situation
- **EOC**: Emergency Operation Center
- **EOP**: Emergency Operation Plans
- **First responder**: A person who is involved with the beginning stages of an incident with the principle purpose of protecting and preserving life and property.
- **HSPD**: Homeland Security Presidential Directive
- **Met-HB**: Methemoglobin saturation as a percentage of total hemoglobin
- **NIMS**: National Incident Management System
- **PIO**: Public Information Officer
- **SitMan**: Situation Manual
- **TCL**: Target Capabilities List
- **UTL**: Universal Task List
- **Worried Well**: Individuals who are concerned that they might have the condition being described, without actually having the condition. They may experience some of the same symptoms.