

# Portia's Pain

**Planning Notes:**

- 1) **Teams:** 4 students
- 2) **Length:** 2-3 class periods (45-75 minutes each)
- 3) **Resources:** Copies of student workbook; Computers/Internet for research and preparing presentation

**OVERVIEW:**

Portia, a 5-year-old African American female, has recently started complaining to her parents that she is having pain in her tummy and feet and is sleeping more than usual. Portia excels in her kindergarten class and is very helpful around the house. But lately she has come home from school exhausted. Understandably, her parents are very distressed. You need to help Portia's parents get to the bottom of this problem by making an accurate and evidence-based diagnosis so that Portia can begin a treatment plan.

**GOAL:**

Identify the illness Portia has by conducting a differential diagnosis and forming an accurate and evidence-based conclusion.

**Correct Final Diagnosis:** Sickle Cell Disease, also known as Sickle Cell Anemia

**ROLE:**

Team members will act as Portia's health care team: one physician, one nurse, one certified nurse assistant, and one social worker.

**OBJECTIVE:**

Have students think about the different roles each health professional would play in this situation, and how they would work together effectively as a team.

Obj. 5.9: Conduct a differential diagnosis in order to determine an evidence-based final diagnosis.

**NHES STANDARDS:**

**6.12.1:** Assess health practices and overall health status

**DELIVERABLES:**

- 1) SOAP Note Assessment section
- 2) Presentation of one disease "ruled out" on differential diagnosis

**ASSESSMENT:**

Your SOAP note Assessment section and presentation will be evaluated on a rubric based on accuracy, evidence, and clear communication.



Lesson 5.9, focusing on Differential Diagnosis will be an important preparation for this case study. Encourage students to use their workbook and notes!

**Case Introduction:**

Remind students not to overlook any details. If they do not seem to fit in a particular part of the SOAP note, they can add them on an extra sheet of paper.

Portia is a happy-go-lucky five year old most of the time, but her mother has always worried about her health. Every three or four months, Portia seems to be unexplainably lethargic and tired for a few days and complains that her body hurts. The symptoms never seem too serious though, and go away on their own, so her mother chalks them up as just normal childhood "bugs." She was in daycare, then preschool, and now kindergarten, so she has certainly been exposed to plenty of germs.

Portia's periodic spells of tiredness and pain are a classic symptom of sickle cell disease

Family history of sickle cell. Portia's father would also need to be carrying the gene.

Portia is an only child. Her mother generally uses complimentary and alternative medicine and avoids the traditional healthcare system as much as possible. She learned her ways from her mother, who tended to her grandmother's health as she lived with sickle cell anemia for many years. She had Portia through a home birth and initially opted out of immunizations, but later decided to catch Portia up so that she would not have problems entering preschool.

Children with sickle cell are often slightly smaller than average. The cough is a worrisome sign that Portia may have blocked vessels in her lungs. The yellowing in her eyes is a sign of anemia (low blood cell count, hemoglobin)

Portia is slightly small for her age, but earns the highest praise from her kindergarten teacher for her curiosity, eagerness to learn, and kindness toward others. Two days ago, Portia was sent home from school because she couldn't stop crying due to pain. She complained of pain in her feet and her tummy. Her mother also realizes that she has a minor cough and slight yellowing in the whites of her eyes. The pain continues and Portia's mother is not used to seeing her cry so much, so she makes an appointment with her physician.

It is routine now to screen all infants (by law in all 50 states) for sickle cell. However, since Portia's mom had a home birth, this story assumes that her newborn never had the blood test done. The scenario in this case may be uncommon, but is practical for this case.

RED: Indicates details that can be found in the Introduction. BLUE: Indicates information revealed in the OPQRST interview. GREEN: Indicates results of labs/tests that students will need to request on an individual team basis.

**Subjective & Objective:**

Record the information from Portia's story in the appropriate sections of the SOAP note. *Note: There will be some rows left blank due to lack of information.*

SOAP Note	
<b>Subjective:</b>	
Signs & Symptoms	pain in stomach, feet; tired/exhaustion;
Allergies	none known
Medications	none
Past medical history	Inexplicable lethargy & pain (approx every 3-4 months) attends daycare, preschool & kindergarten immunized late; home birth; maternal grandmother - sickle cell
Last oral intake	has not had appetite in the past day, willing to drink apple juice and eat cereal
Events leading to injury or illness	gradually seemed to become more and more tired; then 2 days ago pain began
Frequency	Constant pain (previously every 3-4 months for a few days at a time)
Associated Symptoms	yellow tint in whites of eyes; minor cough
Radiation	pain seems to be in bones and deep-seated all throughout abdomen, especially upper abdomen
Character	patient may not be able to describe clearly due to age, but generally is feeling aching with severe sharp pangs
Onset	2 days ago
Location	pain in abdomen and both feet
Duration	n/a (constant)
Exacerbating Factors	patient does not report any
Relieving Factors	mother gave children's tylenol at pediatric dosage 3x/day for 2 days; limited efficacy
<b>Objective:</b>	
Measurements	5 years old; 42 inches (11th percentile); 39 lbs (23rd percentile)
Vital Signs	HR: 115 beats/min BP: 93/52 (50th percentile for age) RR: 27 breaths/min Temp: 100.1 deg F <a href="http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.pdf">http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.pdf</a>
Exam Results	<b>Bilirubin:</b> total bilirubin level at 2.8 mg/dL (normal values are 0.3 to 1.9 mg/dL) <b>Blood oxygen saturation:</b> 89% (healthy level is 95-100%)
Lab Results	<b>Complete blood count (CBC):</b> low levels of RBCs & hematocrit <b>Hemoglobin electrophoresis</b> (measures amount of hemoglobin in blood): presence of Hb S detected (normally should be 0%); HbS is an abnormal form of Hemoglobin associated with SCD <b>Serum creatinine</b> (indicates how well kidneys are working): Normal <b>Sickle cell test:</b> positive for sickle cell anemia

**Differential Diagnosis:**

Make brief hypotheses about what types of illnesses or disorders Portia may have. Use your initial differential diagnosis list to conduct background research using the table below:

Differential Diagnosis List	Symptoms	Diagnostic Tests

Students don't need to request all of the tests (see results listed in the Objective section) but several would be appropriate. The Sick cell test and hemoglobin electrophoresis are the tests that confirm the diagnosis. The other tests help us understand what effects the sickle cell is having on her body and where we might need to intervene (for example, if she has low oxygen saturation she may need supportive measures for breathing, like oxygen through a nasal cannula).

**Assessment:**

1. Write a short summary of the Portia's situation
2. Identify 3 possible diagnoses from the research you conducted and list them in order of priority (level of urgency based on danger to patient).
3. Before you make your final diagnosis, move on to the next page and determine whether you need any additional information. Gather the new information.
4. Then come back to the assessment box on this page and write your final diagnosis and support it with evidence and reasoning.

**Assessment:**

<b>Summary</b>	
<b>Differential Diagnoses</b>	1. 2. 3.
<b>Final Diagnosis</b>	<p><i>Claim:</i></p> <p><i>Evidence:</i></p> <p><i>Reasoning:</i></p>

**Data Collection:**

Determine what additional information you need, if any, to make a final diagnosis. Write any additional questions for Toby in the space below.

Questions for Portia or her parents	Answers

Diagnostic Tests/Labs Needed	Results

**Note:** Be sure to also go back to your Subjective and Objective sections to fill in the new information gathered here.

**Plan:**

Create a plan for Portia, using information you research about the treatment and management of her diagnosed illness or disorder.

**Plan:****Steps of Plan**

(Consider mental, social and physical health; short- and long-term needs, and follow-up care required)

The plan should include, at minimum:

--education for patient and parents on disease, possible complications, what to expect, and how to carry out treatment plan (they need to understand that there is no cure, the goal is to manage the illness and control symptoms)

--Physical health: immediately needs oxygen, IV fluids, and pain reliever; long-term needs folic acid supplements (helps make new RBCs), antibiotics (to prevent infection); vaccinations updated (including the additional vaccines for Hib, PCV, and PPV)

--Mental health: counseling; social worker to ensure supportive services are received;

--Social health: support group for parents

In the past, people with sickle cell disease often died between ages 20 and 40. Thanks to a better care people now can live to the age of 50 and beyond. Causes of death include organ failure and infection. (MedLine Plus)

**Questions to consider:**

- What is the long-term prognosis (expected outcomes) for Portia?
- What complications might Portia face in the future?
- How will Portia's parents cope? Will they need any support?
- What barriers might make effective treatment difficult?
- In what ways might a public health professional contribute to improving outcomes for those with sickle cell anemia, at a population level?

This module was focused on public health, but this first case study was carried out from a clinical health perspective. Encourage a discussion on students' responses to this question in order to help place this case study in context. The post-case questions at the end of the case will also help students tie back to all of the public health learning objectives.

**Final Presentation:**

It is time to review the cases in the pediatric intensive care unit (PICU). Your team is responsible for presenting for 2-3 minutes on one disease that you “ruled out” during your differential diagnosis. Be sure to include what specific evidence (symptoms, test results, etc.) that allowed you to eliminate this disease as a possibility.

PRESENTATION PLANNING			
Role	Team Member	Portion of Presentation	Notes
Nurse			
CNA (Certified Nurse Assistant)			
Physician			
Social Worker			

Have students think about what information would be most aligned to each of their different roles (considering social, emotional, physical, mental health). Ask how the work of public health is integrated into each of their roles as well.



**Rubric:**

You will be graded on the stated objective (PH1.9: Recognize, gather, and organize subjective data in a simple patient case scenario) using the rubric below:

PH1.9: Recognize, gather, and organize subjective data in a simple patient case scenario			
Needs Improvement	Emerging Mastery	Partial Mastery	Mastery
<u>ASSESSMENT:</u> <b>Summary:</b> Missing or incomplete <b>Differential diagnosis:</b> 1 or less diseases researched <b>Diagnosis:</b> Final diagnosis incorrect and not supported with evidence and reasoning or missing.	<u>ASSESSMENT:</u> <b>Summary:</b> Some essential facts of the case are present. <b>Differential diagnosis:</b> Research on diseases not thorough or supported with evidence <b>Diagnosis:</b> Final diagnosis incorrect and not supported with evidence and reasoning.	<u>ASSESSMENT:</u> <b>Summary:</b> Most essential facts of the case are summarized clearly. <b>Differential diagnosis:</b> Thorough research conducted on 2-3 diseases but may not be prioritized or supported with evidence <b>Diagnosis:</b> Final diagnosis may be correct or incorrect, but is supported with evidence and reasoning.	<u>ASSESSMENT:</u> <b>Summary:</b> All essential facts of the case are summarized clearly. <b>Differential diagnosis:</b> Thorough research conducted on 3 or more diseases, listed in priority of urgency, ruled out using specific evidence <b>Diagnosis:</b> Final diagnosis is correct, based on evidence, and supported with logical reasoning.
<u>PRESENTATION:</u> <b>Information:</b> Total lack of clarity <b>Logic and Evidence:</b> No logic or evidence presented to support <b>Teamwork:</b> Some team members do not contribute	<u>PRESENTATION:</u> <b>Information:</b> Symptoms and diagnostic criteria presented with lack of clarity <b>Logic and Evidence:</b> Rationale does not make sense and is not evidence-based <b>Teamwork:</b> Some team members do not contribute	<u>PRESENTATION:</u> <b>Information:</b> Symptoms and diagnostic criteria presented with slight lack of clarity <b>Logic and Evidence:</b> Rationale for why the disease was ruled out makes sense but is not evidence-based <b>Teamwork:</b> All team members contribute, but unevenly	<u>PRESENTATION:</u> <b>Information:</b> Disease symptoms and diagnostic criteria clearly presented <b>Logic and Evidence:</b> Rationale for why the disease was ruled out makes sense and is evidence-based <b>Teamwork:</b> All team members contribute to presentation

**Post-Case Wrap-up Questions:****Module 5 Learning Objectives:**

<b>Obj 5.1:</b> Identify communities and the factors that shape their health.
<b>Obj 5.2:</b> Identify examples of the ten essential functions of public health
<b>Obj 5.3:</b> Analyze a problem to identify factors on various levels of the social-ecological model
<b>Obj 5.4:</b> Differentiate between communicable and noncommunicable disease.
<b>Obj 5.5:</b> Differentiate between modifiable, unmodifiable, predisposing, enabling, and reinforcing risk factors.
<b>Obj 5.6:</b> Distinguish between primary, secondary, and tertiary prevention.
<b>Obj 5.7:</b> Evaluate the potential consequences of the anti-vaccination movement.

ANSWER THE FOLLOWING QUESTIONS ON A SEPARATE SHEET OF PAPER.

**Obj. 5.1:** What type of communities may face a greater likelihood of developing the disorder Portia was diagnosed with? Why?

**Obj. 5.2:** Name three different functions of public health that could be enacted to help reduce the impact of this disease in patients like Portia. Explain an example of how each of those functions would be carried out in the case of this disease.

**Obj. 5.3:** Consider Portia's treatment plan. Name one factor on each level of the social-ecological model (individual, relationships, community, societal) that will influence her health outcomes.

**Obj. 5.4:** Is Portia's illness communicable or noncommunicable? Explain your answer. If it was communicable, how was it transmitted? If noncommunicable, how what factors caused her to acquire it?

**Obj. 5.5:** All 50 states now have laws to test infants for Portia's illness at birth. We know Portia had a home birth and somehow slipped through the cracks so she did not receive this type of testing. Most children with her illness would have been diagnosed sooner. Besides the blood testing she did not receive as an infant, name at least two other risk factors that led to her late diagnosis. Explain what type of risk factors they are--modifiable, unmodifiable, predisposing, enabling, and/or reinforcing.

**Obj. 5.6:** What type of prevention is Portia now receiving, after being diagnosed, treated and sent home with a long-term treatment plan?

**Obj. 5.7:** Given what you know about Portia's mother and her attitudes and values related to health, why do you think she might resist getting Portia vaccinated? What consequences may have arisen if she did not get Portia vaccinated?