## Lesson Overview

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| How many days are needed to teach this lesson? | 3 |
| Grade Level(s) | 9-12 |
| Subject(s) | Anatomy and Physiology<br><br>(At my school the class called Biomedical Sciences 100. It is considered a Life Science, Career Technical Education, and Dual Enrollment Course.) |
| Lesson Summary | Students investigate the impact of long-COVID on the nervous system in both the United States. and Mexico. |
| Standards | Next Generation Science Standards<br><br>**HS-LS1-2:** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.<br><br>California Career Technical Education Model Curriculum Standards for Health Science and Medical Technology Patient Care Pathway<br><br>**B2.0:** Understand the basic structure and function of the human body and relate normal function to common disorders. |
| Focus Pulitzer Center news story/stories | Long COVID in Mexico: Neurological and Psychiatric Symptoms \| Pulitzer Center |
| Content Advisory | COVID-19<br>Mental Health Disorders and Suicide<br>Death |
| Notes on Context | The course that I teach is called Biomedical Sciences 100. This course is an introductory dual enrollment Anatomy and Physiology course. Students would take this course prior to taking college level anatomy and physiology. This course is a part of a Health Careers Academy Patient Care Pathway. The students in this course are in the Health Career Academy and are interested in pursuing a career in health care. |

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| | This course counts as a career technical education course as well as a life science course. Students are receiving both high school and college credit for this course. |

## Lesson Plan

| Lesson Objective(s) or Essential Question(s) |
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| **Student Lesson Objectives (What students will learn from this lesson):**<br>• I can list and describe the structures and functions of the nervous system.<br>• I can list and describe the long term neurological symptoms of COVID-19.<br>• I can create a model to show the cause, mechanism, and effect of the long-term neurological symptoms of COVID-19.<br>• I can compare and contrast the availability of treatments for long-COVID in both the United States and in Mexico.<br>• I can raise awareness on the impacts of long-COVID and identify steps to address the impacts of long COVID-19 in Mexico.<br>• I can come up with solutions on how to help patients who are experiencing long-COVID neurological symptoms.<br>• I can create an educational tool to raise awareness on the impacts of long-COVID. |
| **Focus Pulitzer Center News Story/Stories** |
| • "Long COVID in Mexico: Neurological and Psychiatric Symptoms" by Alice Pipitone and Quetzalli Blanco<br><br>**Additional Resources:**<br>• **Graphic Organizers,** influenced by:<br>  ○ The Wonder of Science , *Graphics & tools*.<br>• **Clinical Case Study,** influenced by:<br>  ○ "Food tastes like 'sewage' for 11-year-old with long COVID who can't eat" by Aristos Georgiou (Newsweek)<br>• **Course Text Book**:<br>  ○ Shier, D. N., Butler, J., Lewis, R., & *et al.* (2015). *Hole's essentials of human anatomy & physiology* |

(12th ed.). McGraw-Hill Education.

- **Videos**
  - "Parosmia' is the rancid-smelling aftermath of COVID-19 that has many concerned"
  - "Mobile doctor explains 'Parosmia', rancid-smelling aftermath of COVID-19"
  - "Leading researcher breaks down first-ever Long COVID Congressional hearing"
  - "Struggling with long COVID neurological effects in Mexico"

- **School Library Database**
  - https://sites.google.com/sbunified.org/smroyalslibrary/databases-ebooks?authuser=2

## Lesson Steps

**Lesson Slide Deck**

**Day 1: 90 Minute Block Period**

1. Review of the Nervous System (15 Minutes)
   a. What are the structures of the nervous system?
   b. What are the functions of the nervous system?
   c. Students think about these questions and answer them on the *Structure and Function Graphic Organizer.*
   d. Students turn to a neighbor to compare the structures and functions that they wrote in the *Structure and Function Graphic Organizer* with one another's.
   e. Student volunteers come up to the smart board or white board to write down their findings.

2. Introduction to COVID-19 (15 Minutes)
   a. Padlet Discussion Board: What do you know about COVID-19?
      i. Students answer this question via padlet.
   b. Padlet Discussion Board: What are some symptoms that people experience as an effect of COVID-19?
      i. Students answer this question via padlet.
3. COVID-19 and the Nervous System: Clinical Case Study (30 Minutes)
   a. Students read the case study to themselves the first time. They do not mark the text.
   b. Students read the case study to themselves the second time and this time they do mark the text.
      i. Number each paragraph
      ii. Circle: Subjective Data
      iii. [Bracket]: Objective Data

iv. Underline: Recommendations

c. Students compare their markings with one another.
   i. What did you mark that was the same?
   ii. What did you mark that was different?
   iii. Are there any changes you want to make?
d. The whole class goes through the case study together via the powerpoint slides. During this time, students complete the patient profile information.
e. SBAR (Situation, Background, Assessment, Recommendation)
   i. Students complete the SBAR on their own in the Case Study. Students can use the patient background information to help them complete this part.
   ii. Students partner up and practice sharing their SBAR with one another. An SBAR is a method of communication among health care providers.
f. Students work in their table groups to review questions for the case study.
g. After students have answered the questions, the class will go over the questions together and discuss the answers.

4. Why does COVID-19 lead to Parosmia? (25Minutes)
   a. What is the effect of Parosmia**?**
      i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
      ii. Students then share their thoughts with a partner.
      iii. Class has a discussion on the possible effects
   b. What is the cause of Parosmia?
      i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
      ii. Students then share their thoughts with a partner.
      iii. Class has a discussion on the possible effects
   c. What is the Mechanism of Parosmia?
      i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
      ii. Students then share their thoughts with a partner.
      iii. Class has a discussion on the possible effects
   d. Show 2 Videos,
      i. 'Parosmia' is the rancid-smelling aftermath of COVID-19 that has many concerned
      ii. "Mobile doctor explains 'Parosmia', rancid-smelling aftermath of COVID-19"
   e. Are there any changes you want to make to your graphic organizer?
      i. Students have time to make modifications
      ii. Class has a discussion on the possible modification to improve the information previously written on the *Cause, Mechanism, Effect* graphic organizer.

5. Exit Ticket
   a. How is Parosmia a neurological symptom of long-COVID-19?

**Day 2: 90 Minute Block Period**

1. Introduction: Neurological Symptoms of COVID-19. (10 Minutes)
    a. Padlet Discussion Board: Besides Parosmia, how else does COVID-19 affect the nervous system?
        i. Students answer this question via padlet.
    b. Show the graphic of the neurological symptoms of long COVID

2. How is the United States dealing with Long-COVID? (10 Minutes)
    a. Video: Leading researcher breaks down first-ever Long COVID Congressional hearing
    b. Complete Graphic Organizer: the United States dealing with Long-COVID

3. How is Mexico dealing with Long-COVID? (15 Minutes)
    a. Video: Struggling with long COVID neurological effects in Mexico
    b. Complete Graphic Organizer:: Mexico dealing with Long-COVID

4. Class discussion (15 minutes)
    a. What was unique to each country?
    b. What is different?

5. Why does COVID-19 lead to Long Term Neurological Symptoms ? (25Minutes)
    a. What is the effect of Long Term Neurological Symptoms**?**
        i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
        ii. Students then share their thoughts with a partner.
        iii. Class has a discussion on the possible effects
    b. What is the cause of Long Term Neurological Symptoms?
        i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
        ii. Students then share their thoughts with a partner.
        iii. Class has a discussion on the possible effects
    c. What is the Mechanism of Long Term Neurological Symptoms?
        i. Students write down their thoughts on the *Cause, Mechanism, Effect* graphic organizer.
        ii. Students then share their thoughts with a partner.
        iii. Class has a discussion on the possible effects

6. Introduce Culminating Project (30 Minutes)
    a. Disease Project

7. Exit Ticket: Why is it important to raise awareness of long-COVID Neurological Symptoms?

**Day 3:**

1. Library collaboration for students to work on their culminating project (60 minutes)
2. Students will go to the school library and use school library database as resources for their project
3. Gallery Walk for students to give feedback to each other on the project (15 minutes)
    a. Provide one strength
    b. Provide one area of improvement
4. Based on feedback, students make any modifications to their projects (15 minutes)
5. Students will print out their posters, laminate , and translate them in Spanish (Optional)

**Performance Task(s)**

- Students will create a poster that raises awareness on the long-term effects of long-COVID
- Students will use the information that they learned in the lessons as well as information from the database to create their poster.
- The posters will be delivered to a clinic in Mexico, in the cities of Guadalajara and Agauscalients, and the town of El Sitio, Zacatecas. (I have family members who work as doctors in these clinics who will receive the posters to distribute them.)
- Students will also send posters to health offices in our school district and to local skilled nursing facilities that focus on neurological care and COVID-19 prevention.
- Since over 75% of my students are bilingual. I will have students volunteer to translate the posters in Spanish as well.

**Assessment**

1. Padlets
2. Clinical Case Study
3. Graphic Organizers
4. Class Discussions
5. Performance Task: Culminating Project