

Telehealth Simulation: Cardiopulmonary
****indicate telehealth focused content***

A. Cover Sheet/Overview of Case

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Date of case development:

11/10/2020

***Case purpose (e.g., brief description of the patient case and telehealth integration)**

The purpose of this case is to assist the learner to utilize telehealth for care delivery in a primary care clinic and demonstrate use of history, physical exam, and clinical reasoning skills to diagnose a patient with a cardiopulmonary disorder.

The case will illustrate telehealth care delivery tools that can be adapted for:

- 1) Telehealth visit using only ZOOM and no telehealth cart/remote patient monitoring/home kits
- 2) Telehealth visit using ZOOM telehealth cart (or other similar equipment and platform) and peripheral tools otoscope, ophthalmoscope, dermoscope, horoscope, and digital stethoscope
- 3) Telehealth visit using remote patient monitoring

***Case Objectives (Sample objectives below. Select those that apply or create new)**

- Demonstrate an understanding of the different types of telehealth technologies and the use of telehealth as a care delivery method
- Demonstrate use of a decision-making algorithm for choosing telehealth or other type of best care delivery method
- Implement telehealth etiquette, professionalism, communication, and therapeutic influence skills during a virtual patient encounter
- Demonstrate a focused cardiopulmonary assessment and adaptation in technique for a virtual patient telehealth encounter
- Demonstrate best practices and evidence-based guidelines during a telehealth visit with an appropriate physical assessment, establishment of a differential diagnosis, and management of a patient with cardiopulmonary issues

***Learner's prerequisite knowledge and skill:**

- Use of telehealth videoconferencing platform and telehealth peripherals
- Telehealth etiquette and professionalism skills
- Ability to assess, diagnose and manage the non-complex (stable) primary care patient
- Basic knowledge of advanced history and physical assessment, pathophysiology, pharmacology, health promotion, primary prevention, secondary screening; and guidelines for staging and managing hypertension, and pre-hypertension risk factors

***Telehealth Technology Addressed:**

Synchronous and asynchronous methods

***Telehealth Technology Included in Case: (Select all that apply)**

- Computer
- Videoconferencing using ZOOM for healthcare and icloud (or alternate platforms)
- Telehealth cart and peripheral tools (alternate equipment may include Tytocare)
- Telehealth backpack (travel kits)
- Digital stethoscope
- Remote patient monitoring of vital signs and SaO2
- Home monitoring equipment kits (Tyto or alternate home care kits)

***Scenario requirements:**

- Standardized older adult patient (65yrs)
- RN in telehealth hub (RN is optional if patient home is originating site)
- Home care giver (this is optional if RN in telehealth hub is used)
- Telehealth cart and tools (cart is optional if patient home is originating site)
- Computers and ZOOM for healthcare for connection between provider and patient
- Home monitoring equipment (optional if telehealth hub is originating site)
- Tytocare, travel kits, or alternate home care kits if connection is to patient home

Case Complexity Adaption:

- Beginning student: This case can be used with beginning students learning the role of the APRN provider in telehealth care delivery. A beginning student could focus on how to initiate a visit and orient the patient who is using telehealth for the first time. Depending on the equipment available and site of origin of the visit, the focus in a simple scenario would be on each other's roles and orientation/education of the patient. For each role, there would be a demonstration using evaluation tools and skills checklists of telehealth etiquette, telehealth professionalism, and communication.
- Intermediate/mastery student: This case can be adapted to a higher-level student using a telehealth cart and peripheral tools in a telehealth learning suite with RN, APRN-NP and patient in the primary care telehealth hub. If no telehealth cart is available, other equipment such as Tytocare or Travel kit or Backpack may be used. This case can be adapted to a higher level of complexity using ZOOM or other video conferencing connection to the patient's home to do a cardiopulmonary history and physical exam, to diagnose and manage hypertension and cardiovascular risk factors, and review the data from the remote patient monitoring and/or home kit.
- The scenario is adaptable to the university's resources and level of student.

B. Case Information for Learners

Case Scenario Brief

** You are the nurse practitioner provider who has an appointment with a (standardized) patient who lives in a rural area 500 miles away from you. In the town, there is a telehealth hub with an RN, a telehealth cart with peripheral tools, and a platform that requires WIFI and ZOOM for health care. All people of the town have WIFI, broadband and ZOOM in their homes. The telehealth hub RN or caregiver in the home knows how to use the telehealth cart and peripheral tools. The RN or caregiver are also educated about remote patient monitoring and home monitoring kits. Patients have an option to stay in their home as the originating site of the visit or come to the telehealth hub.*

The goal is to complete a patient visit and address the problem. At the minimum there should be a focused history and physical exam around the patient's chief complaint, a management plan, and a follow up visit scheduled.

The choices for the visit are:

- *Videoconferencing with patient in their home/with home equipment/caregiver present*
- *Videoconferencing with patient at the telehealth hub with telehealth cart and peripheral tools with RN provider present with patient and APRN-NP remotely*
- *Hybrid model*

The provider(s) can demonstrate clinical judgement skills, choose the best telehealth visit platform, implement best practices for telehealth, make a list of differential and medical diagnoses; implement a plan of care based on evidenced based guidelines; decide what type of visit for follow-up, and decide what equipment is needed for the patient's home and how to ship it and educate the patient.

Patient Name: Smith **Age:** 65 – 68 years – older adult **Gender:** Male or female

Setting:

Rural area with telehealth hub, WIFI and ZOOM or other videoconferencing platform
Patient in hub or home setting.

History:

Chief complaint

“I feel tired and don’t have energy. My blood pressure might be elevated and I feel more tired than usual and am not sleeping very well. Otherwise I feel pretty good. Just worried I guess.”

HPI:

Has no current medical diagnoses. One week ago was at a health fair and found out blood pressure was higher than normal. Has a family history of hypertension and a long-term nicotine addiction (30 pack year history). About one month ago, switched to vaping regularly, and vapes daily. Rates health at 8/10 mainly due to borderline BP elevation, substance use disorder, and feeling tired. Has no limitations to doing activities. Lives in small rural town. Last visit to the doctor was 5 years ago. Visits stopped when provider retired. Heard about the primary care clinic telehealth hub in the town and considering establishing care with a telehealth primary care provider.

PMH:

Illnesses/injuries

None

Screening/prevention

Has not had any immunizations or screening tests in last five years. Has not had a colonoscopy or any other screening tests in the last 10 years. Does not see a doctor unless ill. Last TDaP was over 10 years ago.

Medications (prescription, over the counter, supplements)

None; occasionally Tylenol for headache.

Allergies (e.g. environmental, food, medication and reaction)

Has no allergies

Psychiatric

None

Social History

Has own health plan plus Medicare insurance

Substance use (past and present)

Tobacco use, smoked 1 pack per day for 30 years, one month ago switched to vaping because heard it was safer. Vapes 1-3 cartridges almost every day. Denies alcohol use.

Lives with wife, married 35 years; Owns home, Retired/was a bank president. Daughter and granddaughter recently moved in when they lost their apartment when daughter was laid off from work. Has lots of friends and attends church regularly. Is retired and in a monogamous relationship.

On no special diet and walks every day.

Family Medical History

Mother and father died at age 88 and 90 respectively

Mother no health problems; broke hip at age 72, died of pneumonia

Father had high blood pressure at age 58 and took BP pills after diagnosis, died of stroke

Has one brother who has high BP and takes one pill a day

Has 1 daughter and 1 grandchild who are healthy

Physical Exam:

Decide technology to use. At minimum complete a focused exam for chief complaint. If possible, take a complete set of vital signs and listen to heart and lung sounds including bruits as appropriate. Choose which systems to examine doing at least 2-3 (For example, heart, lung, and peripheral vascular inspection, palpation, percussion, and auscultation techniques using peripherals or home kit). Set up a follow-up appointment.

Labs and Diagnostic Tests: TBD – student to ask or look in record for most recent labs and tests.

A. Standardized Patient Information

Case summary/presenting information

- **Patient's opening statement**
 - "I have been feeling tired for the last two months. One week ago I was at a health fair and found out from a screening tool that I have some bad habits. For example, I have an addiction to tobacco which I don't want to discuss today but might later in another appointment. I was told I have borderline high blood pressure and I have family members with high blood pressure. Other than these factors, I feel pretty good. But I am getting older and want to be healthy and age well."
 - "I live in this small rural town and we lost our provider. I want to try telehealth so I don't have to drive far especially on icy and snowy roads in the winter. This is my first-time using telehealth. I understand I can have appointments at the telehealth hub in the town clinic or that I can have my appointments at home. How does this work? What equipment is needed? Can I take my BP at home and send it to you? What kind of equipment do I need? What do the readings mean and how can I get my BP down?"
 - Visit format choices
 - ZOOM or other videoconferencing platform
 - ZOOM or other videoconferencing and choice of equipment (telehealth cart/peripheral tools, Tytocare, Backpack, or travel kit)
 - Hybrid model
- **General appearance**
 - Smiles and is friendly.
- **Dress**
 - Well dressed and well groomed, business casual attire
- **Presentation and resulting behaviors**
 - Steady eye contact, relaxed body posture, speaks well and is articulate
- **Mood and emotions**
 - Happy but concerned about health status
- **Dealing with open ended questions and guidelines for disclosures**
 - Answer naturally to open ended questions

History of Present Illness

- Onset: Fatigue started two months ago
- Location: All over body tiredness
- Duration: Tired most every day especially in afternoon.
- Characteristics/quality: Not usual tiredness after a long day but like I am not getting enough sleep and I worry about things
- Intensity: Moderate, is managing sleeplessness so far
- Alleviating factors (what makes it better): Napping in afternoon and coffee
- Aggravating factors (what makes it feel worse): Baby crying at night, lots of noises from my daughter and grandbaby moving in; seems to have started when they moved in, started drinking coffee during the day and napping to keep going
- Precipitating factors (what seems to bring it on): Noise, interruption of routine
- Radiation: NA

- Treatments: Napping and coffee
- Significance (impact on patient's life): Significant, I almost fell asleep while driving to get groceries.
- Associated/other symptoms: None
- Pertinent negatives (if on SP checklist or other evaluation instrument) If asked:
- Are you eating well? Yes
- Any unusual bruising? No
- Any headache? No
- Any memory loss? No
- Any temperature, coughing, chest tightness, trouble breathing, racing heart or heart palpitations? No

Review of systems (e.g. pertinent positives and negatives)

General: Denies fever and shortness of breath

HEENT: Denies ear pain, pharyngitis, sore throat, discharge, or pain/swelling in neck

Cardiac: Denies chest pain, cyanosis, palpitations, swelling in feet

Pulmonary: Denies shortness of breath at rest or with walking upstairs; Denies wheezing or coughing; Denies sputum, Last TB was 10 years ago and was negative; Last chest x-ray was 10 years ago and was normal

Abdomen: Denies diarrhea/vomiting/blood or tarry stool

Genitourinary: Denies frequency/urgency/painful urination

Musculoskeletal: Denies any muscle weakness or pain

Neuro: Denies headache, weakness, syncope, vertigo

Past Medical History:

Illnesses/injuries: None

Hospitalizations: None

Surgical history: None

Screening/prevention: No screening tests in last 10 years. Had influenza vaccination in 2019 at health fair; Had childhood and boosters in high school but no other immunizations in last 10 years

Medications (prescription, over the counter, supplements): Tylenol

Allergies (e.g. environmental, food, medication and reaction): None

Gynecologic: Deferred

Psychiatric: None

Family History:

Family tree (e.g. health status, age, cause of death)

Mother and father died at age 88

Mother no health problems; broke hip at age 72, died of pneumonia

Father had high blood pressure at age 58 and took BP pills after diagnosis, died of stroke

Brother alive and has high BP and takes one pill a day

One daughter and granddaughter alive and well without health problems

Social History:

Has own health plan plus Medicare insurance

Substance use (past and present)

Drug use (recreational) None

Tobacco use: Smoked 1 pack per day for 30 years. Recently (one month ago) switched to vaping because heard it was safer. Vapes 1-2 cartridges a day almost every day

Alcohol use: None

Home situation/environment: Lives with spouse, married 35 years

Support systems: Wife, daughter, brother, grandchild, church

Occupation: Retired from banking industry as bank president

Relationship status: Monogamous relationship

Leisure activities: Golfing and gardening

Diet: Nothing special eats 3 meals per day

Exercise: Daily walks

Physical Exam Findings:

Vital Signs: Use these or will be done in exam

(T98.6 P72 R20) (SaO₂ 98%) (BP 128/88)

Exam done by RN at telehealth hub or by patient at home with guidance from caregiver. The findings below are a guide and the standard patient findings are what will be documented. The exam should be done on a minimum of 3 systems chosen by learner.

General: Through the camera, there is a healthy appearing patient who has good color. The patient is relaxed and talkative with good eye contact. Answer questions accurately in normal voice, has good recall, and has a comfortable demeanor.

Head: Normocephalic with equal distribution of hair. Hair color is gray.

Eyes: On inspection pupils are equal, round, and with penlight applied by the patient or provider at telehealth hub, the pupils are reactive to light and accommodation (patient or provider to shine penlight in eyes). No nystagmus. Sclera is white, conjunctiva light pink. EOMs intact.

Nose: On inspection there is no nasal flaring, the nose is normal color and blends with rest of skin tone; no drainage or swelling or bumps or bruising; with head tilted back and use of penlight nares are patent, no redness, swelling or drainage; turbinate are slightly pink and no swelling or bogginess. On palpation by patient/care giver/ telehealth hub RN, there is no pain.

Ears: On inspection pinna appear smooth and set equal to canthus of eye, no visible drainage or ear wax present, with palpation there are no lumps or pain; no pain to palpation of tragus. Telehealth hub RN can use the telehealth cart otoscope to send a picture of inner ear to APRN provider. (If patient in home, the patient/caregiver can use the home equipment otoscope in ear so APRN provider can view inner ear). The tympanic membranes are pearly grey with good light reflex and landmarks at appropriate locations, no distortions or bulging present.

Mouth/Throat: On inspection teeth are intact and no cavities; tongue is midline; posterior pharynx is pink without exudate; tonsils +2 bilaterally without exudate.

Neck: On inspection no swelling in neck. No supraclavicular retractions. On palpation no tenderness in neck in location of occipital, posterior, anterior and lateral lymph nodes. On palpation, no tenderness or lumps in thyroid region of neck. Able to swallow without difficulty. No hoarseness with talking.

Cardiac: On inspection of anterior thorax there are no visible pulsations. On palpation by patient/caregiver or telehealth hub RN there is a regular rate and rhythm pulsation. On auscultation with digital stethoscope there is clear and distinct S1 and S2 and no murmurs, skips or gallops, no S3 or S4 auscultated. (If patient in home, instruct patient/caregiver to apply a home stethoscope to listen to heart sounds and patient can palpate own pulse for rate and regularity) (If patient in telehealth hub the RN will use the cart tools and digital stethoscope to transmit sounds to APRN provider).

Pulmonary: On inspection there is a respiratory rate of 20, rhythm and depth of respirations is normal and full. The skin tone is normal color for rest of the body and no bruising or lesions. On palpation there are no areas of pain or tenderness or lumps. (If patient in home, instruct patient/caregiver to

apply stethoscope from home kit to listen to lung sounds). (If patient in telehealth hub the RN will use the cart tools and digital stethoscope to transmit sounds to APRN provider). On auscultation the lungs are clear with vesicular sounds, with no wheezing, rales, or rhonchi.

Abdomen: On inspection there are no visible pulsations. On palpation (by patient/ caregiver or telehealth hub RN) there is no pain or tenderness in any of the four quadrants. On auscultation there are normoactive bowel sounds in all four quadrants. (Adapt for use of cart tools and digital stethoscope or home kit).

Peripheral vascular/extremities: On inspection there is normal color and no cyanosis; no swelling or edema; on palpation the patient/caregiver or RN palpates warm toes and fingers; on palpation there are strong pulses (2+) in the carotid, brachial, and radial areas on both upper extremities which are equal; on palpation the patient/caregiver or RN reports strongly felt (2+) pulses in the femoral, popliteal, and tibial pulses which are equal on both sides. On palpation there is no pitting edema with applied pressure. On auscultation the provider(s) will use the stethoscope to listen for bruits in carotid and abdominal and femoral arteries (use adaptation for home kit tools).

Additional materials (optional)

Chemistry Profile

Thyroid T3, T4, TSH

Lipid panel

CBC

WBC

Chest radiograph or spiral CT scan
(follow Medicare guidelines)

B. Evaluation Tools for this Case

Suggested Templates:

- Faculty Evaluation of Student Telehealth Etiquette and Professionalism during Telehealth Visit
- Standard Patient Evaluation of Student on Telehealth Etiquette and Professionalism During Patient Care Encounter
- Student Self Evaluation and Reflection for Improvement

- Faculty Evaluation of Student Telehealth Etiquette and Professionalism during Telehealth Visit (Basic Skills Check-off) (May be Adapted as Student Progresses from basic to mastery level and for Scenario and Complexity of Patient from Non-complex to Complex)

Student Name: Date: 1 = did not meet 5 = basic 10 = mastery	Did not meet 1				Basic Level met 5					Mastery Level Met 10
Verbalized and demonstrated the importance and use of a quality web cam and telemedicine platform.										
Assured Consent										
Introduced all present in both patient and provider rooms										
Developed a safety plan (ID of patient, emergency contact, location and local emergency responders)										
Was on time and started appointment on time.										
Set the webcam at eye level and had good eye contact with patient.										
Informed the patient they would look away from them at times and would take notes.										
Introduced self and explained how a telehealth visit works.										
Set up a professional space for visit.										
Was aware of surroundings and able to respond to change in surroundings as case unfolded.										
Space had neutral colors and no distractions and writings on walls.										
Remembered to use all HIPPA rules that applied.										
	1				5					10

Eliminated distracting noise, telephone ringing, knocking on door. Put up a sign of “Do Not Disturb”										
Dressed professionally. Wore no distracting jewelry. Attended to tips for setting a good first impression.										
Prepared ahead of time by reading the patient's complaint and history.										
Followed all guidelines of a face to face appointment (beginning, middle, and ending)										
Discussed the lag time and showed awareness of lag time during appointment.										
Demonstrated diagnostic reasoning and evidenced based care management skills for situation (substance use disorders: alcohol and vaping/tobacco use) (hypertension and risk for CV disease)										
Demonstrated patient safety during appointment.										
Demonstrated knowledge of 6 domains of quality care and use in telehealth and patient care delivery.										
Could verbalize the 5 determinants of health and how they related to the patient encounter and quality care.										
Used SBIRT- Screening brief intervention, Resources/Referral to Treatment										
Used simple methods such as teach back to make sure patient understood the major education points.										
Clearly communicated all instructions including next appointment time, ended the encounter appropriately.										
Prepared for sending secure report on visit with the plan referral, and follow-up information.										
Demonstrated the 8 Telehealth Competencies (NONPF)	1				5					10

1. Showed telehealth etiquette and professionalism while videoconferencing.										
2. Demonstrated skills in using peripherals, otoscope, electronic stethoscope, dermascope, and ophthalmoscope.										
3. Demonstrated and could articulate an understanding of when telehealth should and should not be used										
4. Demonstrated understanding of privacy/protected health information (PHI) regulations										
5. Demonstrated proficiency in the use of synchronous and asynchronous telehealth technology.										
6. Demonstrated knowledge of appropriate documentation and billing of telehealth technology.										
7. Demonstrated ability to collaborate inter-professionally using telehealth technologies.										
8. Demonstrated proficiency in taking a history, performing an appropriate physical exam, and generate differential diagnoses using telehealth.										

Student Self Evaluation and Reflection for Improvement

Education level: _____ Gender: __Male __Female Age in years: ____

What characteristics make you a caring provider?

Do you feel you can project your caring attributes through a telehealth computer screen? Yes No
If no, why not?

Rate your confidence.

How confident do you feel right now that you can use the telehealth equipment in the practice setting?

1	2	3	4	5	6	7	8	9	10
Not confident									Very confident

How confident do you feel right now that you can apply telehealth etiquette skills during a telehealth visit?

1	2	3	4	5	6	7	8	9	10
Not confident									Very confident

Rate you level of disagreement or Agreement with the following statements (higher scores mean higher agreement).

I am very satisfied with the telehealth learning experience we had today.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I am very satisfied with the faculty in this experience.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I am very satisfied with the interaction with other students in this experience.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I am very satisfied with the student discussions in this experience.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I am very satisfied with the student hand-outs and the preparation materials for this experience.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I am very satisfied with the demonstration using the telehealth equipment.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I believe telehealth is an important part of health care delivery and should be taught to all students before they graduate.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

Overall, I am very satisfied with this learning experience.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

I would recommend this experience for other students.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

What one thing would improve this experience?

List and Reflect on your strengths, areas of challenge, and plan for improvement.

Strengths	Challenges	Plan for Improvement