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SCHOOL OF GRADUATE STUDIES

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Health Systems Science (HSS):
A Longitudinal Curriculum



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Health Systems Science (HSS) Longitudinal Curriculum

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Preface

The Quintuple Aim

Over the years, the triple aim^{1,2} led to the quadruple aim, which led to the quintuple aim^{3,4}. The complexities of the modern healthcare environment allow little margin for error. More importantly, the complexities of our patients' lives, including the many social determinants impacting their health⁵ must not be overlooked. As the healthcare community has acknowledged the importance of communication, collaboration, and teamwork, the emphasis from *individuals* providing quality healthcare has shifted to *teams* providing quality healthcare made better by working together.

In the *World Economic Forum*,⁶ Laurence Spierling makes the case that in the business world, we actively break down silos to enhance outcomes, and that healthcare should look to that model to enhance care.

Interprofessional collaboration improves safety, patient outcomes, and patient satisfaction. Healthcare professionals seeing those improvements are less likely to feel burnt out, undervalued, and ineffective.

However, these skills do not emerge spontaneously in healthcare professionals; instead, these skills require intentional cultivation, just like the cognitive and psychomotor skills necessary for successful healthcare delivery.

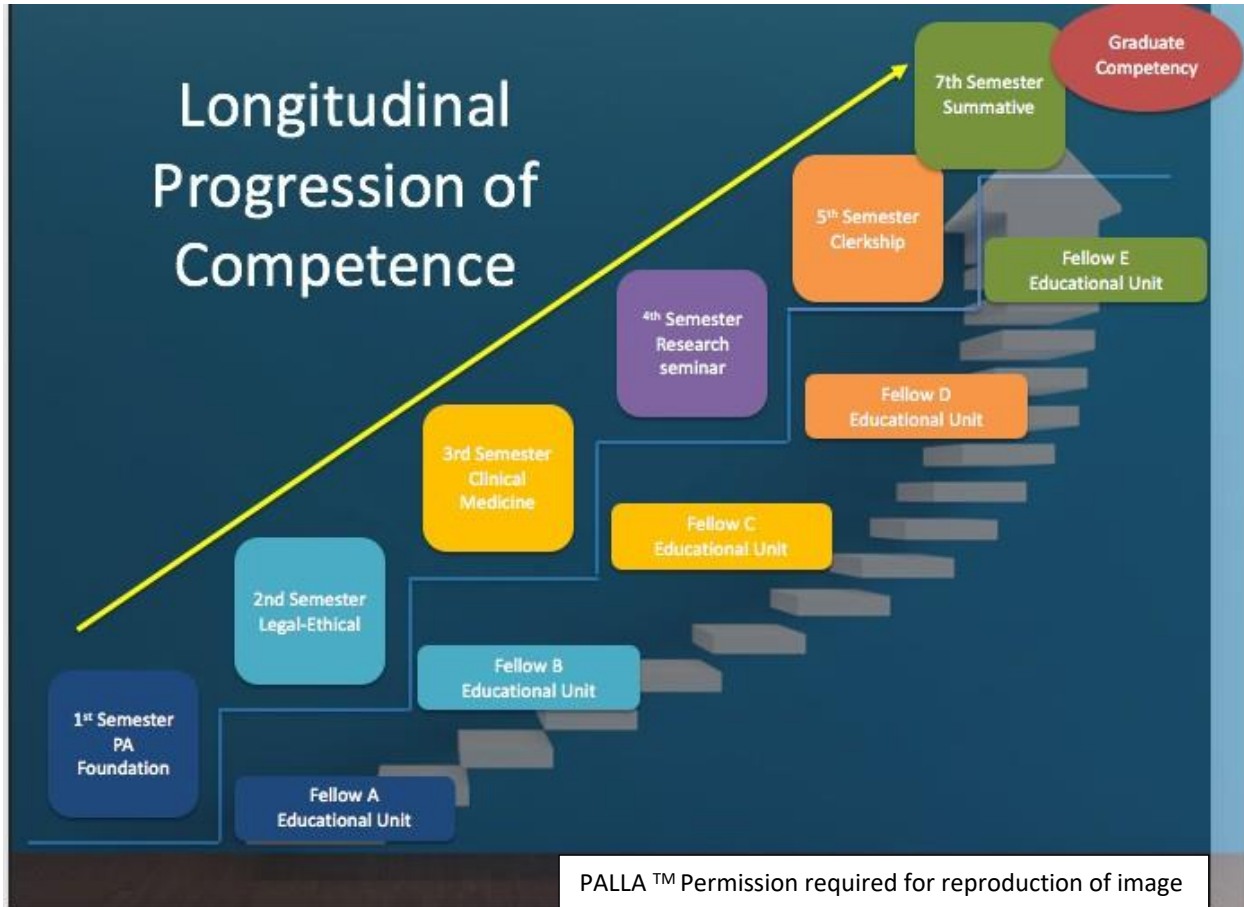
Health Systems Science (HSS) is the field of study of how health care is delivered by professionals and experienced by patients and families, how health professionals work together to provide care, and how the health system can improve patient outcomes and satisfaction. It is now recognized as one of the three pillars of medical science, along with the basic and clinical sciences. HSS has an emphasis on understanding the role of human factors, systems engineering, leadership, and patient improvement strategies that will help transform

the future of health care and ensure greater patient safety This module introduces the key concepts of HSS and how these concepts can be leveraged by an individual PA to address the challenges and opportunities facing the health care system in the 21st century.

Connections to the ARC-PA Standards

The process of implementing health systems science and health systems thinking should start long before the healthcare professional works with their first patient. Laying the groundwork during health professions education could garner a shift in mindset and a more prepared next generation of healthcare practitioners and leaders. For physician assistants/associates, health systems thinking aligns with the ARC-PA standards,⁷ but in the face of packed curricula and with little time for new curricular development, educators may find it overwhelming to weave this important topic through the curriculum. This curricular product offers ideas for practical implementation and intentional threading of health systems science into existing PA curricula. The objectives, assessments, and instructional strategies are adjustable to your local program and context, and we encourage you to adapt them as needed. We hope you enjoy this curriculum and find it a useful addition to your classroom tools.

Curricular Framework: Longitudinal Progression of Competency



This curricular product was developed using principles of competency-based education. Each educational unit is intended to build on the prior unit, by which, an increasing level of competency is expected of a student as they progress from one educational unit to the next. Learners are expected to meet the level of knowledge, skill, and value defined by the program-level learning outcomes by the end of the curriculum and/or terminal point of the PA educational program. The educational units for this curricular product are targeted to correlate to the 1st, 2nd, 3rd, 4th, 5th, and 7th semester time periods of a PA educational program, with each educational unit intended to be embedded within one of those six courses.

Program Outcomes, PAEA New Graduate Competencies, and Course Objectives

PAEA New Graduate Competencies		Program Outcomes*				
		Outcome 1 Patient-Centered Practice	Outcome 2 Society & Population Health	Outcome 3 Health Literacy and Communication	Outcome 4 Interprofessional Collaborative Practice & Leadership	Outcome 5 Professional and Legal Aspects of Healthcare
	Graduates will demonstrate the ability to utilize up-to-date scientific evidence to inform clinical reasoning and clinical judgment in context of patients' lives.	Graduates will be able to recognize and understand that the influences of the larger community may affect the health of patients and integrate knowledge of social determinants of health into care decisions.	Graduates will be able to communicate with patients as partners who engage in shared decision-making and who communicate, interpret, and express themselves as individuals with unique personal, cultural, and social values.	Graduates will be able to recognize that the patient is at the center of all health care decisions and to partner with the patient to define the patient's health care goals.	Graduates will be able to practice medicine in a beneficent manner, recognizing and adhering to the standards of care while attuned to advancing social justice.	Graduates will be able to articulate the essential aspects of value-based health care and apply this understanding to the delivery of safe and quality care.
		Cultural Humility				
		Self-assessment and ongoing professional development				
PA Courses	Instructional Objective					
1 st PA Foundation	Accurately identify and describe foundational principles of health systems science.	B			B	B
2 nd Legal Ethical	Identify and describe recent key legal regulations and ethical principles that govern healthcare practice, including patient rights, confidentiality, and informed consent.	B	B		B	
3 rd Research Seminar	Critically appraise the literature for evidence based data	B			I	
4 th Clinical Medicine	Recognize the roles of the multidisciplinary team; identifying how their roles support the principles of health system science	I	I	I	I	
5 th Clerkship	Demonstrate in a simulated patient encounter a patient evaluation (including history, physical examination, laboratory or imaging data interpretation, communication with the patient and family, referrals that address unmet needs, and communication with the interprofessional team).			I	I	
7 th Summative	explain the various components of health systems science and how they work together	A	A		A	I

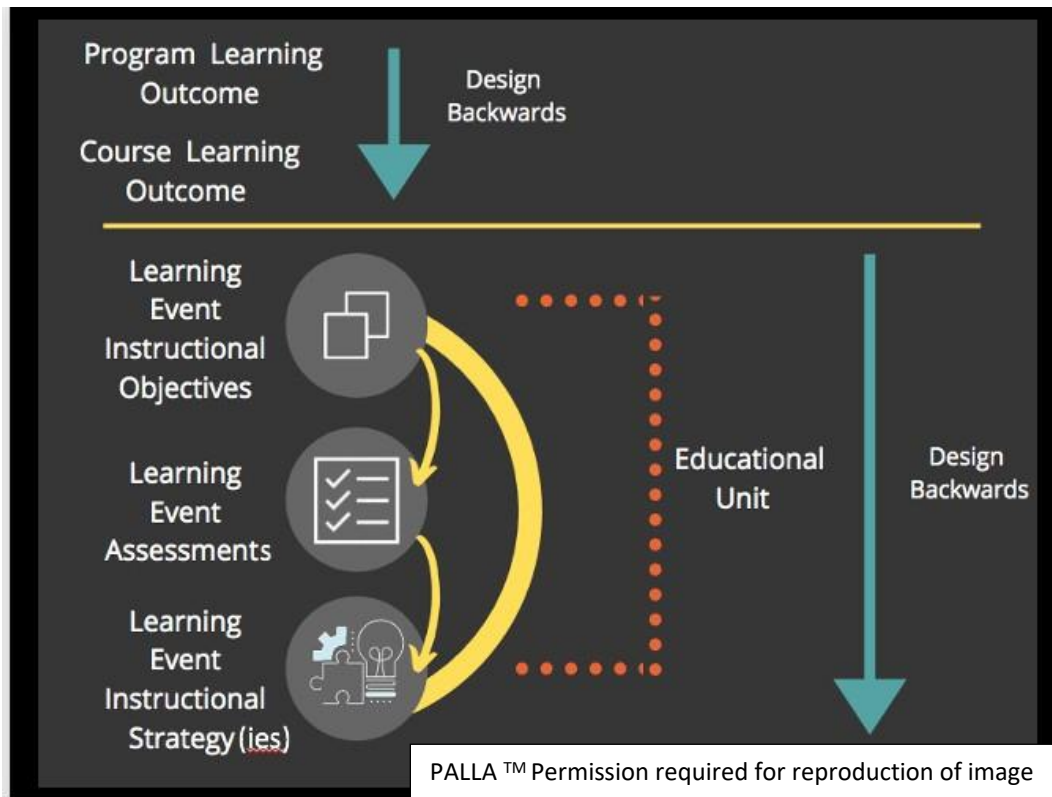
Legend: B = Beginning (Green), I = Intermediate (Purple), A = Advanced (Red)

*Actual program outcomes are not relevant for this project; instead, the curriculum was aligned to the PAEA New Graduate Competencies as these are relevant for all programs.

See footnote next page

Curricular map. This curriculum is designed to be adaptable for individual programs. Therefore, in lieu of program goals, we have framed the curriculum in the [PAEA New Graduate Competencies](#),⁸ which are shown across the top of the table. As described in the competencies,⁸ cultural humility, and self-assessment and ongoing professional development are also foundational for all PA coursework. Additionally, the AAMC DEI Competencies⁹ were a guiding resource document, and the influence of those competencies is threaded throughout the curriculum. On the left side of the table, we have demonstrated how the course objectives for each course in the curriculum align with learner development from beginner, to intermediate, to advanced.

Longitudinal Curricular Development and Alignment



Each educational unit has vertical alignment both with the course in which the educational unit is intended to be embedded within as well as with the program level learning outcome for the topic. The educational units also have horizontal alignment in that the instructional objectives, assessments, and instructional strategies align. The educational content was generated using a backward curricular design.¹⁰ First, instructional objectives were created for each educational unit followed by creating assessments designed to measure if students met the expectations outlined in the instructional objectives. Once instructional assessments were framed, instructional strategies were outlined and instructional materials created and designed to have learners engaged in activities that would appropriately prepare them to meet the outlined assessments.

Educational Unit 1, PA Foundations

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

Define foundational principles and terms related to health systems science as they pertain to the professional standards of PA practice.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none"> 1. define key terms related to health systems science (such as healthcare delivery, health policy, and social determinants of health) in their own words 2. accurately identify and describe foundational principles of health systems science (including patient-centered care, population health, and systems thinking) 3. explain how different principles and terms in health systems science interconnect and influence one another in real-world healthcare scenarios 4. apply foundational principles and relevant terminology to discuss case studies or examples, illustrating their understanding of how these concepts impact healthcare delivery and outcomes 	<ol style="list-style-type: none"> 1. Formative Matching (IO 1) 2. Formative Graphic Organizer (IO 2,3,4) 3. Summative MCQs (IO 1,2,3,4) 	<ol style="list-style-type: none"> 1. “Memory” Matrix 2. Pre-reading and Discussion 3. Jigsaw

Instructional Strategies Unit 1

Activity 1. “Memory” Matrix:

Unit 1 Instructional Objective # 1: Upon completion of the learning activities the student will be able to define key terms related to health systems science (such as healthcare delivery, health policy, and social determinants of health) in their own words.

Faculty Instructions:

1. The memory matrix instructional strategy is typically to assess the recall or prior knowledge of important content and the ability to organize the content based on categories provided by the instructor. It utilizes retrieval practice based on the pre-class readings (table of definitions above).
2. Faculty provide students with a table that has the headers pre-populated, ready to be filled (example provided below).
3. Students should fill in the empty cells with what they know about the topic before faculty lead an in-class discussion of the terms, definitions, and examples/applications.
4. At the end of the discussion, the student should review the matrix they completed before discussion to self-assess what they learned during the discussion. Provide time for students to review this and to fill in empty cells with information they have now learned.

Term	Definition	Example / Application
Healthcare Delivery	The methods and processes through which healthcare services are provided to patients.	A patient seeing a PA at a clinic
Health Policy	Decisions and laws that govern the operation of healthcare systems and affect how care is delivered.	HIPAA
Health Informatics	The use of information technology and data analysis to improve health outcomes and streamline healthcare processes.	Electronic medical records
Patient Safety	The prevention of errors and adverse effects associated with healthcare, ensuring the safety of patients during their care.	Surgery time out to confirm patient, procedure, etc.
Value Based Care	A healthcare delivery model in which providers are paid based on patient health outcomes rather than the volume of services provided.	Integrated care teams
Social Determinants of Health	The conditions in which people are born, grow, live, work, and age that affect their health and well-being.	Proximity to grocery stores, transportation, etc.

Student Instructions:

Fill in the table provided to the best of your ability. Do not worry if the terms are unfamiliar, the intent is to self-assess prior knowledge in anticipation of a faculty led discussion to ensure understanding, and to provide a framework within which to contextualize new learning.

Term	Definition	Example / Application
Healthcare Delivery		
Health Policy		
Health Informatics		
Patient Safety		
Value Based Care		
Social Determinants of Health		

Activity 2. Pre-reading and Discussion:

Unit 1 Instructional Objective # 2: Upon completion of the learning activities the student will be able to accurately identify and describe foundational principles of health systems science including patient-centered care, population health, and systems thinking.

Unit 1 Instructional Objective # 3: Upon completion of the learning activities the student will be able to explain how different principles and terms in health systems science interconnect and influence one another in real-world healthcare scenarios.

Faculty Instructions:

Students should read the assigned article and scenario before class. Prompts are provided in the students' instructions to guide their reading. In class, discuss the article including the prompts. This activity prepares the students for assessment 2.

Pre-class required reading:

Before attending class read: Article: Bartoletta KM, Starr SR. Health systems science. *Adv Pediatr.* 2021;68:1-19. doi:10.1016/j.yapd.2021.05.001.

Student Instructions, part 1:

Familiarize with the scenario below in the context of the above article’s framework. Be prepared to discuss how the various aspects of HSS reflected in the scenario affect each other.

Scenario: Perioperative Glycemic Control in People with Diabetes Undergoing Open Heart Surgery

A hospital has failed to meet government metrics on a reoccurring basis. The administrators determine that this failure is impacting their reimbursement. The hospital implements an interdisciplinary care approach to manage perioperative glycemic control for patients with diabetes undergoing open heart surgery. The team includes surgeons, anesthesiologists, endocrinologists, nurses, dietitians, and pharmacists. The team identifies that patients with diabetes undergoing open heart surgery at the hospital experience higher rates of postoperative complications, such as infections and delayed wound healing. They analyze data to design interventions targeting this at-risk population.

The team identifies gaps in glycemic control processes, such as delays in insulin delivery. They address these by improving workflows, such as integrating glycemic management into the electronic health record (EHR) for real-time monitoring and alerts. A standardized protocol for perioperative glycemic control is developed to ensure consistent practices across departments. This protocol includes preoperative blood glucose optimization, intraoperative insulin infusion monitoring, and postoperative blood sugar management. The team leader implements quality improvement initiatives and conducts staff training on the importance of glycemic control, and tracks trends and metrics to test and refine interventions.

Each individual patient’s preferences, cultural beliefs, and concerns about insulin use are incorporated into the care plan with an emphasis on shared decision-making. Recognizing that patients’ home environments and socioeconomic status impact their diabetes management, social workers and case managers are engaged to connect patients with resources for medication affordability, dietary planning, and transportation to follow-up visits. The team ensures equitable access to resources and modifies the glycemic control protocol to accommodate individual needs without financial or cultural barriers.

The team evaluates the cost-effectiveness of their glycemic control interventions by tracking reduced rates of complications, shorter hospital stays, and lower readmission rates.

Student Instructions, part 2: Reflect on the scenario from your pre reading as you discuss with your classmates and faculty to understand the importance and relationships between various aspects of HSS. This discussion, along with the knowledge gained from your pre-readings, should enable you to begin drafting your graphic organizer assignment (Assessment #2).

Activity 3. Jigsaw:

Unit 1 Instructional Objective # 4: Upon completion of the learning activities the student will be able to apply foundational principles and relevant terminology to discuss case studies or examples, illustrating their understanding of how these concepts impact healthcare delivery and outcomes.

Faculty Instructions: Video overview of the Jigsaw Teaching Method [The Jigsaw Method](#)

Students should be presented with an overview of the goals of the activity and then divided into “expert

groups.” Number and size of each group should be determined by faculty based on cohort and program characteristics; each group can be assigned to illustrate 1-2 foundational principles and / or key terms.

Together, students from each group ensure “expertise” for their topic and develop a brief scenario to illustrate their principle(s) of HSS. The group will present their “case” or example to the class. After all groups have presented, students are then redistributed to new groups so that members of each expert group are in a new group to engage in small group discussions identifying the overlap and interconnectedness of the various principles highlighted in their scenarios. Following this collaboration, students will be prepared to put the final touches on their graphic organizers.

Link: <https://www.youtube.com/watch?v=euhtXUgBEts>

Student Instructions: Before class, review the terms and principles covered in this unit. Faculty will divide you into groups, with each group then tasked to create a case or example illustrating 1 or more concepts central to the theme of HSS. After all cases are presented to the class, redistribution of the groups will allow for new perspective in identifying additional HSS principles that unintentionally were reflected in each scenario, and deeper understanding of the relationships between principles and how they impact health outcomes in realistic scenarios.

Assessments Unit 1

Formative assessments:

Formative Matching Activity (IO 1)

Student Instructions: Match each term in **Column A** to the correct definition in **Column B**.

Column A: Terms

1. Healthcare Delivery
2. Health Policy
3. Health Informatics
4. Patient Safety
5. Value-Based Care
6. Social Determinants of Health

Column B: Definitions

- A. The conditions in which people are born, grow, live, work, and age that affect their health and well-being.
- B. A healthcare delivery model in which providers are paid based on patient health outcomes rather than the volume of services provided.
- C. The methods and processes through which healthcare services are provided to patients.
- D. The prevention of errors and adverse effects associated with healthcare, ensuring the safety of patients during their care.
- E. The use of information technology and data analysis to improve health outcomes and streamline healthcare processes.
- F. Decisions and laws that govern the operation of healthcare systems and affect how care is delivered.

Answer Key

- 1 → C
2 → F
3 → E
4 → D
5 → B
6 → A

Reference: American Medical Association. *Health Systems Science: Advancing Health Care Transformation*. Ed Hub. <https://edhub.ama-assn.org/health-systems-science>. Published 2024. Accessed December 11, 2024.

Formative Assignment: Create a Graphic Organizer for the Principles of Health Systems Science (IO 2,3,4)

Student Instructions:

Design a visual representation (e.g., a concept map, flowchart, infographic, or diagram) that organizes and illustrates the foundational principles of Health Systems Science (HSS).

Include brief explanations or definitions for each principle and show how the principles influence or interact with each other.

Incorporate examples (case study, policy, program) to demonstrate the application of each foundational principle.

Include a reference section to properly cite your sources.

Evaluation Criteria:

Your submission will be assessed based on the following.

A rubric is available on the next page:

1. **Accuracy:** The graphic accurately reflects the principles of HSS.
2. **Clarity:** The content is well-organized, easy to follow, and visually appealing.
3. **Connections:** Clear and logical relationships are demonstrated between principles.
4. **Examples:** Real-world examples effectively illustrate each principle.
5. **Visual Appeal:** Thoughtful use of visuals, colors, and design elements.

Rubric for Grading the Graphic Organizer Assignment

Criteria	Exceptional (4)	Proficient (3)	Developing (2)	Beginning (1)	Score
Accuracy of Content	All principles are accurately defined, with clear explanations and appropriate examples.	Most principles are accurately defined, with minor inaccuracies or omissions in examples.	Some principles are inaccurately defined or missing; examples are incomplete or unclear.	Significant inaccuracies or omissions in the principles and examples.	
Clarity and Organization	Clear, logically structured, and easy to follow.	Mostly clear and well-organized, with minor issues in flow or structure.	Somewhat disorganized, hard to follow the relationships.	Lacks clarity and organization, creating confusion.	
Connections Between Principles	Strong and logical connections are shown between principles, clearly illustrating interrelationships.	Most connections between principles are clear and logical, with minor gaps.	Some connections are unclear or missing, showing limited understanding of relationships.	Few or no connections are shown between principles.	

Incorporation of Examples	Thoughtful, relevant, and diverse examples are included for all principles.	Relevant examples are included for most principles, with minor gaps.	Examples are included but may lack relevance or depth.	Few or no examples are included, or examples are irrelevant.	
Visual Appeal	Highly creative and visually engaging, with excellent use of colors, icons, and layout to enhance understanding.	Visually appealing, with appropriate use of design elements to support understanding.	Some design elements are present but may not enhance understanding effectively.	Limited or no visual elements; design detracts from clarity.	
Citations and References	All sources are correctly cited in a clear and consistent format, with no errors.	Most sources are cited correctly, with minor errors in formatting or completeness.	Few sources are cited, or citations are incomplete or inconsistent.	No citations are provided.	

Grading Scale

- **20–24 Points:** Exceptional work; demonstrates comprehensive understanding and creativity.
- **15–19 Points:** Proficient work; demonstrates good understanding and effort with minor issues.
- **10–14 Points:** Developing work; demonstrates limited understanding and effort with notable issues.
- **6–9 Points:** Beginning work; demonstrates minimal understanding or effort.

Summative Assessments: MCQs

1. Which of the following terms refers to a healthcare delivery model that incentivizes providers to improve patient outcomes while reducing healthcare costs, rather than rewarding volume-based services?
 - A. Capitation
 - B. Fee-for-service
 - C. Integrated care
 - D. Value-based care

Key: D. Value-based care

Rationale: Capitation is incorrect because while it incentivizes reducing healthcare costs, it does not emphasize improved outcomes. Fee-for-service is incorrect because reimbursement under this model is based on quantity of services provided regardless of quality of outcome. Integrated care is incorrect because it does not address incentive structure. Value-based care is correct because it emphasizes improving patient outcomes while controlling costs.

References:

Centers for Medicare & Medicaid Services (CMS). Value-based care. (2023).

<https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/value-based-care>

2. Which of the following scenarios **BEST** demonstrates the application of systems thinking in health systems science?
 - A. A clinic focusing solely on treating symptoms rather than addressing the root causes of disease.
 - B. A community health initiative focusing on individual patient care without considering community-level trends.
 - C. A healthcare team analyzing the interconnected roles of providers, insurance companies, and social services to reduce patient readmissions.
 - D. A hospital increasing the number of staff to meet short-term patient demands without assessing long-term needs.

Key: C. A healthcare team analyzing the interconnected roles of providers, insurance companies, and social services to reduce patient readmissions.

Rationale: Systems thinking involves understanding the interconnections and dynamics within the healthcare ecosystem to improve outcomes. Only option C illustrates this concept.

References:

Braithwaite J. Changing how we think about healthcare improvement: From the system to the patient and back again. *Int J Qual Health Care*. 2018;30(suppl_1):1-5. doi:10.1093/intqhc/mzx164

3. Which of the following **BEST** describes "social determinants of health"?

- A. Community-level healthcare services provided free of charge
- B. Governmental policies regulating healthcare organizations
- C. Medical conditions that arise due to genetic predispositions
- D. Non-medical factors like housing, education, and income that influence health outcomes

Key: D. Non-medical factors like housing, education, and income that influence health outcomes.

Rationale: Social determinants of health refer to non-medical factors, such as socioeconomic conditions, that shape individual and community health outcomes. None of the other options meets the definition provided.

Reference:

Marmot M, Allen JJ. Social determinants of health equity. *Am J Public Health.* 2014;104(S4):S517-S519. doi:10.2105/AJPH.2014.302200

4. How do population health and patient-centered care interconnect to improve healthcare outcomes in a real-world setting?

- A. By allowing these two principles function independently, with no overlap in practical applications.
- B. By ensuring patient-centered care addresses the needs of individual patients, while population health focuses solely on community-level statistics.
- C. By guaranteeing healthcare providers can ensure interventions are personalized while addressing broader community needs.
- D. By integrating patient-centered care principles into population health strategies

Key: D. By integrating patient-centered care principles into population health strategies, healthcare providers can ensure interventions are personalized while addressing broader community needs.

Rationale: Option D is correct because patient-centered care complements population health by tailoring interventions to individual needs while aligning with community-wide strategies to address disparities and improve outcomes. None of the other options acknowledge the inherent connection between these two principles.

References:

Stange KC. The problem of fragmentation and the need for integrative solutions. *Ann Fam Med.* 2009;7(2):100-103. doi:10.1370/afm.971

Kindig D, Stoddart G. What is population health? *Am J Public Health.* 2003;93(3):380-383. doi:10.2105/AJPH.93.3.380

5. The care of a 22-year-old woman with type 1 diabetes, diagnosed 6 months ago, is managed by a multidisciplinary team including a PA, Certified Diabetes Educator (CDE), nurse, Registered Dietician (RD), and social worker. She expresses concern about the mental burden of managing her diabetes. The PA reviews her insulin regimen, discusses insulin pump options, and coordinates follow-up with the RD and CDE. The social worker addresses barriers to adherence, such as insurance and reluctance to use a visible device.

Which of the following **BEST** describes the role of the PA in this team-based care model?

- A. The PA's role is limited to providing direct care for the patient's medical conditions without considering patient preferences or coordinating care with the team.
- B. The PA's role is primarily to diagnose the patient's condition and prescribe medications without consulting other healthcare professionals.
- C. The PA's role is to focus solely on managing the patient's medications and leave lifestyle and social factors to other members of the team.
- D. The PA's role is to provide individualized care, work collaboratively with other team members, and ensure that the patient receives comprehensive care addressing both medical and social needs.

Key: D. The PA's role is to provide individualized care, work collaboratively with other team members, and ensure that the patient receives comprehensive care addressing both medical and social needs.

Rationale:

Option A is incorrect because in a team-based care model, the PA does not work in isolation but as part of a team that shares responsibility for the patient's overall care plan. Option B is incorrect because patient-centered and team-based care requires consideration of patient preferences and coordination with the team. Option C is incorrect because comprehensive care includes addressing medical, social, and lifestyle factors to ensure optimal outcomes. Option D is correct because the PA plays a central role in coordinating care and collaborating with other healthcare professionals to provide comprehensive, patient-centered care.

Reference:

American Academy of Physician Assistants (AAPA). The physician assistant in team-based care. (2017) <https://www.aapa.org/what-is-a-pa/>

6. In a rural hospital, patients frequently experience delayed treatment due to a lack of coordination among healthcare providers. Which foundational principle of health systems science should be **PRIORITIZED** to address this issue?

- A. Evidence-based medicine
- B. Health equity
- C. Population health
- D. Systems-based practice

Key: D- Systems-based practice

Rationale: Evidence based medicine is incorrect because it does not specifically address preventing delays in treatment. Health equity is incorrect because it does not address coordination among providers. Population health is incorrect because it does not provide a solution to the lack of coordination causing treatment delays. Systems-based practice is correct because it emphasizes the importance of improving care delivery through better coordination and integration across different healthcare providers, making it the best solution for addressing delays.

Reference:

Epstein RM, Street RL Jr. The values and value of patient-centered care. *Ann Fam Med.* 2011;9(2):100-103. doi:10.1370/afm.1239

7. A community clinic identifies that residents of a low-income neighborhood have higher rates of preventable chronic diseases compared to other areas. Which action demonstrates the application of health systems science to address this issue?

- A. Expanding telemedicine services for all patients in the area.
- B. Hiring more healthcare providers to reduce patient wait times.
- C. Increasing clinic hours to accommodate more patients from the neighborhood.
- D. Launching a community outreach program focused on addressing social determinants of health.

Key: D. Launching a community outreach program focused on addressing social determinants of health

Rationale: Expanding telemedicine services is incorrect because it does not specifically address the root causes of chronic disease disparities, such as social determinants of health. Hiring more providers to reduce wait times is incorrect because it improves access but fails to address the systemic factors driving health disparities. Increasing clinic hours is incorrect because it enhances availability but does not tackle the upstream causes of preventable chronic diseases. Launching a program to address social determinants of health is correct because it aligns with foundational principles of health systems science and directly targets the root cause of preventable chronic diseases in underserved populations.

Reference:

Frampton SB, Guastello S, Libby Hoy S, Naylor M, Sheridan S, and Johnston-Fleece M. Harnessing evidence and experience to change culture: a guiding framework for patient and family engaged care. *NAM Perspectives.* Discussion Paper, National Academy of Medicine, Washington, D.C.
<https://doi.org/10.31478/201701f> <https://nam.edu/harnessing-evidence-and-experience-to-change-culture-a-guiding-framework-for-patient-and-family-engaged-care/>

Educational Unit 2, Legal and Ethical Considerations for the PA

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

Explain the legal/ethical responsibilities for maintaining professional standards of clinical care in coordination with the principles of health systems science.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none"> 1. identify and describe key legal regulations and ethical principles that govern healthcare practice 2. explain the implications of major healthcare laws and ethical frameworks on clinical decision making and patient care 3. evaluate the effectiveness of current roles of government in the delivery of healthcare including, but not limited to healthcare access and financing 4. analyze case studies to demonstrate how to apply legal and ethical principles in real-world healthcare scenarios 	<ol style="list-style-type: none"> 1. Formative multiple choice questions (IO 1) 2. Summative written case study prompt (IO 2,3,4) 	<ol style="list-style-type: none"> 1. "Memory" matrix 2. Case-Based Discussion and Role Playing 3. Policy Simulation

Instructional Strategies Unit 2

Activity 1. “Memory” Matrix:

Unit 2, Instructional Objective # 1: Upon completion of the learning activities the student will be able to identify and describe key legal regulations and ethical principles that govern healthcare practice

Faculty Instructions:

1. The memory matrix instructional strategy is typically to assess the recall or prior knowledge of important content and the ability to organize the content based on categories provided by the instructor. It utilizes retrieval practice based on the pre-class readings (table of definitions above).
2. Faculty provide students with a table that has the headers pre-populated, ready to be filled (example provided below).
3. Students should fill in the empty cells with what they know about the topic before faculty lead an in-class discussion of the terms, definitions, and examples/applications.
4. At the end of the discussion, the student should review the matrix they completed before discussion to self-assess what they learned during the discussion. Provide time for students to review this and to fill in empty cells with information they have now learned.

	Term Definition	Example/Application
Autonomy	The quality or state of being self-governing	Healthcare professionals must respect patients' decisions, provide them with all necessary information to make informed choices, and support them in their decision-making process. Autonomy also implies the right to refuse treatment.
Beneficence	The quality or state of doing or producing good: the quality or state of being	Healthcare professionals are obligated to act in the best interests of their patients by offering treatments that benefit their physical, emotional, and psychological health.
Nonmaleficence	Obligation to "do no harm."	Healthcare providers must ensure that treatments, interventions, and care plans do not cause harm or exacerbate a patient's condition. This principle underpins the importance of evidence-based practices and careful decision-making.
Justice	Fairness in the distribution	Healthcare professionals must ensure that they provide care without discrimination based on race, gender, socioeconomic status, or other personal characteristics. Additionally, they must advocate for equitable access to healthcare resources, especially for underserved populations.

	Term Definition	Example/Application
Confidentiality	The quality or state of being private or confidential	Healthcare providers must ensure that they maintain patient confidentiality and adhere to relevant laws, such as HIPAA, to prevent unauthorized disclosure of patient information. Breaches of confidentiality can harm the patient-provider relationship and result in legal penalties.
Health Insurance Portability and Accountability Act (HIPAA)	Federal law that governs the protection of patient privacy and the security of healthcare information	Healthcare professionals must safeguard patient data and obtain proper consent before disclosing medical information. Violations can result in legal penalties, including fines and loss of licensure.
Affordable Care Act (ACA)	Also known as Obamacare, aimed to increase access to health insurance, reduce healthcare costs, and improve the quality of care. It established regulations around insurance coverage, patient rights, and the expansion of Medicaid in certain states.	Healthcare professionals must be aware of the insurance coverage options available to patients, including Medicaid and private insurance, to ensure patients have access to the necessary services. Additionally, providers must follow regulations regarding coverage for preventive care and ensure patients are not discriminated against based on pre-existing conditions.
The Emergency Medical Treatment and Labor Act (EMTALA)	EMTALA requires that hospitals with emergency departments provide emergency medical treatments to all patients, regardless of their ability to pay or their insurance status.	Healthcare professionals must treat patients in emergency situations without discrimination, ensuring they are provided with timely care regardless of their financial or insurance status. Failure to comply with EMTALA can result in hospital penalties and lawsuits

Student Instructions:

Fill in the table provided to the best of your independent ability. Don't worry if you don't remember everything, we will review it together—just do your best.

Pre-class required reading:

Before attending class, familiarize yourself with the definitions below. Resource for terms below:

<https://www.merriam-webster.com/dictionary/>

	Term Definition	Example/Application
Autonomy		
Beneficence		
Nonmaleficence		
Justice		
Confidentiality		
Health Insurance Portability and Accountability Act (HIPAA)		
Affordable Care Act (ACA)		
The Emergency Medical Treatment and Labor Act (EMTALA)		

Activity 2. Case-Based Discussion and Role Playing

Unit 2, Instructional Objective #2: Explain the implications of major healthcare laws and ethical frameworks on clinical decision making and patient care. Analyze case studies to demonstrate how to apply legal and ethical principles in real-world healthcare scenarios

Unit 2, Instructional Objective #4: Analyze case studies to demonstrate how to apply legal and ethical principles in real-world healthcare scenarios

Faculty Instructions:

This activity builds upon the memory matrix activity that students participated in previously. The purpose is to enable students to understand and explain the implications of major healthcare laws (HIPAA, EMTALA, ACA) and ethical frameworks (autonomy, beneficence, justice) on clinical decision-making and patient care.

Begin the session by briefly reviewing major healthcare laws and ethical frameworks as taught in the memory matrix. Students have been given the following article to engage in an interactive discussion prior to working on their case study. Below is the article and questions to guide the discussion. Depending on the available time, you may determine which of the discussion questions are most useful for your students.

Article: Adashi, E. Y., & Cohen, I. G. (2023). [EMTALA After Dobbs : Emergency Reproductive Health Care in the Balance](https://doi.org/10.7326/M22-3222). *Annals of Internal Medicine*, 176(2), 268–269. <https://doi.org/10.7326/M22-3222>

Discussion questions:

1. In what ways does the article highlight the challenges healthcare providers face in balancing EMTALA requirements with state-level abortion bans after the Dobbs decision?
2. Should EMTALA be amended or clarified to address the evolving landscape of reproductive health care post-Dobbs?
3. What is the responsibility of healthcare institutions in educating their staff about the legal risks and ethical challenges in providing emergency reproductive care post-Dobbs?
4. How might delays or denials of emergency care due to legal concerns impact patient health outcomes, especially for marginalized groups?

Provide students with the case study below and related questions that incorporate both legal and ethical issues. The case study should present a clinical scenario that challenges students to apply healthcare laws and ethical principles.

Case Study: A 65-year-old patient is admitted to the emergency department after a motor vehicle accident. The patient is uninsured and presents with a fractured leg and signs of internal bleeding. The patient refuses blood transfusion due to religious beliefs. The healthcare team must decide whether to respect the patient's autonomy and religious beliefs or intervene to save the patient's life, potentially violating the patient's autonomy in the process. Additionally, the patient is asking for information about their financial responsibility and healthcare options.

Divide the class into small groups (3-5 students per group). Assign each group to play the role of the healthcare team (provider, nurses, social workers) or the patient. Ask each group to discuss the case from their perspective and make decisions based on legal and ethical considerations.

After group discussion, each group presents their decision to the class, explaining the legal and ethical frameworks they used to make their decisions. Conclude by summarizing the key takeaways from the discussion using the debriefing questions below. Emphasize the importance of understanding both legal regulations and ethical principles in making informed, compassionate clinical decisions. Discuss how these frameworks ensure quality patient care while protecting patient rights.

Debriefing Questions:

1. What were the most challenging ethical dilemmas in the case?
2. How did the legal considerations (EMTALA, ACA) influence the decisions made by your group?
3. How did the ethical principles (autonomy, beneficence, justice) play a role in the decision-making process?
4. Were there any conflicts between ethical principles (autonomy vs. beneficence)? How did you resolve them?
5. How can healthcare professionals balance ethical concerns and legal requirements in real-world clinical settings?

Access to a whiteboard or digital projector for debriefing questions will be helpful. If no visual tool is available, the faculty can also state these verbally.

Student Instructions:

In your small group, choose between the role of “provider”, “nurse”, “social worker” or “patient”

Read the following case study and answer the following questions from the perspective of the role you picked.

Case Study: A 65-year-old patient is admitted to the emergency department after a motor vehicle accident. The patient is uninsured and presents with a fractured leg and signs of internal bleeding. The patient refuses blood transfusion due to religious beliefs. The healthcare team must decide whether to respect the patient’s autonomy and religious beliefs or intervene to save the patient’s life, potentially violating the patient’s autonomy in the process. Additionally, the patient is asking for information about their financial responsibility and healthcare options.

Case Study Questions:

1. What healthcare laws are relevant in this case (e.g., EMTALA, ACA)?
2. How does the principle of **autonomy** apply here, considering the patient’s refusal of treatment?
3. How should the healthcare team handle the patient’s **confidentiality** and financial concerns?
4. What role does **beneficence** play in deciding whether to override the patient’s refusal of treatment?
5. What are the **justice** concerns in ensuring the patient has access to care, regardless of their financial situation?

Choose a representative to share your decision to the class, explaining the legal and ethical frameworks you chose to make your decisions.

Pre-class required reading:

Grant, S. C. (2021). [Informed Consent—We Can and Should Do Better](https://doi.org/10.1001/jamanetworkopen.2021.10848). JAMA Network Open, 4(4), e2110848–e2110848. <https://doi.org/10.1001/jamanetworkopen.2021.10848>

Hoffman, S. (2022). [Privacy and Security — Protecting Patients’ Health Information](https://doi.org/10.1056/NEJMp2201676). The New England Journal of Medicine, 387(21), 1913–1916. <https://doi.org/10.1056/NEJMp2201676>

AAPA. (n.d.). [Ethical Guidelines for the PA Profession](https://www.aapa.org/career-central/practice-tools/ethical-guidelines-for-the-pa-profession/). <https://www.aapa.org/career-central/practice-tools/ethical-guidelines-for-the-pa-profession/>

Upon attending class, be ready to discuss the following article: Adashi, E. Y., & Cohen, I. G. (2023). [EMTALA After Dobbs : Emergency Reproductive Health Care in the Balance](https://doi.org/10.7326/M22-3222). Annals of Internal Medicine, 176(2), 268–269. <https://doi.org/10.7326/M22-3222>

Activity 3. Policy Simulation

Unit 2, Instructional Objective #3: Evaluate the effectiveness of current roles of government in the delivery of healthcare including, but not limited to healthcare access and financing

Unit 2, Instructional Objective #4: Analyze case studies to demonstrate how to apply legal and ethical principles in real-world healthcare scenarios

Faculty Instructions:

This activity provides students the opportunity to evaluate the effectiveness of the government's role in healthcare delivery, focusing on access, financing, and other relevant areas, by simulating real-world policy-making decisions. Students will participate in a role-playing simulation where they represent different stakeholders in a healthcare policy-making scenario. The goal of the simulation is for students to propose and debate healthcare policies that address current issues related to government roles in healthcare access and financing.

Steps:

1. Introduce the activity, providing the below scenario, and answer any questions (15 minutes)
2. Split the class up to small groups of 3-4 students and assign them one of the roles as listed below.
3. Allow them 15 minutes to outline their stance
4. Debate and Negotiation (30 minutes): Groups present their positions and 3 key objectives. They negotiate with one another to find compromises and solutions. The government representatives (legislators/policy makers) lead the discussion and attempt to pass a healthcare policy that balances the needs of all stakeholders- choosing 6 total key objectives.
5. Voting (10 minutes): Once a compromise policy is reached, students vote on whether they support the policy, based on their group’s stance

Materials Needed:

- Role-play instructions and scenario handouts
- Access to healthcare policy resources (government reports, policy briefs) online
- Whiteboard or digital presentation tools
- Evaluation rubrics for policy proposals
- Markers, paper, or digital platforms for students to prepare their proposals

Student Instructions:

The following questions are to guide your pre-reading/listening. Note, there are further instructions below **after** you complete the readings.

1. What are the current roles of the federal and state governments in the delivery of healthcare services?
2. How effective are Medicare and Medicaid in ensuring access to care for underserved populations?
3. What impact has the ACA had on reducing healthcare disparities and improving access to insurance?
4. How does government spending on healthcare (e.g., through public insurance programs) affect the overall healthcare system and its sustainability?

Pre-class required listening/reading:

YouTube. (2017, March 6). How the Affordable Care Act affects healthcare [Video]. YouTube.

<https://www.youtube.com/watch?v=j9tRVESzJ1M>

YouTube. (2020, April 7). The role of government in healthcare [Video]. YouTube.

<https://www.youtube.com/watch?v=mTXVcwVVjoQ>

Centers for Medicare & Medicaid Services. (n.d.). Original Medicare: Enrollment and renewal for Part A & B. Centers for Medicare & Medicaid Services. <https://www.cms.gov/medicare/enrollment-renewal/original-part-a-b>

Centers for Medicare & Medicaid Services. (n.d.). Maryland All-Payer Model. Centers for Medicare & Medicaid Services.

<https://www.cms.gov/priorities/innovation/innovation-models/maryland-all-payer-model>

Ruger, J. P., Ruger, T. W., & Annas, G. J. (2015). [The Elusive Right to Health Care under U.S. Law](#). The New England Journal of Medicine, 372(26), 2558–2563. <https://doi.org/10.1056/NEJMhle1412262>

1. Today we will be taking on role play once more to explore different stakeholder roles in healthcare policy-making.
2. You will be divided into small groups and provided one of the following roles:
 - a. Government Representatives (Legislators/Policy Makers): These students are responsible for crafting, proposing, and defending healthcare policies. They must balance healthcare access, financing, and public concerns.
 - b. Healthcare Providers (Doctors, PAs, Hospitals): These students represent healthcare providers who have a vested interest in the policies' impact on reimbursement, access to

- care, and the quality of care provided.
- c. Insurance Providers: These students represent private and public insurance companies. They are concerned with the financial implications of the policy, including premiums, payments, and sustainability.
 - d. Advocates for Vulnerable Populations (low-income communities, elderly): These students represent non-governmental organizations or advocacy groups that advocate for increased access to care for underserved populations.
 - e. Public/Media Representatives: These students represent the general public or media, tasked with voicing public concerns about healthcare costs, equity, and access.
3. With the lens of your role, please examine the following scenario and deliver a brief position outline on your stance on the proposed healthcare reform and develop 3 key objectives

The government has decided to implement a new national healthcare reform program aimed at expanding access to healthcare and controlling costs. However, the program needs to balance multiple priorities, including:

- Expanding healthcare coverage to underserved populations
 - Ensuring that the program is financially sustainable
 - Maintaining quality of care and patient outcomes.
 - Managing political challenges and public support for the reform
4. As a group, present your stance and 3 key objectives for your classmates to provide feedback
 5. Government representatives will guide the class toward a final draft of the healthcare reform policy with 6 key objectives, trying to incorporate aspects of all stakeholders' concerns.
 6. Finally, the class will vote on whether to pass the policy by a show of hands

Assessments Unit Two

Formative assessments:

These are not intended as final exam questions; instead, they may be useful as in-class knowledge checks or just-in-time assessments of students' understanding.

Multiple choice questions:

1. Which of the following is a key ethical principle that governs healthcare practice, particularly in the context of ensuring patients understand their treatment options before consenting to care?
 - A. Autonomy
 - B. Beneficence
 - C. Justice
 - D. Non-maleficence

Key: A. Autonomy

Rationale: Autonomy refers to the ethical principle that individuals have the right to make their own decisions about their healthcare, provided they are fully informed and aware of the risks, benefits, and alternatives to treatment before making a decision about their care.

2. What does the principle of beneficence require healthcare professionals to do?
 - A. Act in the best interests of the patient, promoting their physical, emotional, and psychological well-being.
 - B. Ensure that no harm is done to the patient during treatment.
 - C. Protect the privacy of the patient's medical information.
 - D. Respect the patient's decision to refuse treatment.

Key: A. Act in the best interests of the patient

Rationale: Promoting patients' physical, emotional, and psychological well-being is acting in their best interests. Beneficence refers to the ethical obligation to act in the best interests of the patient. Healthcare providers must promote the well-being of their patients, not just by preventing harm (nonmaleficence) but also by taking positive actions to improve their health and quality of life. This includes offering treatments that are beneficial to the patient's physical, emotional, and psychological health.

3. Under the Health Insurance Portability and Accountability Act (HIPAA), healthcare providers must:
 - A. Ensure fairness in distributing healthcare resources.
 - B. Ensure patient privacy and protect healthcare information.
 - C. Give patients the right to refuse treatment.
 - D. Provide care to all patients regardless of their ability to pay.

Key: B. Ensure patient privacy and protect healthcare information.

Rationale: HIPAA is a federal law designed to protect patient privacy and ensure the security of healthcare information. It mandates that healthcare professionals safeguard confidential patient data, maintain the confidentiality of patient records, and only disclose information with proper consent or when legally required. HIPAA violations can result in severe penalties, including fines and loss of licensure.

Case Vignettes:

1. A 52-year-old man with chronic obstructive pulmonary disease (COPD) and a 30 pack year history of smoking presents to a hospital in Maryland for an exacerbation of his condition. He has been uninsured for the last several years and has limited financial resources. His exacerbation requires hospitalization, but the patient is concerned about the financial burden of inpatient care.

Given the patient's financial concerns, which of the following would most likely occur as a result of the hospital's participation in [Maryland's All-Payer Model](#) and its value-based reimbursement system?

- A. The hospital will be incentivized to discharge the patient as soon as possible to reduce its costs.
- B. The hospital will refuse to provide care to the patient unless he is enrolled in Medicaid, as the All-Payer Model only applies to insured patients.
- C. The patient will be charged a lower rate for his hospitalization due to the fixed payment system and vouchers which applies a uniform rate to all patients, regardless of insurance status.
- D. The patient will be enrolled in a transitional care management program after discharge, with a focus on reducing the need for inpatient care and hospital readmissions.

Key: D. The patient will be enrolled in a transitional care management program

Rationale: Understanding that hospitals are incentivized to focus on patient outcomes, such as reducing readmissions and improving chronic disease management, patients require transitional care (answer choice D). Incentivization to cut costs (answer choice A), refusal of care (answer choice B), a lower rate is not compatible with a fixed rate system (answer choice C).

2. A 45-year-old patient with a history of diabetes presents at the emergency room after being in a car accident. The patient does not have health insurance and is unable to pay for treatment. According to EMTALA, the hospital is required to:
 - A. Deny care and refer the patient to a facility that accepts their insurance.
 - B. Offer the patient a payment plan for the treatment after stabilization.
 - C. Provide emergency medical treatment, regardless of the patient's ability to pay.
 - D. Treat the patient only if they are able to pay for the treatment.

Key: C. Provide emergency medical treatment, regardless of the patient's ability to pay. EMTALA mandates that hospitals must provide emergency medical treatment to all individuals, regardless of their financial situation or insurance status. This ensures that patients in emergency situations receive necessary care and prevents hospitals from discriminating against uninsured or underinsured individuals. Denying care based on financial status would violate EMTALA regulations (answer choices A, B, and D).

Summative Assessments:

Read the following case study and complete the following questions on your own.

John Doe arrives at the emergency department (ED) complaining of severe chest pain, radiating down his left arm, and difficulty breathing. He reports a history of hypertension and type 2 diabetes. Given his risk factors (age, smoking, diabetes), his symptoms raise concerns for a potential myocardial infarction (heart attack). He has been to the same ED multiple times this week and due to his vulgar outbursts, he has a strained relationship with some staff members. He has been in transition between homes and currently lacks insurance. The ED team orders an echocardiogram (EKG), blood tests (for cardiac markers), and aspirin. John's diagnostic tests indicate elevated troponin levels, suggesting myocardial injury. Cardiology is consulted. The cardiologist recommends cardiac catheterization to assess for coronary artery blockage. The cardiologist explains the need for catheterization, the risks (bleeding, arrhythmias), and the benefits (identifying blockages for potential stenting). John expresses hesitation. He states that he does not want the cardiac catheterization due to concerns about the procedure's risks and his personal fears about medical intervention. John has a sister listed on his file; however, he states he does not want her involved with this medical situation. He leaves the ED.

What is EMTALA and how does it ensure that John receives care in the ED?

How does informed consent impact the patient's autonomy in decision-making, and what role does the cardiologist play in ensuring the process is thorough?

How does the principle of beneficence guide the decision-making of healthcare providers when a patient refuses treatment, and what ethical obligations do they have to ensure the patient's well-being?

In what ways do these frameworks protect patients, and how can they sometimes present challenges in ensuring optimal patient care?

Key:

The Emergency Medical Treatment and Labor Act (EMTALA) is a federal law that mandates all hospitals with emergency departments (ED) to treat all individuals who come to the ED, regardless of their ability to pay, insurance status, or other financial factors. EMTALA ensures that patients who present with emergency medical conditions, such as John Doe, are not turned away or denied care. In John's case, his symptoms, including chest pain, difficulty breathing, and radiating pain (classic signs of a potential myocardial infarction), qualify as an emergency medical condition. Under EMTALA, the hospital is legally required to provide an initial medical screening, necessary stabilization, and treatment to John without discrimination, even though he lacks insurance. This ensures John receives the appropriate care needed for his condition, such as diagnostic testing and consultation with specialists like cardiology.

Informed consent is a legal and ethical process that respects a patient's autonomy, or their right to make decisions about their own healthcare. It requires that healthcare providers give the patient clear, understandable information about the proposed treatment, including the benefits, risks, alternatives, and potential consequences of not undergoing the treatment. This allows the patient to make an informed decision about their care based on their values and preferences.

In this case, the cardiologist plays a key role in ensuring that John's informed consent process is thorough. The cardiologist must explain the need for the cardiac catheterization, providing John with information on why the procedure is necessary to diagnose any blockages, and the risks (bleeding, arrhythmias) and benefits (identifying blockages for potential stenting, improving heart function). John's concerns about the procedure should be addressed in a non-judgmental, respectful way, ensuring he fully understands his options. If John still refuses, the cardiologist must respect his decision but must also document that informed consent was provided and that the risks of refusing treatment were discussed. Informed consent ensures John has the autonomy to make decisions regarding his own health, even if those decisions go against medical recommendations.

The principle of beneficence refers to the ethical obligation of healthcare providers to act in the best interest of the patient, promoting their well-being and doing good. It calls for actions that benefit the patient's physical, emotional, and psychological health. However, when a patient like John refuses treatment, beneficence becomes more complex. The healthcare team must weigh the patient's right to autonomy against the potential harm that could result from refusing recommended care. In this scenario, while John's refusal of the cardiac catheterization is his right, healthcare providers still have an ethical obligation to ensure that he is making an informed decision. The team must continue to provide the necessary information, clarify his concerns, and explain the potential risks of refusing treatment (heart failure, further heart damage). The healthcare team must ensure John understands the serious consequences of his decision and has access to the necessary support and resources to manage his condition (e.g., follow-up care, medications). The healthcare providers must also document the patient's refusal and offer alternative care options to maintain their commitment to beneficence, even if the patient ultimately decides against the recommended procedure.

The frameworks of EMTALA, informed consent, and beneficence are designed to protect patients in different ways: EMTALA ensures that hospitals are required to provide care for all patients, regardless of their financial situation or insurance status, protecting patients from being turned away from emergency care when they need it most. Informed consent ensures that patients are given the information they need to make knowledgeable, autonomous decisions about their care. This protects the patient's right to choose what happens to their own body and health. Beneficence ensures that healthcare providers are acting in the patient's best interests, offering treatment that promotes the patient's health and well-being.

However, these frameworks can sometimes present challenges in ensuring optimal patient care: EMTALA ensures care for emergency conditions, but it does not guarantee comprehensive follow-up or preventative care, especially for patients who lack insurance. John may receive emergency care in the ED, but without insurance, accessing further necessary care (cardiac rehab, outpatient care) can be difficult.

Informed consent can be challenging when a patient refuses treatment despite being informed of the risks and benefits. Healthcare providers must respect the patient's decision, but this can conflict with their duty to do no harm and promote the patient's well-being. In John's case, if he refuses the cardiac catheterization, the medical team may feel conflicted about his choice, particularly if they believe the procedure could save his life.

Beneficence requires healthcare providers to act in the patient's best interest, but this can be complicated when patients, like John, make decisions that appear to be against their best interests. Healthcare providers must respect the patient's autonomy while still striving to offer the best possible care.

Ultimately, these frameworks protect patients by ensuring that their rights, safety, and well-being are prioritized, but they can create ethical dilemmas and challenges when patients make decisions that deviate from medical recommendations or when resources are limited.

References:

Centers for Medicare and Medicaid Services. Maryland All-Payer Model.

<https://www.cms.gov/priorities/innovation/innovation-models/maryland-all-payer-model>.

Accessed February 4, 2025.

Centers for Medicare and Medicaid Services. Emergency Medical Treatment and Labor Act.

[https://www.cms.gov/medicare/regulations-guidance/legislation/emergency-medical-treatment-labor-](https://www.cms.gov/medicare/regulations-guidance/legislation/emergency-medical-treatment-labor-act#:~:text=In%201986%2C%20Congress%20enacted%20the,regardless%20of%20ability%20to%20pay)

[act#:~:text=In%201986%2C%20Congress%20enacted%20the,regardless%20of%20ability%20to%20pay](https://www.cms.gov/medicare/regulations-guidance/legislation/emergency-medical-treatment-labor-act#:~:text=In%201986%2C%20Congress%20enacted%20the,regardless%20of%20ability%20to%20pay). Accessed February 4, 2025.

Educational Unit 3, Research Seminar

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

Demonstrate competence in critically evaluating and discussing evidence on research-supported assessment and intervention reflective of the principles of health systems science.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none"> 1. identify a research question relating to health systems science 2. execute a search of evidence-based literature to support the research question with current, relevant information 3. critically appraise the literature for evidence-based data 4. author an essay explaining the research process and the appraisal of the literature. 	<ol style="list-style-type: none"> 1. MCQ quiz (IO 1, 2) 2. Essay explaining literature appraisal process and findings (IO 1, 2, 3, and 4) 	<ol style="list-style-type: none"> 1. Pre-course: PubMed interactive website learning about patient, intervention, comparison, outcome (PICO) question structure followed by classroom, small group discussion of student created PICO questions. 2. Interactive session on using the library database to perform a literature search. 3. Work through an article appraisal together during class.

Instructional Strategies Unit 3

Activity 1. Small Group PICO Discussion:

Unit 3, Instructional Objective # 1: Upon completion of the learning activities the student will be able to identify a research question relating to health systems science.

Faculty Instructions:

Break down the class into small groups; the exact number will depend on your class size. Each group member should be prepared with their own PICO question. The groups should work through each students' question to determine the patient, intervention, comparison and outcome in the students' research question based on health systems science. After each group has worked through their questions, ask for a student from each group to volunteer and share their PICO question with the rest of the class.

Pre-class required reading and activity:

Please complete Module 1 "Intro to EBP" found at <https://guides.mclibrary.duke.edu/ebptutorial/home>

Please read the following article regarding levels of evidence
<https://guides.library.ucdavis.edu/systematic-reviews/levels-of-evidence>

Before attending class, please go to the following website and complete "PubMed and evidence based practice" and "develop a clinical question" activities and readings listed under "Course Home" on the left hand side of the page. https://www.nlm.nih.gov/oet/ed/pubmed/pubmed_in_ebp/index.html

Come prepared to class with your own written PICO on a health systems science topic of your choosing and be prepared to discuss your own question and how it fits the PICO structure.

Student Instructions:

Learning how to write a high-quality PICO question helps direct your evidence-based research. After performing the pre-class activity, you should understand how to effectively do this. During this learning session, you will come prepared with your own health systems science research question based upon the PICO format.

During class you will work in small groups to discuss your PICO question. Please work respectfully within your small group to evaluate your peers' PICO question and determine if it fits the format correctly and will make a good research topic. You may be able to help your classmates, and they may be able to help you so please approach this with an open mind.

Activity 2. Interactive session on using the library and PubMed database to perform a literature search

Unit 3, Instructional Objective # 2: Upon completion of the learning activities the student will be able to execute a search of evidence-based literature to support the research question with current, relevant information.

Faculty Instructions: Guide the students into creating a PICO question that they want to research during this class session. Once the question has been established, perform a search of the literature using appropriate terms in both the library database found at <https://www.hshsl.umaryland.edu/> and the PubMed database found at <https://pubmed.ncbi.nlm.nih.gov/>.

Pre-class required reading and activity:

Review the PubMed site and section, “Use PubMed to Find Relevant Articles” and “next steps” and “scenario practice.” https://www.nlm.nih.gov/oet/ed/pubmed/pubmed_in_ebp/03-200.html

Watch “PubMed Building a search” found at <https://www.youtube.com/watch?v=xGYFDrORpZA&t=134s>



PubMed: Building a Search

JOHNS HOPKINS
UNIVERSITY OF MEDICINE
Welch Medical Library

Again, review the levels of evidence found at <https://guides.library.ucdavis.edu/systematic-reviews/levels-of-evidence>

Student Instructions:

Please complete all pre-class work and come prepared to offer suggestions and create a PICO question in class to be searched together. This demonstration will help prepare you when you are searching for and choosing your article for your article appraisal which will be due towards the end of this course. You will learn how to choose the terms you use to begin your search as well as tools to use to find the best articles for your purposes. Be cognizant of the hierarchy of levels of evidence when choosing your article to appraise.

Activity 3. Work through an article appraisal together during class

Unit 3, Instructional Objective # 3: Upon completion of the learning activities the student will be able to critically appraise the literature for evidence-based data.

Faculty Instructions:

For demonstration purposes, select an article that is a systematic review. An example of a systematic review about the efficacy of COVID-19 antiviral treatment is found at the following link.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8802260/>

Next, utilize the systematic review appraisal tool found at <https://guides.library.ucdavis.edu/systematic-reviews/levels-of-evidence>. With this tool, guide the students through answering the questions appropriately. This should be an interactive session where the students provide the answers and only need guidance getting to the correct information and answers. These appraisal tools are the same that they will use when writing their appraisal essay.

Pre-class required reading and activity:

Please complete the Duke University Modules 2 – 7 found at:

<https://guides.mclibrary.duke.edu/ebptutorial/acquire>

Review the critical appraisal tools found at:

<https://www.cebm.ox.ac.uk/resources/ebm-tools/critical-appraisal-tools>

Student Instructions:

Please come prepared to class by completing modules 2 – 7 and by reviewing the link with the article appraisal tools. These article appraisal tools will help you weed out good evidence from the not so great evidence. These are the tools that you will need to utilize when writing your article appraisal essay which is due at the end of this course. It is important to keep in mind the hierarchy of evidence when choosing your articles to find the best evidence-based medicine. You'll also want to be sure that your chosen article for your essay relates to health systems science.

Assessments Unit Three

Formative assessments:

1. Which of the following studies provides the best quality research in the hierarchy of evidence?
 - A. Animal studies
 - B. Case control studies
 - C. Case reports
 - D. Meta-analysis

Key: D. Meta-analysis

Rationale: Meta-analysis provides the highest level of quality of evidence. The other answer choices do not provide evidence as strong as a meta-analysis

2. The chart below provides information regarding 6 different trials in the treatment of pericarditis. Based upon the information in the chart from that article, which trial provides the best quality information?

Trial (Year)	Indication	Blinding	Patients	Treatment Duration	Primary Endpoint	Results
COPE trial (2005)	Acute pericarditis	No	120 patients	3–4weeks (A), 3 months (A+ C)	Recurrence	33.3% in A vs. 11.7% in A+ C (P=0.009)
CORE trial (2005)	Recurrent pericarditis	No	84 patients	3–4weeks (A), 6months (A+ C)	Recurrence	50.6% in A vs. 24% in A+ C (P=0.02)
CORP trial (2011)	Recurrent pericarditis	Yes	120 patients	A/Ib: 3–4weeks; Pl or C: 6 months	Recurrence	55% in A vs. 24% in A+ C (P<0.001)
ICAP trial (2013)	Acute pericarditis	Yes	240 patients	A/Ib: 3–4weeks; Pl or C: 3 months	Incessant or recurrent pericarditis	37.5% in A vs. 16.7% A+ C (P<0.001)
CORP-2 trial (2014)	Recurrent pericarditis (2 or more events)	Yes	240 patients	A/Ib/In: 3–4weeks; Pl or C: 6 months	Recurrence	42.5% in A vs. 21.6% in A+ C (P=0.0009)
CAFE-AIP trial (2019)	First episode of acute pericarditis (not secondary to cardiac injury or connective tissue disease)	No	110 patients	Group 1: A/Ib/In: 3–4weeks; group 2: A/Ib/In: 3–4weeks+ C: 3 months	Recurrence	13.5% in A/Ib/In vs. 7.8% in A/Ib/In+ C (P=0.34)

- A. COPE trial
- B. CORE trial
- C. CORP trial
- D. ICAP trial

Key: D. ICAP trial

Rationale: ICAP trial as it is blinded and has the most participants. The other's are either not blinded or have fewer participants.

3. Which resource provides the best quality, evidence-based information?
- A. Dr. Oz
 - C. WebMD
 - D. Wikipedia
 - E. UpToDate

Key: D. UpToDate

Rationale: UpToDate is the only peer reviewed, evidence-based resource listed.

References:

UC Davis Library. Systematic reviews. Levels of Evidence. Updated November 6, 2024. Accessed December November 20, 2024. <https://guides.library.ucdavis.edu/systematic-reviews/levels-of-evidence>

Chiabrando JG, Bonaventura A, Vecchié A, et al. Management of Acute and Recurrent Pericarditis: JACC State-of-the-Art Review. *Journal of the American College of Cardiology*. 2020;75(1):76-92. doi:<https://doi.org/10.1016/j.jacc.2019.11.021>

Healey Library. Comparing Popular Magazines and Scholarly Journals Updated December 6, 2024. Accessed December 16, 2024. <https://umb.libguides.com/scholarlyjournals/compareperiodicals>

Summative Assessments:

Faculty Instructions: Students will build on the in-class activities to perform a literature search on their PICO question and develop their findings in essay format. A rubric is provided for grading.

Student Instructions: Using your own created PICO question, perform a search of the literature utilizing the hierarchy of evidence. You will then use the appraisal tools from the session 2 pre-readings to help complete your appraisal. The rubric below provides all the information that should be included within your essay; use the rubric like a checklist to make sure you address all aspects that will be graded.

Essay Article Appraisal Rubric

Content Expectations	Complete (2 points)	Partially Complete (1 point)	Incomplete (0 points)
PICO question identified			
Description of search for article including databases and terms used			
Article is chosen from a peer reviewed source and source identified			
Subject of research identified			
Problem and/or reason for article identified			
Study design described including sample size, inclusion and exclusion criteria			
Describe type of statistical analysis used			
Summarize results			
Explain implication of results in clinical practice			
List strengths and weaknesses of study			
Essay is clearly organized and submitted with AMA formatting and citations			
Essay contains appropriate grammar, spelling and syntax			
Essay submitted on time (yes = 2 points, no = 0 points)			
Subtotals:			
Total points:			

*Our intent for including this category is not to penalize students who need improvement in this area, but to assign a small point value so students try their best and educators may match students with appropriate resources as needed to prepare them for written communication in their future clinical work.

Educational Unit 4, Clinical Medicine

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

Communicate with interprofessional colleagues and counsel patients in a manner that reflects the principles of health systems science.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none"> 1. recognize the roles of the interdisciplinary team, identifying how their roles support the principles of health system science 2. differentiate between cost, value, and effectiveness in regard to patient experience and population health 3. develop skills to evaluate patient care delivery and adapt evidence-based medicine 4. engage in a case study-based role play that involves interprofessional colleagues 	<ol style="list-style-type: none"> 1. Formative multiple choice (IOs 1, 2) 2. Summative multiple choice (IO 2) 3. Competency checklist (IOs 3, 4) 4. Objective Structured Clinical Exam (OSCE) (IOs 3, 4) 	<ol style="list-style-type: none"> 1. Structured Role Play 2. Article Review Workshop

Instructional Strategies Unit 4

Activity 1. Structured Role Play (Instructional Strategy) with Competency Checklist (Assessment)

Unit 4, Instructional Objective # 1: Upon completion of the learning activities the student will be able to recognize the roles of the interdisciplinary team, identifying how their roles support the principles of health system science.

Unit 4, Instructional Objective # 3: Develop skills to evaluate patient care delivery and adapt evidence-based medicine

Unit 4, Instructional Objective # 4: Engage in a case study-based role play that involves interprofessional colleagues

Faculty Instructions: During this activity, students will be role playing as one of the healthcare professionals on an interdisciplinary team. The team is managing a patient with atrial fibrillation and mechanical valve replacement. Students should read the case description then interact, ask questions, and collaborate as if they are part of the interdisciplinary team.

1. Time Allotment:
 - 10 minutes: Students meet briefly to plan their approach
 - 15 minutes: Role play (faculty observes)
 - 10 minutes: Team presents a collaborative care plan summarizing solutions and next steps
 - 15 minutes: Faculty-led feedback and debriefing
2. Video:

This video may be shown in the beginning of class. It discusses the role of interdisciplinary teams and strategies for those teams working together:

[Professions Working Together - Synchronous and Asynchronous Collaboration](https://youtu.be/vuKhx6Cjpu4?si=MruBMFhsfqPU4t6C)
<https://youtu.be/vuKhx6Cjpu4?si=MruBMFhsfqPU4t6C>
3. Role play
 - The PA student introduces all team members and facilitates the discussion.
 - Each student role playing as a healthcare professional should introduce their role and collaborate to create a care plan that is clear and actionable for the patient.
 - The student role playing the patient actively engages, asking questions and expressing concerns.

After the activity, students can review the competency checklist below, to assess individuals and team performance during the role-play activity. Faculty can use this to provide feedback and guide improvement efforts.

Student Competency Checklist: This assessment tool is listed in context with the instructional strategy rather than in the assessments section. It may be useful to share with students so they know the expectations.

Competency Area	Description	Satisfactory	Unsatisfactory	Not Done
Communication	Effectively introduced themselves in the team.			
Communication	Used clear, concise, and professional language.			
Communication	Actively listened to other team members.			
Communication	Responded appropriately to concerns and questions raised by other team members			
Role Clarity and Contribution	Demonstrated a clear understanding of their professional role.			
Role Clarity and Contribution	Provided discipline-specific input relevant to the patient's care.			
Role Clarity and Contribution	Collaborated effectively with other team members.			
Role Clarity and Contribution	Respected the roles and contributions of other disciplines.			

Competency Area	Description	Satisfactory	Unsatisfactory	Not Done
Patient-Centered Care	Addressed the patient's expressed concerns and priorities.			
Patient-Centered Care	Developed a care plan that aligned with the patient's needs and goals.			
Patient-Centered Care	Ensured the care plan promoted patient safety and well-being.			
Teamwork and Collaboration	Contributed to a collaborative decision-making process.			
Teamwork and Collaboration	Acknowledged and built upon input from other team members.			
Teamwork and Collaboration	Helped resolve any conflicts or misunderstandings constructively.			
Teamwork and Collaboration	Encouraged a team-based approach to patient care.			

Student Instructions: During this activity, you will be role playing as one of the healthcare professionals on an interdisciplinary team. The team is managing a patient with atrial fibrillation and mechanical valve replacement. Read the case description. Be ready to interact, ask questions, and collaborate as part of the care team.

Pre-class required reading:

Before attending class, familiarize with The National Center for Interprofessional Practice and Education. What is interprofessional education? [YouTube video]. Published July 14, 2020. Accessed June 16, 2024. https://youtu.be/Ety_8fB7_jo See table on next page.

Before attending class, be familiar with the following terms:

Roles	Education	Settings
Physician: diagnosis, treatment and prevention of disease and conditions of the body.	Requires an undergraduate degree and attendance of medical school and residency. Residency can be 3-7 years, some specialties require fellowship.	Found in variety of settings: private practice, hospital settings, clinical industry, research.
Nursing professions: perform assessments, deliver patient education, provide direct patient care.	Ranges 2-5 years with an associate's degree or a bachelor's degree. Nurses can also have an advanced practice registered nursing with an additional 1000 clinical training hours and can have a variety of other specialties.	Found in variety of settings: private practice, hospital settings, clinical industry, research.
Pharmacist: order and interpret drug therapies and related laboratory tests. Work with other healthcare providers to initiate, adjust, and discontinue medications in order to manage a patient's health.	Requires an undergraduate degree and completion of a doctoral program that is 3-4 years. Post-doctoral education can be 1-2 years and may focus on general practice or specialties.	Found in clinical, industry, or research settings including community pharmacies, hospital pharmacies, pharmacies associated with outpatient clinics, and research facilities like pharmaceutical companies.
Physical therapist: Focus on rehabilitation, wellness and injury/illness prevention with the goal of optimizing functional ability.	Requires an undergraduate degree and completion of a 3-year doctoral program. Residencies and fellowships are optional and take 1-2 years.	Found in clinical and research settings that can include acute care, rehab rehabilitation, or skilled nursing facilities, schools or outpatient clinics.

<p>Social worker: provides psychosocial and health counseling information and referral services for individuals, families, or groups.</p>	<p>Requires a undergraduate degree and completion of a 2-year master of social work degree. Graduates may spend an additional 2 years of supervised clinical experience in order to complete their training.</p>	<p>Settings can include clinical/hospital care, teaching, research, policy, or administration. Social workers may provide health and human services in community based drug and alcohol, treatment programs, family services, and agencies.</p>
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Case Description:

Patient: 80-year-old who underwent mechanical mitral valve replacement 3 months ago and now presents with atrial fibrillation.

Setting: Interdisciplinary rounds after evaluating the patient in a hospital setting.

Key Patient Information:

- **Medical Concerns:**
 - Recently started warfarin for anticoagulation therapy.
 - INR level fluctuates (recent reading: 2.1; target range 2.5–3.5).
 - Expresses fear of falling and having a bleed.
- **Social/Functional Status:**
 - Lives alone with minimal family support.
 - Uses a cane for walking but complains of poor balance.
 - Unsure about dietary restrictions (e.g., vitamin K interactions).
- **Vitals:**
 - BP: 138/85 mmHg
 - Heart Rate: 88 bpm, irregular
 - Weight: 145 lbs.

Roles:

1. Nurse: Addresses safety concerns, provides education on blood pressure and heart rate monitoring, and assesses patient understanding.
2. Pharmacist: Educates on the anticoagulant (e.g., warfarin) and its management, including INR monitoring, dietary interactions, and side effects.
3. Physician Assistant (PA): Coordinates the team discussion, assesses medical stability, and ensures continuity of care.
4. Physical Therapist (PT): Discusses fall prevention strategies and develops a plan to improve mobility and balance safely.
5. Patient: Wants to participate in the care planning but feels overwhelmed and worried about

managing everything related to the situation

Role-Specific Instructions:

1. Nurse:
 - Reinforce the importance of monitoring blood pressure, heart rate, and symptoms of bleeding.
 - Educate on recognizing signs of complications (e.g., bruising, bleeding gums).
 - Assess the patient’s understanding of their condition and therapy.
2. Pharmacist:
 - Provide education about warfarin:
 - INR target range and the importance of routine monitoring.
 - Dietary considerations (e.g., intake of leafy greens).
 - Medication adherence and managing side effects.
 - Address the patient’s concerns about bleeding risks.
3. Physician Assistant:
 - Lead the discussion and summarize the patient’s medical history and concerns.
 - Ensure the care plan includes INR monitoring, fall prevention, and ongoing care coordination.
 - Discuss the importance of managing AFib to prevent stroke and heart failure.
4. Physical Therapist:
 - Assess the patient’s mobility and risk of falls.
 - Recommend specific exercises to improve balance and strength.
 - Suggest home safety modifications (e.g., grab bars, minimizing clutter).
5. Patient:
 - Asks and answers questions with the care team

Activity 2 Article Review Workshop

Unit 4, Instructional Objective # 2: Upon completion of the learning activities the student will be able to differentiate between cost, value, and effectiveness in regards to patient experience and population health.

Faculty Instructions:

Instruct students to read the article carefully. Organize students in groups to analyze the article, which evaluates the cost-effectiveness of social determinants of health-related interventions. Group sizes should be determined by the faculty member.

Students should reflect on the guiding questions below and take notes for discussion. They should be prepared to share their thoughts and collaborate with their teammates.

Guiding Questions for Article Review:

1. What are the primary interventions evaluated in the article?

2. How were cost-effectiveness and outcomes measured?
3. What are the key findings regarding the effectiveness of these interventions?
4. What challenges or limitations were identified in implementing these interventions?
5. How can these findings inform best practices in healthcare?

Faculty Debriefing:

After the small group work, the faculty member may facilitate a whole-class discussion. In addition to the questions above, the following questions may also be useful to guide this discussion:

1. What are the key takeaways from the article?
2. What best practices for high-value, cost-conscious care are discussed?
3. What challenges might arise when implementing these practices in real-world settings?
4. How can healthcare students and trainees incorporate these principles into their education and future practice?

Pre Class Required Reading :

1. van Baal P, Barros PP. Drug Pricing, Patient Welfare, and Cost-Effectiveness Analysis. *Value Health*. 2024 Mar;27(3):271-272. doi: 10.1016/j.jval.2024.01.006.
2. Rutstein SE, Price JT, Rosenberg NE, Rennie SM, Biddle AK, Miller WC. Hidden costs: The ethics of cost-effectiveness analyses for health interventions in resource-limited settings. *Glob Public Health*. 2017 Oct;12(10):1269-1281. doi: 10.1080/17441692.2016.1178319.
3. Honeycutt AA, Khavjou OA, Tayebali Z, Dempsey M, Glasgow L, Hacker K. Cost-Effectiveness of Social Determinants of Health Interventions: Evaluating Multisector Community Partnerships' Efforts. *Am J Prev Med*. 2024 Dec;67(6):916-923. doi: 10.1016/j.amepre.2024.07.016. **(will be reviewed in class)**

Student Instructions:

Read all assigned pre-readings.

Pre-Workshop: Read the Honeycutt article thoroughly, taking notes on:

- a. The effectiveness of the interventions
- b. Cost considerations
- c. Best practices for implementation
- d. Challenges and limitations

Assessments Unit Four

Practical Assessments:

Competency Checklist:

Note the competency checklist associated with the structured role play described above. It is listed above for context but is intended to be used as an assessment.

Objective Structured Clinical Examination (OSCE):

Attached at the end of this curriculum, is a case packet that includes an OSCE. Using the patient case, students will demonstrate a conversation with a social worker. Post-encounter, students should generate a progress note about the patient's visit.

Formative assessments:

1. The following question is about your pre-class reading, Honeycutt AA, Khavjou OA, Tayebali Z, Dempsey M, Glasgow L, Hacker K. Cost-Effectiveness of Social Determinants of Health Interventions: Evaluating Multisector Community Partnerships' Efforts. *Am J Prev Med.* 2024 Dec;67(6):916-923. doi: 10.1016/j.amepre.2024.07.016.

According to the above article, what is the primary purpose of evaluating cost-effectiveness of social determinants of health (SDOH) interventions?

- A. To assess the financial impact of interventions on community health programs.
- B. To evaluate the role of clinical care compared to SDOH-based interventions.
- C. To identify interventions that provide the greatest benefit relative to their cost.
- D. To prioritize community health interventions for funding and implementation.

Key: C. To identify interventions that provide the greatest benefit relative to their cost.

Rationale: The article below emphasizes that cost-effectiveness analyses help decision-makers allocate resources by focusing on interventions that achieve health outcomes. None of the other options are supported by course readings.

Reference: Honeycutt AA, Khavjou OA, Tayebali Z, Dempsey M, Glasgow L, Hacker K. Cost-Effectiveness of Social Determinants of Health Interventions: Evaluating Multisector Community Partnerships' Efforts. *Am J Prev Med.* 2024 Dec;67(6):916-923. doi: 10.1016/j.amepre.2024.07.016.

Summative Assessments:

1. A 65-year-old male with diabetes mellitus type II presents to an internal medicine clinic for his annual check-up. He is currently on oral antihyperglycemic medications and has maintained blood glucose within target range. His blood pressure is slightly elevated and may warrant starting antihypertensive medication. The PA discusses options including an effective, high-cost

medication recently released and a lower-cost, well-established medication.

Which of the following approaches **BEST** demonstrates an understanding of cost, value, and effectiveness in supporting health system science principles?

- A. Recommend only the high-cost option since it may be the most effective, regardless of the cost to the patient.
- B. Recommend providing direct care for the patient's medical conditions without considering patient preferences or coordinating care with the team.
- C. Recommend the higher-cost medication as it has shown effectiveness in recent studies, and you want to ensure the patient receives the latest treatment.
- D. Recommend the lower-cost, well-established medication if it is effective for the patient, as it provides good value by balancing cost and clinical benefit.

Key: D. Recommend the lower-cost, well-established medication if it is effective for the patient, as it provides good value by balancing cost and clinical benefit.

Rationale: This choice demonstrates an understanding of the health system science principle by balancing cost (choosing a lower-cost medication), value (considering patient outcomes relative to cost), and effectiveness (ensuring the medication provides clinical benefit), thereby promoting efficient and equitable care.

Reference: American Diabetes Association Professional Practice Committee; 10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025. *Diabetes Care* 1 January 2025; 48 (Supplement_1): S207–S238. <https://doi.org/10.2337/dc25-S010>

Educational Unit 5, Clerkship

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

In a clerkship, demonstrate competence with engaging in assessment and interventions across the lifespan while reflecting the principles of health systems science.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none"> 1. apply principles of health systems science (HSS) to the clinical practice setting for patient evaluation and health care service delivery. 2. distinguish biopsychosocial factors impact that the quality of the patient experience within the health system. 3. demonstrate professional behavior consistent with the Guidelines for Ethical Conduct for the PA Profession when engaging with patients throughout a patient care encounter. 4. formulate a patient-centered discharge plan with interprofessional collaboration to optimize care quality and safety. 	<ol style="list-style-type: none"> 1. Simulated Clinical Case OSCE (IO 1,2,3) 2. Oral presentation of simulated clinical case (IO 1,2,4) 3. Discharge Plan SOAP Note (IO 4) 	<ol style="list-style-type: none"> 1. Peer to Peer Role Play with Debrief 2. Post Activity Class Discussion/Debrief

Instructional Strategies Unit 5

Activity 1. Peer to Peer Role Play with Debrief

Unit 5 Instructional Objective #1: Upon completion of the learning activities the student will be able to apply principles of health systems science (HSS) to the clinical practice setting for patient evaluation and health care service delivery.

Unit 5 Instructional Objective #2: Upon completion of the learning activities the student will be able to distinguish biopsychosocial factors that impact the quality of the patient experience within the health system.

Unit 5 Instructional Objective #3: Upon completion of the learning activities the student will be able to demonstrate professional behavior consistent with the [Guidelines for Ethical Conduct for the PA Profession](#) when engaging with patients throughout a patient care encounter.

Unit 5 Instructional Objective #4: Upon completion of the learning activities the student will be able to formulate a patient-centered discharge plan with interprofessional collaboration to optimize care quality and safety.

Faculty Instructions: The class will organize into groups of 3 students (“trios”) with one faculty per room if feasible. The number of rooms and faculty will vary by your room size and class size. Within their trios, students will engage in a role play which includes a patient, a PA, and a proctor for 10 minutes each. A rubric is available in the assessments section of this unit.

- Student “PAs” focus on taking a history that demonstrates compassionate, socially competent, and ethical care, addressing the patient’s concerns, without a physical examination.
- The student “patient” acts the role of the patient outlined in the case
- The “proctor” student will have the rubric for formative instruction to guide them in giving peer feedback.

Ideally, each student will have a turn with each role. After the students get to play each role, the trios return to their group to discuss the patient’s needs and offer peer feedback for 10 minutes. Each trio should choose a spokesperson; the students will regroup as a whole class to discuss their assessment of the patient’s needs. The faculty can facilitate the class discussion/debrief using the thought questions below for guidance. Any questions or comments about the pre-reading could also be discussed here.

Debrief/Discussion:

What medical(biological) concerns arose?

What psychological concerns arose?

What social issues/barriers arose?

Did you consider the cost of the antibiotic options? Consulting pharmacist?

Did you consider the deconditioning from bedrest and the role PT plays in the care? Safety concerns?

Did you feel confident you could reassure the patient that their needs/concerns could be addressed based on your knowledge of the roles of the interprofessional team members?

Did anyone have a lived experience with yourself or family member with similar concerns/fears?

A post-session graded assessment will be for each student to submit a 2-3 minute voice or video thread on the learning management system “presenting” this patient in as if in front of a preceptor and a written SOAP note (omitting the objective section) with a patient-centered treatment plan addressing the patient’s medical, psychological, and social needs. (see assessments section of this unit for full details).

Pre-class required readings:

Before attending class, familiarize yourself with the following resources. The goal is to understand the key concepts. As you read try to formulate a take-home message rather than being hyper-focused on memorizing detail.

1. [Roles and Responsibilities of Health Care Providers on an Interdisciplinary Team](#) (this
2. [Guidelines for Ethical Conduct for the PA Profession](#)
3. [Social determinants of health healthcare providers should consider in the evaluation and treatment of patients](#) (attached).
4. O'Rourke, B. , Widenhoefer, T. , Reimer, N. , Vazquez, E. & Wolpert, C. (2018). Roles, Responsibilities, and Implications of Health Care Practitioners Providing Interprofessional Collaborative Practice to the Geriatric Population. *Topics in Geriatric Rehabilitation, 34* (3), 165-170. doi: 10.1097/TGR.000000000000189.

Attached for faculty reference: [ARC- PA Standards that reflect Health Systems Science Principles](#)

Student Instructions:

You will be placed in groups of 3 students (“trios”). Each trio will rotate between three roles: Patient, PA, and Proctor.

Role Descriptions:

- PA: Focus on taking a history that demonstrates compassionate, socially competent, and ethical care, addressing the patient’s concerns (no physical examination required).
- Patient: Act out the patient role as outlined in the case scenario.
- Proctor: Use the rubric to guide and assess the role-playing process, providing constructive feedback.

Role-Playing Procedure

- Role Allocation: Each role will be performed for 10 minutes.
- Switch Roles: After the time is up, switch roles within your trio until each student has experienced all three roles.
- Choose a spokesperson for your trio.

Activity 2. Post-activity class discussion:

Whole-Class Discussion:

After role-playing, reconvene with your whole class to discuss your assessment and plan. Any questions or comments about the pre-reading may be discussed here.

Note to students: Discussing barriers to accessing healthcare can bring up past experiences that may have been difficult for you, your family or your classmates. Please respect and learn from your classmates' unique experiences even if they are not situations, you have personally experienced.

Assessments Unit Five

Formative Assessment:

Case for Peer to Peer Role Play:

Mrs. Rivera is a 68 year old female admitted for perforated sigmoid diverticulitis with abscess status-post diverting colostomy now ready for discharge home. The nurse tells you in pre-rounds the patient has several concerns such as caring for the ostomy, feeling deconditioned from extended bed rest, obtaining her antibiotics, paying for her ostomy supplies, and transportation to her follow-up visit with the surgeon.

Instructions to the Learner:

You, as the PA, will see a patient who is ready for discharge during your rounds. Your task is to inform the patient about their discharge and discuss their progress towards that goal. The interaction will be conversational, no physical examination is required, and the goal is to assess the patient's needs and formulate a plan for how the interprofessional team can address the patient's needs within the health system.

Door note:

To the learner: No new issues overnight, vital signs stable, all labs normal, clinically stable and ready for discharge home tomorrow.

Peer to Peer Simulated Patient Encounter Rubric

History	Yes 2 points	Partial 1 point	No 0 points	Comments
Student introduces themselves				
Student verifies patient's name, age, DOB				
Tells patient she is ready for discharge planning				
Interviews patient in a compassionate, culturally sensitive, and ethical manner				
Interviews patient with the following open-ended questions: <ul style="list-style-type: none"> a. Do they have any concerns about the discharge? b. Do they feel capable of caring for the ostomy? c. How are you adjusting to the ostomy? d. What are the financial barriers to obtaining ostomy supplies, antibiotics? e. Why are they concerned about transportation to the surgeon's office? <ul style="list-style-type: none"> Cost? Distance? No one to drive them? 				

Summative Assessments:

1. Verbal patient presentation:

Each student shall submit a brief 2–3-minute voice or video thread on the learning management system “presenting” this patient to a clinical preceptor. Include a brief subjective summary, identify the patients’ needs/concerns, and complete the following statement: “I am planning” to meet the patient’s needs.

Rubric for Oral Presentation of Case from Simulated Peer to Peer Role Play:

Subjective	3 points all elements	2 points at least 1-2 elements	0 points no elements	Comments
States age, procedure and admitting diagnosis: “The patient is a 68 y.o. female s/p Hartmann’s procedure or equivalent (emergency laparotomy with colostomy)”				
States “patient ready for discharge home”	Yes=3 pts.		No=0 pts.	
She expressed concern about: 1. Ostomy care 2. Paying for antibiotics 3. Transportation 4. Deconditioning/muscle weakness	3 points all elements	2 points 2-3 elements	No credit 0-1 element	
Assessment				
Identifies which interprofessional team members have been consulted/seen the patient their recommendations including: 1. PT/OT 2. Ostomy nurse 3. SW (Case coordinator) 4. Pharmacy	3 points 3-4 elements	2 points 2-3 elements	No credit 0-1 element	
Plan:				
1. We should consult Case management for home health services, affordable transportation options, home ostomy teaching, setting up home PT/OT 2. I plan to discuss her ability to care for the ostomy with the wound ostomy nurse.” 3. “I plan to discuss options for more affordable antibiotics with the pharmacy” 4. Expresses concern or attention to her psychological adjustment to the ostomy				
Total Points				

2. Discharge Plan Soap Note:

Students shall submit a written SOAP note with a patient-centered treatment plan addressing the patient’s medical, psychological, and social needs, and demonstrating the principles of health science.

Rubric for Discharge Plan SOAP Note

Subjective	3 points: 4-5 elements	2 points: 2-3 elements	0 points: 0-1 elements	Comments
Student summarizes the patient’s concerns/needs in a history paragraph from the interview in proper grammatical* form:				
<ul style="list-style-type: none"> a. Strength and mobility at home b. Paying for antibiotics and ostomy supplies c. Additional ostomy teaching for increased confidence d. Transportation needs 				
Assessment				
Identify Needs: <ul style="list-style-type: none"> 1. Assistance with obtaining and covering the cost of ostomy supplies and antibiotics 2. Transportation options 3. Home health services for RN ostomy teaching and PT/OT 				
Plan				
<ul style="list-style-type: none"> 1. Reassures patient that her needs will be addressed prior to discharge 2. Case Management consult to address: <ul style="list-style-type: none"> a. Transportation options (cab voucher or other service) b. Obtaining ostomy supplies a. Home health nurse for additional ostomy teaching and medication management. 3. IP collaboration: <ul style="list-style-type: none"> a. Confirm with ostomy nurse the patient has completed the necessary teaching prior to D/C. b. Discuss with her nurse the patient’s progress and any concerns they have noticed while caring for the patient. c. Confirm PT/OT has worked with the 				

<p>patient to determine safety at home and any ambulatory needs (walker, cane, bedside commode, hospital bed)</p> <p>d. Discuss cost effective antibiotic options with pharmacy</p>				
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*Our intent for including this category is not to penalize students who need improvement in this area, but to assign a small point value so students try their best and educators may match students with appropriate resources as needed to prepare them for written communication in their future clinical work.

Pre-readings

Roles and Responsibilities of Health Care Providers on an interdisciplinary team

The following output was obtained from Chat GPT on 12/15/2024:

Prompt: What are the roles and responsibilities of health care providers on an interdisciplinary team?

The roles and responsibilities of healthcare providers on an interdisciplinary team are centered on collaborative, patient-centered care. Each team member contributes their specific expertise while working together to achieve shared goals for the patient's health and well-being. Here's an overview of the roles typically found in such teams:

1. Physicians

Role: Diagnose and treat illnesses, develop and oversee care plans, and make critical medical decisions.

Responsibilities:

Conduct medical assessments and order diagnostic tests.

Prescribe medications and treatments.

Provide expertise in complex cases.

Collaborate with the team to ensure continuity of care.

2. Physician Assistants (PAs) - edited

Role: Diagnose and treat illnesses, provide diagnostic, therapeutic, and preventive healthcare while collaborating with physicians and other care team members.

Responsibilities:

Conduct medical assessments and order diagnostic tests.

Prescribe medications and treatments.

Perform physical exams and order/interpreting tests.

Assist in surgeries and manage patient care.

Educate patients on treatment options and health maintenance.

Serve as a bridge between physicians and the rest of the team.

3. Nurses (RNs, LPNs, and Nurse Practitioners)

Role: Deliver direct patient care and coordinate with other providers to implement care plans.

Responsibilities:

Monitor patient health and administer treatments or medications.

Provide patient education on health management.

Act as patient advocates and liaisons between patients and the team.

Lead care coordination in managing chronic conditions.

4. Pharmacists

Role: Ensure safe and effective medication use.

Responsibilities:

Review and verify prescriptions for safety and effectiveness.
Educate patients and providers about medication use and interactions.
Assist with medication reconciliation and adherence.
Provide recommendations for cost-effective therapy.

5. Social Workers

Role: Address the social and emotional aspects of patient care.

Responsibilities:

Assess patients' social, emotional, and financial needs.
Connect patients with community resources and support.
Provide counseling for coping with illnesses or life changes.
Facilitate discharge planning and transitions of care.

6. Physical, Occupational, and Speech Therapists

Role: Restore or maintain physical, functional, or communication abilities.

Responsibilities:

Develop and implement therapy plans for recovery or adaptation.
Monitor progress and adjust interventions as needed.
Educate patients and families on exercises or techniques to use at home.
Contribute expertise to team discussions about mobility, daily function, or communication needs.

7. Dietitians/Nutritionists

Role: Manage patients' nutritional needs to support health and recovery.

Responsibilities:

Assess dietary habits and provide tailored nutrition plans.
Address specific dietary requirements for chronic conditions (e.g., diabetes, kidney disease).
Educate patients on healthy eating practices and food choices.

8. Case Managers

Role: Coordinate overall care and ensure efficient use of resources.

Responsibilities:

Develop comprehensive care plans.
Communicate with payers, families, and providers to streamline care.
Monitor progress and adjust plans for optimal outcomes.

9. Mental Health Providers (Psychologists, Psychiatrists, and Counselors)

Role: Address psychological and emotional aspects of health.

Responsibilities:

Provide therapy and counseling for mental health conditions.
Prescribe and monitor psychiatric medications (psychiatrists).
Work with other team members to integrate mental health care.

10. Administrative Staff

Role: Ensure the smooth operation of the healthcare team and patient interactions.

Responsibilities:

- Schedule appointments and manage documentation.
 - Facilitate communication between patients and providers.
 - Handle billing, insurance, and other logistical tasks.
-

Core Principles of Interdisciplinary Teams

- Collaboration:** Active sharing of expertise to create a unified care plan.
 - Communication:** Regular meetings and updates to ensure everyone is aligned.
 - Respect for Roles:** Understanding and valuing each team member's contributions.
 - Patient-Centered Focus:** Aligning all efforts toward achieving the best outcomes for the patient.
- Would you like further insights into specific roles or examples of successful interdisciplinary collaboration?

What social determinants of health should healthcare providers consider in the evaluation and treatment of patients?

The following output was obtained from Chat GPT on 12/15/2024:

Prompt: What are the social determinants of health that healthcare providers consider in the evaluation and treatment of patients?

Healthcare providers should consider a broad range of social determinants of health (SDOH) when evaluating and treating patients. These factors significantly impact health outcomes and access to care. Below are the key SDOH categories and examples of what providers should assess:

1. Economic Stability

Examples:

- Employment status and job security.
 - Household income and financial stress.
 - Access to affordable healthcare, medications, and other resources.
- Impact: Financial instability can lead to delayed treatments, inability to afford medications, or limited access to nutritious food.
-

2. Education Access and Quality

Examples:

- Literacy levels, including health literacy.
 - Educational attainment.
 - Access to quality early childhood education and adult education opportunities.
- Impact: Poor education and health literacy can hinder understanding of treatment plans or preventive measures.
-

3. Healthcare Access and Quality

Examples:

Availability of primary care providers and specialists.

Health insurance status and coverage.

Proximity to healthcare facilities.

Impact: Limited access to quality care can exacerbate chronic conditions and delay timely interventions.

4. Neighborhood and Built Environment

Examples:

Housing quality and stability (e.g., overcrowding, homelessness).

Safety of the local environment (e.g., crime, pollution).

Access to transportation and reliable infrastructure.

Availability of recreational spaces and grocery stores with nutritious food.

Impact: Unsafe or unhealthy living conditions can increase exposure to diseases and limit physical activity.

5. Social and Community Context

Examples:

Social support systems, including family and friends.

Experiences of discrimination, racism, or social exclusion.

Community engagement and connectedness.

Impact: Strong social networks improve mental health and resilience, while isolation or discrimination can worsen health disparities.

6. Food Security

Examples:

Consistent access to sufficient, safe, and nutritious food.

Prevalence of food deserts in the patient's community.

Impact: Food insecurity contributes to malnutrition, obesity, and chronic conditions such as diabetes and hypertension.

7. Cultural and Linguistic Factors

Examples:

Language barriers in healthcare settings.

Cultural beliefs or practices that may influence healthcare decisions.

Impact: Miscommunication due to cultural or linguistic differences can lead to mistrust, poor adherence to treatment, or inadequate care.

8. Health Behaviors Influenced by Social Determinants

Examples:

Smoking, alcohol use, and substance abuse.

Physical activity levels, often shaped by available resources and community norms.

Impact: These behaviors are often influenced by environmental and social factors rather than individual choice alone.

9. Policy and System-Level Influences

Examples:

Local, state, and federal health policies.

Access to programs like Medicaid, Medicare, or public housing.

Impact: Policies that fail to address systemic inequities perpetuate poor health outcomes.

Strategies for Providers

Screen patients for SDOH using standardized tools like the PRAPARE (Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences).

Collaborate with social workers, community organizations, and care coordinators to address unmet needs.

Advocate for systemic changes to improve equity in healthcare.

These considerations emphasize a holistic, patient-centered approach to care that accounts for more than clinical symptoms. Addressing SDOH can significantly improve both individual and population health outcomes. Would you like examples of specific interventions for addressing these determinants?

5th Edition ARC- PA Standards that Reflect Health Systems Science Principles

B2.04 The curriculum must include instruction in interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families and other health professionals.

B2.07 The curriculum must include instruction in patient evaluation, diagnosis and management across all age groups and from initial presentation through ongoing follow-up, including: a) interviewing and eliciting a medical history, b) performing complete and focused physical examinations, c) generating differential diagnoses, d) ordering and interpreting diagnostic studies, e) patient management including acute and chronic care plans, and f) patient education and referral.

B2.10 The curriculum must prepare students to work collaboratively in interprofessional patient centered teams. Instruction must: a) include content on the roles and responsibilities of various health care professionals, b) emphasize the team approach to patient centered care beyond the traditional physician-PA team approach, and c) include application of these principles in interprofessional teams.

B2.14 The curriculum must include instruction about the business of health care to include: a) coding and billing, b) documentation of care, c) health care delivery systems, and d) health policy.

B2.15 The curriculum must include instruction in concepts of public health as they relate to the role of the practicing PA and: a) disease prevention, surveillance, reporting and intervention, b) the public health system, c) patient advocacy, and d) maintenance of population health.

Educational Unit 7, Summative

Framework

Program Learning Outcome:

Demonstrate the ability to screen, evaluate, manage, treat, provide patient education, and advocate for wellness and prevention of impairment across the lifespan of patient populations reflective of the principles of health systems science.

Course Learning Outcome:

Demonstrate the application of the cumulative knowledge and skills acquired in the courses taken within the PA curriculum and apply it to the delivery of safe, quality, and value-based care demonstrating ability to assess, and tailor interventions reflective of the principles of health systems science.

Instructional Objectives	Assessments	Instructional Strategies
<p>Upon completion of the learning activities the student will be able to:</p> <ol style="list-style-type: none">1. explain the various components of health systems science and how they work together in the context of patient care.2. identify a community health gap and apply a potential framework for the health system to address that gap.3. obtain a minimum score on a cumulative multiple choice assessment	<ol style="list-style-type: none">1. OSCE with Standardized patient experience and SOAP note (IO 1)2. Group project (IO 2)3. Multiple choice questions on cumulative exam (IO 3)	<ol style="list-style-type: none">1. Case Review2. Retrieval Practice

Instructional Strategies Unit 7

Activity 1. Case Review:

Unit 7, Instructional Objective # 1: Upon completion of the learning activities the student will be able to explain the various components of health systems science and how they work together in the context of patient care.

Faculty Instructions: The table below suggests content for PowerPoint slides; adjust content as needed for your class and students. Present the case to the students one slide at a time. Allow the students, as a class, to work together to ask questions to fill in the details and come up with an appropriate plan. If time allows, consider having the students write a SOAP note with the information obtained. (This could be done in pairs during class, or as an individual assignment).

Pre-class required reading:

Prior to class review information from previous units to familiarize yourself with the various components of the health system and how those components work together.

Student Instructions: As a class work together to gain the necessary details to develop an appropriate plan for the patient case presented.

Case Presentation:

Slide	Notes
<p>J. S. is a 67 year old who presents to your office for a routine appointment. You last saw this patient 6 months ago. The patient has history of hypertension and type 2 diabetes mellitus.</p> <p>The medical assistant obtained the following vital signs: HR: 98 BP: 168/92 Temp: 97.9F Wt: 89.5 Kg BMI: 29.1 kg/m²</p> <p>What additional history questions do you want to ask?</p>	<p>Questions to expect? What medications are prescribed? Are you taking your medications? Are you checking your blood sugar? Do you have a log of your blood sugar? Do you have a log of your blood pressure? Do you smoke or vape? (current or former) Do you drink alcohol? If so, how much? Do you use recreational drugs?</p>
<p>The patient is not keeping a log of blood sugar or blood pressure</p> <p>The patient is not checking blood sugar</p> <p>The patient is a current smoker, about 1/2 ppd x 50 years</p> <p>The patient denies drinking alcohol and denies recreational drug use</p>	
<p>Medications prescribed: Semaglutide 1mg weekly Valsartan/hydrochlorothiazide 160mg/12.5mg, 1 tablet</p>	<p>Questions to expect? What changed 3 months ago that lead to you not taking your medications?</p>

<p>daily The patient reports not taking these medications for the last 3 months What do you want to ask next?</p>	<p>Are you experiencing side effects from these medications?</p>
<p>The patient reports they became homeless 3 months ago after the death of their spouse. Since becoming homeless the patient is unable to keep up with taking medications. What additional questions do you want to ask?</p>	<p>Questions to expect? Are you unable to take your medications due to cost? Due to not being able to get to the pharmacy? Are you staying at a shelter? Where are you sleeping? Where are you getting meals? Have you been in contact with/are you working with a social worker? Mental health questions- Are you feeling down, depressed, hopeless? Are you having any thoughts of ending your life? Are you working with a grief counselor/going to any support groups? Who is your support system?</p>
<p>The patient reports the medications are too expensive. The patient's spouse carried the health insurance and after they died the patient no longer has health insurance. The patient is retired and has a fixed income. The cost of these medications without insurance is too much. The patient is currently sleeping in the car. They get the majority of their meals from community food kitchens that offer free meals as well as food banks. The patient reports having little support since the loss of their spouse. They did not have any children. The patient's only sibling, a brother, died 6 years ago. The patient does feel down and hopeless, especially since becoming homeless. The patient denies thoughts of suicide. The patient is not seeing a therapist or counselor and is unfamiliar with grief support groups. Are there any additional questions you want to ask? What ROS questions do you want to ask?</p>	<p>Questions to expect? Are you interested in seeing a therapist or starting grief counseling? Are you interested in resources for food/housing?</p>
<p>The patient does not want to see a therapist or counselor however is willing to consider a support group. The patient would like resources for food/housing ROS: Negative except for feeling down/depressed</p>	<p>Next steps should be physical exam and finger stick glucose in the office</p>

What comes next?	
<p>Physical Exam: Overall well-appearing, alert, responds appropriately to questions HEENT: Pupils equal, round, reactive to light and accommodation. Oropharynx clear. No neck lymphadenopathy. No thyroid nodules Cardiac: normal rate and rhythm. Normal S1S2 without murmurs/rubs/gallops. No peripheral edema Pulm: no respiratory distress. Coarse rhonchi bilaterally clears with cough. Skin: no clubbing, no cyanosis Neuro: alert and oriented x3. Normal gait. Finger stick: 197 mg/dL</p>	
What is your plan?	<p>Expected Plan Labs- CBC, BMP, A1C (assess for anemia, kidney function, baseline a1c)</p> <p>Consults/Referrals-</p> <ol style="list-style-type: none"> 1. medical social work/case manager for help with medicare application and medication costs 2. Community social work to for help with food/housing 3. Grief support group <p>Interim medications- are there samples in the office? Is there a free pharmacy to cover medications? Are there more affordable options? What about semaglutide (needs refrigerated)</p> <p>Follow up in the office in 6 weeks (no more than 3 months)</p>

Activity 2. Retrieval Practice:

Unit 7, Instructional Objective # 1: Upon completion of the learning activities the student will be able to explain the various components of health systems science and how they work together in the context of patient care.

Unit 7, Instructional Objective #2: Obtain a minimum score on a cumulative multiple choice assessment.

Faculty Instructions: Prior to class provide students with a link to a survey requesting topics that need review or specific questions they have. Alternatively, students could email this information to designated faculty. Using a survey link allows all of the answers to be easily accessed in one location.

1. Generate questions from students' submissions. (consider using AI to consolidate themes and generate the list of questions).
2. Create a simple presentation of the questions to use during the class.
 - a. How many questions to review is determined by the amount of class time dedicated to this strategy. Each question should have a minimum of 5 minutes allowed for answer/review.
3. Present the questions to the students one at a time
 - a. Have the students BRIEFLY discuss the answers in pairs. Recommend no more than 2-3 minutes for pair-discussion
 - b. Have one pair answer the question aloud for the class
 - c. Discuss/clarify as needed
 - d. After the clarification advance to the next question

Pre-class required reading:

Prior to class, review what you have learned in previous units. Respond to survey link with topics that need review or with specific questions

Student Instructions: During class you will work in pairs to answer review questions from previous units. These answers will be discussed as a class.

Assessments Unit Seven

Formative assessments:

1. Group Project

Student instructions

- Working in groups of 3-4 students, identify 3 community health gaps in the city or county where your PA program is housed.
- Examples: lack of mental health resources, high rates of childhood obesity, low vaccination rates, low rates of adults who complete preventative screening such as colonoscopy or mammogram.
- Review the rubric below before you begin working so you know what is expected. Review the rubric below before you begin working so you know what is expected.
- Choose 1 of the gaps your group identified and design a potential solution for how a health system could address that gap. (Example: community health fair, free screenings, bringing resources to the schools, advertising campaign to spread awareness of existing resources).
- Final projects will be presented to the class. You may choose how you wish to display the information for your presentation (e.g., PowerPoint, poster, advertising flier/pamphlet).
- You will need to submit your presentation idea for approval.

There are two deliverables for this project. Rubrics are available on the following pages.

1. A summary of the health gaps your group identified.
 - a. Include a statement regarding which gap you will focus on for the final portion of this project. It is important that you use and cite (AMA format) relevant sources when identifying these gaps.
 - b. When submitting the summary, submit a separate statement identifying the format for your final presentation. This is a simple statement of the format for approval. You do not have to include the details of the final presentation. (Example: We will be designing a poster for the final presentation).
2. The final presentation will be given to the class.
 - a. The format used to display that information will be decided by each group.
 - b. During the presentation you will need to summarize the initial gaps identified, and clearly state which gap you are addressing.
 - c. You will explain to the class the solution you propose to address that gap, including why this solution was chosen and how it works to address the problem.
 - d. Identify which parts of the health system will be involved (ex: community physicians/PAs/NPs, social work, radiology, laboratory).

The final Grade for this project will be based on the deliverables and your participation. Each group member will submit a short survey regarding participation of the other individual members. This will be submitted directly to faculty. The faculty will use all the surveys to identify if full participation points will be awarded, or if there will be deductions.

	Exceeds Expectations	Meets Expectations	Does not Meet Expectations	Missing
Gaps identified are appropriate, distinct and clearly stated	At least 3 gaps identified. Evidence of extra effort. Points available: 4-5	At least 3 gaps identified. Meets expectations for graduate level student. Points available: 2-3	Less than 3 gaps identified. Effort does not meet expectation for graduate level student. Points available: 1	Not completed Points available: 0
Gap summary demonstrates an understanding of the problems identified including who is affected	Demonstrates significant understanding of the problems identified and who is affected. Points available: 4-5	Demonstrates an average understanding of the problems identified and who is affected. Points available: 2-3	Demonstrates poor understanding of the problems identified and who is affected. Points available: 1	Summary not submitted Points available: 0
Grammar: Including spelling, sentence structure, verb tense, punctuation*	1 or fewer grammatical mistakes. Points available: 3	2-3 grammatical mistakes. Points available: 2	4 or more grammatical mistakes. Points available: 1	Summary not submitted. Points available: 0
Formatting: AMA format, including citations and cover page	Evidence of extra effort. Points available: 3	Meets expectations of graduate level student. Points available 2	Less than satisfactory. Elements missing. Points available: 1	Summary not submitted . Points available: 0
Sources are appropriate and relevant	More than 1 source per gap identified. Points available: 3	1 source per gap identified. Points available: 2	1 or more gaps without identified source. Points available: 1	Sources not submitted. Points available: 0
Presentation idea submitted	N/A	With Summary Points: 1	Late Points: 0.5	Missing Points: 0

*Our intent for including this category is not to penalize students who need improvement in this area, but to assign a small point value so students try their best and educators may match students with appropriate resources as needed to prepare them for written communication in their future clinical work.

	Exceeds Expectations	Meets Expectations	Does not Meet Expectations	Missing
Identified gaps are summarized in a clear and concise manner	Exceeds expectations of graduate level students. Evidence of extra effort. Points available: 4-5	Meets expectations of graduate level students. Points available: 2-3	Less than satisfactory. Points available: 1	Not included in presentation. Points available: 0
Target gap is clearly stated including target audience	Exceeds expectations for graduate level students. Evidence of extra effort. Points available: 2	Meets expectations for graduate level students. Points available: 1	Less than satisfactory. Points available: 0.5	Not included in presentation. Points available: 0
Involved components of Health Systems appropriately identified, including their role in the proposed framework	Exceeds expectations for graduate level students. Evidence of extra effort. Points available: 3	Meets expectations for graduate level students. Points available: 2	Less than satisfactory. Points available: 1	Not included in presentation. Points available: 0
Proposed framework addresses the problem, is realistic, and appropriate for the intended community	Exceeds expectations for graduate level students. Evidence of extra effort. Points available: 9-10	Meets expectations for graduate level students. Points available: 7-8	Less than satisfactory. Points available: 1-6	Not included in presentation.

				Points available: 0
Presentation is well organized, engaging, easy to understand	Exceeds expectations for graduate level students Points available: 9-10	Meets expectations for graduate level students Points available: 7-8	Less than satisfactory Points available: 1-6	Presentation not performed Points available: 0

Survey of Participation

Each member of the group should complete this survey for all other individuals in the group.

(Recommendation for survey to be submitted directly to faculty who is grading the project.

Additional recommendation for point deduction based on summary of surveys. For example, if the consensus from the group is one member did not meet the participation expectations, that students grade should be reduced using faculty discretion.

Average participation score 5 = no deduction

Average participation score 4 = 10% deduction

Average participation score 3 = 20% deduction

Average participation score 2 = 30% deduction

Average participation score 1 = 40% deduction

If all members of the group report a score of 0 for the same person, then that person should not be given credit for this project.)

Name of group member being surveyed _____

Name of group member completing survey _____

On a scale of 0-5 please rate the participation of the group member. _____

0 = no participation

1 = limited participation

2 = more than limited participation, however student offered little to discussions, research, summary, presentation design, etc.

3 = student was present and participated in most discussions, but did not participate in research, summary, presentation, design, etc.

4 = student was present and participated in discussions, but made little contribution to research, summary, presentation design, etc.

5 = full participation and effort as expected for a group project

Summative Assessments: MCQs

1. What is **NOT** a requirement of informed consent?
 - A. Alternatives to the procedure
 - B. Benefits of procedure
 - C. Cost of the procedure
 - D. Risks of the procedure

Key: answer: C. Cost of procedure

Rationale: Answer choice C is correct because discussion about cost of procedure is not required when obtaining informed consent. Answer choice A is incorrect because giving alternatives to the procedure is required when obtaining informed consent. Answer choice B is incorrect because discussion of benefits of the procedure is required when obtaining informed consent. Answer choice D is incorrect because discussion of risks of the procedure is required when obtaining informed consent.

References:

Shah P, Thornton I, Turrin D, Hipkind JE. Informed consent. National Library of Medicine. Published October 15, 2024. <https://www.ncbi.nlm.nih.gov/books/NBK430827/>

Use the following Clinical Vignette to answer the next 3 questions:

A 76 y/o female has been hospitalized for a left hip fracture. She was found on the bathroom floor by her family after they had not heard from her in 24 hours. While hospitalized the patient had a left hip replacement. She has a history of high blood pressure and type 2 diabetes mellitus (DM). The patient currently lives alone and speaks to her family daily. She manages her own medications and ADLs. The family is concerned about the patient being discharged back to her home, because she lives alone.

1. Who is the **MOST** likely point of contact for the family in regard to a safe/satisfactory discharge plan?
 - A. Case Manager
 - B. Internal Medicine team (hospitalist)
 - C. Orthopedic surgery team
 - D. Primary nurse

Key: answer: A. Case manager

Rationale: Answer choice A is correct because the case manager will assist with coordination of admission to SNF for rehab and/or setting up home PT/OT/Nurse visits if the patient is discharged to home. Answer choice B is incorrect because the internal medicine team can place orders for discharge and home care, but these providers are not involved with the coordination of resources or arranging admission to SNF. Answer choice C is incorrect because the orthopedic surgery team can place orders for discharge and home care, but these providers are not involved with the coordination of resources or arranging admission to SNF. Answer choice D is incorrect because the primary nurse is responsible for bedside care, not discharge planning.

References:

Hunter T, Nelson J, Birmingham J. (2013). Preventing Readmissions Through Comprehensive Discharge Planning. *Professional Case Management*. 2013;18(2):56-63.
doi:<https://doi.org/10.1097/ncm.0b013e31827de1ce>

2. What consult will most likely occur **PRIOR** to discharge from the hospital

- A. Dietician
- B. Pharmacist
- C. Physical therapy
- D. Speech language pathology

Key: answer: B. Physical therapy

Rationale: Answer choice is C is correct because a patient who is admitted for hip fracture with surgical repair will need physical therapy as part of the recovery process. Physical therapy will be involved in the hospital, because early mobility is associated with improved outcomes. Answer choice A is incorrect because consult with a dietician is not a routine part of post-op care after hip arthroplasty. Answer choice B is incorrect because consult with a pharmacist is not a routine part of post-op care after hip arthroplasty. Answer choice D is incorrect because there is nothing in the vignette that indicates this patient is having difficulty with swallowing or speaking.

References:

Lim JW, Hutchison P, Riemen AHK, Hutchison JD. The multidisciplinary management of hip fractures in older patients: an update. *Orthopaedics and Trauma*. 2024;38(2):85-88.
doi:10.1016/j.mporth.2024.01.003.

3. While the above patient was hospitalized, the patient reveals she has been taking her antihypertensive medication every other day instead of daily as prescribed. The patient states the

medication is too expensive and she cannot afford to pick it up every month, which is why she is not taking it as prescribed. What is the **MOST** appropriate next step?

- A. Consult the pharmacist for recommendations for alternative medications and see if these are better covered by the patient's insurance.
- B. Counsel the patient and family about the importance of taking medication as prescribed, reviewing the negative outcomes associated with uncontrolled high blood pressure.
- C. Discontinue the medication. It is better to not take the medication, than to take it incorrectly.
- D. Make no changes. The patient is getting the medication as prescribed while in the hospital and is being discharged to skilled nursing rehab, and they will continue as prescribed.

Key: answer: A. Consult the pharmacist for recommendations for alternative medications and see if these are better covered by the patient's insurance.

Rationale: Answer choice A is correct because addressing the cause of non-compliance (this patient is unable to afford her medication) by prescribing a more affordable alternative will improve compliance once the patient is able to return home. Answer choice B is incorrect because explaining the importance of the medication is not addressing the reason for this patient is not taking the medication as prescribed. Answer choice C is incorrect because discontinuing the medication without prescribing an appropriate alternative leaves her hypertension untreated. Answer choice D is incorrect because once the patient is discharged from the hospital and then discharged from SNF rehab she will be in the same position of not being able to afford her medication.

References:

Contributor: Medication Adherence Is Not a Zero-Sum Game. AJMC.

<https://www.ajmc.com/view/contributor-medication-adherence-is-not-a-zero-sum-game>

4. Which of the following terms refers to a healthcare delivery model where health services are managed and delivered in a way that coordinates services across different levels and sites of care?
- A. Capitation
 - B. Fee-for-service
 - C. Integrated care
 - D. Value-based care

Key: answer: C. Integrated care

Rationale: Answer choice C is correct because this is the definition of integrated care . Answer choice A is incorrect because capitation is a payment model. Answer choice B is incorrect because fee-for-service

is a payment model. Answer choice D is incorrect because value based care is a model focused on high quality care with improved outcomes while reducing cost.

References

Goodwin N. Understanding Integrated Care. *Int J Integr Care*. 2016 Oct 28;16(4):6. doi: 10.5334/ijic.2530.

5. Of the study types listed below, which provides the best quality research in the hierarchy of evidence?
- A. Animal studies
 - B. Case-control studies
 - C. Case reports
 - D. Randomized controlled trials

Key: answer: D. Randomized controlled trials

Rationale: Answer choice D is correct because randomized controlled trials (RCT) are ranked the highest in strength and reliability of the given answers. Answer choice A is incorrect because animal studies are ranked low in terms of strength and reliability. Answer choice B is incorrect because they are not ranked as high as RCT in terms of strength and reliability. Answer choice C is incorrect because they are not ranked as high as RCT in terms of strength and reliability.

References:

Petrisor B, Bhandari M. The hierarchy of evidence: Levels and grades of recommendation. *Indian J Orthop*. 2007 Jan;41(1):11-5. doi:10.4103/0019-5413.30519.

6. Which of the following does **NOT** contribute to the need for interdisciplinary teamwork?
- A. An aging population with more complex needs
 - B. Improved outcomes associated with continuity of care
 - C. Increased reimbursement when more personnel are involved
 - D. Increased specialization within healthcare

Key: answer: C. Increased reimbursement when more personnel are involved

Rationale: Answer choice C is correct because the needs for interdisciplinary teamwork are related to care delivery, not reimbursement. Answer choice A is incorrect because an aging population DOES contribute to the need for interdisciplinary teamwork. Answer choice B is incorrect because improved outcomes are associated with continuity of care which contributes to interdisciplinary

teamwork. Answer choice D is incorrect because the increased specialization in healthcare contributes to more interdisciplinary teamwork.

References:

Nancarrow SA, Booth A, Ariss S, Smith T, Enderby P, Roots A. Ten principles of good interdisciplinary teamwork. Hum Resour Health. 2013 May 10;11:19. doi:10.1186/1478-4491-11-19.

7. Which of the following is **NOT** a fundamental principle of ethics in healthcare?
- A. Autonomy
 - B. Beneficence
 - C. Confidentiality
 - D. Justice

Key: answer: C. Confidentiality

Rationale: Answer choice C is correct because confidentiality is not a core principle of ethics. Answer choice A is incorrect because autonomy is a core principle of ethics. Answer choice B is incorrect because beneficence is a core principle of ethics. Answer choice D is incorrect because justice is a core principle of ethics.

References

Varkey B. Principles of Clinical Ethics and Their Application to Practice. Med Princ Pract. 2021;30(1):17-28. doi: 10.1159/000509119. Epub 2020 Jun 4. PMID: 32498071; PMCID: PMC7923912.

8. Which of the following is **NOT** a component of health systems science?
- A. Improved reimbursement
 - B. Interprofessional teamwork
 - C. Quality improvement
 - D. Value-based care

Key: answer: A. Improved reimbursement

Rationale: Answer choice A is correct because improved reimbursement is not a component of health systems science. Answer choice B is incorrect because interprofessional teamwork is a component of health systems science. Answer choice C is incorrect because quality improvement is a component of health system science. Answer choice D is incorrect because value-based care is a component of health systems science.

References

Richardson J, Gordon M, Pacis R, Wurster C, Hammoud MM. Health Systems Science: Insights From 155 U.S. Allopathic Medical Schools, 2020–2021. *Acad Med.* 2023;98(11S):S214-S215. doi:10.1097/ACM.0000000000005416.

9. An 18-year-old patient with type 1 diabetes mellitus was admitted to the ICU with diabetic ketoacidosis. The patient's parents call with questions about the patient's status, and have specific questions regarding results and plan of care. This call is transferred to the PA covering the unit. What is the appropriate response?
- A. Answer their questions because they are the parents
 - B. Ask the patient permission prior to answering specific questions
 - C. Deny the request because the patient is legally an adult
 - D. Transfer the call to the primary nurse

Key: answer: B. Ask the patient permission prior to answering specific questions

Rationale: Answer choice B is correct because this patient is entitled to confidentiality under HIPAA law, but this patient is able to give permission to discuss the details of his hospital course. Answer choice A is incorrect because this patient is legally an adult. Even though it is his parents asking questions, as an adult he is entitled to confidentiality under HIPAA law. Answer choice C is incorrect because the patient is able to give permission to speak with his parents and answer their questions. Answer choice D is incorrect because as the provider caring for the patient you are able to answer the questions with the patient's permission, or explain to the parents that the patient is covered by HIPAA and you cannot give specific information if the patient does not give permission.

References

DiPietro C. HIPAA: When a Minor Becomes an Adult. *Total Medical Compliance.* January 25, 2021. Accessed December 4, 2024. https://totalmedicalcompliance.com/hippa-when-a-minor-becomes-an-adult/?srsId=AfmBOopCNVQZV5c1rcD_GT8qX2RyO4BjTBZXnhxID1EcVmVleXG1jGnN.

Summative Assessments: OSCE with standardized patient experience and SOAP note

A Full summative OSCE with standardized patient experience and a focused note emphasizing assessment and plan. Students will be given a prompt to obtain a history from the standardized patient. Following the interaction students will go to a separate room to write the AP portion of a SOAP note. The goal of this exercise is to elicit a detailed HPI including barriers to care and social determinants of health and then develop a plan utilizing

the various elements of the health system.

See appendix for the case packet which includes case details, rubric for standardized patient experience and rubric for the note.

Cited works:

1. Berwick DM, Nolan TW, Whittington J. The Triple Aim: Care, Health, And Cost. <https://doi.org/10.1377/hlthaff.2017.27.3.759>. 2017;27(3):759-769. doi:10.1377/HLTHAFF.27.3.759
2. Improvement Area: Triple Aim and Population Health | Institute for Healthcare Improvement. Accessed February 23, 2025. <https://www.ihl.org/improvement-areas/improvement-area-triple-aim-and-population-health>
3. Itchhaporia D. The Evolution of the Quintuple Aim: Health Equity, Health Outcomes, and the Economy. *J Am Coll Cardiol*. 2021;78(22):2262-2264. doi:10.1016/j.jacc.2021.10.018
4. Nundy S, Cooper LA, Mate KS. The Quintuple Aim for Health Care Improvement: A New Imperative to Advance Health Equity. *JAMA*. 2022;327(6):521-522. doi:10.1001/jama.2021.25181
5. Social Determinants of Health - Healthy People 2030 | health.gov. Accessed March 2, 2021. <https://health.gov/healthypeople/objectives-and-data/social-determinants-health>
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7. Accreditation Review Commission on Education for the Physician Assistant. Accreditation Standards for Physician Assistant Education. Published online 2023:1-25. www.arc-pa.org
8. Physician Assistant Education Association. *Core Competencies for New Physician Assistant Graduates Background*.; 2019.
9. Association of American Medical Colleges. *Diversity, Equity, and Inclusion Competencies Across the Learning Continuum*.; 2022.
10. Wiggins G, McTighe J. *Understanding by Design*. 2nd ed. Association for Supervision and Curriculum Development Wiggins, Grant; McTighe, Jay. *Understanding by Design, Expanded 2nd Edition* (p. ii). Association for Supervision & Curriculum Development. Kindle Edition.; 2005.



Association of Standardized Patient Educators

Case Development Template

Template Development Team (listed alphabetically)

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- Part 8 – Note Rubric or Answer Key for Post-Encounter Activities
- Part 9 – Briefing/Learner Orientation
- Part 10 - Debriefing

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Part 1 – Administrative Details

Patient (SP) Name:

Patient's Reason for the Visit (e.g. why is the patient coming to the doctor today?): ESRD

Patient's Chief complaint: Fatigue and lethargy

Differential Diagnosis: Difficulty adhering to treatment plan, hypervolemia, unavailability and inaccessibility of health-care facilities

Actual Diagnosis: Unavailability and inaccessibility of health-care facilities

Case Purpose or Goal: (e.g. formative, summative, teaching, learner practice, assessment, lecture, demonstration) Formative, learner practice, teaching, assessment

Level of the learner and discipline: (e.g. 3rd year Nursing Learner)
Emerging, first year PA Students Unit 4, Clin Med

Learner's prerequisite knowledge and skills: First/second semester PA students Foundational science

Case authors: Sarah Webster, Ashley Nnorom, Robin Fencel

Date of case development: 11/23/2024

Summary of patient story: 62 year old who was recently hospitalized with newly diagnosed end stage renal disease presents to primary care for follow up after missing dialysis appointment

Learning/Case objectives:

1. Recognize the roles of the multidisciplinary team, identifying how their roles support the principles of health system science
2. Develop skills to evaluate patient care delivery and adapt these skills to practice evidence-based medicine
3. Engage in a case-based role play with an interprofessional colleague regarding patient care

List of learner assessment instruments used: (e.g. SP checklist, post-encounter note, quiz)

Guiding checklist for interprofessional colleague (SW) part 4 Checklist for the grader part 5

Event format: (e.g. formative, summative, small group, individual, multi-station OSCE, duration)

Formative, multi-station OSCE, post-encounter note sent to the nephrologist

Demographics of patient/recruitment guidelines: (e.g. age range, gender, body type, ethnicity, other)
62 years old

List of special supplies needed for encounter: (e.g. additional materials see part 6, moulage, props, SP attire, physical exam equipment, etc.)

Monologue for the social work encounter, provided encounter of patient who comes into the office for a hospital follow up

Recommended SP training agenda:

Script for the SP, dos & don'ts to be given to student, how to grade student on the oral presentation

SP Training materials needed: (e.g. documents, video, physical exam equipment, references, images, websites)

Provide the script document for SP's monologue according to program needs

Instructions for additional staff: (e.g. sim tech, proctor, sim educator)

20 minutes total for student to read the case and have encounter with the SP who serves as the social worker.

Part 2 – Door Chart/Note & Learner Instruction

Setting (place/time): Primary Care Office. November

Patient Name: John Doe

Age: 62

Gender: M

Chief Complaint: "I missed my last dialysis appointment."

Vital Signs: (if applicable)

Blood Pressure: 150/90 mmHg

Temperature: 98.6 degrees Fahrenheit

Respiratory Rate: 20

Heart Rate: 92

BMI: 32

Lab Results: (if applicable) No labs obtained.

Image Results: (if applicable) No images obtained.

Instructions to Learners:

- You have 20 minutes to review the case, discuss the patient's interval history since hospital discharge, and formulate a plan with social work regarding barriers to care (20 minutes).
- Discharge summary from the hospital states: 62 y.o. male presented to the hospital after feeling confused/SOB, was diagnosed with ESRD and a permacath was placed. He was discharged with follow ups with vascular surgery, nephrology, and set up for dialysis within the community on M/W/F. Per patient encounter, VSS, unable to make his last dialysis appointment due to transportation issues.
- Write a progress note that will be sent to Nephrology discussing interval events since hospital discharge and coordination of care with Social Work (40 minutes)

Part 3 – Content for SPs

Presentation and Resulting Behaviors (e.g. body language, non-verbal communication, verbal characteristics)

Affect: pleasant and cooperative Body language: relaxed

Facial expression: relaxed Eye contact: natural

Opening Statement: Thank you for your consultation. Please let us know how we can assist patient care coordination and provide patient resources.

Dealing with Open-Ended Questions and Guidelines for Disclosure:

Information offered spontaneously after the student asks if there is anything we can offer for transportation: Looks like the patient is on Medicaid- offer to arrange NEMT (Medicaid Non- Emergency Medical Transportation) services, which provide transportation to medical appointments for eligible individuals.

History of Present Illness (HPI): (consider the following)

Quality/Character Confusion, lethargy, SOB
Onset 3 days prior
Duration Progressing over 3 days
Location n/a
Radiation n/a
Intensity n/a
Aggravating Factors (what makes it worse): Supine positioning
Alleviating Factors (what makes it better): Putting pillows under my head
Precipitating Factors (does anything seem to bring it on): has been progressive over the last 3 months; however, just came back from a cruise where he could not maintain his kidney diet
Associated Symptoms leg swelling, decrease appetite, heart racing
Significance to Patient (impact on patient’s life, patient’s beliefs about origin of problem, underlying concerns/fears, expectations for the visit): Not being able to sleep or perform ADLS, family is concern about mentation, want back to be back to acting normally

Review of Systems: (e.g., pertinent positives and negatives)

General: 15lb weight gain in 2 weeks, generalized weakness
HEENT: pertinent negative icteric sclera
Cardiac: palpitations, negative CP
Respiratory: positive SOB at rest and exertional, negative cough
GI: positive decrease appetite, nausea, and abdominal distension, negative vomiting and diarrhea, hematochezia and melena
GU: decrease urine output, negative dysuria, hematuria
Neuro: positive lethargy
Skin: negative rashes, jaundice

Past Medical History (PMH): (consider the following)

Illnesses/Injuries hypertension, diabetes mellitus, chronic kidney disease, obesity, OSA
Hospitalizations Hypertensive urgency 12 months hospitalization DKA hospitalization 6 months prior Chest pain 8 months prior
Surgical History: Right carotid artery endarterectomy (5 years ago) for atherosclerosis. Tonsillectomy as a child.
Screening/Preventive (if relevant) Annual flu vaccine and pneumococcal vaccine
Medications (Prescription, Over the Counter, Supplements) losartan metformin Coreg atorvastatin aspirin and Plavix
Allergies (e.g. environmental, food, medication and reaction) sulfa allergy
Gynecologic History (if relevant) N/A

Family Medical History: (consider the following)

Family tree (e.g. health status, age, cause of death for appropriate family members) Father hx of MI 65 Father had HTN and DM Maternal breast CA
Relevant Conditions/Chronic Diseases (management/treatment): Diabetes, type II

Social History:

Substance Use (past and present) Drug Use (Recreational and medications prescribed to other people): n/a Tobacco Use: former smoker 20ppk Alcohol Use: socially
Home Environment widowed and lives with adult daughter
Social Supports adult daughter
Occupation IT Sales
Relationship Status widowed Current sexual partners (if relevant) none Lifetime sexual partners (if relevant) 3 Safety in relationship (if relevant) n/a
Leisure Activities watching football, and plays online poker
Diet Fast foods and does not adhere to kidney diet
Exercise n/a

Physical Exam Findings: (may also include instructions on replicating findings)

Vitals: 165/93 mmHg, 98.6°F, RR 24 breaths per minute, 107 beats per minute
Other measures: BMI 35, A&Ox2 (disoriented to date/time)
HEENT: Normocephalic
Cardiac: Tachycardic, generalized edema
Respiratory: Tachynepia, diminished BL, rales BL, no retractions
Abdomen: +distension, soft, no CVA tenderness, bowel sounds normal. GU: scant dark urine
Neuro: Cranial nerves intact, no focal deficit

Prompts and Special Instructions: N/A

Part 4 – SP Checklist to be Issued to Student at Patient Encounter

Learner Name:

Date:

SP:

Grading Scale (Likert or Dichotomous):

Please describe the scale to be used for each item in this section (e.g. Yes/No, Done/Not Done, etc.).

Include the point values for each. (e.g. Yes = 1, No = 0)

CRITERIA	GOOD = 2	NEEDS IMPROVEMENT = 1	UNSATISFACTORY = 0
Introduction <ul style="list-style-type: none"> ● Student should knock on door and wait for an invitation to enter ● Student introduces themselves as student and introduces the preceptor they're working with 			
Explanation of problem <ul style="list-style-type: none"> ● Provided pertinent history i.e., new diagnosis, upcoming follow up appointments ● Provided pertinent patient education: i.e., stable patient, does not need hospitalization 			
Management <ul style="list-style-type: none"> ● Ask what available resources for the patient 			
Professional <ul style="list-style-type: none"> ● Concise but courteous 			

Part 5 – Checklist Guidelines

This checklist offers suggestions for each item. Not all items on the checklist must be included; however, clarification of certain items may be useful for rater/SPs based on expectations within individual PA programs.

This checklist includes specifics of what raters/SPs should be looking for in order to receive credit for an item. Include examples of questions or approaches a student might take and the appropriate response.

Examples (note these are institution specific, authors do not intend example criteria to serve as recommendations for a specific technique, see notes in below table)

CRITERIA	GOOD = 2	NEEDS IMPROVEMENT = 1	UNSATISFACTORY = 0
Introduction <ul style="list-style-type: none"> ● Student should knock on door and wait for an invitation to enter ● Student introduces themselves as student and the preceptor they're working with 			
Explanation of problem <ul style="list-style-type: none"> ● Provided pertinent history. i.e., new diagnosis, follow up appointments coming up ● Provided pertinent patient education: i.e., stable patient, does not need hospitalization 			
Management <ul style="list-style-type: none"> ● Ask what available resources for the patient 			
Professional <ul style="list-style-type: none"> ● Concise but courteous 			

History

#3. Learner asks about shortness of breath: (circle one) Yes No

Note to scorers: Any questions about trouble breathing, difficulty breathing or trouble catching your breath would warrant credit for this item.

note to scorers: Questions about "lung problems" would not warrant credit for this item.

Physical

#7. Learner palpated the area of pain.

DONE: The learner will place his hand OR fingertips right over the area of pain.

DONE INCORRECTLY: The student does this maneuver over gown (or other clothing).

#10. Learner examined neck on ONE side while patient was lying down (head of bed elevated 15-45o).

DONE

Not Done

Done incorrectly

Note for scorers: for credit, must be done while patient is lying down at an angle of 15-45 degrees. The learner should turn your head to one side to see if the veins in neck are distended (sticking out).

-Criteria for DONE INCORRECTLY:

- If the learner attempts this maneuver while patient is lying flat OR sitting upright.
- If the learner does not have the patient turn head.

Part 6 – Additional Learner Materials

(e.g. laboratory results/readings, images, physical exam results cards)

Discharge Summary from Hospital Visit
<p>Patient Name John Doe DOB 03/24/1962</p>
<p>HPI Patient is a 62 year old male with past medical history of diabetes mellitus type 2 an oral hypoglycemic agents, hypertension, and peripheral artery disease status post right endarterectomy, history of chronic kidney disease who presents to our facility with progressive worsening the confusion, lethargy, and shortness of breath for the past three days. Patient presented with adult daughter at bedside. Patient had recently traveled on a cruise; per daughter patient has not been consistent with diet and home medication. In emergency room a febrile hemodynamically stable noted to have a serum creatinine of 7.8 potassium of 5.2 EKG Normal sinus rhythm without T wave abnormality patient was admitted for further evaluation and management.</p>
<p>Hospital Course Patient admitted due to concerns for lethargy questionable TIA/Stroke vs Metabolic Disorder. A CT head without contrast was ordered which was negative for signs of acute infarct. Concerns for acute metabolic encephalopathy secondary to end stage renal disease. During hospitalization nephrology and vascular surgery were consulted at this time. No indication for emergent dialysis however a permacatheter was placed. Patient was seen by outpatient nephrologists who has arranged patient to receive 3 sessions of dialysis during hospitalization. Patient was seen by social work who helped with arrangements for dialysis in the community. No complications were noted. Currently patient mental status demonstrates significant improvement. Patient is medically stable for discharge plan of care discussed with patient and patients daughter.</p>
<p>Vitals: 165/93 mmHg, 98.6°F, RR 24 breaths per minute, 107 beats per minute Other measures: BMI 35 A&Ox2 (disoriented to date/time) HEENT: normocephalic Cardiac: RRR, permacath Respiratory: CTAB Abdomen: soft, no CVA tenderness, bowel sounds normal. Neuro: cranial nerves intact, no focal deficit</p>

Part 7 – Post-Encounter Activities

Post-encounter activities:

- Student will write a progress note to the nephrologist, to be completed within a 40 minute time limit.
- Post-encounter debrief (see Part 10 of this packet for details)

Part 8 – Note Rubric or Answer Key for Post-Encounter Activities

	Content	Complete (2 pts)	Partially Complete (1 pt)	Incomplete (0 pts)	
Subjective	Date/Time				
	Source/Reliability				
	Chief Complaint				
	HPI				
	Each component of OLDCARTS				
	Pertinent ROS				
	Current Meds				
	Allergies (including reaction)				
	PMHx: (Childhood/Adult/Surgical/Hospitalizations)				
	Tobacco/Drug/Alcohol Use				
	Objective	Vitals			
		General Survey			
		Exam Findings			
Lab Results					
Imaging Results					
Assessment	Diagnoses Listed in Pertinent Order				
Plan	Includes Medical Management Plan				
	Includes Pertinent Consultants				
	Includes Social Work Plans				
	Includes All Follow Up				
General	Appropriate Signature and Title				
	Note is in Logical Order				
Column Subtotals					
Total Points					

Part 9 – Briefing/Learner Orientation

Format and timing:

You will have 20 minutes to review the case, discuss the patient's interval history since hospital discharge, and formulate a plan with the social worker regarding barriers to care.

You will have 20 minutes to review the case, discuss the patient's interval history since hospital discharge, and formulate a plan with social work regarding barriers to care.

After your interaction, you will have 40 minutes to write a progress note to the nephrologist.

Session objectives: (as applicable)

1. Recognize the roles of the interdisciplinary team, identifying how their roles support the principles of health system science
2. Differentiate between cost, value, and effectiveness in regard to patient experience and population health
3. Develop skills to evaluate patient care delivery and adapt evidence-based medicine
4. Engage in a case study-based role play that involves interprofessional colleagues

Special instructions: (e.g. special equipment)

Clipboard, note sheet, and pen.

Part 10 - Debriefing

Technique to be used: (e.g. Plus-Delta, Advocacy-Inquiry, Debriefing with Good Judgment)

Plus-Delta: Learners and educators/facilitators identify positive aspects of the simulated interaction with the social worker and areas for improvement. Active listening and interaction between the learner and instructor will help students articulate their reasoning and focus on learning.

I said to use a Plus-Delta. Have the learners and those reviewing the case scenario identify positive aspects of the interaction with the social worker as well as areas for improvement. I believe the active listening and interaction between both the learner and instructor will help students articulate their reasoning + focus on learning improvement.

Discussion questions/topics:

1. How did you feel during the simulation?
2. What did you do well?
3. What would you do differently?
4. What is your understanding of the social worker role after this simulation?

Under questions:

1. How did you feel the scenario went?
2. What did you do well?
3. What would you do differently?
4. Do you understand the role of the social worker?



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Unit 7 Case Packet Table of Contents

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Part 1 – Administrative Details

Patient (SP) Name: Same as Unit 4 case (Appendix A)

Patient's Reason for the Visit (e.g. why is the patient coming to the doctor today?):
New on HD for ESRD, complaining of recurrent hypoglycemia since starting HD

Patient's Chief complaint:
"My sugar keeps dropping"

Differential Diagnosis:
Not applicable

Actual Diagnosis:
reduced insulin requirements since starting dialysis

Case Purpose or Goal:
Summative, learner practice, teaching, assessment

Level of the learner and discipline:
Second year PA Students
Unit 7, Summative

Learner's prerequisite knowledge and skills:
final semester PA students, approaching graduation
Foundational science, clinical medicine, rotations

Case authors:
Avital Lehmann, Elizabeth Donovan, Jill Adkins

Date of case development:
12/12/24

Summary of patient story:
62 year old with poorly controlled IDDM 2 and recently diagnosed ESRD now on HD x several months.

Learning/Case objectives:

1. explain the various components of health systems science and how they work together in the context of patient care.

List of learner assessment instruments used: (e.g. SP checklist, post-encounter note, quiz)
Post-encounter SOAP note - Rubric
OSCE rubric

Event format: (e.g. formative, summative, small group, individual, multi-station OSCE, duration)
Summative OSCE

Duration - 15 minutes for pt. assessment (focused on history rather than PE given HSS / coordination of care intent of case). An additional 15 minutes is needed for the A/P section of the SOAP note

Demographics of patient/recruitment guidelines: (e.g. age range, gender, body type, ethnicity, other)
See Unit 4 for details

List of special supplies needed for encounter: (e.g. additional materials see part 6, moulage, props, SP attire, physical exam equipment, etc.)
N/A

Recommended SP training agenda:
Prompts the SP should provide
Script provided in advance to be reviewed (see part 3)

SP Training materials needed: (e.g. documents, video, physical exam equipment, references, images, websites)
Script, when to meet with SP for prep, rehearsal

Instructions for additional staff: (e.g. sim tech, proctor, sim educator)
Proctor to observe and grade is preferred in addition to the SP
Door note
Someone to coordinate moving the student from the exam room to the chart room.
Video recorded faculty observation/proctoring – Blinco cameras and tech support

Part 2 – Door Chart/Note & Learner Instruction

Setting (place/time)
PCP office, several weeks after last seen in unit 4

Patient Name: same as unit 4
Age: 62
Gender: same as unit 4
Chief Complaint: “my sugars keep dropping”

Vital Signs: (if applicable)
Blood Pressure 130/70
Temperature 36.8 C
Respiratory Rate 18

Heart Rate 88
BMI: same as unit 4
Weight: as per unit 4

Lab Results: (if applicable) A1c 8% down from 10% during hospitalization last month
Image Results: (if applicable) n/a

Instructions to Learners:

- Tasks to be completed: elicit an appropriate history, asking about home insulin regimen and compliance, diet, home bgm, hypoglycemic awareness, etc.
- PE not necessary given HSS focus.
- Patient encounter length approximately 15 minutes
- Create a SOAP note that focuses on the assessment and plan - approximately 15 minutes.

Part 3 – Content for SPs

Presentation and Resulting Behaviors (e.g. body language, non-verbal communication, verbal characteristics)

Affect: pleasant and cooperative, mildly anxious

Body language: relaxed

Facial expression: relaxed

Eye contact: natural

Opening Statement:

“Dialysis certainly takes some getting used to, but I think I’m doing pretty well. I haven’t missed any dialysis sessions and I’m sticking to the renal diet about 90% of the time. But my sugar keeps dropping and that scares me.”

Dealing with Open-Ended Questions and Guidelines for Disclosure

Information offered spontaneously

1. Diet- mostly low carb as he has been doing for years for his DM, trying to combine with renal diet. appetite not great
2. Basal insulin- takes 25 units qhs but doesnt take it if glucose was low at any time that day
3. Prandial coverage- takes Humalog 8 units tid
4. Checking fs am and hs. glucose readings range 40s-250s

Information hidden until asked directly (what the patient should withhold until specific questioning)

1. Diet- sometimes skips meals on dialysis days because things get too hectic
2. Basal insulin- thinks he is skipping 3-4 doses / wk due to hypos. admits to running higher the day after skipping

3. Prandial coverage- has sometimes taken his HL and then not eaten much due to poor appetite. conversely, if am glucose is low he will eat an extra sugary breakfast and skip his HL dose
4. Hypos are usually fasting (following Lantus 25 the evening prior) or after taking HL 8 and not eating much
5. Spikes tend to occur in the mornings after skipping his Lantus or “randomly” at hs
Admits he doesn’t know glucose throughout the day because it’s difficult for him to check (unless he “feels low”) so may be missing both hypos and spikes if not checking
6. Hypoglycemic sx: feels lightheaded and occasionally sweaty, when this happens, he checks fs and it reads 40s-50s. however sometimes checks per routine am and hs and notes asymptomatic 50s-60s, so admits to the possibility he may be “missing” additional hypos throughout the day
7. Social hx:
 - i. Lives with wife, who cooks dinner for him nightly, which is a “healthy, balanced meal”. he manages the rest of his diet himself (see above)
 - ii. Has 2 adult children who visit often
 - iii. Still working as a self-employed CPA, which is thankfully able to continue even from the HD chair, but admits he has had to cut back and stop accepting new clients
 - iv. Has private health insurance through his wife, who is a public school teacher
8. HD access- has follow up scheduled with vascular surgery next week to check fistula and determine if ready for use. currently still using temporary tunneled HD catheter

History of Present Illness (HPI): (consider the following)

Quality/Character: hypoglycemia- sx (headache, lightheadedness, sweating) or meter just reading low

Onset: recurrent since starting HD

Duration: episodes typically persist until I get something to eat to bring my sugar up

Location: N/A

Radiation N/A

Intensity N/A

Aggravating Factors (what makes it worse): N/A

Alleviating Factors (what makes it better): eating or drinking something sugary

Precipitating Factors (does anything seem to bring it on): taking Lantus the prior evening, taking HL without eating

Associated Symptoms- headache, sweating, lightheadedness

Significance to Patient (impact on patient’s life, patient’s beliefs about origin of problem, underlying concerns/fears, expectations for the visit): “I’m afraid my sugar’s gonna drop so low I just won’t wake up one morning”

Review of Systems: (e.g. pertinent positives and negatives)

+ appetite change (decreased) since starting HD

- unexpected wt change

+ diaphoresis during episodes

+ occasional blurry vision during episodes

- SOB / CP / palpitations

- N/V/D

- syncope

+ dizziness, lightheadedness, headache during episodes

- + weakness during episodes
- + tremors during episodes
- seizures
- significant confusion
- + mild “brain fog” and difficulty concentrating during episodes

Past Medical History (PMH): (consider the following)- SEE UNIT 4

Illnesses/Injuries

Hospitalizations

Surgical History

Medications (Prescription, Over the Counter, Supplements) SAME AS UNIT 4

Lantus 25 qhs

Humalog 8 qac

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

N/A

Gynecologic History: N/A

Family Medical History: see unit 4, Appendix A

Social History: see unit 4, Appendix A

Substance Use (past and present): see unit 4, Appendix A

Home Environment- lives with wife

Social Supports- wife, 2 adult children visit frequently

Occupation- CPA

Relationship Status

Current sexual partners: married, monogamous

Safety in relationship: patient reports no concerns

Physical Exam Findings: (may also include instructions on replicating findings)

Consider the student can observe and document overall appearance (AOx 3, NAD, well nourished?)

PE can be skipped due to focus on HSS and coordination of care

Prompts and Special Instructions

Questions the patient MUST ask/ Statements patient must make:

- “What’s to stop my sugar from bottoming out overnight and killing me while I sleep?”

Questions the patient will ask if given the opportunity

- “How do I reconcile the dietary recommendations for renal diet with low carb diet plus the need to boost my sugar when it drops? It’s all so confusing and overwhelming.”
- What should I expect from this visit?

Student should offer reassurance, reduction in insulin regimen across the board, endocrine referral, nutritionist follow up referral, CGM rx

Guidelines for Feedback: (e.g. logistics, content for feedback)
defer to program faculty

Part 4 – SP Checklist

Learner Name:

Date:

SP:

Grading Scale: Full credit/partial credit/no credit

Point Value: Full =2, No = 0, partial = 1

We recommend using the OSCE rubric for the entire assessment by the faculty proctor (see part 8).

History Checklist:

1. Why are you concerned your sugar will drop so low you will never wake up?
2. What is your goal for the visit today?
3. Inquire about symptoms of hypoglycemia (dizziness, lightheaded, tremors, sweats, weakness, brain “fog”)
4. Ask patient for an example of his typical diet for one day
5. When and with what is he checking his blood glucose? - delete
6. When and what types of insulin are they using? - delete
7. Do they have the insulin they need? Student doesn’t assume they have it.

Physical Checklist:

Student can comment on overall appearance, AOX3, NAD, affect.

No detailed PE will be required for this SP encounter due to the focus on application of HSS.

Assessment and Plan Checklist: See Part 8 OSCE Rubric

Part 5 – Checklist Guidelines

Checklist guidelines are a description of the intent of a checklist item. Not all items on a checklist must be included; however, clarification of certain items may be useful for rater/SPs.

This includes specifics of what raters/SPs should be looking for in order to receive credit for an item. Include examples of questions or approaches a student might take and the appropriate response.

Examples: (note these are institution specific, authors do not intend example criteria to serve as recommendations for a specific technique)

History:

- 1 Why are you concerned?
 - i. If the student expresses more curiosity about the statement “I’m afraid....”
- 2 Any version of what the patient expects, hopes, anticipates they will leave the office with after the encounter.
- 3 Student should ask at least 3 symptoms to demonstrate they are clearly thinking about the degree to which the patient is symptomatic.
- 4 Could also be any open ended question about barriers to their own health care (financial, community, psychological, transportation, medication delivery)

Part 6 – Additional Learner Materials

Weight check (69.2 kg) - comparison to past weights (stable)

Exam room FS: 230

Review glucose log book (below):

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
before breakfast	89 no HL	44 no HL	42 no HL	122 HL 8	53 no HL	130 HL 8	71 no HL
before lunch	x HL 8	x HL 8	x HL 8	62 no HL	x HL 8- didnt eat much	x HL 8	x HL 8
before dinner	x HL 8	56 no HL	x HL 8- didn't eat much	x HL 8	x HL 8	x HL 8	x HL 8
bedtime	300 Lantus 25	250 Lantus 25	66 no Lantus	218 Lantus 25	101 no Lantus	230 Lantus 25	107 no Lantus

Part 7 – Post-Encounter Activities

Describe the type of activity the student will engage after the SP Encounter: SOAP note, Debrief (Write a SOAP Note, Order Labs, Answer Multiple choice questions, etc.)

- 1 Write a SOAP note - 15 minutes, include all focused/pertinent elements of the S/O with emphasis on A/P as this will reflect their understanding of how the parts of the health system will be needed to address the patient's medical, social, psychological, and financial needs.
- 2 Debriefing (see part 10)

Part 8 – Note Rubric or Answer Key for Post-Encounter Activities

	Full Credit	Partial Credit	No Credit
Identifies patient including name, age, birthday	2 points All elements included	1 point Up to 2 elements missing	0 points No patient identifiers
Assessment Includes new (primary) diagnosis as well as relevant chronic diagnose 1. Hypoglycemic episodes secondary to reduced insulin requirement after starting dialysis 2. IDDM type 2 3. ESRD on dialysis	5 points All elements (new and chronic) included	3 points Missing new or chronic diagnoses	0 points Incorrect diagnoses OR Assessment missing from note
Plan Includes <ul style="list-style-type: none"> • Labs- CBC, BMP, A1C • CGM ordered • Adjust insulin • Referral to endocrine • Referral to nutrition • Home health care ordered to assist with medication management • Consult social work/case manager to assist with medication and supply costs • Reassurance that the plan will address his fear of “not waking up” 	10 points Includes at least 5 elements of suggested plan	5 points Includes at least 2 elements of suggested plan	0 points Includes only 1 element OR Plan missing from note
Document -Systematic/Logical order of information -Professional terminology -Spelling and grammar	3 points Systematic and logical No more than 1 error in terminology, spelling, grammar	1 point Minor organizational error OR 2-4 errors in terminology, spelling, grammar	0 points Disorganized OR 5 or more errors in terminology, spelling, grammar

*Our intent for including this category is not to penalize students who need improvement in this area, but to assign a small point value so students try their best and educators may match students with appropriate resources as needed to prepare them for written communication in their future clinical work.

Part 9 – Briefing/Learner Orientation

Format and timing:

Summative OSCE

Station 1: SP interaction- 15 mins

Station 2: SOAP note with focus on A/P

- OSCE should be set up in a way that all students complete the SP interaction prior to the SOAP note station

Session objectives: (as applicable)

1. Perform complete HPI including social history and identify a plan with focus on integrated care utilizing health systems science principles
2. Write an A/P summarizing the plan including identifying what components of the health system will be utilized

Special instructions: (e.g. special equipment)

SP needed

Computer with document writing software needed

Part 10 - Debriefing

Technique to be used:

SP- survey provided to SP to inquire about areas with room for improvement/suggestions for future encounters.

Faculty evaluator- survey to be filled out for faculty coordinator regarding what went well and areas with room for improvement. Post-assessment evaluation of points that were missed by a significant portion of the class. Does there need to be general remediation? Should points be awarded differently for this class?

Students- If a student fails this summative OSCE they should be provided an opportunity for remediation. Students should be provided an opportunity to discuss concerns about the format/material included

Discussion questions/topics:

- What are areas of concern? Opportunities for improvement?
- Is there a topic/point that a significant number of students missed? Does there need to be general remediation for the class? Does the rubric/grading system need to be adjusted?