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DETT 607  
Assignment 2: Learning Design: Methadone Primer  
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## Maximizing Safety and Efficacy in Methadone Dosing Among Hospice Patients

### **Introduction**

A context analysis previously submitted disclosed a performance gap in the appropriate use of methadone by Seasons Hospice & Palliative Care (Seasons) independent licensed practitioners. The majority of the performance gap was accounted for by lack of knowledge, which could be remedied by providing education to these prescribers. This report will introduce the learning design for the course “Maximizing Safety and Efficacy in Methadone Dosing in Hospice and Palliative Care (hereinafter referred to as Methadone Primer).” The course overview, learning objectives, theoretical background, learner engagement strategies, subject matter content, learning and assessment strategies, and plan for providing learners with feedback will be addressed.

### **Course Overview**

*Description* – The Methadone Primer will be a three week, asynchronous, online course that will be required for all Seasons Hospice & Palliative Care independent licensed practitioners. There will be a pre-course survey of knowledge, skills and attitudes in seven content domains. After completing this survey, participants will complete three modules (Understanding Methadone, Dosing Methadone, and Monitoring Methadone). Each module will provide opportunities to practice skills, and receive formative feedback prior to a summative assessment. After completing the modules, all learners will complete the post-course survey of knowledge, skills and attitudes in seven content domains. The pre- and post-course survey will NOT collect learner identifying information, but will be structured such that pre- and post-surveys can be paired (e.g., your first pet’s name, favorite color).

*Materials* - There is no text book for this short course, but the American Pain Society guidelines for methadone dosing will be required reading (Chou, 2014). The Seasons protocol for methadone use will also be required reading. All learning objects (readings, pre-recorded narrated presentations, problem sets, discussion boards) will be contained in a learning management system (HealthStream).

*Grading Information* – Successful completion of the Methadone Primer consists of completing all assignments by the posted deadline, and passing all summative assessments. Knowledge quizzes may be taken twice, with a passing rate of 90%. Learners may have two attempts with the summative mathematical problems sets, but a passing score is 100%. This may seem harsh, but the consequence of NOT achieving 100% in caring for patients could include harm to patients, or possibly a fatality. If a learner does not achieve the passing score after two attempts, s/he will need to wait one month before attempting the course again. Remedial readings will be provided for the interim.

### **Measurable Learning Objectives**

There are three terminal performance objectives in the Methadone Primer, as follows:

At the conclusion of this course, the independent licensed practitioner employed by Seasons Hospice & Palliative Care will be able to:

1. Given an actual or simulated patient, assess risk status for methadone therapy and determine whether patient is an appropriate candidate or not per the Seasons protocol.
2. Given an actual or simulated patient with pain, determine a starting dose of methadone consistent with Seasons' protocol with 100% accuracy.
3. Given an actual or simulated patient receiving methadone for pain, describe a monitoring plan consistent with Seasons' protocol with 100% accuracy.

A grading rubric and/or key will be provided to all instructors to assure consistent grading and to provide clear expectations to learners.

### **Theoretical Background**

Current learning theories primarily stem from three major theoretical frameworks: behaviorist, cognitivist and constructivist learning theory (Harasim, 2012, p. 9). Behaviorist pedagogy is operationalized by promoting observable behavior in individuals. For example, behavioral instructional design may well be represented by practice and reinforcement, and given a determined stimulus (“Tell me the half-life of methadone”) the appropriate response will result (“On average, 24 hours”). Indisputably, there is a need for behaviorist pedagogy in the Methadone Primer; some facts must simply be assimilated and regurgitated when needed. Closely related, the objectivist learning model espouses an efficient transfer of knowledge from the teacher to the learner (Schell & Janicki, 2012, p. 27). The objectivist model is still quite popular in higher education today, with the professor pontificating “at” the learners, and assessments are frequently multiple choice question exams. The objectivist model is “teacher-centric”; the learner has no say in what is taught.

Constructivism refers to a much more “learner-centric” model where learners “construct” their own understanding and knowledge based on their interactions with the community and environment (Harasim, p. 60). With this theory, learners play a much more active role (e.g., active learning, learning-by-doing, scaffolded learning, collaborative learning) (Harasim, p. 68). Henson describes advantages of this “learner-centric” model including an increase in “students’ intellectual curiosity, creativity, drive, and leadership skills” (Henson, 2003 as cited in Collins, 2008, p. 2). Constructivism plays a large role in the process of critical thinking (Popovic & Maksimovic, 2014); practitioners caring for patients with advanced illnesses must have exquisite critical thinking skills! In the Methadone Primer, the majority of the course is designed to include active learning. Prescribers come

to this training program with significant life experiences; active learning exercises hone the critical thinking process by building on those experiences, as learners create their own new meaning.

### **Subject Matter Content**

The Methadone Primer is divided into three modules: Understanding Methadone, Dosing Methadone, and Monitoring Methadone. Learners will be given several readings to complete, and they will be asked to watch and complete pre-recorded mini-lectures and white-board demonstrations. Students will post to the discussion board, and will conduct case-based learning first in groups, then individually.

### **Interaction and Motivation**

Interaction between learners and the instructor and between learners is critically important, particularly in the online environment. Research has shown that the more learners can form relationships, the more likely they are to stick with the program (Stavredes and Herder, 2014, pp. 81-82). This includes cognitive presence (learners constructing meaning), social presence (learners injecting their personality into the community), and teaching presence (instructor facilitates learners developing social and cognitive presence) (Stavredes and Herder, 2014, pp. 81-83). In the Methadone Primer, social presence is fostered by an introductory discussion board, and subsequent discussion board posts. Cognitive presence is fostered through group work in the Methadone Primer, which helps build learner confidence. This will enable the learner to more successfully complete individual summative assessments. Cognitive and social presence will be enhanced by learners first working in groups to solve mathematical problem sets, then individually as they address the problem sets completed by other groups. Teaching presence will be enhanced by extremely frequent instructor comments in the discussion boards, addressing learners by name when responding, and sending or posting updates at the beginning and end of each week.

Interaction and motivation to perform and stick with the program has been optimized by using the ARCS model (Keller, 2016). Clinicians are immediately intrigued by a clinical situation, so the use of case-based learning will garner attention from learners. Learners will realize the relevance of the Methadone Primer by reading clear learning objectives and enabling objectives, and the case-based approach that appeals to their familiar activities of daily professional life. Allowing learners to work in groups and providing thorough feedback will build learner confidence, and mastering skills as shown through formative assessments and group work will enhance learner satisfaction.

### **Assessment Strategies and Feedback**

In the Methadone Primer learners will receive both formative and summative feedback. Formative assessments will include self-assessment activities embedded in pre-recorded videos and narrations, with feedback provided for correct and incorrect responses. The instructor will provide feedback on the discussion board after all learners have had the opportunity to critique another group's work. Last, summative assessments will consist of quizzing, and individual successful completion of mathematical problem sets pertaining to methadone dosing and monitoring.

### **Course Outline**

Learning objectives are shown above; details of the course are as follows:

<p><b>Module 1 – Understanding Methadone</b></p> <p><b>Terminal Performance Objective:</b> Given an actual or simulated patient, assess risk status for methadone therapy and determine whether patient is an appropriate candidate or not per the Seasons protocol.</p> <p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>• Describe the pharmacokinetics of methadone including absorption, distribution, metabolism and excretion</li> <li>• Describe the pharmacodynamics of methadone including three mechanisms of action, and adverse effects (usual opioid adverse effects and methadone-specific adverse effects)</li> <li>• Describe the American Pain Society recommendations for methadone dosing</li> <li>• Describe the Seasons policy for methadone dosing</li> </ul>
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<ul style="list-style-type: none"> <li>List five strong methadone enzyme inhibiting medications and five strong methadone enzyme inducing medications</li> </ul>	
Course Resources / Instructional Materials	<ul style="list-style-type: none"> <li>American Pain Society methadone guideline article</li> <li>Seasons methadone protocol</li> <li>Short (8 minute) narrated video presentations on pharmacokinetics, pharmacodynamics, mechanism of action, adverse effects, drug interactions with methadone, recommended monitoring. Formative self-assessment activities built in with feedback provided. Articulate Storyline 2 used to record, with text written on side.</li> <li>Simulated patient case.</li> </ul>
Course Activities (individual [IA] and group [GA])	<ul style="list-style-type: none"> <li>Review American Pain Society methadone guidelines and Seasons methadone protocol, and take Quiz 1 on content (IA)</li> <li>View video recordings; take Quiz 2 on content (IA)</li> <li>Review assigned simulated case of patient who may start methadone therapy. Considering all variables (p'kin, p'dyn, mechanism, past medical history, recommendations/policy, drug interactions) group will assess patient's risk status and make recommendation for starting/not starting methadone and provide rationale. Post to discussion board (GA).</li> <li>Discussion board</li> </ul>
Discussion topics	<ul style="list-style-type: none"> <li>Getting start/ice breaker – Introduce self and Seasons office affiliation, list top three barriers to safe and effective use of methadone. Respond to at least one classmate.</li> <li>How to contact instructor/help with LMS.</li> <li>Read and react to a different groups risk assessment case; post group assessment (agree or disagree and why).</li> <li>Muddiest point</li> </ul>
Assessments	<ul style="list-style-type: none"> <li>Formative assessment in video recordings with correct/incorrect feedback provided.</li> <li>Summative assessment (Quiz 1) from Am Pain Soc article and Seasons protocol (two attempts, 90% to pass)</li> <li>Summative assessment (Quiz 2) module quiz; (two attempts allowed, 90% to pass)</li> <li>Quality of discussion posts with feedback to group</li> </ul>
Schedule	<p>Quiz 1 due by Day 3, Week 1  Quiz 2 due by Day 6, Week 1  Discussion post ice breaker due by Day 2, Week 1  Group posting of case response due by Day 4, Week 1  Response to a different group posting due by Day 7, Week 1</p>

<p><b>Module 2 – Dosing Methadone</b></p> <p><b>Terminal Performance Objective:</b> Given an actual or simulated patient with pain, determine a starting dose of methadone consistent with Seasons' protocol with 100% accuracy.</p> <p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>Define acceptable methadone starting dose range per Seasons protocol.</li> <li>Demonstrate consideration of variables that affect risk status when prescribing methadone in an opioid-naïve patient.</li> </ul>
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	<ul style="list-style-type: none"> <li>Given an actual or simulated patient receiving opioids, calculate an equivalent total daily dose in oral morphine equivalents.</li> <li>After calculating a dose of methadone in an opioid-tolerant patient, adjust the calculated dose to allow for enzyme inducing and enzyme inhibiting medications.</li> <li>Titrate methadone dose based on patient response to therapy.</li> </ul>
Course Resources / Instructional Materials	<ul style="list-style-type: none"> <li>Seasons methadone protocol</li> <li>Self-tutorial on opioid conversion calculations, determining oral morphine equivalents</li> <li>Narrated white board presentations demonstrating (transcript provided): <ul style="list-style-type: none"> <li>Selecting methadone starting dose in opioid naïve patients per protocol, and discussion of impact of patient-related variables.</li> <li>Conversion to oral morphine equivalents.</li> <li>Selecting methadone starting dose in opioid tolerant patients per protocol, and discussion of impact of patient-related variables.</li> <li>Adjusting methadone therapy based on patient response</li> </ul> </li> </ul>
Course Activities (individual [IA] and group [GA])	<ul style="list-style-type: none"> <li>View narrated white board presentations, take Quiz 3 on content (IA)</li> <li>Discussion board</li> <li>Work through self-paced opioid conversion calculation tutorial (optional) (IA)</li> <li>Group assigned a problem set of 10 cases of calculating methadone doses; group must agree with problem solution. Post to discussion board (GA).</li> <li>Review problem set from a different group and provide feedback on their therapeutic decision-making. Post to discussion board (IA).</li> <li>Individual problem set; submit solutions to problem set with rationale (IA).</li> </ul>
Discussion topics	<ul style="list-style-type: none"> <li>Open ended questions regarding calculating oral morphine equivalents and methadone.</li> <li>Review problem set from different group and respond.</li> <li>Muddiest point</li> </ul>
Assessments	<ul style="list-style-type: none"> <li>Formative assessment provided in recorded narrated white board presentation.</li> <li>Formative assessment provided in response to group problem sets.</li> <li>Summative assessment (Quiz 3) (two attempts, 90% to pass)</li> <li>Summative assessment from individual problem set (two attempts, 100% to pass).</li> <li>Quality of discussion posts with feedback to group.</li> </ul>
Schedule	<ul style="list-style-type: none"> <li>Quiz 3 due by Day 3, Week 2</li> <li>Group posting of case response due by Day 4, Week 2</li> <li>Discussion board open-ended questions due by Day 5, Week 2</li> <li>Response to a different group posting due by Day 7, Week 2</li> <li>Submitting individual problem set due Day 7, Week 2</li> </ul>

<p><b>Module 3 – Monitoring Methadone</b></p> <p><b>Terminal Performance Objective:</b> Given an actual or simulated patient receiving methadone for pain, describe a monitoring plan consistent with Seasons’ protocol with 100% accuracy.</p> <p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>Describe the recommended monitoring plan for nursing.</li> <li>Describe the recommended monitoring plan for family/caregivers.</li> </ul>
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	<ul style="list-style-type: none"> <li>Given follow-up monitoring data for a patient new to methadone, recommend corrective action if appropriate.</li> </ul>
Course Resources / Instructional Materials	<ul style="list-style-type: none"> <li>Seasons methadone protocol</li> <li>Short (8 minute) narrated video presentation on monitoring of methadone, including action steps. Formative self-assessment activities built in with feedback provided. Articulate Storyline 2 used to record, with text written on side.</li> </ul>
Course Activities (individual [IA] and group [GA])	<ul style="list-style-type: none"> <li>View video recordings, take Quiz 4 on content (IA).</li> <li>Discussion board</li> <li>“Find the error” assignment – three case presentations that contains errors and omissions in monitoring and methadone management (per Seasons protocol). Group will work together to identify errors and omissions and provide corrective action. Post to discussion board (GA).</li> <li>Group assigned a problem set of 10 cases that address appropriate candidate selection for methadone, methadone dosage calculation, monitoring and management. Group must agree with problem solution. Post to discussion board (GA).</li> <li>Review problem set from a different group and provide feedback on their therapeutic decision making. Post to discussion board (IA).</li> <li>Individual problem set; submit solutions to problem set with rationale (IA).</li> </ul>
Discussion topics	<ul style="list-style-type: none"> <li>Open ended questions regarding monitoring and follow up management of methadone patient, per Seasons protocol.</li> <li>Review problem set from different group and respond.</li> <li>Muddiest point</li> </ul>
Assessments	<ul style="list-style-type: none"> <li>Formative assessment provided in video recordings with correct/incorrect feedback provided.</li> <li>Formative assessment provided in response to group problem sets.</li> <li>Summative assessment (Quiz 4) (two attempts, 90% to pass)</li> <li>Summative assessment from individual problem set (two attempts, 100% to pass).</li> </ul>
Schedule	<ul style="list-style-type: none"> <li>Quiz 4 due by Day 3, Week 3</li> <li>Group posting of case response due by Day 4, Week 3</li> <li>Discussion board open-ended questions due by Day 5, Week 3</li> <li>Response to a different group posting due by Day 7, Week 3</li> <li>Submitting individual problem set due Day 7, Week 3</li> <li>Quality of discussion posts with feedback to group.</li> </ul>

### Conclusion

As demonstrated in the context analysis, despite being a very useful opioid, prescribers are reluctant to use methadone for a variety of reasons. The primary reason is lack of knowledge on how to select appropriate candidates for methadone therapy, and how to dose and monitor the drug. The

Methadone Primer course is a three week course that will allow learners to work in a culture of safety that will allow them to acquire necessary knowledge to comfortably prescribe methadone. Using a constructivist approach, learners will be actively engaged with each other and the instructor. Feedback will be provided in a frequent and timely fashion, and rubrics and keys will be developed to optimize learner success. The course learning objectives form the basis for the course, are aligned with the instructional materials, course activities and tools, and culminate in assessments that reflect achievement of the stated learning objectives.

## References

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