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DETT 607
Assignment 1: Context Analysis
June 12, 2016
Word Count: 2088

Maximizing Safety and Efficacy in Methadone Dosing Among Hospice Patients

Introduction

Patients with advanced illnesses more often than not experience physical discomfort, generally requiring opioid therapy. Methadone is an opioid with unique characteristics that make it more difficult to dose; failure to dose and monitor appropriately can result in patient harm or death. However, methadone is an inexpensive and highly effective analgesic, therefore use is encouraged. Leadership of Seasons Hospice & Palliative Care (Seasons) wishes their practitioners to demonstrate a consistent level of skill in dosing and monitoring methadone, however past performance has demonstrated this is not the case. Seasons has requested an educational training program to rectify this situation.

Organizational Context


Seasons Hospice & Palliative Care (Seasons, 2014) is a for-profit organization with offices in 18 states, spanning from Maryland to California. Combined, Seasons provides care to approximately 4,500 patients per day, at one of four levels of care (routine home hospice, inpatient hospice, respite care, and continuous hospice care). Seasons' mission statement is "to honor life and offer hope" (Seasons, 2014), which they do by providing palliative care and hospice services. Palliative care defines the practice of providing care to patients with advanced illnesses and their families, with particular attention to physical symptoms (e.g., pain, nausea, constipation, shortness of breath, etc.), psychosocial/spiritual suffering, advanced care planning and grief and bereavement. Hospice is a component of palliative care, specifically referring to care provided in the last six months of life.

One of the primary symptoms associated with advanced illness is physical discomfort. Occasionally non-opioids such as acetaminophen or a nonsteroidal anti-inflammatory drug may be sufficient to treat the patient's pain, but in the majority of cases opioid therapy will be necessary (e.g., morphine, oxycodone, hydromorphone). For pain that is refractory to conventional opioids, hospice and palliative medicine practitioners turn to methadone. Methadone is most commonly known for preventing previous heroin-users from relapsing into their pattern of abuse. However, methadone is also an excellent analgesic for complicated pain syndromes (Sandoval, 2005). Unfortunately, the dosing and monitoring of methadone is an exacting science, and failure to appreciate this exacts a very high toll. Physicians and other prescribers are not classically training in care for patients with advanced illnesses, and in particular are not taught how to prescribe methadone.

To maximize the benefit, and minimize risk associated with methadone use, Seasons Hospice and Palliative Care questions why their independent licensed practitioners are reluctant to write prescriptions for methadone, and when they do prescribe methadone why they do not use a consistent or correct process. There have been several "near misses" in methadone dosing in the past year, where prescribers have not correctly dosed or monitored methadone therapy. Seasons employs almost 200 independent licensed prescribers; approximately 160 physicians (MD, DO), and 30 advance-practice nurses (DPN, NP). The appropriate use of methadone has been shown to relieve pain and ease suffering, which is highly consistent with Seasons' mission statement. To this end, Seasons' has approached an instructional designer with a request to create an educational program designed to improve their prescriber's ability to use methadone.

Problem Analysis

When faced with a performance problem, organizations often immediately jump to the conclusion that education and training is the answer. Frequently, they are correct, however there are other variables that may be causing the problem. Franklin (2006) proposes a front-end analysis to determine why a performance gap exists, and to identify the causative factors. In this case, the performance gap is as follows:

Desired State		Current State
Seasons' independent licensed practitioners will select patients appropriate for methadone therapy, determine a correct starting dose, titrate the methadone dose safely and effectively, and conduct appropriate monitoring throughout.		Seasons' independent licensed practitioners are not selecting methadone frequently, and when they do, they are uncomfortable determining the starting dose, how to titrate the dose, and how to monitor therapy.

A root cause analysis of a performance problem may disclose a lack of knowledge, which may be remedied with education, but may also disclose problems with physical resources, structure and process, lack of information, motives, wellness or others (Franklin, 2006, p. 9).

As a first step, an interview was conducted with a content expert with Seasons – Dr. Daniel Maison, Associate Chief Medical Officer. When asked about the goals for methadone use at Seasons, Dr. Maison stated there were three primary goals, as follows:

1. For independent licensed prescribers to recognize the value of using methadone for pain management; to be excited about learning more about the appropriate use of methadone.
2. To implement a standardized approach for all independent licensed prescribers employed by Seasons who prescribe methadone.
3. To assure that all independent licensed prescribers employed by Seasons follow an evidence-based protocol for the prescribing of methadone.

Dr. Maison felt that barriers to these three goals were lack of awareness of resources available to Seasons prescribers (access to clinical pharmacist, methadone protocol), concerns about negative outcomes with methadone prescribing, and most importantly, a lack of knowledge about how to dose and monitor methadone safely and effectively.

Based on this expert interview, a survey instrument was prepared and deployed, inviting all independent licensed prescribers employed by Seasons to take the survey over a two day period (Appendix A). The survey queried respondents' attitudes, self-perceived skill, and knowledge in seven domains pertaining to methadone therapy. The seven domains are as follows:

1. Pharmacokinetic and pharmacodynamics properties of methadone
2. Appropriate and inappropriate candidates for methadone therapy
3. Risk stratification with methadone
4. Drug interactions with methadone
5. Dosing methadone in opioid-naïve patients
6. Dosing methadone in opioid-tolerant patients
7. Monitoring and education with methadone therapy

Twenty-nine practitioners completed the survey (22 physicians, 9 advance practice nurses; Results see Appendix B). The majority of respondents have been in practice between 11 and 20 years, with a range of years' experience in hospice and palliative medicine. Approximately half the respondents are board-certified in hospice and palliative medicine. When asked the level of interest in using methadone to treat pain in advanced illness, 64.3% responded "very interested" and the remainder were "somewhat interested." No respondents selected "not at all."

When asked an open-ended question about the barriers to more effective use of methadone, 13 of 21 who answered the question stated lack of knowledge, 4 of 21 stated there was no standardized

process to follow and 3 of 21 stated they feared a lack of sufficient follow-up monitoring once starting methadone. This is valuable information, showing that education is absolutely important in narrowing this performance gap, but there is a process problem as well.

Respondents were asked one question per domain regarding the importance of being knowledgeable in each domain. Importantly, prescribers overwhelmingly thought being knowledgeable in all 7 domains was very important (see Table 1); ranging from 79-96% agreement. One question was asked in each domain evaluating self-perceived skills (“how accurately or how skillfully can you complete this task?”). As shown in Table 1, the majority of respondents thought they could perform each skill “somewhat well.” This is consistent with the results from knowledge assessment. Two knowledge questions were asked per domain, with a correct percentage ranging from 18.8 to 69.2%.

Table 1: Domain	How important do you feel...			How skillfully can you...			Knowledge
	Very	Somewhat	Not at all	Very	Somewhat	Not at all	Percent
	Impt	Impt	Impt	Well	Well	Well	Correct
	%	%	%	%	%	%	%
Pkin and Pdyn of methadone	79.3	21.7	0	17.3	65.5	17.2	34.7
Appropriate/inappro candidates	82.1	17.9	0	21.4	64.3	14.3	62.2
Risk stratification with methadone	96.6	3.4	0	20.7	58.6	20.7	69.2
Drug interactions with methadone	93.1	6.9	0	27.6	48.3	24.1	24.5
Dosing in opioid-naïve patients	89.7	13.3	0	14.8	59.3	25.9	28.3
Dosing in opioid-tolerant patients	85.7	14.3	0	21.4	50	28.6	18.8
Monitoring and education	89.7	10.3	0	37.9	48.3	13.8	42.2

These results show that respondents were highly interested in developing proficiency in methadone dosing, and felt that knowledge in all seven domains was important. They correctly self-assessed their ability to perform in all seven areas as shown by the knowledge quiz (which was poor to modest).

Likely reasons for the lack of knowledge in methadone dosing are lack of taught content in professional curricula, lack of guidance on the job, and fears from recent publicity regarding opioid abuse, misuse and overdose deaths.

One last question was asked regarding preferences for learning new content on methadone dosing. Approximately 29% of respondents selected a live, scheduled session. Almost 65% selected online asynchronous learning. The remaining 7% selected assigned readings and independent practice. This is unsurprising data as these professionals work long and erratic hours; it is very difficult to find a mutually convenient time for synchronous training, even if by distance. All proposed learners possess advanced college degrees and are highly computer literate. Accessing information and learning via distance education is an everyday occurrence for these professionals, therefore this will not be a challenge. Seasons has its own learning management system (Health Stream) and all learners are adept at accessing and using this system.

Proposed Solution

An asynchronous course will be developed and will be mandatory for all independent licensed prescribers employed by Seasons. There will be a pre-course survey of knowledge, skills and attitudes (similar to the needs assessment survey) covering all seven content domains. After completing this survey, participants will complete seven modules, one per domain. Each module will contain a self-assessment quiz that the participant may take as often as desired, and feedback will be provided for the correct and incorrect responses. A short pre-recorded video presentation will be posted, approximately 10-15 minutes in duration. Interactive exercises will also be posted so participants can practice the skills in that module; these will be realistic and case-based, representative of the actual patient population. Each module will conclude with an assessment quiz; the quiz may be taken twice and the participant must achieve an 80% pass rate. After concluding all seven modules, the participant will

complete a post-course survey of knowledge, skills and attitudes, which is the same as the pre-course survey. An additional pre-recorded video will be posted on the LMS describing Seasons' methadone protocol (based on national guidelines; Chou, et al, 2014), and other resources in place to assist with methadone dosing (e.g., availability of consultant pharmacist).

In designing this education, we have chosen a constructivist approach to learning. In the constructivist approach learners build their own meaning, which is largely achieved through active learning and learning-by-doing (Harasim, 2012, p. 68). Pre-recorded videos will be kept as brief as possible, allowing maximal time for active learning, which students prefer (Wexler, 2015). After completing all learning activities, the independent licensed prescriber employed by Seasons will achieve the following terminal performance objectives:

1. Assess risk status for potential methadone patients and determine whether patient is an appropriate candidate.
2. Given an actual or simulated patient with pain, determine a starting dose of methadone consistent with the Seasons' protocol with 100% accuracy.
3. Given an actual or simulated patient receiving methadone for pain, describe a monitoring plan consistent with the Seasons' protocol with 100% accuracy.

Conclusion

Methadone is a highly effective opioid that exhibits complicated dosing characteristics. It is imperative that hospice and palliative care prescribers possess the critical skills necessary to safely and effectively dose and monitor methadone. Learner analysis has disclosed a demonstrated lack of knowledge pertaining to methadone dosing, and a preference for online distance education to enhance skills. The proposed course will provide those skills, and will allow Levels 1 and 2 evaluation. Post-

training, Seasons will be able to perform Levels 3 and 4 evaluations, evaluating if patients are achieving enhanced therapeutic outcomes.

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