



Comprehensive SUD Curriculum for Second Year Medical Students

Frank H. Netter MD School of Medicine at Quinnipiac University

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A. Abstract

Rationale: A recent SAMSHA National Survey on Drug Use and Health reported that 19.3 million adults in the US have an SUD (McCance-Katz, 2020). Thus, regardless of specialty, physicians will have patients with SUD and pain management challenges. It is important that students are introduced to these topics in medical school so that they can deliver the best possible care and so that stigma is reduced. In 2016, the American Board of Medical Specialties recognized Addiction Medicine as a sub-specialty fostering the acknowledgement of the need to provide medical students with the skills and knowledge needed to enter the field. While appropriate and comprehensive education on SUD and pain management has historically been insufficient in undergraduate medical education (Kunz and Wiegand, 2016), recent efforts to enhance the curriculum on these topics have emerged and continue to develop (Howard, 2018); (Karon, 2017); (Kothari et al., 2011). A number of groups have devoted effort to the development of core competencies for undergraduate medical students on the subjects of SUD and pain management. These include those found in a report by Antman et al, (2016) describing, among other things, the needed competency of patient evaluation for substance use and risk. A report on the conclusions of a national symposium on opioid use education in medical schools describes the core competencies that would derive from learning about pharmacology, screening, and treatments among others (Wallace et al., 2019). Among the topics suggested by Muzyk et al., (2019) for enhancing the medical school curriculum on SUD were increasing student involvement in clinical situations and increasing content relevant to substances other than opioids alone. Polydorou et al., (2008) stressed the importance of using multiple formats and modes of content delivery while educating students about SUDs. Enhanced medical school education on SUDs, including patient interactions, can reduce negative attitudes towards patients with SUDs (Parawita et al., 2020), and thus improve patient care. Additionally, it is critical to understand and appreciate the specific challenges faced by people with SUDs in the LGBTQ+ community (Girouard et al., 2019).

The Comprehensive SUD Curriculum for Second Year Medical Students aims to enhance students' basic knowledge and clinical skills and reduce the hesitancy to fully engage with patients with SUDs, using multiple learning settings and formats.

Funding for this initiative was made possible (in part) by grant no. 1H79TI083343 from SAMHSA. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

The innovation stems from the progression of the elements from faculty taught basic knowledge → self-paced knowledge acquisition → evaluation of a faculty-developed case → patient interaction and clinical practices → reporting on clinical cases → peer-to-peer teaching on new research.

B. Educational Objectives

As a result of these learning sessions, medical students will:

1. Obtain insight from patient perspectives and experiences in the community.
2. Identify the pharmacology of substances that are misused and the treatment modalities for each.
3. Describe the endogenous opioid system and how exogenous opioids affect pain and the effects on reward system.
4. Demonstrate a biopsychosocial approach to patient centered care, including interviewing, examining and developing an appropriate treatment plan for patients with substance use disorder.
5. Highlight potential areas of stigma and develop skills to reduce implicit bias associated with stigma.
6. Develop a greater appreciation for the current status of substance use disorder research from a biological, psychological and public health perspective.

C. Introduction

The curriculum includes units which will be placed into each of the 3 required courses at the Frank H. Netter, MD SOM at Quinnipiac University, and that may be adopted/ adapted into other settings, in whole or in part.

The Frank H. Netter, MD SOM courses are the Foundations of Medicine (FOM), Clinical Arts and Sciences (CAS) and Scholarly Reflection and Capstone Concentration (SRCC), which is designed to teach students biostatistics, responsible research practices and the skills to be able to critically evaluate the medical/scientific literature in the format of journal clubs. responsible research practices and the skills to be able to critically evaluate the medical/scientific literature in the format of journal clubs. The curriculum is comprised of 6 units which will be book-ended by events that are already in place: Lectures on SUD, the pharmacology of drugs of abuse and on opioids/pain management will precede the units, and an Addiction Medicine Day event will be held at the conclusion of the units.

The 6 units include *:

1. A lecture on patient interviewing followed by an interactive interview Patient Panel session in the style of a Grand Rounds with people who are current substance users and those in recovery (2 hrs; CAS). This will be designed to spark interest in the challenges faced by patients with SUD;
2. A self-paced asynchronous learning module delivered *via* Elucidat (self-paced ~ 2 hrs; FOM);
- 3) A small group faculty-facilitated discussion of a case (1hr; FOM);
3. A Clinical Skills Workshop followed by series of 3 FOSCEs with standardized patients, two of which will be in-person and one by teleconference (3 hrs; CAS);

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4. A Clinical Reasoning session to follow the FOSCEs in which small groups of students will report on their experiences and findings (1 hr; CAS); and
5. Three journal club presentations in which students will engage in peer-to-peer teaching about the recent literature on SUD (3 hrs; SRCC).

D. Curriculum Design

The two-week curriculum provides an essential multifactorial approach in understanding the different aspects of addiction medicine. A wide variety of student driven, interactive modalities provide medical students with different levels of experience and practice working with patients to provide competent and non-judgmental care. A pre-curriculum examination can be administered to evaluate knowledge and attitudes. The same tool may be given to students following all units to assess the impact of the curriculum. This would focus on the knowledge obtained in physiology, competent care, stigma, research, and social support for patients affected by substance use disorders. In the clinical components of the curriculum, verbal and recorded feedback should be provided on a regular basis. A FOSCE (Formative Objective Structured Clinical Examination) with standardized patients should be recorded for student and professor review. In addition, during FOSCEs standardized patients provide grades to students, review history taking and physical exam skills, as well as provide verbal feedback following the session. A rubric may be used to evaluate student notes and verbal feedback given to student following oral presentations. This provides a format for evaluation of the patient treatment plan that the student develops.

Following lecture material that is currently implemented in the curriculum, in our school we will have a series of curricular events over a two-week addiction medicine unit to engage and inform second year medical students on competent assessment and treatment of patients with substance use disorders. These units may be adopted or adapted for use in other settings.

Outline of the Six Units:

1. **Clinical Arts and Sciences (CAS): Patient Panel**
2. **Self-learning Elucidat Module**
3. **Interactive Case Discussion**
4. **CAS: Skills /Workshop followed by FOSCEs**
5. **CAS Clinical Reasoning**
6. **SRCC Journal Club**

Unit 1: CAS Patient Panel and Skills Workshop: Advanced clinical skills for assessment of patients with SUD

The curriculum begins with interactive interviews with community members with current or past substance use, both in and out of recovery. The interviewer should be an experienced community clinician. Patient and community presentation have been an effective method of engaging medical students and enhancing their desire to increase their knowledge and comfort in treating the community. Hearing the first-hand experiences of patients and community members will offer a powerful starting point for an interactive and informative addiction medicine unit.

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The interviews may be paused intermittently to present relevant didactic material and answer student questions.

Unit 1 Learning objectives:

1. Describe the first-hand accounts of substance use histories by community members that include both those currently using and those in recovery.
2. Use a non-judgmental, empathetic and culturally aware approach to a patient presenting with SUD.
3. Implement an assessment of patients with SUD in a primary care setting, including focused patient history and physical exam.
4. Describe differences in presentation of disorders of the use of opioids, stimulants, and more recently available substances such as synthetic cannabinoids (K2) and gamma-hydroxybutyrate (GHB).
5. Describe different treatment modalities and levels of care for SUD and be able to explain options to a patient: harm reduction, medication treatment, cognitive-behavioral, inpatient and outpatient.
6. Develop appropriate responses to SUD patients showing signs of anxiety, agitation or disorientation, and be able to establish patient trust and a safe space in the clinic.
7. Describe how OUD may present differently in different patient populations, social and cultural contexts, and appreciate the importance of an approach that takes those differences into account.
8. Review epidemiology of common comorbidities/co-occurring disorders of SUD, and review the associated patient history questions, physical exam procedures, and diagnostic procedures needed to exclude such complications.

Unit 2: Self-learning Module

Following the Patient Panel, we will institute a self-learning Elucidat module. This is an innovative way for students to engage with this material. These modules have been used previously by instructors at our institution for other topics with great success and positive feedback from students. Other platforms may be used to implement the module.

Students will complete this module on their own time, without the pressures of answering questions correctly, and instead focus on learning the material and completion. This will be an effective way to reinforce the topics of addiction medicine – allowing students to fill in any knowledge gaps they may have before moving onto the next portion of the curriculum. Being able to complete the module on their own, students will not feel like they are being judged by their answer choices. Students who have a hard time with this topic or find it particularly sensitive will be able to engage when and where they feel comfortable. Content for this portion will focus on the different substances that fall under addiction medicine, stigma associated with addiction and treatment options, and effective care strategies.

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Unit 2 Learning Objectives:

1. Describe the different substances that fall under addiction medicine, how they are used and the major concerns with their use
2. Examine the ways in which stigma can be displayed during patient care experiences
3. Appraise your current impression or stigma in encountering a patient experiencing substance use disorder
4. Implement a plan of care for (2) patient cases involving substance use disorders
5. Appraise different treatment options and effective care strategies for people struggling with substance use disorders

The students taking the module will be presented with 2 cases of patients with a substance use disorder. The students will be asked to develop a series of questions for the patient. In between each prompted set of questions, the module will "reveal" a set of important questions that the students might have developed. If they did develop those questions, kudos to them. If they missed some questions for the patient, then this will be an informal and non-judgmental way of prompting them on the ways to interview a patient with SUD. The students will also be asked to self-assess the level of stigma towards people with SUD that they believe they have. Then, 2 scripts of a conversation between a physician and a patient will be presented. The students will be asked to indicate which parts of the interaction were appropriate and compassionate, and which displayed stigma. After the students respond, they will be presented with an explanation of the scripts and a description of which parts of the scripts showed stigma.

Unit 3: Interactive Case Discussion

Following the Elucidat module, a patient case can be used to integrate the clinical topics with the Foundations of Medicine curriculum. This would be a team-based discussion where students, led by a faculty member, discuss clinical aspects of the case presentation and physiology concepts they have learned in class. The proposed case is a 37-year-old male returning for follow-up with his primary care provider to discuss his continued back pain related to his recent injury at his construction job. As the students learn more about the case, it can be revealed in the social history that the patient has recently started using IV heroin because a friend said heroin helped more with pain than prescription opioids. The students then progress through a discussion of how to have a conversation with the patient about his patterns of use and harm reduction techniques. They will be asked to review the endogenous opioid system and relate the mechanism of action of exogenous opioids to this system.

Unit 3 Learning Objectives:

1. Describe the mechanism of action of endogenous opioids and name their sites of action throughout the body.
2. Explain how exogenous opioids act in the endogenous pain control system to reduce pain. Explain how medications like naloxone, buprenorphine, and methadone can reverse or block these effects.
3. Compare and contrast these routes of drug administration: IV, oral, sublingual, buccal, and nasal.
4. Discuss how to speak with patients about recreational drug use, especially in the context of stigma in the medical field.

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5. Review safer use measures available to patients and the spectrum of recreational drug use.
6. Explain the gate control theory of pain and psychosocial factors associated with pain.

Unit 4: CAS: Skills Workshop and FOSCEs Advanced Substance Use Disorder Cases

The session will cover an approach to a patient with SUD, including principles of interviewing, PE, assessment, and treatment modalities. This session builds on foundational knowledge of clinical skills, including screening for SUD, covered in year 1, by focusing on more advanced topics in clinical approaches to SUD. Format: 2 in person and 1 teleFOSCE, plus clinical reasoning debrief session.

Unit 4 Learning Objectives:

1. Demonstrate the performance of a problem-focused history and focused ROS and physical examination with two patients in the SPAC and one patient via telemedicine with different substance used disorders during the FOSCE.
2. Demonstrate the ability to perform a thorough drug history with respect to various substance use disorders, inclusive of opioids, stimulants, and more recent substances such as synthetic cannabinoids (K2) and gamma-hydroxybutyrate (GHB).
3. Learn how to demonstrate nonjudgmental, empathic verbal and nonverbal behaviors during screening and/or conversations about substance abuse.
4. Demonstrate the ability to document a patient note after the FOSCE is completed
5. Demonstrate the ability to prepare for an oral presentation after the FOSCE is completed.
6. Demonstrate motivational interviewing, safety counseling, and patient education skills with respect to different substance use disorders.
7. Implement the Screening, Brief Intervention and Referral to Treatment (SBIRT) protocol in an outpatient primary care office setting.

Scenario 1: (in-person FOSCE) 67-year-old veteran coming-in for a follow-up visit after overnight ED stay for fentanyl overdose treatment. The patient reports smoking K2 that was sprayed with fentanyl (unknown to him). Other health conditions include the patient being positive for Hepatitis C and HIV. Patient reports being on methadone treatment, which he discontinued one week ago and is motivated to resume treatment.

Scenario 2: (in-person FOSCE) 43-year-old transfeminine sex worker presenting with CHF caused by 20-year-long history of methamphetamine use disorder. History of methamphetamine-induced psychosis. Patient is not interested in treatment but is motivated to hear about harm reduction approaches and would like to take heart medication and also wants to go on PrEP.

Scenario 3: (teleFOSCE) 22-year-old male presenting with chronic gamma-hydroxybutyrate (GHB) use disorder and recreational use of methylenedioxy-methamphetamine (MDMA) and ketamine. The patient also reports “cooking” his own GHB from gamma-butyrolactone (GBL) powder or drinking GHB analogue butanediol (BDO). He is motivated to stop but is afraid that he may experience a seizure, which happened last time he tried to “quit cold-turkey.”

Resources:

- Space: S-PAC Orientation room, demo room, and exam rooms
- Timing: can be flexible, likely three sessions: 2 in-person sessions, 1 teleFOSCE, and 1 clinical reasoning session.
- Faculty: will receive pre-briefing and debriefing guides to be developed, faculty will moderate de-briefing session
- Standardized patients: optional, can be substituted by student playing patients. Pre-briefing guide for SPs/student patients to be developed
- Students: receive Student Guide outlining objectives and providing the necessary clinical information for patients presenting with different substance use disorders.
- Media: demonstration patient visit to be recorded for students to view before the encounter, diagnostic imaging, sounds, and lab results to be developed to be included as part of the cases.

Unit 5: CAS Clinical Reasoning Session

Following the standardized clinical encounters, students will practice documenting the encounter and determining an assessment and plan for treatment of the patient. At the end of the unit, students will meet with their Clinical Arts and Sciences small groups to each present a case along with their assessment and plan. This should be a supportive and safe environment in small groups of 4 along with a supervising physician to synthesize the information taught throughout the previous two weeks and practice determining and implementing a treatment plan for a patient with a history or currently affected by a substance use disorder. These sessions are highly effective for a safe opportunity for students to practice something for the first time and gain more confidence, as well as receive and provide feedback for their colleagues. Additionally, the two-hour session allows opportunity for discussion and further student-driven learning. By hearing the ideas and plans for treatment by others, students will be able to build off each other for the best approach for the patient. Students should end the clinical reasoning session with the experience of having personally interacted with three standardized patients with a substance use history, developing an assessment and treatment plan for each patient, with the opportunity to synthesize and receive student and preceptor feedback for their approach. This session should build confidence in treating patients with substance use disorder, breaking down stigma and barriers to competent care for patients.

Unit 6: SRCC Journal Club

The Scholarly Reflection and Concentration Capstone (SRCC) course aims to teach medical students about research design, statistics, ethics, and scholarship. The course also uses interactive journal clubs to teach students the importance of critical appraisal and determining source credibility. Furthermore, students take an active role in their education by pursuing scholarly interests in a variety of disciplines, such as basic science, medical humanities, global health, and medical education. This independent research culminates in a capstone project that is presented during the student's fourth year of medical school. The SRCC course will play an important role in augmenting our school's addiction medicine curriculum.

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Students may be placed in small groups based on their preference for learning about the neurobiological, psychological, or public health aspects of addiction. As a group, students will select a current paper in their selected discipline to discuss and present. There should be a list of example papers that the students can choose from, or the students can independently select an alternative paper.

Broadly, some article topics for students to consider will include:

- Neuroscience of Addiction
- Pathways for specific drugs with a deeper look at the role of neuroanatomy in addiction
- Prefrontal Cortex (PFC), Nucleus Accumbens
- Deepened and up to date understanding of the role of dopamine in addiction, and the reward pathway in the brain
- Psychiatry and Addiction
- How dual diagnosis affects the diagnosis and treatment of an SUD
- Lack of insight and other barriers for those with an SUD to overcome in order to start the conversation with their doctor
- Public Health Considerations with Addiction
- Socioeconomics and its role in addiction in terms of prevalence, hurdles, and treatment outcomes
- Is one demographic at greater risk for an SUD than others?
- Narrative medicine and the role of the support person
- Burn-out: how to prevent and manage it, resources for a support person such as Al-Anon
- The support person's unique perspective on addiction and navigating the healthcare system: a caring observer's reflections on supporting someone with an SUD
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Before the session, students will be expected to read their group's paper and reflect on strengths, weaknesses, and conclusions one can draw from the reading. The day of the session, each group will have one hour to share their thoughts on the selected reading and create a streamlined PowerPoint presentation focusing on the major findings. In the second part of class, students will join a larger group that contains one neurobiology-focused group, one psychology-focused group, and one public health- focused group.

Each group should have 30 minutes to present their paper to the other groups. In that time, students should have the opportunity to discuss the prompts below as they relate to the research presented.

Questions for the students to consider:

1. If the paper uses an animal model, what are potential experiments that could be done to assess the translational impact of the given research?
2. How would you as a future physician apply the findings to your practice?
3. How can community-based interventions be implemented to combat addiction? What are some interventions that should be considered?

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4. What are some of the biological, psychological, and social barriers to treating and receiving care for substance use disorders? What are ways we can try to eliminate those barriers?
5. What additional questions do you have after discussing this research?

After class, students fill out a form reflecting on the experience. Students note what they learned and give feedback as to how they would improve the session. There may also be a place for students to express if there are topics they would like to learn more about. The Addiction Medicine Interest Group or similar organization can compile this data and use it to guide planning speakers and activities for an annual Addiction Medicine Day. A word map infographic built from the collected data can illustrate the students' current interests and questions back to the student population to further strengthen their engagement on Addiction Medicine Day.

The learning objectives for the SRCC portion of the addiction medicine curriculum:

1. Develop a greater appreciation for the current status of addiction medicine research in the United States from a biological, psychological, and public health perspective.
2. Develop competency in searching for, discussing, and presenting scientific papers findings to others.
Investigate novel ways of investigating addiction through biological, psychological, and public health models.

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