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Medical training to effectively support patients who use substances across practice settings: a scoping review of recommended competencies

Formation médicale pour soutenir efficacement les patients qui consomment des substances dans tous les contextes de pratique : Un examen approfondi des compétences recommandées

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Abstract

Background: The responsibility for addressing the healthcare needs of PWUS is the responsibility of all physicians. Within the healthcare system, research consistently reveals inequitable experiences in healthcare with people who use substances (PWUS) reporting stigmatization, marginalization, and a lack of compassion.

Objectives: The aim of this scoping review was to find and describe competencies being taught, developed, and fostered within medical education and then to provide recommendations to improve care for this population of patients.

Results: Nineteen articles were included. Recommended knowledge competencies tend to promote understanding neurophysiological changes caused by substances, alongside knowing how to evaluate of 'risky' behaviours. Commonly recommended skills relate to the screening and management of substance use disorders. Recommended attitude competencies include identifying personal bias and establishing a patient-centered culture among practice teams. The disease model of addiction informed all papers, with no acknowledgement of potential beneficial or non-problematic experiences of substance use. To enhance knowledge-type competencies, medical education programs are advised to include addiction specialists as educators and prevent stigmatization through the hidden curriculum.

Conclusion: To reduce experiences of stigmatization and marginalization among patients who use illicit substances and to improve quality of care, knowledge, skills, and attitudes competencies can be more effectively taught in medical education programs.

Résumé

Contexte : Il incombe à tous les médecins de répondre aux besoins en matière de soins de santé des consommateurs de substances psychoactives. Au sein du système de santé, les recherches révèlent régulièrement des expériences inéquitables en matière de soins de santé, les consommateurs de substances faisant état de stigmatisation, de marginalisation et d'un manque de compassion.

Objectifs : L'objectif de cette étude exploratoire était de trouver et de décrire les compétences enseignées, développées et encouragées dans le cadre de la formation médicale, puis de formuler des recommandations pour améliorer les soins prodigués à ces patients.

Résultats : Au total, 19 articles ont été inclus. Les compétences recommandées en matière de connaissances tendent à promouvoir la compréhension des changements neurophysiologiques causés par les substances, ainsi que la connaissance de l'évaluation des comportements « à risque ». Les compétences couramment recommandées concernent le dépistage et la gestion des troubles liés à l'usage de substances. Les compétences recommandées en matière d'attitude comprennent l'identification des préjugés personnels et l'instauration d'une culture centrée sur le patient au sein des équipes de praticiens. Tous les articles s'appuient sur le modèle pathologique de la toxicomanie et ne reconnaissent pas les expériences potentiellement bénéfiques ou non problématiques de la consommation de substances. Pour améliorer les compétences en matière de connaissances, il est conseillé aux programmes de formation médicale d'inclure des spécialistes de la toxicomanie en tant qu'éducateurs et de prévenir la stigmatisation par le biais d'un programme d'études caché.

Conclusion : Pour réduire les expériences de stigmatisation et de marginalisation parmi les patients qui consomment des substances illicites et pour améliorer la qualité des soins, les connaissances, les aptitudes et les attitudes peuvent être enseignées plus efficacement dans les programmes de formation médicale.

Introduction

People who use substances (PWUS) receive healthcare from across all practice areas, from obstetrics to palliative care, in many settings (e.g., inpatient, outpatient, emergency room). While 'substance' generally refers to an illicit substance, alcohol and cannabis are also substances. Substance use in Canada is prevalent: 21% of Canadians reported having used cannabis in the past 12 months, 2% reported using cocaine and 76% reported having consumed alcohol in the same period.[1] Substances use is not inherently problematic, and the term conveys a range of experiences, from beneficial, to non-problematic, to at-risk, to addiction.[2] Although the term PWUS is theoretically broad, it typically relates to people who use illicit substances in ways that are problematic or meet the criteria of addiction.[3] Inequitable care is pervasive, with PWUS reporting stigmatization, marginalization, and a lack of caring and compassionate interactions with healthcare providers, including physicians.[4] Patients report a perception that healthcare providers tend to view substance use as a 'moral failing.'[5] Quality of standard health is also impacted, with most Canadian hospitals lacking policies to guide effective responses to illicit drug use, including an absence of clinical protocols for pain management among patients who use injection drugs [(6)]. Healthcare providers operate without clear standards and under the "fear of being 'deceived' by 'drug-seeking' patients."[7(p. 329)] Care decisions are predominantly informed by personal beliefs, values, and moral standpoints. This results in dramatic provider-dependent variability in services, ranging from enforcement of abstinence, implementation of risk management efforts, and/or integration of harm reduction strategies.[6] Unsurprisingly, healthcare experiences among PWUS are "characterized by pain and discomfort, early discharge and drug-related risk."[6(p. 5).]

Addressing healthcare needs of PWUS is the responsibility of *all* physicians and it is insufficient to expect all patient needs to be met under the subspecialty of Addiction Medicine. Current guidelines from both the College of Family Physicians of Canada and the British Columbia Ministry of Health reinforce the importance of family physician practices to integrate screening and treatment of substance use disorders.[8-11] This requires family physicians, alongside physicians in other areas of practice, to be prepared to approach the subject of substance use with all their patients. As such, it is timely to examine competencies required to address this part of the physician's scope of practice.

One way of examining competencies expected within a physician's scope of practice is to explore the competencies that are being taught, developed, and fostered within medical education. Over the past two decades, healthcare education and training has shifted toward a competency-based education model.[12] Competency-based education (CBE) is an approach to healthcare training that adopts a "concept of 'progression of competence,' meaning learners advance along a series of defined milestones on their way to the explicit outcome goals of training."[13] The competencies medical students are trained to master represent a list of the entrustable professional activities (EPAs) and values that are required of professionals in each discipline. In 2014, the RCPSC announced the implementation of Competency-Based Medical Education (CBME).[14,15] Familiar to readers of this journal, competencies are categorized into the following domains: i) knowledge, ii) skills, and iii) attitudes and behaviour.[16] The CanMEDS framework consists of seven 'roles' and defines "necessary competencies for all areas of medical practice" (see Appendix A).[17] Enabling competencies are the essential components of a key competency. The CanMEDS framework is the most widely accepted and applied physician competency framework in the world.[17]

Inadequate medical education and training regarding patient substance use can inadvertently contribute to negative attitudes (e.g., mutual mistrust) and lead to negative health outcomes for PWUS, as patients may avoid or leave medical environments.[4,7] A study by Kidd et al. highlights that medical students are willing to learn from PWUS and can improve their attitudes towards PWUS in response to specialized curriculum focused on addressing these attitudes.[18] Though medical students have the willingness to learn how to better support PWUS, it is not clear what competencies are taught within medical education in relation to supporting and caring for PWUS. Therefore, the aim of this study was to review the current literature regarding recommended competencies for medical students to effectively respond to the healthcare needs of PWUS. A scoping review was chosen as an effective methodology to gather, identify, and summarize these competencies across a large body of literature.

Objective

We conducted this scoping review to describe and explore recommended competencies to be embedded into medical education to provide effective and equitable healthcare to PWUS. To understand and contextualize the recommended competencies within Canadian medical education, we mapped the findings onto the CanMEDS framework. We formulated the following research questions: [(1)] What are the competencies recommended for training physicians for encounters with PWUS and how do they align with the CanMEDS framework?;[4] What methodology was used to develop the competencies?;[5] What perspectives on substance use or model of addiction underlie the competencies?

Methods

The scoping review followed the recently outlined Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-ScR) Checklist.[19] The checklist items are described below and include the following: Protocol and registration, eligibility criteria, information sources, search information, selection of sources of evidence, data charting process, data items, critical appraisal of individual sources of evidence, and the synthesis of results.

Eligibility criteria

The inclusion and exclusion criteria are listed in Table 1. To focus the results on articles that reflect the current model of competency-based education and contemporary views on substance use, the searches were restricted to results published between January 2010 to July 2021.

Table 1. Inclusion and exclusion criteria outlined for scoping review

Inclusion Criteria	Exclusion criteria
Published in English language	Published before 2010
Discusses education or training for undergraduate or postgraduate medical education, including specialty residency training	Discusses training for health care providers that are not physicians (i.e., nurses, occupational therapists, psychologists)
Published from 2010-2022	Does not recommend competencies
Recommends competencies pertaining to providing care to individuals who use substances	
Quantitative study, qualitative study, report, or review	

Information sources and search

An Evidence Synthesis & Information Services Librarian (RP) was consulted on the final list of keywords and databases selected for the formal queries. Five databases (MEDLINE, EMBASE, APA PsycInfo, SCOPUS, and ERIC) were searched in July 2021, using queries that combine select keywords. Keywords included variations of: [(substance OR substance use OR drug use OR substance abuse) (in title or abstract) AND (competencies OR competency-based education OR clinical competence) (in title or abstract) AND (medical education OR medical training OR medical student OR medical school) (anywhere)], with modifications to best fit the search strategy within each database. The full search strategy for MEDLINE can be found in Table 2.

Table 2. Search Strategy: MEDLINE at OVID

Search #	Query
1	MH "Comptency-Based Education+" OR MH "Clinical Competence"
2	(competenc* OR competency-based education OR clinical competence)ab,kw,ti
3	1 OR 2
4	MH "Education, Medical+"
5	((medicine OR medical) adj2 (education OR training OR student* OR school*))ab,kw,ti
6	4 OR 5
7	MH "Substance-Related Disorders+"
8	((substance OR drug) adj2 (use* OR abuse*))ab,kw,ti
9	7 OR 8
10	3 AND 6 AND 9

Selection of sources of evidence

Resultant articles were imported to Covidence Systematic Review Software Version 2.0 (Veritas Health Innovation) and duplicates removed. Titles and abstracts were screened independently for inclusion by two reviewers (DA and CA). Full texts of selected citations were then reviewed independently by two reviewers (DA and CA). Disagreements at either stage were resolved by a third reviewer (NK).

Data charting process and data items

Data extraction was conducted by the lead author (DA) in consultation with NK using an independently created Microsoft Excel document. Extracted data included: year of publication; country of publication; study design; study aim; population of focus; method of competency development; type of medical care; and recommended competencies.

Each identified competency was categorized as either a skill, knowledge, or attitude by the lead author (DA). Knowledge competencies were analyzed for the

theoretical framework of addiction they reflect. The second author (CA) then mapped the extracted competencies onto the CanMEDS framework 'roles' and 'enabling competencies,' with feedback from DA using the code system identified in Appendix A, Table 3. The mapping of skills, knowledge, and attitude competencies can be found in Appendix B, Tables 4-6, respectively. When mapping the competencies onto the CanMEDS framework, some competencies were mapped onto several roles and enabling competencies due to the wording or inclusion of several competencies in one indicator. For example, "Referral for recurrent relapse and polysubstance dependence"[20] was mapped to ME4.1 ("Implement a patient-centered care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation") and COL3.1 ("Determine when care should be transferred to another physician or health care professional"). Therefore, percentages provided for each section will not total 100% and, instead, represent the percentage of competencies within that category that mapped onto each role.

Critical appraisal of individual sources of evidence were not conducted, as it is infeasible to assess the quality of studies scoping review studies when drawing on research that includes a wide breadth of research methodologies.

Descriptive summaries were used to describe the subset of medical trainees for which the competencies are recommended, as well as the methodology used to identify the competencies.

Results

The PRISMA-ScR is depicted in Figure 1. A total of 590 articles were retrieved, 165 of which were removed as duplicates, and another 323 excluded for irrelevance at the title and abstract screening. Full texts for the remaining 102 were retrieved and articles reviewed, resulting in 83 articles excluded at this stage (reasons outlined in Figure 1), with a total of three conflicts at this stage (97.1% agreement). A resultant total of 19 articles were included in this scoping review.

The 19 articles included in the review are published in six countries: United States (*n* = 12), Canada (*n* = 1), India (*n* = 1), Indonesia (*n* = 1), Netherlands (*n* = 1), and United Kingdom (*n* = 1). Two articles are the result of an international collaboration conducted by the International Society of Addiction Medicine.[21,22]

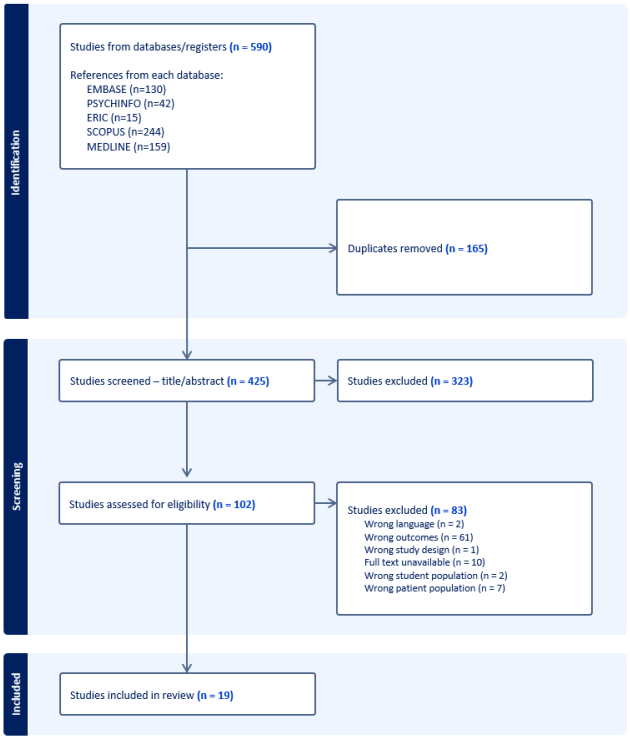

Figure 1. PRISMA-ScR

Situating and contextualising competencies

The reviewed articles cover a range of medical practices and medical education. Types and patterns of substance use varied. Authors situate competencies according to specific types of substances used or patterns of use. Four articles pertain to patients' illicit use of opioids[23-26] one to 'illicit use' of prescription drugs,[27] while the rest (*n* = 14) focus on substance misuse/abuse in general.[16,20,21,22,28-37]

Among articles that focus on opioids, Koh et al. list recommended competencies specific to postgraduate medical education (PGME) of emergency medicine residents and competencies pertain to screening for opioid use and reduction of opioid-related harms within the Emergency Department.[24] The remaining three articles focus on competencies for undergraduate medical education (UGME) and describe competencies related to effective pain management as part of complete opioid misuse care including: "monitors the effects of pain management approaches to adjust the plan of care as needed with respect to functional outcomes,"[25] "conduct a pain-focused history and physical examination"[23(p. 1891)] and "understanding the physiology of acute and chronic pain."[26]

Authors discuss competency recommendations across levels of medical education, including: UGME only (*n* = 7);[20,22,23,25–28] PGME only (*n* = 9)[16,24,29–35] both UGME and PGME (*n* = 2)[36,37] and all levels, including continuing medical education (*n* = 1).[21] Among these, authors of two articles identify competencies informing Addiction Medicine training as a PGME subspecialty.[29,32] DeJong et al. describe competencies used in the development of a curriculum for a Dutch Master in Addiction Medicine Program.[29] Jacob et al. draw on these recommendations and propose competencies for a Primary Care specialty training curriculum in India.[20] From Indonesia, Pinxten et al. derive competencies from current training gaps in states where no Addiction Medicine training program exists as a first step for the development of an addictions program. [32] Schwartz et al. describe Addiction Medicine competencies to incorporate into Psychiatric Residency training in the United States.[33]

Competencies for family medicine training are discussed in two articles.[31,34] Authors from both articles recommend the development of competencies focused on developing screening skills (e.g., "Perform age, gender and culturally appropriate unhealthy substance use screening,"[31] providing pharmocological treatments for withdrawal symptoms, and substance use complications (e.g., "Provide pharmacologic withdrawal to patients with substance dependence,"[34] as well as acquiring the knowledge and skill to "refer patients with substance use disorders to appropriate treatment and supportive services."[34]

Authors who identify competencies for UGME acknowledge competition for curriculum time between specialties within UGME.[28,36] Whereas the International Society of Addiction Medicine champions short courses for both undergraduate and postgraduate learners,[20] Rasyidi et al. advocate that competencies be incorporated into multiple units, rather than hoping proficiency can be acquired within a single block dedicated to substance use.[36]

Identifying competencies

All competencies recommended in the 19 papers were extracted. This yielded 261 original competencies (though some share common foci or language) that were recommended for integration into medical education. Competencies were categorized as pertaining to skill, knowledge, or attitude.

Skills

The majority (*n* = 149) of the competencies pertain to the performance of identified skills in providing care for patients when their use of substances is having a negative impact on their health. Within these skill-type competencies, 73.8% align with the Medical Expert role,[16,20–37] 20.8% align with the Collaborator role,[16,20–22,25–34,36,37] 18.8% align with the Communicator role,[16,22,24,25,27–36] 10.7% align with the Scholar role,[21,25–27,32,33] 7.4% align with the Health Advocate role,[20,21,24–27,29,33,37] 2.7% align with the Professional role,[25,26,28] and one of the competencies (0.7%) aligns with the Leader role.[35] For a detailed overview, see Table 4.

Knowledge

A total of 98 competencies in the literature are categorized as knowledge-type competencies. Within these knowledge-type competencies, 74.5% align with the Medical Expert role,[16,21–23,25,26,31,33,35–37] 16.3% align with the Health Advocate role,[21,25,26,33] 8.2% align with the Professional role,[22,25,28,30,37] 5.1% align with the Collaborator role,[23,25] 4.1% align with the Scholar role,[21,25] 3.1% align with the Communicator role,[23] and none of the competencies aligns with the Leader role. More than half (58.9%) of the knowledge competencies that align with the Medical Expert role specifically align with ME1.3 due to its wording: "Apply knowledge of the clinical and biomedical sciences relevant to their discipline." This specific enabling competency in the CanMEDS framework is worded broadly and therefore encompasses any competency in the literature that relates to chemical components of substances, biological reactions, or physiological outcomes of substance use. For a detailed overview, see Table 5.

Attitudes

A total of 14 competencies in the literature can be considered attitude-type competencies. Within these attitude-type competencies, 35.7% align with the Communicator role,[16,25,37] 35.7% align with the Professional role,[16,25,33,35] 21.4% align with the Health Advocate role,[25,26,33] 14.3% align with the Scholar role,[21,29] one competency (7.1%) aligns with the Medical Expert role,[25] one competency (7.1%) aligns with the Leader role,[29] and none of the competencies aligns with the Collaborator role. For a detailed overview, see Table 6.

Processes for determining competencies

A variety of processes and methods were implemented by researchers when identifying and developing essential competencies. The most employed method was consensus

among a selected group of experts in different medical specialties, often addiction medicine, psychiatry, and medical education. In Ashburn and Levine, Antman et al. and Schwartz et al. the competency identification method began with a review of available literature for pertinent education modules.[23,27,33] The results of the review were used to develop an initial list of competencies that was then commented on, modified, and approved by an assembled task-force of medical educators.[23,27,33] In other articles, authors describe processes of recurrent telephone or in-person conferences between experts to identify sets of competencies.[26,31,32,35] Ayu et al. interviewed the 13 members of the International Society of Addiction Medicine for their views on recommended competencies for UGME, PGME and continuing medical education.[21] No article specifically mentioned surveying or incorporating stakeholder opinions.

Some studies relied on identifying competencies previously put forth in the literature and modifying them to fit the current needs in medical education. Five publications drew directly from the list of competencies developed by the Association for Medical Education and Research in Substance Abuse in their Project MAINSTREAM report from 2002.[28,30,34,36,37] De Jong et al. derived their list of competencies from the CanMEDS 2005 physician competency framework, the Canadian Medical Association, Dutch examples such as the profile of the Dutch Addiction Medicine specialists, and international programs of Addiction Psychiatry curricula.[29]

Finally, both Koh et al. and Ayu et al. identified competencies by conducting literature reviews for concepts and skills pertinent to care for PWUSs and grouped the results into recommended competencies.[22,24]

Underlying theories of substance use

Recommended skills are almost entirely focused on the identification of pathological use. For instance, the competencies recommended by International Society of Addiction Medicine, Maine Medical Center, and the Osteopathic Academy of Addiction Medicine only include the ability to screen for substance abuse.[21,22,28,35] No article mentions developing the skills to appropriately approach and discuss patterns of beneficial or non-problematic substance use with patients.

Recommended knowledge competencies reflect a disease model of addiction and reify theories that frame addiction as a chronic disease. Rutkowski and Antman et al. specifically espouse that addiction is a chronic neurological disorder with current research elucidating its underlying pathophysiology.[27,37] Furthermore, both Lande et al. and Ayu et al. include in their recommendations that physicians demonstrate knowledge of the biopsychosocial model of chronic disease management in their approach to substance use.[21,28] Examples about moving beyond a focus on pathological use were exemplified in articles related to the Pennsylvania State Medical School[23] and Cedars-Sinai Medical Center,[36] where it is recommended that substance use be taught as a spectrum with variation between substance use and substance abuse. The report from the UK Medical Royal Colleges includes in its recommended attitudes that medical graduates "be confident and comfortable discussing the use of alcohol and drugs with patients,"[16] without specifying misuse or abuse. From this perspective, medical graduates would be required to approach the topic of substances without ascribing judgment and without searching for pathology that would discomfort the physician and the patient.

Competencies and stigma

Among the included articles, the Medical Education Working Group of Massachusetts[27] and the Maine Medical Center[35] recommended medical students be trained to recognise their own bias on the subject of substance use. Training about the use of non-stigmatized language and the inclusion of patients in the decision making process as seen in University of California's competencies for medical education can reduce inequities in care across physicians.[25]

One common option proposed to mitigate the potential for stigma to be unintentionally embedded in the hidden curriculum is to hire educators specialized in addiction, as it was reported that physicians who specialized in addiction and spend more time with PWUD present less biased views related to substance use.[28,30,31]

Discussion

As the provision of healthcare for PWUD is being integrated into the scope of practice of physicians across all specialties, this review offers an overview of the competencies currently recommended in the literature to better prepare medical professionals, including students and residents, to provide care for PWUD.

Competencies for educating physicians

One of the questions posed in our research is 'What are the competencies recommended for training physicians for encounters with PWUS?' Competencies were more comprehensive regarding knowledge and skills pertaining

to screening and prevention of substance use disorders; assessment and diagnosis of substance use disorders; management and treatment of substance use disorders, and referral of medical, surgical, and psychiatric complications. However, according to our results, there is a disproportionate focus on skill-type competencies compared to attitude-type competencies. A focus on skill-based competencies is common in medical education research.[38] Unfortunately, this focus on skills as a primary indicator of effectively responding to PWUS is misaligned with research that convey patients' perspectives of what is considered helpful in their interactions with health professionals and what caused them to disengage from or avoid medical care.[2-5.] Existing research indicates that PWUS report past experiences of being negatively judged, discarded, not listened to, or written off, which contributes to a lack of trust in health care providers,[39] with such interactions associated with reduced healthcare service utilization and lower retention rates.[40] When working with PWUS, positive outcomes are facilitated when a strong therapeutic alliance is established.[2] Therefore, it is important for physician training to reflect the skills and attitudes required to develop, continue, and calibrate relationships that are the basis for patient-centered care. This model of care has been shown to "increase treatment engagement, reduce mental health symptom severity, and improve functioning, community living skills, quality of life, and patient satisfaction."[41]

Patient-informed competencies

Our findings reveal that identification of competencies have relied heavily on specialist opinion. There is a paucity of literature that integrates stakeholder opinions in the identification of competencies. While our findings shed light on the types of competencies to be considered when developing UGME and PGME curricula, more needs to be done to genuinely integrate the voice, perspectives, and guidance of the patient population.[3] Incorporating stakeholder opinion can redress a perceived deficit in medical policy, improve public trust in medical practice, improve transparency and accountability, and ensure research is designed to meet end users' needs.[42] This gap is especially glaring when the ability to incorporate stakeholder needs and opinions is touted as one of the advantages of moving to a competency-based education system.[12] When responding to the healthcare needs of people who experience marginalization and social inequalities, it becomes even more crucial to develop processes that include patient voices.

We briefly present three opportunities that were largely absent in the reviewed articles as recommendations for enhancing equitable quality of care.

a) Competency identification

An effective and comprehensive curriculum may be better achieved by refining and focusing which competencies warrant further development and decisions can be made about how to effectively teach and evaluate these competencies. The CanMEDS Leader role includes indicators such as, "quality improvement," contributing "to a culture that promotes patient safety," and "facilitate change," and underlie a central aim of providing patient centered care through trust, communication, satisfaction, and positive health outcomes.[43] Yet, even in this context, PWUS report experiencing mistrust and discrimination from healthcare providers.[4,7] PWUS may face social-structure inequities (e.g. criminalization, racism) and institutional policies and practices that contribute to adverse outcomes.[4] In our study, we found a disparity between the Leader role, of which few competencies arose, and Medical Expert role.

b) Underlying theories of substance use

Whereas the disease model of addiction is thought to contribute to reducing social stigma and increase receptiveness of medical professionals to consider substance use as part of their scope of practice,[44-45] neglecting to consider other theories constrains understandings. First, the disease model of addiction neglects acknowledgement of systemic inequities underlying negative consequences attributed to or contributing to addiction. While substance use has physiological and neurological effects, adverse consequences intersect with systemic inequities and discrimination related to racism, colonialism, poverty, homelessness, mental health, child welfare systems, education, housing and employment [(46)]. Viewing substance use as disease undermines the need for societal level responses.

Second, the disease model of addiction renders invisible most patterns of substance use among the general population and medical students develop partial understandings, which leaves them ill-equipped to relate to patient experiences.[47–49] For instance, medical professionals are among those in the Canadian population who use illicit substances in ways that are controlled and beneficial.[50-51] Failing to acknowledge diverse experiences of substance use and perpetually positioning substance use

by patients as inherently harmful – while paradoxically viewing personal choices around substance use by self and/or peers as deliberate and reasoned – perpetuates stigmatization, marginalization, and silencing of diverse lived experiences.

c) Reflexive practice

We identify critical reflection as a gap in the recommended competencies in the articles reviewed. There was a paucity of discussion about the importance of student mentorship to critical reflect on attitudes, assumptions, and biases related to substance use. Erroneous beliefs contribute to stigmatising practices. When presented with a vignette that involved a medical case where the patient used substance, medical students provided poorer diagnoses, were more likely to view medical complaints as internally controllable, and expressed a lower desire to help the patient.[52] Even when substance use is not identified as negatively impacting a patient's health, it is important the be able to disclose use to physicians without fear of being judged or coerced and to trust that the physical will attempt to understand the patient's concerns without bias.

Critical reflexivity is further required when seeking to understand the hidden curriculum and practices of educators. There may be contradictions between the official curriculum and what students observe being said or done by professors, tutors, mentors, supervisors, and other health professionals.[53,54] Longitudinal studies designed to evaluate medical students' attitudes and knowledge on substance use have shown that although knowledge and skills increase throughout their medical education, students paradoxically feel less competent to effectively respond to the needs of PWUS.[55] Lack of knowledge and attention towards attitudes is due in part to the common deficiency in curricular time devoted to substance use/misuse.[52,56] Even with the identification of appropriate competencies, several barriers remain including a lack of uniformity between universities, a lack of continuous training from undergraduate to postgraduate levels and finally several barriers to implementation, once a curriculum is designed (e.g., competition for time slots, lack of well-trained trainers, lack of role models).[21,22] Hiring more physicians specialized in addictions to teach undergraduate medicine is a mitigating strategy proposed in the articles reviewed.[28,30,31] The majority of included articles represent North American institutions where undergraduate medical students rarely have core rotations with educators who specialize in the treatment of substance use disorders and, instead, addiction medicine is the purview of postgraduate psychiatric training.

Medical education in the context of decriminalization

Increasingly, in Canada, including the province of British Columbia,[57] the municipality of Vancouver,[58] Toronto Public Health,[59] and the Canadian Association of Chiefs of Police[60] there are calls for the decriminalization of drugs. Such positions are grounded in the framing of substance use as a social and health issue, not a legal issue. However many people whose deaths are attributed to opioid overdose had recent contact with a healthcare provider.[61,62] Physicians have a professional responsibility to meet the needs of Canadians and substance use is no longer an area of care that can be viewed as the scope of practice of physicians with specialized trainings.

Limitations

We acknowledge that competencies are not a complete medical curriculum; however, our findings indicated opportunities for a targeted, systematic review of curricula pertaining to substance use as currently taught within medical education programs.

Based on our inclusion and exclusion process, we only included peer-reviewed literature that explicitly discussed competencies, omitting articles that evaluated effective of specific interventions taught to medical students (e.g., interview skills; intervention techniques). These articles may provide richer insight about the education of patient-centred approaches.

Conclusion

Medical curricula include a wide range of knowledge and skills relevant to preparing students to work with PWUS. we found a significant gap in attitude competencies, which are essential to promote patient engagement and retention and to reduce incidence of patients discharging against medical advice.[63] It is imperative that PWUS help guide medical education programs to prioritize competencies that may be most effective to enhance equitable care experiences and outcomes. As part of this process, the Leadership role needs to be re-envisioned to involve patient partnerships and genuinely inclusion of PWUS in curricula design and decision-making.

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References

1. Statistics Canada. *Alcohol and drug use in Canada*, 2019 2021 Available from: https://www150.statcan.gc.ca/n1/daily-quotidien/211220/dq211220c-eng.pdf [Accessed on Jan 25, 2024].
2. Government of Canada. *Substance use spectrum* 2023 Available from: https://www.canada.ca/en/health-canada/services/substance-use/about-substance-use.html. [Accessed on Feb 25, 2024].
3. Touesnard N, Patten S, McCrindle J, et al. Hear us, see us, respect us: respecting the expertise of people who use drugs (3.0). *Zenodo* 2021. https://doi.org/10.5281/zenodo.5514066
4. McNeil R, Small W, Wood E, Kerr T. Hospitals as a "risk environment": an ethno-epidemiological study of voluntary and involuntary discharge from hospital against medical advice among people who inject drugs. *Soc Sci Med* 2014 Mar; 105:59–66. https://doi.org/10.1016/j.socscimed.2014.01.010
5. Velez CM, Nicolaidis C, Korthuis PT, Englander H. "It's been an experience, a life learning experience": a qualitative study of hospitalized patients with substance use disorders. *J Gen Intern Med.* 2017 Mar; 32(3):296–303. https://doi.org/10.1007/s11606-016-3919-4
6. Strike C, Robinson S, Guta A, Tan DH, O'Leary B, Cooper C, et al. Illicit drug use while admitted to hospital: Patient and health care provider perspectives. *PloS One*. 2020;15(3):e0229713. https://doi.org/10.1371/journal.pone.0229713
7. Merrill JO, Rhodes LA, Deyo RA, Marlatt GA, Bradley KA. Mutual mistrust in the medical care of drug users. *J Gen Intern Med.* 2002 May; 17(5):327–33. https://doi.org/10.1046/j.1525-1497.2002.10625.x
8. British Columbia Center on Substance Use. *A guideline for the clinical management of opioid use disorder*. 2017. Available from: http://www.bccsu.ca/care-guidance-publications/. [Accessed on Jan 25, 2024].
9. British Columbia Center on Substance Use. *Provincial guideline for the clinical management of high-risk drinking and alcohol use disorder.* 2019 Available from: https://www.bccsu.ca/clinical-care-guidance/. [Accessed on Jan 25, 2024].
10. Korownyk C, Perry D, Ton J, et al. Managing opioid use disorder in primary care. *Can Fam Physician.* 2019 May; 65(5):321–30.
11. Spithoff S, Kahan M. Primary care management of alcohol use disorder and at-risk drinking: Part 1: screening and assessment. *Can Fam Physician Med Fam Can*. 2015 Jun; 61(6):509–14.
12. Stockley D, Egan R, Van Wylick R, et al. A systems approach for institutional CBME adoption at Queen's University. *Med Teach*. 2020 Aug; 42(8):916–21. https://doi.org/10.1080/0142159X.2020.1767768
13. Lane DS, Ross V. The importance of defining physicians' competencies: Lessons from preventive medicine. *Acad Med.* 1994 Dec; 69(12):972. https://doi.org/10.1097/00001888-199412000-00010
14. Dagnone D, Stockley D, Flynn L, et al. Delivering on the promise of competency based medical education – an institutional approach. *Can Med Educ J.* 2019 Mar 13; 10(1):e28–38. https://doi.org/10.36834/cmej.43303
15. Dagnone JD, Chan MK, Meschino D, et al. Living in a world of change: Bridging the gap from competency-based medical education theory to practice in Canada. *Acad Med J Assoc Am Med Coll*. 2020 Nov; 95(11):1643–6. https://doi.org/10.1097/ACM.0000000000003216
16. Morris-Williams Z, Monrouxe L, Grant A, Edwards A. Teaching postgraduates about managing drug and alcohol misuse. *BMJ.* 2012 Sep 4; 345:e5816. https://doi.org/10.1136/bmj.e5816
17. Royal College of Physicians and Surgeons of Canada. *About CanMEDS.* Available from: https://www.royalcollege.ca/content/rcpsc/ca/en/canmeds/about-canmeds.html [Accessed on Oct 26, 2023].
18. Kidd JD, Smith JL, Hu MC, et al. Medical student attitudes toward substance use disorders before and after a skills-based Screening, Brief Intervention, and Referral to Treatment (SBIRT) curriculum. *Adv Med Educ Pract.* 2020 Jun 30; 11:455–61. https://doi.org/10.2147/AMEP.S251391
19. Tricco AC, Lillie E, Zarin Wet al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med.* 2018 Oct; 169(7):467–73. https://doi.org/10.7326/M18-0850
20. Jacob KS, Kuruvilla A, Zachariah A. Psychiatric curriculum for training physicians. *Natl Med J India*. 2019; 32(1):32–7. https://doi.org/10.4103/0970-258X.272115
21. Ayu AP, el-Guebaly N, Schellekens A, et al. Core addiction medicine competencies for doctors: an international consultation on training. *Subst Abuse*. 2017; 38(4):483–7. https://doi.org/10.1080/08897077.2017.1355868
22. Ayu AP, Schellekens AFA, Iskandar S, Pinxten L, De Jong CAJ. Effectiveness and organization of addiction medicine training across the globe. *Eur Addict Res*. 2015; 21(5):223–39. https://doi.org/10.1159/000381671
23. Ashburn MA, Levine RL. Pennsylvania State core competencies for education on opioids and addiction. *Pain Med Malden* Mass. 2017 Oct 1; 18(10):1890–4. https://doi.org/10.1093/pm/pnw348
24. Koh JJ, Paterson QS, Ong M, Martin LJ, Woods RA, Dong K. Addressing the opioid crisis in the era of competency-based medical education: recommendations for emergency department interventions. *CJEM.* 2019 Jul; 21(4):452–4. https://doi.org/10.1017/cem.2019.20
25. Servis M, Fishman SM, Wallace MS, et al. Responding to the opioid epidemic: Educational competencies for pain and substance use disorder from the medical schools of the University of California. *Pain Med Malden Mass*. 2021 Feb 4; 22(1):60–6. https://doi.org/10.1093/pm/pnaa399
26. Wallace PM, Warrier S, Kahn MJ, Welsh C, Fischer M. Developing an opioid curriculum for medical students: A consensus report from a national symposium. *Subst Abuse.* 2020; 41(4):425–31. https://doi.org/10.1080/08897077.2019.1635971
27. Antman KH, Berman HA, Flotte TR, Flier J, Dimitri DM, Bharel M. Developing core competencies for the prevention and management of prescription drug misuse: a medical education collaboration in Massachusetts. *Acad Med*. 2016 Oct; 91(10):1348. https://doi.org/10.1097/ACM.0000000000001347

28. Lande RG, Wyatt SA, Przekop PR. Addiction medicine: a model osteopathic medical school curriculum. *J Am Osteopath Assoc.* 2010 Mar; 110(3):127–32.
29. De Jong C, Luycks L, Delicat JW. The master in addiction medicine program in the Netherlands. *Subst Abuse*. 2011 Apr; 32(2):108–14. https://doi.org/10.1080/08897077.2011.555713
30. Jackson AH, Alford DP, Dubé CE, Saitz R. Internal medicine residency training for unhealthy alcohol and other drug use: recommendations for curriculum design. *BMC Med Educ*. 2010 Mar 15; 10(1):22. https://doi.org/10.1186/1472-6920-10-22
31. O'Connor PG, Nyquist JG, McLellan AT. Integrating addiction medicine into graduate medical education in primary care: the time has come. *Ann Intern Med*. 2011 Jan 4; 154(1):56–9. https://doi.org/10.7326/0003-4819-154-1-201101040-00008
32. Pinxten WJL, De Jong C, Hidayat T, et al. Developing a competence-based addiction medicine curriculum in Indonesia: the training needs assessment. *Subst Abuse*. 2011 Apr; 32(2):101–7. https://doi.org/10.1080/08897077.2011.555710
33. Schwartz AC, Frank A, Welsh JW, Blankenship K, DeJong SM. Addictions training in general psychiatry training programs: current gaps and barriers. *Acad Psychiatry J Am Assoc Dir Psychiatr Resid Train Assoc Acad Psychiatry*. 2018 Oct; 42(5):642–7. https://doi.org/10.1007/s40596-018-0950-2
34. Seale JP, Shellenberger S, Clark DC. Providing competency-based family medicine residency training in substance abuse in the new millennium: a model curriculum. *BMC Med Educ*. 2010 May 11; 10(1):33. https://doi.org/10.1186/1472-6920-10-33
35. Truncali A, Silva K, Stickney I, Johnson M, Holt CT. An asynchronous curriculum to address substance use disorder training needs for medical and surgical residents. *J Public Health Manag Pract JPHMP.* 2021 Jun 1; 27(Suppl 3):S168–73. https://doi.org/10.1097/PHH.0000000000001305
36. Rasyidi E, Wilkins JN, Danovitch I. Training the next generation of providers in addiction medicine. *Psychiatr Clin North Am.* 2012 Jun; 35(2):461–80. https://doi.org/10.1016/j.psc.2012.04.001
37. Rutkowski BA. Specific disciplines addressing substance use: AMERSA in the 21st century. *Subst Abuse*. 2019; 40(4):392–5. https://doi.org/10.1080/08897077.2019.1686726
38. Scalese RJ, Obeso VT, Issenberg SB. Simulation technology for skills training and competency assessment in medical education. *J Gen Intern Med.* 2008 Jan; 23 Suppl 1(Suppl 1):46–9. https://doi.org/10.1007/s11606-007-0283-4
39. Pauly BB, McCall J, Browne AJ, Parker J, Mollison A. Toward cultural safety: nurse and patient perceptions of illicit substance use in a hospitalized setting. *ANS Adv Nurs Sci.* 2015; 38(2):121–35. https://doi.org/10.1097/ANS.0000000000000070
40. Ti L, Ti L. Leaving the hospital against medical advice among people who use illicit drugs: a systematic review. *Am J Public Health.* 2015 Dec; 105(12):e53-59. https://doi.org/10.2105/AJPH.2015.302885
41. Hamovitch EK, Choy-Brown M, Stanhope V. Person-Ccentered care and the therapeutic alliance. *Community Ment Health J.* 2018 Oct; 54(7):951–8. https://doi.org/10.1007/s10597-018-0295-z
42. Shippee ND, Domecq Garces JP, Prutsky Lopez GJ, et al. Patient and service user engagement in research: a systematic review and synthesized framework. *Health Expect Int J Public Particip Health Care Health Policy.* 2015 Oct; 18(5):1151–66. https://doi.org/10.1111/hex.12090
43. Canadian Medical Association, *Canadian Nurses Association. Principles to guide health care transformation in Canada*. 2011 Available from: https://policybase.cma.ca/link/policy10218. [Accessed on Jan 25, 2024].
44. Bacchi C. Drug problematizations and politics: Deploying a poststructural analytic strategy. *Contemp Drug Probl*. 2018 Mar 1; 45(1):3–14. https://doi.org/10.1177/0091450917748760
45. Kiepek N, Van de Ven K, Dunn M, Forlini C. Seeking legitimacy for broad understandings of substance use. *Int J Drug Policy.* 2019 Nov; 73:58–63. https://doi.org/10.1016/j.drugpo.2019.07.014
46. Councillor Swanson. *Council member's motion: 4 Decriminalizing poverty and supporting community-led safety initiatives.* 2020. Available from https://council.vancouver.ca/20200707/documents/b4.pdf. [Accessed on Feb 16, 2024].
47. Culberson JW. Alcohol use in the elderly: Beyond the CAGE. Part 1 of 2: prevalence and patterns of problem drinking. *Geriatrics.* 2006 Oct; 61(10):23–7.
48. d'Angelo LC, Savulich G, Sahakian BJ. Lifestyle use of drugs by healthy people for enhancing cognition, creativity, motivation and pleasure. *Br J Pharmacol*. 2017 Oct; 174(19):3257–67. https://doi.org/10.1111/bph.13813
49. Reiff-Hekking S, Ockene JK, Hurley TG, Reed GW. Brief physician and nurse practitioner–delivered counseling for high-risk drinking. *J Gen Intern Med*. 2005 Jan; 20(1):7–13. https://doi.org/10.1111/j.1525-1497.2005.21240.x
50. Kiepek N, Beagan B, Ausman C, Patten S. "A reward for surviving the day": Women professionals' substance use to enhance performance. *Perform Enhanc Health.* 2022; 10(2):100220. https://doi.org/10.1016/j.peh.2022.100220
51. Kiepek N, Ausman C. "You are you, but you are also your profession": nebulous boundaries of personal substance use. *Contemp Drug Problems.* 2023; 50(1):63-84. https://doi.org/10.1177/00914509221132301
52. Cape G, Hannah A, Sellman D. A longitudinal evaluation of medical student knowledge, skills and attitudes to alcohol and drugs. *Addict Abingdon Engl.* 2006 Jun; 101(6):841–9. https://doi.org/10.1111/j.1360-0443.2006.01476.x
53. Kleinman A. The divided self, hidden values, and moral sensibility in medicine. *Lancet*. 2011 Mar 5; 377(9768):804–5. https://doi.org/10.1016/S0140-6736(11)60295-X
54. Ram A, Chisolm MS. The time is now: Improving substance abuse training in medical schools. *Acad Psychiatry J Am Assoc Dir Psychiatr Resid Train Assoc Acad Psychiatry.* 2016 Jun; 40(3):454–60. https://doi.org/10.1007/s40596-015-0314-0
55. Lee CS, Abrantes AM, Colby SM, López SR, Jordan TJ. Medical student judgments of adolescents with alcohol use disorders (AUD). *Subst Use Misuse*. 2008; 43(5):709–21. https://doi.org/10.1080/10826080701202791
56. O'Gara C, Keaney F, Best D, et al. Substance misuse training among psychiatric doctors, psychiatric nurses, medical students and nursing students in a South London psychiatric teaching hospital. *Drugs Educ Prev Policy.* 2005 Aug 1; 12(4):327–36. https://doi.org/10.1080/09687630500083691

57. Aziz S. Global News. *There are growing calls for drug decriminalization. Could it solve Canada's opioid crisis?* 2021 Available from: https://globalnews.ca/news/8359890/drug-decriminalization-opioid-crisis/. [Accessed on Oct 26, 2023].
58. Zimonjic P. CBC News. *Police chiefs call on Ottawa to decriminalize possession of illicit drugs for personal use.* 2020 Available from: https://www.cbc.ca/news/politics/chiefs-police-decriminalize-posession-personal-use-1.5643687 [Accessed on Oct 26, 2023].
59. Toronto Public Health. *Exemption request: Request for exemption to the Controlled Drugs and Substances Act to allow for the possession of drugs for personal use in Toronto*. 2022 Available from: https://www.toronto.ca/wp-content/uploads/2022/01/943b-TPH-Exemption-Request-Jan-4-2022-FNLAODA.pdf. [Accessed on Oct 26, 2023].
60. Canadian Association of Chiefs of Police. *Decriminalization for simple possession of illicit drugs: exploring impacts on public safety and policing.* 2020. Available from: https://www.cacp.ca/index.html?asst_id=2189 [Accessed on Oct 26, 2023].
61. Government of Alberta. *Alberta COVID-19 Opioid response surveillance report Q2 2020.* 2020.Available from: https://open.alberta.ca/dataset/f4b74c38-88cb-41ed-aa6f-32db93c7c391/resource/e8c44bab-900a-4af4-905a-8b3ef84ebe5f/download/health-alberta-covid-19-opioid-response-surveillance-report-2020-q2.pdf [Accessed on Oct 26, 2023].
62. MacDougall L, Smolina K, Otterstatter M, et al. Development and characteristics of the provincial overdose cohort in British Columbia, Canada. *PLoS ONE*. 2019 Jan 10; 14(1):e0210129. https://doi.org/10.1371/journal.pone.0210129
63. Kiepek N, Jones-Bonofiglio K, Freemantle S, Byerley-Vita M, Quaid K. Exploring care of hospital inpatients with substance involvement. *Soc Sci Med*. 2021; 281:114071. https://doi.org/10.1016/j.socscimed.2021.114071

Appendix A.

Table 3. CanMEDS Framework

Role	Competencies	Enabling Competencies	Code Created
Medical Expert	1. Practice medicine within their defined scope of practice and expertise	1.1 Demonstrate a commitment to high-quality care of their patients	ME1.1
		1.2 Integrate the CanMEDS Instrinsic Roles into their practice of medicine	
		1.3 Apply knowledge of the clinical and biomedical sciences relevant to their discipline	ME1.2
		1.4 Perform appropriately timed clinical assessments with recommendations that are presented in an organized manner	ME1.3
		1.5 Carry out professional duties in the face of multiple, competing demands	
		1.6 Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice	ME1.4
			ME1.5
			ME1.6
	2. Perform a patient-centred clinical assessment and establish a management plan	2.1 Prioritize issues to be addressed in a patient encounter	ME2.1
		2.2 Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion	ME2.2
		2.3 Establish goals of care in collaboration with patients and their families, which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation	
		2.4 Establish a patient-centred management plan	ME2.3
			ME2.4
	3. Plan and perform procedures and therapies for the purpose of assessment and/or management	3.1 Determine the most appropriate procedures or therapies	ME3.1
		3.2 Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy	ME3.2
		3.3 Prioritize a procedure or therapy, taking into account clinical urgency and available resources	
		3.4 Perform a procedure in a skilful and safe manner, adapting to unanticipated findings or changing clinical circumstances	ME3.3
			ME3.4
	4. Establish plans for ongoing care and, when appropriate, timely consultation	4.1 Implement a patient-centred care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation	ME4.1
	5. Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety	5.1 Recognize and respond to harm from health care delivery, including patient safety incidents	ME5.1
		5.2 Adopt strategies that promote patient safety and address human and system factors	ME5.2

Communicator	1. Establish professional therapeutic relationships with patients and their families	1.1 Communicate using a patient-centred approach that encourages patient trust and autonomy and is characterized by empathy, respect, and compassion	COM1.1
		1.2 Optimize the physical environment for patient comfort, dignity, privacy, engagement, and safety	
		1.3 Recognize when the values, biases, or perspectives of patients, physicians, or other health care professionals may have an impact on the quality of care, and modify the approach to the patient accordingly	COM1.2
		1.4 Respond to a patient's non-verbal behaviours to enhance communication	COM1.3
		1.5 Manage disagreements and emotionally charged conversations	
		1.6 Adapt to the unique needs and preferences of each patient and to his or her clinical condition and circumstances	
			COM1.4
			COM1.5
			COM1.6
	2. Elicit and synthesize accurate and relevant information, incorporating the perspectives of patients and their families	2.1 Use patient-centred interviewing skills to effectively gather relevant biomedical and psychosocial information	COM2.1
		2.2 Provide a clear structure for and manage the flow of an entire patient encounter	
		2.3 Seek and synthesize relevant information from other sources, including the patient's family, with the patient's consent	COM2.2
			COM2.3
	3. Share health care information and plans with patients and their families	3.1 Share information and explanations that are clear, accurate, and timely, while checking for patient and family understanding	COM3.1
		3.2 Disclose harmful patient safety incidents to patients and their families accurately and appropriately	
			COM3.2
	4. Engage patients and their families in developing plans that reflect the patient's health care needs and goals	4.1 Facilitate discussions with patients and their families in a way that is respectful, non-judgemental, and culturally safe	COM4.1
		4.2 Assist patients and their families to identify, access, and make use of information and communication technologies to support their care and manage their health	COM4.2
		4.3 Use communication skills and strategies that help patients and their families make informed decisions regarding their health	
			COM4.3
	5. Document and share written and electronic information about the medical encounter to optimize clinical decision-making, patient safety, confidentiality, and privacy	5.1 Document clinical encounters in an accurate, complete, timely, and accessible manner, in compliance with regulatory and legal requirements	COM5.1
		5.2 Communicate effectively using a written health record, electronic medical record, or other digital technology	
		5.3 Share information with patients and others in a manner that respects patient privacy and confidentiality and enhances understanding	COM5.2
		5.4 Adopt strategies that promote patient safety and address human and system factors	
			COM5.3
			COM5.4

Collaborator	1. Work effectively with physicians and other colleagues in the health care professions	1.1 Establish and maintain positive relationships with physicians and other colleagues in the health care professions to support relationship-centred collaborative care	COL1.1
		1.2 Negotiate overlapping and shared responsibilities with physicians and other colleagues in the health care professions in episodic and ongoing care	
		1.3 Engage in respectful shared decision-making with physicians and other colleagues in the health care professions	COL1.2
			COL1.3
	2. Work with physicians and other colleagues in the health care professions to promote understanding, manage differences, and resolve conflicts	2.1 Show respect toward collaborators	COL2.1
		2.2 Implement strategies to promote understanding, manage differences, and resolve conflicts in a manner that supports a collaborative culture	COL2.2
	3. Hand over the care of a patient to another health care professional to facilitate continuity of safe patient care	3.1 Determine when care should be transferred to another physician or health care professional	COL3.1
		3.2 Demonstrate safe handover of care, using both verbal and written communication, during a patient transition to a different health care professional, setting, or stage of care	COL3.2
Leader	1. Contribute to the improvement of health care delivery in teams, organizations, and systems	1.1 Apply the science of quality improvement to contribute to improving systems of patient care	LE1.1
		1.2 Contribute to a culture that promotes patient safety	
		1.3 Analyze patient safety incidents to enhance systems of care	LE1.2
		1.4 Use health informatics to improve the quality of patient care and optimize patient safety	LE1.3
			LE1.4
	2. Engage in the stewardship of health care resources	2.1 Allocate health care resources for optimal patient care	LE2.1
		2.2 Apply evidence and management processes to achieve cost-appropriate care	LE2.2
	3. Demonstrate leadership in professional practice	3.1 Demonstrate leadership skills to enhance health care	LE3.1
		3.2 Facilitate change in health care to enhance services and outcomes	LE3.2
	4. Manage career planning, finances, and health human resources in a practice	4.1 Set priorities and manage time to integrate practice and personal life	LE4.1
		4.2 Manage a career and a practice	
		4.3 Implement processes to ensure personal practice improvement	LE4.2
			LE4.3
Health Advocate	1. Respond to an individual patient's health needs by advocating with the patient within and beyond the clinical environment	1.1 Work with patients to address determinants of health that affect them and their access to needed health services or resources	HA1.1
		1.2 Work with patients and their families to increase opportunities to adopt healthy behaviours	
		1.3 Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients	HA1.2
			HA1.3
	2. Respond to the needs of the communities or populations they serve by advocating with them for system-level change in a socially accountable manner	2.1 Work with a community or population to identify the determinants of health that affect them	HA2.1
		2.2 Improve clinical practice by applying a process of continuous quality improvement to disease prevention, health promotion, and health surveillance activities	HA2.2
		2.3 Contribute to a process to improve health in the community or population they serve	

			HA2.3
Scholar	1. Engage in the continuous enhancement of their professional activities through ongoing learning	1.1 Develop, implement, monitor, and revise a personal learning plan to enhance professional practice	SCH1.1
		1.2 Identify opportunities for learning and improvement by regularly reflecting on and assessing their performance using various internal and external data sources	SCH1.2
		1.3 Engage in collaborative learning to continuously improve personal practice and contribute to collective improvements in practice	SCH1.3
	2. Teach students, residents, the public, and other health care professionals	2.1 Recognize the influence of role-modelling and the impact of the formal, informal, and hidden curriculum on learners	SCH2.1
		2.2 Promote a safe learning environment	
		2.3 Ensure patient safety is maintained when learners are involved	SCH2.2
		2.4 Plan and deliver a learning activity	SCH2.3
		2.5 Provide feedback to enhance learning and performance	
		2.6 Assess and evaluate learners, teachers, and programs in an educationally appropriate manner	SCH2.4 SCH2.5 SCH2.6
	3. Integrate best available evidence into practice	3.1 Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that address them	SCH3.1
		3.2 Identify, select, and navigate pre-appraised resources	
		3.3 Critically evaluate the integrity, reliability, and applicability of health-related research and literature	SCH3.2
		3.4 Integrate evidence into decision-making in their practice	SCH3.3 SCH3.4
	4. Contribute to the creation and dissemination of knowledge and practices applicable to health	4.1 Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care	SCH4.1
		4.2 Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and considering vulnerable populations	
		4.3 Contribute to the work of a research program	SCH4.2
		4.4 Pose questions amenable to scholarly inquiry and select appropriate methods to address them	
		4.5 Summarize and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry	SCH4.3 SCH4.4 SCH4.5
Professional	1. Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards	1.1 Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality	PRO1.1
		1.2 Demonstrate a commitment to excellence in all aspects of practice	
		1.3 Recognize and respond to ethical issues encountered in practice	
		1.4 Recognize and manage conflicts of interest	
		1.5 Exhibit professional behaviours in the use of technology-enabled communication	

			PRO1.2 PRO1.3 PRO1.4 PRO1.5
	2. Demonstrate a commitment to society by recognizing and responding to societal expectations in health care	2.1 Demonstrate accountability to patients, society, and the profession by responding to societal expectations of physicians 2.2 Demonstrate a commitment to patient safety and quality improvement	PRO2.1 PRO2.2
	3. Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation	3.1 Fulfill and adhere to the professional and ethical codes, standards of practice, and laws governing practice 3.2 Recognize and respond to unprofessional and unethical behaviours in physicians and other colleagues in the health care professions 3.3 Participate in peer assessment and standard setting	PRO3.1 PRO3.2 PRO3.3
	4. Demonstrate a commitment to physician health and well-being to foster optimal patient care	4.1 Exhibit self-awareness and manage influences on personal well-being and professional performance 4.2 Manage personal and professional demands for a sustainable practice throughout the physician life cycle 4.3 Promote a culture that recognizes, supports, and responds effectively to colleagues in need	PRO4.1 PRO4.2 PRO4.3

Appendix B. Supplemental Tables

Table 4. Mapping 'skills' competencies

Article	Competencies (Skills)	CanMEDS Framework Roles and Enabling Competencies
Antman et al., 2016[27]	Identify and describe potential pharmacological and nonpharmacological treatment options, including opioid and nonopioid pharmacological treatments for acute and chronic pain management, along with patient communication and education regarding the risks and benefits associated with each of these available treatment options.	ME3.1, ME3.2
	Describe substance use disorder treatment options, including medication-assisted treatment, as well as demonstrate the ability to appropriately refer patients to addiction medicine specialists and treatment programs for both relapse prevention and co-occurring psychiatric disorders.	ME1.3, ME3.1, ME3.2, COL3.1
	Prepare evidence-based and patient-centered pain management and substance use disorder treatment plans for patients with acute and chronic pain with special attention to safe prescribing and recognizing patients displaying signs of aberrant prescription use behaviors.	ME2.4, ME5.1, SCH3.4
	Demonstrate the foundational skills in patient-centered counseling and behavior change in the context of a patient encounter, consistent with evidence-based techniques.	COM2.1, COM4.1, COM4.3, COM5.4, SCH3.4
	Recognize the risk factors for, and signs of, opioid overdose and demonstrate the correct use of naloxone rescue.	ME1.3, ME1.6
	Identify and incorporate relevant data regarding social determinants of health into treatment planning for substance use disorders.	HA1.1
Ashburn & Levine, 2017[23]	Demonstrate how to conduct a pain-focused history and physical examination to determine the cause(s) of the patient's pain.	ME1.4, ME2.2
Ayu et al., 2015[22]	Detect risk of alcohol and substance use, abuse, and addiction	ME1.3, ME1.4, ME2.2
	Interview of alcohol and substance use history	ME1.4, ME2.2, COM2.1
	Education and communication of the consequences of alcohol and substance use (patient, family, and public)	ME3.2, COM1.1, COM3.1
	Brief intervention to stop or reduce alcohol and substance use	ME3.4, ME4.1
	Physical examination of intoxication and withdrawal symptoms	ME2.2
	Management of intoxication and withdrawal symptoms	ME4.1
	Develop relevant treatment plans (from initial treatment until relapse management)	ME2.4
	Prescribing drugs (including drugs with abuse potential)	ME3.1, ME4.1
	Assessment, management, and referral of medical, surgical, and psychiatric complications related to SUDs	ME1.4, ME2.4, ME4.1, COL3.1
	Screening, brief intervention, assessment and diagnosis, management of SUD problems in special populations	ME1.4, ME2.2, ME2.4, ME3.4, ME4.1, COM1.6
Ayu et al., 2017[21]	Acquire clinical skills: clinical interview, treatment, identification of psychiatric problem, referral to other specialty.	ME1.3, ME1.4, ME2.2, ME3.4, COL3.1
	Increase awareness of substance use disorders among general public.	HA2.1
	Deliver demand-based training.	SCH2.4
De Jong, 2011[29]	Formulates an adequate treatment plan taking into account medical psychological and social interventions.	ME2.4
	Carries out parts of the treatment plan effectively.	ME4.1
	Discusses treatment options with a patient, performs shared decision making on these options, and record the option that was agreed on in the formal treatment agreement.	COM3.1, COM4.1, COM4.3, COM5.1
	Communicates adequately and collaborates well with patients, their family members, other professionals in addiction treatment facilities and mental health and public health organizations.	COM1.1, COL1.1
Jackson et al., 2010[30]	Residents will perform age, gender and culturally appropriate unhealthy substance use screening	ME1.4, ME2.2
	Residents will effectively assess patients with unhealthy substance use	ME1.4, ME2.2
	Residents will provide brief interventions to patients with unhealthy substance use	ME3.4, ME4.1
	Residents will demonstrate effective counseling methods to help prevent unhealthy substance use	COM1.1, COM2.1, COM4.1, COM4.3
	Residents will refer patients with substance use disorders to treatment settings that provide pharmacotherapy for relapse prevention	COL3.1
	Residents will recognize, treat or refer co-morbid medical and psychiatric conditions in patients with substance use conditions	ME1.3, ME1.4, ME2.2, COL3.1
	Residents will refer patients with substance use disorders to appropriate treatment and supportive services	COL3.1
	Residents will provide pharmacologic withdrawal to patients with substance dependence	ME3.4

	Residents will provide or refer for treatment for relapse prevention in patients with substance use disorders, both pharmacotherapy and psychosocial counseling	ME3.4, ME4.1, COL3.1
Jacob, 2019[20]	Symptomatic management of withdrawal, delirium and psychosis	ME2.3, ME3.1
	Psychosocial management to prevent relapse	ME2.4, HA1.1, HA1.2, HA1.3
	Identify hepatic encephalopathy and major complications	ME1.4, ME2.2
	Referral for recurrent relapse and polysubstance dependence	ME4.1, COL3.1
Koh, 2019[24]	Ensure transition of care and social stabilization: Residents should address social determinants of health that affect health care access, in particular, housing, income, and medication coverage, as well as whether patients have photo identification and a provincial health card.	HA1.1
	Reduce opioid-related harm: As regular opioid prescribers, residents must identify patients at higher risk of opioid-related harm and effectively counsel all patients about the risks of opioid medications	ME1.3, ME2.2, COM1.1, COM4.1, COM4.3, COM5.4
Lande et al., 2010[28]	Performing preventive counseling and brief interventions	ME3.4, COM2.1
	Evaluating patients with substance use disorders and staging the disorders.	ME1.4
	Referring such patients to specialized addiction services that match patients' individual treatment needs	COL3.1
	Addressing needs of special populations, such as adolescents and older adults	ME1.3, ME1.6
	Identifying and managing, or appropriately referring, patients with medical conditions and psychiatric disorders that co-occur with, or are complications of, substance use disorders.	ME1.4, ME2.2, ME2.4, ME4.1, COL3.1
	Monitoring patients for potential nonmedical use of such medications and addressing any indications of such nonmedical use	ME1.4, ME2.2
	Recognizing substance use disorders in fellow physicians or other health professionals	PRO1.3, PRO3.2, PRO4.3
	Making appropriate referrals so as to protect patients and the public while helping ht impaired individual obtain treatment.	COL3.1
Morris-Williams, 2012[16]	Recognise the wide range of acute and long term presentations associated with the use of alcohol and other drugs (such as trauma, depression, and hypertension)	ME1.4
	Provide brief advice on the use of alcohol and other drugs	COM1.1, COM3.1
	Provide management or referral when appropriate	ME4.1, COL3.1
O'Connor 2011[31]	Screen patients for unhealthy substance use and diagnose substance use disorders	ME1.4, ME2.2
	Assess patioents for substance use-related medical, behavioural and social consequences.	ME1.4, ME2.2
	Use brief intervention and other counseling approaches to advise and assist patients concerning unhealthy substance use and substance use disorders.	ME3.4, ME4.1, COM1.1, COM4.1, COM4.3
	Use medications indicated for the treatment of substance use disorders	ME3.1
	Refer patients to substance abuse treatment programs when indicated	COL3.1
Pinxten 2011[32]	Selecting appropriate screening/assessment tools for substance use	ME1.4, ME2.2
	Screening risk of substance use problems	ME1.4, ME2.2
	Assessing substance use problems by taking a patients history	ME1.4, ME2.2
	Assessing substance use problems by a physical examination	ME1.4, ME2.2
	Selecting appropriate diagnostic lab. test	ME3.1
	Interpreting substance use by screening, assessment, lab results	ME1.4, ME2.2
	Using an evidence-based approach in assessment	ME1.4, SCH3.4
	Formulating a SUD diagnose according to DSM-IV	ME2.2
	Explaining diagnosis, prevention and treatment plan to the patient	COM3.1
	Developing a written treatment plan	ME2.4, COM5.1
	Selecting indicated initial treatment medications	ME3.1
	Starting maintenance and substitution treatment	ME4.1
	Providing general medical and social care to addiction patient	ME1.1
	Using evidence-based and up-to-date approach in treatment	SCH3.4
	Using motivational techniques to support adherence to treatment	ME5.2, COM4.3, COM5.4
	Using basic psychosocial strategies to support recovery	ME5.2
	Consulting other medical professionals	COL1.3
	Consulting nonmedical professionals	COL1.3
	Selecting indicated maintenance and treatment medications	ME3.1
	Managing Intoxication	ME4.1

	Managing withdrawal	ME4.1
	Managing Craving	ME4.1
	Managing overdoses	ME4.1
	Managing medical emergencies	ME4.1
	Monitoring substance use patients for relapse during treatment	ME4.1, ME5.1
	Using groups interventions effectively	ME3.4
	Collaborating with other medical professionals	COL1.3
	Collaborating with nonmedical professionals	COL1.3
	Distinguishing SUD co-occurring psychiatric disorders	ME1.3, ME1.4, ME1.6
	Addressing additional psychological and psychiatric problems	ME1.1, ME1.3
Rasyidi et al., 2012[36]	Screen and for and diagnose addiction.	ME1.4, ME2.2
	Assess the medical, behavioral, and social consequences of addiction.	ME1.4, ME2.2
	Use brief intervention and counseling approaches.	ME3.4, ME4.1, COM1.1, COM2.1, COM4.1
	Use appropriate medications for addictions.	ME1.3, ME3.1
	Refer patients to substance abuse treatment programs when indicated.	COL3.1
Rutkowski, 2019[37]	Perform age, gender and culturally appropriate substance use screening	ME1.4, ME2.2
	Provide brief interventions to patients with risky use or SUD.	ME2.4, ME4.1
	Refer patients with SUD to appropriate treatment and supportive services	COL3.1, COL3.2
	Treat patients for nicotine use disorder	ME2.4, ME4.1
	Initiate and maintain patients on pharmacotherapy for treatment of opioid and alcohol use disorders	ME2.4, ME4.1
	Use Urine Drug Tests and Prescription Drug Monitoring Programs correctly	ME4.1, HA1.3
Schwartz et al., 2018[33]	Screening, including identifying high-risk group	ME1.4, ME2.2
	Assessing and diagnosing using DSM-5	ME1.4, ME2.2, SCH3.2
	Using a stages-of-change model in evaluating and treating	SCH3.2, SCH3.4
	Identifying and managing psychiatric co-morbidities	ME1.4, ME2.2, ME2.4
	Identifying and managing/triaging medical comorbidities, including pain	ME1.4, ME2.2, ME2.4, ME3.3
	Identifying psychoactive substance intoxication and withdrawal	ME1.4, ME2.2
	Triaging and managing withdrawal treatment appropriately	ME2.1, ME2.4, ME3.3
	Consulting to other healthcare providers (e.g., in IntegratedPrimary/MH Care orEmergency Room)	COL1.3
	Preventing opioid overdose, including knowledge of overprescribing, diversion, and misuse	ME3.1, ME5.1, HA1.3
	Managing opioid overdose, including naloxone administration protocol	ME3.4, ME5.1
	Developing and implementing a comprehensive treatment plan using a harm reduction model	ME2.4, ME3.1, ME4.1
	Using evidence-based psychotherapy (Motivational Interviewing, 12-Step Facilitation, CBT and/or Relapse Prevention, Contingency Management, Family)	SCH3.4
	Using evidence-based pharmacotherapy, following monitoring parameters, and assessing for drug-drug interactions	ME4.1, SCH3.4
	Identifying and managing SUDs in special populations (e.g., transitional age youth, pregnant teenagers, specific ethnic/cultural populations)	ME1.4, ME2.2
Seale et al., 2010[34]	Demonstrate effective counseling methods to help prevent unhealthy substance use	COM1.1, COM2.1, COM4.1, COM4.3, COM5.4
	Refer patients with substance use disorders to treatment settings that provide pharmacotherapy and/or psychosocial counseling for relapse prevention	COL3.1
	Recognize, treat, or refer co-morbid medical and psychiatric conditions in patients with substance use conditions	ME1.4, ME2.2, ME3.1, ME3.4, ME4.1, COL3.1
	Refer patients with substance use disorders to appropriate treatment and supportive services	COL3.1
	Provide pharmacologic withdrawal to patients with substance dependence	ME3.4, ME4.1
	Provide or refer for treatment for relapse prevention in patients with substance use disorders, both pharmacotherapy and psychosocial counseling	ME3.4, ME4.1, COL3.1
	Uses a biopsychosocial-spiritual model to evaluate persons with pain	ME1.4, COM2.1, SCH3.4

Servis et al., 2021[25]	Uses valid and reliable tools for measuring pain, function, and associated symptoms to assess and reassess related outcomes appropriate to the clinical context and population	ME1.4, ME2.2, SCH3.2
	Demonstrates use of proper patient assessment, including physical exam and history, when treating pain	ME1.4, ME2.2
	Demonstrates empathic, compassionate, and professional communication during pain assessment	COM1.1, COM1.6, PRO1.1
	Evaluates a patient's pain using culturally appropriate, evidence-based methodologies considering age and gender	ME1.4, COM2.1, SCH3.4
	Uses a biopsychosocial-spiritual model to develop a whole-person care plan and prevention strategies for persons with pain	ME2.4, SCH3.4
	Develops a treatment plan that takes into account the differences among acute pain, acute-on-chronicpain, chronic or persistent pain, and pain at the end of life	ME1.6, ME2.4
	Develops a pain treatment plan based on benefits and risks of available treatments	ME2.4, ME3.1
	Demonstrates the inclusion of the patient and others, as appropriate, in the shared decision-making process for pain care	COM4.1, COM4.3, COL2.1
	Monitors the effects of pain management approaches to adjust the plan of care as needed with respect to functional outcomes	ME4.1, ME5.1
	Empowers patients to recognize and apply health promotion and self-management strategies	COM4.1, HA1.2, HA1.3
	Demonstrates how to assess and manage pain across settings and transitions of care	ME1.4, ME2.4, ME4.1, COL3.1, COL3.2
	Uses an individualized pain management plan (including risk mitigation) that integrates the perspectives of patients, family and social support systems, and clinicians in the context of available resources	ME2.4, ME4.1, COM4.3, HA1.2
	Uses a biopsychosocial-spiritual model to screen for and evaluate persons with substance use disorder	ME1.4, SCH3.4
	Recognizes and stratifies patient risk for opioid use disorder and other adverse effects, including overdose	ME1.6, ME3.3, ME5.1
	Demonstrates sufficient knowledge to perform proper assessment, diagnosis, and referral for treatment of substance use disorder	ME1.4, ME2.2, COL3.1, COL3.2
	Demonstrates empathic and compassionate communication during SUD assessment	COM1.1
	Uses a biopsychosocial-spiritual model to develop a whole-person care plan for persons with substance use disorder	ME2.4, COM2.1, SCH3.4
	Demonstrates effective communication skills in counseling patients and families on the use of medical therapies	COM1.1, COM3.1, COM4.1
	Uses an integrated, team-based approach to substance use disorder treatment	COL1.2, COL1.3
	Engages patients who use drugs in harm reduction and other secondary prevention interventions to reduce morbidity	COM4.1, HA1.2, HA1.3
	Engages patients' family and social support in the care of substance use disorder	COM4.1
Truncali et al., 2021[35]	Identification and intervention with the broad spectrum of unhealthy SU	ME1.4, ME2.2, ME2.4, ME4.1
	Introduce the following: screening tools, screening vs detection, high-risk SU use vs SU disorder, steps of brief intervention, motivational interviewing introduction, treatment options, concept of reachable moments, role of all providers in recommending and motivating treatment and medication as standard for alcohol and OUDs	ME1.4, ME2.2, COM2.1, COM3.1
	Assessment of pain, how to effectively prescribe nonopioids and decide on need for opioids	ME1.4, ME2.2, ME3.1
	Practice of key skills and added information about local resources	ME1.1, LE4.3
	Two role-plays including (1) Offering naloxone to a newly inherited patient taking opioids for chronic pain and (2) Assessment and intervention with a patient admitted for a motor vehicle accident with high-risk alcohol use vs alcohol use disorder	ME1.4, ME2.2
Wallace et al., 2020[26]	Ability to take a collaborative, multidisciplinary, interprofessional approach to treating pain	COL1.3
	Recognition of opioid use disorder risk factors and appropriate prevention strategies	ME1.4, ME3.1, HA1.1, HA1.3
	Ability to take a collaborative, multidisciplinary, interprofessional approach to treating opioid use disorder	COL1.3
	Ability to provide trauma-informed care	ME1.1, ME5.2, HA1.1, SCH3.4, PRO2.2
	Resilience assessment and enhancement among patients and providers	ME1.4, PRO4.3
	Understanding and treating pain in a palliative care context	ME2.4, ME4.1

Table 5. Mapping 'knowledge' competencies

Author	Competencies (Knowledge)	CanMEDS Framework Roles and Enabling Competencies
Ashburn & Levine, 2017[23]	Describe the criteria used to diagnose an opioid use disorder.	ME1.4, ME2.2
	Report the difference between opioid use disorder, physical dependence, and tolerance.	ME1.3, ME1.4, ME2.2
	Summarize the precipitants and factors that interfere with successful treatment of substance use disorder.	ME1.6, ME3.1, ME5.1
	Identify and discuss the impact that concurrent mental health disorders and social history can have on successful referral and treatment for sub-stance use disorders.	ME4.1, COL3.1
	Identify the common medical conditions that are associated with chronic substance use disorder, which may include infection (including sexually transmitted infections), HIV, hepatitis, cancer, and cardiovascular disease.	ME1.3, ME1.4, ME2.2
	Describe the impact that substance use disorder can have on chronic health conditions, including diabetes, oral health, and infection	ME1.3
	Describe options for how to properly screen patients for substance use disorder.	ME1.4, ME2.2, ME3.1
	Explain the role that patient screening tools can play in patient assessment for substance use disorder.	ME1.4, ME2.2
	Summarize the importance of proper patient referral for substance use disorder	COL3.1
	Explain the importance of treating the patient with dignity, respect, and a nonjudgmental manner when discussing substance use disorders.	COM1.1, COM1.3, PRO1.1
	Describe how to discuss the diagnosis of substance use disorder with a patient, including methods for effective referral of a patient for treatment of substance use disorder.	ME3.2, COM1.1, COM3.1, COL3.1
	Explain the importance of patient assessment, including the value and limitations of patient-reported pain intensity.	ME1.4, ME2.2
	Describe the importance of assessment of mood, sleep, and physical functioning in the evaluation of a patient with chronic pain	ME1.4, ME2.2
	Summarize the risk factors associated with in-creased risk of harm associated with opioid therapy in both the hospital and outpatient setting.	ME1.3
	Defend the statement that both acute and chronic pain can be best treated using a multimodal treatment that may include the use of regional anesthetic techniques, nonopioid analgesics, self-management techniques, and physical therapy	ME2.4, ME3.1
	Summarize opioid pharmacology, including: i. choice of opioid, route of administration (PO vs IV), ii. use of short-acting vs long-acting drugs, iii. the factors that place the patient at increased risk of harm when opioids are used to treat acute pain, and iv. identifying steps that can be taken to avoid patient harm.	ME2.4, ME3.1
	Describe how acute opioid prescribing decisions can directly impact the risk for long-term use, including nonmedical use and development of substance use disorder. Summarize what steps can be taken to minimize the risk of patient harm.	ME2.4, ME3.1
	Describe proper opioid formulation selection (including short-acting vs long-acting formulations, as well as when an abuse-deterrent formulationmay be indicated) and drug dosing when usingopioids to treat acute pain.	ME2.4, ME3.1
	Report on the factors that increase the risk of patient harm, as well as the factors that decrease the chances of improved patient outcomes	ME1.3, ME1.6, ME5.1
	Describe what concurrent medications or medical conditions increase the risk of patient harm	ME3.1
	Discuss the indications for prescribing naloxone for home use to treat opioid overdose	ME3.1
	Discuss the role that screening tools might play in identifying patients at increased risk for harm.	ME1.4, ME2.2
	Describe the key patient attributes that may in-crease the risk of aberrant drug-related behaviors or substance use disorder.	ME5.1
	Summarize proper methods for patient educationrelated to proper medication storage and disposal	ME3.2, ME5.2, COM1.1
	Defend the role for opioid treatment agreements.	PRO2.2
	Describe the role that shared decision-making can play when considering chronic opioid therapy, in-cluding the possible role that family members canplay, especially in younger patients.	COL1.3
	Review the role of urine drug screens and reviewof data contained in the prescription drugdatabase(s).	ME1.4, ME2.2
	Describe the value associated with establishing treatment goals and how treatment goals can be documented and monitored throughout treatment	ME2.3
Ayu et al., 2015[22]	Complications	ME1.3
	Epidemiology	ME1.3
	Neuroscience and genetics	ME1.3

Ayu et al., 2017[21]	Know how route of ingestion and mechanism of action shape substance use.	ME1.3, ME3.1
	Consider specific needs of target population (women, people who inject drugs).	ME1.3, HA1.1, HA1.2, HA2.1
	Incorporate knowledge on "new or emerging" substances.	ME1.3, SCH3.4
	Incorporate knowledge and skills on new emerging treatments for substance use disorders.	ME2.4, ME3.1, ME4.1, SCH3.4
Jackson et al., 2010[30]	Residents will be aware of the ethical and legal issues around physician impairment from substance use and of resources for referring potential impaired colleagues, including employee assistance programs, hospital-based committees, and state physician health programs and licensure boards	PRO1.3, PRO3.1, PRO3.2
	Residents will identify the legal and ethical issues involved in the care of patients with unhealthy sub-stance use	PRO3.1
Lande et al., 2010	Understanding and being prepared to address the legal and ethical issues raised by the diagnosis and treatment of patients with substance use disorders.	PRO1.3
	Understanding and being prepared to address the clinical, legal, and ethical issues involved in prescribing medications with abuse potential	PRO1.3, PRO3.1
Morris-Williams, 2012[16]	Addictive potential of alcohol and other drugs, including prescribed and over the counter drugs	ME1.3
	Range of interventions, treatments, and prognoses for use of alcohol and other drugs	ME1.3, ME2.4, ME3.1
	Effects of alcohol and other drugs on the unborn child, children, and families	ME1.3
	Recommended limits on alcohol intake	ME1.3, ME5.1
O'Connor 2011[31]	Describe the epidemiology and spectrum of unhealthy substance use, including risky use, problem use, consequences, abuse and dependence.	ME1.3
Rasyidi et al., 2012[36]	Describe the epidemiology and spectrum of addiction.	ME1.3
Rutkowski, 2019[37]	Knowledge of: Risk from substance use varies across age and during pregnancy	ME1.3
	Knowledge of: Large, nationally representative data sources on the epidemiology of substance use are used to track trends in drug use.	ME1.3
	Knowledge of: There are 11 criteria used for diagnosing a substance use disorder; disorders are categorized as mild, moderate or severe depending on the number of positive criteria	ME1.3
	Knowledge of: Several risk and protective factors mediate the risk of SUD	ME1.3
	Knowledge of: Addiction is a chronic neurological disorder. Research is revealing its pathophysiological basis.	ME1.3
	Knowledge of: Substance use disorders are treatable medical conditions	ME1.3
	Knowledge of: Co-occurring mental health disorders are common in patients with SUD.	ME1.3
	Knowledge of: Substance use is associated with a variety of health harms, and chronic medical problems are associated with associated with increased risk of substance use disorders	ME1.3
	Knowledge of: High risk behaviors and social factors are associated with substance use	ME1.3
	Knowledge of: The care of patients with SUD is complicated by unique legal and ethical issues involved in the care of patients with SUD	ME1.3
	Knowledge of: Access to medication for addiction treatment is currently inadequate, especially for special populations.	ME1.3
	Recognize the ethical and legal issues around physician impairment from SUD and of resources for referring potential impaired colleagues; including employee assistance programs, hospital-based committees, state physician health programs, and licensure boards	PRO1.1, PRO1.3, PRO3.1, PRO3.2
Schwartz et al., 2018[33]	Identifying the family impact	HA1.1, HA1.2, HA2.1
	Describing the social impact, including economic	HA1.1, HA2.1
	Describing the underlying neurobiology	ME1.3
Servis et al., 2021[25]	Describes the complex, multidimensional, and individual-specific nature of pain	ME1.3
	Describes how cultural, institutional, societal, and regulatory influences affect assessment and management of pain	HA1.1, HA2.1
	Demonstrates knowledge of the theories and science for understanding the physiology of pain and pain transmission	SCH3.2, SCH3.4
	Demonstrates knowledge of the terminology for describing pain, including acute pain, chronic pain, and pain at the end of life	ME1.3
	Describes patient, clinician, and system factors that can facilitate or interfere with effective pain assessment and management	HA1.1, HA1.3, HA2.1, HA2.2
	Demonstrates knowledge of risk stratification, patient selection, and ongoing monitoring for pharmacological pain treatment	ME3.1, ME4.1
	Differentiates among physical dependence, substance use disorder, misuse, tolerance, and nonadherence in patients	ME1.3, ME1.6, ME2.1
	Identifies appropriate multimodal pain treatment options as part of a comprehensive pain management plan	ME2.4, ME3.1
	Identifies and describes potential pharmacological and nonpharmacological treatment options	ME3.1

	Describes the unique pain assessment and management needs of special populations	ME3.1, HA2.1
	Describes the role, scope of practice, and contribution of the different professions within multidisciplinary pain management care teams	COL1.1
	Describes the interrelated nature of pain and opioid use disorder, including their neurobiology	ME1.3
	Demonstrates knowledge of the pathophysiology of substance use disorders	ME1.3
	Recognizes the spectrum of and differences among substance use, misuse, use disorders, physical dependence, tolerance, withdrawal, and pain	ME1.3
	Identifies the impact of substance (alcohol, cannabis, tobacco, opioid, sedative, and stimulant) use on health	ME1.3
	Recognizes signs and symptoms of controlled substance overdose and demonstrates fundamental knowledge of management strategies	ME1.4, ME2.2, ME3.1
	Displays knowledge of substance use disorder treatment, including pharmacologic (opioids, nicotine, and alcohol use disorder), behavioral, and social options using a chronic disease model	ME1.3, ME3.1
	Identifies and incorporates relevant data regarding social determinants of health into treatment planning for substance use disorders	HA1.1, HA2.1
	Identifies strategies to mitigate the risk of substance use disorder and promote wellness in clinicians	PRO2.2, PRO3.1, PRO3.2
	Critically evaluates systems and seeks evidence-based solutions that deliver quality care in the treatment of substance use disorders	SCH3.3, SCH3.4
	Describes the impact of pain, opioid use disorder, and other substance use disorders on society	HA2.2, HA2.3
	Describes the social, environmental, health care system, industry, and regulatory drivers that have shaped opioid prescribing and approach to pain care, including the social determinants of health in the distribution of morbidity and mortality	HA1.1, HA2.1
	Describes population health and policy efforts intended to address the opioid misuse and overdose epidemics, including the co-prescribing of naloxone.	HA2.1, HA2.2
	Recognizes the role of health and health care disparities in pain and substance use treatment	HA1.1, HA2.1
	Recognizes pain, opioid use disorder, and other substance use disorders as multidimensional public	HA2.1, HA2.2
	Demonstrates knowledge of the epidemiology of medical and nonmedical opioid use and overdose in the United States	ME1.3
	Identifies primary, secondary, and tertiary prevention strategies to address opioid misuse and overdose	ME3.1
Truncali et al., 2021[35]	Identify the risk of opioid prescribing for acute pain in adults and provides learners with the knowledge to develop an opioid-sparing and risk-mitigating approach to acute pain management	ME1.3
Wallace et al., 2020[26]	Understanding the physiology of acute and chronic pain	ME1.3
	Knowledge of pain assessment tools	ME3.1
	Knowledge of ffective pharmacologic and nonpharmacologic treatments	ME3.1
	Appreciation of biopsychosocial causes and consequences of pain	ME1.3, HA1.1, HA2.1
	Understanding the physiology of opioid use disorder	ME1.3
	Knowledge of opioid use disorder screening tools	ME3.1
	Knowledge of effective opioid use disorder treatments	ME3.1, ME3.4
	Understanding pain and opioid use disorder from a public health perspective	ME1.3, HA1.1, HA2.1
	Consideration of the relationship between our health care system and pain, opioid use disorder	ME1.6, HA1.3, HA2.2, HA2.3
	Consideration of the relationship between our society and pain, opioid use disorder	HA1.3, HA2.2, HA2.3

Table 6. Mapping 'attitude' competencies

Authors	Competencies (Attitudes)	CanMEDS Framework Roles and Enabling Competencies
Ayu et al., 2017[21]	Foster addiction research by health care professionals.	SCH3.1, SCH4.3, SCH4.5
De Jong, 2011[29]	Looks after his/her own professional development and contributes to the development of colleagues in the organization and the professional group.	LE4.2, SCH1.2, SCH1.3
Morris-Williams, 2012[16]	Work in a supportive, empathic, and non-judgmental manner without collusion	PRO1.1, PRO1.2
	Be confident and comfortable discussing the use of alcohol and drugs with patients	COM1.1
	Act appropriately on any worries about own or colleagues' use of alcohol or drugs	PRO3.2
Rutkowski, 2019[37]	Approach patients in a nonjudgmental, culturally sensitive and caring manner.	COM1.1
	Demonstrate respect for patients by using person first non-stigmatizing language.	COM1.1
Schwartz et al., 2018[33]	Understanding and integrating into treatment the role of attitude, counter-transference, and stigma	HA1.3, HA2.3, PRO1.1
Servis et al., 2021[25]	Recognizes patient preferences and values to determine pain-related goals and priorities, including quality of life	ME2.3, COM1.3
	Uses and models language that destigmatizes pain, reflects a whole-person perspective, builds a therapeutic alliance, and promotes behavior change	COM5.4
	Recognizes the role of the clinician as an advocate in assisting patients in meeting treatment goals, including recognizing own and societal bias against patients with chronic pain	HA2.1, HA2.2
	Recognizes their own and societal biases and stigmatization against patients with substance use disorders, including barriers faced by special populations	PRO4.1
Truncali et al., 2021[35]	Address provider attitudes and communication regarding care of patients with SUD by exploring concepts of implicit bias and self-awareness	PRO3.3, PRO4.1
Wallace et al., 2020[26]	Patient-centeredness: viewing pain and opioid use disorder from the patient's perspective and within their life's context	HA1.1, HA1.3