

# Drug Overdose and Suicide Among Veteran Enrollees in the VHA: Comparison Among Local, Regional, and National Data

Zaccheus J. Ahonle, PhD, CRC; Huangang Jia, PhD; Stephen A. Mudra, MD; Sergio Romero, PhD; Gail Castaneda, PhD; and Charles Levy, MD

**Background:** Suicide is the 10th leading cause of death in the US, primarily from drug overdose. In 2017, 67.8% of drug overdoses were with prescription opioids. The rate of opioid use disorder among patients in the Veterans Health Administration (VHA) is 7 times higher than that of non-VHA enrollees. This study compares the incidence of overdose and suicide across facility, regional, and national levels in the VHA system in the context of a multispecialty opioid risk reduction program at the North Florida/South Georgia Veteran Health System (NF/SGVHS).

**Methods:** This retrospective study used fiscal years 2012 to 2016 overdose and suicide aggregate data from the US Department of Veterans Affairs (VA) Support Service Center medical diagnosis cube and VA Suicide Prevention Program.

Overdose data were aggregated by facility and fiscal year, and overdose rates (per 1,000 individuals) were calculated.

**Results:** The average annual rate of overdose diagnosis at NF/SGVHS during the study period was slightly higher (16.8 per 1,000) compared with its region (16.0 per 1,000), and VHA national (15.3 per 1,000) rates. The NF/SGVHS had the lowest average annual rate of suicide (9.1 per 100,000) during the study period, which was one-quarter of the VHA national rate.

**Conclusions:** NF/SGVHS developed and implemented a biopsychosocial model of pain treatment that includes primary care integrated with mental health and addiction services. The presence of this program during a period when the facility was tapering opioid prescriptions could explain the relative reduced suicide rate.

Author affiliations can be found at the end of the article.

*Fed Pract.* 2020;37(9):420-425.  
doi:10.12788/fp.0025

Suicide is the 10th leading cause of death in the US. In 2017, there were 47,173 deaths by suicide (14 deaths per 100,000 people), representing a 33% increase from 1999.<sup>1</sup> In 2017 veterans accounted for 13.5% of all suicide deaths among US adults, although veterans comprised only 7.9% of the adult population; the age- and sex-adjusted suicide rate was 1.5 times higher for veterans than that of nonveteran adults.<sup>2,3</sup>

Among veteran users of Veterans Health Administration (VHA) services, mental health and substance use disorders, chronic medical conditions, and chronic pain are associated with an increased risk for suicide.<sup>3</sup> About one-half of VHA veterans have been diagnosed with chronic pain.<sup>4</sup> A chronic pain diagnosis (eg, back pain, migraine, and psychogenic pain) increased the risk of death by suicide even after adjusting for comorbid psychiatric diagnoses, according to a study on pain and suicide among US veterans.<sup>5</sup>

One-quarter of veterans received an opioid prescription during VHA outpatient care in 2012.<sup>4</sup> Increased prescribing of opioid medications has been associated with opioid overdose and suicides.<sup>6-10</sup> Opioids are

the most common drugs found in suicide by overdose.<sup>11</sup> The rate of opioid-related suicide deaths is 13 times higher among individuals with opioid use disorder (OUD) than it is for those without OUD.<sup>12</sup> The rate of OUD diagnosis among VHA users was 7 times higher than that for non-VHA users.<sup>13</sup>

In the US the age-adjusted rate of drug overdose deaths increased from 6 per 100,000 persons in 1999 to 22 per 100,000 in 2017.<sup>14</sup> Drug overdoses accounted for 52,404 US deaths in 2015; 33,091 (63.1%) were from opioids.<sup>15</sup> In 2017, there were 70,237 drug overdose deaths; 67.8% involved opioids (ie, 5 per 100,000 population represent prescription opioids).<sup>16</sup>

The VHA is committed to reducing opioid use and veteran suicide prevention. In 2013 the VHA launched the Opioid Safety Initiative employing 4 strategies: education, pain management, risk management, and addiction treatment.<sup>17</sup> To address the opioid epidemic, the North Florida/South Georgia Veteran Health System (NF/SGVHS) developed and implemented a multispecialty Opioid Risk Reduction Program that is fully integrated with mental health and addiction services. The purpose of the NF/SGVHS one-stop pain addiction clinic is to provide

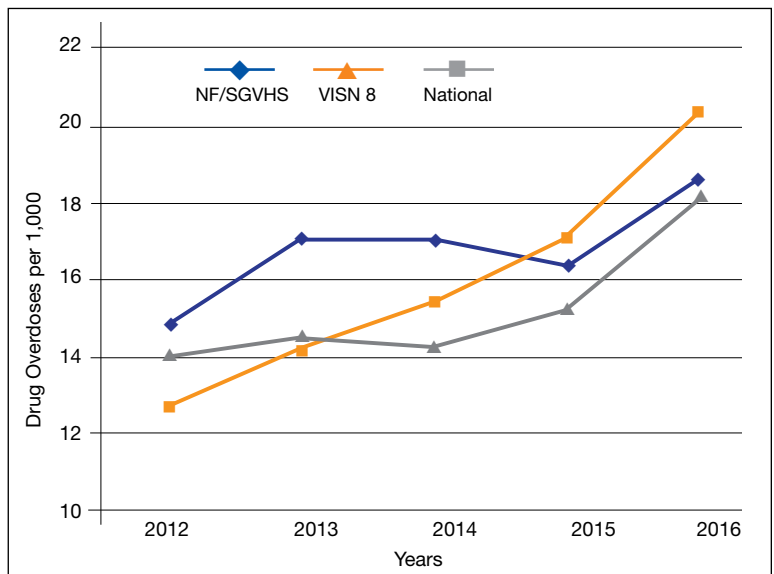
a treatment program for chronic pain and addiction. The program includes elements of a whole health approach to pain care, including battlefield and traditional acupuncture. The focus went beyond replacing pharmacologic treatments with a complementary integrative health approach to helping veterans regain control of their lives through empowerment, skill building, shared goal setting, and reinforcing self-management.

The self-management programs include a pain school for patient education, a pain psychology program, and a yoga program, all stressing self-management offered on-site and via telehealth. Special effort was directed to identify patients with OUD and opioid dependence. Many of these patients were transitioned to buprenorphine, a potent analgesic that suppresses opioid cravings and withdrawal symptoms associated with stopping opioids. The clinic was structured so that patients could be seen often for follow-up and support. In addition, open lines of communication and referral were set up between this clinic, the interventional pain clinic, and the physical medicine and rehabilitation service. A detailed description of this program has been published elsewhere.<sup>18</sup>

The number of veterans receiving opioid prescription across the VHA system decreased by 172,000 prescriptions quarterly between 2012 and 2016.<sup>19</sup> Fewer veterans were prescribed high doses of opioids or concomitant interacting medicines and more veterans were receiving nonopioid therapies.<sup>19</sup> The prescription reduction across the VHA has varied. For example, from 2012 to 2017 the NF/SGVHS reported an 87% reduction of opioid prescriptions ( $\geq 100$  mg morphine equivalents/d), compared with the VHA national average reduction of 49%.<sup>18</sup>

Vigorous opioid reduction is controversial. In a systematic review on opioid reduction, Frank and colleagues reported some beneficial effects of opioid reduction, such as increased health-related quality of life.<sup>20</sup> However, another study suggested a risk of increased pain with opioid tapering.<sup>21</sup> The literature findings on the association between prescription opioid use and suicide are mixed. The VHA Office of Men-

**FIGURE 1** Overdose Rates



Fiscal Years	NF/SGVHS	VISN 8	National
2012	14.9	12.7	14.1
2013	17.1	14.2	14.5
2014	17.1	15.4	14.3
2015	16.4	17.1	15.2
2016	18.6	20.4	18.2

Abbreviations: NF/SGVHS, North Florida/South Georgia Veterans Health System; VISN, Veterans Integrated Service Network.

tal Health and Suicide Prevention literature review reported that veterans were at increased risk of committing suicide within the first 6 months of discontinuing opioid therapy.<sup>22</sup> Another study reported that veterans who discontinued long-term opioid treatment had an increased risk for suicidal ideation.<sup>23</sup> However, higher doses of opioids were associated with an increased risk for suicide among individuals with chronic pain.<sup>10</sup> The link between opioid tapering and the risk of suicide or overdose is uncertain.

Bohnert and Ilgen suggested that discontinuing prescription opioids leads to suicide without examining the risk factors that influenced discontinuation is ill-informed.<sup>7</sup> Strong evidence about the association or relationship among opi-

oid use, overdose, and suicide is needed. To increase our understanding of that association, Bohnert and Ilgen argued for multifaceted interventions that simultaneously address the shared causes and risk factors for OUD,<sup>7</sup> such as the multispecialty Opioid Risk Reduction Program at NF/SGVHS.

Because of the reported association between robust integrated mental health and addiction, primary care pain clinic intervention, and the higher rate of opioid tapering in NF/SGVHS,<sup>18</sup> this study aims to describe the pattern of overdose diagnosis (opioid overdose and nonopioid overdose) and pattern of suicide rates among veterans enrolled in NF/SGVHS, Veterans Integrated Service Network (VISN) 8, and the entire VA health care system during 2012 to 2016. The study reviewed and compared overdose diagnosis and suicide rates among veterans across NF/SGVHS and 2 other levels of the VA health care system to determine whether there were variances in the pattern of overdose/suicide rates and to explore these differences.

## METHODS

In this retrospective study, aggregate data were obtained from several sources. First, the drug overdose data were extracted from the VA Support Service Center (VSSC) medical diagnosis cube. We reviewed the literature for opioid codes reported in the literature and compared these reported opioid *International Classification of Diseases, Ninth Revision (ICD-9)* and *International Classification of Diseases, 10th Revision (ICD-10)* codes with the local facility patient-level comprehensive overdose diagnosis codes. Based on the comparison, we found 98 ICD-9 and ICD-10 overdose diagnosis codes and ran the modified codes against the VSSC national database. Overdose data were aggregated by facility and fiscal year, and the overdose rates (per 1,000) were calculated for unique veteran users at the 3 levels (NF/SGVHS, VISN 8, and VA national) as the denominator.

Each of the 18 VISNs comprise multiple VAMCs and clinics within a geographic region. VISN 8 encompasses most of Florida and portions of southern Georgia and the Caribbean (Puerto Rico, US Virgin Islands), including NF/SGVHS.

In this study, drug overdose refers to the overdose or poisoning from all drugs (ie, opioids, cocaine, amphetamines, sedatives, etc) and defined as any unintentional (accidental), deliberate, or intent undetermined drug poisoning.<sup>24</sup> The suicide data for this study were drawn from the VA Suicide Prevention Program at 3 different levels: NF/SGVHS, VISN 8, and VHA national. Suicide is death caused by an intentional act of injuring oneself with the intent to die.<sup>25</sup>

This descriptive study compared the rate of annual drug overdoses (per 1,000 enrollees) between NF/SGVHS, VISN 8, and VHA national from 2012 to 2016. It also compared the annual rate of suicide per 100,000 enrollees across these 3 levels of the VHA. The overdose and suicide rates and numbers are mutually exclusive, meaning the VISN 8 data do not include the NF/SGVHS information, and the national data excluded data from VISN 8 and NF/SGVHS. This approach helped improve the quality of multiple level comparisons for different levels of the VHA system.

## RESULTS

Figure 1 shows the pattern of overdose diagnosis by rates (per 1,000) across the study period (2012 to 2016) and compares patterns at 3 levels of VHA (NF/SGVHS, VISN 8, and VHA national). The average annual rate of overdose diagnoses for NF/SGVHS during the study was slightly higher (16.8 per 1,000) than that of VISN 8 (16 per 1,000) and VHA national (15.3 per 1,000), but by the end of the study period the NF/SGVHS rate (18.6 per 1,000) nearly matched the national rate (18.2 per 1,000) and was lower than the VISN 8 rate (20.4 per 1,000). Additionally, NF/SGVHS had less variability (SD, 1.34) in yearly average overdose rates compared with VISN 8 (SD, 2.96), and VHA national (SD, 1.69).

From 2013 to 2014 the overdose diagnosis rate for NF/SGVHS remained the same (17.1 per 1,000). A similar pattern was observed for the VHA national data, whereas the VISN 8 data showed a steady increase during the same period. In 2015, the NF/SGVHS had 0.7 per 1,000 decrease in overdose diagnosis rate, whereas VISN 8 and VHA national data showed 1.7 per 1,000 and 0.9 per 1,000

increases, respectively. During the last year of the study (2016), there was a dramatic increase in overdose diagnosis for all the health care systems, ranging from 2.2 per 1,000 for NF/SGVHS to 3.3 per 1,000 for VISN 8.

Figure 2 shows the annual rates (per 100,000 individuals) of suicide for NF/SGVHS, VISN 8, and VHA national. The suicide pattern for VISN 8 shows a cyclical acceleration and deceleration trend across the study period. From 2012 to 2014, the VHA national data show a steady increase of about 1 per 100,000 from year to year. On the contrary, NF/SGVHS shows a low suicide rate from year to year within the same period with a rate of 10 per 100,000 in 2013 compared with the previous year. Although the NF/SGVHS suicide rate increased in 2016 (10.4 per 100,000), it remained lower than that of VISN 8 (10.7 per 100,000) and VHA national (38.2 per 100,000).

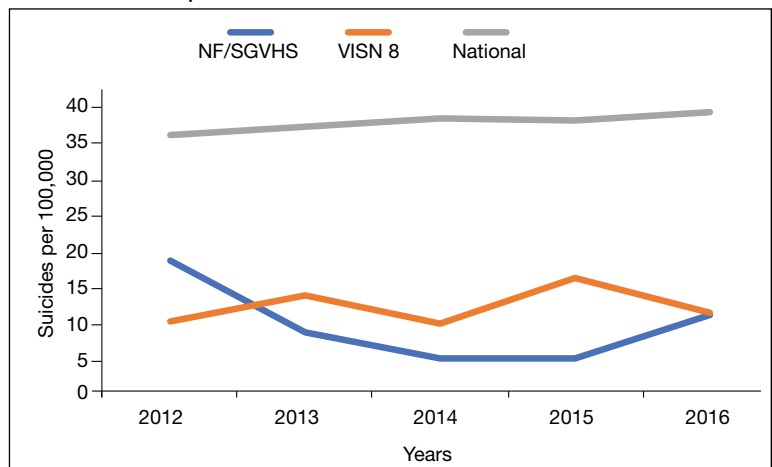
This study shows that NF/SGVHS had the lowest average annual rate of suicide (9.1 per 100,000) during the study period, which was 4 times lower than that of VHA national and 2.6 times lower than VISN 8.

## DISCUSSION

This study described and compared the distribution pattern of overdose (nonopioid and opioid) and suicide rates at different levels of the VHA system. Although VHA implemented systemwide opioid tapering in 2013, little is known about the association between opioid tapering and overdose and suicide. We believe a retrospective examination regarding overdose and suicide among VHA users at 3 different levels of the system from 2012 to 2016 could contribute to the discussion regarding the potential risks and benefits of discontinuing opioids.

First, the average annual rate of overdose diagnosis for NF/SGVHS during the study period was slightly higher (16.8 per 1,000) compared with those of VISN 8 (16.0 per 1,000) and VHA national (15.3 per 1,000) with a general pattern of increase and minimum variations in the rates observed during the study period among the 3 levels of the system. These increased overdose patterns are consistent with other reports in the literature.<sup>14</sup> By the end of the study period, the NF/SGVHS rate (18.6 per 1,000) nearly matched the national rate (18.2 per

**FIGURE 2** Comparison of Annual Suicide Rates



Fiscal Years	NF/SGVHS	VISN 8	National
2012	18.1	9.6	35.1
2013	8.0	13.1	36.2
2014	4.6	9.3	37.3
2015	4.5	15.6	37.2
2016	10.4	10.7	38.2

Abbreviations: NF/SGVHS, North Florida/South Georgia Veterans Health System; VISN, Veterans Integrated Service Network.

1,000) and was lower than VISN 8 (20.4 per 1,000). During the last year of the study period (2016), there was a dramatic increase in overdose diagnosis for all health care systems ranging from 2.2 per 1,000 for NF/SGVHS to 3.3 per 1,000 for VISN 8, which might be because of the VHA systemwide change of diagnosis code from ICD-9 to ICD-10, which includes more detailed diagnosis codes.

Second, our results showed that NF/SGVHS had the lowest average annual suicide rate (9.1 per 100,000) during the study period, which is one-fourth the VHA national rate and 2.6 per 100,000 lower than the VISN 8 rate. According to Bohnert and Ilgen, programs that improve the quality of pain care, expand access to psychotherapy, and increase access to medication-assisted treatment for OUDs could reduce suicide by drug overdose.<sup>7</sup> We suggest that the low suicide rate at NF/SGVHS and the difference in the suicide rates between the NF/SGVHS and VISN 8 and VHA national data might

be associated with the practice-based biopsychosocial interventions implemented at NF/SGVHS.

Our data showed a rise in the incidence of suicide at the NF/SGVHS in 2016. We are not aware of a local change in conditions, policy, and practice that would account for this increase. Suicide is variable, and data are likely to show spikes and valleys. Based on the available data, although the incidence of suicides at the NF/SGVHS in 2016 was higher, it remained below the VISN 8 and national VHA rate. This study seems to support the practice of tapering or stopping opioids within the context of a multidisciplinary approach that offers frequent follow-up, nonopioid options, and treatment of opioid addiction/dependence.

### Limitations

The research findings of this study are limited by the retrospective and descriptive nature of its design. However, the findings might provide important information for understanding variations of overdose and suicide among VHA enrollees. Studies that use more robust methodologies are warranted to clinically investigate the impact of a multispecialty opioid risk reduction program targeting chronic pain and addiction management and identify best practices of opioid reduction and any unintended consequences that might arise from opioid tapering.<sup>26</sup> Further, we did not have access to the VA national overdose and suicide data after 2016. Similar to most retrospective data studies, ours might be limited by availability of national overdose and suicide data after 2016. It is important for future studies to cross-validate our study findings.

### CONCLUSIONS

The NF/SGVHS developed and implemented a biopsychosocial model of pain treatment that includes multicomponent primary care integrated with mental health and addiction services as well as the interventional pain and physical medicine and rehabilitation services. The presence of this program, during a period when the facility was tapering opioids is likely to account for at least part of the relative reduction in suicide.

### Author affiliations

**Zaccheus Ahonle** is a Research Assistant, **Huanguang Jia** is a Research Health Scientist, **Gail Castaneda** is a Health Science Specialist, **Sergio Romero is Codirector**, all at Veterans Rural Health Resource Center in Gainesville, Florida. **Stephen Mudra** is the Chief of Primary Care, Pain Management, and **Charles Levy** is the Chief of Physical Medicine and Rehabilitation, both at Gainesville VA Medical Center. **Zaccheus Ahonle** is an Assistant Professor in the Department of Counseling, Educational Psychology & Foundations at Mississippi State University, and **Sergio Romero** is a Research Assistant Professor, at the University of Florida in Gainesville.

### Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

### Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of *Federal Practitioner*, Frontline Medical Communications Inc., the US Government, or any of its agencies. This article may discuss unlabeled or investigational use of certain drugs. Please review the complete prescribing information for specific drugs or drug combinations—including indications, contraindications, warnings, and adverse effects—before administering pharmacologic therapy to patients.

### References

1. American Foundation for Suicide Prevention. Suicide statistics. <https://afsp.org/about-suicide/suicide-statistics>. Updated 2019. Accessed September 2, 2020.
2. Shane L 3rd. New veteran suicide numbers raise concerns among experts hoping for positive news. <https://www.militarytimes.com/news/pentagon-congress/2019/10/09/new-veteran-suicide-numbers-raise-concerns-among-experts-hoping-for-positive-news>. Published October 9, 2019. Accessed July 23, 2020.
3. Veterans Health Administration, Office of Mental Health and Suicide Prevention. Veteran suicide data report, 2005–2017. [https://www.mentalhealth.va.gov/docs/data-sheets/2019/2019\\_National\\_Veteran\\_Suicide\\_Prevention\\_Annual\\_Report\\_508.pdf](https://www.mentalhealth.va.gov/docs/data-sheets/2019/2019_National_Veteran_Suicide_Prevention_Annual_Report_508.pdf). Published September 2019. Accessed July 20, 2020.
4. Gallagher RM. Advancing the pain agenda in the veteran population. *Anesthesiol Clin*. 2016;34(2):357–378. doi:10.1016/j.anclin.2016.01.003
5. Ilgen MA, Kleinberg F, Ignacio RV, et al. Noncancer pain conditions and risk of suicide. *JAMA Psychiatry*. 2013;70(7):692–697. doi:10.1001/jamapsychiatry.2013.908
6. Frenk SM, Porter KS, Paulozzi LJ. Prescription opioid analgesic use among adults: United States, 1999–2012. National Center for Health Statistics data brief. <https://www.cdc.gov/nchs/products/databriefs/db189.htm>. Published February 25, 2015. Accessed July 20, 2020.
7. Bohnert ASB, Ilgen MA. Understanding links among opioid use, overdose, and suicide. *N Engl J Med*. 2019;380(14):71–79. doi:10.1056/NEJMc1901540
8. Dunn KM, Saunders KW, Rutter CM, et al. Opioid prescriptions for chronic pain and overdose: a cohort study. *Ann Intern Med*. 2010;152(2):85–92. doi:10.7326/0003-4819-152-2-201001190-00006
9. Gomes T, Mamdani MM, Dhalla IA, Paterson JM, Juurlink DN. Opioid dose and drug-related mortality in patients with nonmalignant pain. *Arch Intern Med*. 2011;171(7):686–691. doi:10.1001/archinternmed.2011.117
10. Ilgen MA, Bohnert AS, Ganoczy D, Bair MJ, McCarthy JF, Blow FC. Opioid dose and risk of suicide. *Pain*. 2016;157(5):1079–1084. doi:10.1097/j.pain.0000000000000484
11. Sinyor M, Howlett A, Cheung AH, Schaffer A. Substances used in completed suicide by overdose in Toronto: an observational study of coroner's data. *Can J Psychiatry*. 2012;57(3):184–191. doi:10.1177/070674371205700308

12. Wilcox HC, Conner KR, Caine ED. Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies. *Drug Alcohol Depend.* 2004;76(suppl):S11-S19. doi:10.1016/j.drugalcdep.2004.08.003.
13. Baser OL, Mardekian XJ, Schaaf D, Wang L, Joshi AV. Prevalence of diagnosed opioid abuse and its economic burden in the Veterans Health Administration. *Pain Pract.* 2014;14(5):437-445. doi:10.1111/papr.12097
14. Hedegaard H, Warner M, Miniño AM. Drug overdose deaths in the United States, 1999-2015. National Center for Health Statistics data brief. <https://www.cdc.gov/nchs/data/databriefs/db273.pdf>. Published February 2017. Accessed July 20, 2020.
15. Rudd RA, Seth P, David F, Scholl L. Increases in drug and opioid-involved overdose deaths—United States, 2010-2015. *MMWR Morb Mortal Wkly Rep.* 2016;65(50-51):1445-1452. doi:10.15585/mmwr.mm655051e1
16. Scholl L, Seth P, Kariisa M, Wilson N, Baldwin G. Drug and opioid-involved overdose deaths—United States, 2013-2017. *MMWR Morb Mortal Wkly Rep.* 2019;67(5152):1419-1427. doi:10.15585/mmwr.mm675152e1
17. US Department of Veterans Affairs and Department of Defense. VA/DOD clinical practice guideline for opioid therapy for chronic pain version 3.0. <https://www.healthquality.va.gov/guidelines/pain/cot>. Updated March 1, 2018. Accessed July 20, 2020.
18. Vaughn IA, Beyth RJ, Ayers ML, et al. Multispecialty opioid risk reduction program targeting chronic pain and addiction management in veterans. *Fed Pract.* 2019;36(9):406-411.
19. Gellad WF, Good CB, Shulkin DJ. Addressing the opioid epidemic in the United States: lessons from the Department of Veterans Affairs. *JAMA Intern Med.* 2017;177(5):611-612. doi:10.1001/jamainternmed.2017.0147
20. Frank JW, Lovejoy TI, Becker WC, et al. Patient outcomes in dose reduction or discontinuation of long-term opioid therapy: a systematic review. *Ann Intern Med.* 2017;167(3):181-191. doi:10.7326/M17-0598
21. Berna C, Kulich RJ, Rathmell JP. Tapering long-term opioid therapy in chronic noncancer pain: evidence and recommendations for everyday practice. *Mayo Clin Proc.* 2015;90(6):828-842. doi:10.1016/j.mayocp.2015.04.003
22. Veterans Health Administration, Office of Mental Health and Suicide Prevention. Opioid use and suicide risk. [https://www.mentalhealth.va.gov/suicide\\_prevention/docs/Literature\\_Review\\_Opioid\\_Use\\_and\\_Suicide\\_Risk\\_508\\_FINAL\\_04-26-2019.pdf](https://www.mentalhealth.va.gov/suicide_prevention/docs/Literature_Review_Opioid_Use_and_Suicide_Risk_508_FINAL_04-26-2019.pdf). Published April 26, 2019. Accessed July 20, 2020.
23. Demidenko MI, Dobscha SK, Morasco BJ, Meath THA, Ilgen MA, Lovejoy TI. Suicidal ideation and suicidal self-directed violence following clinician-initiated prescription opioid discontinuation among long-term opioid users. *Gen Hosp Psychiatry.* 2017;47:29-35. doi:10.1016/j.genhosppsych.2017.04.011
24. National Institute on Drug Abuse. Intentional versus unintentional overdose deaths. <https://www.drugabuse.gov/related-topics/treatment/intentional-vs-unintentional-overdose-deaths>. Updated February 13, 2017. Accessed July 20, 2020.
25. Centers for Disease Control and Prevention. Preventing suicide. <https://www.cdc.gov/violenceprevention/pdf/suicide-factsheet.pdf>. Published 2018. Accessed July 20, 2020.
26. Webster LR. Pain and suicide: the other side of the opioid story. *Pain Med.* 2014;15(3):345-346. doi:10.1111/pme.12398