A Cross-sectional, Comparative Study of Pain and Activity in Persons With and Without Injection-Related Venous Ulcers

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Abstract
Persons with leg ulcers, including venous ulcers, often report pain. A cross-sectional, comparative study was conducted among 61 patients receiving care in an urban clinic (31 with and 30 without a venous ulcer, mean age 54 years [range 40 to 65 years], 93% African American) to examine pain and its relation to activity and walking in persons with injection-related venous ulcers. The questionnaire included items about pain and its treatment, as well as activity and walking (ie, Brief Pain Inventory [BPI] Short Form, Self-Treatment of Pain, Pain and Narcotic Use, Difficulty with Activities, and Walking Scale questionnaires). Among those with a venous ulcer (VU+), worst pain significantly related to total interference ($r = 0.65$, $P <0.0001$) and total difficulty ($r = 0.42$, $P = 0.02$) BPI scores. The common pain sites for those VU+ involved the legs (24, 36.4%), wound sites (13, 19.7%), back (eight, 12.1%), general body (five, 7.6%), shoulder and knee (four, 6.1% each), and other (eight, 12.1%). Persons VU+ were more likely than those without a venous ulcer (VU-) to have received a prescription for narcotics in the past year (96% versus 41%, $X^2 = 21.3$, $P <0.0001$). Persons VU+ versus VU- were significantly ($X^2 = 8.89$, $P = 0.003$) more likely to resort to street drug use and relapse to addiction if pain was not adequately treated. They were also twice as likely to have decreased walking over the past 5 years (67% versus 33%, $X^2 = 5.93$, $P <0.02$). Among those VU+, venous ulcers added to chronic pain and decreased walking. These findings highlight the negative effects of injection-related venous ulcers on pain, activity, and walking, as well as the propensity of this group to resort to illicit drug use for pain control. Persons VU+ should have pain assessed and treated.

Keywords: venous ulcers, intravenous substance abuse, complication, pain, activity


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arterial ulcers, diabetic ulcers, and so on). Despite these limitations, the findings from these varied studies are important to examine.

During a pilot study to document pain during 5 weeks of treatment with compression bandages, Nemeth et al reported 18 of 20 patients at baseline had pain. Pain was present throughout the 5 weeks of the study, but decreased over time. Venous ulcer-related pain was described as aching, stabbing, tender, tingling, throbbing, burning, and itchy. In Goncalves et al's descriptive, cross-sectional study of 90 patients with chronic leg ulcers, 73 patients had venous ulcers. The mean pain intensity rating was 3.1 out of 10 for patients with chronic leg ulcers. Persons in the lowest income sector and women reported the most intense pain; pain intensity was correlated with alterations in sleep, movement, walking, and mood. The authors concluded more attention and understanding must be given to leg ulcer pain. Similarly, Nemeth et al, who examined venous ulcer leg pain in 255 persons in a point-prevalence, three-season study, reported mean pain severity scores <3 (10-point scale). Persons with more pain also had osteoarthritis and a foot ulcer. Pain decreased over time in persons with venous ulcers, but most patients continued to have pain. Interestingly, the demographic and clinical profiles of patients in pain were otherwise similar to those without pain. Approximately 50% of patients with venous ulcer pain were receiving analgesia; 75% reported it was effective.

In a review of 37 published studies that reported the impact of leg ulcers on patients' daily life, primary limitations of leg ulcers were pain and immobility; both negatively impacted participants' lives. All articles reviewed showed leg ulcers pose a threat to physical functioning and have a negative impact on psychological functioning. Standing and walking tended to aggravate pain and were avoided. Patients' experience with pain was largely ignored by health professionals who frequently did not report pain as part of assessment.

Heinen et al performed a systematic literature review of 23 papers on the effect of leg ulcers on daily life and pain-related interventions. They reported finding no interventions for pain relief in daily life and concluded there is need for pain assessment and treatment in patients with venous ulcers but that little research had been conducted regarding effective pain treatments. Van Hecke et al completed a literature review of 31 studies regarding reasons or determinants for nonadherence to leg ulcer treatment. Primary reasons for nonadherence were pain, discomfort, and lack of a valid lifestyle advice by healthcare providers. Although pain and discomfort were the prominent factors of nonadherence, these factors were seldom measured. The authors recommended research regarding pain treatment of leg ulcers and adherence to care.

Woo discussed the literature regarding the effects of pain and stress. He concluded pain was common in patients with chronic wounds, is a source of anxiety, and can negatively affect healing. Despite reports that pain can impede venous ulcer healing, clinicians undervalued the extent to which pain affected the lives of these patients.

Some research has been done about painful activities. Pieper and Templin performed a cross-sectional study about pain and function in 100 persons who had a history of injection drug use. Leg pain and interference with functioning were related to the severity of venous disease. Controlling for other chronic diseases, leg pain was a mediator of the relationship between venous disease and function in path analysis. The most painful activities identified by persons with injection-related venous ulcers were working, walking outside, standing, and stair climbing. In another cross-sectional, comparative design study involving 713 persons in methadone treatment, venous disease pain affected mobility, and leg pain negatively related to walking mobility. Subsequently, walk speeds tended toward very slow.

In an early descriptive study (N = 32) of persons who had a history of injected drugs, Pieper et al reported the natural log of the ulcer size was related to pain, with larger ulcerated area significantly related to both greater current pain (P = 0.05) and worst pain (P = 0.05) in 24 hours. In another study, Pieper et al examined ankle mobility with goniometry in 104 persons in methadone treatment. Ankle mobility is necessary for the calf muscle pump to return blood to the heart. Decreased ankle mobility was negatively associated with severity of CVI. To control pain in the legs, injection users often did not move their feet or ankle joint while walking, which negatively affected calf muscle pump function.

To complicate matters, injection drug users with venous disease generally reported having at least three additional medical diagnoses. Several of the conditions (eg, arthritis, human immunodeficiency virus [HIV] infection, diabetes mellitus) also can cause pain, and general pain is a concern for illicit drug users. Chronic pain is common in persons seeking treatment for addictive diseases; 24% of patients admitted for treatment of addiction experience severe chronic
pain. In a survey study of 2,573 opioid-dependent patients entering treatment across the United States, approximately 75% of drug treatment patients >45 years of age had debilitating pain. Larson et al conducted a randomized, controlled trial in an urban detoxification program (N = 397) as a way to improve linkages with primary medical care. Chronic pain was common among individuals leaving residential detoxification (16% had persistent pain and 54% had intermittent pain), and it was independently associated with long-term substance use.

In summary, pain is a dominant concern for persons with venous ulcers as well as for those with addictive disease. Venous ulcers and leg pain add disease burden to the individual, and pain levels for persons with venous ulcers correlate negatively with movement and walking. Leg pain is especially troubling because of the multiplicity of factors it can affect, such as wound healing, employment, family life, self-esteem, and quality of life.

The purpose of this study was to examine pain and its relation to activity and walking in a clinic population of persons, similar in terms of having an indigent health insurance and living in poverty, with and without injection-related venous ulcers. The research questions were: 1) How do persons with and without injection-related venous ulcers compare in terms of pain conditions, pain ratings, pain interference, and difficulty with activities due to pain? 2) What pharmacologic and nonpharmacologic pain treatments are used among persons with and without injection-related venous ulcers? 3) How do persons with and without injection-related venous ulcers compare in distance walked?

Methods

Design and study population. Participants in this cross-sectional, comparative design study were recruited consecutively when they came for their scheduled appointment and were distinguished by those with (VU+) and those without (VU-) venous ulcers. Participants signed informed consent documents approved by the hospital’s nursing and medical research committees and the university’s Institutional Review Board. Data were collected during May and June 2011. Participants were compensated $10 for their 1-hour participation time. Participation time was not considered burdensome to the patient. The study’s methodology is described in more detail in a publication about falls and balance confidence, which were other variables in the study.

Inclusion and exclusion criteria. Inclusion criteria stipulated participants be 40 to 65 years of age; have an injection-related venous ulcer (VU+ group) and no current lower extremity wound for the comparison group (VU- group); be able to respond in English; and be a registered patient in the clinic. The registered nurses excluded persons according to the following criteria: physically or mentally too ill to respond to the questionnaires or allow the physical examination of the legs, amputation of a lower extremity, and/or not able to walk.

Sample size determination. Because it was a pilot for generating future hypotheses, this study was not powered for the detailed pain assessment. The sample size was limited by the available number of patients with injection-related venous ulcers. Researchers assessed pain involving the entire body because patients with venous ulcers, especially those who injected drugs, can have multiple pain sites.

Instruments. Questionnaires were read to participants to facilitate completion.

Demographic and health questionnaires. These instruments obtained general information about each participant such as gender, race, education, age, medications, and medical diagnoses. Self-rated health was scored on a scale of 1 (ill) to 10 (healthy). Participants were asked if they had a condition associated with pain. If they had such a condition, they were given a list of common pain locations (eg, legs, back, shoulders, knees, wound) and noted the sites that had pain.

Brief Pain Inventory (BPI) Short Form. This questionnaire was used to measure pain severity and functional status/pain interference. Participants rated bodily pain for least, worst, average, and current/now pain severity. Pain in each location was rated for severity on an 11-point scale, which ranged from 0 (no pain) to 10 (pain as bad as you can imagine). Pain severity is the primary factor for the impact of pain on the individual. The pain severity items have Cronbach’s alpha of 0.85 and 0.84 in a similar study.

BPI Pain Interference with Function Scale. This instrument comprises seven items (general activity, mood, working, walking, sleep, relationships, and enjoying life) rated 0 (does not interfere) to 10 (completely interferes). The time frame is pain in the past 24 hours. The higher the rating, the greater pain interferes with function. Items can be examined individually or as a total score ranging from 0 to 70. The pain interference score has a Cronbach’s alpha reliability of 0.87 for patients with chronic nonmalignant pain and, in a clinical study similar to this paper, 0.88.

Difficulty with Activities Questionnaire. Items in this instrument assess how difficult it was in terms of pain to walk, stand, climb stairs, and work outside the home or housework for the past 24 hours. Response options range from 0 (no problem) to 10 (great difficulty). Items can be examined individually or as a total score ranging from 0 to 40. The higher the rating, the greater the difficulty performing the activity because of pain.

Walking scale. Participants were asked how far they walked per day with responses dichotomized into less than and greater than a half mile. Participants also were asked if their past 5 years of sitting, walking, standing, or participation in sports/exercise had increased, decreased, or stayed the same. To increase statistical power, the response increased was combined with stayed the same and compared to decreased activity.

Self Treatment of Pain Questionnaire. In this questionnaire, participants were asked to identify all prescription,
over-the-counter, and herbal/alternative therapies, as well as nonmedicinal therapies, they had used to treat pain. This provided descriptive information of methods used for pain therapy aside from prescribed medications.

Pain and Narcotic Use Questionnaire. This instrument asked questions about receipt of an opioid prescription within the past year, whether alcohol or street drugs were used to treat the pain, and if pain was thought to result in subsequent use of illicit drugs.

Physical assessment. Both legs were assessed for venous disease by a registered nurse using the clinical section of the Clinical-Etiology-Anatomy-Pathophysiology (CEAP) Classification. This assessment was done to assure the VU- group did not have leg ulcers. The clinical CEAP has eight clinical classifications (one category is divided into two parts) that range from Class 0 (no visible or palpable signs of venous disease) to Class 6 (active venous ulcer). Inter-rater reliability in a drug use population was reported as 0.97 for the right leg and 0.94 for the left leg.1

Data analyses. Descriptive statistics were used to examine the frequency and distribution of demographic characteristics, along with means and standard deviations of quantitative measures. Correlations and analysis of variance allowed for examination of the relationships among the variables.

The differences in continuous variables between persons VU+ and VU- were examined with Student’s t-test, while chi-square test of association described between-group differences in categorical variables.

Results

Participants. Participants (N = 61) included 35 (57.4%) men and 26 women, mean age of 54 years (SD = 5.53, range 40–65), 57 (93%) African American, in two groups: 31 VU+ gender-matched with 30 VU-. Of the 65 patients asked to participate, four declined due to lack of interest/time. Participants in the VU+ and VU- groups did not differ significantly on gender or race. Participants VU+ as compared to those VU- were significantly older (56.10 ± 6.41 versus 52.00 ± 6.41 years), rated their health worse (5.84 ± 1.66 versus 6.93 ± 1.7), and had more comorbidities (specifically, deep vein thrombosis, hepatitis C, and neuropathies) (5.54 ± 2.56 versus 3.20 ± 1.71). Both groups included persons who used illicit drugs, although seven (23.3%) participants VU- reported never using them. For the VU+ group, four persons had venous ulcers on the right leg only, 13 on the left leg only, and 14 had the ulcers on both legs. A detailed description of the sample was previously published.18

Pain rating, interference, and difficulty. Although the VU+ group had higher pain scores, VU+ and VU- participants did not differ significantly on any of the BPI pain severity items (ie, average, worst, least, or now) or in the total pain interference score (see Table 1). Although the pain interference item scores were generally higher (showing more interference) for those VU+ versus VU-, scores were significantly higher only for pain interference with working (P = 0.01) and marginally significantly higher for pain interference with walking (P = 0.06). Persons VU+ had greater total Difficulty with Activities scores (P = 0.02), with regard to walking, stair climbing, and working (see Table 1).

Among VU+ persons, worst pain was significantly correlated with total interference (r = 0.65, P <0.0001) and total difficulty (r = 0.42, P = 0.02) scores, while interference and difficulty were also strongly correlated (r = 0.68, P <0.0001). For VU- persons, similar patterns were noted, but the association between worst pain and total difficulty was not significantly related (P = 0.12).

Table 1. Brief Pain Inventory (BPI) Short Form Pain: severity, interference, and difficulty items for participants (N = 61) with (VU+) and without (VU-) injection-related venous ulcers

<table>
<thead>
<tr>
<th>BPI Scale Item</th>
<th>VU+  (n = 31)</th>
<th>VU-  (n = 30)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average pain</td>
<td>5.4 ± 3.1</td>
<td>4.0 ± 3.2</td>
<td>0.09</td>
</tr>
<tr>
<td>Worst pain</td>
<td>7.0 ± 3.3</td>
<td>6.2 ± 3.9</td>
<td>0.36</td>
</tr>
<tr>
<td>Least pain</td>
<td>3.1 ± 2.9</td>
<td>2.6 ± 2.6</td>
<td>0.44</td>
</tr>
<tr>
<td>Pain now</td>
<td>4.2 ± 3.2</td>
<td>4.1 ± 3.7</td>
<td>0.86</td>
</tr>
<tr>
<td>Pain interference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General activity</td>
<td>4.7 ± 3.9</td>
<td>3.7 ± 3.8</td>
<td>0.33</td>
</tr>
<tr>
<td>Mood</td>
<td>4.5 ± 3.8</td>
<td>3.3 ± 3.8</td>
<td>0.25</td>
</tr>
<tr>
<td>Walking ability</td>
<td>5.3 ± 3.8</td>
<td>3.4 ± 3.8</td>
<td>0.06</td>
</tr>
<tr>
<td>Normal work</td>
<td>5.7 ± 4.1</td>
<td>3.0 ± 3.9</td>
<td>0.01</td>
</tr>
<tr>
<td>Relationships with other people</td>
<td>3.5 ± 3.4</td>
<td>2.3 ± 3.6</td>
<td>0.17</td>
</tr>
<tr>
<td>Sleep</td>
<td>4.6 ± 3.8</td>
<td>4.1 ± 3.9</td>
<td>0.65</td>
</tr>
<tr>
<td>Enjoyment in life</td>
<td>4.7 ± 3.7</td>
<td>3.2 ± 4.1</td>
<td>0.17</td>
</tr>
<tr>
<td>Total interference score</td>
<td>33.0 ± 24.3</td>
<td>23.1 ± 25.1</td>
<td>0.13</td>
</tr>
<tr>
<td>Difficulty questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td>4.9 ± 3.7</td>
<td>3.0 ± 3.9</td>
<td>0.05</td>
</tr>
<tr>
<td>Stair climbing</td>
<td>6.1 ± 3.3</td>
<td>3.8 ± 3.9</td>
<td>0.015</td>
</tr>
<tr>
<td>Working</td>
<td>6.3 ± 3.4</td>
<td>3.6 ± 4.2</td>
<td>0.009</td>
</tr>
<tr>
<td>Standing</td>
<td>4.9 ± 3.3</td>
<td>3.2 ± 4.1</td>
<td>0.07</td>
</tr>
<tr>
<td>Total difficulty score</td>
<td>22.3±12.6</td>
<td>13.6±14.4</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Pain location and treatment modalities. Participants had multiple locations of pain and did not differ significantly in having a condition that caused pain (90% of the VU+ and 77%, VU-). The common pain sites (66 responses) for those VU+ involved the legs (24, 36.4%), wound sites (13, 19.7%), back (eight, 12.1%), general body (five, 7.6%), shoulder and knee (four, 6.1% each), and other (eight, 12.1%). The pain locations (24 responses) for the VU- group were back (seven, 29.2%), legs (five, 20.8%), shoulder (five, 20.8%), abdomen (three, 12.5%), knee (two, 8.3%) and general body and head (each one, 4.2%).

Pain was treated pharmacologically and nonpharmacologically in both groups. Forty-one (41, 69.5%) participants had received at least one prescription for a narcotic medication in the past year. Patients who reported a pain condition versus those without a pain condition were more likely to take opioids for pain (75% versus 27%; Fisher’s exact P = 0.005). Persons VU+ were more likely to have received a prescription for narcotics in the past year (96% versus 41%, $X^2 = 21.3, P < 0.0001$) and to have used narcotics in the past year (93% versus 38%, $X^2 = 20.2, P < 0.0001$). The most common opioids prescribed were a form of hydrocodone (n = 41) and acetaminophen with codeine (n = 10). Participants reported taking opioid medications as often as prescribed (44.5%), less often (23%), and more often (18%); some did not take them at all (11%).

Interestingly for the entire sample, 31.6% of participants resorted to street drug use when their pain was not adequately treated and 22.8% resorted to alcohol use. Nearly 30% reported that inadequate pain treatment caused them to relapse to substance abuse. Persons VU+ were more likely to resort to street drug use versus those VU- (48% versus 12%, $X^2 = 8.89, P = 0.003$) and were more likely to relapse to their addiction (41% versus 15%, $X^2 = 4.76, P = 0.03$). The two groups did not differ significantly on use of alcohol to treat pain.

Nonpharmacologic methods to treat pain used by VU+ persons included joint rest (n = 15), exercise (n = 13), television (n = 13), and DVDs (n = 13). Persons VU- primarily used exercise (n = 12), heat (n = 12), and over-the-counter topical agents (n = 10).

Walking. Significantly more VU+ participants (65%) reported walking <0.5 mile per day compared to those VU- (35%) ($X^2 = 4.73, P = 0.03$). No significant relationship was noted between distance walked and their usual pain. Persons VU+ were twice as likely as those VU- to have decreased walking over the past 5 years (67% versus 33%, $X^2 = 5.93, P < 0.02$). The two groups did not report decrease in other activities (ie, sitting, standing, or participation in sports). Regardless of venous ulcer status, all participants with decreased walking over the past 5 years reported greater pain compared to all those whose walking frequency increased or stayed the same (6.5 versus 4.68, $t = 2.29, P = 0.025$).

Discussion

Pain severity, pain interference with various activities, difficulty performing basic activities, methods of pain treatment, and walking ability and frequency were examined among persons with injection-related venous ulcers compared to persons without these ulcers; all were receiving care in an urban clinic. Venous ulcer status did not significantly influence pain scores, although participants VU+ had relatively higher scores. Both groups had multiple comorbidities that contributed to increased pain. Pain resulted in greater difficulties in persons VU+, notably for walking, stair climbing, and working. About 70% of the total sample received a prescription for an opioid pain medication within the past year; persons VU+ were more likely to receive such a prescription and also to use the medications. Less than half the total sample took the medication as prescribed. Approximately one third of participants resorted to illicit drugs when pain was not adequately controlled; this occurred significantly more often in the VU+ group. In addition, persons VU+ walked significantly shorter distances per day and also were more likely to report their walking had decreased over the past 5 years compared to those VU-.

Venous ulcers are chronic wounds associated with pain. Participants VU+ reported average and worst pain scores as high (5.4 and 7.0, respectively). In general, these scores were more than double the pain scores reported by other studies. Venous ulcer pain is a concern for injection users and adds to the pain experienced by these patients from other chronic, painful conditions.

Pain in persons VU+ can interfere with many aspects of life. In previous research, the most painful activities identified by persons with injection-related venous ulcers were working, walking outside, standing, and stair climbing. Persoon et al reported major limitations of leg ulcers were pain and immobility, sleep disturbances, lack of energy, limitations in work and leisure, worries, frustrations, and lack of self-esteem. Mobility also is limited by the dressing, edema, and wound drainage of venous ulcers.

Venous ulcer pain is often inadequately treated. In this study, although persons VU+ were more likely to have received opioid prescriptions in the past year and to have used the medication, their pain remained high. Pain relief was found important to improve quality of life, enable patients to mobilize, and improve appetite. However, research is lacking on the best way to treat pain. Nonsubstance abuse patients primarily used nonsteroidal anti-inflammatory drugs (70%) for pain management, but the researchers acknowledged the need for more attention and understanding of leg ulcer pain by clinicians.

Less than half of the total participants took opioid medications as prescribed. In a retrospective analysis of 938,586 patient urine drug screen samples ordered by physicians to screen for noncompliance, Couto et al reported 75% of patients were not taking their medications for chronic pain in a manner consistent with the prescription. In the urine
drug screen, 38% had no detectable level of their prescription, 27% had a drug level higher than expected, and 11% had illicit drugs detected. The authors concluded this was a substantial clinical concern. Katz et al examined urine toxicology testing with behavioral monitoring for 122 patients maintained on chronic opioid therapy for noncancer pain. They reported 43% of these patients had a problem, such as a positive urine toxicology or one or more aberrant drug-taking behaviors. Patients with chronic pain tended to underestimate their medication use and provided incorrect information on illicit drug use. Edlund et al investigated the distribution of mean daily dose and mean days of supply among patients with chronic noncancer pain in two disparate populations. Although the sample size was not stated, a large national commercially insured population and a state-based Medicaid population were studied. The likelihood of heavy opioid use was increased among persons with multiple pain conditions, mental health disorders, alcohol abuse, and illicit drug use. Banta-Green et al interviewed 704 patients from a large health maintenance organization; all were prescribed chronic opioids. The study involved testing an instrument about prescription drug use. They identified factors such as addictive behaviors (buying drugs on the street), addictive concerns (losing medications), pain treatment (pain inadequately treated), and opioid abuse and dependence. They noted trends for prescription misuse and addictive use of opioid medications have increased substantially in recent years. Opioids are effective pain medications and can be safely prescribed, but patients need to use them as directed.

Approximately one third of current study participants reported to street drug use if their pain was not adequately controlled; this percentage was close to 50% in persons VU+. This finding is supported in the literature. Larson et al examined pain and substance use after detoxification for substance abuse (N = 397). Persistent pain at follow-up was associated with an increased use of any substance (80%), heroin/opioid use (34%), and heavy alcohol use (56%). The authors concluded chronic pain is a common problem and is associated independently with long-term substance use after detoxification. Hwang et al randomly selected participants (N = 152) from a shelter and screened them for chronic pain for a cross-sectional survey pain study. Homeless individuals with chronic pain reported street drug use (46%), alcohol use (29%), and prescribed medications (43%) to treat their pain.

Limitations
The sample size was modest, which potentially limits generalizability as well as the types of statistical analyses that could be performed. To obtain a large, diverse sample of persons VU+, a multicenter study design using wound care clinic sites would be needed. Pain in general versus leg or ulcer pain was examined because of the diversity of patient pain sites. Research is needed about ulcer pain as compared to bodily pain and to examine if ulcer pain adds substantially to bodily pain. In addition, participants VU+ were significantly older, had more comorbidities, and rated their health worse than those VU--; these factors could have affected pain ratings.

A cross-sectional, descriptive study design was employed. Data were not collected about the number and type of opioid prescriptions given over the past year. Longitudinal data about pain and its management for persons VU+ are needed. Bham et al surveyed 248 primary care physicians on the use of opioids for chronic pain. They reported physicians were comfortable prescribing opioids to patients with cancer but were less comfortable prescribing them to persons with a current or past history of drug or alcohol abuse because they were worried patients would abuse prescriptive opioids. Physicians also were concerned with drug abuse, addiction, adverse events, tolerance, and medication interactions.

The current study sample consisted primarily of African American adults (93%); thus, racial differences regarding pain and its management could not be examined. Disparities in pain treatment have been shown. For example, in a large national database study of chronic abdominal pain, opioid prescriptions were less common among the uninsured and African American patients.

Implications for Care
Persons VU+ should have their pain assessed and treated. In addition, venous ulcers need greater recognition in addiction healthcare, especially in terms of pain and its management. Persons with substance abuse, chronic pain, and venous ulcers may have different addiction treatment needs. Addressing comorbidities, such as venous ulcers, and pain as treatable chronic conditions among adults receiving treatment for drug addiction presents a potential opportunity to improve long-term clinical outcomes for these individuals. These patients need long-term pain management strategies and an infrastructure to enhance pain management safety and minimize drug diversion.

Conclusion
Among injection drug users, venous ulcers are associated with chronic pain and add to the chronic pain conditions found among this population. This pain affected walking, stair climbing, and working. Opioid medications were used for pain management. Persons receiving opioid medications often did not use them as prescribed. These findings highlight the negative effects of injection-related venous ulcers on pain, activity, and walking, as well as the propensity of these individuals to resort to illicit drug use for pain control.

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The product must remain frozen at -75°C ± 10°C continuously until ready for use.

Dermagraft is manufactured using sterile components and is grown under aseptic conditions. Prior to use, Dermagraft must be stored continuously at -75°C ± 10°C.

Dermagraft is a cryopreserved human fibroblast-derived dermal substitute. (1)

Dermagraft is contraindicated in patients with known hypersensitivity to bovine products, as it may contain trace amounts of bovine proteins from the manufacturing medium and storage solution. (3)

Dermagraft at room temperature for more than 30 minutes. After 30 minutes, the product should be discarded and a new piece thawed and prepared consistent with Preparation for Use instructions.

Patient Counseling Information: After implantation of Dermagraft, patients should be instructed not to disturb the ulcer site for approximately 72 hours (three days). After this time period, the patient, or caregiver, should perform the first dressing change. The frequency of additional dressing changes should be determined by the treating physician. Patients should be given detailed instructions on proper wound care so they can manage dressing changes between visits. Compliance with off-weight-bearing instructions should be emphasized. Patients should be advised that they are expected to return for follow-up examinations on a routine basis, until the ulcer heals or until they are discharged from treatment. Patients should be instructed to contact their physician, if at any time they experience pain or discomfort at the ulcer site or if they notice redness, swelling, or discharge around/from the ulcer. (8)

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