Cancer treatment is an arduous and lengthy process. Although pharmaceutical and technological advances have improved treatment outcomes, patients continue to experience many undesirable sequelae. Besides the side effects of chemotherapy, patients experience psychosocial effects, including feelings of hopelessness, helplessness, anxiety, depression, and isolation (Karagozoglu & Kahve, 2013). In addition, the incidence of anxiety is reported to be as high as 50% among new patients with cancer (Sheldon, Swanson, Dolce, Marsh, & Summers, 2008).

To help alleviate the negative consequences of cancer and side effects of treatment, about 48%–80% of patients with cancer report using integrative therapies, the most common being massage therapy, as stated in Greenlee et al. (2014). In a study conducted at a major cancer center when massage therapy was integrated into inpatient and outpatient care, patients reported a 50% decrease in pain, fatigue, stress, anxiety, nausea, and depression (Cassileth & Vickers, 2004). Oncology nurses play a crucial role in supporting patients with cancer throughout their journey.

The fast-paced, disease-focused nature of cancer care can create a physical and emotional disconnect between patients and nurses. However, when nurses use touch in a therapeutic capacity, it reconnects the nurse and patient, leading to a strengthened relationship, a crucial component of nursing care (Connor & Howett, 2009; Kolcaba, Dowd, Steiner, & Mitzel, 2004). In addition, intentional touch in the form of a nurse-delivered massage is an evidence-based, nonverbal way for a nurse to communicate compassion, concern, and empathy while reducing patient anxiety and improving patient comfort (Connor & Howett, 2009; Karagozoglu & Kahve, 2013).

Hand massage has been shown to strengthen the nurse–patient relationship; improve patient comfort, relaxation, and satisfaction; and reduce stress and anxiety. Therefore, the purpose of this evidence-based practice project was to incorporate positive and therapeutic touch in the form of a nurse-delivered hand massage at an academic National Cancer Institute (NCI)–designated chemotherapy infusion suite.

**Touch in Nursing Care**

The types of touch used for nursing care can be categorized as procedural or intentional (Connor & Howett, 2009). *Procedural touch* is defined as the
contact required for medical interventions, such as placing an IV, taking a blood pressure, or helping a patient move. Intentional touch is described as the nurse’s purposeful use of touch to convey concern, empathy, understanding, and compassion. Intentional touch is an important part of nursing practice and has been shown to improve patient and nurse communication and support a safe, trusting, and therapeutic nurse–patient relationship (Connor & Howett, 2009; Leonard & Kalman, 2015).

Connor and Howett (2009) note that the experience of providing intentional touch “transforms the way in which the nurse regards his or her patients. Rather than seeing a demanding patient, the use of intentional touch helps the nurse see the person as a human being like themselves” (p. 130). Although touching with intention can ease suffering in patients, it also has a positive impact on nurses. When nurses provide touch with intention, they experience a sense of comfort, peace, calm, well-being, and security (Connor & Howett, 2009).

Hand Massage
Administering a massage can be as simple as someone with knowledge of massage principles applying intentional touch by rubbing or kneading soft tissue for a few minutes, or it can be a structured therapy session provided by a certified massage therapist (Westman & Blaisdell, 2016). Florence Nightingale, the pioneer of modern nursing, incorporated massage training into nursing school curricula across the United States in the 1880s–1900s (Ruffin, 2011). Massage was considered a nursing core competency, and a back rub was considered a nursing standard in caring for hospitalized patients (Ruffin, 2011). Unfortunately, nurse-provided massage gradually lost ground with increased reliance on pharmacologic interventions, documentation demands, and patient acuity (Ruffin, 2011; Westman & Blaisdell, 2016).

The feasibility, positive benefits, and patient satisfaction that occur with nurse-delivered massage have increased its use across various healthcare settings (Karagözoglu & Kahve, 2013; Thompson, Wilson, James, Symbal, & Izumi, 2013; Westman & Blaisdell, 2016). Patients who received a hand massage before ambulatory surgery experienced a statistically significant decrease in preoperative anxiety compared to patients who received standard nursing care (Brand, Munroe, & Gavin, 2013; Nazari, Ahmadzadeh, Mohammadi, & Rafiei Kiasari, 2012). In a 2001 study of patients undergoing cataract surgery, five minutes of hand massage before surgery resulted in a statistically significant decrease in systolic and diastolic blood pressure, pulse rate, epinephrine, norepinephrine, and cortical levels while reducing patient anxiety and stress and improving patient comfort and satisfaction (Kim, Cho, Woo, & Kim, 2001).

Studies conducted in long-term care facilities suggest that residents who received a hand massage experienced a statistically significant reduction in pain (Cino, 2014) and a significant increase in comfort compared to the residents who did not receive the hand massage (Kolcaba, Schirm, & Steiner, 2006). Individuals on hospice who received a hand massage twice weekly for three weeks had increased comfort compared to those who did not (Kolcaba et al., 2004).

Nurses also benefit from providing massages to their patients. In Thompson et al. (2013), nurses on a variety of inpatient units were taught basic massage principles and encouraged to integrate massage into their regular practice. Nurses reported that providing massage increased their feeling of pride and level of care provided to patients. In addition, patients indicated that they received a higher quality of care and improved pain control. Overall, touch is an essential component of nursing care, and hand massage is an evidence-based method of providing superior mutually beneficial care.

Few risks are associated with receiving a hand massage, particularly if light pressure is used. Contraindications for receiving a hand massage include affictions in the arm or hand, such as deep vein thrombosis, IV access complications, open wounds, rashes, lymphedema, or any pain or sensitivity (Kolcaba et al., 2004).

Methods
Sample and Setting
The evidence-based practice project was implemented at an NCI-designated adult outpatient chemotherapy infusion suite at University of Iowa Hospitals and Clinics in Iowa City from July to December 2015. Prior to implementation, the site offered a limited number of integrative therapies for patients, and no modalities were formally integrated into patient care.

The infusion suite contained 32 chairs and 8 beds for chemotherapy administration. Twenty-two nurses were employed on the unit, and 12–16 nurses were scheduled to work each day. The project site administered an average of 92 infusions per day during the project implementation period. Two of the more commonly used drugs in the chemotherapy suite are paclitaxel (“Taxol”) and docetaxel (“Taxotere”). Because of the anaphylaxis risk of these drugs, the institution required a nurse to be at the patient’s bedside during the first 15 minutes of the first two infusions, creating

“When nurses use touch in a therapeutic capacity, it reconnects the nurse and patient.”

Overall, touch is an essential component of nursing care, and hand massage is an evidence-based method of providing superior mutually beneficial care.
the ideal time period for hands-on, personalized nursing care in the form of a five-minute hand massage.

Implementation Strategy
The project leader was an oncology-certified nurse at the project site and a Doctor of Nursing Practice student in the family nurse practitioner specialty with five years of oncology experience. She provided verbal and written education to the staff nurses regarding the overall scope of the project, the staff’s role in the project, and the process of data collection.

The leader provided a training program for the nurses to learn hand-massage techniques. The classes were taught during work hours, as agreed on by the nurse manager. Nurses were instructed on the benefits and contraindications and on how to obtain verbal consent from the patient. A hospital-approved water-based, fragrance-free lotion was used to minimize patient reaction. Training was provided via an instructional DVD of a massage therapist providing step-by-step directions and technique tips, which included the suggested pressure and recommended massage movements to include the front and back of the hand and to stroke fingers individually. Nurses practiced the hand massage on one another and provided feedback. All nurses had documentation that they had viewed the video and conducted a practice hand massage on another nurse, and the project leader observed each nurse provide a hand massage. Massage pressure, use of hypoallergenic lotion, and inclusion of all aspects of the hand, including individualized finger stroking, were standardized. Step-by-step instructions of the technique were kept at each nurse station to allow for easy review.

Project Design
A pre-/postimplementation group comparison design was used to evaluate project effect on identified patient outcomes through patient surveys. Participating nurses completed Likert-type scales from 1 (strongly disagree) to 4 (strongly agree) pre- and postimplementation (see Table 1). Patients were eligible for the project if they required 15 minutes of chairside monitoring during their first and second chemotherapy infusion. Preimplementation participants received the old standard of care, which did not include massage, and completed surveys on selected outcome measures that provided baseline data before the project was implemented. Postimplementation participants received a five-minute hand massage at the beginning of their chemotherapy infusion, and their responses were obtained after the first 15 minutes of their infusion was completed.

Measurement
Data were collected from patients and nurses pre- and postimplementation through self-report surveys. Patients in both groups completed self-report measures of stress, comfort, and satisfaction using a Likert-type scale and a visual analog scale for anxiety, with scores ranging from 1 (strongly disagree) to 4 (strongly agree). Participating nurses completed Likert-type scale surveys on the perceived benefit of hand massage to patients, impact on patient anxiety, nursing practice, and preparation in providing a safe and effective hand massage. The project leader created the questionnaires, and two nurse scientists established face validity through review. The Likert-type scales’ response options included strongly disagree, disagree, agree, and strongly agree. Patients responded to the survey questions using a paper-and-pencil method; nurses were invited via email to respond to the online survey using Qualtrics.

Program Intervention
Patients in the preimplementation group received the standard of care (the nurse sitting at the chairside for the first 15 minutes of their infusion). After the nurse finished monitoring, patients completed the self-report survey. Participants in the postimplementation group received an information sheet that outlined the

### Table 1. Pre- and Postimplementation Nursing Staff Survey Results

<table>
<thead>
<tr>
<th>Statement</th>
<th>Preimplementation (N = 23)</th>
<th>Postimplementation (N = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A hand-massage program would be beneficial to patients.</td>
<td>2.9 (SD 0.9)</td>
<td>3.7 (SD 0.5)</td>
</tr>
<tr>
<td>A hand-massage program would have a positive impact on patient anxiety.</td>
<td>2.9 (SD 0.9)</td>
<td>3.6 (SD 0.5)</td>
</tr>
<tr>
<td>I feel well prepared to administer an effective hand massage.</td>
<td>2.2 (SD 0.7)</td>
<td>3.5 (SD 0.7)</td>
</tr>
<tr>
<td>I feel well prepared to administer a safe hand massage.</td>
<td>2.2 (SD 0.7)</td>
<td>3.6 (SD 0.7)</td>
</tr>
<tr>
<td>A hand-massage program would improve my nursing practice.</td>
<td>2.6 (SD 0.9)</td>
<td>3.2 (SD 0.8)</td>
</tr>
</tbody>
</table>

Note: Statements were rated on a Likert-type scale from 1 (strongly disagree) to 4 (strongly agree).
purpose and benefit of the hand-massage program and were offered a five-minute hand massage during the first 15 minutes of their chemotherapy infusion. Nurses were instructed to massage one hand for five minutes and were given the option to massage the other hand if desired. After the first 15 minutes of the infusion was completed, all patients filled out a self-report survey that was placed in an anonymous envelope and handed to the unit clerk at checkout to be returned to the project leader. The staff nurse was not allowed to view the participants’ survey responses.

**Ethical Considerations**

Institutional review board approval was obtained from the project site and the project leader’s academic institution; neither required full review before initiating implementation because it was deemed to be an evidence-based quality improvement project. To protect patient confidentiality, no patient identifiers were included on any of the surveys, and nurses did not see survey responses. Massage is within a nurse’s scope of practice (J. Reyes, personal communication, December 15, 2015). To ensure patient safety, education was provided to nurses regarding the contraindications to providing a hand massage and how to identify patient discomfort during the hand massage. No adverse events occurred during the project’s implementation.

**Results**

**Participants**

Twenty-one nurses filled out the preimplementation surveys, and 18 nurses filled out surveys postimplementation. Of 22 nurses employed on the unit, 21 were taught hand-massage techniques, and about 15 nurses administered a hand massage. Data were collected for 41 days for the preimplementation group and 48 days for the postimplementation group. Sixty-nine patients in the preimplementation group and 43 patients in the postimplementation group filled out surveys. Both groups were demographically similar. The age range for participants in the preimplementation group (33–96 years) was similar to that of the postimplementation group (30–92 years), and the mean ages were 59 years and 63 years, respectively. Seventeen males, 47 females, and 5 no-gender responses were surveyed in the preimplementation group, and 14 males, 26 females, and 3 no-gender responses received hand massages in the postimplementation group. Twelve different cancer diagnoses were reported in the preimplementation group and nine diagnoses were reported among postimplementation group participants. Breast cancer was the most common diagnosis in both groups.

A two-sample t test was used for statistical analysis. Participants who received the hand-massage intervention ($\bar{X} = 3.7, SD = 0.6$) compared to those who did not receive a hand massage ($\bar{X} = 3.4, SD = 0.7$) reported a statistically significant improvement in comfort ($p < 0.05$) (see Table 2). A positive trend was also seen across all indicators in the patient surveys from the preimplementation to postimplementation group. All patients in the postimplementation group either agreed or strongly agreed that the hand massage was beneficial to them and that it had a positive impact on their experience at the cancer center.

Among nurses who responded to the surveys, analysis found that the postimplementation group respondents had a much higher mean in all indicators. Of clinical significance is the change in perception of the benefit of a hand-massage program to patients. Nurses reported a greater benefit of a hand-massage program to their nursing practice preimplementation ($\bar{X} = 2.6, SD = 0.9$) when

<table>
<thead>
<tr>
<th>TABLE 2. PRE- AND POSTIMPLEMENTATION PATIENT SURVEY RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATEMENT</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>I feel relaxed.</td>
</tr>
<tr>
<td>I feel comfortable.</td>
</tr>
<tr>
<td>I have had a positive experience at the cancer center today.</td>
</tr>
<tr>
<td>I feel stressed.</td>
</tr>
<tr>
<td>The hand massage had a positive impact on my experience.</td>
</tr>
<tr>
<td>I feel the hand massage was beneficial to me.</td>
</tr>
<tr>
<td>A hand massage program would improve my nursing practice.</td>
</tr>
</tbody>
</table>

**Note.** Statements were rated on a Likert-type scale from 1 (strongly disagree) to 4 (strongly agree).
Integrate nurse-delivered therapeutic hand massage into patient care; it is efficient, safe, and effective for patients across all healthcare settings.

Provide a hand massage to communicate compassion, empathy, and concern while reconnecting to mindfulness and presence.

Administer a hand massage to communicate with patients on a deeper and more personal level.

Discussion
The implementation of this evidence-based practice project represented a significant culture change for the infusion suite. The project site did not use any formal integrative modalities, and this was the first time hand massage had been introduced in this setting. The initial reaction of the nurses to the project ranged from full support to hesitation, and one nurse declined participation. With time, education, and peer participation, nurses became more receptive and interested in participating in the project. Several nurses noted that the first time they administered the massage on a patient was the most difficult, but they became more comfortable with each massage.

Research evidence supports intentional touch in the form of a hand massage as a safe nursing intervention that can be used in a variety of settings (Brand et al., 2013). Kolcaba’s theory of comfort and the conceptual model of intentional comfort touch support the positive effects of nurses providing intentional touch in the form of hand massage. In Kolcaba’s theory of comfort, nurses are directed to assess the physical, psychospiritual, sociocultural, and environmental comfort needs of patients (Kolcaba et al., 2004). This integrative approach to providing nursing care creates a healing environment that supports feelings of patient comfort and relaxation. The conceptual model of intentional comfort touch (Connor & Howett, 2009) identified the positive and negative inputs and the potential barriers that correlate to the level of touch applied by a nurse and the outputs that occur based on the touch provided to the patient.

Patient and nurse comments provide evidence of the mutually therapeutic and beneficial environment created through the delivery of a hand massage. Patients reported that the hand massage helped take their mind off their chemotherapy, made talking to their nurse easier, and made them feel more comfortable. In the following quotes, participants explain whether the hand massage helped them relax:

- “I was apprehensive about the entire experience, and [the hand massage] helped.”
- “[The hand massage] gave [the nurse and me] a chance for a nice conversation. Take your mind off any problems.”
- “Promotes comfort and well-being. Massage is true to the essence of nursing. The hand massage made me feel like someone cares about me.”

Nurses reported that providing a hand massage made them feel more connected to their patients, helped them feel they were making a positive difference in their care, and was “the most relaxing part of my day.” According to one nurse, “Giving a [hand massage] allowed me to connect to my patient in a deeper way.”

Discussion
The implementation of this evidence-based practice project represented a significant culture change for the infusion suite. The project site did not use any formal integrative modalities, and this was the first time hand massage had been introduced in this setting. The initial reaction of the nurses to the project ranged from full support to hesitation, and one nurse declined participation. With time, education, and peer participation, nurses became more receptive and interested in participating in the project. Several nurses noted that the first time they administered the massage on a patient was the most difficult, but they became more comfortable with each massage.

Research evidence supports intentional touch in the form of a hand massage as a safe nursing intervention that can be used in a variety of settings (Brand et al., 2013). Kolcaba’s theory of comfort and the conceptual model of intentional comfort touch support the positive effects of nurses providing intentional touch in the form of hand massage. In Kolcaba’s theory of comfort, nurses are directed to assess the physical, psychospiritual, sociocultural, and environmental comfort needs of patients (Kolcaba et al., 2004). This integrative approach to providing nursing care creates a healing environment that supports feelings of patient comfort and relaxation. The conceptual model of intentional comfort touch (Connor & Howett, 2009) identified the positive and negative inputs and the potential barriers that correlate to the level of touch applied by a nurse and the outputs that occur based on the touch provided to the patient.

Patient and nurse comments provide evidence of the mutually therapeutic and beneficial environment created through the delivery of a hand massage. Patients reported that the hand massage helped take their mind off their chemotherapy, made talking to their nurse easier, and made them feel more comfortable. In the following quotes, participants explain whether the hand massage helped them relax:

- “I was apprehensive about the entire experience, and [the hand massage] helped.”
- “[The hand massage] gave [the nurse and me] a chance for a nice conversation. Take your mind off any problems.”
- “Promotes comfort and well-being. Massage is true to the essence of nursing. The hand massage made me feel like someone cares about me.”

Nurses reported that providing a hand massage made them feel more connected to their patients, helped them feel they were making a positive difference in their care, and was “the most relaxing part of my day.” According to one nurse, “Giving a [hand massage] allowed me to connect to my patient in a deeper way.”

Another said that a hand massage was “such an easy way for me to help my patients relax without medication.”

Oncology nurses share a deep commitment to supporting patients during times of crisis and often provide care during a prolonged period of time, cultivating meaningful and trusting relationships. Nurses derive great satisfaction through positive patient contact, and compassionate and therapeutic touch provides one of the key foundations for patient-centered integrative nursing. The time and energy that accompanies a hand massage provides an opportunity for nurses to connect to their patients and strengthen their relationship. As noted in other studies, nurses experience a more meaningful and rewarding relationship with their patients when they administer massage (Kolcaba et al., 2004; Thompson et al., 2013). An enhanced nurse–patient relationship can improve job satisfaction and subsequently decrease burnout (Grunfeld et al., 2004). In addition, Thompson et al. (2013) discussed the notion of compassion satisfaction that can occur when nurses provide hand massage. Compassion satisfaction is hypothesized to be a protective factor for the experience of compassion fatigue, which is a known culprit for decreased work satisfaction and nurse burnout.

Limitations
Ideally, a licensed massage therapist would have provided in-person instruction. However, a licensed massage therapist created the DVDs, and nurses had access to them at any time to review techniques. Otherwise, staffing issues, increase in census, and numbers of nurses participating during project implementation were the primary study limitations. During project implementation, the project site was consistently short-staffed by one to three nurses, and the average number of patients infused increased from 80 to 90 patients per day. The staffing shortage caused an increased patient load and led to the decreased number of patients who received a hand massage. In addition, although 22 nurses work on the unit, about 15 participated in the project; more participating nurses could have increased the number of patients who received the intervention and contributed to more robust data.

Conclusion
A hand-massage program is inexpensive, patient-centered, sustainable, and feasible. It supports an integrative and therapeutic nurse–patient relationship. The statistically significant improvement in comfort, combined with the positive trend across all other nursing and patient indicators, indicates that hand massage is a powerful and effective nursing intervention for the patient and nurse alike.
NURSE-ADMINISTERED HAND MASSAGE

The results of this project indicate that this simple, nonpharmacologic, and patient-centered intervention has positive effects with significant patient and nursing outcomes and can be effectively implemented across multiple healthcare settings.

Caitlin M. Braithwaite, DNP, APRN, FNP-C, OCN®, is an RN at the University of Iowa Hospital and Clinics in Iowa City; and Deborah Ringdahl, DNP, APRN, CNM, is a clinical associate professor in the School of Nursing at the University of Minnesota in Minneapolis. Braithwaite can be reached at polgr005@umn.edu, with copy to CJONEditor@ons.org. (Submitted September 2016. Accepted February 1, 2017.)

The authors take full responsibility for this content. Ringdahl has previously consulted for and received honorarium from the University of Minnesota Center for Spirituality and Healing. During the writing of this article, Ringdahl was supported by a performance-based incentive payments grant. The article has been reviewed by independent peer reviewers to ensure that it is objective and free from bias. Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Oncology Nursing Society.

REFERENCES