Trauma-Informed Care in Medical Imaging and Radiation Therapy to Reduce Retraumatization

Kevin R Clark, EdD, R.T.(R)(QM), FAEIRS, FASRT
Jennifer S Sonsiadek, MSN-FN, RN, SANE-A

Purpose To provide an overview of trauma-informed care, including the neurobiology of trauma, interventions to reduce retraumatizing patients who have experienced trauma, and implications of trauma-informed care in medical imaging and radiation therapy.

Methods A comprehensive search of electronic databases related to the purpose of this project resulted in the collection of 12 peer-reviewed journal articles. Two conference papers, 1 behavioral science textbook, 1 trauma neurobiology textbook, 1 professional conference presentation, and 1 governmental report also were reviewed to complement the journal articles. A thematic analysis was performed to identify commonalities among the selected sources.

Results Four themes identified in the literature included definitions of trauma-informed care, neurobiology of trauma, pillars of trauma-informed care for intervention, and implications in medical imaging and radiation therapy.

Discussion A trauma-informed health care professional realizes the prevalence of trauma, recognizes the signs and symptoms of trauma, responds by integrating knowledge about trauma into practice, and actively resists retraumatizing the patient (ie, avoids creating an environment that inadvertently reminds patients of their traumatic experiences and causes them to experience emotional and biological stress). The pillars of trauma-informed care include safety, trustworthiness or transparency, peer support, collaboration, empowerment, and responsiveness or cultural considerations. Delivery of health care often involves assessment and interventions in locations on the patient's body where trauma has previously occurred, increasing the probability of retraumatization and manifestation of signs and symptoms of trauma. Radiologic technologists and radiation therapists should be trauma-informed when they are interacting with and caring for patients to reduce retraumatization. A hypothetical case study also is presented to show how radiologic technologists can use the pillars of trauma-informed care in the clinic.

Conclusion Because many aspects of care, including routine care in medical imaging and radiation therapy, can be an unintentional reminder of a traumatic experience, health care professionals should be trauma-informed when they are interacting with and caring for patients.

Keywords | *trauma-informed care, neurobiology of trauma, retraumatization prevention, grounding techniques, medical imaging, radiation therapy*

Trauma is a serious problem that affects the health of individuals, families, and communities. In the United States, trauma has a high prevalence and has no boundaries with respect to a person's age, gender, socioeconomic status, race, ethnicity, or sexual orientation.[1,2] Although a universal definition of trauma does not exist, the Substance Abuse and Mental Health Services Administration states that trauma is an event or circumstance that results in physical, emotional, or life-threatening harm, potentially having lasting adverse effects on individuals' mental, physical, emotional, or social health, as well as their spiritual well-being.[1] Experiences that might be traumatic include[1,2]:

- childhood neglect
- emotional, physical, or sexual abuse
- human trafficking
- interpersonal violence

- living with a family member with mental health or substance use disorders
- medical procedures and illness
- natural disasters
- poverty
- racism, discrimination, and oppression
- sexual assault
- sudden, unexplained separation from a loved one
- violence in the community, war, or terrorism

The Adverse Childhood Experiences Study, conducted by the Centers for Disease Control and Prevention and Kaiser Permanente, found that exposure to trauma, including abuse, neglect, discrimination, violence, and other adverse experiences, particularly during childhood, significantly increases the risks of serious health problems into adulthood.[3] Trauma can negatively affect areas of the brain responsible for cognitive functions, including short-term memory and emotional regulation.[2] Adults who experience trauma in childhood might struggle to respond appropriately to situations that would otherwise appear ordinary and nonthreatening because their brains are primed to deal with constant stress.[2] Though some individuals who experience trauma live without lasting negative effects, others struggle and have difficulty coping with the effects of the traumatic event.[1,3]

Because many aspects of medical care can be an unintentional reminder of a traumatic experience, especially routine care in medical imaging and radiation therapy, trauma-informed practices should be used when interacting with and caring for patients. Being trauma-informed means they realize the prevalence of trauma, recognize the signs and symptoms of trauma, respond by integrating knowledge about trauma into practice, and actively resist retraumatizing the patient (ie, avoids creating an environment that inadvertently reminds patients of their traumatic experiences, which causes them to experience emotional and biological stress).[4] Providing an overview of trauma-informed care is needed, including the neurobiology of trauma, interventions to reduce retraumatizing patients who have experienced trauma, and implications of trauma-informed care in medical imaging and radiation therapy. The guiding research questions included:

- What is trauma-informed care, and what are the guiding principles of this framework?
- What is the neurobiological response to trauma?
- What interventions can radiologic technologists and radiation therapists use to reduce retraumatization of patients?
- What are the implications of trauma-informed care in medical imaging and radiation therapy?

Methods

Multiple electronic databases, including Cumulative Index to Nursing and Allied Health Literature, MEDLINE-Ovid, PsycInfo, PubMed, and Science Direct, were searched to collect peer-reviewed articles and other scholarly sources for this systematic review. Searches were limited to literature published after 2012 except a 1999 conference paper that was seminal to trauma-informed care. Keywords used in the searches included *trauma-informed care, neurobiology of trauma, retraumatization prevention, grounding techniques, trauma, sensitive practice, medical imaging,* and *radiation therapy.*

Each abstract was assessed to determine whether the peer-reviewed journal article was relevant to the review's guiding questions. Twelve peer-reviewed journal articles were analyzed for this review. In addition, 2 conference papers, 1 behavioral science textbook, 1 trauma neurobiology textbook, 1 professional conference presentation, and 1 governmental report also were reviewed to complement the journal articles.

A thematic analysis was performed to identify commonalities among the selected sources. The analysis helped to organize the scholarly articles according to the identified themes in the literature and to synthesize similarities and differences among the sources.

Results and Discussion

Four themes identified from the analysis were definitions of trauma-informed care, neurobiology of trauma, pillars of trauma-informed care for intervention, and implications in medical imaging and radiation therapy.

Definitions of Trauma-Informed Care

The growing awareness of increased rates of trauma in the lives of people accessing health care has formed the basis of trauma-informed care.[5] The foundation of

trauma-informed care includes a grasp of the prevalence and types of traumatic events experienced by populations receiving services, an understanding of the neurobiology of trauma, recognition of the signs and symptoms commonly experienced by survivors, and application of policies that guide trauma-sensitive approaches and interventions to reduce retraumatization.[6,7] Although gathering a trauma history can help in designing an individualized plan to minimize retraumatization during interactions and procedures, many survivors of trauma are not able to recount those experiences or choose not to disclose their trauma.[6] Without information about a patient's traumatic experiences, trauma-informed care principles and systematic interventions can be used to minimize the harm of retraumatization, increase patient engagement in health care, and improve patient outcomes.[8]

An important component of being trauma-informed is having knowledge about sensitive practice.[6-10] Ades et al proposed a trauma-informed framework at a clinic in New York City to empower female patients who experienced sexual violence or sex trafficking.[9] Because specific gynecologic symptoms are more prevalent in patients with a history of sexual trauma (eg, dysmenorrhea, menorrhagia, and chronic pelvic pain), the researchers believed these health conditions contributed to a decreased likelihood of visiting a health care professional, including avoiding routine gynecologic examinations.[9] Some patients choose not to disclose a traumatic experience; therefore, Raja et al recommended universal trauma precautions that included small changes practiced with all patients.[10] Their universal trauma precautions involved using patient-centered communication techniques to reduce patient anxiety and increase rapport with patients; understanding the health effects of trauma, such as adverse coping behaviors and medication adherence; collaborating interprofessionally to ensure continuity of care; reflecting on personal trauma history and how it might influence patient interactions; screening patients for current and past traumatic events; and providing appropriate resources and services when a patient discloses a history of trauma.[10] Raja et al stated that details about the traumatic event are not relevant, only confirmation that a patient has experienced trauma or has a history of trauma is needed to provide sensitive care.[10]

The goal at the New York City clinic was to provide patients who had experienced sexual assault or sex trafficking with routine gynecologic care using a trauma-sensitive approach and to offer mental health services.[9] Much of their integrated model of care included various aspects of universal trauma precautions recommended by Ades et al and Raja et al, including obtaining a routine medical history with the patient fully clothed to decrease feelings of vulnerability.[9,10] However, health care professionals at the clinic in New York City asked screening questions that inquired about details of the incident, such as when the trauma occurred, duration of the trauma, identity of the perpetrator in relation to the patient, and whether the patient is safe from the perpetrator or is in contact with the individual.[9] Ades et al and Raja et al agreed on the use of de-escalation strategies if the patient became emotionally distressed or agitated such as allowing patients to share their story at their own pace, summarizing periodically, and praising patients for their strength to survive and disclose their trauma.[9,10]

Ades et al and Raja et al noted that trauma-informed practices should reduce feelings of fear, vulnerability, and helplessness a patient is experiencing when they present for care.[9,10] Researchers also encouraged limiting exposure of the patient's body as much as possible during a physical examination and frequently explaining what is happening and why it is happening.[9,10] The concept of ongoing informed consent is a vital component of sensitive practice. During physical contact with patients, health care professionals should ask constantly for permission to continue the examination or procedure, giving patients full control.[9]

Neurobiology of Trauma

Understanding the body's response to trauma is another critical component of trauma-informed care.[6,7] The 3 areas of the brain that aid in understanding neuromechanisms most associated with physiological and behavioral responses to danger detection are the brainstem, limbic brain, and prefrontal cortex.[11,12] The brainstem is responsible for life-sustaining functions that include regulation of vital organs and the

autonomic nervous system.[11] The limbic brain assigns emotions, relevance, and perception to stimuli and experiences. The prefrontal cortex is responsible for attention, memory, control of cognitive functions, and impulse control.[11] These parts of the brain work together to detect and manage perceived and actual danger for self-preservation.[11,12]

As stimuli are received through the senses, the information collected by sight, sound, and sensations are combined in the thalamus and sent to the amygdala.[11,12] Together with the hippocampus, which stores relevance of past experiences, the amygdala determines the type and level of danger.[11,12] The prefrontal cortex provides additional discernment of dynamics related to the danger and applies rational context.[11] The prefrontal cortex can also assist with danger detection by assessing and predicting potential outcomes that could lead to danger or trauma.[11]

A perceived threat can trigger a cascade of hormones to support survival, including adrenaline, cortisol, endorphins, and oxytocin.[11,13,14] Each of these hormones have associated physiological manifestations. Adrenaline and cortisol are responsible for an increase in heart rate, blood pressure, respiratory rate, blood glucose, and pupil dilatation, all increasing the efficiency in response to a threat.[13] Endorphins and oxytocin help to manage pain and emotions like fear and terror.[13]

After a traumatic event, elements that are unresolved circulate in the brain as flashbacks, which can occur randomly.[11] The ability of the brain to recognize stimuli that resemble the dynamics of traumatic events or dangerous situations is vital for survival.[11] After a traumatic experience, the nervous system and the brain are changed through the development of hypersensitivity to stimuli that resemble the trauma.[11,12] The amygdala is unable to differentiate between a past event and current perceptions.[11,12] Therefore, when a stimulus reminiscent of a trauma is experienced, the brain and nervous system can respond automatically with the cascade of hormones needed for survival.[13,14] Signs and symptoms after trauma can vary depending on the dynamics, intensity, and frequency of the traumatic experience and can affect cognitive functions, physical behavior, emotional regulation, social interactions, and spiritual well-being.[15] Common signs that manifest after trauma include[9,13]:

- assuming the fetal position
- being startled easily
- changes in vital signs
- hyperarousal
- muscle tension
- physical or emotional withdrawal
- rocking back and forth
- tonic immobility
- visible trembling or shaking.

Symptoms reported after trauma include[9,13]:

- anxiety
- changes in attention span
- confusion
- depression
- fear
- feelings of guilt
- irritability
- memory impairment
- self-blame
- sleep disruptions
- slowed thought process

Delivery of health care often involves assessment and interventions in locations on a patient's body where trauma has occurred previously, increasing the probability of retraumatization and manifestation of these common signs and symptoms. Sensitive practice should be incorporated to reduce unintentional retraumatization.[6-10]

Pillars of Trauma-Informed Care for Intervention

There are guiding principles related to trauma-informed practices, which can be implemented by health care professionals. The pillars of trauma-informed care include[16-18]:

- safety
- trustworthiness or transparency
- peer support
- collaboration
- empowerment
- responsiveness or cultural considerations

Patients need to feel safe, physically and emotionally, while they are in a health care facility.[16-18] Fleishman et al encourage health care professionals to introduce themselves and share their role during every patient interaction.[16] For patients who have experienced a violent act, like sexual assault, the examination room

is their safe place, and staff should knock and ask for permission before entering the room. Some researchers believe offering food, water, or warm blankets promotes a sense of psychological and emotional safety.[19] Ades et al cautioned health care professionals to always consider their body language during patient interactions and to keep their arms uncrossed and hands in view.[9] Other safety considerations include providing ample space in waiting rooms so patients are not retraumatized by sitting in close contact with strangers and having proper lighting in parking lots and garages to promote a sense of security for those patients who seek care during evening and night shifts.[16,18]

To promote trustworthiness and transparency, details of an examination or procedure should be verbalized clearly.[9,10,16] If the procedure might cause discomfort, awareness of what will occur during a visit can be reassuring to patients.[9,10,16] Poldon et al also shared that trust can be gained if the provider clearly explains the consent and confidentiality processes to the patient.[19] Ongoing informed consent can promote a sense of trust between the provider and patient and is vital to sensitive practice. Ades et al suggested promoting trust and transparency by normalizing the traumatic experience for the patient by saying, "Many people have experienced trauma."[9] Fleishman et al concluded that knowing what to expect, particularly during invasive procedures, reduces the opportunity for trauma reactivation.[16] Raja et al provided additional recommendations to promote trust with patients such as asking patients what can make them more comfortable during the examination; offering a mirror to see procedures that are out of the patient's field of view; and agreeing on a nonverbal behavior that indicates distress (eg, raising hand during a Papanicolaou test).[10]

Another guiding principle of trauma-informed care is peer support.[16-18] Health care professionals should approach the patient as a peer who actively listens to determine the patient's needs rather than as someone who is trying to fix or heal a situation.[18,20] Several researchers mentioned that staff can become focused solely on fixing or healing a patient that they fail to actively listen to determine a patient's needs.[18,20] Moreover, health care professionals who have experience with certain types of trauma might be best suited to provide care for patients with similar trauma. Ades et al encouraged the use of nonjudgmental communication by referring to patients as *survivors* rather than as *victims* or stating, "sex without a condom" compared with "risky sex."[9] Further, there is consensus in the literature that a trauma-informed approach includes asking a patient, "What has happened to you?" rather than "What is wrong with you?"[7,9,10,16,18] Asking patients what is wrong with them implies a negative impression on them and not their situation.

Like peer support, collaboration and empowerment are important pillars to consider with trauma-informed care.[16-18] To ensure collaboration with patients to achieve a desired outcome, Fleishman et al thought that medical jargon should be avoided and the teach-back method should be used.[16] Poldon et al also urged the use of the teach-back method with regard to informed consent and confidentiality processes.[19] The teach-back method involves sharing information in small chunks that the patient then repeats in their own words.[16,19] This method allows health care professionals the opportunity to confirm understanding or clarify confusion. Empowering patients to make decisions about their health care lets them know that their voices are being heard and their choices are being respected, and allows them to be more actively engaged in their own health care.[16,18-20] Empowerment language should be used as often as possible when a patient discloses a history of trauma[7,9]:

- "I'm so glad you are sharing this with me."
- "I believe you. It took a lot of courage to tell me about this."
- "It's not your fault. You didn't do anything to deserve this."
- "I am so sorry that happened."
- "It is normal to feel stressed about this."

The last pillar of trauma-informed care is responsiveness or cultural considerations.[16-18] The potential for retraumatization from the lack of sensitivity to cultural, racial, gender, or other biases is a major concern with implementing a trauma-informed approach.[16] A patient's autonomy should always be considered and respected.[16-18] For example, if a patient feels more comfortable receiving care from a female provider, that request should be accommodated. If that is not possible,

then another medical professional of the requested gender should be present during the examination. Adequate access to gender-responsive services is a critical component of trauma-informed care.[21]

Implications in Medical Imaging and Radiation Therapy

Many aspects of care in medical imaging and radiation therapy can be unintentional reminders of a traumatic experience for a patient. A trigger is defined as a distressing reminder of a traumatic event that produces a response like that which was elicited by the traumatic event.[7,22] For example, a patient who has experienced sexual assault might potentially be retraumatized by a provider who is wearing a tie because a tie was used as a restraint. An adult patient who was neglected as a child might be retraumatized inadvertently when the technologist leaves the patient in a secluded holding area between imaging. An individual who experiences intimate partner violence on a regular basis might become triggered when the provider acquires a history while standing in front of the examination door and blocking the exit. Other potential triggers in medical imaging and radiation therapy are listed in **Box 1**.

When patients are retraumatized and become overwhelmed, they might dissociate. Dissociation is a defensive strategy that enables aspects of an event to be disconnected or not remembered, making the situation momentarily bearable.[22] Because trauma patients might not reveal that they dissociate, radiologic technologists and radiation therapists need to be aware of the common signs of dissociation by patients[22]:

- absorbed by a flashback or memory
- does not respond to questions
- has tunnel vision
- shuts eyes
- spaces out or appears dazed
- unable to see or hear clearly

When a patient shows signs of dissociation, stopping the examination or procedure is imperative. Typically, in medical imaging and radiation therapy, technologists or therapists might feel the need to respond by rushing the procedure or treatment by saying, "Just a little bit longer. I am almost finished. It'll be over before you know it." However, those words could be like what a perpetrator said during a sexual assault. Raja et al emphasized that reassuring patients is not the same as assessing their level of anxiety.[10] Often in health care, particularly in medical imaging and radiation therapy, patients are told that they have nothing to worry about; however, for trauma patients, this statement might not

Box 1

Potential Triggers for Patient Retraumatization During Medical Imaging and Radiation Therapy

Being touched (palpating landmarks)
Breast biopsy (laying on table, putting breast through a hole)
Breasts or other private areas of body exposed
Catheter or feeding tube insertion
Clothing of health care professional (like perpetrator's)
Cylinders inserted into vagina for brachytherapy
Dark lighting
Demeanor or attitude of the health care professional
Door being closed and locked
Footsteps in hallway
Health care professional enters patient room without knocking and asking for permission to enter
Health care professional standing between patient and door (blocking the exit)
Hearing certain phrases (eg, "Hold still.", "Don't move.", "It'll be over shortly.", or "Let's take a picture.")
Latex gloves (like a condom)
Laying still for an extended period
Not fully understanding what to expect during examination
Restraints
Secluded in a holding area
Sedation medication
Sensation of something foreign being inserted into the body
Smells (eg, perfume, cologne, aftershave, alcohol, cigarette smoke)
Starting an intravenous line
Stirrups (spreading legs)
Submissive positioning (health care professionals standing over the patient)
Taste of contrast media
Treatment masks for head and neck cancers
Ultrasound gel
Undressing
Voice of health care professional (like perpetrator's)

help them feel more in control of their bodies.[10,16-18] Clark et al suggested orienting the dissociating patient to the 4 Ws: who, where, when, and what.[22] Tell patients who they are and who you are; tell them where they are currently; tell them the present date and time (when); and tell them what is happening.[22]

To reduce retraumatization, technologists and therapists should use trauma-informed approaches when interacting with and caring for patients. If a patient becomes retraumatized inadvertently, grounding strategies are effective tools to modulate arousal and help the individual return to a tolerable state.[22,23] Grounding techniques are coping strategies to help a patient reconnect to the present moment and avoid a panic attack, flashback, unwanted memory, distressing emotion, or dissociation.[22] For example, to return a patient to a calming state, technologists and therapists might use the 5-4-3-2-1 grounding technique. This technique uses the 5 senses to focus (ie, ground) distressed patients in the present moment and return to a tolerable state. During various times of the procedure, the provider could strategically ask patients to name 5 things in the room that are blue in color; name 4 things they can touch near them; name 3 things they hear; name 2 things they smell; and name 1 thing they can taste.[23] **Box 2** provides additional sensory grounding techniques to help return patients who have been retraumatized to a calm state.

Education and Training

Poldon et al interviewed 8 sexual assault nurse examiners (SANEs) on how they incorporated trauma-informed practices in the care of adult and adolescent patients who have experienced sexual violence.[19] Results showed that the examiners believed trauma-informed care allowed them to practice sensitively with patients who have experienced sexual assault; however, they shared concerns about trauma-informed practices not being integrated by all health care professionals who might care for patients who have experienced trauma such as staff in the emergency department and inpatient mental health.[19] One SANE stated, "Part of our struggle with the ER [emergency department] is that we kind of get incomplete reports. I think that's because patients do not feel safe to talk about what actually happened to them."[19] Poldon et al emphasized that continuing education on trauma-informed care is important for all health care professionals who interact with patients.[19] In addition to continuing education, Cochran encouraged pairing new graduate nurses with experienced nurses who embrace sensitive practice to act as mentors.[18] The mentors could provide training during residency programs and orientation to the emergency department.[18] These same opportunities should be considered in medical imaging and radiation therapy to elevate the care being provided to patients.

Hypothetical Case Study

Laura is a 20-year-old female patient who presented to the emergency department with a complaint of chest wall pain after a collision with a teammate during college basketball practice. The attending physician ordered a chest radiograph. During the walk to the examination room, she was conversational and pleasant with Paul, the radiologic technologist. In the examination room, she remarked that she had never received radiography. Paul instructed Laura to face the bucky as he stood behind her and placed his hands on her shoulders to guide positioning for the posteroanterior (PA) projection. Laura began to tremble, and her respiratory rate increased. She turned, with her eyes wide open, and said, "I don't want to do this anymore. I want to go home," as she ran out of the examination room. Staff in the emergency department attempted to explain the importance of the chest radiograph for her assessment and medical care; however, she left against medical advice without treatment. The care team did not understand what happened and why Laura responded this way. A month before her presentation to the emergency department, Laura was running on a trail when she was grabbed from behind and assaulted. She had not disclosed the incident to anyone and had not received treatment for the assault.

In this hypothetical case study, Paul inadvertently retraumatized Laura while he was positioning her for the PA projection of the chest. There are trauma-informed interventions that could have improved Laura's course of care. During introductions, Paul could have explained his role and responsibilities, and stated, "I want you to know I am a safe person for you. What concerns you most about this examination?" While in

Box 2

Sensory Techniques to Focus and Calm Patients Who Have Been Retraumatized

Hearing

Would you like to use headphones to listen to music, white noise, nature sounds, or for noise cancellation?
Tell me about something positive throughout the procedure.
Name 3 things you can hear right now.
Would you like to sing your favorite song?
Recite your to-do list for tomorrow.
Would you like a bell, clicker, maracas, or other noise maker?
Tell me how you make your favorite meal.
Name your family members and their ages.

Proprioception

Would it be helpful if you clap your hands (with or without your eyes closed)?
Would you like to stomp your feet on the floor before or after the procedure?
Would you like to press your palms together?
Would you like to clasp your hands and fingers?
Would you like to cross your legs or ankles?

Sight

Would you like to watch television?
Name 5 things in the room you can see that are your favorite color (or specify color).
Would you like to have a book or magazine to look at during the examination?
Look at the pictures on the ceiling tiles.
Would you like to look at optical illusion cards?
Would you like to view or check your social media?

Smell

Would like to spray your favorite scent in your mask?
Name 2 things you can smell right now.
Would you like an essential oil on a cotton ball to smell?
Would you like a flower to smell?

Taste

Would you like to do controlled breathing exercises?
Would you like cool or warm water (if patient is cleared for oral intake)?
Would you like ice chips (if patient is cleared for oral intake)?
Name 1 thing you can taste right now.

Touch

Would you like a warm blanket?
Would you like to hold your support items during the procedure?
Would you like modeling clay to play with during the procedure?
Would you like a stress ball to squeeze during the examination?
Can you help me find landmarks on your body during the procedure?
Would you like a stuffed animal to hold during the treatment?
I am going to say the places on your body I need to touch, and I want you to let me know when you are ready to be touched.
May I tap your shoulder?
Name 4 things you can touch right now.

Vestibular

Would you like to jump up and down before and after the procedure?
Would you like to stretch before, during, or after the examination (eg, open and close hands, curl toes)?
Can we discuss positioning options for comfort?
I am going to tell you what is happening throughout the examination and where I will be.
Would you like to swing your arms or legs before or after the procedure?

the familiarity of the emergency department, Paul could have asked about Laura's previous experience with medical imaging procedures. He could have described each part of the medical imaging examination and explained what she could anticipate such as relocating from the emergency department to the imaging examination room, the imaging equipment, dark lighting in the examination room, and removing all metal (including her bra) from the waist up. Further, he could have shared sounds that she might hear as well as describing each position for the chest radiograph. Specifically, it would be important for Paul to explain where he would be standing in relation to equipment and to Laura. Also, Paul should have explained that he would step behind the control panel to operate the equipment during the exposures. Using the teach-back method, Laura could have been asked to repeat what would happen during the examination to assess her understanding.

Paul could consider asking Laura, "Is there anything you feel is important to share with me?" Laura might or might not have been able to share her trauma of being assaulted a month earlier by a stranger. Paul could have guided the discussion by asking if there were steps that sounded uncomfortable and offered modifications and comforts if desired. A warm blanket might have helped Laura feel safe in the examination room. Listening to her favorite song might have redirected her attention to a positive memory. Allowing Laura to voice where Paul should stand, left or right side, would have provided control, empowerment, and a feeling of safety. In addition, Paul should have asked for permission to touch Laura before positioning. If Laura still had been retraumatized despite these interventions, Paul could have stopped the examination and said, "You are safe here." He could have reduced her trauma response by providing grounding interventions such as the 5-4-3-2-1 technique. Often, a health care professional repeatedly saying "You are safe here." can be calming for a patient.

Conclusion

Trauma-informed care is a framework that requires health care professionals to realize the prevalence of trauma, recognize the signs and symptoms of trauma, respond by integrating knowledge about trauma into practice, and actively avoid retraumatizing the patient. Medical imaging and radiation therapy professionals can positively affect the comfort and health care engagement of patient populations who have traumatic histories by implementing a trauma-informed approach to patient care. Offering continuing education on sensitive practice and incorporating mentorship by staff who have competency in trauma-informed techniques can reinforce practical application of trauma-informed concepts to reduce retraumatization. Further research should be conducted to explore medical imaging and radiation therapy professionals' knowledge and use of trauma-informed care, including opportunities and obstacles related to implementation.

Kevin R Clark, EdD, R.T.(R)(QM), FAEIRS, FASRT, is associate professor and associate director for the School of Health Professions at The University of Texas MD Anderson Cancer Center in Houston. He is also founder and CEO of CW Elite, LLC, a professional editing and consulting company. He can be contacted at KRClark@mdanderson.org.

Jennifer S Sonsiadek, MSN-FN, RN, SANE-A, is clinical forensic program manager for Saint Luke's Health System in Kansas City, Missouri. She is adjunct professor of Introduction to Forensic Nursing course for Saint Luke's College of Health Sciences at Rockhurst University and coteacher of Health, Trauma, and Crime course for University of Missouri Kansas City Department of Criminal Justice and Criminology.

Received December 7, 2022; accepted February 28, 2023.

Reprint requests may be mailed to the American Society of Radiologic Technologists, Publications Department, 15000 Central Ave SE, Albuquerque, NM 87123-3909, or emailed to publications @asrt.org.

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