

# Incorporating Trauma-informed Approaches to Care in Vascularized Composite Allotransplantation

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**Summary:** Since 1998, vascularized composite allotransplantation (VCA) has been a growing area of research in the field of reconstructive surgery. Although conditions treated with VCA often result from a traumatic injury, there has been limited emphasis on incorporating trauma-informed care (TIC) models in VCA. Considering the importance of psychosocial well-being in VCA candidates and recipients, applying best practices in TIC to the face, upper extremity, and penile transplantation may be critical in minimizing retraumatization throughout the perioperative process. There are six main principles of TIC: safety; trustworthiness and transparency; peer support; collaboration and mutuality; empowerment and choice; and cultural, historical, and gender issues, which may be further incorporated in care for VCA patients. Evaluating for PTSD and incorporating TIC may have substantial benefit to postoperative outcomes. (*Plast Reconstr Surg Glob Open* 2024; 12:e5553; doi: 10.1097/GOX.0000000000005553; Published online 24 January 2024.)

## INTRODUCTION

Vascularized composite allotransplantation (VCA) is a relatively novel reconstructive option for individuals whose injuries are irreparable with traditional surgical reconstructive techniques. First successfully performed in 1998,<sup>1</sup> VCA has demonstrated the ability to restore form and function for individuals who have experienced serious physical trauma such as burns, self-inflicted gunshot wounds, motor vehicle accidents, animal attacks, or other injuries resulting in profound adverse impact on their quality of life.<sup>1-4</sup> Moreover, the volume of traumatic injuries for which VCA may be a feasible therapeutic option has increased exponentially due to injuries sustained during military conflicts in Iraq and Afghanistan beginning in 2004, many of which were caused by improvised explosive devices.<sup>5</sup> Of the 30,000 U. S. military members injured by improvised explosive devices, approximately 4000 had facial injuries and 500 resulted in limb amputation.<sup>5,6</sup> The sheer magnitude of

these injuries created demand for greater technological advancements to develop more effective reconstructive surgical options, including VCA. In the United States, the Department of Defense (DoD) has provided much of the initial funding to support VCA research, allocating \$130 million to fund progress within the field over the last decade.<sup>7</sup>

Although reconstructive transplant techniques have demonstrated surgical success, VCA imposes long-term risks associated with the need for lifelong immunosuppression, especially as it is a life-enhancing and not life-saving procedure.<sup>8</sup> Similarly, accounts of VCA candidates and recipients underscore the need for comprehensive psychosocial counseling and support before and after surgery.<sup>9</sup> Many VCA candidates and recipients have endured physical and psychological trauma resulting in the need for VCA, and recognition of the impact of traumatic experiences on short- and long-term outcomes of surgery can help to ensure optimal postsurgical recovery.<sup>10</sup> This is especially the case given that immunosuppressive non-adherence can lead to allotransplant tissue necrosis and graft loss.<sup>11</sup>

In other subspecialties of plastic surgery and general surgery, a trauma-informed care (TIC) approach has led to improvements in patient support and surgical outcomes.<sup>12-14</sup> Considering the traumatic etiology of many of the injuries and conditions leading to candidacy for VCA, thoughtful integration of TIC approaches in VCA would be beneficial, if not essential. In this analysis, we review gold standard principles of TIC and offer recommendations for incorporating TIC approaches in centers with dedicated VCA programs.

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Received for publication October 23, 2023; accepted December 6, 2023.

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DOI: 10.1097/GOX.0000000000005553

Disclosure statements are at the end of this article, following the correspondence information.

## TRAUMA IN VCA

In the context of surgery, trauma is commonly used as a technical term to describe damage to tissue or a physical structure. In the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), trauma and its related mental health sequelae are associated with experiencing or witnessing events such as a death, threat, injury, or sexual violence.<sup>15</sup> The trauma-informed approaches to care proposed here are intended to provide a holistic view of trauma incorporating the physical and psychosocial dimensions of a traumatic event (or series of experiences) affecting a person's physical, social, and emotional well-being.<sup>16</sup> The physical and psychosocial ramifications of sudden traumatic injuries can include living with pain; difficulties speaking, breathing, and/or eating; the social stigma of having a disfigured or amputated body part and resulting social withdrawal and isolation; and loss of autonomy or becoming dependent on a caretaker.<sup>5,17</sup> All of these contribute to the higher prevalence of psychiatric conditions among transplant recipients, such as depression, anxiety, substance use disorders, and suicidality.<sup>11</sup> Although several reports reference a high prevalence of PTSD among VCA recipients,<sup>1,18,19</sup> very few studies have published explicitly measured rates of PTSD in this patient population.<sup>11,20</sup> However, there is evidence that 40% of those exposed to trauma proceed to a diagnosis of PTSD.<sup>21</sup> There is certainly a need for more research to examine how rates and severity of PTSD vary pre- and postsurgery using standardized measures across different types of VCA.<sup>22</sup> This research also has the potential to further identify supportive measures and interventions necessary to improve surgical outcomes and extend surgical eligibility beyond current candidates.<sup>10</sup> The current absence of data is not evidence in and of itself, particularly as the sequelae of trauma can extend far beyond the causative episode.

Considering the traumatic and often visible nature of injuries leading to evaluation for VCA, individuals may experience both the physical and psychosocial ramifications of their injuries, leading to posttraumatic stress disorder, depression, and substance abuse.<sup>1,11,20</sup> Face or hand transplantation are both considered more visible than solid organ transplantation, and, along with penile transplantation, can impact social interactions and integration.<sup>20</sup> In this way, scarring as a result of the original injuries and VCA itself may also be stigmatizing and potentially retraumatizing. Many recipients of face transplantation report feeling stigmatized, losing self-esteem, and experiencing social exclusion or withdrawal as a result, which has been found to exacerbate depression, anxiety, and suicidality and lead to medication nonadherence.<sup>4,21,23,24</sup> In fact, the visibility of some of these injuries often serves as a reminder to victims of their trauma and is attributed to the development of PTSD.<sup>21</sup> Despite the importance of encompassing all aspects of care in VCA, trauma-informed approaches to patient counseling and support after surgery has received little focus in the surgical literature and warrants further discussion to create the infrastructure and resources to better address the

## Takeaways

**Question:** How can trauma-informed care (TIC) better support the psychosocial health and well-being of patients undergoing VCA?

**Findings:** VCA patients tend to be at elevated risk of posttraumatic stress due to the etiology of their injuries. In this analysis, we review gold standard principles of TIC and offer recommendations for incorporating TIC approaches in centers with dedicated VCA programs.

**Meaning:** As the field of VCA continues to evolve, implementation of more robust TIC practices reflecting the range of unique considerations for each VCA subtype can help to better support patients' psychosocial health and well-being during the perioperative period.

psychosocial well-being of VCA recipients and ensure optimal surgical outcomes.

## GOLD STANDARD TRAUMA-INFORMED APPROACHES IN OTHER AREAS OF MEDICINE

Several TIC models have been proposed, but the most common model centers on the framework consisting of six principles proposed by the Substance Abuse and Mental Health Services Administration, the National Council for Behavioral Health, and the Trauma-informed Care Implementation Resource Center<sup>16,19,25</sup>:

1. Safety;
2. Trustworthiness and transparency;
3. Peer support;
4. Collaboration and mutuality;
5. Empowerment and choice;
6. Cultural, historical, and gender issues.

Safety refers to both the patient and healthcare team feeling both physically and mentally safe in the environment where patient care is provided.<sup>25</sup> Some applications of this in the intensive care unit, for example, include reducing sound or alarm volume, altering light intensity, and finding alternatives to physical restraints.<sup>19</sup> Demonstrations of trustworthiness and transparency in clinical settings include asking for the patient's consent before anything that may be perceived or interpreted as a threat, whether it be closing doors, asking the patient to close their eyes, or beginning a physical examination.<sup>26</sup> Providers must earn the trust of their patients through transparent communication and treatments specifically tailored to the individual, thereby promoting patient autonomy.<sup>26</sup> Peer support may consist of flexible visitation policies in hospital settings or having a member of the multidisciplinary team involved in the patient's care be available to provide psychosocial support. In fact, in cases of posttraumatic stress disorders, prospective studies on group cognitive behavioral therapy found improvements in long-term health outcomes when compared with other models of care.<sup>19,27</sup> In addition, giving the patient a choice and involving them to

collaborate with the provider can glean some insight into the patient's values and priorities.<sup>26</sup> The healthcare team must also respond to the patient's trauma without cultural, historical, or gender bias.<sup>19,25</sup>

In practice, TIC can even begin as early as the intake process when staff members offer patients a quiet, secluded area to complete paperwork and disclose their trauma history and needs if they opt to.<sup>26</sup> Empowering patients to decide where to sit and be involved in their healthcare decisions can be a simple but effective demonstration of TIC in a clinical setting. Cultural, historical, and gender issues consist of intentional representation by the people surrounding the patient and training healthcare staff about how the various power dynamics surrounding race, class, and gender may impact patient care.<sup>19</sup> Staff trained in TIC have a more thorough understanding of the impacts of trauma on the individual, their coping strategies, and most effective treatment options.<sup>28</sup>

Meanwhile, TIC for female trauma survivors often emphasizes an empowerment model in which a woman is made to feel valued, her goals are established collaboratively with her provider, and her experiences are contextualized in the sociopolitical and cultural environment.<sup>28</sup> The woman should be made to feel validated for her strengths and resilience thus far to then build upon. This model also emphasizes the importance of making the physical space and training staff to provide a safe, welcoming environment for survivors and minimize instances of retraumatization, especially during invasive procedures when a woman would most benefit from having complete control over her body and limits.<sup>28</sup> This process requires a relationship between the patient and provider be built on trust, consistency, predictability, and nonviolence.<sup>28</sup> This trust-building process will largely rely on the collaboration between patient and staff to reduce the inherent power dynamic within healthcare settings and make it explicit for the patient that she has the right to refuse answering a question or refusing treatment.<sup>28</sup> All of this can contribute to making the woman feel empowered and more in control, as the healthcare team works to be intentional about creating a feeling of safety at every stage of interfacing with the staff and office. With an increased number of female members in the armed forces, addition of not only TIC in their therapy but a female-focused one may further improve outcomes. Many TIC services incorporate peer-run services as opportunities to not only connect with other women with similar experiences but to also elicit feedback and give the women an outlet to take charge of their health and the way they may want to receive it.<sup>28</sup> Cultural humility is another skill to develop to better understand the woman's culture and how her experiences may impact her perceptions of the office staff and recovery from trauma.<sup>28</sup> In addition to culture, educating ourselves and being open minded to learn more about the patient's race and ethnicity, socioeconomic status, disability status, etc, and how those identities may influence her relationships not only with people but with herself and her trauma can also serve to contribute to the patient's recovery.<sup>28</sup>

TIC in military primary care settings follow the same six principles. The sense of both physical and emotional safety can begin as early as the parking lot and inside the patient

examination rooms to the warm, compassionate interactions between patients and staff.<sup>25,29</sup> The current model for TIC for military and active service members builds upon the premise that healing from trauma relies not only on the individual and their resilience, but their families and support systems as well.<sup>25,26</sup> When treating the patient, it is also important to consider the treatment of their family members or support systems who may experience secondary traumatic symptoms. Of the most researched family-oriented interventions, Families Overcoming Under Stress and solution-focused therapy seem promising to families impacted by trauma associated with the military.<sup>26</sup> The six principles of TIC have been proposed as applicable to the family members of military members to better understand their secondary trauma and facilitate their recovery and treatment, not only for their trauma but other associated symptoms and diagnoses.<sup>26</sup>

### TIC IN VCA

Some elements of the TIC model have indeed been applied to the field of VCA. VCA candidates typically undergo an extensive screening process during which a variety of measures such as the PHQ-9 may be used to assess psychosocial factors that have an impact on patients' postoperative outcomes.<sup>11</sup> Certain psychiatric conditions such as chronic depression, bipolar disorder, active substance use disorders, and personality disorders increase the risk of poor surgical outcomes and are considered a contraindication for VCA by some programs.<sup>30,31</sup> Other risk factors identified during the screening process include unreasonable postoperative expectations, history of nonadherence, lack of coping skills, and lack of social support.<sup>18,30-32</sup> The role of social support is generally considered critical in VCA postoperative recovery and thereby a key element of eligibility screening.<sup>9</sup> Although the use of social support in candidacy determination has recently been contested in the context of solid organ transplantation, social support plays a somewhat different role for certain VCA procedures, particularly those still considered experimental and entailing a substantial postoperative recovery regimen.<sup>2,9</sup> Transparency about the screening process for candidacy can help promote more equitable, person-centered access to VCA.<sup>9,33</sup> VCA programs are multidisciplinary in nature and offer psychological support throughout the perioperative process.<sup>1</sup> This includes involvement from physical and occupational therapists, social workers, psychologists, and psychiatrists.<sup>3,19</sup> However, there is ample room for TIC to be further incorporated.

Whether it be empowering the patient during an encounter and validating the patient's ownership of their body or giving them a sense of control inside the examination room itself, it would benefit any patient who has experienced trauma for members of the healthcare team involved in their care to be trained in TIC to understand how to best acknowledge a patient's trauma while avoiding retraumatizing them.<sup>19,34</sup> The timing of the VCA procedure relative to the original injury should also be taken into account, such as where the patient is in their grieving process, whether they may be seeking potential treatment for posttraumatic

stress disorder, properly assessing their motivations for undergoing surgery, and confirming the patient's understanding of what the often demanding postoperative rehabilitation process entails.<sup>20</sup> Many patients attribute positive perioperative experiences to the realistic expectations set before surgery regarding their postoperative rehabilitation, immunosuppression, and function, along with psychosocial support.<sup>35</sup> Additionally, for each type of VCA, the psychosocial impact of the injuries varies, and the provision of TIC to each patient should reflect this nuance.

### Face

For patients considering face transplantation, their injuries are often more visible than other VCA types. Therefore, these patients frequently experience social stigma of people noticing or staring at them, which often further exacerbates their feelings of social isolation.<sup>23</sup> Offering these patients the option to schedule their appointments at the end of the day or without overlapping with other patients to minimize interaction with others may offer them the option to feel more comfortable in a healthcare setting. By acknowledging the patient's trauma and potential discomfort from others not accustomed to their specific injuries, this subtle incorporation of TIC encompasses many of the gold standard principles, including safety, trustworthiness and transparency, collaboration, and empowerment and choice.

Another consideration may be necessary for patients who have difficulty speaking due to their injuries and the importance of finding a method best suited to their preferences in communicating with their healthcare team. After all, rapport between patients and their healthcare team have demonstrated improved patient outcomes.<sup>36</sup> If a loved one is verbally communicating on the patient's behalf during the appointment, still addressing the patient first and foremost and understanding how the patient communicates their agreement or disagreement to what is being said will allow for the active involvement of the patient whose care is being discussed.

With some cases of facial trauma which may have a gendered component, such as women who are victims of acid attacks or men with self-inflicted gunshot wounds,<sup>37</sup> the unique sensitivity surrounding trauma associated with their injuries may require the healthcare team to be particularly considerate of the team's gender composition. This decision should involve the patient, who should have the option of active involvement in deciding who may be engaged in their care, particularly when that care may require close physical contact during wound care or physical examinations, and psychological support or counseling consisting of intimate conversations and disclosures.

### Upper Extremity

During the psychosocial assessment to determine a patient's candidacy for an upper extremity transplantation, an interview is conducted to learn the patient's psychiatric history and details of the original injury.<sup>31</sup> Depending on variables such as the time passed since the injury, the psychosocial well-being of the patient, and the

patient's own relationship with their injury and trauma, this detailed history-taking may be harmful to the patient who is effectively having to relive their trauma with their healthcare team. Before doing so, the patient-provider relationship should feel positive, empathetic, and safe, following a mutual participation model in which the patient is considered the expert of their trauma while the physician plays their part in supporting the patient to achieve their goals.<sup>38</sup>

It may even benefit the patient to decide how they would rather disclose the nature of their injury and feelings about their anatomy, whether it be prerecorded from the comfort of their own home, transcribed by a loved one before the appointment or in the waiting room, or described verbally to the surgeon during the appointment. The expectation of patients to complete medical paperwork in the waiting room may exacerbate feelings of stigma surrounding their injury or disability, so anticipating their preference before the patient arriving at the clinic may best facilitate the patient's comfort and trust in their healthcare team.

### Penile

After penile trauma, a patient may have functional concerns about urinary dysfunction or discomfort sitting, in addition to the psychological impacts of aesthetic dissatisfaction or sexual dysfunction, and these concerns may affect their experience in a waiting room or during a physical examination.<sup>39</sup> After check-in, a staff person may encourage the patient to find a place they would feel comfortable waiting rather than making them feel obligated to sit in a public space. Offering clear directions to a bathroom may give patients comfort knowing they can access one easily and without permission.

During the physical examination, rather than assuming the patient needs help undressing and reinforcing the patient's sense of helplessness, disability, or shame, empowering them to undress when they are ready and encouraging them to ask for help if they would like it maintains the patient's empowerment and choice, while also avoiding feelings of emasculation often reported within this demographic.<sup>15,39</sup> Similar to the role of gender in facial trauma, patients eligible for penile transplantation should be given ample opportunity to voice their comfort or discomfort with the genders of the people who are involved in their care.

## CONCLUSIONS

VCA is typically offered to individuals who have experienced traumatic injury and have limited alternate treatment options to improve their quality of life. With patients who are inherently vulnerable and considered higher risk with many reporting psychological distress due to their injuries, TIC is pivotal in better ensuring positive perioperative outcomes and can greatly improve patients' experiences in healthcare. Of the six principles of TIC, safety; trustworthiness and transparency; peer support; collaboration and mutuality; empowerment and choice; and cultural, historical, and gender issues, some have already

been incorporated in patient care. However, as the field of VCA continues to evolve, there is ample room to tailor and implement more robust TIC practices, reflecting the range of unique considerations for each VCA subtype.

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### DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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