

# Understanding Tattoos in Medicolegal Assessments

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Tattoos have held different meanings throughout history, with particular significance in cultural, social, and clinical contexts. Psychiatrists have long been interested in understanding the relevance of the tattooed body in a clinical or forensic evaluation and in settling on interpretive models that hold reliable value. Some studies have indicated that tattoos may be associated with markers of high-risk behaviors, mental illness diagnosis, and personality disorders. We attempt to provide an updated and comprehensive guide for forensic evaluators, so they can incorporate the observation of tattoos into their assessments with a review of the scientific literature that supports the interpretations and places them in context. The association between tattoos and risk, mental health, or behavioral implications is not as clear or linear as one might initially imagine, and mental health professionals should have a sophisticated understanding of the practice.

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Tattoo application requires a painful penetration of ink into the dermis culminating in injury and alteration of the skin. Tattoos have been present in human society for more than 12,000 years. Their significance continues to evolve, allowing groups to distinguish themselves indelibly from the general population, whether in society at large or in a prison setting. Traditionally, there are close associations between tattoos and sociocultural associations that a psychiatrist must be aware of: former or current gang affiliation, human trafficking, military experience, grief, or another major life event.

One in 5 Americans has a tattoo according to a 2012 Harris Poll.<sup>1</sup> Approximately 25 percent of the U.S. population aged 18 to 50 years has a tattoo, with the highest prevalence among the 20 to 39 year age group.<sup>2</sup> Tattoos have become equally common among males and females. A 2006 study<sup>3</sup> described tattooed women as predominantly white, single, college educated, with stable family relationships, and moderate to strong religious beliefs. This stands in contrast with the demographics of the 1970s, when

tattoos were commonly associated with low cultural status and often stereotyped as analogous to graffiti.<sup>4</sup>

## Tattoos, Medicine, and Psychiatry

Tattoo regret is equally common in men and women, with 15 to 20 percent considering removal of their tattoos.<sup>5</sup> For a forensic psychiatrist, the removal of a tattoo may be as relevant as the acquisition of one. Acquiring a holy-cross tattoo may signify identification with religion, whereas removal of such may signify loss of faith. Evaluators should assess the motivation that provoked the decision to remove the tattoo, as the person's rationale may provide more insight into a risk assessment, for example. Removal of a tattoo that was acquired at a time of disorganized cognition or affective instability may suggest that the patient has detached himself from previous delusions or developed insight into his behavior. In contrast, removal of a cross in a patient who has satanic delusions may imply worsening illness.

Reasons for removal have also been studied. Requests for removal are more common in women and, in up to 37 percent, are for professional reasons. Close to 43 percent ask for removal for personal reasons, most commonly, a change in marital or relationship status.<sup>6</sup> If a removal is impossible or incomplete, tattoo artists can create overlay designs. There

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is a grass roots project in the American tattoo community to provide overlays for victims of human trafficking who had their captors' names tattooed on them.<sup>7</sup>

Tattoos can be used for cosmetic purposes, such as the application of permanent makeup (i.e., eyebrow fillings<sup>8</sup>), treatment of skin conditions (such as pruritus or vitiligo), or as an aid for patients with advanced dementias.<sup>9</sup> In Turkey, for example, tattoo artists are providing patients with Alzheimer disease with tattoos of their names and address in case they are lost.<sup>10</sup> Tattoos have found their place in breast cancer survivors who tattoo over their mastectomy scars as an alternative to reconstructive surgery or prosthetics. Patients who undergo mastectomy and who have breast reconstruction often turn toward specialized tattoo artists who provide a facsimile of the areola or a 3D creation of a nipple over the reconstructed breast flap.<sup>11</sup> Tattoos may also be used to cover surgical scars or stretch marks.<sup>12,13</sup>

Researchers have studied the relationship between tattoos and traits, such as attitudes and impulsivity, and between tattoos and specific diagnoses or disorders (personality disorder, psychosis, or acute pathology).<sup>14</sup> In a 2013 study,<sup>15</sup> researchers looked at the interaction between risky decisions, impulsiveness, and smoking in young tattooed women. Tattooed women showed significantly higher scores in the impulsivity scale and preference for disadvantageous card decks on gambling tasks compared with nontattooed women. However, there was no significant correlation between tattoos and risky decision-making or impulsivity measures.

Another study<sup>5</sup> attempted to explore the effects of a tattoo on men's behavior and attitudes toward women. Prior research had shown that women with tattoos were rated by male subjects as less attractive, but as more likely to be promiscuous. The study found that more men approached tattooed women, the latency to approach was shorter, and men estimated that they had better higher chances of having a date and sex on the first date with tattooed women. However, there are no data to support the claim that women with tattoos are indeed more promiscuous. This finding can be important in cases involving sexual assault, trauma, or sexual harassment.<sup>16</sup>

At the 1999 American Academy of Psychiatry and the Law (AAPL) meeting, Cardasis and associates<sup>17</sup> presented a study of 55 insanity acquittees, suggesting there was a relationship between tattoos and an-

tisocial personality disorder (ASPD). Cardasis *et al.* mentioned that religious symbols, such as a cross, often held no particular religious meaning to the owner, and aggressive symbols, such as a skull and crossbones, might mean little more than what appealed to the person when he was young and intoxicated. Although this research was not published, the author used the data as a foundation for his 2008 article in which he examined the prevalence of tattoos in 36 forensic psychiatry inpatients. In that study, Cardasis *et al.* reported a significant association between tattoos and ASPD. These patients also had a significantly greater number of tattoos, a trend toward having a greater percentage of their total body surface area tattooed and were more likely to have a history of substance abuse than patients without ASPD. Tattooed subjects, with or without ASPD, were significantly more likely to have histories of substance abuse, sexual abuse, and suicide attempts than bare-skinned counterparts.

Studies have also looked at the psychodynamic associations between tattoos and ASPD,<sup>18-20</sup> with regard to impulsivity and self-mutilating behavior. A study from 2012<sup>21</sup> looked at the association between tattoos and death by homicide. Although there was no significant association between the two, memorial tattoos in black persons were significantly more common among homicide victims than in controls. In Australia, tattoos depicting 19th century outlaw Ned Kelly have been associated with a higher incidence of traumatic deaths (suicides, accidents, and homicides) among males, possibly indicating a tendency to rebel against authority, regulations, or the state.<sup>22</sup>

Borderline personality disorder and narcissism were associated with tattoos in the mid 20th century.<sup>23</sup> After analyzing 232 patients across two facilities over seven months, the authors found that patients with personality disorders were more likely to have multiple tattoos, with large emblems, located outside the lower arm. The article did not establish a significant correlation between personality disorders and tattoos, but it created a descriptive foundation of the tattoos and their meanings that is used by researchers today.<sup>24</sup> Another study<sup>25</sup> found an association between tattoos and a current diagnosis of personality disorder, alcoholism, past treatment for drug abuse, and parasuicide.

Some studies have indicated that tattoos are associated with markers of high-risk behaviors, including alcohol and drug abuse, violence, promiscuity, eating

disorders, and suicide.<sup>26,27</sup> It is unclear to what degree these correlations persist today. Higher rates of tattoos have been found among detainees compared with the general population. In a study looking at young offenders in South Australian correctional facilities, aged 11 to 20 years, weak but significant correlations were found between tattoos and responses to items relating to aggression and substance use, but tattooed status was not significantly related to 6 month postrelease recidivism.<sup>28</sup>

Increased rates of recidivism and behavioral infractions, however, were noted among inmates with prison or antisocial-themed tattoos, compared with prisoners with other types of tattoos, inmates without tattoos, and tattooed college students.<sup>29</sup> The authors defined prison tattoos as images depicting life in prison, such as clock faces, gang symbols, or prison bars. They also included participants who self-reported that their tattoos were related to their sentence regardless of the subject matter. Non-prison tattoos, seen in the general public, included tattoos signifying love, national origin, or religious affiliation.

With regard to psychosis, in a 1999 study, Birmingham and colleagues<sup>30</sup> found a statistically significant relationship between visible tattoos and schizophrenia or related psychotic disorders. Although they found no relationship between visible tattoos and lifetime Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) mental disorders, when subcategorized into primary diagnostic criteria (i.e., affective, psychotic, anxiety, and personality disorders), there was an apparent association between visible tattoos and psychosis. Similar associations were not found between visible tattoos and the other primary diagnostic subcategories of DSM-IV mental disorders.<sup>31</sup> No association was found between tattoos and acute psychopathology in a 1998 study on an acute inpatient unit.<sup>32</sup>

Among drug users, tattoo images have been found to be related to a specific drug, or used to hide signs of repeated drug use or identify ideal sites for injection.<sup>33</sup> In adolescents, having a tattoo correlated with a higher likelihood of smoking, earlier age of smoking behavior, and higher consumption per day.<sup>34</sup>

Tattoos increase the risk of negative stereotyping by others. According to a study from 2010,<sup>35</sup> nurses with the most body art were rated as the least caring, skilled, and knowledgeable by students, other nurses, and faculty. Another study found that college stu-

dents rated female models with different tattoos more negatively than their nontattooed counterparts on 13 personal characteristics (such as intelligence, honesty, and generosity).<sup>36</sup> Perhaps most important for forensic psychiatrists serving as expert witnesses, another study<sup>37</sup> found that despite comparable ratings on attractiveness, tattooed individuals were ranked significantly lower in credibility by a sample of 421 participating undergraduate students in a large Western university.

In the past decades, researchers have found that clinical findings correlate better with the presence of a tattoo than with its artistic content.<sup>38</sup> Psychiatrists have also speculated on whether tattoos constitute a form of legitimized self-harm.<sup>39,40</sup> The American Academy of Child and Adolescent Psychiatry released a statement in 1999, reiterated in 2013,<sup>41</sup> in which they listed tattooing and “excessive piercing” along with picking, burning, head banging, and cutting as possible forms of self-injury. Along those lines, others have characterized tattooing as a pursuit revealing “sensation-seeking” traits or behaviors.<sup>42</sup> Especially among adolescents, tattoos may constitute a symbol of normative rebellion, one that may not be seen or challenged by an authority or a parental figure. Psychiatrists should not automatically assume that tattoos in adolescents represent self-destructive behavior but may signify a developmentally appropriate symbol of independence from one’s family of origin.<sup>6</sup>

Research has found that tattooed men, but not women, become sexually active at a younger age than their nontattooed counterparts.<sup>43</sup> However, association between tattoos and sexual promiscuity in the absence of other risk factors, such as drug use, has been inconclusive.

## Observation and Description of Ink

### Location

Whether a tattoo is exposed, partially exposed (e.g., feet, skull, and back of the neck), or concealed may bear some relevance to the personal, social, or professional context of the individual.

Tattoos in hypersensitive areas, such as the genitals, breasts, ribs, and sternum may be motivated by sexual enhancement, indication of tribal status, esthetical enhancement or a strong need for uniqueness.<sup>44</sup> Intraoral mucosa tattoos have become more common and, given their simplicity, are often ac-

quired in nonprofessional settings. Most recently, some tattoo artists have initiated a trend of “eyeball tattooing,” which should be distinguished from corneal tattooing. Corneal tattooing is a cosmetic procedure to change the color of the eyes in a permanent manner (similar to color contact lenses). Eyeball tattooing consists of injecting ink (most often black) into the sclera, to make the entire eye appear black. The procedure carries significant risk of complications, including blindness.<sup>45</sup>

### **Size and Number**

Large tattoos differ significantly in design, planning, execution, and cost from smaller single-session ones. A large tattoo may take many hours over multiple sessions, interspersed by weeks (to allow for proper healing before continuation) and therefore would not suggest an impulsive act by a young individual without financial resources. Tattoo work by a reputable artist may cost \$100 to \$200 or more per hour.

### **Color**

The choice of colored tattoos versus grayscale or black also conveys relevant information. Color inks require upkeep and touchup sessions more frequently than gray or black/blue inks. Metallic inks may interfere with medical procedures, such as magnetic resonance images (MRIs).<sup>28,46</sup> White ink may reveal more scarring or allergic reactions. UV light ink cannot be seen by the naked eye and may only appear in black light, such as at rave parties, and the risks associated with it are still unclear.

### **Age and Context**

As mentioned above, most people get their first tattoos in adolescence or early adulthood. However, critical life situations may also lead to the decision to obtain a tattoo, such as deployment, grief, sobriety, marriage, divorce, and so forth. Similarly, a recent tattoo may have been acquired in the context of a manic or psychotic episode, and, if so, may inform concepts of capacity, insight and judgment, and reality testing.

### **Content and Criminal Forensic Implications**

In the West, there are two primary forms of tattoo: professional and jailhouse. Professional tattoo artists are regulated by the Alliance of Professional Tattoo-

ists (APT), an organization founded in 1992 to promote health and safety in the tattoo industry. Members of the APT have met requirements for training and supervision for services, such as autoclaving, sterilizing tools, and wearing gloves and barriers, and must work under sterile conditions. Jailhouse tattoos often follow a much cruder and painful procedure, oftentimes used as a rite of passage to join a group or affiliation. Securing a tattoo gun is often difficult, although not impossible in jail or prison. They are often fabricated out of commonly available items.<sup>47</sup> Tattoos in prisons, mental health settings, and juvenile facilities can be applied without access to tattoo needles or proper sanitation or may involve use of shared needles.<sup>48</sup>

In the correctional population, it is important to consider how the inmate acquires the tattoo, how he finances it, and whether the image is appropriate. Inmates may use their prescribed medications as payment for tattoo application. Second, sharing tattoo needles in prison carries a risk of HIV, hepatitis C, and other blood-borne diseases. A tattoo received in a prison setting may indicate that the inmate has a new allegiance to a gang.

Several factors have been associated with tattooing in prison, including age, length of incarceration (over one year, or more than four episodes of incarceration), sexual history (sexual relationships while in prison, multiple vaginal sex partners, female homosexuality, and inconsistent condom use), and history of sharing needles.<sup>49</sup> Japanese and Polynesian technique tattoos in prison are still applied with a manually controlled needle (rather than electrically powered), and they most often follow clearly defined motifs involving mythical heroes and legendary battles, as specified in a few known classic and revered mythologies.<sup>50,51</sup>

### **Military**

Most military branches typically ban tattoos that are visible while in uniform, but tattoos continue to be extremely common among British and American military personnel, who often choose patriotic or remembrance motifs.<sup>8,52</sup> British military personnel with tattoos typically have more than one; the most common design is their name.<sup>53</sup> They most often acquire their first tattoo before their first deployment, are not under the influence of alcohol or drugs, and do not regret their tattoos. Soldiers in the U.S. Army are no longer limited to a number or size of



tattoos or restricted from placing them on their arms or legs.<sup>54</sup> They are not allowed tattoos on the face, neck, or hands, except for one ring tattoo on each hand. They are also not allowed tattoos that are extremist, indecent, sexist, or racist.<sup>8,55</sup>

### **Groups**

Gang affiliations clearly identified by their tattoos include M-18, Mara Salvatrucha (M-13), Mexican Mafia North and South, Bloods and Crips, Māori Gangs Of New Zealand (Mongrel Mob, Black Power, and Nomads), Dundon-McCarthy faction of the United Kingdom (soldiers of these gangs show tattoo tributes in memory of fallen comrades), Yakuza, Tongan Crisps Polynesian Gang, White Supremacists and Nazi Lowriders, Dead Man Incorporated, and Latin Kings.<sup>56</sup>

### **Symbols**

Unfortunately, there is little official record or testament to these symbols that can in fact be established. Published research studies on tattoos mainly focus on images pertaining to specific religions or cultures. For instance, Shoham in 2010<sup>57</sup> established a record and provided interpretation of tattoos among Russian inmates in Israel's prisons. A crowned snake ascending along a skull with knives indicates a gang leader. An image of a bee on the prisoner's genital organ (a forcibly inscribed tattoo) indicates homosexuality. Images such as daggers, skulls, and bones may indicate pride or value in the use of violence. Images of churches or ankle chains represented imprisonment, where each church dome or chain link indicates a year spent in prison. Flowers located on the forearm represent adoption of the criminal lifestyle from a young age. The poppy can indicate alcoholism or illicit drug use. Shoham concluded that prisoners often use images of animals to express their characteristics and qualities. For instance, images of spiders and cats represents secrecy and caution, qualities valuable to a thief. Also common among Russian gangs is the Madonna and child, an image that is meant to ward off evil spirits and misfortune.

Whereas time imprisoned is demonstrated by church domes and ankle chains among Russian inmates, other subcultures use different images to express the same message. For British gang members, a dot is located between the knuckle and first joint of the four fingers. Both cultures, however, will use tat-

toos of dice or a deck of cards to symbolize the concept of fate.

Gang membership, participation, and commitment are often demonstrated through facial tattoos and may include fangs tattooed under the lips, to signify that the inmate will bite, and devil horns on the foreheads. Individual dots may also reveal how many people an inmate has killed or has lost in life. Personal loss is also sometimes represented in tattooed tears instead of dots. If the teardrop is clear, it can mean the wearer has either attempted or committed a murder in a vengeful act for the killing of a close friend or family member. For The Bloods, commitment is tattooed in one of their mottos: Blood In, Blood Out (meaning that the gang member takes a beating to get in, and will have to die to get out).

In the context of drug use, tattoos may display the drug of choice. "H" represents heroin, "M" marijuana, and the "13" is morphine (the 13th letter of the alphabet is M).

The semicolon tattoo is used to symbolize a new beginning. Popularized by social media, Project Semicolon is a group that supports individuals who are troubled with addiction, depression, self-harm, and suicidal tendencies. Patients currently tackling mental health hurdles may tattoo a semicolon on the wrist to symbolize their fight against these difficulties.<sup>58</sup> Another tattoo that symbolizes survival of hardships is the "neda" tattoo. Depicted by creatively merging a heart with the letter S, this tattoo identifies and strengthens individuals recovering from eating disorders.

### **Numbers**

Numbers may also have particular significance or meaning. The number 666 means "the number of the Beast" and is typically indicates evil intent or power within the prison establishment. In the combination of the numbers 14 and 88, 1488, the 14 represents a 14-word quote by neo-Nazi leader David Lane who said, "We must secure the existence of our people and a future for white children."<sup>59</sup> The number 8 represents the eighth letter of the alphabet, and 88 represents HH, shorthand for Heil Hitler. The number 12 stands for AB, or Aryan Brotherhood.

### **Involuntary Tattoos**

Tattoos have been imposed on individuals as brands in human trafficking syndicates. Domestic

traffickers (pimps) have used ink for similar purposes. One pimp who trafficked a group of underage Latino female prostitutes in New York City had bar codes tattooed on them as part of the commodification of their bodies,<sup>60</sup> and the same was found in a roundup of women forced into prostitution in Spain.<sup>61</sup> Traffickers also use tattoos to inform other traffickers that they are in control of the women. In Madrid in 2007, traffickers tattooed numbers that represented the initial debt owed to the traffickers by the women. These debts also allowed the women to be traded among traffickers or to be purchased by clients. More remotely, the letters KL were tattooed on Jewish concentration camp prisoners to identify them if they attempted to escape, and stood for the German term for concentration camp, *Konzentrationslager*.<sup>62</sup>

Interpol and the UN Office on Drugs and Crime, which coordinates international efforts on human trafficking, list branding tattoos as indicators that a person may be a subject of human trafficking. These markings are usually visible on the neck or back of individuals who exhibit other signs consistent with domestic violence or sexual predation.<sup>63</sup>

More information about common tattoos can be found in Table 1.

### Discussion

This article is intended to be a starting point for forensic evaluators to understand the meaning behind the tattoos or the process involved in this form of body modification. In some evaluations, the tattoo may be a distractor that the evaluator notices but does not comment on beyond a few words when describing their appearance. In other cases, an evaluation could be dramatically affected by the presence of tattoos or, in some cases, such as a prison-based evaluation, their absence.

For those evaluators who do not have tattoos, an interaction with a tattooed subject can be regarded as a cross-cultural experience. Ideas discussed in this article, such as the commonality of tattoos, tattoo removal, and tattoo content and meaning, may provide a nexus for discussion that can make an evaluation more effective through the development of rapport. In other cases, the information on tattoos may enable evaluators to identify a current or prior gang affiliation. It may also help them to understand the external expression of distress, pride, relationships, or

other deeply held ideas that individuals may express through tattoos.

From a psychodynamic perspective, tattooing can be considered to be acting out.<sup>74</sup> Tattoos are unique from other forms of body modification, such as piercings and self-mutilation, as the product is a unique image that may specifically relate to an unconscious or conscious focus. Tattooed images provide a medium of symbolic communication at a point where language proves to be insufficient. The image is one that will never have to be relinquished.

However, in the context of involuntary tattoos, such as those employed by human traffickers, the evaluator clearly should explore the problems that have arisen around trauma and exposure to victimization. This psychological bondage can make it harder for victims of human trafficking to escape from the negative impact of their prior situation. The tattoo becomes a reminder of a period in the person's life that involved intense shame, and it can even evoke symptoms of post-traumatic stress disorder (PTSD).

Psychiatrists must use balanced clinical judgment when assessing patients with tattoos. Recognizing and asking about visible tattoos can be tantamount to addressing the "elephant in the room" for patients who have prominent ink on display. If done in a nonjudgmental way, it can contribute to rapport building and engagement. Other interpretations of tattoos can include distinguishing between signs of acute illness, chronic personality traits, increased behavioral risk, or nonpathological criminal indicators.

Evaluators should be aware of the impact of a heavily tattooed individual on their own biases and reactions. The professional may be intrigued or captivated by certain tattoos, or intimidated or repulsed by them. For example, a Jewish surgeon refused to operate on a patient with a swastika tattoo.<sup>75</sup> Proper analysis and understanding of the perception of tattoos may inform one's roles as a health professional or expert witness. Evaluators should also be aware that patients may not provide accurate information about the significance or symbolism of a particular tattoo.

In the civil setting, exposed tattoos may be a source of dispute in matters of workplace discrimination, or estimation of risk in custody evaluations. U.S. courts have consistently rejected public employees' claims that a tattoo or piercing is protected by the First Amendment (freedom of speech or expression). Tat-

**Table 1** Meanings of Common Tattoos

Tattoo	Location	Association
Lotus flower <sup>64</sup>	Variable	Enlightenment, rising from amidst hardships
Semicolon	Commonly, the wrist	Commitment to life, fighting against depression and suicidal ideation
Triquetra/Trinity knot	Variable	Connectedness with the elements around us: earth, sea and sky. Can also mean eternity or connectedness with God.
“Om” (sacred syllable) <sup>65</sup>	Variable	Hindu religion: God or universe; For some, peace, good karma, tranquility
A wave	Variable	Strength, fighting against fate
Anchor <sup>66</sup>	Variable	Hope, salvation, and eternity
Cobweb (black and white) <sup>67</sup>	Commonly, the elbow	Long prison sentences
Tear drop <sup>68</sup>	Underneath eye	Filled in tear: committed murder; if only outline: attempted murder
Five-point crown <sup>69,70</sup>	Variable	Latin Kings gang (Hispanic gang originally based in Chicago)
Three dots	Lateral to eye corner or on hands	“mi vida loca (my crazy life)” and “Los Vatos Locos (The Crazy Dudes)”; associated with the gang lifestyle
Five dots <sup>71</sup>	Outer surface of hand, between thumb and index finger	Time spent in prison
MS-13 <sup>72</sup>	Visible areas: face, hand, neck	Mara Salvatrucha gang
Cards (playing cards)	Variable	Association with gambling, such as gambling with life, popular in Russian prisons
ACAB	Knuckles	Willingness to go to prison for one’s gang; “all cops are bastards”
Three dots	Between thumb and index finger	Death to police
Question mark	Second phalanx of ring finger	Bisexuality
Four dots	On one finger of either hand	Lesbian orientation
Watch with no minute hands	Hands	Doing time in prison
Stars	Shoulder	Rank in gang
Stars	Knees	“The bearer will bow down to no man.”
Cross	Chest	Highest rank in Russian gang
EWMN	Variable, commonly knuckles	“Evil, wicked, mean, nasty”; animosity to authority and police
Black hand with “M” in the middle	Variable	Mexican Mafia, North and South
Dragons and Japanese flowers	Tattoo encompassing large areas of the body in the shape of armor suits	Yazuka body suits, associated with Polynesian tradition
“Tongan Crisps” with hands underneath the words	Variable	Tongan Crisps Polynesian gang
Swastika with 14	Variable	White supremacists and Nazi lowriders
Pyramid with a center eye <sup>73</sup>	Variable	Dead Man incorporated, in support of the Illuminati or New World Order against religion and government

toos and piercings are considered to be alterable; therefore, they do not automatically receive any special legal protection.<sup>76</sup>

Adolescence and young adulthood is the most common age range for acquisition of the first tattoo. In this population, careful evaluation of capacity to consent to the tattoo must be considered, especially given the high rate of regret associated with tattoos years later. Fortunately, newer inks may be less reactive, and newer laser modalities may provide removal options with less scarring potential.<sup>77</sup>

Unfortunately, there has been no contemporary research to highlight the significance of tattoos

and psychosocial disorders in the 21st century. More comprehensive work in specific age groups (adolescents, young adults, older adults, and veterans) appears to be warranted. There is a dearth of current research that has been conducted in a structured manner that would produce significant and valuable results. An analysis of the more extreme forms of body modification, such as branding, scarification, extreme piercing, suspension piercing, and surgical alteration of the anatomy would also be useful, as there is little information about comorbid psychopathology in the tattooed population.

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