

194 Tattoo Artists

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1 Core Messages

- Tattoo artists are exposed to biological hazards, like HBV, HCV, HIV or eventually *Mycobacterium chelonae*.
- Wet work and glove use favor irritant hand dermatitis.
- Allergic contact dermatitis is due mainly to rubber gloves, disinfectants, topical anesthetics, or dressings used in the procedure.
- Heavy metals used as pigments can induce allergic and photoallergic contact dermatitis, granulomatous reactions, pseudolymphoma, and skin cancers.
- Mercury is the main allergen, but chromium, cobalt, cadmium, and nickel can also induce adverse reactions due to tattooing.
- Temporary tattoos, performed usually outside the tattoo studio, contain mainly para-phenylenediamine which can sensitize the client and, eventually, the artist.

2 Tattoo Artists

Tattoos are widely accepted worldwide and are performed in many more settings apart from the original cultural or tribal meaning or as a hallmark of an important event. They belong to the arts of body decoration that is being developed as the image of the body and is increasingly appreciated. Tattoo artists, often practicing also other techniques of body decoration, have a flourishing job, and tattoo studios or tattoo shops are widely distributed in most regions of the globe (Kluger 2010). Many artists are well informed and meet regularly to exchange news on the materials and techniques of tattooing and perform their job in the most adequate setting, with cleansing measures that resemble a medical setting. But, many other tattoo artists still develop their techniques with no or very few measures to protect both himself/herself and his/her client.

In their job, tattoo artists prepare the skin for tattooing: they clean the skin surface usually with soaps and antiseptics, remove the hairs either with wax or by shaving, and often they apply an anesthetic cream containing lidocaine or a mixture of lidocaine and prilocaine. Then the drawing is made with charcoal stencil

and with an electric needle the pigment is introduced into the dermis. A sterile dressing or a topical antibiotic may be used thereafter (Adams 1999).

Adverse reactions from biological agents are decreasing as tattoo artists use rubber gloves and disposable material as much as possible, disinfect the material in autoclaves and use sterile pigments. But, occasionally they dissolve the pigments or clean the instruments in tap water and this can be harmful both for the client and, eventually, for the professional: infections by several pyogenic bacteria or mycobacteria can be transmitted during the tattooing procedure, mostly infections induced by *Mycobacterium chelonae*, a microorganism that can be found in tap water (Kluger et al. 2008a; Preda et al. 2009; Drage et al. 2010). Transmission of hepatitis B or C virus or HIV may also theoretically occur.

The inks to permanently color the skin are prepared “secretly” by the artist, but mostly bought as pre-made or as pre-dispersed inks, even though with no full ingredient labeling. These inks are then mixed or diluted before skin application. They usually include a solvent or carrier (water, ethyl alcohol or other alcohols, propylene glycol, and glycerine) and several pigments. These are based mainly in India ink containing mostly inert carbon particles for black, oxides, and metals salts for most colors, and sometimes also organic dyes, like azo- or naphtha-derived chemicals. Main heavy metals used as colors include mercury, as mercuric sulfide or cinnabar (red), lead (yellow, green, white), cadmium (red, orange, yellow), nickel (black), zinc (yellow, white), chromium (green), cobalt (blue), aluminum (green, violet), titanium (white), copper (blue, green), iron (brown, red, black), and barium (white). Mercury, chromium, and cadmium are responsible for most adverse reactions involving delayed hypersensitivity reactions (allergic contact dermatitis) or granulomatous reactions (Bagley et al. 1987; Morales-Callaghan et al. 2006; Jacob et al. 2008; Kaur et al. 2009; Kluger 2010). Occasional photoallergic dermatitis with cadmium (Kaur et al. 2009), urticaria or anaphylactic reactions with cobalt (Kaur et al. 2009; Lee-Wong et al. 2009), pseudolymphoma, and skin tumors (keratoacanthoma) have been described mostly in clients (Kaur et al. 2009; Kazandjieva and Tsankov 2007; Kluger 2010).

■ Table 194.1

Contact irritants. Adapted from Adams 1999

Water (wet work)
Hand cleaning soap and detergents
Germicidal solutions for skin cleaning

■ Table 194.2

Contact allergens. Adapted from Adams 1999

Baseline series:
Thiuram mix, 1% pet (gloves)
2-mercaptobenzotiazol, 2% pet (gloves)
Mercapto mix, 2% pet (gloves)
Formaldehyde, 1% aq. (cleaning solutions)
Wool alcohols, 30% pet (medications)
Potassium dichromate 0.5% pet (ink pigment)
Cobalt chloride 1% pet (ink pigment)
Nickel sulfate 5% per (ink pigment)
Additional allergens:
Chlorhexidine digluconate, 0.5% aq. (antiseptic solutions)
Ammoniated mercury chloride, 1% pet (ink pigments)
Cadmium chloride 1% aq. (ink pigments)

During their job, tattoo artists can be exposed to irritants, namely disinfectants, germicidal soaps, and detergents, and can be sensitized to several chemicals manipulated in the working place: rubber chemicals from protection gloves, disinfectants and antibiotics from dressings, lidocaine or its mixture with prilocaine for patient anesthesia, and other vehicles from topical drugs.

Apart from permanent tattooing, there is an increased tendency to paint the skin with temporary tattoos, known as Henna tattoos. Henna itself is relatively safe, but high amounts of para-phenylenediamine are added to increase the color, persistence of the tattoo, and facilitate skin painting. These individuals do not need any particular

training and usually perform this task under no vigilance in touristic places, not in tattoo studios. They frequently induce allergic contact dermatitis or sensitize their clients with para-phenylenediamine, sometimes after a single ink painting, and, in theory, they can also be sensitized to para-phenylenediamine in their job (Mascarenhas et al. 2002; Kluger et al. 2008b; Neri et al. 2009).

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