

Microbial infections through tattoos and piercings

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PIERCING AND TATTOOING: ANCIENT AND MODERN BODY ART



Tattoo: Definition

- The application of colourant(s) on or into the skin

Types

- *Temporary tattoo* (=superficial):
will disappear in days or weeks
- *Permanent tattoo*:
 - in epiderm and papillary derm will disappear or fade in the next years (=semipermanent)
 - dermal deposition will persist (=permanent)

Permanent tattoos

Technique amateurs

Technique professionals

Technique professional

Permanent make-up: technique

- What?
 - Micropigmentation = tattooing
- How?
 - disposable oscillating needle
 - Pigments and dyes
 - + / - local anesthesia



Tattoos and permanent make-up

- Risks and complications:
 - bleeding
 - crusting and swelling
 - **infection**
 - allergic reaction
 - granuloma
 - hypertrophic scar / keloid
 - MRI complications

Infection

–Bacterial

- **Common:**

- *Staph. Aureus*

- *Group A streptococci*

- *Pseudomonas spp.*

- **Exc.**

- *Tetanos*

- *Leprosy/syphilis/leishmaniasis*

- *Tuberculosis / atyp. Mycobacteria*

Bacterial infections

Impetigo

Ulceration

Streptococcus dysgalactiae

Bacterial infections

- Cutaneous
 - Impetigo
 - Erysipelas / cellulitis
 - Ulceration / gangrene

Abscess formation, methicillin-resistant Staphylococcus aureus positive. (a) Initial presentation, (b) after abscess surgery, (c) after systemic antibiotics and negative pressure wound therapy

Ref: Wollina U. Indian Journal of Dermatology 2012; 57(6), 439-43

Bacterial infections

- Systemic
 - Sepsis
 - Spinal abscess
 - Endocarditis
 - Xanthogranulomatous pyelonephritis (MRSA)
- At risk:
 - Immunosuppressed patient
 - Congenital heart disease

Bacterial infections

Atyp. mycobact. (courtesy ML Pérez-Cotapos)

Sporotrichoid atypical mycobacteriosis.

Before triple therapy and at the end of triple therapy

Ref: Wollina U. Indian Journal of Dermatology 2012; 57(6), 439-43

- **Mycotic**

- **Viral**

- **Herpes simplex/ HPV**

- **Hepatitis B/C/D/G**

- **HIV**

Verrucae planae

Pityriasis versicolor

Mollusca contagiosa

Tattoos and permanent make-up

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Infection

Infections

- Source
 - Site
 - Practitioner
 - Host
 - Materials: devices

Infections

- Source
 - Materials: **TATTOO INK**

Materials

Colourant	Pigment: eg. Carbon (CI 77266)
	Dye
Auxiliary ingredients	Vehicle: water (H ₂ O)
	Solvent
	Additives: <ul style="list-style-type: none">- Wetting agents: Glycerine, Ethyleenglycol- Preservatives: eg. Witch hazel- Stabiliser- Thickeners: Glycerine- pH-regulators
Impurities from the production process	- Carcinogenic aromatic amines



Materials

Colours	Metals	Organic	other	-
Black	Logwood (chrome)	-	Charcoal, Carbon	-
Brown	Ferric oxide, ferric sulphate; Cadmium sulfide	-	-	-
White	Lead carbonate Zinc oxide Titanium dioxide	-	-	-
Violet	-	Azo dyes	Manganese	-
Purple/Lilac	-	-	Manganese oxide	Rare allergic reactions
Flesh	Ferric oxide	-	-	-
Green	Chromium oxide (Casalic green), Hydrous chromium oxides (Guignets green) Chromium sesquioxide (Viridian)	Chlorinated copper (phthalo-cyanine)	-	Allergies for hexavalent chromium
Red	Mercury sulphide (cinnabar) Cadmium selenide	Azo dyes	Sienna, Brasiline, Carmine Cochinilla red Santaline	Allergic reactions to mercury, Phototoxic reactions
Yellow	Cadmium sulfide	Azo dyes	-	Phototoxic reactions
Blue	Cobalt	Copper (phthalo-cyanine)	Indigo	Granulomatous reactions



- **Resolution ResAP(2008)1**

on requirements and criteria for the safety of tattoos and permanent make-up (superseding Resolution **ResAP(2003)2** on tattoos and permanent make-up)

- ...“Considering that tattoos and PMU may pose a risk to human health due to *microbiological contamination* and/or the presence of harmful substances in the products used for tattoos and PMU and/or the possibility of being tattooed *under questionable hygienic conditions* “ ...

Resolution ResAP(2008)1

- 3.2. ...in addition to the requirements set out in paragraph 3.1, tattoo and PMU products must only be used if they comply with all the following requirements
- - they are sterile and supplied in a container which maintains the sterility of the product until application, preferably in a packaging size appropriate for single use. In case multi-use containers are used, their design should ensure that the contents will not be contaminated during the period of use;

Resolution ResAP(2008)1

- - preservatives should only be used to ensure the preservation of the product after opening and by no means as a correction of insufficient microbiologic purity in the course of manufacture and of inadequate hygiene in tattooing and PMU practice; - preservatives should only be used after a safety assessment and in the lowest effective concentration.

Resolution ResAP(2008)1

- 3.3. Tattoo and PMU products should contain the following information on the packaging: - the name and address of the manufacturer or the person responsible for placing the product on the market;
 - the date of minimum durability;¹
 - the conditions of use and warnings;
 - the batch number or other reference used by the manufacturer for batch identification;
 - the list of ingredients according to their International Union of Pure and Applied Chemistry (IUPAC) name, CAS number (Chemical Abstract Service of the American Chemical Society) or Colour Index (CI) number;
 - the guarantee of sterility of the contents.

Microbial status and product labelling of 58 original tattoo inks.

Conclusions : *The European Council resolutions regarding safety of tattoo inks are not effective. Stock bottles of tattoo ink may contain bacteria pathogenic to humans and environmental bacteria, and packaging, labelling and preservation of inks are of inadequate quality. Claim of sterility can be erroneous.*

Ref: Hoegsberg et al. JEADV2013, 27, 73-80

Resolution ResAP(2008)1

- 3.4. Tattooing and the application of PMU – including treatment and maintenance of the instruments, in particular their sterilisation and disinfection – must be carried out by the tattooist in conformity with the hygiene regulations laid down by national public health services.





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