

# Tattoos Artwork on Skin

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*Nowadays, finding a person (regardless of gender) with a tattoo is not a difficult task. Recent surveys show that 30-35% of individuals in Europe, Australia, and US have tattoos out of which the majority is between the ages of 18-50. In the Sri Lankan context tattoo art is still not very common, yet there is an increasing demand for it among the younger generation.*



The word tattoo is believed to have two major derivations: the first is from the Polynesian word “ta” means “striking something,” and the second is the Tahitian word “tatau” means “to mark something.” The oldest example of tattoo dates back to 3000 BC and is represented by a 5300-year old mummy, called “Ötzi the Iceman”, discovered in 1991, which has over 50 black tattoos.

## Classification

Tattoos can be classified into a few categories namely, professional, amateur, traumatic, cosmetic, decorative or medical. Tattoos can be made by amateur or professional artists. Amateur artists use Indian ink, charcoal/soot or ash powder on a common needle or a nail instead of the special needle used for tattooing. These tattoos have a poor artistic quality and pose a risk of infections. The professional artists use pigments containing various metal salts (sulphides, oxides, selenides, or coloured minerals) of mercury (red), chromium (green), manganese (blue-purple), cobalt (blue), cadmium (yellow), iron (yellow), or organic compounds such as sandalwood (red) or *Caesalpinia echinata* (red).

**Traumatic tattoos** are classified into abrasive and explosive types. The abrasive form leaves the pigment deposit in the more superficial layers of the skin. Tattooing is performed in black or grey colour to cover up any scars/wounds that occurred as a result of an accident/explosion.

**Cosmetic tattoos** are used with the aim to perform a permanent makeup of the eyes, lips and eyebrows or for breast reconstruction. This has become very famous among celebrities.

**Medical tattoos** are commonly used to outline permanent landmarks for radiation therapy.

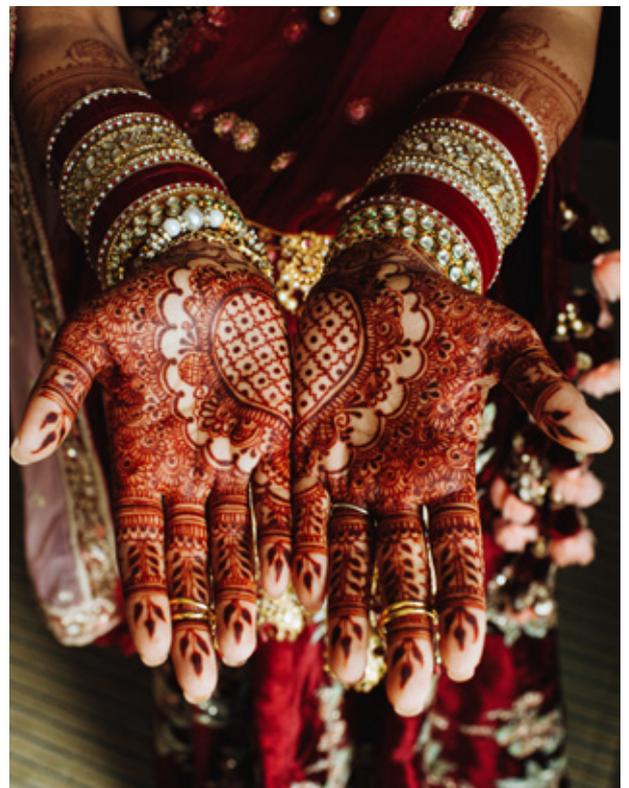


## Temporary tattoos

In temporary tattoos, the pigment is applied superficially in the outer layer of the skin. These tattoos are made with Henna, a natural pigment obtained from the plant *Laws onia interims* that stains the skin in reddish-brown and disappears after two or three weeks. Lemon, vinegar or tea leaves are used to prevent the deterioration of tattoos and chemical additives (phenylenediamine or its derivatives) are used for blackening the Henna pigment (black Henna- hair dye).

## Concepts behind tattooing

Performing tattoos consists of introducing a pigment into the skin dermis using a pin. The colour pigment is placed between the collagen fibers in the skin's dermis, approximately 2 mm beneath the skin and deposits the pigment for a lifetime. To place the pigment in the dermis, a technique was practiced in the early era, where the needle made from bones was placed on a stick and the stick was hammered frequently so the pigment could be placed on the skin. It is said that the word "tatau" came from the sound that the hand tool makes when it is hammered to the needle stick. Now the tattoo machines are electrically driven and consist of 3-7 stainless steel needles. The gauges of these needles are usually 5, with a length of 36 mm and a thickness of 0.36 mm, and are kept about 0.3 mm away from each other. The speed ranges from 1500-9500 strokes per minute and the depth of needle penetration is adjustable from 1 to 2 mm.





## Health risks of tattooing

More recently, there has been an increase in the number of consumer complaints mentioning adverse reactions at their tattoo sites. The most common reactions were tenderness and itching, associated with allergic reactions and bumps secondary to granulomatous reactions. The side effects may appear immediately, or weeks or years after tattooing. Many allergic reactions after tattooing are suspected to originate from the metal salts (chromium, cobalt, nickel). The National Centre for Toxicological Research has found that azo pigments decompose into known carcinogens with exposure to UV/sun light. Cases of transmission of diseases like leprosy, syphilis, tuberculosis, hepatitis, HIV, dermatophytes, and sporotrichosis as a result of breakage of skin barrier, were reported. Only a few cases of skin cancers arising from tattoos have been described since 1930, but recent studies show that the reported incidents are increasing day by day because of the utilization of improper, insecure and amateur techniques for tattooing. For example, the majority of tattoo ink used by amateurs is industrial-grade printer ink or automobile paint which is known to have carcinogenic properties. Therefore, legislation is urgently needed. As a result, the American Academy of Micropigmentation has established a regulation framework to improve the quality and practice through a certification process in this field.

## Tattoo removal

Tattoo removal has become a major concern because of its permanent character. There are various approaches used for tattoo removal; mechanical techniques such as salabrasion (water- and salts-like substances are used to peel out the upper layers of the skin), dermabrasion (wire brush or diamond wheels are used to peel out the upper skin), surgical excision (removal) using plastic surgery techniques and lasers. Those mechanical techniques are now abandoned, and laser treatments have become the popular choice of treatment. The lasers react with pigments and break them down into smaller particles which will be removed by macrophages of the skin. The results will depend on the depth of the pigments, and colour shades (multicolour or single colour). Although laser treatment has become very popular, many complications such as structural changes of the skin, scars, temporary and permanent changes in skin pigmentation may result.

