Review

Body piercing: medical consequences and psychological motivations

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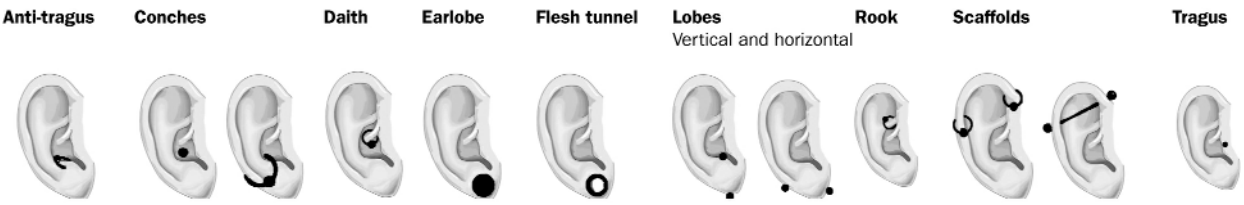
Body piercing is increasing in popularity around the world. In this review, I describe the history, origins, and peculiarities of various forms of body piercing, and procedures involved, variations in healing time, legal aspects and regulations, and complications and side-effects. I have also included a discussion of the motivation for and psychological background behind body piercing. In presenting research results, I aim to raise awareness of the many risks associated with body piercing. In presenting psychological data, I intend to create an understanding of the multifaceted and often intense motivations associated with body piercing, and, thus, to diminish any prejudices held by health professionals against people with piercings.



Known from almost all peoples of the world. Flesh tunnels are known especially from Africa and India and other Asian countries. Contemporary flesh tunnels are frequently widened with tunnel-like metal tubes, to which rings can be attached. Mostly done in pistol technique (should not be applied to cartilage). Healing times: earlobe: 6–8 weeks; cartilage: 4–12 months.
With permission from Perforations, Brighton, UK (http://www.perforations.com).

Table 1: **Contemporary ear piercings**

Body piercing is defined as "a penetration of jewellery into openings made in such body areas as eyebrows, helix of the ears, lips, tongue, nose, navel, nipples, and genitals".[1,2] Piercing of the earlobe (table 1), referred to as ear piercing, which has traditional roots in western societies, is not included in this definition, and is distinguished from practices that do not have a traditional background in western societies. Kelly Muldoon,[3] however, has suggested that what was once considered traditional—ie, single hole ear piercings—has now come to include piercings above and below the neck.[3] Body piercing sites other than the face are also called "intimate"[4] or "non-mainstream".[5] By comparison with tattoos, ear and body piercings are not considered permanent by practitioners of body art, because the tracts, especially if small, can close if jewellery is removed for a period of time. However, in regulatory legislation, definitions are kept wider and permanence is judged differently. For example, in legislation in the state of Virginia, USA, body piercing is defined as "the act of penetrating the skin to make a hole, mark or scar, generally permanent in nature".[6] In this review, I include earlobe piercing in the definition of body piercing, especially with respect to medical complications and side-effects.

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Prevalence

Body piercing and other body modifications have increased tremendously in popularity in recent years, and have started to be practised across many social and age groups.[7] However, no exact statistics for these practices are available, and estimates of incidence have been derived from studies with few participants. Estimates of the prevalence of the related body modification of tattooing in the USA lie between 7 million and 20 million people—the higher estimate is equivalent to around 13% of the population.[8] These data suggest the possibility that the number of pierced individuals is even greater, especially if those with ear piercing are included. Gauntlet, a chain of piercing shops located in California and New York in the USA and in Paris in France, reported doing at least 30 000 new piercings per year in the late 1990s.[9] Results from a survey among 481 college students in New York showed that 42% of the men and 60% of the women surveyed had body piercings.[10] In 2000 in Australia, a random sample

Search strategy

The material covered in this review was obtained from in-depth research, extensive field-work, and personal knowledge. I searched Medline, PSYNDEX, PsychLit, and PubMed databases of English, German, and French articles published from 1966 until December, 2002, using the search term "piercing" (578 references), and then narrowing results to articles relevant to "body piercing" and "ear piercing". I reviewed sources mentioned in the bibliographies of these references for additional citations, and have thus included relevant books. Additionally, I did an extensive internet search for "piercing", and narrowed results as before.

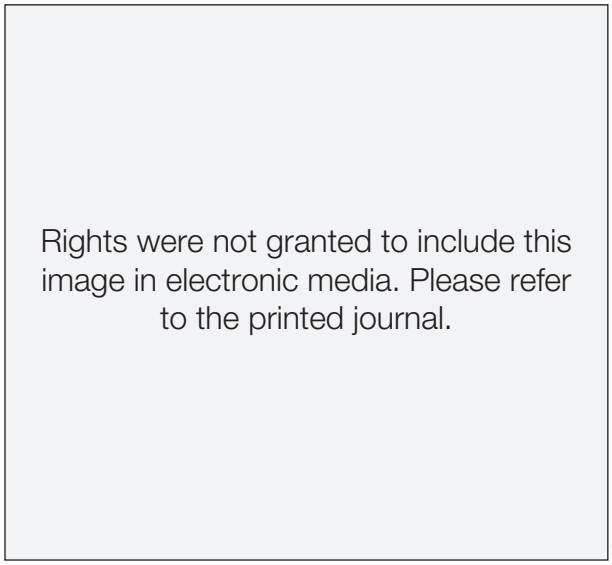

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Figure 1: **Removal of a tongue piercing**

survey of 10 030 individuals aged at least 14 years showed that 10% had had a tattoo at some point in their lives and 8% had some form of body piercing.[11] The number of individuals with body piercings in western societies is still rising and has not yet reached its peak.

In this article, I present the various contemporary forms of body piercing, their history and origins, and expose the peculiarities of piercing practices and summarise research results from various medical faculties. I have paid special attention to studies in psychosomatic medicine and psychotherapy, and, in addition to data from medical studies, have analysed results from the few studies that have been undertaken by psychologists, social anthropologists, and sociologists.

Effect on health-care systems

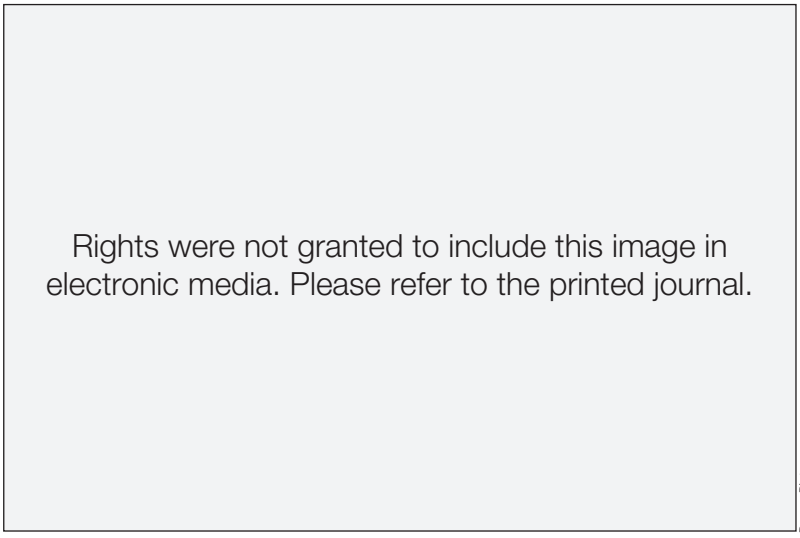
Reports of side-effects and complications associated with body piercing are increasing. These side-effects are thought to have an economic effect on health-care systems.[12] In a 1999 UK survey, 95% of family practitioners in Bury and Rochdale stated they had seen patients with a complication resulting from a piercing.[13] Among Pace University undergraduates in NY, USA, 17% reported a medical complication such as bleeding, tissue trauma, or bacterial infection relating to body piercing, especially of the navel.[11] Emergency situations, such as trauma and bleeding (including motor vehicle accidents, aspiration of the tongue or mouth jewellery, or interference with intubation) when speed of treatment is crucial and health-care professionals are unsure about how or when to remove jewellery,[14] can be especially problematic (figure 1). In a survey of 28 accident and emergency doctors, only six were able to accurately describe the opening mechanisms of the commonly used types of jewellery in body piercing.[15] Such knowledge is essential for fast action in case of emergency.

General instructions on dealing with body piercings to inform a wide range of medical practitioners are not available. Besides dermatologists, health-care professionals likely to be involved with body piercing in one way or another include surgeons, accident and emergency doctors, radiologists, urologists, gynaecologists, obstetricians, dentists, dental surgeons, otolaryngologists, internists, paediatricians, sports physicians, psychiatrists, and psychotherapists. These specialists should be familiar with issues that may be concerned with body modification, be able to discuss the topic from an informed and non-prejudiced perspective, and have access to up-to-date information to enable them to advise people with, or who are contemplating, body piercing. However, prejudices and negative attitudes towards body-modified individuals seem common even among health professionals.[16]

History, origins, and global significance

Body piercing confined to the ears, mouth, and nose has been a common practice in almost every society around the world as far back as can be traced.[17] Furthermore, body piercing is practised by contemporary tribal societies on almost all continents (figure 2), but especially in Africa, Asia, and South America. Next to beauty and community affiliation, the main motivations for body piercing in tribal societies are ritual initiation, rites of passage, and sexuality. The ability to stand pain is closely linked to passing through adolescence to adulthood, and is often commemorated by body piercing. The piercing of the male genital region has been confirmed only in a few tribes in Borneo, who wear bone implants (palang) in the glans.[18] In many tribal societies, body piercing is connected to other forms of body modification such as tattooing, encumberments (wearing iron, stone, or cane rings as heavy bracelets, anklets, neck ornamentation, footwear, manacles, encasements, chains, penile rings, etc), or compression of limbs through tight bands. Piercing of earlobes or lips mostly starts at an early age and frequently involves gradual stretching and widening of the resulting holes over time (figure 3).

Practitioners of various Asian religious traditions such as shamans in animistic or semianimistic religions perform temporary ritual piercings through their cheeks or tongue as an extroverted documentation of their state of trance. Similar piercings are seen in the followers of Sufism, the mystical form of Islam, and in adherents of extreme forms of Hinduism in India, Sri Lanka, and Malaysia—both in ascetics (sadhus) and in lay people.[19] In ceremonies dating from as early as the ancient Mayan



Panos Pictures

Figure 2: **Nose piercing in Australian Aboriginal Man**

civilisations (700 AD), whose royalty pierced their tongues and genitals as part of religious bloodletting rituals,[20] devotees pierce their bodies on special religious occasions (figure 4), often in multiple ways, or wear kavandis (frameworks of sharp metal rods that penetrate increasingly deeper into the flesh the longer they are worn).[21] Practitioners intend to show their devotion to a certain deity or to "break the illusionary boundaries of the ego as it is dictated by the body in order to reach higher states of consciousness".[22] A quite similar concept existed among North American Indian populations, such as the Mandan and the Lakota, who underwent ritual suspensions from chest piercings (Sun dance, *O-Kee-Pa*) to attain altered states of consciousness.[23]

Names for and interpretations of the significance of body piercings, especially of rather extreme forms, have been made up by promoters of body art in western societies to increase interest in the practice.[17] Reliable historical evidence of ancient piercing practices exists only for penis piercings to which jewellery is attached, as documented in the *Kama Sutra*.[24] Egyptian Pharaohs piercing their navels as a rite of passage is more myth than fact, and Roman and Greek athletes attaching their tunics to their bodies by a nipple piercing is pure invention.[17]

By the Victorian era, mentions of female nipple jewellery can be found in journals,[17] and male genital piercing was possibly also being practised. One of the most popular types of male genital piercings, the Prince Albert, is named after Queen Victoria's husband. Albert supposedly wore a penile ring, which he called a dressing ring, to firmly secure his genitals in either the right or the left leg of the extremely tight uniform trousers of the period.[19] However, historical evidence for this interpretation is disputed.[17] Little is known about the practice in the 19th and the beginning of the 20th century. However, solid evidence shows that tongue, nipple, and labia piercings were done, often together with tattoos, in Germany shortly after World War II.[25] Body piercing was probably also common before the war and existed in the USA or the UK, along with the well known and documented practice of tattooing.

In connection with a renaissance of body modification practices such as tattooing, piercing became common among members of the punk movement towards the end of the 1970s in Europe, at first with simple safety pins, and then, probably because of allergic reactions, with increasingly finer alloys of niobium or titanium. Punks' self-wounding decorations signified mutilation and thus social stigmatisation. They created a counterculture that was supposed to shock and provoke, which was interpreted as an expression of a feeling of impotence in a competitive society.[26] At the same time, body piercing became popular among homosexual and sadomasochist subcultures in the USA and UK. Fashion designers took piercing, along with punk and sadomasochistic styles, as an inspiration, and these trends had repercussions on mainstream taste. Body piercing also became a trademark among idols of the music and film scene around this time.[27]

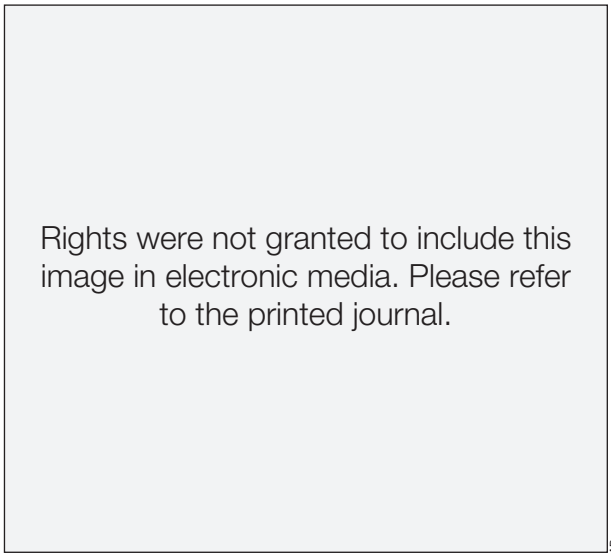


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Figure 4: **Singapore Hindu man in Hindu Thaipusam procession, Singapore**

During the past 20 years, body piercing has become common in the USA, the UK, France, Germany, and other western countries. Previously identified exclusively with individuals outside mainstream society, body piercing is gaining widespread popularity, especially with adolescents.[28] In 1997, the *Hartford Courant* cited the tattoo industry (of which body piercing practice is a part) as being among the top six fastest growing businesses.[29] Recent developments in body art practices include brandings—scarifications through the application of a heated material to the skin; cuttings—designs cut into the skin using a sharp blade, leaving a fine scar; and implants—implantation of three-dimensional objects under the skin for the purpose of affecting a sculptural change of the surface.


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Figure 3: **An Apa Tani woman from northeast India with wooden disks in pierced nose and earlobes**

Regulations

Body piercing is done in regulated and unregulated shops, department stores, jewellery shops, homes, or physicians' offices. Generally no antibiotic is used, and sterilisation methods vary. Ear piercing is frequently done in beauty salons or jewellery stores, and body piercing often takes place in tattoo establishments. In general, body piercing is in the hands of unlicensed personnel, who have learned techniques from magazines, videos, and other people who do piercings (piercers).[30] Although some

practitioners claim to be certified, there are no official agencies that grant certification and it is up to the piercer to understand and use aseptic techniques and sterilise equipment correctly. In a highly unregulated industry, uninformed clients have difficulty knowing whether the piercer is using proper procedures and equipment. However, self-interest groups and associations have been founded by professional piercers and tattooists in several countries to promote good practice. They provide online guidelines for hygiene and techniques, and work in close association with health workers on the development of model codes for comprehensive approaches and consistent regulations.[31–34]

Despite the industry's rapid growth, the USA has no universal regulations for body art practitioners. Only 13 (26%) states apply some regulatory authority over tattooing establishments, and only six of these exercise authority over body-piercing establishments.[32,35]

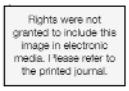
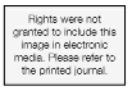
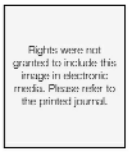
In the UK, the local government (miscellaneous provisions) act of 1982 relates only to tattooing, acupuncture, electrolysis, and earlobe piercing, which reflects the low incidence of other forms of piercing at the time the legislation was framed.[36] Female genital piercings are not permitted under the UK prohibition of female circumcision act, 1985, which prohibits cutting, piercing, or otherwise modifying female genitalia for non-medical reasons.[4] In the UK, only London Boroughs have any powers to inspect body piercers.[13] After a recent department of health consultation exercise,[37] however, proposals have been put forward to introduce relevant legislation, albeit alongside the deregulation of other forms of skin piercing.[38]

The European Union has issued a general prohibition of piercing jewellery containing nickel, which became effective, for example, in Germany in June, 2000.[39] In Germany, hygiene regulations in piercing and tattoo establishments are enforced by local health departments. Several programmes have been developed for better compliance of piercing and tattoo establishments in terms of maintaining hygiene standards, at times in cooperation with tattoo establishments.[40,33]

Sites and procedures

Earlobes and ear cartilage are the sites most frequently pierced. Other body parts that are often pierced include eyebrows, nose, cheeks, lips, frenulum, tongue, uvula, nipple, navel, and various genital sites (tables 1–5). Piercings in less frequently used sites, including flat surfaces such as the chest wall or the palm of the hand, have a high rate of rejection.[23]

Body piercing is usually done without anaesthesia. A hollow 12–18-gauge needle is passed through the body part and body jewellery inserted in the hole. A common side-effect is bleeding, which can be substantial in certain sites. Piercing guns can lead to tissue crushes and are difficult to sterilise. The type of jewellery used depends on the body part and has to be appropriate in length and width to accommodate the swelling that follows the piercing procedure. The alloy should be composed of surgical grade steel, niobium, titanium, or 14 or 18 carat gold to avoid skin reactions to brass or nickel.[41] Healing times for body piercing vary substantially with the site (tables 1–5).

Place and look of piercing	Name	Origin (O), background (B)	Description, peculiarities, and healing time (HT)
	Nostril	O: India, South Asia. Already belongs to the more or less mainstream fashion piercings in western societies.	HT: 6 weeks to 4 months.
	Septum	O: India, Africa, Polynesia, South America. B: nose-stick variation is intended to prevent evil spirits from creeping into the person by symbolically closing the respiratory tract.	Piercing goes through the thin tissue below the cartilage of the nasal septum. HT: between 6–8 weeks and 6–8 months. Place is pressure-sensitive for some time and remains open for a long period even if jewellery is removed. It tends to be rather painful.
	Labret	O: South-American Indians, Africa: Kenya, Zambia, north Cameroon.	Upper lip piercing is called Madonna (UK) and Marilyn (USA). The real labret is worn 1 cm below the lower lip. HT: the lower lip might be swollen for a few days. With time, the cap sinks into the flesh of the lip's inner wall. 2–3 months.
	Eyebrow	O: Europe and North America in the 20th century.	Should not be executed closer to the nose than the middle of the pupil because of the fascicles. HT: 6–8 weeks.
	Tongue	O: ritual impermanent act among Mayan people; Asian religious traditions such as shamanism or Hinduism. B: to show spiritual strength.	Care has to be taken, since not skin but a muscle is pierced. Skin swells after the piercing for 3–5 days. Variation: tongue frenum. Even uvula. HT: 3–6 weeks.
	Bridge (nose root)	O: Europe and North America in the 20th century.	Very dangerous because of the many fascicles. HT: 8–10 weeks.

*Images from Ziegler B, Zoschke B. Body piercing. Rastatt: Pabel Moewig, 1997. Originally published in *Transfigurations*, Quadrillion Publishing Inc.
†Image with permission from Perforations, Brighton, UK (http://www.perforations.com).

Table 2: **Contemporary facial piercings (male and female)**

Place and look of piercing	Name	Origin (O), myths (M)	Description, peculiarities, and healing time (HT)
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Navel	O: Europe and USA in the 20th century. M: Egypt. As a sign of nobilty it was reserved to priesthood and aristocracy.	Difficult to do. Best if umbilicus does not protrude. HT: depends on age and thickness of skin and depth of navel. 4 weeks to 12 months. Dampness from perspiration can prolong the healing process.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Nipple	O: society girls of the Victorian era to enhance the shape and size of their nipples. M: Roman centurions: as a sign of courage and virility; as dress accessory for holding their short capes. North African Cabyle women: as part of traditional customs. South Turkish Cilician women: left breasts as part of a ritual initiation. Aristocratic ladies at the court of Louis the 14th: to be fashionable.	Normally on the lower side of the nipple, if the nipple is very small, the areola is used. Unprofessional piercing may cause outgrowing of the ring. Piercing direction normally is horizontal, however, vertical and diagonal piercings are also done. Pegs may cause swelling. Normally breastfeeding is not constrained, milk ducti remain intact. Should be removed in the 6th month of pregnancy, can be re-implemented 3 months after ablactation. HT: 6 weeks to 6 months.
	Armpit, chestwall, handweb	O: Europe and North America in the 20th century.	Rings grow out of the skin fast. High incidence of rejection.

*Images by Doug Malloy. Courtesy of RE/Search Publications, San Francisco, USA.

Table 3: **Contemporary body piercings (male and female)**

Health effects and complications

General

The rate of acute complications resulting from body piercing is determined by piercing site, material, practitioner experience, hygiene, and aftercare (table 6). Local infection or bleeding is reported in 10–30% of piercings.[42–44] In the UK, 95% of family practitioners reported treating medical complications arising from body piercing in various sites: navel (40%), ear (35%), nose (12%), nipple (5%), and 8% split between tongue, chin, eyebrows, and genitals.[13] Infection was the most common cause of complication accounting for 78% of all admissions. Typical symptoms are redness, swelling, warmth, pain, and purulent drainage. The most common causal agents are *Staphylococcus aureus*, group A streptococcus, and *Pseudomonas* spp, which can cause life-threatening complications even in the earlobe.[42] However, the incidence of severe complications in the ear region is below 1%.[44]

The risk of sexually transmitted diseases (STD) varies with the circumstances and hygiene of the piercing procedure.[12] Viral transmission is another risk (hepatitis B, C, D, or G), and a few cases of fatal fulminant hepatitis have been described immediately after piercing.[42,45,46] However, whether piercing is a general risk factor for hepatitis infection is unclear.[47–49] HIV infection can probably be transmitted by piercing.[42] In general, both piercer and recipient risk transmission of viral and bacterial infections from exposure to contaminated needles or instruments.[12] Transmission of tetanus, leprosy, and tuberculosis have also been reported.[42,50,51]

Pseudolymphoma or lymphadenopathy can occur in any individual who has been pierced.[52] Any break in the skin can expose a person to the danger of a local infection as well as systemic illness. Cellulitis or abscesses can result from infection invading surrounding tissue. In extreme cases, infection can become systemic, especially if local infection is not properly treated or immune response is impaired.[53–55] Scars and keloid scars can also result.[41,56]

Place and look of piercing	Name	Origin	Description, peculiarities, and healing time (HT)
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Outer labia	Europe and USA in the 20th century.	Due to the thickness of the tissue, several and even heavy ornaments may be worn. Thus, a ladder is an arrangement of multiple parallel piercings. After piercing, the labia tend to swell considerably for a few days. HT: 4–10 weeks.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Inner labia	Europe and USA in the 20th century.	HT: short if hygiene precautions are heeded and clothes worn are not too tight. Piercing hole vanishes fast after removal of ring.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Clit, clit hood, triangle	Europe and USA in the 20th century.	Since clitoral piercing is difficult and very painful, piercing of the clitoral hood is practised more frequently. Horizontal and vertical piercings may be channelled. Triangle is a very deep horizontal hood piercing, and is done behind the clitoris as opposed to in front of it. Usually done at the crease of the hood, and often with a ring. HT: 4–10 weeks.

*Images from Ziegler B, Zoschke B. Body piercing. Rastatt: Pabel Moewig, 1997. Originally published in *Transfigurations*, Quadrillion Publishing Inc.
†Images by Doug Malloy. Courtesy of RE/Search Publications, San Francisco, USA.

Table 4: **Contemporary genital piercings (female)**

Place and look of genital piercing	Name	Origin (O), background (B), and myths (M)	Description, peculiarities, and healing time (HT)
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Ampallang	O: Borneo and supposedly Sulawesi (Celebes) in Indonesia. B: part of ritual initiation. Jewellery was made of bone, ivory, or precious metal Intended to give sexual pleasure to female sexual partners.	Horizontal pin through the glans (spongeosum). Very bloody and painful. Requires an experienced piercer. If cavernosum is hit by mistake, bleeding can be very hard to stop, loss of erection may follow. HT: 8–10 weeks, sometimes even 6 months. Foreskin has to remain pulled back for adequate circulation of air.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Apadravya	O: India. Described in the *Kama Sutra*.	Vertical pin through the glans, mostly between the onset of the frenulum and the top of the glans. Difficult and uncommon piercing that requires an experienced piercer. HT: at least 2 months.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Dydoe	O: USA in the 20th century. M: supposed to have originated in the Jewish community. B: intended to sexually stimulate its wearer.	Worn by circumcised men. Through the rim of the glans. Requires a professional piercer. HT: 4–6 weeks.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Prince Albert	O: USA in the 20th century. M: supposedly derived from Queen Victoria's husband, who is said to have pierced a ring through his penis tip to attach his penis either to the right or the left of his uniform trousers.	Piercing goes from the opening of the urethra to the frenulum (reverse Prince Albert goes to the top of the glans). The size of the ring must be chosen correctly—small rings may cleave the glans, large rings may cause pain for the partner. HT: quite fast (aided by sterility of urine).
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Frenum/frenulum	O: unpierced penis rings are known from a number of tribal societies (eg, Tangkhul Nagas in northeast India). Pierced version: Europe and USA in the 20th century. B: used to prevent (frenum) or facilitate erection (frenulum).	Less painful than other penis piercings, easier to execute. A variation of the frenulum is the frenulum ladder—an arrangement of multiple parallel piercings along the bottom of the penis.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Guiche (female version fourchette)	O: USA in the 20th century. M: South Pacific Islands (Tahiti). Part of ritual initiation. Adolescent men are cut with a knife and a leather ring is pulled through the opening. Intended to stimulate the perineum.	Piercing canal with a hollow needle through seam between scrotum and anus (raphe). Steel ring, sometimes with additional weights through the opening. HT: at least 6–8 weeks, during which sitting or bicycling may be painful.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Hafada	O: USA in the 20th century. M: Arab countries. Part of ritual initiation. Symbolically meant to prevent the testis from re-ascending back into the belly. Sign of wealth and manliness.	Scrotal skin piercing between testis and penis base. Not very painful. Experience needed. Serves rather a decorative than a sexual purpose. Often several rings are worn to which jewellery or weights are attached. HT: short.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Pubic	O: Europe in the 20th century. B: serves a decorative rather than a sexual purpose.	To be pierced directly above the penis base, in order to prevent lengthy healing times.
Rights were not granted to include this image in electronic media. Please refer to the printed journal.	Oetang	O: USA in the 20th century. M: it was used as a chastity belt both in Myanmar and in Ancient Rome for slaves and athletes.	Foreskin is pierced on both sides of its edge and is closed with rings. Other foreskin piercing may contain multiple rings. HT: short; more than two piercings should not be done at the same time, since this part may swell considerably.

*Images from Ziegler B, Zoschke B. Body piercing. Rastatt: Pabel Moewig, 1997. Originally published in *Transfigurations*, Quadrillion Publishing Inc.
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Table 5: **Contemporary genital piercings (male)**

Operating theatre procedures

Health professionals working in operating theatres must be clear about policy and procedures concerning piercings. Electrical burns can occur if body jewellery is worn and exposed to a current, as occurs during electrocauterisation. Also, all piercing jewellery must be removed before magnetic resonance tomography procedures. Jewellery may be removed—ideally with the patient's consent—either before, or if too painful, during general anaesthesia, and should be replaced before the patient is transferred to the recovery room. Jewellery that has been removed should be treated as contaminated with body fluid and placed in a container with antiseptic solution.[57]

To remove jewellery, the bead must be detached.[58] There are two types of bead closures: captive bead ring and bead screw. The captive bead ring is held closed by

pressure; the hoop can be opened and pulled apart at the bead. The bead screw is commonly part of hoops, barbells, and circular barbells (often called horse shoes); the bead is removed by turning counterclockwise. A guide to oral jewellery removal and preparation of a non-metal jewellery replacement is available online.[59]

Ear

Infection and purulent discharge can result from non-sterile piercing techniques.[46] The lobe can split or tear,[60] especially if it is gradually stretched to accommodate a so-called flesh-tunnel ring. Other complications include chondritis from *Pseudomonas* spp infecting cartilage,[61] cephalic tetanus,[62] non-menstrual toxic shock syndrome from absorption of an endotoxin produced by *Staph aureus*,[53,63] and conversion to hepatitis seropositivity.[47,48] Side-effects include pyrexia, headache, sore throat, vomiting, diarrhoea, and confusion.[64] Piercings in the cartilage of the rim of the ear can be difficult to heal, since the blood supply needed to promote healing is poor. Proximity of hair and pressure on the ear during sleep promotes infections.[41]

Eyebrow

In a case report of complications after eyebrow piercing, transient local inflammation was noted, which healed

Piercing site	Infections/syndromes/side-effects/ severe complications	Causative agent	Reference
General	Local to systemic infection. Pseudolymphoma, lymphadenopathy	*Staphylococcus aureus*, group A streptococcus, and *Pseudomonas* spp	Guiard-Schmitt et al (2000)[42] Mann and Peachy (1983)[52]
	Hepatitis	Hepatitis B, C, D, G	Guiard-Schmitt et al (2000)[42] De Man et al (1999)[45] Samantha et al (1998)[46]
	Possibly AIDS	HIV	Guiard-Schmitt et al (2000)[42]
	Tetanus	*Clostridium tetani*	Dyce et al (2000)[50]
	Tuberculosis	*Clostridium tetani*	Guiard-Schmitt et al (2000)[42]
	Leprosy	*Mycobacterium tuberculosis* *M leprae*	Mittal and Gupta (1997)[51]
Ear	Chondritis, perichondritis, local infection, or perichondrial auricular abscesses	*P aeruginosa*, lactobacillus (in diabetics)	Koenig and Carnes (1999)[76] Simplot and Hoffman (1998)[44] Turkeltaub and Habal (1990)[61]
	Non-menstrual toxic shock syndrome	Endotoxin of *Staph aureus*	McCance and Huether (1994)[54]
	Post-streptococcus glomerulonephritis	Group A streptococcus	McCarthy and Peoples (1988)[63]
	Hepatitis	Hepatitis B, hepatitis C, hepatitis delta	Hayes and Harkness (2001)[48]
	Cephalic tetanus	*C tetani*	Strom et al (1998)[62]
Nasal region	Post-piercing infections	*Staph aureus*	Armstrong (1998)[41]
	Endocarditis	*Staph aureus*	Ramage et al (1997)[66]
	Granulomatous perichondritis of the nasal ala	*P aeruginosa*	Folz et al (2000)[67]
Mouth region	Abrasion of tooth surface, teeth fractures	..	De Moor et al (2000)[71]
	Endocarditis	*Haemophilus aphrophilus*, *Neisseria mucosa*	Akhondi and Rahimi (2002)[35] Tronel et al (2001)[74]
	Local infection	*Staph aureus*, *Pseudomonas* spp	Bassiouny et al (2001)[72] Price and Lewis (1997)[73] Scully and Chen (1994)[75]
	Post-piercing oedema. Trauma to the lingual anterior gingiva	..	Keogh and O'Leary (2001)[68]
	Deep abscess of the tongue and acute dyspnoea with hereditary angio-oedema	..	Olsen (2001)[70]
	Cerebral abscess (cerebellum)	*Strep viridans*	Martinelli and Cooney (2001)[78]
	Ludwig's angina with infection of the spaties	Group A streptococcus	Koenig and Carnes (1999)[76] Samantha et al (1998)[46] Perkins et al (1997)[77]
Nipple	Granulomatous mastitis presented as mass lesion	*M abscessus*	Trupiano et al (2001)[80]
	Epidermis endocarditis in a patient with a bicuspid aortic valve	*Staph aureus*	Ochsenfahrt et al (2001)[81]
	Infection of breast implant	*Staph aureus*	Javaid and Shibu (1999)[82]
Navel	Local infection	*Staph aureus*, group A streptococcus, and *Pseudomonas* spp	Mayers et al (2002)[14]
Female genitals	Strictures	..	Kaatz (2001)[12]
Male genitals	Prostatitis, testicular infection	*Escherichia coli*, *Klebsiella* spp, *Proteus mirabilis*, *Pseudomonas* spp, *Staph aureus*, *Enterococcus* spp, *Staph saprophyticus*	Kaatz (2001)[12]
	Paraphimosis	..	http://www.perforations.com (2002)[89]
	Priapism	..	Slawik et al (1999)[92]
	Condolymata acuminata	..	Altman and Manglani (1997)[87]

Table 6: **Infections and severe complications**

spontaneously. 1 month later, pain, pressure, redness, and swelling of the cheek and face developed with a solid, movable, tender, cherry-size swelling of the lateral third of the right eyebrow, redness of the eyelid, and a large swelling of the cheek. The condition required systemic antibiotics and surgical removal of inflammatory tissue. The muscle and piercing-canal tissue contained histiolymphocytic infiltrates with epithelioid and solitary giant cells.[65]

Nose

Staphylococcal endocarditis of the mitral valve has been reported after nasal piercing and subsequent embedding of jewellery in subcutaneous tissue,[66] as well as granulomatous perichondritis of the nasal ala.[67] Since the nose can be colonised by staphylococcal organisms, this site is particularly susceptible to infection after piercing. A high risk lies in piercing the bridge of the nose, since many nerve fascicles cross that area (table 2).[27]

Mouth

Tongue piercing carries various risks: airway obstruction due to post-piercing oedema, critical upper airway compromise after central tongue piercing,[68] intensive bleeding, and hypovolaemic shock.[69] A case report of tongue piercing noted a deep lingual abscess and acute dyspnoea of a patient with hereditary angio-oedema, who became symptomatic during piercing.[70] Common dental problems include chips, cracks, and cusp fractures of teeth as well as selective dental abrasion. Trauma to the lingual anterior gingiva is the most common gingival problem. Oral piercings can also interfere with mastication.[71] Complications after tongue piercing include bacterial infections with *Staph aureus* and *Pseudomonas* spp,[72,73] neisseria endocarditis,[74] and Ludwig's angina;[75–77] and cerebral abscess as a secondary complication.[78] In emergency situations, tongue or mouth jewellery can be aspirated, interfere with intubation, or be torn out, causing blood loss. If a piece of jewellery is aspirated, visualisation with a laryngoscope and removal of the item is necessary to clear the airway. A radiograph might be necessary to locate aspirated rings or studs if they cannot be seen.[57]

Nipple

Case reports of complications after piercing of the nipple include a patient who began to produce breast milk about 5 weeks after having both her nipples pierced along with massively raised prolactin concentrations,[79] a patient who developed granulomatous mastitis due to mycobacterium abscess that presented as a mass lesion,[80] a patient with a bicuspid aortic valve who developed endocarditis,[81] and another whose breast implant became infected.[82] Defibrillation during cardiac arrest could result in burns if a nipple ring were present. During breastfeeding, the ring might increase any discomfort felt by the mother, or if dislodged, be aspirated by the feeding infant.[41] Nipple piercings that are accidentally torn out can cause abscess formation that could require drainage, surgical irrigation, and debridement.[83] Piercing of an adolescent's nipple could cause problems during growth.

Navel

40% of reported piercing complications result from navel piercing.[10,13] Not all navels can be successfully pierced. An infection of an extroverted navel, being a remnant of the umbilical cord, could spread to the interior of the abdomen and internal organs. A navel pointing inward with a distinct ridge or lip is most likely to be able to be pierced successfully, but navels without a distinct ridge often cannot support a piercing, causing migration or rejection of the jewellery.[84] Navel piercings can take up to 9 months to heal,[6] a process that can be hindered by tight clothing that increases moisture and thus promotes bacteria. Piercing jewellery can cause discoloration of the skin and a persistent discharge. Finally, during gestation the navel ring might impede the growing uterus.[85]

Genital

Healing times of genital piercings are long. After piercing of the female genital tract, inflammatory pelvic bowel disease can develop, which may lead to sterility.[12] During birth, delivery could be impeded, depending on the piercing. The orifices pierced can become obstructed, which could hinder insertion of a urethral catheter. Strictures are a common chronic complication since some piercings lead directly through the urethra.

A urethral rupture occurred in a homosexual man after avulsion of a Prince Albert penile ring.[86] Injuries of large blood vessels or nerves and infections can cause acute complications in male genital piercings. Infertility can result from an ascending infection, for example as a consequence of prostatitis or infection of the testis after scrotal piercing.[12] A case of recurrent and widespread condylomata acuminata has also been reported.[87] Lesions can occur in male homosexual partners of men with a Prince Albert piercing.[88] Furthermore, many penile piercings result in additional permanent openings of the urethra that permit additional outlets for urine and semen. Paraphimosis, a strangulation of the glans caused by foreskin retraction, can occur in penile piercings in uncircumcised men. The tip of the penis becomes swollen and tender as blood and fluid are trapped. To release the constriction, the foreskin is pulled down over the glans.[89] Priapism can be caused by penile rings.[90–92] Risk of infection is increased if pierced individuals engage in sexual intercourse while the wound is still healing. Certainly, piercing of an adolescent's genitalia can cause problems as a result of growth. Finally, condoms can become damaged by piercings during intercourse.

Psychological and sociological perspectives

Few data exist for the psychological and sociological aspects of body modifications in western societies. Most reports in this area have discriminative overtones, associating a certain psychopathological or antisocial behaviour with forms of body modification such as tattoos or piercings.[93] Even forensic and psychiatric studies associate culturally-sanctioned practices such as tattooing and body piercing with self-mutilation—ie, deliberate, non-suicidal destruction of one's own body tissue.[94] Body piercing has also been described as a "fashion-caused infringement of physical immaculacy",[43] that "mutilates the body".[95] Unfortunately, potential employers also tend to have negative perceptions of pierced individuals.[16] Nowadays, discriminatory and exclusively pathological interpretations of this widespread practice are not appropriate.

Body piercing can be interpreted as a visible, self-produced violation of socially defined beauty standards and body boundaries and, thus, arouses social provocation.[93] Provocation, however, is certainly one of the motivations for body piercing in teenagers; other

reasons include making a personal statement, being daring, and being fashionable. The most common background for piercing in teenagers is peer pressure and the wish to fit into a group.[2] If an adolescent wants some form of body art (tattooing, body piercing, or branding) they will often obtain it regardless of regulations, risks, or financial cost.[96]

One view is that body piercing might be undertaken to increase self-esteem.[5] The need for even young adolescents to improve their appearance and self-esteem with extreme and even risky measures can be viewed as evidence of a regressive trend in western culture.[97] However, this view does not address the fact that many body piercings are done by college students—who are in transition between childhood and adulthood. Thus, for students in particular, body art is "a way of creating their own rite of passage for something that they miss in our societies, and which these do not hold in stock for them"—ie, a comprehensive preparation in adolescence for adulthood.[98] Furthermore, body piercing is not connected to a pathological "lust for pain",[5] the pain involved is only the side-effect necessary for a successful rite of passage, which can be understood as one of the main motivations for body modifications even in western societies.[5]

Thus, the occasionally suggested connection between erotic piercings and sadomasochism and fetishism[99] can no longer serve as the only valid interpretation of the motivations underlying piercing. Results of a survey among 134 readers of a body-art magazine showed that fewer than 20% saw themselves as being a masochist, sadist, fetishist, exhibitionist, or narcissist, though slightly more than 50% thought of themselves as "adventurous".[100,101] Some female participants reported that they experienced their first orgasm during vaginal intercourse after getting clitoris or clitoral hood piercings.[17]

Traditionally, genital piercing has long been associated exclusively with homosexual men; however, both women and men undergo genital piercings for aesthetic and sexual reasons.[7] In a study undertaken by a clinic for sexually transmitted diseases, body piercing was not correlated with socioeconomic status, method of contraception, multiple partners, or the presence of genital infection.[102] The results of the study also supported the suggestion that most body piercing is done for reasons of fashion. Indeed, within a context of changing ideals of beauty and fashion norms, body piercing can be understood as one of many worldwide traditions of body alteration to concord with culturally sanctioned standards of beauty.[93] However, to consider body piercing as only a fad might be shortsighted, since fashion, by definition, implies a transient and changing state. In interviews with 35 individuals with various degrees of piercings and tattoos, Paul Sweetman[103] noted that most participants described using body piercing to create something different, individual, and lasting on themselves, despite being aware that piercings are not as permanent as tattoos. This attitude and the intense pain frequently involved in piercing contradict the fashion theory.

Rather, it is likely that piercings and tattoos derive their meaning from both the process and the result. Sweetman's findings are supported by those of a questionnaire survey of 104 people that I undertook.[104] Additionally, among the most frequently stated reasons for having a body piercing were that the piercings denoted individuality and personal identity. Participants described feeling whole, new, or contained as individuals since they had their piercings done, and that this feeling grew stronger with every new piercing. These individuals reported that they got their piercings at special moments in their lives, to commemorate positive experiences or to mark the end and overcoming of negative ones. There is a strong relation between tattoos and piercings and personal events, especially if traumatic.[105–108]

Commemoration or overcoming of personal traumatic episodes by tattooing or piercing applies especially to female genital piercings. These piercings seem to allow people to reclaim parts of their body that they had psychologically separated from themselves because experiences associated with these parts of their body, such as sexual abuse, were too painful to be supportable.[108,109] Through the act of re-experiencing a violent pain, but in the controlled setting of the body-piercing session during which the former victim psychologically identifies themselves with the aggressor, the reclamation of body parts that were disassociated in the traumatic act becomes possible. Thus, body piercing can be thought of as a process aiding the construction of a coherent sense of self-identity, a form of self-creation. The semipermanence of piercing is suitable for the establishment of a consistent personal narrative,[103] enabling certain life events to be marked and being replaceable if the episode is overcome and the piercing is no longer needed.

Thus, body piercing can also be seen as a therapeutic action: the procedure is followed by weeks or months of self-care, which forces the individual to be concerned with their body and themselves during the healing process. Because of the often intense meanings practitioners of body piercing attribute to this practice, the topic should be investigated, at least briefly, in anamnestic exploration.[2,104]

Conclusion

Depending on where on the body a piercing is located, body piercing makes both an introverted, private, and an extroverted, public statement towards society. In return, piercing is perceived with ambivalence and somewhat negatively by society. However, the collective prejudices against body piercing and the often severe side-effects seem to be incentives rather than disincentives for the practice. Thus, irrespective of personal judgment, this form of body modification should be accepted as a social reality. Health professionals should therefore be aware of the latest research results in this area to be able to give adequate advice and deal competently with any side-effects.

To limit the effects of body piercing on individuals and the general health system, authorities (health ministries and departments) and those involved in the business (piercers, tattooists) should establish uniform and obligatory regulations for the piercing industry (training, education, and hygiene enforcement). At the same time, any health professional treating a pierced individual should be free from prejudice and aware of the messages that an individual might be trying to convey with their body piercings, such as a sense of identity and a coherent self.

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