- **Warts usually resolve spontaneously, because of the development of natural immunity to the human papilloma virus, but time to resolution can vary markedly between individuals:**
    - Two-thirds of warts will resolve spontaneously after 2 years [Sterling et al, 2001].
    - Trials have found cure rates of 30% at 10 weeks with placebo preparations [Bigby and Gibbs, 2005].
    - One study found that, in children with warts at the age of 11 years, 90% no longer had warts by the age of 16 years [Sterling et al, 2001].
    - Warts seem to persist for longer in older children and adults [Massing and Epstein, 1963].
    - A wart may persist unchanged for months or even years, or alternatively large numbers may develop rapidly [Sterling and Kurtz, 1998].

- Treatment failure (defined as incomplete clearance of wart) and recurrence are common [Rinker and Shenefelt, 2005].
- In immunocompromised people, warts may be impossible to eradicate [Lowy and Androphy, 1999].

Plantar warts

- **Corns and calluses**
  - Common skin lesions, in which there is a localized area of thickened skin (due to exposure to friction or pressure).
  - Most commonly occur on the hands and feet.
  - Corns are inflamed and painful, while calluses are areas of painless hard skin.
  - Paring of corns leads to a pearly bead of keratin, rather than a small thrombosed vessel of viral warts.

[Arnold et al, 1990]

Clinical type	Site	Appearance	Number
Common wart	Typically occur on the hands (palmar warts), elbows, and knees, but can occur anywhere	Firm, rough, keratotic papules and nodules	Single or multiple, but usually less than 20
Plane wart (flat warts)	Typically occur on the hands, face, and legs, usually in young children (rare in adults)	Flat-topped papules with minimal scaling. Skin-coloured, light brown, or pigmented rashes are often not recognised as planar warts.	One to a hundred; may coalesce
Plantar warts (verrucas)	Occur on the soles of feet, as well as heels and toes. Can be overlying the metatarsal heads, but also consider calluses in pressure-point areas.	Sharply defined, rough, keratotic lesion with a smooth collar of thickened skin. Punctuate black dots (thrombosed capillaries) are seen if the surface is shaved away.	Single or multiple, usually less than 20. Individually can grow from 1 mm to 1 cm in size, but may coalesce to form mosaic warts.
Mosaic warts	Hands or feet	Occur when palmar or plantar warts coalesce into larger plaques	Usually one or a few in an area, but often with nearby small individual plantar warts.
Filiform warts	Face	Fingerlike projections	Typically in clusters

Data from [Sterling and Kurtz, 1998; Lowy and Androphy, 1999; Sterling et al, 2001]

- epidermis of the skin and caused by infection with the human papilloma virus (HPV).

    - HPV infects epithelial cells, and viral replication results in proliferation of the cells with the formation of the typical warty papule or plaque.
    - Over 100 HPV types are recognized, with affinity for different sites of the body.
    - Mucous membranes and anogenital regions can be affected.
    - The clinical appearance of warts is variable and depends to some extent on the type of HPV involved and the site of infection.
- Warts are benign lesions:
    - A small subset of HPV types (types 6, 11, 16, 18, 31, and 35) are associated with cervical carcinoma and some anal, genital and oropharyngeal carcinomas (especially in people with immunosuppression).
    - The common types associated with genital warts (type 6 and 11) however are not associated with cancer.

[Rinker and Shenefelt, 2005]

How are they caught and spread?

- Warts are spread by contact, either directly from person to person, or indirectly via fomites left on surfaces (such as towels, shoes, floors) [BAD, 2005].
- Infection via the environment is more likely to occur if the skin is macerated and in contact with roughened surfaces (conditions that are common in swimming pools and communal washing areas).
- Auto-inoculation can lead to persistence of infection:
    - Scratching can lead to local spread of wart lesions.
    - Nail biting and finger sucking spreads subungual and periungual lesions [Sterling and Kurtz, 1998].
    - Shaving of the face or legs can cause plane/flat warts to spread [Sterling and Kurtz, 1998].
- Warts are thought to be contagious for as long as they are present [HPA, 2003].
- The incubation period varies from 1 to 24 months [HPA, 2003].

How common are they?

- treatment can cause adverse effects (such as local skin irritation).
- **Treatment may be preferred if** the wart is painful or cosmetically unsightly, or if it is persisting. If treatment is required:

    - **Offer topical salicylic acid or clinic-based cryotherapy** with liquid nitrogen.
    - **Alternatively,** occlusion with duct tape can be tried.

- **Children with warts and verrucae should not be excluded from activities such as sports and swimming.** However, it is sensible to consider measures to reduce the risk of transmission:
    - Cover the wart with a waterproof plaster when swimming.
    - Wear flip-flops in communal showers.
    - Avoid sharing towels

- **Topical salicylic** acid can be self-administered and seems to be as equally effective as cryotherapy, but is less likely to cause adverse effects. Avoid use on the face.
- **Clinic-based cryotherapy** requires several clinic visits, can be painful at the time of application, and is more likely to cause adverse effects such as local pain and blistering.
- **Duct tape** has only limited evidence supporting its effectiveness, but adverse effects are uncommon. Avoid use on the face.
- **Facial warts:** cryotherapy is recommended. Avoid salicylic acid (risk of severe irritation and scarring) and duct tape (risk of irritation and unsightly).
- **Pregnancy:** try not to treat at all (warts are eventually self-limiting) or use a treatment that does not contain salicylic acid, such as duct tape or cryotherapy.
- **People with poor circulation** (diabetes and peripheral vascular disease): both salicylic acid and cryotherapy should be avoided where possible (increased risk of damage to skin, nerves, and tendons). Consider referral to chiropody to exclude corns, calluses, and underlying ulcers for plantar warts.
- **Apply treatment daily.** It may need to be used for 12 weeks or longer.
- **Before applying treatment, soak the wart** in warm water for 5 minutes to soften the skin.
- **Peel off any film** remaining from the previous application.
- **Debride the wart/verruca surface with a disposable nail-file once or twice a week,** to remove excess keratin (hard skin). (Do not share nail-files.)
- **Additional occlusion,** for example with a plaster, might improve the clearance of warts.
- Age from 4 years onwards

Advice: Freezing warts or verrucas with liquid nitrogen can be used to treat them. Liquid nitrogen is sprayed on, or applied to, the wart by the GP or practice nurseShared decision making

- **Warts and verrucas usually clear without treatment.** You have about a 50/50 chance that they will go within a year. Most go eventually.
- If you prefer treatment:

Salicylic acid will usually clear warts:

- Apply each day. It takes up to three months to clear warts.
- Rub off the dead tissue from the top of the wart with a pumice stone or similar once or twice a week.
- It is best to soak the wart in water for five minutes before applying the salicylic acid.
- Do not apply it to the face.
- Try not to get it on the surrounding skin.

- **Freezing the warts** is an alternative — for example, with liquid nitrogen. It is about as effective as acid, but may be painful.
- **Covering with tape may also clear warts:**
    - Cover the wart with duct tape and leave for six days. (If the tape falls off, apply a fresh piece.)
    - After six days, remove the tape, soak the wart in warm water for five minutes and then gently rub off dead tissue with a pumice stone or similar.
    - Leave the wart uncovered overnight and apply a fresh piece of tape the next day.
    - Continue treatment for up to two months.
    - develops for a day or so on the nearby skin after treatment.

Alternative: duct tape

Advice note: duct tape

- Age from 1 month onwards
- Advice: Cover the wart or verruca with duct tape for 6 days. (If the tape falls off, apply a fresh piece of tape.) After 6 days, take the tape off and soak the affected area in warm water to soften the skin (e.g. for 5-10 minutes). Rub the wart/verruca surface gently with a nail file or foot file to remove hard skin. Leave the wart uncovered overnight and then reapply the duct tape the next day. Continue treatment until the wart/verruca disappears. If it is still persisting after 2 months of treatment, seek further medical advice.