

## PedsCases Podcast Scripts

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### **Approach to Warts**

Developed by Aryan Riahi and Dr. M.B. Shokravi for PedsCases.com.  
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### **Introduction**

Hello, and welcome to PedsCases! My name is Aryan Riahi and I am a 4<sup>th</sup> year medical student at the University of British Columbia. This podcast was developed in collaboration with dermatologist, Dr. M.B. Shokravi, MD, FRCPC in Vancouver, British Columbia. This podcast will review an approach to common warts in paediatric patients. After listening to this podcast, the learner should be able to do the following:

### **Learning outcomes:**

1. Describe the morphology of common warts, genital warts, flat warts, and palmoplantar warts.
2. Describe the management of children with common warts.
3. Discuss the indications for vaccines in preventing warts.
4. List indications on when to refer a patient with common warts to a Dermatologist.

Now, let's talk about how warts can present in children by first starting out with a case. This child is coming in with a common complaint.

### **Part One: Warts**

#### **Case:**

Sally is an otherwise healthy 5 year old Caucasian girl who comes to your clinic with her parents complaining of multiple progressive "bumps" on her right hand for the last 2 months. The patient does not complain of pain, or itchiness. No other family members have been affected. She attends the local public school and lives at home with her parents.



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What are clinical features of verruca vulgaris?

1. Verruca vulgaris, more commonly called warts, appear as hyperkeratotic, dome-shaped, exophytic papules. If you see small black dots superficially, those are capillaries that have thrombosed.
2. Their distribution can be anywhere on the body, but they most commonly appear on the dorsal aspect of the hands and fingers
3. Trauma to the skin (e.g. nail biting) can promote their spread.

Papules resembling verruca vulgaris (common warts) are common presentations in a family medicine clinic. What else is on your differential?

1. Consider molluscum contagiosum, corns, callosities, seborrheic (non-viral) warts, epidermal nevi, and lichen planus.
2. In adults, consider seborrheic keratosis and squamous cell carcinoma.

How prevalent are common warts? Who do they most commonly present in?

1. The prevalence of common warts peaks during adolescence, with approximately 5-20% of teenagers affected. It is also common in school-age children between the ages of 5 to 12 years, with approximately 1-5% of them affected.
2. Expect to see common warts in primary care, as it is one of the top three skin complaints in children. The other two complaints are acne and atopic dermatitis.
3. There is a 1:1 ratio for prevalence among males and females.

What is the cause of verruca vulgaris?

1. Human Papillomavirus (HPV) is the causative agent.
2. HPV infects the basal keratinocytes in the epithelial layer of the skin.
3. The resulting growth of the epithelium (hyperplasia) leads to the classic appearance of a wart.

Is verruca vulgaris transmissible?

1. Yes, through skin-to-skin contact as well as surfaces. Certain sports such as wrestling, for example, experience excessive skin-to-skin contact, and objects. Patients can even spread the virus to an unaffected area of skin. This is why it is so important to tell patients not to touch their warts and to groom the affected body part with different equipment to prevent further spread.

Why are there so many morphologies of common warts? What determines the morphology?

1. The type of wart depends on the specific HPV type that the patient is infected with.
2. There are at least 80 different strains of HPV that can cause verruca vulgaris.
3. Verruca vulgaris, the most common type of wart, is caused by HPV-2 and HPV-4.
4. Condylomata acuminata, external genital warts, are typically caused by HPV-6 and HPV-11. Less commonly, HPV-16 and HPV-18 may be the causative agent. These two strain appear in the genitalia or perianal areas. HPV-16 and HPV-18 are also the causative agents for cervical intraepithelial neoplasia, a precancerous lesion that can lead to cervical cancer, and are associated with an increased risk of anorectal cancer.
5. Verruca planae, called flat warts, are caused by HPV-3 and HPV-10. These tend to be skin-colored papules with flat tops and smooth, slightly raised surfaces. They commonly

affect areas that come in contact with exposed surfaces (face, arms, dorsal hands, shins, knees). Often they are clustered and sometimes linear in arrangement because of rasing.



6. Palmoplantar warts are caused by HPV-1. These present as thick papules that depress deeply into the soles of the skin. They are typically found at pressure sites such as metatarsal heads, heels, and toes. When they merge into larger plaques, they are called mosaic warts. The patient may present with pain when walking. Thick calluses tend to form around the wart.



How are common warts treated?

1. In most cases, observation alone is effective, given that over 75% of cases self-resolve by two years. If warts are bothersome or a cosmetic concern, treatment may be warranted.
2. For all treatment types, including laser, acidic compounds, or cryotherapy, multiple treatment courses are required.

3. Like most conditions, start with treatments that are the least invasive and carry the lowest risk of side effects. The main concern with treatments are depigmentation or scarring.
4. Treatment depends on age and what degree of pain patients can tolerate. Painful treatments such as liquid nitrogen therapy are not recommended for younger children. Some treatments are quicker but more painful such as topical cantharidin and liquid nitrogen therapy.
5. Unfortunately, there is no therapy that specifically targets HPV. Instead, treatments aim to stimulate the immune system to clear the virus.
6. Options for local destruction include: cryotherapy, salicylic acid, tretinoin cream, shave removal, adhesive tapes, laser, topical 5-fluorouracil and intralesional injections of bleomycin. Among these, cryotherapy and salicylic acids are the most commonly used.
7. The first line approach to treating warts depends on how many there are and the distribution. For example, cryotherapy works well when there are only a few warts on the hand and foot, face, or other sites. Salicylic acid works well when there are many warts on the hand and foot. However, it is not used on the face due to cosmetically undesirable risk of irritation with secondary hyperpigmentation or hypopigmentation.
8. Cryotherapy applies liquid nitrogen to affected sites.
9. Salicylic acid applies a chemical irritant that is destructive to warts by its keratolysis effect

How should cryotherapy be applied? What are the two main ways it can be delivered?

1. The two ways to deliver cryotherapy include cryoguns and cotton swabs. Continuous or pulse spraying may be used with a cryogun. Alternatively, some providers use a cotton tip. Cryoguns are more efficient as they do not cross-contaminate lesions. Since small regular cotton swabs result in less depth of freezing (due to its minimal absorption of liquid nitrogen), care must be taken to use a new swab with each dip into a liquid nitrogen container.
2. When it comes to length of freezing, under-freezing is better than over-freezing to minimize complications. You can then freeze the lesions on follow-up visits. Frozen lesions turn white immediately, which is expected. The frozen area or “freeze ball” should be 1.5 times the area of the lesion regardless of size. For small papules, freeze for 3 seconds to leave a rim of white of 1-3 mm around lesions. Thicker lesions require freezing for 5 seconds.
3. Cellular destruction is more pronounced with rapid freezing and slower thaw cycles. No anesthetics are required, but the procedure is painful. If multiple freezing attempts are needed, the provider should wait until lesions thaw completely before refreezing again.

What are the main side effects of cryotherapy to inform patients about?

1. Pain.
2. Post-inflammatory pigment alteration (PIPA) is more common in pigmented skin. This could be pigmented or hyperpigmented, and be temporary or permanent.
3. Other side effects include scarring, pain, blistering, and dystrophy of nails.

The figure below shows immediate swelling after cryotherapy.



Aside from cryotherapy, what is another common method of treating common warts?

1. Salicylic acid is used in concentrations of 17% to 40%.
2. Salicylic acid works by loosening connections between HPV-infected keratinocytes, a process called keratolysis, as if you are sanding it.
3. Cure rates with salicylic acid are similar to cryotherapy, but cure rates improve when both therapies are combined.
4. Patients are instructed to apply salicylic acid under occlusion (e.g. tape) and change it every 1 to 2 days.
5. Side effects include redness, irritation, and maceration secondary to occlusion.

When should a primary care provider consider referral to a dermatologist for common warts?

1. Primary care providers commonly use cryotherapy and salicylic acid. When patients do not respond to these treatments, consider referral to a dermatologist for specialist treatment.
2. Dermatologists may consider using additional modalities, such as laser (e.g. pulse dye lasers, ablative carbon dioxide), topical sensitizers (e.g. squaric acid), or intralesional injections of chemotherapeutic agents (e.g.: bleomycin).

Previously, we talked about patient preferences factoring guiding which treatments are chosen. What are some ways patient preferences may affect treatment modality?

1. Both cryotherapy and laser are painful, particularly for children, and both need multiple treatments.
2. Liquid nitrogen cryotherapy is not well tolerated by young children due to pain. The more anxious a patient is, the more painful the procedure may be. The use of distraction techniques such as viewing videos before or during the procedure can help lessen pain and anxiety in younger children.

3. Salicylic acid takes a few months for it to be effective. Keeping the affected areas occluded can be cumbersome in children, especially when lesions are located on the fingers and hands.
4. Cockayne *et al.* studied the effect of patient preference between cryotherapy versus salicylic acid on wart clearance rates.<sup>2</sup> Patients were aged 12 years or older and had at least one plantar wart suitable for treatment. Pre-randomization results showed that, of the 240 patients, 48% had no treatment preference, and of those with a preference, 42% preferred cryotherapy compared with 10% for salicylic acid. There was no association between patient or healthcare provider preference and verruca clearance rates or treatment compliance rates.
5. Inform your patients of their options and encourage them to make the choice that best suits their needs.

We previously mentioned the different types of warts. Can you recall the four main types? Which of the four types requires particularly thorough history taking, and a high index of suspicion?

1. All patients who present with genital warts require a sexual history. Ensure to discuss the limits of confidentiality with adolescents, and complete a full HEADS history to ensure there are no high-risk behaviors.
2. A sexual history is important to understand the potential route of transmission of HPV. It also provides an opportunity to discuss the risk of transmitting HPV to sexual partners given the ease in which HPV spreads. HPV is spread through sexual contact between partners, which can include direct contact or intercourse.
3. It is also important to take the time to counsel adolescents on safe sexual practices, screening for HIV and other sexually transmitted infections (STIs),
4. HPV infection is one of the most common STIs, with a peak prevalence between 20-24 years of age in woman and 25-29 year of age in men.
5. Most people end up getting infected with HPV even if asymptomatic. One study observing the prevalence of HPV-DNA of any type among 554 women in Quebec found that HPV-DNA was detected in 58% of women ages 15-19 years, 30.1% in ages 20-29 years, 25.4% in ages 30-39 years, 13.4% in ages 40-49 years, 16.9% in ages 50-59 years, and 28.1% in ages 60-69 years.<sup>3</sup>

How can HPV infection be prevented?

6. While there is no single vaccine for all types of HPV, there are vaccinations that protect against some of the more harmful ones.
7. HPV vaccinations such as Gardasil and Cervarix have been approved by the Food and Drug Administration and Centers for Disease Control and Prevention. Both are effective against HPV 16 and 18, which are associated with increased risk of cervical cancer.
8. The Centers for Disease Control and Prevention recommends that vaccination occur as early as 11-12 years of age for adolescents in 2 dose series, female patients 9-26 years old in 3 dose series, and male patients 9-21 years old in 3 dose series. Immunosuppressed, transgender, and men who have sexual intercourse with other men are also factors to consider vaccination up to 26 years old in 3 dose series.

9. The Canadian Pediatric Society estimates the lifetime risk of all HPV types to be 70%.<sup>4</sup> Safe and effective HPV vaccination against nine HPV types is currently available in Canada. All boys and girls between the ages of 9 to 13 years should receive the vaccine. Programs are available in schools to receive the vaccination between grades 4 and 8. If a child has not received the vaccination through a routine program, catch-up programs are available.
10. Safe sexual practices can help lower the patient's chances of acquiring HPV. Condoms and dental dams are recommended every time partners wish to engage in oral, vaginal, or anal sex.

### **Summary:**

Before we conclude this podcast, let's take a moment to summarize and recap the key points:

1. Warts are common complaints among children. They are caused by HPV, which has numerous types.
2. Treatment for warts requires multiple attempts. Treatment depends on location, number of warts, type of warts, and patient preferences (e.g. pain tolerance).
3. HPV vaccination is recommended for adolescents and young adults to reduce the risk of developing genital warts and cancers associated with HPV (e.g.: cervical and anorectal cancer).

That concludes our PedsCases podcast on common warts! Thanks for listening to PedsCases podcasts!

### **References:**

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