



# The Skin Is In

## Skin Conditions in Children and Adults with Down Syndrome

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## Conflicts of Interest and Disclosures

- I do not have any financial disclosures or conflicts of interest
- I will be discussing off-label treatments today

## Our Road Map

Welcome to the “Clinic”

Welcome to the “Lab”



The “Big 6”



Research Helps

## The “Big 6” in Clinic

Dry Skin

Dandruff

Psoriasis

Alopecia Areata

Folliculitis/HS

Foot Fungus

# Announcement



# Collaboration between LuMIND and Society of Pediatric Dermatology



## Patient Handouts on Skin Conditions in Children with Down Syndrome



<https://pedsderm.net/for-patients-families/resources-for-patients-with-down-syndrome/>

You can also Google:

**“SPD Down syndrome skin handouts”**

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## Resources for Patients With Down Syndrome

The Society for Pediatric Dermatology (SPD) has created a series of informative handouts for use by pediatric patients with Down syndrome and their families. Please see the list below for current topics to access and/or print. These handouts are for personal and/or educational use, and should not be used commercially or for profit. The SPD cannot be held responsible for any errors or for any consequences arising from the use of the information contained in these handouts. This handout series was created through a partnership with the Lumind IDSC Foundation.

### DOWN SYNDROME PATIENT CARE THROUGH THE LIFE STAGES

Certain skin conditions are more common in infants, children, and teenagers with Down syndrome. The Life Stages handouts below are organized into specific age categories to illustrate some of the more common skin conditions seen in each of these developmental stages.

**Infants and Toddlers Handout | [Word Version for EMR](#) | [Greyscale Version](#)**

- Dry Skin and Eczema
- Livedo Reticularis
- Diaper Rash
- Alopecia Areata
- Rashes Around the Mouth
- Scars
- Sun Protection



- 
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# Specific Skin Conditions

**PATIENT PERSPECTIVES** **DOWN SYNDROME SERIES**

## DOWN SYNDROME AND Folliculitis

Folliculitis is a skin issue that happens when a hair follicle gets inflamed. Folliculitis is one of the most common skin conditions in people with Down syndrome.

**WHAT DOES FOLLICULITIS LOOK LIKE?**

You may see raised, pinkish or reddish bumps around the hair follicles. These can be itchy or painful. Sometimes there is pus or peeling skin around the bumps. These bumps can appear anywhere on the body, but the buttocks and thighs are the most common. When the bumps go away, they may leave behind dark spots or pits. These usually fade over time.

Sometimes a single bump can become infected. When this happens, it gets swollen, red, and painful. This is called a "boil" or "abscess."

It can be hard to tell the difference between folliculitis and another skin condition called hidradenitis suppurativa (HS). HS is large, painful bumps in the armpits, buttocks, and legs. HS is also common in people with Down syndrome. Talk with your child's doctor about monitoring for HS.

**WHAT CAUSES FOLLICULITIS?**

Folliculitis is caused by inflammation or infection of the hair follicle.

- Hair follicles are small openings on the skin where the hair comes out. They may become blocked or damaged from rubbing against clothing or shaving.
- People with Down syndrome may be more likely to have folliculitis because of the extra copy of chromosome 21. This may cause follicles to become blocked more easily because of differences in skin proteins and the immune system.
- Clogged follicles may trap bacteria that normally live on the skin. Bacteria grow inside the follicles, causing them to become red, swollen, and bumpy.

**HOW CAN I PREVENT FOLLICULITIS?**

If your child is prone to folliculitis, wash your child's skin regularly with antibacterial soap. You can refer to your hand, a clean towel, or washcloth. Avoid sharing washcloths with others. If you child prefers bath, and/or application of soap is difficult, talk with your child's doctor about bleach baths.

**Shaving Care**

- Avoid shaving when possible.
- Do shave when a hair is starting to poke through.
- Shave in the same direction that the hair grows.
- Use shaving cream to soften the hair.
- Do not share razors with others.

**Clothing**

- Regularly wash clothing with soap and water.
- Avoid tight clothes that rub against the skin.

**PATIENT PERSPECTIVES** **GENETIC DIVERSITY AND BIODIVERSITY SPECIAL ISSUE**

## Down syndrome and hidradenitis suppurativa (HS)

Hidradenitis suppurativa (hi-drai-ent-ee-rop-pen-ah-TEE-sah-er) HS is a chronic condition with recurrent painful bumps and draining sores of the skin. Sometimes it can look like acne. It more commonly affects the skin folds, such as the underarms, buttock crease, and groin area. When severe, it can appear in other parts of the body as well. HS seems to be more common in people with Down syndrome.

The exact mechanism of your child's skin inflammation is not completely understood. It is not caused by poor hygiene. The immune system and local factors play a role in the disease. People with Down syndrome have three copies of chromosome 21, and this can lead to changes in the immune system and skin that make HS more common. There might be other genetic factors that contribute, and it might run in families.

**WHAT CAUSES HS?**

The exact mechanism of your child's skin inflammation is not completely understood. It is not caused by poor hygiene. The immune system and local factors play a role in the disease. People with Down syndrome have three copies of chromosome 21, and this can lead to changes in the immune system and skin that make HS more common. There might be other genetic factors that contribute, and it might run in families.

**WHEN DOES HS START?**

HS can develop as a child, teenager, or adult. HS can start at a younger age or people with Down syndrome.

**WHAT DOES HS LOOK LIKE?**

HS can range from mild to severe. It can look like multiple comedones (blackheads) to painful bumps and abscesses that heal with scarring. Painful bumps can go on to form draining tunnels ("sinus tracts") under the skin. These tunnels or tracts often have sores. The tunnels can drain out or bleed, which can result in a bad smell.

**HOW IS HS DIAGNOSED?**

The diagnosis is made by your child's doctor examining their skin. Since HS is more common in Down syndrome, it is recommended that a doctor look for signs of HS every year starting around age 10. Your doctor may check for infection of the skin before making the diagnosis. Other tests are often not necessary.

**HOW LONG DOES HS LAST?**

The individual bumps and sores may last for weeks or months. They may keep coming back. In most cases, HS is considered a chronic, long-lasting condition. Each patient is different and the bumps may get better or worse over time.

**WHAT ARE THE TREATMENTS FOR HS?**

While there are many treatment options, HS can be very hard to treat. It may take time to find the best treatment plan for each person. Medicines take weeks to months to work. The patient and do not stop a medication without first discussing with your doctor.

Friction can make HS worse. Ask your doctor for recommendations on techniques and clothing to reduce friction with the skin. Avoid closely shaving the areas where you have HS.

Dietary changes and a healthy lifestyle may help reduce skin-on-skin friction through weight loss and may improve HS.

**TIPS FOR MANAGING HS**

- See your child's dermatologist or other doctor regularly. They are your partners in helping your child comfortable in their own skin.
- Make sure your doctor asks about how your child's HS feels. How does it bother them? Does it hurt? Knowing these answers can help the medical professional come up with a helpful treatment plan.
- Wear loose, comfortable clothes. Do not closely shave the areas of HS. Shaving and friction can make HS worse.
- Healthy eating and exercise may improve HS.
- Wash affected areas gently. Do not scrub the areas, and always use clean washcloths.
- Do not pop the " pimples and bumps", as this can make them worse. Warm compresses or soaks can help the bumps to drain gently.
- Avoid having the areas with HS cut into or shaved unless you are seeing a surgeon specifically for the HS.
- For severe pain or a sudden change in the condition, call your doctor.

# Life Stages Handouts

**SKIN CONDITIONS & DOWN SYNDROME**

Many different skin conditions can happen during childhood, but some are more common in infants and toddlers with Down syndrome. In this handout, we review skin conditions most commonly seen in the first five years of life. We also provide links to other Patient Perspectives handouts where you can learn more.

**LIFE STAGES**

## Infants & Toddlers

**Dry Skin and Eczema**

Dry skin is common in people with Down syndrome. This can start at a young age, and it commonly happens on the face and hands. Sometimes dry skin can lead to pink, itchy patches called eczema. Using moisturizing creams or ointments can help and your child's doctor can give other tips and treatments.

**Livedo Reticularis**

Infants and children with Down syndrome can have a red, net-like pattern on their skin called livedo reticularis or cake pie dermatitis. This is not painful or dangerous. It can be more noticeable when it is cold. It appears more commonly on the arms and legs. Warming the body sometimes helps. As this grows, it may fade but it can continue on an adult. If it continues for years, talk to your doctor about it early may be caused by an underlying medical condition. If you have questions, ask your child's doctor about livedo reticularis.

**Diaper Rash**

Diaper rash is common in all infants and toddlers. Sometimes children with Down syndrome can have a condition called ichthyosiform dermatitis. This disease is diagnosed at birth and generally goes away from moving through the body normally. Ichthyosiform dermatitis can be treated by surgery, but these children can still develop diaper rash. If your child has ichthyosiform dermatitis, talk to their doctor about how to prevent diaper rash.

**Alpecia Areata**

Alpecia areata is hair loss from immune cells attacking the hair causing:

- Round spots of missing hair on the head.
- Eyebrows and eyelashes to sometimes fall out.

This happens more often in children and adults with Down syndrome because they are more likely to develop conditions caused by the immune system. For many, the first sign of alpecia areata starts as a child. Talk to your doctor if you think your child is losing hair. If they suspect alpecia areata, they should make sure thyroid testing is up-to-date.

**SKIN CONDITIONS & DOWN SYNDROME**

Many different skin conditions can happen during childhood, but some are more common in children with Down syndrome. In this handout, we review skin conditions most commonly seen in school-age children with Down syndrome. We also provide links to other Patient Perspectives handouts where you can learn more.

**LIFE STAGES**

## School-Age Children

**Dry Skin and Eczema**

Dry skin is common in children with Down syndrome. This can start at a young age and often happens on the face and hands. Sometimes dry skin can lead to pink, itchy patches called eczema. This may also make thickened skin called "hyperkeratosis" on the elbows, knees, hands, and feet. Using moisturizing creams or ointments can help, and your child's doctor can give other tips and treatments.

**Rashes Around the Mouth**

In children with Down syndrome, there are many reasons for rashes around the mouth:

- Saliva around the mouth
- Weaker mouth muscles
- A larger tongue

There can be a dry, cracked lip and sore at the corners of the mouth called "angular cheilitis." Perioral or periorificial dermatitis is another common rash that looks like small pink bumps around the mouth, nose, and eyes. Using moisturizing creams can help rashes around the mouth. Your child's doctor can give other tips and treatments.

**Alpecia Areata**

Alpecia areata is hair loss from immune cells attacking the hair causing:

- Round spots of missing hair on the head.
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**SKIN CONDITIONS & DOWN SYNDROME**

Many different skin conditions can happen during the teenage years, but some are more common in teenagers with Down syndrome. In this handout, we review skin conditions most commonly seen in teenagers with Down syndrome. We also provide links to other Patient Perspectives handouts where you can learn more.

**LIFE STAGES**

## Teenagers

**Dry Skin and Eczema**

Dry skin is common in teenagers with Down syndrome. This can start at a young age and especially happens on the face and hands. Sometimes dry skin can lead to pink, itchy patches called eczema. This may also make thickened skin called "hyperkeratosis" on the elbows, knees, hands, and feet. Using moisturizing creams or ointments can help, and your doctor can give other tips and treatments.

**Acne**

Acne, known as "zits," usually starts as a teenager. Acne can look like red bumps, white bumps, or blackheads. It can happen on the face, back, or chest. Acne happens as a teenage "surge" of hormones change from puberty. Your skin starts to make more oil which gets trapped, causing pimples. There are other causes of acne like family history and bacteria on your skin.

**Syngonias**

Syngonias are skin-colored to yellow bumps on the skin. These are common on the face, particularly around the eyes. Syngonias are more common in people with Down syndrome, especially in women. Syngonias are not harmful but can be hard to treat.

**Rashes Around the Mouth**

In teenagers with Down syndrome, there are many reasons for rashes around the mouth:

- Saliva
- Weaker mouth muscles
- A larger tongue

There can be dry, cracked lips and sores at the corners of the mouth called "angular cheilitis." Perioral or periorificial dermatitis is another common rash that looks like small pink bumps around the mouth, nose, and eyes. Using moisturizing creams can help rashes around the mouth. Your doctor can give other tips and treatments.

## Let's Head to the 'Clinic!'



## The “Big 6”

Dry Skin

PATIENT PERSPECTIVES

DOWN SYNDROME SERIES

## DOWN SYNDROME AND Dry Skin

Dry skin, or xerosis (zee-ROH-sid), is one of the most common skin conditions in people with Down syndrome. Dry skin can occur from infancy through adulthood. Frequent moisturizing and changes to lifestyle habits, such as bathing and laundry, can often keep it under control.

**WHAT DOES DRY SKIN LOOK LIKE?**

- Rough, bumpy, flaky, cracked, and/or peeling skin on the face and body
- Thick skin on the elbows, knees, and bottoms of the feet called "hyperkeratosis"
- Light, dark, or pink patches of rough skin
- Itchy skin, which can cause scratching and open sores

**WHAT CAUSES DRY SKIN?**

Dry skin in people with Down syndrome can be from a mix of environmental and genetic causes. It can be affected by the soaps, water, detergents, medications, and family history. People with Down syndrome have an extra copy of chromosome 21. This can lead to differences in skin proteins that cause the skin to become dry and lose moisture easily.

**HOW IS DRY SKIN DIAGNOSED?**

Dry skin is diagnosed by looking at the skin. Your doctor may also ask about your child's medical history, daily activities, and family history. Some patients with dry skin may also have related skin conditions, like eczema or psoriasis.

**WHAT ARE THE TREATMENTS FOR DRY SKIN?**

Dry skin can be treated by regularly using moisturizing creams or ointments and changing skin care habits. For itchy sores, a doctor may prescribe a topical steroid. It is unusual to see side effects from a topical steroid if the doctor's instructions are followed.

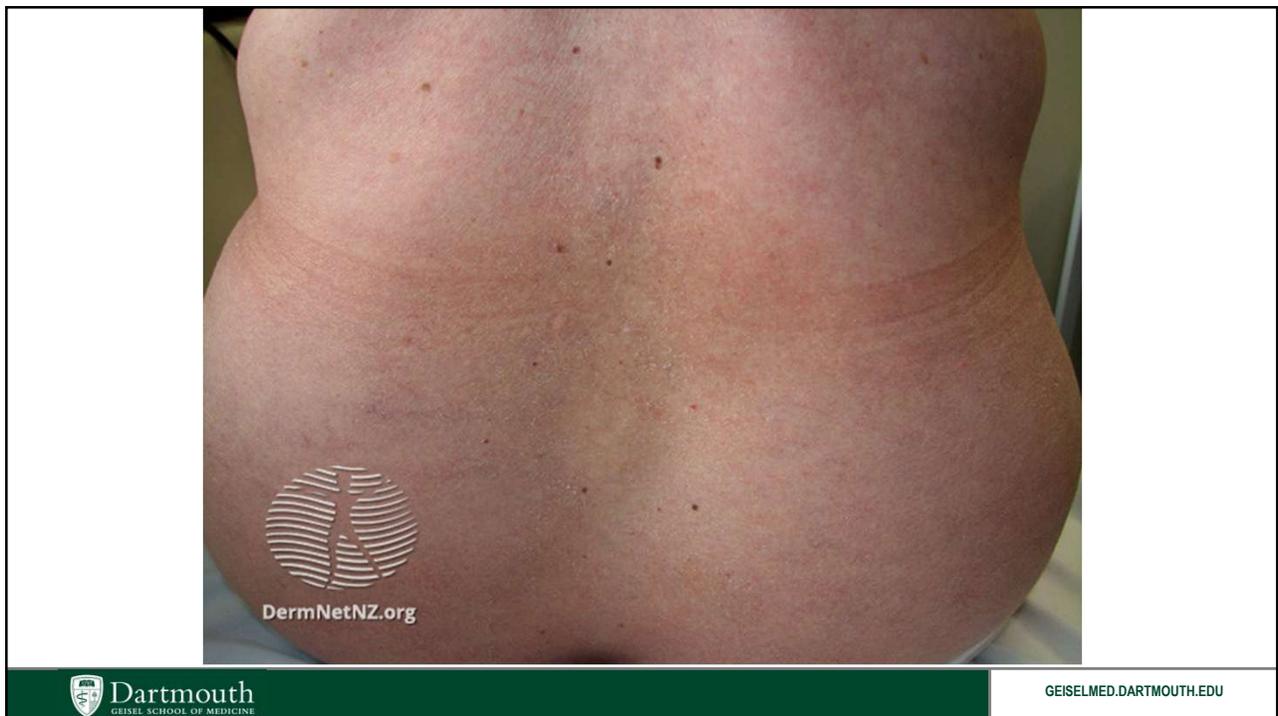
**WHAT IS HYPERKERATOSIS AND HOW CAN YOU TREAT IT?**

- Hyperkeratosis is a condition that can be seen with dry skin, but everyone with dry skin will have hyperkeratosis.
- "Hyperkeratosis" means thickened skin. This can be due to other skin conditions or be seen on its own.
- People with Down syndrome may have hyperkeratosis on the soles, sides of the feet, elbows, and knees.
- Washing the body with a plain fragrance-free antibacterial cleanser can help prevent thick skin from building up. Talk to your child's doctor about how often to use this type of soap.
- Some moisturizers have ingredients that can help thicken skin. These vitamins or creams have ingredients like urea, lactic acid, or salicylic acid.
- These special soaps and creams may cause skin irritation for some people. Talk to your child's doctor about if these creams are a good option for your child.
- Consider differences in sensory processing. If your child feels itching, burning, or stinging, have a comfort item ready like a favorite toy. Let your child know that the feeling will only last for a short time. Try a different cream next time.
- Wearing comfortable shoes that are not too tight can help prevent thick skin on the soles of the feet.
- A regular moisturizing routine can help prevent thick skin elsewhere. Encourage your child to not scratch or rub their skin, as this can make thick skin worse. Bring them different activities, like a dance or song, to do if your child feels itchy. Talk to their doctor about medicines to help itch.





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# Hyperkeratosis



We will  
come back  
to this!

#### WHAT IS HYPERKERATOSIS AND HOW CAN YOU TREAT IT?

- » Hyperkeratosis is a condition that can be seen with dry skin. Not everyone with dry skin will have hyperkeratosis.
- » "Hyperkeratosis" means thickened skin. This can be due to other skin conditions or be seen on its own.
- » People with Down syndrome may have hyperkeratosis on the palms, soles of the feet, elbows, and knees.
- » Washing the body with a plain (fragrance-free) exfoliating cleanser can help prevent thick skin from building up. Talk to your child's doctor about how often to use this type of wash.

# Moisturize!

That's great Dr. Rork. With what?



Not all moisturizers are created equal

Lotion  
Cream  
Ointment/Oil

## A lotion is often not the best choice

- Thinnest moisturizer
- High water content
- Hurt on open skin



## Recommend creams and ointments

### Creams

- Thicker than lotions
- Vanish

### Ointments/Oils

- The thickest
- Do not hurt
- Best moisturizer



## Poison ivy is “all-natural” and “organic”



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GEISEL SCHOOL OF MEDICINE [nps.gov/fjis/planyourvisit/avoid-poison-ivy.htm](https://www.nps.gov/fjis/planyourvisit/avoid-poison-ivy.htm)

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If the product says “baby”  
it is not always great for sensitive skin



# Fragrance-free creams



# Fragrance-free ointments



## Bathing Tips

- Daily bathes are okay
- Limit to 10 minutes
- Cleanser or Fragrance Free Soap
- Only to “dirty” parts of body
- Avoid bubbles

## Soak and Smear

Bathe!



Pat dry the skin!



Apply moisturizer!



## Bathing Pictural Decks Available



Advocate Medical Group  
Adult Down Syndrome Center

# My Shower Routine

 <p>turn on water</p>	 <p>get wet</p>	 <p>wash hair</p>	 <p>rinse</p>	 <p>put soap on washcloth</p>
 <p>wash face</p>	 <p>wash arms</p>	 <p>wash chest</p>	 <p>wash back</p>	 <p>wash legs</p>
 <p>rinse</p>	 <p>turn off water</p>	 <p>dry off</p>		

### Bathing/Showering Tips



Use a **shower head with lights** that change color based on the water temperature.



**Goggles** or **bath visors** are options for those who strongly dislike or fear getting water into their eyes while showering or bathing.



**Ear plugs** or a **neoprene headband** are options for those with ear tubes or those who want to avoid getting water in their ears.



# Hyperkeratosis



There are over-the-counter moisturizers to help with thicker areas of skin



Apply once nightly in the beginning as they can be irritating

## The “Big 6”

Dry Skin

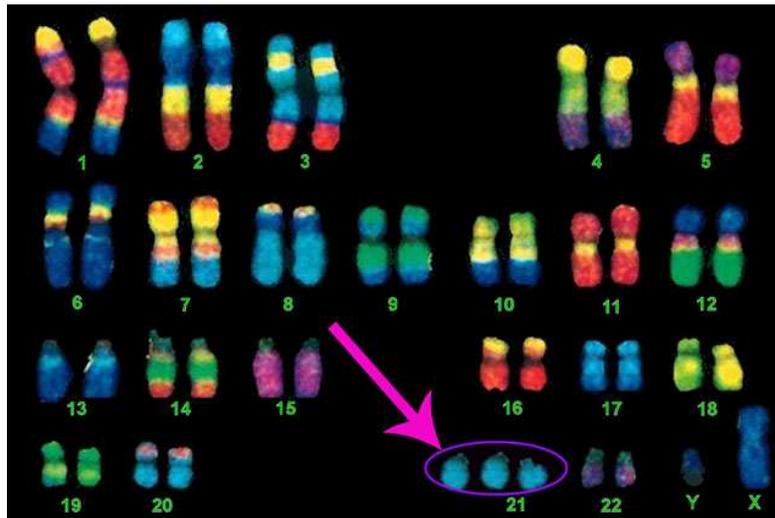
Dandruff

## Let's Head to the 'Lab!'



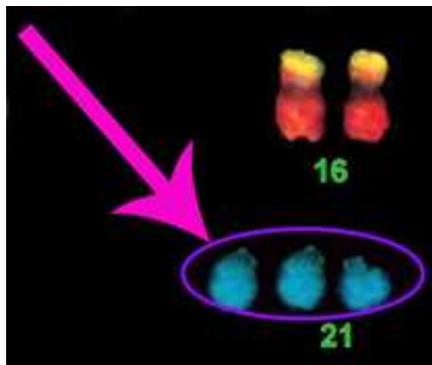
<https://news.feinberg.northwestern.edu/2019/06/17/northwestern-opens-largest-biomedical-academic-research-building-in-u-s/>

## Trisomy 21 = Three copies of the 21<sup>st</sup> chromosome

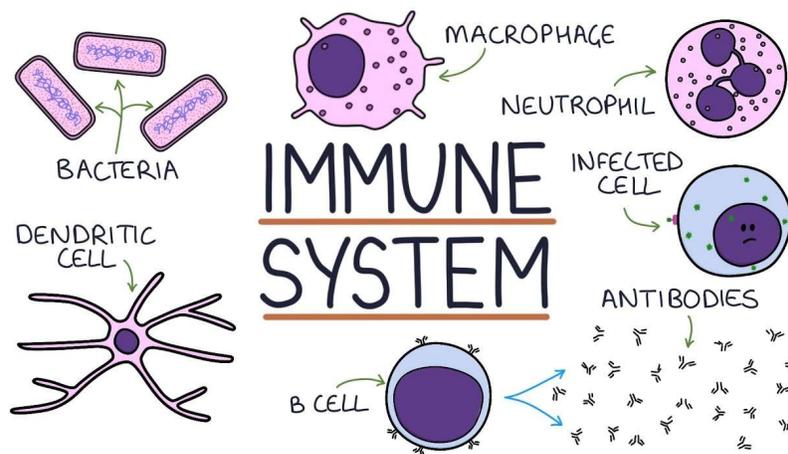


<https://noahsdad.com/down-syndrome/>

## What genes are on the 21<sup>st</sup> chromosome?



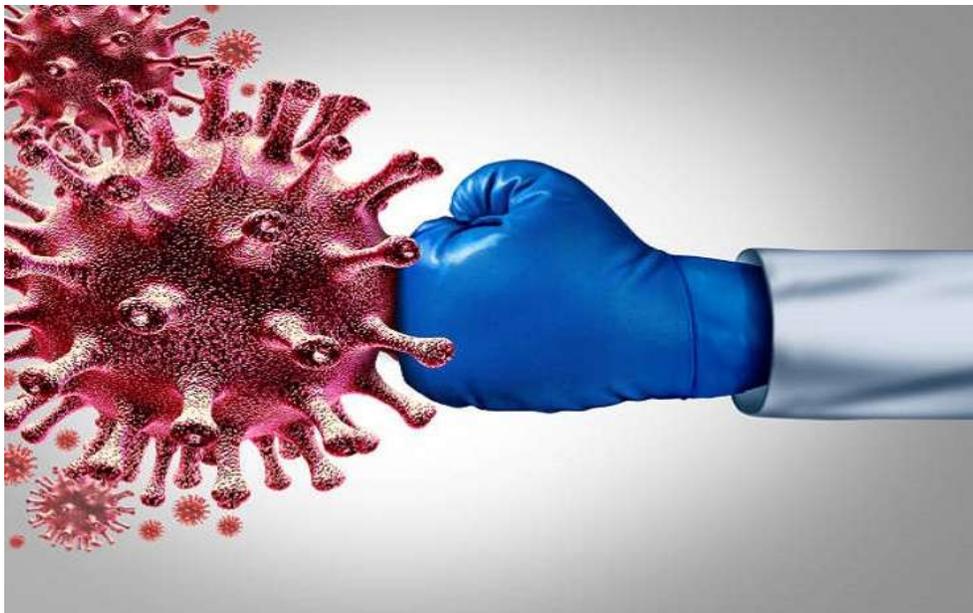
# Genes that affect the immune system



[https://www.youtube.com/watch?v=\\_jBpv9fYSU4](https://www.youtube.com/watch?v=_jBpv9fYSU4)

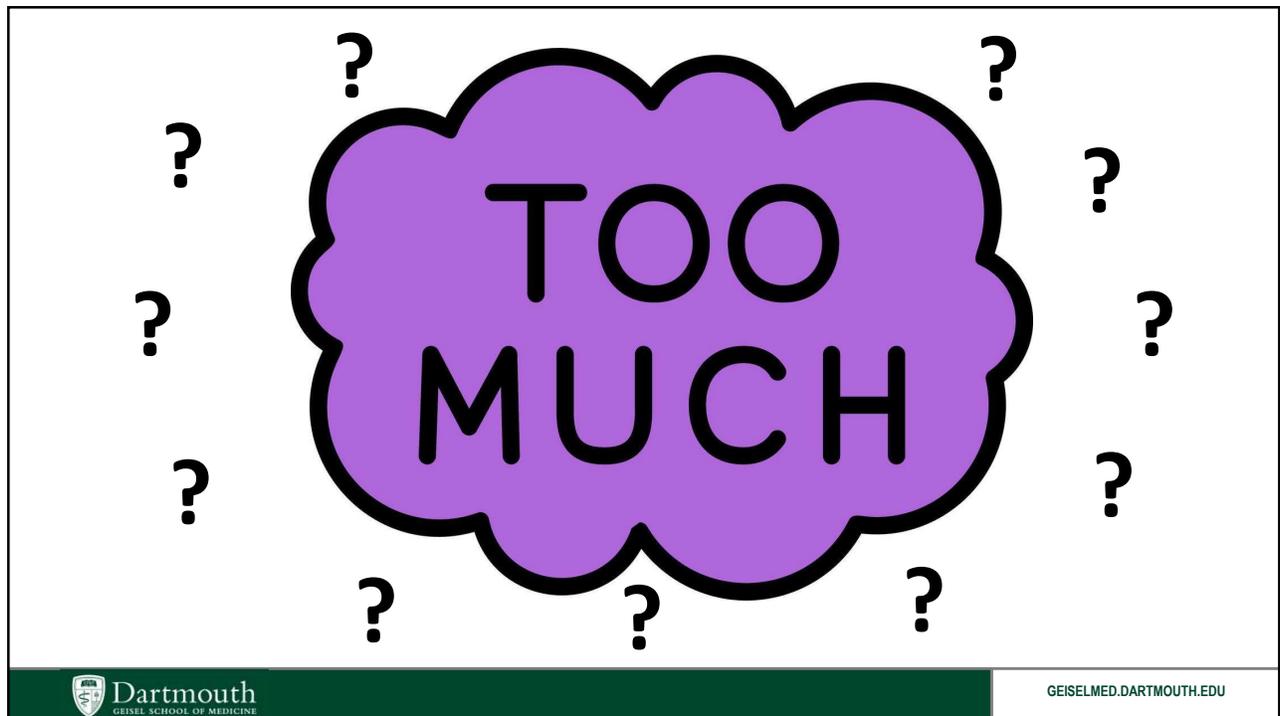
## What is the immune system?

The immune system is a complex network of cells and organs that protect us from disease by recognizing and responding to germs (bacteria, viruses, fungus) and unhealthy cells

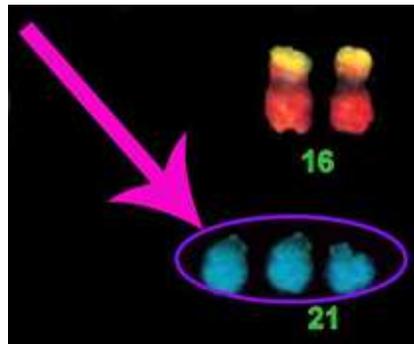


<https://www.healthck.in/onezero-unique-ways-to-boost-your-immune-system-naturally-bg-127>



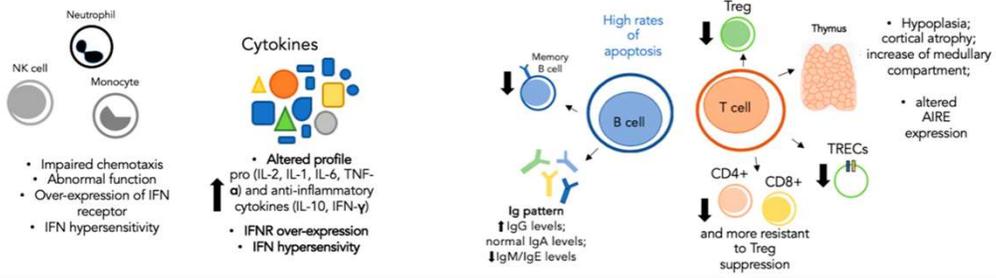


## People with Down syndrome have a dysregulated immune system



# It get's complex...

## Immune dysregulation





<https://www.serenabakessimplyfromscratch.com/2014/01/alphabet-vegetable-soup.html>

# Interferon



Immune system  
messenger

## Down syndrome causes increase Interferon signaling



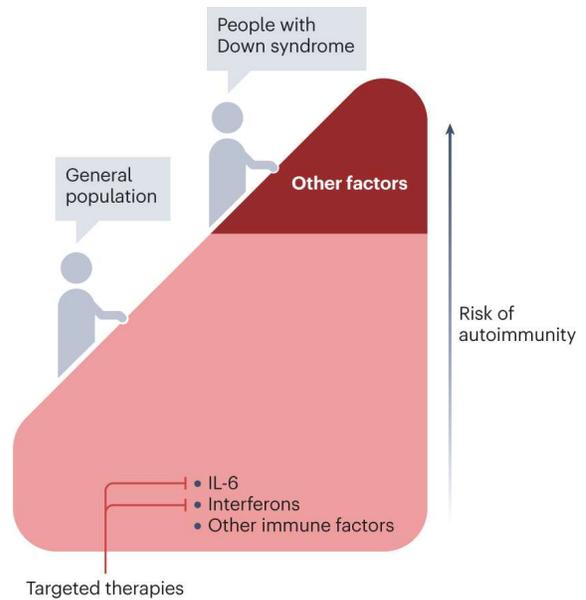
<https://harrypotter.fandom.com/wiki/Owl>

## Increased Interferon Signaling = Immune System Dysregulation

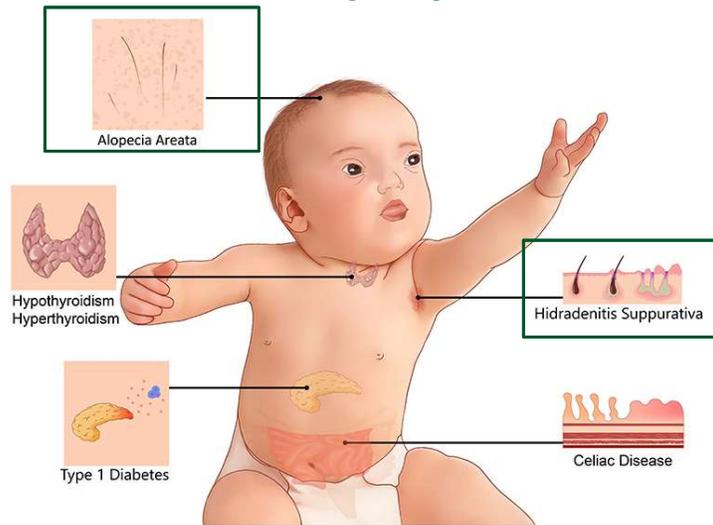


<https://harrypotter.fandom.com/wiki/Owl>

When an immune system is dysregulated it can cause health problems like autoimmune conditions



## Autoimmune conditions in people with Down syndrome



<https://www.dovepress.com/interferon-driven-immune-dysregulation-in-down-syndrome-a-review-of-th-peer-reviewed-fulltext-article-JIR>

## The immune system causes many skin conditions

Seborrheic Dermatitis

Psoriasis

## The immune system causes many skin conditions



Alopecia Areata

Alopecia Areata

Sureshababu, R., Kumari, R., Ranugha, S., Sathyamoorthy, R., Udayashankar, C., Oudeacoumar, P. Phenotypic and dermatological manifestations in Down Syndrome. *Dermatol. Online J.* 2011; 17(2).

## The immune system causes many skin conditions

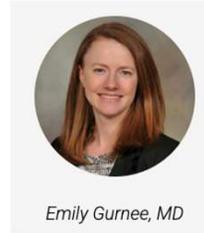
Folliculitis

Hidradenitis Suppurativa

## The immune system causes many skin conditions

Foot and Toenail Fungus

## Immune Dysregulation – Skin – JAK-Inhibitors



## An Open Window...



<https://www.ggf.org.uk/myglazing/knowledge-hub/windows>

## Let's Head back to the 'Clinic!'



## The "Big 6"

Dry Skin

Dandruff

PATIENT PERSPECTIVES

#46 SEBORRHOIC DERMATITIS

## What is seborrheic dermatitis?

Seborrheic (seb-o-REE-ih) dermatitis is a common skin rash. It develops in skin areas that have oil glands. It commonly affects the face and scalp. It also affects other body parts. When it affects the scalp in babies it is called cradle cap. On the scalp of kids or older people it is called dandruff. It is most common in infants, teens, and adults.

**WHAT CAUSES SEBORRHOIC DERMATITIS?**

We don't know exactly what causes seborrheic dermatitis. It can appear with hormone changes. It can also happen when normal skin yeast called *Malassezia* grows too much. Seborrheic dermatitis is not an infection. It is not contagious. Stress, cold weather, and sickness can worsen the rash, but they do not cause it. Seborrheic dermatitis may run in families. It is not known to be related to diet.

**SHOULD A DOCTOR TREAT MY SEBORRHOIC DERMATITIS?**

You may be able to combat your seborrheic dermatitis at home just with over-the-counter shampoos and creams. See your doctor if you are not getting better or if you are not sure about the diagnosis. Although there is no cure for seborrheic dermatitis, it usually gets better with treatment and time.

**SEBORRHOIC DERMATITIS FACTS**

- Seborrheic dermatitis looks like skin flaking. You might also see skin color changes.
- Depending on a person's skin color, the rash may look pink, darker, or lighter in color.
- Skin flakes may look dry, dusty, or greasy. The flakes may be white, yellow, or brown.
- On the scalp, sometimes the flaky skin can be very thick and difficult to clear up.
- On the face, the rash can be in the eyebrows, nose creases, cheeks, and behind and inside the ears.
- It can also be on the chest, upper back, armpits, and groin.
- The rash can be very itchy or not itchy at all.
- In infants, it often goes away within the first year of life. In teens and adults, it may come and go for years.



**HOW CAN I TREAT MY DANDRUFF (SCALP SEBORRHOIC DERMATITIS)?**

Over-the-counter medicated shampoos treat dandruff. They also help get rid of skin flakes and product build-up that makes dandruff worse. How often you use the shampoo will depend on your hair type, hair length, and how severe the rash/itch is. For example, someone who has naturally oily hair might need to use the special shampoo daily. People with long, curly, coily, or braided hair will use the medicated shampoo less often.

Medicated dandruff shampoos should be used directly on the scalp skin. These are not hair shampoos. They can dry your hair out too much.

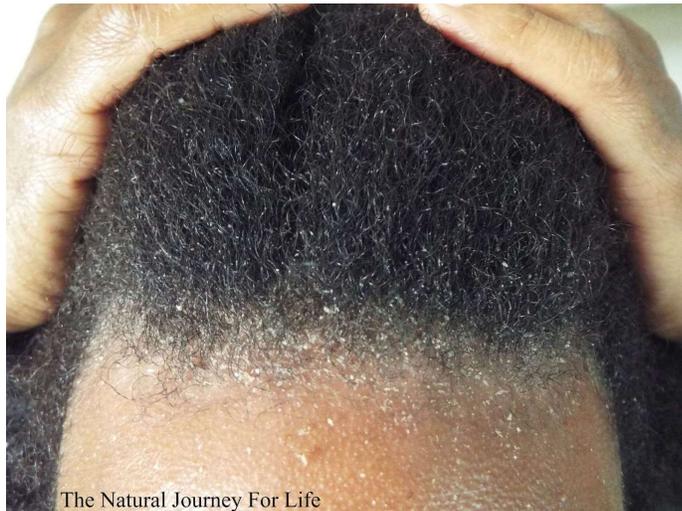
**In the shower, before you use your regular hair care:**

- Apply dandruff shampoo to your hands.
- Use your fingertips to spread the shampoo on your scalp skin.
- Massage the dandruff shampoo into your scalp.
- Work it into your scalp skin for 3-5 minutes. (Sing a song!)
- When the treatment is done, rinse the shampoo out well.
- Then only as needed, you can continue with your regular hair care routine.



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## Dandruff can happen on many places on the head



The Natural Journey For Life



<https://www.goodrx.com/conditions/seborrheic-dermatitis>

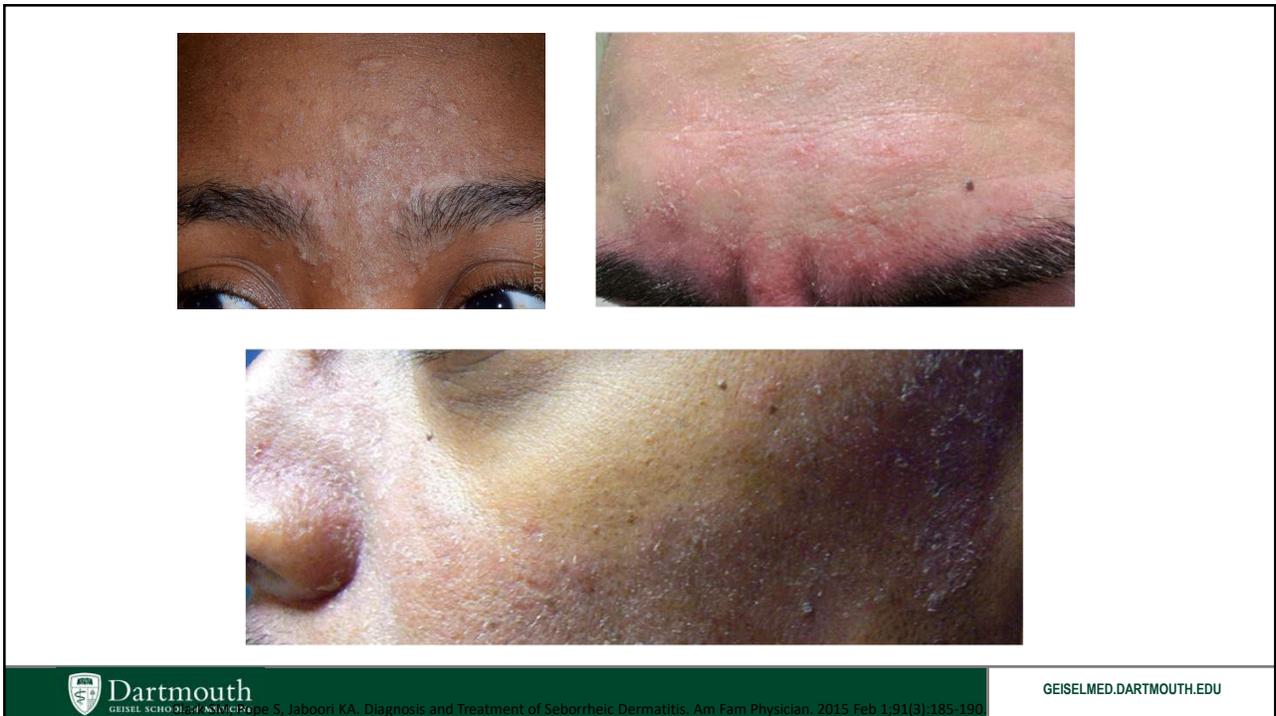
Dandruff “Seborrheic Dermatitis” can cause hair loss



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GEISEL SCHOOL OF MEDICINE Courtesy of Dr. Leah Belazarian

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GEISEL MEDICAL CENTER | 2015 Feb 1;91(3):185-190

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## Treatments for scalp seborrheic dermatitis

- Shampoos:
  - Over-the-counter tea-tree oil, anti-dandruff, keratolytic shampoos
  - **Ketoconazole 2% shampoo** – Prescription
  - **Ciclopirox 1% shampoo** – Prescription
- Corticosteroids (Prescription):
  - Solutions or foams
    - **Fluocinolone 0.01% solution**
    - **Fluocinonide 0.05% solution**
    - **Clobetasol 0.05% solution/foam**
  - Consider oil for younger children or open areas
    - **Fluocinolone 0.01% oil** (Derma-Smoothe)

## Potential plan for scalp seborrheic dermatitis

- **Ketoconazole 2% shampoo** 2-3 times per week
- Let these shampoos sit on the skin around 1-2 minutes!
- **Fluocinolone 0.01% solution** nightly until symptoms improve, then taper off.

## The “Big 6”

Dry Skin

Dandruff

Psoriasis

PATIENT PERSPECTIVES

# What is Psoriasis?

Psoriasis is a common, chronic condition in which red plaques with thick scales form on the skin.

Psoriasis is a fairly common skin condition that affects 1-2% of all people. It is chronic, meaning the symptoms can come and go at any time throughout a person's life. Psoriasis can develop at any age - from infancy to adulthood. In fact, one-third of psoriasis patients develop the condition before the age of 20. Psoriasis varies from person to person, both in severity and how it responds to treatment. There is no cure for psoriasis, but many treatment options are available depending on where it is located on the body and the severity of the disease.

### WHAT CAUSES PSORIASIS?

We do not yet know what causes psoriasis, but we do know that the immune system and genetics play major roles in its development. In patients with psoriasis, the immune system is mistakenly activated, resulting in a faster growth cycle of skin cells. Normally, the skin goes through constant renewal by shedding the outer, dead layer of skin cells while new skin cells are made underneath. Normal skin cells mature and fall off the skin in three to four weeks. Psoriasis skin cells only take three to four days to go through this cycle. Instead of falling off, the cells pile up and form thick, red, scaly patches.

Psoriasis tends to run in families. If one parent has the condition, there is a 20% chance that each child will have it. Certain triggers can bring out psoriasis or make it worse. In children, injury to the skin and infections are common triggers. Up to half of children with psoriasis will have a flare-up of psoriasis 2-6 weeks after illnesses such as ear infections, strep throat, or a common cold. Psoriasis itself, however, is not contagious.

### WHAT ARE THE SIGNS AND SYMPTOMS OF PSORIASIS?

Psoriasis usually appears as dry, red, scaly patches on the skin. The patches can be very itchy and sometimes burn. They can come and go in an unpredictable way.

There are several different forms of the condition, but the most common in children is **plaque psoriasis**. It can be limited to a few patches or can involve large areas of the skin. It can arise anywhere on the body, but it tends to most commonly affect the elbows, knees and scalp. **Guttate psoriasis** - where the rash takes the form of small, drop-like lesions - is another common form of psoriasis in kids. The face and genital areas are often affected in younger children. Psoriasis can also develop in the nails usually in the form of small depressions or pits in the nail, and in the joints called **psoriatic arthritis**. The severity of psoriasis can range from mild to severe and varies from person to person and may change over time.

### HOW IS PSORIASIS DIAGNOSED?

No special blood tests exist to diagnose psoriasis. A dermatologist diagnoses psoriasis by looking at the skin. A skin biopsy is occasionally needed to confirm the diagnosis or to ensure that the rash is not being caused by something else.

### EMOTIONAL CONSIDERATIONS IN CHILDREN

For many children, the main problem with psoriasis is its visibility and the effect it may have on the child's self-esteem and confidence. Children with psoriasis are at risk of depression and anxiety. Though psoriasis is not contagious, and the patches do not leave permanent scars on the skin, it can leave emotional scars. Caregivers are encouraged to keep a close eye on their child's emotions and maintain open communication about their mood.

### OTHER CONCERNS FOR CHILDREN WITH PSORIASIS

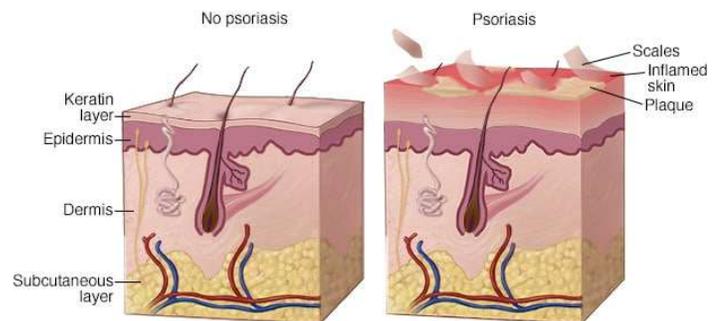
Children with psoriasis are at risk of suffering from obesity, diabetes, high blood sugar, high cholesterol, and heart disease later in life. It is important to maintain a healthy weight by eating a good, balanced diet and staying active. The whole family should be part of this healthy lifestyle.



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## What is Psoriasis?

A skin condition where the **immune system makes the skin cells grow and shed to quickly**, leading to red, scaly patches often on the elbows, knees, and scalp



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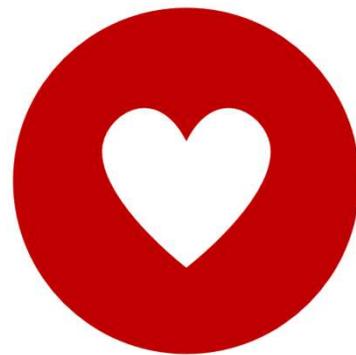


## Let's Head to the 'Lab!'



<https://news.feinberg.northwestern.edu/2019/06/17/northwestern-opens-largest-biomedical-academic-research-building-in-u-s/>

# NIH INCLUDE Project at Dartmouth



## The Project's Team – It Takes a Village



Jillian Rork, MD



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MPH



Amy Buros Stein, PhD



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MS



**Epic**  
**Cosmos**

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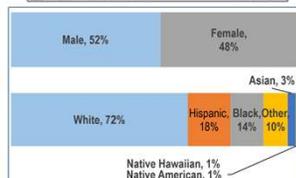
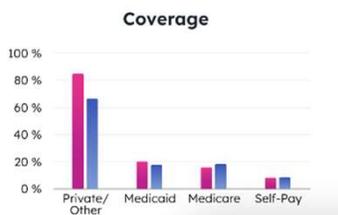
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# Aim 1: Evaluate demographics, occurrence, treatments, and severity of psoriasis in children and adults with Down syndrome

**Table 1.** Psoriasis, cardiometabolic risk factor, cardiovascular disease ICD-10 codes

Psoriasis	ICD-10 Code
Psoriasis vulgaris	L40.0
Generalized pustular psoriasis	L40.1
Guttate psoriasis	L40.4
Other psoriasis	L40.8
Psoriasis, unspecified	L40.9



**Figure 2.** Sex and race/ethnicity of Cosmos database DS population. The sum of race/ethnicity categories exceeds 100% due to patient selection of multiple categories.

**Table 2.** RxNorm codes for psoriasis treatments

Medication Category	Sample Medications (RxNorm)
Topical corticosteroids	Triamcinolone 0.1% cream (1014314)
Topical vitamin D analogues	Calcipotriene 0.005% cream (313921)
Topical calcineurin inhibitors	Tacrolimus 0.1% ointment (314266)
Topical aryl hydrocarbon receptor agonist	Tapinarof (2602301)
Topical retinoids	Tazarotene 0.1% cream (313200)
Topical salicylic acid	Salicylic acid 6% shampoo (667904)
Topical anti-fungal shampoos	Ketoconazole 2% shampoo (106336)
Oral retinoids	Acitretin (199689)
Oral antimetabolites	Methotrexate (1921592)
Oral immunosuppressants	Cyclosporine (197553)
Disease-Modifying Anti-Rheumatic Drugs	Apremilast (1492744), Ustekinumab (853358), Tofacitinib (1357536)

CPT code	Description
96900	Actinotherapy (UVA or UVB therapy)
96910	Photochemotherapy by Goekerman treatment or using psoralen and UVA
96912	Photochemotherapy using psoralen plus UVA
96913	Photochemotherapy of severe dermatoses requiring a minimum of 4 hours of care under direct physician supervision

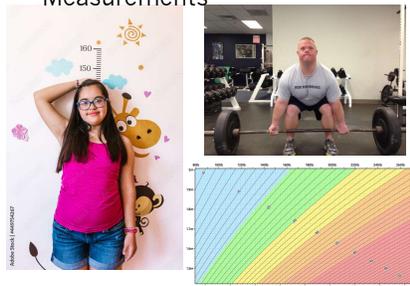
Abbreviation: CPT, Current Procedural Terminology.

# Aim 2: Determine the association between psoriasis, cardiometabolic risk factors, and cardiovascular disease in children and adults with Down syndrome

## ICD-10 Diagnosis

Codes	
<b>Cardiometabolic Risk Factors</b>	
Overweight, Obese	E66.3, E66.9
Hypertension	I10
Hypercholesterolemia	E78.0
Hyperlipidemia	E78.1-5
Type II diabetes	E11.9
<b>Cardiovascular Disease</b>	
Atherosclerosis	I70.x
Acute coronary syndrome	I24.9
Myocardial infarction	I21.x
Chronic ischemic heart disease	I25.x
Peripheral arterial disease	I73.9
Transient cerebral ischemic attack	G45.9
Cerebral infarction	I63.x

## Anthropometric Measurements



## Physiologic Data



## Laboratory Values



<https://labs.selfdecode.com/blog/high-hemoglobin-a1c/>  
<https://www.everydayhealth.com/high-blood-pressure/guide/symptoms/>  
<https://www.wbur.org/onlygame/2013/11/09/stoklosa-powerlifter-down-syndrome>  
<https://stock.adobe.com/images/hispanic-teen-girl-with-down-syndrome-measuring-her-height-on-the-wall-in-disability-concept-in-latin-america/449754267>

## Results so far...

1) Psoriasis happens in 3% of adults with Down syndrome

2) Psoriasis happens in 1% of children with Down syndrome

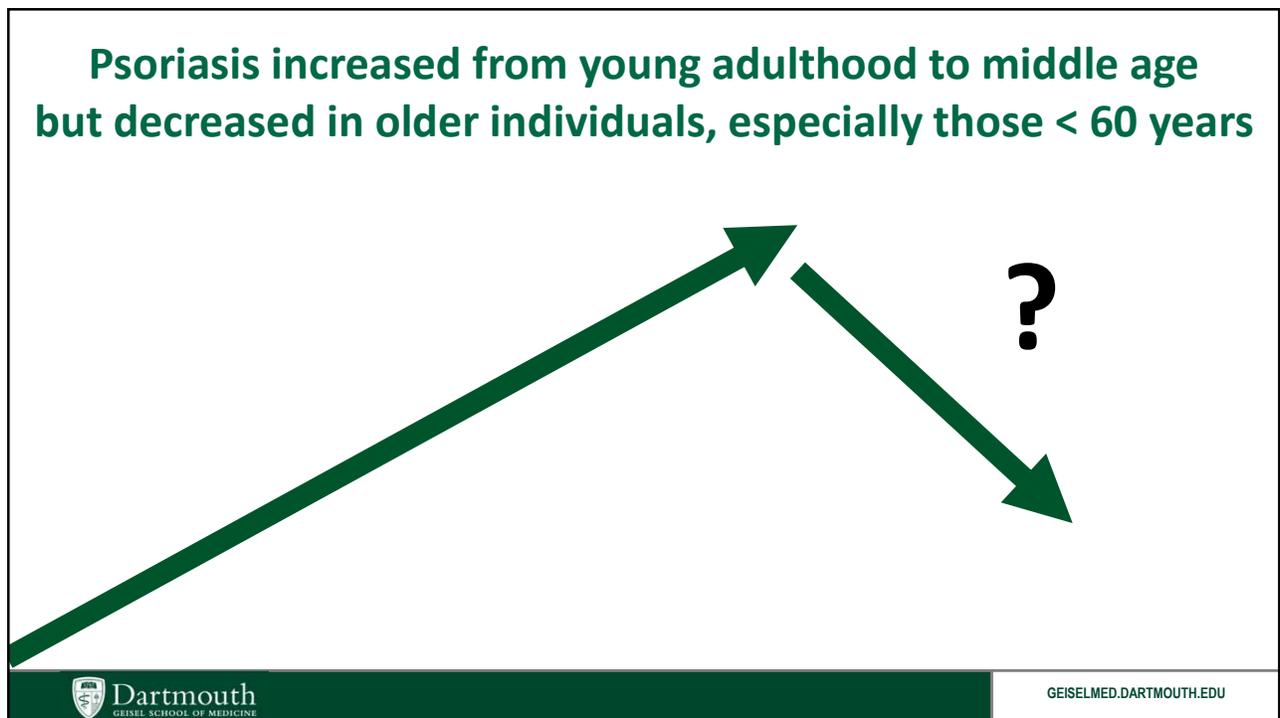
This is at least equal to the general population

## Adults had 4 times higher odds of psoriasis than pediatric patients (p-value <.0001)



<https://www.instagram.com/lumindisc/p/DG5zmnWTRZQ/>

<https://www.gponline.com/clinical-review-downs-syndrome/genetics/genetics/article/1103527>



## Psoriasis is more common in men than women



>



<https://www.science.org/content/article/restoring-key-hormone-could-help-people-down-syndrome>  
<https://www.topdoctors.co.uk/medical-dictionary/down-s-syndrome>

**Black, African American, and Hispanic individuals had significantly lower odds of psoriasis than White individuals**

## There are many ways to treat psoriasis



# Results so far...

## **Dermatologists predominantly manage skin conditions**

- 43% Dermatologists
- 23% Family Medicine
- 16% Internal Medicine
- Remaining 18% Pediatrics, Genetics, Other

SO **WHY** DOES ANY OF  
THIS **MATTER?!**

Who to educate?

How severe?

Who has access?

<https://theaustincommon.com/how-does-the-city-spend-your-money-you-decide/screen-shot-2019-08-22-at-10-08-26-pm/>

## Treatments



Topical prescriptions (94%)



Systemic prescriptions (40%)

## Most Common Topical Prescriptions



Corticosteroids (90%)



Salicylic acid (74%).

## Most Common Systemic Medications



Apremilast (8%)



Adalimumab (11%)

SO **WHY** DOES ANY OF  
THIS **MATTER?!**

No formal trials

How helpful?

Immune system?

What side effects?

<https://theaustincommon.com/how-does-the-city-spend-your-money-you-decide/screen-shot-2019-08-22-at-10-08-26-pm/>

SO **WHY** DOES ANY OF  
THIS **MATTER?!**

Mental Health?

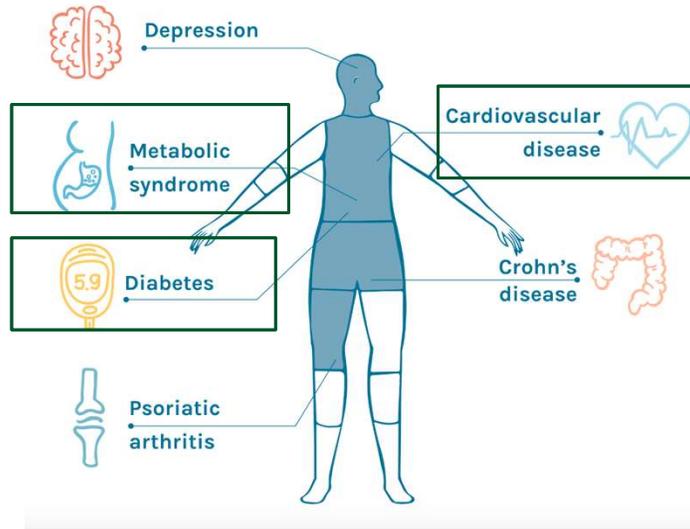
Cardiometabolic Health?

Other Autoimmune Conditions?

Quality of Life?

<https://theaustincommon.com/how-does-the-city-spend-your-money-you-decide/screen-shot-2019-08-22-at-10-08-26-pm/>

## Psoriasis does not just affect the skin

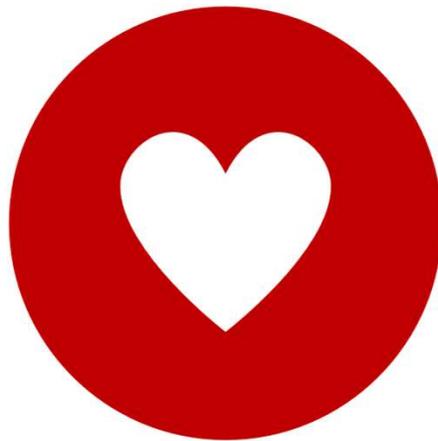


<https://www.psoriasis.com/psoriasis-patients/tips/psoriasis-comorbidities>

## Individuals with Down syndrome rarely develop heart disease (heart attacks, stroke)



**Coming in March 2026 and beyond...**



## Let's Head back to the 'Clinic!'



## The “Big 6”

Dry Skin

Dandruff

Psoriasis

Alopecia Areata

PATIENT PERSPECTIVES

# What is alopecia areata?

Alopecia areata is a condition that causes hair loss. It usually shows up as round patches on the scalp. Alopecia areata is one of the most common causes of hair loss in children.

About 1 in 50 people will experience alopecia areata in their lifetime. In most people, hair eventually grows back, although this process can take months or years.

### WHAT CAUSES ALOPECIA AREATA?

Alopecia areata is an autoimmune condition. It is caused by the immune system attacking the hair.

The immune system normally fights against germs. In patients with alopecia areata, the immune system attacks the hair. This causes hair to fall out. It is not clear what triggers the immune system to start mistakenly fighting the hair.

### WHAT TESTS ARE NEEDED IN ALOPECIA AREATA?

Usually, doctors can diagnose alopecia areata by looking at the areas of hair loss. Sometimes they might do a special test called a biopsy, where they take a small piece of skin from the scalp to look at under a microscope.

Most children with alopecia areata are otherwise healthy. Some children with alopecia may also need testing of their thyroid. Your doctor may order some blood tests if needed.

### WHAT CAN I EXPECT FROM TREATMENT OF ALOPECIA AREATA?

There is no cure for alopecia areata, but there are treatments that can help. Treatment options may include:

- **No treatment:** Some kids' hair grows back on its own without any treatment. In milder cases, you and your doctor may choose to wait to see if the hair grows back on its own.
- **Topical steroids:** These include creams and solutions that are applied to the scalp. The goal is to lower the inflammation in the scalp so the hair can grow back.
- **Steroid injections:** Steroids can be injected into the scalp to lower the inflammation under the skin of the scalp. These injections are painful but are an option for older children and teens who want to try them.

### WHAT ARE THE DIFFERENT TYPES OF ALOPECIA AREATA?

There are three common forms of alopecia areata. The type depends on how much hair is lost:

- **ALOPECIA AREATA:** round patches of hair loss. This is the most common type and can occur anywhere on the body that has hair.
- **ALOPECIA TOTALIS:** loss of all hair on the scalp.
- **ALOPECIA UNIVERSALIS:** loss of all scalp and body hair.



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## Alopecia Areata



Schepis C, Barone C, Lazzaro Danzuso GC, Romano C. Alopecia areata in Down syndrome: a clinical evaluation. J Eur Acad Dermatol Venerol. 2005; 19: 769-70.

## Alopecia Areata



Alopecia areata is more prevalent, presents earlier,  
and may be more severe.



Alopecia areata was diagnosed in 0.83%  
of DS patients, compared with 0.06% in  
the general population

**(RR 15; 95% CI 14.0-16.1; P<0.001)**

Sureshbabu, R., Kumari, R., Ranugha, S., Sathyamoorthy, R., Udayashankar, C., Oudeacoumar, P. Phenotypic and dermatological manifestations in Down Syndrome. Dermatol. Online J. 2011; 17(2).



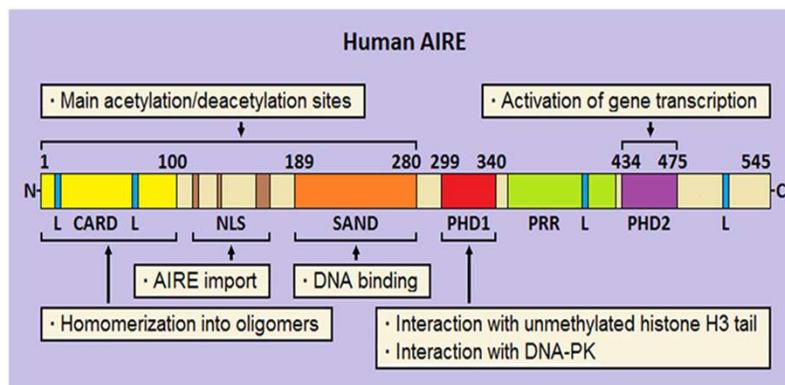
Remember Interferon?  
This plays a role!



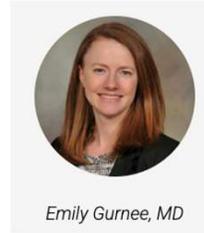
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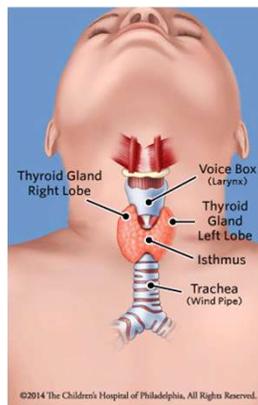
## Autoimmune regulator (AIRE) gene is located on chromosome 21



## Immune Dysregulation – Skin – JAK-Inhibitors



## Alopecia areata is more common in people with Down syndrome who have thyroid disease



## Let's Head to the 'Lab!'



<https://news.feinberg.northwestern.edu/2019/06/17/northwestern-opens-largest-biomedical-academic-research-building-in-u-s/>



In patients with DS, those with AA had an **elevated risk of thyroid disease** (**RR 1.6**; 95% CI 1.501.7, P<0.001) when compared to DS patients without AA

Kranyak et al. Alopecia areata and thyroid screening in Down syndrome: Leveraging epic cosmos data set. J Am Acad Dermatol 2023 Mar 28; 20190-9622.



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## If you have alopecia areata, make sure thyroid studies are up-to-date

Ages 6 months and 12 months

Annually beginning at age 1 years

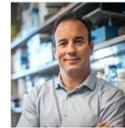
Every 1-2 years beginning at age 21 years

## Treatment of alopecia areata

- Topical treatments
  - Topical steroids
  - Topical irritants
  - Minoxidil 5% solution or foam
- Intralesional corticosteroids
- Oral treatments
  - Prednisone
  - Oral minoxidil
  - **JAK-inhibitors**
    - Baricitinib (JAK1/2); Ritlecitinib (JAK3/TEC); Deuruxolitinib (JAK1/2)

**Ask for a referral to a Dermatologist to discuss treatment options for alopecia areata**

## The Promise of JAK Inhibitors



First clinical trial for JAK inhibition in Down Syndrome

Alopecia areata  
(patchy hair loss)



Hidradenitis suppurativa  
(boils)



Atopic dermatitis  
(eczema)



Psoriasis



Vitiligo



4-9 months of treatment with JAK inhibitor **Tofacitinib**

Funded by:



THE INCLUDE PROJECT



National Institute of  
Arthritis and Musculoskeletal  
and Skin Diseases



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## The “Big 6”

Dry Skin

Dandruff

Psoriasis

Alopecia Areata

Folliculitis/HS

**PATIENT PERSPECTIVES** DOWN SYNDROME SERIES

## DOWN SYNDROME AND Folliculitis

Folliculitis is a skin issue that happens when a hair follicle gets inflamed. Folliculitis is one of the most common skin conditions in people with Down syndrome.

**WHAT DOES FOLLICULITIS LOOK LIKE?**

You may see raised, pinkish or reddish bumps around the hair follicle. These can be itchy or painful. Sometimes there is pus or peeling skin around the bumps. These bumps can appear anywhere on the body, but the buttocks and thighs are the most common. When the bumps go away, they may leave behind dark spots or pink spots. These usually fade over time.

Sometimes a single bump can become infected. When this happens, it gets swollen, red, and painful. This is called a "boil" or "abscess".

It can be hard to tell the difference between folliculitis and another skin condition called hidradenitis suppurativa (HS). HS is larger, painful bumps in the armpits, buttocks, and legs. HS is also common in people with Down syndrome. Talk with your child's doctor about monitoring for HS.

**WHAT CAUSES FOLLICULITIS?**

Folliculitis is caused by inflammation or infection of the hair follicle.

- Hair follicles are small openings on the skin where the hair comes out. They may become blocked or damaged from rubbing against clothing or shaving.
- People with Down syndrome may be more likely to have folliculitis because of the extra copy of chromosome 21. This may cause follicles to become blocked more easily because of differences in skin proteins and the immune system.
- Clogged follicles may trap bacteria that normally live on the skin. Bacteria grow inside the follicle, causing them to become red, swollen, and bumpy.

**HOW CAN I PREVENT FOLLICULITIS?**

If your child is prone to folliculitis, wash your child's skin regularly with antibacterial soap. You can either use your hand, a clean towel, or washcloth. Avoid sharing washcloths with others. If your child prefers baths and/or application of soap is difficult, talk with your child's doctor about bleach baths.

**Shaving Care**

- Avoid shaving when possible.
- An electric razor is less irritating than a blade razor.
- Shave in the same direction that the hair grows.
- Use shaving cream to lessen friction.
- Do not share razors with others.



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Folliculitis is one of the most common skin conditions in people with Down syndrome



▶ WHAT DOES FOLLICULITIS LOOK LIKE?



Body acne

Folliculitis is often on the bottom and thighs



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Courtesy of Dr. Leah Belazarian

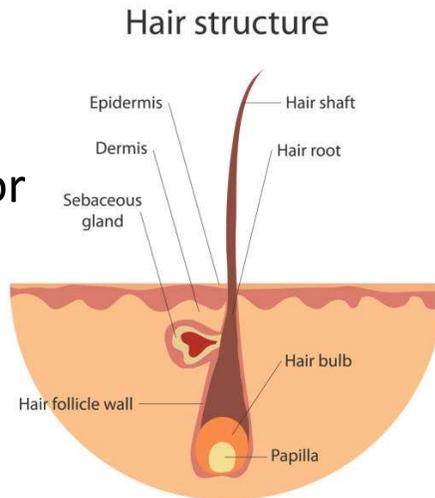
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# Folliculitis can cause scarring



## WHAT CAUSES FOLLICULITIS?

Clog pores –  
Amyloid Precursor  
Protein?



Microbiome?

Immune system?

## Treatments for folliculitis

- **Bathes and/or showers**
  - Once daily or every other day
- **Body washes**
  - Tea tree oil body wash
  - Benzoyl peroxide wash
  - Hibiclens wash (watch for dryness)



## Treatment for folliculitis

- **Bleach bathes in the bathtub**
  - Full tub: ½ cup bleach
  - Half-tub: ¼ cup bleach
  - Gallon of water: 1 teaspoon bleach
- **Time in the swimming pool!**
  - Make sure to shower after swimming, especially in a public pool

## Treatments for folliculitis

- **Antibiotics for the skin**
  - **Clindamycin 1% lotion** once daily
  - **Metronidazole 0.77% cream** once daily
  - **Erythromycin 2% pads**
  - Typically pair with a wash or soak
- **Topical retinoids** – Adapalene or tretinoin
- **Resorcinol 15% cream** – For big bumps, specialty pharmacy
- **Antibiotics by mouth– be careful!**
  - **Keflex 500 mg** twice daily for short term
  - **Doxycycline 50-100 mg** 1-2 times daily for short term

## Treatments for folliculitis

- **Oral Zinc gluconate**
  - Zinc gluconate 30 mg – 100 mg daily
  - Watch for stomach upset
  - Watch for copper deficiency
  - Ask a dermatologist!
- **Oral Isotretinoin (Accutane)**
  - Ask a dermatologist!

# Hidradenitis Suppurativa

PATIENT PERSPECTIVES

EQUITY, DIVERSITY, AND INCLUSION SPECIAL ISSUE

## Down syndrome and hidradenitis suppurativa (HS)

Hidradenitis suppurativa (*HI-drad-en-I-tis sup-per-ah-TEE-vah* or HS) is a chronic condition with recurrent painful bumps and draining sores of the skin. Sometimes it can look like acne. It more commonly affects the skin folds, such as the underarms, buttock crease, and groin area. When severe, it can appear in other parts of the body as well. HS seems to be more common in people with Down syndrome.

### WHAT CAUSES HS?

The cause is not completely clear. HS is not an infection and is not contagious. It is not caused by poor hygiene. The immune system and local factors play a role in the disease. People with Down syndrome have three copies of chromosome 21, and this can lead to changes in the immune system and skin that make HS more common. There might be other genetic factors that contribute, and it might run in families.

### WHEN DOES HS START?

HS can develop as a child, teenager, or adult. HS can start at a younger age in people with Down syndrome.

### WHAT DOES HS LOOK LIKE?

HS can range from mild to severe. It can look like multiple comedones ("blackheads") to painful bumps and abscesses that heal with scarring. Painful bumps can go on to form draining tunnels (" sinus tracts") under the skin. Deep bumps or tracts often leave scars. The tunnels can drain pus or blood, which can result in a bad smell.

### HOW IS HS DIAGNOSED?

The diagnosis is made by your child's doctor examining their skin. Since HS is more common in Down syndrome, it is recommended that a doctor look for signs of HS every year starting around age 10. Your doctor may check for infection of the skin before making this diagnosis. Other tests are often not necessary.

### HOW LONG DOES HS LAST?

The individual bumps and sores may last for weeks or months. They may keep coming back. In most cases, HS is considered a chronic, long-lasting condition. Each patient is different and the bumps may get better or worse over time.

### WHAT ARE THE TREATMENTS FOR HS?

While there are many treatment options, HS can be very hard to treat. It may take time to find the best treatment plan for each person. Medicines take weeks to months to work. Be patient, and do not stop a medication without first discussing with your doctor.

Friction can make HS worse. Ask your doctor for recommendations on

### TIPS FOR MANAGING HS

- See your child's dermatologist or other doctor regularly. They are your partners in helping them feel comfortable in their own skin!
- Make sure your doctor asks about how your child's HS feels. How does it bother them? Does it hurt? Knowing these answers can help the medical professional come up with a helpful treatment plan.
- Wear loose, comfortable clothes. Do not closely shave the areas of HS. Rubbing and friction can make HS worse.
- Healthy eating and exercise may improve HS.
- Wash affected areas gently. Do not scrub the areas, and always use clean washcloths.
- Do not pop the "pimples and bumps" as this can make them worse. Warm compresses or soaks can help the bumps to drain gently.
- Avoid having the areas with HS cut into or drained, unless you are seeing a surgeon specifically for the HS.
- For severe pain or a sudden change in the condition, call your doctor.



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## Hidradenitis can appear in different ways



© Waikato District Health Board

Inflammatory bump/boil



DermNetNZ.org

Scars



© Waikato District Health Board

Comedones



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Hidradenitis can happen in the armpits, groin, under the breasts, and sometimes other areas



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## Different severities/stages of hidradenitis



Hurley Stage 1

Hurley Stage 2

Hurley Stage 3

Folliculitis and Hidradenitis Suppurativa  
are often on a continuum

## Let's Head to the 'Lab!'



<https://news.feinberg.northwestern.edu/2019/06/17/northwestern-opens-largest-biomedical-academic-research-building-in-u-s/>

## Hidradenitis is likely more common

**Adults with Down syndrome were over 5 times more likely to have HS**  
(Adjusted OR 5.24, 95% CI 4.62-5.94)

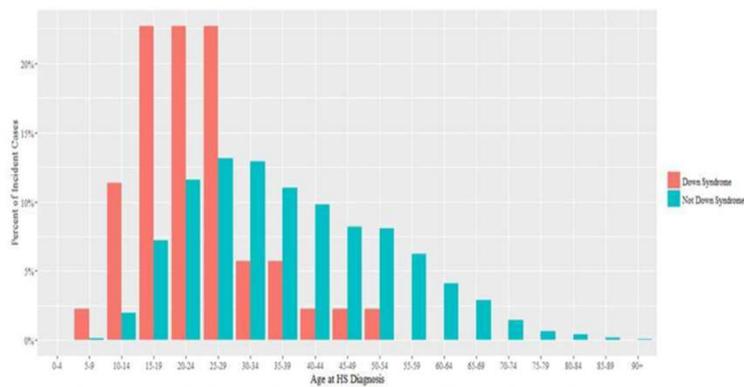
Br J Dermatol. 2018;178(3):697-703.



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# Hidradenitis may present earlier in life

Figure 1: Age at HS Diagnosis for Patients with and without Down Syndrome (May 2012 – May 2017)



Hidradenitis diagnosis by age 29 years in **80%** of patients with Down syndrome compared to **34%** in those without

# Screen every year for hidradenitis suppurativa Start at a young age (8 years)

REVIEW

## Comorbidity screening in hidradenitis suppurativa: Evidence-based recommendations from the US and Canadian Hidradenitis Suppurativa Foundations

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Tarannum Jaleel, MD,<sup>1</sup> Alexa B. Kimball, MD, MPH,<sup>8</sup> Joslyn S. Kirby, MD, MEd, MS,<sup>1</sup>  
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Haley B. Naik, MD, MHSc<sup>1</sup>

*New Hyde Park, Hempstead, and New York, New York; Toronto, Drummondville, St. John's, and Ottawa, Canada; Sacramento and San Francisco, California; Detroit, Michigan; Minneapolis, Minnesota; Durham and Chapel Hill, North Carolina; Boston, Massachusetts; Hershey, Pennsylvania; Miami, Florida; Philadelphia, Pennsylvania; and Atlanta, Georgia*



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matol. 2021 Jan 23;50190-9622(21)00213-9.

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Check in the armpits, groin, inner thighs and under breasts



## Treatments for Hidradenitis

- **Bathes and/or showers**
  - Once daily or every other day
- **Body washes**
  - Benzoyl peroxide wash
  - Hibiclens wash (watch for skin dryness)



## Treatments for Hidradenitis

- **Wound care, clothing**
- **Topical antibiotics**
  - **Clindamycin 1% lotion** once daily
  - **Metronidazole 0.77% cream** once daily
  - Typically pair with a wash or soak
- **Resorcinol 15% cream** – For big bumps, specialty pharmacy
- **Oral antibiotics**
  - Keflex 500 mg twice daily for short term
  - **Doxycycline 100 mg** twice daily for short term

## Treatments for Hidradenitis

- **Oral hormonal treatments (for women)**
  - Oral contraception/Implant contraception
  - Spironolactone
- **Systemic Zinc Gluconate**
- **Systemic retinoids**
  - Isotretinoin (Accutane)
- **Biologics**
  - Adalimumab – TNF-alpha
  - Infliximab – TNF-alpha
  - Secukinumab – IL-17 (preferred?)
  - JAK-inhibitors – not currently approved
- **Intralesional Kenalog**
- **Surgical treatments**
- **Laser hair treatments**

**If you believe you have hidradenitis,  
talk to your provider and ask for a  
referral to a dermatologist**



<https://pixabay.com/vectors/speak-up-megaphone-communication-5941874/>



**If my hidradenitis had a voice, this is what it would say: the perspective of a young woman with Down syndrome and hidradenitis suppurativa**

Alexis Sokoloff,<sup>1</sup> Morgan Dykman,<sup>2</sup>  
Gwen Sokoloff,<sup>3</sup> Kishore Vellody,<sup>4</sup>  
Kristen Holland<sup>5</sup> and Jillian Rork<sup>6,7</sup>



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**PeDRA** Podcast

If My Hidradenitis Had a  
Voice, This is What it  
Would Say



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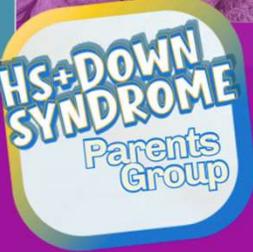


# CAREGIVERS OF HS + DS PATIENTS COMMUNITY

ONLINE ZOOM SUPPORT GROUP  
Free and virtual, meeting monthly



REGISTER NOW!



FOR PARENTS AND CAREGIVERS OF HS + DS PATIENTS, FIND OTHERS WHO GET IT.



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## The “Big 6”

Dry Skin

Dandruff

Psoriasis

Alopecia Areata

Folliculitis/HS

Foot Fungus

PATIENT  
PERSPECTIVES

## What is Tinea?

#70: TINEA INFECTIONS



Tinea is a fungal infection of the skin, hair or nails. These fungal infections are named for where they occur on the body. Some examples are:

- Tinea capitis (scalp)
- Tinea corporis (body)
- Tinea cruris (groin) – ‘jock itch’
- Tinea faciei (face)
- Tinea pedis (feet) – ‘athlete’s foot’
- Tinea unguium or onychomycosis (nail)

**WHY IS TINEA SOMETIMES CALLED “RINGWORM”? IS IT CAUSED BY A WORM?**

On much of the body and face, tinea can look like a red, scaly ring. Because of the ringed shape, it is sometimes called “ringworm” even though it is not caused by a worm.

**WHAT DOES TINEA LOOK LIKE ON THE BODY?**

The appearance of tinea, as well as the symptoms, may be different on different parts of the body.

**Tinea capitis (scalp):**  
The scalp may show flakes of skin resembling dandruff. There may also be pus bumps or patches of hair loss or broken hairs. In some people, the fungus causes more inflammation with redness, crusting and weeping on the scalp, and there may be enlarged lymph nodes in the neck (“swollen glands”). When hair loss occurs, it is usually temporary, and the hair will grow back. However, if the fungus has caused too much inflammation or scarring, the hair may not grow back completely.

**Tinea corporis, faciei, and cruris (body, face and groin):**  
These are typically the areas where the name “ringworm” is used, as the fungal infection looks like a red, scaly ring with clearing in the center. Sometimes there are multiple rings or partial rings or rings

**TINEA IS CONTAGIOUS**

People usually get tinea by touching a person who has it. Family members and close contacts may pass the fungus back and forth. Wrestlers are particularly at risk because of skin contact during the sport. The fungus that causes tinea can also live on sheets, brushes, hats, damp floors, gym mats, in the soil, and on pets. People can get tinea from touching these things too.

Some tips to prevent spreading tinea to others or back to yourself:

- Avoid sharing combs, hair brushes, hats, pillowcases and towels.
- Keep combs and hair brushes clean.
- Towel dry well after baths or showers. Pay special attention to body folds and feet, including the skin between toes.
- Wear sandals or flip flops in locker rooms, public showers and around the pool.
- Change your socks at least once daily.



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## Tinea Pedis (Athlete's Foot)



## Onychomycosis (Nail Fungus)

## A hidden spot!



## Treatment of foot and nail fungus

- **Topical treatments**

- Creams, sprays, lotions 1-2 times per day for 2-4 weeks

- Over-the-counters:

- **Clotrimazole** 1% creams/spray, **Terbinafine** 1% cream spray, **Tinactin** spray

- Prescriptions:

- **Ketoconazole** 2% cream, **Econazole** 1% cream, **Ciclopirox** cream/solution/laquer, **Efinaconazole** 10% (Jublia)

- Children tend to do better with topical nail treatments

- **Oral treatments**

- **Terbinafine** for 1-3 months

## Treatment of foot and nail fungus

- **Keep feet dry**
  - Change socks frequently
  - Consider wearing wicking socks
  - Consider a drying antifungal foot powder
- **Keep shoes dry**
  - Consider treating shoes with antifungal powder
- **Consider a maintenance treatment**

## Our Road Map

Welcome to the “Clinic”

Welcome to the “Lab”



The “Big 6”



Research Helps

## The “Big 6”

Dry Skin

Dandruff

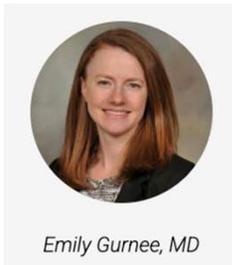
Psoriasis

Alopecia Areata

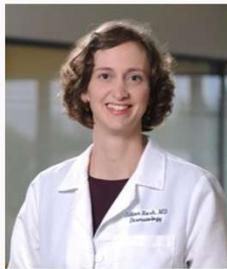
Folliculitis/HS

Foot Fungus

## PeDRA Down Syndrome Subgroup



Emily Gurnee, MD



**Jillian Rork, MD**

Co-Chair



**Kristen Holland,  
MD**

Co-Chair



Irene Lara-Corrales, MD

## PeDRA Down Syndrome Subgroup



Tasya Rakasiwi, BS



Morgan Dykman, MD



Mina Woo, BA



Allison Kranyak, MD



Brianna Green, BA



Chenin Ryan, MD



**PeDRA™**  
Pediatric Dermatology Research Alliance



**Mike Siegel, PhD**  
Executive Director



**Jenn Dawson**  
Director of Educational Programs



**Katherine Devenport**  
Research Programs Manager

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**NIH INCLUDE** Down Syndrome  
Research Plan



 National Institutes of Health

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## Psoriasis R03 Dartmouth Team



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## The power is in collaboration!





# The Skin Is In

## Skin Conditions in Children and Adults with Down Syndrome

Jillian Rork, MD  
Clinical Assistant Professor of Dermatology and Pediatrics  
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