www.HealthHits.info

www.facebook.com/HealthHitsPod

www.twitter.com/HealthHitsPod

HealthHitsPod@gmail.com

Hello and welcome to the Health Hits podcast.

*

I'm your host Tom Fisher and when I was in my mid 20s I was walking through an Egyptian market with my girlfriend of the time. A local came up and said to me: "I like your daughter". I don't know why he said that, did he want me to engage so that I would look at his stall, or was he just fed up of tourists that day? Whatever the reason I felt massively self conscious and this was because I was aware that my hair was starting to thin. It was minor, it was trivial, but that's what happens in hair loss – a minimal cosmetic change that has a disproportionate effect on our self confidence, and how we see ourselves.

Today we cover hair, why we have it, why we lose it, and what the evidence is behind available treatment options.

*

So what is hair?

Hair is a very basic protein structure, its called keratin. We have a thin layer of keratin in our skin, our nails are made from it, and its woven together in the hair follicle to produce the long strands. By the time it leaves the follicle or root, its no longer biologically active its dead, growing only due to new protein fibres being added to the hair from its base. A bit like adding extra rungs to the bottom of a ladder to make it longer.

Most but not quite all mammals have hair to varying degrees. It can be in the form of fur that keep animals warm or display patterns for mating, it can help sense the environment like a cats whiskers, it can protect the eyes by provoking a blink reflex if touched as in the case of eyelashes. In mammals like a hedgehog the hair has evolved to be more like a weapon in form of spines.

The relatively reduced hair-covering in humans when compared to the great apes is perhaps related to the benefits of carrying fewer parasites, or our ability to regulate our temperature with clothing in different climates.

We still see vestiges of our hairier past every time we get goosebumps. These are contraction of tiny muscles in the skin that would normally pull the hairs upright when we are threatened or when we are cold.

Despite losing it from most of our body, it remained on our heads and the variety of colours is related to the presence or absence of two types of melanin pigment woven into the keratin structure of the hair.

More eumelanin produces darker hair, more pheomelanin produces more reddish hair and minimal amounts of either melanin type results in blonde hair.

From this point on I'm just going to focus on the hair on our heads, as that's what most of us, including me, focus on!

It grows from specialised structures in the skin called follicles. This is where the keratin is added to the shaft of the hair to make it grow. We have around 100,000 follicles on our heads, each with its own blood supply to bring the energy and building blocks needed for hair growth. There are three distinct modes that the follicles can be set to: anagen, catagen or telogen.

At any time 80-90% of hair follicles are in the anagen mode. In this mode keratin is being added to the root of the hair and so its growing. Each follicle can stay in this mode anywhere between two and six years.

When the follicle reaches the natural end of the anagen stage it moves into the catagen mode for a couple of weeks. This is happening to only around 2% of our follicles at any one time and involves shrinking of the hair follicle and detachment of the hair from its anchor.

The final stage of hair growth is the resting stage, known as telogen. In this mode the hair follicle is resting for several months. The shaft of the hair generally stays in the skin even though its not anchored, a bit like an arrow in a quiver.

At the end of the telogen mode the hair starts to grow again, which means a new hair starts to form, pushing the old hair shaft out, leading to shedding. At this stage the hair is basically back in the main growing or anagen phase.

So that's how hair grows and sheds naturally. The majority of the hair is in the growing phase, but there is a several month pause between each follicle finishing one hair and starting another.

There are several reasons that we might lose our hair at a faster rate.

Fungal infection of the scalp, which is usually just overgrowth of naturally occurring skin fungus can damage hair follicles directly. It leads to inflammation of the follicles, stopping them working. Usually in small round patches on the scalp, perhaps with dry skin on the top. It's easy to treat with antifungal shampoos or creams, which is just as well because left untreated it can lead to scarring and permanent loss of follicle function.

Another cause of distinct patches of hair loss, but usually without the dry skin, is called alopecia areata. This is an automimmune process, essentially where the immune system targets our own cells. Normally the immune system would attack invader material like a bacteria or virus, but if there is some similarity between invader proteins and some of our own body structures you can end up with the immune cells attacking the wrong thing. In the case of alopecia areata it is hair follicles, leading to inflammation and shutting their function down. In extreme circumstances it can lead to the very dramatic alopecia totalis, where all the hair on the scalp falls out. Applying immune suppressing steroid creams to the area early enough can slow down the loss, but due to the natural cycles that follicles go through it can often take months or years to regrow.

I experienced a couple of patches of hair loss in my beard line after a nasty infection, and it was 2-3 years before the hair grew back, but now you would never know.

Another very well known cause for total hair loss is chemotherapy. Chemotherapy drugs are drugs that damage cells that are very active and since most cancers are very active compared to their slower functioning normal neighbours it can be very effective. However, cells in hair follicles are also quite active, they are busy laying down more and more keratin at the base of the hair. They are unfortunately collateral damage from the chemotherapy drugs.

There is some evidence that temporarily cooling the scalp, resulting in less drug-containing-blood flowing to the skin and so the follicles can reduce the hair damage. I imaging this is quite unpleasant as the treatment can lasts hours at a time, over weeks or months, and can be weighed up against the fact that hair growth usually returns within a month or two anyway.

Ok so now I'm going to move onto the headline act. Pattern baldness.

In men its called male pattern baldness, in women. Female pattern baldness.

It affects around half of all adults by the age of 50, but whilst the volume of hair loss can be more significant in men, it is equally distressing across the genders. And as described earlier, the objective appearance of hair loss to others is often minimal compared to the impact it has on the individual.

How does it develop?

Well the sex hormone or androgen, testosterone circulates in our bloodstream. It is found in much higher levels in men than women, around 10-20 times higher in fact, and plays a role in growth and puberty. In adults it helps regulate muscle mass, bone density and in men plays a big part in sex drive.

In certain parts of the body, including the hair follicles this testosterone can be converted by an enzyme to dihydrotestosterone, a similar but importantly different hormone.

The dihydrotestosterone seems to be toxic to hair follicles and causes them to shrink over time.

No one knows exactly only the scalp is affected, but that hasn't stopped wild theories, including the effect of gravity on the top of our heads. Remembering that we spend 1/3 of our lives lying down, this theory doesn't stack up for me.

So progressive dihydrotestosterone damage and shrinking of the hair follicles on our scalp leads to thinning and ultimate failure of hair growth.

The list of supposed hair loss treatments is truly staggering, and I'm not going to waste time discussing things with no evidence. If you think about what is actually happening on a microscopic level the idea of massage or applying caffeine or adding extra keratin to your shampoo is absurd.

The main two evidence based approaches to pattern baldness are minoxidil and finasteride.

Minoxidil is often marketed as Regaine or Rogaine and is a foam or lotion applied directly to the scalp.

It started life as a blood pressure medication in trials in the 1950s and worked due to dilation of blood vessels. Check out episode 2 on blood pressure to find out more.

During the trials it was noticed that men were experiencing apparent hair growth.

It was quickly accepted as a hair loss treatment and since the late 80s and early 90s its been available in a skin preparation for both men and women.

It seems to work by stimulating the follicles to produce hair faster and thicker, presumably by dilating the blood vessels and suppling the follicles with extra energy and building blocks. It will work on follicles that are partially damaged by dihydrotestosterone, but won't prevent further damage and so won't prevent the follicles ultimately failing.

Its very hard to get a handle on the evidence for minoxidil as most papers only deal with very small numbers of patients, however, the consensus seems to be that about 2/3 of people will get noticeable improvement, 1/3 will not get worse whilst on the treatment, and a few percent will see no improvement. The therapy is applied directly to the skin so side effects are pretty minimal. But its important to remember that is doesn't actually affect the ongoing dihydrotestosterone damage.

The other commonly used pattern baldness treatment is finasteride, commonly marketed as Propecia.

It is a tablet that works by reducing the action of the enzyme 5-alpha-reductase. This is the enzyme that converts testosterone to dihydrotestosterone in the hair follicles and other parts of the body.

By producing less dihydrotestosterone you end up with less damage to the hair follicles and a reduced rate of hair loss. For the same reason it also reduces prostate size in men with a benign overgrowth known as hypertrophy.

A large study with thousands of patients, over five years showed that men taking finasteride initially experienced hair growth, and then hair loss but at a much reduced rate from baseline. In the control group 58% of men lost hair by 1 year, 72% by 2 years and 100% by 5 years. This is compared to 14, 17 and 35% for the men taking finasteride. It is without a doubt a drug that works.

But what about side effects. Well as you can imagine, a drug that effects testosterone and dihydrotestosterone levels can have an impact on sex drive.

A new piece of research published in March 2017 by American researcher Steven Belknap, looked at 11,000 men who had taken finasteride and found that between 1-2% experienced erectile dysfunction or lack of libido. It is not surprising given that we know how important the androgens are on libido, but what was shocking was just how long this problem lasted. On average the effect went on for several years, even in men who only took the drug for 7 months.

This has been a growing concern amongst men who have taken finasteride, but it seems that now there is a reasonably good research paper to support their fears.

So hair loss is expected in at least 50% of us.

It can have a big psychological effect.

And there are treatments out there that can improve the hair's appearance or slow down the rate of thinning.

However, these drugs don't last forever, and in some men can result in catastrophic side effects. Thought your thinning hair was a blow to your self confidence? Try 3 years of erectile dysfunction.

So it seems we men cannot win. I say men because hair loss does affect men more dramatically.

The latest options, brought to mainstream attention by celebrities like Wayne Rooney and James Nesbitt involve removing individual hair follicles from less affected parts of the scalp and implanting them on the thinning top areas.

The results look very impressive and the success rates seem to now be in the high 90s.

But you have to remember several things.

1 – its painful and its expensive. Up to £10,000 per transplant procedure

2 – its possibly temporary, as further hair loss continues around the edges of the transplanted hair, risking leaving you with odd looking islands of hair and perhaps necessitating another expensive treatment.

3 – its not a big deal. We over think it in our heads and we often see ourselves in a much more negative way than others do. A recent survey of several thousand women found that some minor hair loss in a potential male date would not be an issue for 97% of women. Or even for 74% in severe hair loss.

In fact it seems that between 40 and 50% of British and American women find bald men sexy, so maybe in time we'll feel sorry for men with full heads of hair. Maybe they'll start shaving it to get a better aesthetic.

But ultimately it comes down to this. If you think your appearance is your only asset and people won't like you or find you attractive based on your personality or your achievements then you are lost. Anyone superficial or vain enough to judge others for something as trivial as hair loss, likely doesn't deserve any of your attention or your time.

I often think back to my time working with the neurosurgery team in the Queen Elizabeth Hospital in Birmingham. The soldiers there had been scooped off the battlefields of Iraq and Afghanistan where their bodies had been savaged by the conflict. These men and women had lost far more that the follicles on the top of their heads but they conducted themselves with more dignity, more self respect and more humour than I have ever come across. And so I remember that a thinning hairline really isn't such a big deal at all.

If you would like to read the research articles I have discussed, ask questions, or request topics for future episodes, come and find us at www.HealthHits.info or on Twitter or Facebook @HealthHitsPod.

Thank you so much for listening, and please join me for another, episode of Health Hits.