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PART EIGHT

Miscellaneous Myths

90. Hospitals get busier on full moons

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It's another busy night in an inner city hospital emergency department (ED) and patients keep pouring in with injuries from accidents, assaults and self-harm attempts. One veteran nurse turns to a junior doctor, rolls her eyes and mutters 'must be a full moon tonight'.

The junior doctor racks her sleep-deprived brain to remember what the moon looked like on the way to work. She can't recall — and doesn't bother checking — but files the incident away so she can bring it up at social gatherings and retell it as part of the folklore of the ED.

What we have just witnessed (or something like it) happens every week around the country. Despite the 'lunar effect' being one of the most easily studied and thoroughly debunked myths in medicine, it provides a fascinating look at the psychology of rational people who work in jobs where superstitious beliefs can easily develop.

But first, the science.

The biggest study I can find debunking the myth is a 2004 paper from Iran. It analysed just under 55,000 trauma-related admissions to three EDs over 13 months. There was no difference between full-moon days and other days in the number of attendances, nor in the type or severity of patients treated.

Other well-conducted studies include a 1992 Canadian analysis of the relationship between crisis calls to police stations and poison centres, and the lunar cycle (there was no correlation). And another review, also from 1992, which found no relationship between full moons and increased suicide attempts.

A less technical summary from *Scientific American* explains the ancient origins of the belief: the moon was thought to cause intermittent insanity. That's why the Latin word for moon, *luna*, forms the base of the outdated term 'lunatic'.

Perhaps more interesting in the *Scientific America* summary is that the myth persists within groups of professionals who deal with unpredictable patients, such as mental health professionals and emergency service personnel.

Two important effects are at work here. The first is confirmation bias. This is the innate tendency of people to remember and pay attention to facts that confirm an already-held belief, and ignore or downplay facts that tend not to support it.

There are many, many busy and stressful nights in EDs and some of them inevitably fall on nights when the moon is full. These will be the ones that ED staff remember, and they will tend to forget the ones which are not on full moon nights.

The second likely cause of such a persistent myth is that those who work in fields that are inherently unpredictable — where stakes are high and conditions demanding — are more likely to be prone to superstitious or magical thinking. It is a form of the illusion of control cognitive bias.

Part of feeling able to cope with the randomness of life is to develop associations which can be given a meaning, even if the belief seems absurd. The psychologist Michael Shermer has coined the term 'patternicity' to describe this tendency in the context of evolutionary psychology.

So, despite a pedigree dating back to Aristotle, the belief that the full moon affects behaviour in any way only persists because of the very human responses of our front-line health personnel. When they're feeling under the pump, they begin to instinctively look for patterns in random events.

91. Tongues register different tastes in different locations

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The myth that the four common tastes of sweet, sour, salty and bitter are located at different regions of the tongue has existed for more than a century.

It arose from studies in the late 19th and early 20th century that indicated sensitivity for bitter was best at the back of the tongue.

Sweet was best tasted on the sides near the front, salty was most sensitive at the front and sour could be tasted most on the sides near the back of the tongue.

The myth began because the original data was misinterpreted.

In fact, the early studies showed each of the four tastes could be sensed at each of the regions but with modest sensitivity differences.

These differences were overlooked over time to wrongly indicate there were four distinct regions on the tongue — one for each of the tastes.

This powerful myth continues to circulate, even in a current medical textbook.

Researchers began to debunk the myth in the 1970s. Since then, several studies have shown all four tastes can be sensed in all four regions, as indicated in the earlier studies.

Interestingly, despite the renewed interest there is no universal agreement about the most sensitive areas for each taste.

In the two most comprehensive studies, sensitivities for sweet and salt were slightly better at the front and side of the tongue and sour was slightly better on the side towards the back. This fits with the original research.

Resolving the argument over the taste sensitivity of different parts of the tongue is complicated by several factors.

The number of cells that serve the two main nerves in the tongue (the chorda tympani at the front and the glossopharyngeal at the back) differ from person to person.

This means the number of cells each of the nerves activates varies markedly between individuals. But how these two factors affect the sensitivity of tongue regions has not been resolved.

Age can also affect sensitivity in different regions. Children have more taste buds in the tip of the tongue than adults and so are more sensitive to sweetness than adults on the tip. Elderly people in their seventies exhibit little difference in sensitivity in the front, side and back regions for each taste. The age of participants in studies is clearly important.

Another factor in measurements of taste sensitivity is the density of taste cells. This varies dramatically across the tongue, with high density correlating with high sensitivity.

Accordingly, different results have been obtained in different studies because the size of the area stimulated — and therefore the number of cells stimulated — have differed across studies.

We can only conclude that the tongue is more complicated than it appears, but there's little doubt that the myth that special areas of the tongue sense only a particular type of taste is well and truly debunked.

92. Mosquitoes prefer sweet blood

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It's quite a romantic notion that the sweetness of our blood attracts mosquitoes. But in reality, it's probably the cocktail of stinky microbes on our skin that really draws them in.

It's hard to know where this myth started. Perhaps because some insects are known pollinators and attracted to nectar and other plant juices, it was considered that mosquitoes behave similarly. Mosquitoes do feed on plant sugars, and this has been exploited in the development of new mosquito-borne disease surveillance strategies in Australia and North America.

As the saying goes, a spoonful of sugar helps the medicine go down. Perhaps consoling a mosquito bite-covered friend with the words 'it must be your sweet blood' can take the edge off the itch.

It is true that only female mosquitoes bite. She bites to get a hit of protein required for egg development, but preferences for that blood can vary greatly. Some prefer to bite mammals. Some prefer birds. Some even prefer to bite frogs. And, unfortunately, some prefer to bite humans.

There is strong evidence that we all differ in our attractiveness to biting mosquitoes. They are firstly attracted by the carbon dioxide we exhale. Body heat plays a role in attraction too. But while mosquitoes may bite us to get a feed of blood, our blood itself doesn't seem to influence who they bite.

Although studies have suggested that mosquitoes are more attracted to individuals with type O blood, the results are far from conclusive. The trend isn't likely to be consistent for all mosquito species either and it certainly isn't only people with type O blood that get bitten.

Odours produced by microbes on our skin have been shown to attract mosquitoes — and there can be quite a cocktail of smells emanating from us. More than 300 chemical compounds have been identified from human skin, and the abundance of some of these can vary on a daily basis. Differences in the attractiveness of individuals to mosquitoes may be explained by differences in the abundance and diversity of these microbes.

Keep in mind that not all these compounds will attract mosquitoes. Some will actually reduce the likelihood of being bitten.

So what does this all mean for those wanting to be less attractive to mosquitoes?

Researchers may one day produce new repellents or more effective mosquito traps, but the take-home message from decades of research is that everyone varies a little in their attractiveness to biting mosquitoes. You may never know exactly why you get bitten more than your friends.

Remember, it only takes one bite for the transmission of a disease-causing pathogen, so even if you don't think you're top of the list on a mosquito's menu, take precautions to prevent bites.

93. You lose most heat through your head

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As the weather starts to cool down and winter clothes enter rotation in our wardrobes, some peculiar combinations emerge: shorts and scarves; thongs and jackets; T-shirts and beanies. The last is often explained with an old saying: you lose most of your head through your head. But, in fact, scientists know this to be untrue.

Firstly, let's go back to the basics of heat exchange.

Human heat exchange is dictated by a combination of physical principles, variations in body shape and size, and physiological control mechanisms such as altered skin blood flow, shivering and sweating. These interactions maintain a stable deep-body temperature, which is typically just below 37°C.

While survivable extremes of 13.7°C and 46.5°C have been reported, you're likely to feel miserable and unwell when this temperature drops below 35°C or rises above 40°C.

Physical principles

Looking beyond the body, heat is exchanged between all objects via dry pathways (radiation, convection, conduction) and through the evaporation of moisture.

For dry pathways, thermal energy moves from hotter to cooler regions, with its exchange rate depending on the temperature difference between these objects.

For evaporative cooling, water molecules leave moist surfaces to enter less humid air, taking heat with them.

These are the first principles of heat exchange.

Body shape and size

Heat is likely to be lost more rapidly from larger surfaces. Nevertheless, large masses have greater thermal stability, and resist rapid and significant changes in temperature. Thus, the interaction between surface area and mass provides another first principle: the temperature change of any object is dictated by the ratio of its surface area to its mass.

So, a wafer-thin rectangular prism loses heat remarkably quickly, while a sphere, which has the smallest surface area to volume ratio of any object, provides the greatest resistance to heat loss. The relatively spherical shape of the human head, therefore, leads us to challenge the heat-loss myth on the basis of first-principles science.

But we can't ignore the physiological control of skin blood flow, as this is how heat is transported to the skin for dissipation, and sweating, which facilitates heat loss when the air is hotter than the skin.

There are many examples of how natural selection led to physiological changes to support temperature regulation. Take the Toco Toucan: the large surface area of this bird's bill, in combination with its blood supply, enables very efficient heat dissipation. The same applies to elephant ears. In humans, the closest equivalents are the hands and feet.

Physiological control

The head is not an ideal radiator, even though it has many blood vessels close to its surface, as its skin blood flow does not vary significantly when one is either resting comfortably or dramatically cooled. Even when someone has a dangerously high temperature, head skin blood flow increases much less than that of the hands and feet for the same heating stimulus.

Plus, most heads have about 50% hair coverage, which traps air and insulates against heat exchange. Although (sadly) not all heads conform with this generalisation.

The head is not great for evaporative cooling either. While the forehead is the most prolific sweat secretion site per unit area when we're resting, sweating from sites inside the hairline occurs at half this rate.

In fact, the head represents only about 7% of the body surface area, so its contribution to whole-body evaporative cooling at rest is only 10%, and less than that of the hand, back, thigh and lower leg. While this heat loss can triple during exercise, it still accounts for only 13% of total evaporation.

So, it would seem that even though the temperature of the head makes it well suited to losing heat, neither its geometry nor its physiological responses to heating or cooling make it a critical site for heat loss.

Covering your head is no more effective at keeping you warm than covering most other body regions. In other words, you're no more likely to lose heat from your head than other parts of your body — except your hands and feet. So wearing gloves and socks is your best bet.

94. Crossing your legs is bad for your health

Merlin Thomas
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Almost everyone crosses their legs, whether it's conscious or unconscious, for custom, for comfort, for effect, to stop your legs splaying, to take pressure off a foot, or for no reason at all. But is it bad for your health?

Your doctor will often tell you to uncross your legs because blood pressure rises slightly when you cross your legs at the knee. Some people are even able to use this increase in blood pressure to their advantage by crossing their legs to prevent an impending faint. But while high blood pressure is bad for your health, there is no evidence that leg crossing contributes to the condition.

Varicose veins are another reason we're told not to cross our legs. These unsightly, swollen blood vessels occur as a result of damage to the small valves that normally keep the blood moving in one direction: straight back to the heart. In those with varicose veins, some blood refluxes out into the small veins on the surface which subsequently balloon under the pressure.

Varicose veins are more common in women, especially those who have had (many) children and with advancing age. Crossing your legs may draw attention to varicose veins but it's not their cause.

Leg crossing has also been suggested (mostly by chiropractors) to lead to bad posture and its downstream effects on the back, hip and pelvis. Certainly, those with back and hip problems may experience discomfort when crossing their legs. Try it yourself and you may feel the muscles of your back tightening a little. If those same areas were otherwise inflamed it's easy to understand why leg crossing could seem problematic.

But what is cause and effect is unclear, and it may be that sitting in bad chairs for long periods is more to blame than what we are doing with our legs to cope. There is also some evidence that leg crossing could reduce strain on abdominal muscles and improve joint stability, which could actually be beneficial in some cases.

Prolonged compression of the (peroneal) nerve that runs along the outer part of your knee can sometimes make your foot 'fall asleep' after crossing your legs. This is not dangerous or a sign of impending paralysis, and after a few seconds things will usually return to normal. In some people, it takes a bit longer (minutes).

In a very small number, prolonged and/or habitual leg crossing may damage the nerve, and probably has more to do with a special susceptibility rather than the behaviour itself.

In men, crossing your legs while wearing trousers raises the temperature of the groin. This has led to the suggestion that would-be fathers should not cross their legs (or for the same reason wear tight fitting underwear and balance a laptop).

But you'd probably have to leave them crossed for many hours every day to have any effect on your sperm count. And besides, most men tend to rotate their hip out when crossing their legs for long periods to make a 'figure four' and thus alleviate any unwanted tension.

Leg crossing has long been linked to morality and etiquette. In some countries and cultures, leg crossing is looked on as casual, disrespectful, and altogether lower class. For the same reasons, many orthodox religions frown upon leg crossing in church. And what's good for the soul should be good for the feet as well.

But piety and respect aside, you're unlikely to do any long-lasting harm simply by crossing your legs while sitting. The problem is really caused by sitting in the first place. Don't make yourself comfortable — get up and get moving.

95. Shaved hair grows back faster and thicker

Michael Vagg
Deakin University

Hair removal is a modern obsession. Despite the economic downturn, the beauty industry is booming, and it seems that a big part of looking good is getting rid of unwanted hair. Men as well as women are increasingly forking out big dollars for 'permanent'hair removal treatments, preferring to shun the traditional character-building cold steel of a safety razor.

Maybe it's the risk of cuts, but undoubtedly part of the attraction of longer-term hair-removal treatments is the conventional wisdom that shaved hair grows back faster and thicker than it was before.

Some teenage boys hope this one is true, but pretty much everybody else will be relieved to know it's definitely a myth.

For a definitive (and very old) scientific reference, a *Journal of Investigative Dermatology* study from 1970 is as good as any since. But it's fun to speculate about why this belief persists.

The rate of hair growth is determined by a number of factors including genetics, nutrition and nerve function to the area of skin.

When you're healthy, hair growth is determined by the length of time that the follicle spends in the anagen (growth) phase. Around 80% of the your follicles are in this stage at any time, and they can remain in anagen phase for years at a time. The other phases of the hair growth cycle are the catagen (transitional) phase, which lasts for a few weeks after the anagen ends, and the telogen (dormant) phase.

Loss of chunks of hair due to stress, chemotherapy or major surgery occurs when large numbers of follicles hit the telogen phase at the same time, under the influence of regulatory hormones.

Some medications other than chemotherapy drugs can have a similar effect, including beta-blockers such as propranolol for blood pressure, tricyclic antidepressants like amitriptyline and epilepsy drugs such as sodium valproate.

Some medical conditions can cause accelerated hair growth, or a change in the type and distribution of hairs. Excessive exposure to male-type hormones (androgens) will result in more hair on the body and face, and less on the scalp.

The new hair may also be thicker and darker than the previous hair that grew there. This is because androgens cause the hair follicles to produce a specific type of fairly robust hair (androgenic hair), whereas female hormones such as oestrogen stimulate the growth of smaller, lighter hairs known as vellus hair.

Under usual conditions, a person's hair growth stays at a fairly constant rate: an average of 1.25 cm a month for head hair (including ears and nose, gents). Body hair tends to reach a certain length and stop growing, then fall out. The vast majority of body hair is vellus in type.

The perception of faster growth once shaving begins is probably a reflection of increased awareness and possibly even self-consciousness of the area.

There is no convincing evidence I can find that you can improve your genetically and hormonally determined optimal growth rate by taking supplements of any type. Nor can supplements prevent hair loss or improve the appearance of hair. No credible studies have ever been done on the subject, despite a number of product manufacturers making these claims.

The idea that hairs grow back darker and thicker is also an illusion, created by the fact that hairs tend to taper towards their ends. Shaving them at the base will result in a blunt-ended hair that feels more obvious and is slightly thicker than the end of the hair that has been cut. The base of the hair has been this thickness all along. But compared with the end of a longer hair, it seems a lot thicker.

Plucking and waxing removes the hair from the follicle at the base, meaning it will take a bit longer to regenerate and will come out with a tapered end rather than a blunt one. This is probably why plucking and waxing have a reputation for causing hair to grow back more sparsely.

So hair is hair is hair. It grows, it falls out. Sometimes it gets plucked, waxed or lasered. Like many bodily functions, your hair's appearance and behaviour will reflect your overall health and your genetic heritage. Unless you have a condition affecting the skin or the regulation of the hair cycle, you can't make it grow faster or thicker.

96. Bed rest is best for back pain

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Severe low back pain is a common and dreaded problem that rivals only hay fever, asthma, hypertension and dermatitis as Australia's leading cause of long-term illness.

The instinctive response to severe pain is to rest the injured body part and reduce normal activities while it heals.

But from the mid-1990s, studies comparing bed rest to more active treatment for acute back pain have reached the same conclusion: bed rest is not best for pack pain.

Light activity — such as short walks around the house or sitting upright for brief periods throughout the day — reduces the requirement for medication, shortens absences from work and results in fewer visits to health-care professionals.

Bed rest isn't completely forbidden but we know it should be minimised to the shortest time possible. Understanding why it's so important to remain active is more elusive.

The brain's role

It's tempting to assume that chronic pain only occurs in the weak and petulant. But personality factors are one of the few things we're sure of that doesn't contribute to the risk of developing long-term pain.

Those who overlook medical advice and avoid activity may be doing so because they're trying to cope with high pain levels by avoiding all possible movements which may increase it. But the resulting bed rest has a compounding effect on the level and duration of their pain.

Long periods of immobility give the lumbar-stabilising muscles time to lose condition, making recovery of normal movements more difficult when the initial pain settles.

A fearful emotional response to back pain often results in longer recovery and higher risk of disability. Interestingly, this emotional response may reflect a hardwired predisposition in the brain of the pain sufferer — not a weak or melodramatic personality.

So remember: you're not to blame for how your brain reacts in a major pain crisis!

Breaking the cycle

Anticipation of pain can itself cause protective movements to persist for longer than necessary.

A vicious cycle of pain followed by more rest, followed by new pain due to that rest, can spiral downwards over a couple of months and leave you with abnormal movement patterns.

Imagine continuing to limp months after your ankle sprain has healed because you were worried that it would still hurt. You would have secondary pains in the other foot, back and hip due to the persistent limping alone.

Restoration of the pain sufferer's trust in their own back is vital.

This trust tends to be eroded by prolonged bed rest — anyone put to bed for more than a couple of days will develop stiffness and pain in the muscles and joints, and this is equally true for the back.

It's not all bad news

It's reassuring to know that more than 80% of acute back pain will settle within six weeks regardless of the treatment approach used. And fewer than half of those not better by six weeks will go on to have long-term pain.

The goal of managing acute back pain is to reduce it to a point where the sufferer can stay moderately active while the pain settles over the usual four- to six-week period, rather than getting rid of it immediately and completely.

With sensible activity and treatment plans, acute back pain sufferers have good outcomes 95% of the time.

97. Overweight people live longer

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We've long known that too much excess weight increases your likelihood of dying prematurely. Or does it?

A large review of the evidence published in the *Journal of the American Medical Association* (*JAMA*) in January 2013 found that overweight people live longer than leaner people.

But don't reach for the pie and chips just yet.

There is no denying that the high and rising prevalence of obesity and overweight is a major health problem. With 70% of men and 56% of women either overweight or obese, Australia is among the worst-affected countries in the world.

We commonly measure body size with body mass index, or BMI: a person's weight in kilograms divided by the square of their height in metres. It is a good average measure of the amount of fat a person has in their body, which is useful for classifying people in population studies.

The World Health Organization (WHO) defines a 'normal' BMI range as 18.5 to 24.9 and this corresponds to a weight of 49 to 65 kg for Australian women of average height (1.62 m) and 58 to 77 kg for men of average height (1.76 m).

Recent estimates have shown for the first time that a high BMI is now responsible for the greatest burden of disease in Australia and New Zealand, ahead of smoking and high blood pressure.

But the challenges represented by the obesity epidemic have raised the question of what the ideal BMI is for life expectancy.

Two large and well-conducted studies in the *Lancet* and *New England Journal of Medicine* examined this issue by gathering data on more than two million people who had their BMI calculated and were followed for their risk of dying over a defined time period.

The large numbers of participants and detailed individual data in these studies means the researchers were able to look at how small differences in BMI relate to the risk of death, accounting for a range of other factors known to influence this relationship, including illnesses that could potentially affect BMI.

Despite the diversity of populations covered by the studies, and the differences in methods, their findings are remarkably consistent: people with a BMI at the upper end of the WHO 'normal' level (22.5 to 24.9) have the lowest death rates.

As BMI goes up in increments of 2.5 above and below the 22.5-to-24.9 category, so do death rates.

Why do people with a BMI at the upper end of the 'normal' range have the lowest risk of death?

People with BMIs above this optimal level have an increased risk of dying, especially from heart disease, most likely due to increases in blood pressure, cholesterol levels and diabetes caused by excess body fat. They also have an increased risk of dying of cancer.

People with BMI levels below the optimal level also have increased death rates, particularly from respiratory diseases (such as chronic bronchitis) and cancer. The increased risk of death in the people with lower BMIs may also be because chronic illness has caused them to lose weight.

So, with this evidence in mind, how does the *JAMA* paper reach such a different conclusion?

It comes down to the way the data from each of the studies have been collated and presented.

The *JAMA* review used broad classifications for underweight, normal weight, overweight, and obese and very obese, rather than the 2.5 increments of BMI. People with a BMI of 18.5 to 24.9 were included in the 'normal weight' category; this broad category includes people with the lowest risk of death, combined with people with a higher risk of death.

The 'normal weight' category was then used as the comparison group for the studies, and has an average risk of death that is higher than the risk in the broad 'overweight' category.

This skews the optimal weight finding. The result? One that suggests being overweight makes you live longer.

There are varying reasons why the researchers might have used these broad groups, including the fact that many studies are too small to be able to present statistically reliable results according to finer gradations in BMI.

The bottom line is that too much fat is bad for your health and increases your risk of dying prematurely. We still have a long way to go in our fight against obesity and, if anything, we need to redouble, not reduce, our efforts.

98. Feed a cold, starve a fever

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This winter, most of us will catch a cold. Our kids will probably catch at least two or three. We all know you are supposed to feed a cold and starve a fever. But does it really make any difference if they eat or not?

This proverb appears to have become popular in the nineteenth century. However, dozens of websites attribute the phrase back to the fourteenth century and Geoffrey Chaucer's *Canterbury Tales.* But no such phrase by Chaucer exists. It seems that everyone simply copied a story without checking its original source. This is also how many medical myths start.

Colds are caused by viruses that infect the nose, sinuses and throat. But the unpleasant symptoms (blocked and runny nose, cough, sneezing, sore throat and headache) are largely triggered by our body's reaction to them, rather than any damage caused by these bugs.

The runny nose (often accompanied by sneezing) is caused by increased secretions from the glands in the nose and seepage of serum (the yellow cell-free part of blood) into the nose.

Progressively, white blood cells also find their way in and their presence causes the gunk coming out your nose to turn yellow or green, as these cells contain a green protein called myeloperoxidase. This change in colour is not caused by bacteria and does not mean you need to take antibiotics.

The blocked nose comes about as the large veins in your nose dilate to narrow the space available for air to flow, while at the same time, the volume of secretions are increased and their clearance is diminished, especially during the latter phases of a cold.

Curiously, one nostril is usually worse than the other, at any one time. And it's not always the same one. In fact, which nasal passage is most blocked usually alternates from one to the other over a period of several hours. This so-called 'nasal cycle' is thought to be a defensive response, possibly to keep one open while the other one is being pumped clean with protective fluids.

When you have a cold you often don't feel much like eating anything. This is the result of chemicals released by your body to fight off infection also affecting your brain. These same chemicals can also make you feel irritable, lethargic, or just plain miserable.

But why should your brain want you to starve if you are ill? One reason may be that you don't want to waste precious energy finding food that you could otherwise use in getting well. Of course this theory doesn't wash if mum has just made you chicken soup. But the modern brain still works much like a caveman's did.

It has also been suggested that not wanting to eat may be an important natural defence mechanism just like a fever, which helps your immune system fight off infections.

In fact, if you force-feed mice during an infection they are actually more likely to die than if they only eat what they feel like.

These facts have led to the idea that there may have been a semantic shift in the idiom. What we think of as 'feed a cold, starve a fever' may originally have been 'fede a cold starb o'feber' (fede = 'stoke [a fire]', starb = 'die', feber = 'fever') or 'stoke the inflammation of an infection and you die'.

But while starving (in the short term) can keep a feverish mouse alive, this may have little relevance to an innocuous cold.

Most times grown-ups get a cold they don't even get a temperature. Adults generally save fevers for bugs they've never seen before or severe infections, like influenza. So if you have a sore throat and a runny nose, but no fever or cough from the beginning, you're probably just coming down with a common cold. And so you may just as well feed (during) your cold, and save your starving for the fever.

For kids, all bugs are new, so fevers are commonplace. This doesn't mean they're in any danger, but they'll probably be more miserable than you are.

Whether or not you are feeding a cold or starving, it makes little difference to the biology of a common cold. In the end, most colds are mercifully short lived and will peter out after a week or so, regardless.

But feeling healthy is much more than biology. When you have a cold, food is essentially a comfort not a cure. And at these times we all could use some of that.

99. You can think yourself better

Michael Vagg
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Of all the cultural beliefs about health and illness that saturate the developed world, there is none so pervasive and deeply held as the idea that you can 'battle' an illness by sheer force of will.

We admire people like AFL great Jim Stynes, who show a brave and positive face to the public when confronted with a diagnosis of cancer, and somehow expect that a positive and determined mindset will help 'overcome' the disease.

The underlying assumption here is that the mind and body are separate, a philosophical stance known as dualism.

In contrast, the scientific viewpoint is that the mind is caused by the brain. And all the neuroscientific data points this way.

So what, you may say. Even if the mind is caused by the brain, I can still consciously control my thoughts, and therefore I can influence things that go on in my body. This is quite true.

The next question, then, is whether there is evidence that optimism, positive thinking or learning to control your thoughts in some way will be enough to have a significant influence on any disease process.

It's important to note that we're not talking about quality of life. We're interested in whether the actual course of a disease can be changed by purely mental effort.

It's common sense (and supported by mountains of positive studies) that sick people's quality of life can be improved by having a positive outlook.

The consensus is that optimistic people turn up for their treatments more regularly and are more likely to find resourceful ways to get as much as they can out of their life with chronic illness.

Interestingly, pessimism may be more predictive of a bad outcome than optimism is of a good one.

What does the evidence say?

The most comprehensive summary of the evidence on the subject of optimism and health is a 2009 analysis of 83 studies published in the *Annals of Behavioural Medicine.* Most of the studies take a cohort of subjects, score them by questionnaire to rate their levels of optimism, then sit back and watch what happens.

There are no control groups and no interventions to assess — the researchers just trawl the data for a correlation. If links are found, which isn't always the case, a press release is issued and everyone marvels at how amazing the mind-body connection is.

Even if you find a robust and reproducible correlation, it doesn't automatically follow that the link is causal. This is especially true if the study was not specifically set up to show the exact link you are looking for, with all bias and potential distractions removed.

I couldn't find any studies that were set up to look at the effect of becoming more optimistic, or switching from pessimism to optimism, on a person's disease.

But at least there's no harm in being positive, right?

There's not, but it's possible that being blindly and unrelentingly positive can be a burden to disease sufferers.

US researcher James Coyne makes this point in his 2010 paper critiquing the positive psychology movement in cancer care. Coyne notes that enforcing a cultural expectation of positivity leaves many cancer patients scared that they're reducing their chance of survival every time they feel scared, depressed or angry about their disease.

The paper quotes Dutch Olympian Maarten Van der Weijden, who rejected being identified with Lance Armstrong's approach of 'fighting' cancer:

What he basically says is that it is your own fault when you don't make it … You always hear those stories that you have to think positively, that you have to fight to survive. This can be a great burden for patients.

Cancer patients should be reassured that their disease was not caused by personality or emotional factors. Such a callous and false conclusion follows logically from a serious acceptance of the myth. It also would follow that cancer, multiple sclerosis, stroke or any other serious disease could be curable by addressing the emotional issues that supposedly underlie it.

So if there's little evidence that just being an optimistic person is good for your health, there's even less evidence that forcing yourself to use positive thinking can beat your disease. Positive psychology interventions have only really been studied in mental health diseases such as depression, and there seems to be no attempt to use thought to cure disease.

If faced with a serious illness, you're likely to have a better quality of life if you have good social supports and avoid giving in to complete pessimism. Nobody can tell you the perfect formula to deal with the impact of a serious diagnosis.

But don't believe those who tell you your illness is your fault somehow, or that you wouldn't have it if you'd somehow been a better person.

You don't need to feel that you should be completely positive 100% of the time, because not only does that not happen, it's not healthy either. Coping the best way you know how to is all you should be aiming to do.

100. Flatlining patients can be shocked back to life

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Beep....beep..........beep..........beeeeeeeeeeeee eeeeeeeeeeeep.

'We're losing him. Out of my way, nurse!'

The quick-thinking young doctor charges the defibrillator paddles and places them on the chest of the lifeless patient, whose cardiac monitor is showing a straight green line. The patient gets a huge dose of electricity; his back arches and his limp body lifts up off the bed with the shock.

Seconds pass, then the familiar, comforting waveform appears on the monitor. The patient begins to stir, and is soon sitting up enjoying the healing properties of hospital sandwiches and a cup of tea.

You've probably seen this flatlining scene a million times on TV and films. Heck, they even named a Kevin Bacon film after it! It's thrilling, compelling — and completely wrong.

To understand why this myth is so egregious, we need a quick background briefing on cardiac arrest.

The heart's electrical system controls the organ's ability to pump blood to the rest of the body. If the flow of this electricity becomes disorganised or the heart muscle stops responding normally, the regular pumping action is lost. Blood stops flowing and the body tissues have to cope with the sudden lack of oxygen supply. This is known as cardiac arrest.

We can see the various electrical wave patterns of the heart in cardiac arrest using an electrocardiogram or ECG. There are four main rhythms you might see during a cardiac arrest:

1. Pulseless ventricular tachycardia (VT) is a very rapid and inefficient heart rhythm. The heart is beating so quickly that it can't fill properly between beats. Circulation therefore drops rapidly to dangerously low levels.
2. Ventricular fibrillation (VF) is basically chaotic, unco-ordinated contractions of the heart muscle. Picture a heart quivering like a bowl of meaty jelly, unable to summon a proper contraction to send the blood on its way.
3. Pulseless electrical activity (PEA) is where the heart rhythm appears normal on the ECG but the electrical activity is not producing any movement of the heart muscle. The lights are on, physiologically speaking, but nobody is home.
4. Asystole (aka flatline) is the complete absence of any detectable electrical activity of the heart muscle. It appears as a flat line on the monitors. Clearly this is the worst type of cardiac arrest and there's little chance of coming back from it.

These four ECG findings are classified into 'shockable' and 'non-shockable' rhythms, depending on whether they respond to the electrical current of the defibrillator.

Pulseless ventricular tachycardia and ventricular fibrillation (1 and 2) are shockable, largely because they tend to be caused by the electrical activity of the heart being thrown out of whack, and not by the heart muscle itself being badly damaged.

Hitting the heart muscle with a big dose of electrical energy acts a bit like hitting Ctrl-Alt-Delete on your computer (or Alt-Command-Esc for the Mac users). A single shock will cause nearly half of cases to revert to a more normal rhythm with restoration of circulation if given within a few minutes of onset.

Pulseless electrical activity and asystole or flatlining (3 and 4), in contrast, are non-shockable, so they don't respond to defibrillation. These rhythms indicate that the heart muscle itself is dysfunctional; it has stopped listening to the orders to contract. The causes are hard to reverse and survival rates are very low.

The treatment of choice for asystole is to continue CPR (cardiopulmonary resuscitation) and give a whacking great dose of adrenaline. In fact, if you stop CPR to give an inappropriate shock, the patient's outlook is even more dire.

But unlike the famous overdose scene in *Pulp Fiction* might suggest, there seems to be no survival advantage and quite considerable extra risk of giving it directly into the heart. (I'm also ignoring the fact that adrenaline would be useless for a heroin overdose.)

So next time you see that ominous flat line appearing on the monitor, and hear the heroic physician shout 'clear' while busting out the paddles, you can join the exasperated ranks of those in the know, and try not to let reality ruin this most dramatic of TV tropes for you.