

Sample Translation

Don't Ask Your Doctor or Pharmacist by Jan and Ragnhild Schweitzer

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Preface

It wasn't quite a scream that came from the bathroom, but more of a frightened shout. When we came running in, our son Paul, who was ten at the time, was standing under the shower pointing with horror at the lower right-hand side of his abdomen, below his bellybutton. There was a visible bulge there. We immediately knew what it was – and what it meant. We should mention here that we are both doctors. And a hernia is something you often get to see early on in medical school. You also learn early on what usually needs to be done about it: operate. But we began by reassuring our distressed son, saying something along the lines of “we need to let a doctor take a look at it” and “then we'll see.” For the time being we didn't mention the necessary surgery and what it would mean for him. He did a lot of sports and would have to give it up for weeks, so we just didn't have the heart to tell him. Because at that moment we realized that all of this was our doing. Yes, that's right: We, his parents, were to blame for this bulge and everything that came before it and was still to come. Without thinking about it, we had listened to a doctor and simply let a physical therapist do her thing. Even though it would have been much better not to do anything from the start. We write about this in greater detail in Chapter 1 (p. 15 ff.)

But Paul's hernia did have one benefit. It marked the moment that one thing finally became crystal-clear to us: namely, that, when it comes to health, doing something often isn't a good idea – and that, to the contrary, doing nothing at all is usually better. Even if that may sound crazy at first: waiting, when you're sick and could be doing something about it. After all, you can't just stand there doing nothing while this chance to take action slips away! When it comes to health in particular, you have to grab every opportunity! No, you don't. And the best example of this was standing right there in front of us, with a bulge on his belly.

We certainly weren't and aren't the only ones inclined to take immediate action when it comes to health problems. When they come up, many people feel they should do something right away because they hear a little voice somewhere deep inside stubbornly repeating again and again: You need to do something about this! Your body needs you! Don't let it down! So you take action. And for those who don't hear this inner voice, there's probably someone around them urging them to do something. Or they see all the good advice offered on TV, the Internet or in magazines. Because everyone only ever tells you what you should do – no one ever says what you'd be better off not doing.

But we want to change that now. And so we've taken Paul's hernia as an opportunity to write this book. Not just to curb our own excessive impulse to take action once and for all, but also because there are so many situations in both medicine and nutrition where doing something simply does more harm than good – as an increasing body of scientific studies also confirms. In our research, we came across so many things that surprised us and opened our eyes. And we were also reminded that we had experienced our first decisive encounters with overly enthusiastic proactivity just shortly after graduating from medical school.

At the time, we were working as doctors in a hospital. Initially, we admired the chief of medicine for the tremendous interest he took in his patients' wellbeing. For example, in addition to the daily morning rounds, every day he took the time to stop by all the rooms on his private ward again briefly before heading home to his wife and kids. He simply didn't feel at peace calling it a night without making sure that all his patients were doing well first – how considerate of him! We were also incredibly impressed by the thyroid ultrasound scans he granted his patients, some of whom were already well over 80 years old. The way he took care of the older ladies and gents was amazing; how touching that he himself personally made sure that everything was ok! The chief of medicine even performed the “small harbor tour” – an affectionate description of a rectal and prostate exam done with a (gloved) finger – on his male private patients, even those over 80. How genuinely nice of him to relieve his residents of having to do the procedure! After all, it is anything but pleasant for examiner and examinee alike.

So we had a tremendous amount of admiration for the chief of medicine – until at some point our more experienced colleagues explained with a smile that his actions had absolutely nothing to do with caring and kindness, but rather with financial considerations. What the chief of medicine cared about was, to put it bluntly, dough – because he could bill these brief afternoon visits to the hospital rooms – which sometimes disturbed sleeping patients – as a second daily visit by the chief of medicine. And the ultrasound and manual exams that he himself performed also brought in considerably more money than if a resident had done them. Not to mention that both procedures were superfluous for the very senior patients anyway, since they were of absolutely no consequence for them.

It suddenly became very clear to us that medicine is often also a business and by no means always a matter of the patient's wellbeing – welcome to reality! And so we learned quite quickly that there was, on the one hand, a significant number of (head) physicians who ordered unnecessary procedures because they benefitted from them financially and also because, when someone is in the hospital, you have to do something. But we also learned that there was, on the other hand, the pleasant restraint of doctors – usually younger ones – who followed a scientifically oriented approach to medicine and treated patients according to its criteria. And these colleagues were constantly telling us, the new generation of doctors: “Never do anything without considering the consequences and benefits – the consequences a procedure could have and the benefits it should have!” On more than one occasion, they showed us that it can be better *not* to do something: not to order an expensive imaging test, not to prescribe a new drug and not to recommend complicated surgery – but rather to wait, because that is what is best for the patient. Because every diagnostic and therapeutic measure in medicine is also potentially harmful, especially when it isn't even necessary. Because in that case you are risking side effects without there being any benefit whatsoever to what you are doing.

Ever since, the question of scientifically proven benefits has influenced us, not only as doctors but also in our second career as medical journalists. Only in our personal life did it simply

refuse to rub off on us. Because, until Paul's hernia, there was always that stubborn voice inside of us, urging us to take action the second a health problem came up. It never occurred to us simply to give the body a chance to do its thing. Even though we had learned in medical school that the body has incredibly effective repair and protective mechanisms and can take care of many things on its own – and so generally also manages to keep serious diseases at bay for decades. Of course even younger people can get serious or chronic illnesses that require treatment. And that is terrible and not something we mean to make light of in any way here. But the statistics show: Europeans spend the vast majority of their lives in good health, with many people staying in good shape well into their seventies.

It is for these people that we wrote this book: the healthy ones, in other words, but who aren't really interested in statistics. Or who fear they might be outliers. Those who think they are losing their chance if they don't take immediate action and so go straight to the doctor. And those who have all sorts of early detection screenings done; who aimlessly google around, only to become more confused in the process; who take supplements to protect against illnesses; who are afraid of harmful substances or perfectly natural components in their food, or who abuse themselves with crash diets – in other words, all those who, out of habit or insecurity, do completely unnecessary things for their health. And that encompasses many – very many – people. Our book aims to alleviate these people's fears and make them aware that it is often worth it to keep calm and wait, even if it isn't easy. It is intended as a plea of sorts for an equanimity that we ourselves also had to learn.

But please do not see our book as a general call never to do anything or as a substitute for seeing your doctor. Needless to say, anyone who is concerned or has very serious complaints that won't go away should go see their doctor. But there are many complaints and discomforts that often get better or subside on their own, without needing to be examined or treated. Our book is intended to help you recognize these and, with the help of examples from medicine and nutrition, give you a sense of how many unnecessary and thus potentially harmful things you can – and actually do – do for your health: We ourselves are the best example of this and want to help you avoid making the same mistakes. So our book aims to give you the courage to think things through calmly before you take any action for your health. Because one other thing is clear to us too: It often takes courage simply to let things run their course and not do anything. Yet in medicine, less is often more, so often what is best for your health is to *not* ask your doctor or pharmacist.

[...]

Acute back pain

Back pain, especially lower back pain, is one of the most common complaints. By this point it has become a widespread affliction – and to some extent a fad. The back as a topic is featured on the covers of fitness, health, women’s and news magazines and entire television programs are dedicated to it. But it hasn’t always been like this: In the late 19th and early 20th century, back pain was nowhere near as big a social issue as it is today, nowhere near as present in the literature. We can only speculate about why this change came about (different working conditions, decreased physical activity, etc.), but what is clear is that back pain has become an incredibly important factor of health – or rather, of disease – that supports an entire industry today: Over 70 percent of people in industrial nations are afflicted by it at least once in the course of their lives – with some sources even putting this number at 85 percent. It’s no wonder then that back pain is the second most common diagnosis in Germany, with doctors diagnosing it in 25 percent of the population in 2011. It is the fifth most common reason people go to the doctor and, in 2008, it cost the German healthcare system 3.6 billion euros. But these numbers are beside the point, really: Most of us have had “back” at some point, are familiar with this pain that shoots across our lower back when we stand up, refuses to go away all day (and often all night as well), can often last for several days and ruin any number of things for us. For some people, it has already simply become a part of life.

Of course typical office work, which involves a lot of sitting and not much movement, is an important cause, but research in recent years has focused increasingly on another factor: stress. Stress allegedly makes people sit in a cramped-up way at work, which in turn strains the muscles – that is the assumption behind the connection, which may seem odd at first.

Since we cannot simply do away with either – too little physical activity or lots of stress – you will be happy to hear the good news that back pain is one of the ailments with the highest rates of spontaneous recovery. For 90 percent of those afflicted, acute back pain disappears within six weeks, without requiring treatment by a doctor or other healthcare professional. So your best bet is to start by not having a doctor take a look at your back, so he or she doesn’t order an X-ray, inject a drug deep into your spinal musculature, begin electrotherapy or do anything else. He or she also should not recommend that you take it easy. Not only are all of these measures superfluous, they can even be harmful, as studies have shown time and again.

Regarding X-rays, for example: Experts estimate that up to 80 percent are, to put it mildly, unnecessary. To put it less mildly: They can be harmful for the patient. If you are thinking about radiation exposure, you’re right – but that’s the lesser problem. What is much worse is that doctors often find something on these images of the back – and that includes magnetic resonance imaging and computerized tomography (MRI and CT) scans as well. And that something is then blamed for the complaints, even though it may not have anything to do with them. Scans done on people who aren’t suffering from any back pain show that up to 87 percent also reveal abnormalities that look anything but good. Intervertebral disc degeneration, for example. But

degeneration is simply a part of life and does not necessarily indicate disease. Studies show that about 20 percent of the intervertebral discs of 20-year-olds already show signs of wear and tear; for 40-year-olds that number is 40 percent and for 60-year-olds it rises all the way to 80 percent.

And yet, these images make an impression on both doctors and patients – after all, they show that something is obviously wrong: “Look at this, Mr. Mueller – you can see perfectly clearly what’s causing the pain here!” the doctor crows and then starts the ball rolling on something unnecessary that may even have side effects and be harmful. And the patient? He sees, in black and white, that there really is something wrong with him. Which doesn’t necessarily reassure him or lead to an improvement in the symptoms, but sometimes to the very opposite – a so-called somatic fixation and, consequently, chronification. What he had feared – namely, that there is something wrong with his back – seems in fact to be case! Shouldn’t he have another test done, just to be absolutely sure? No, he shouldn’t. Because these images almost never offer absolute certainty, just apparent certainty. And they are incredibly tempting, revealing changes in the back in tremendous detail. But even when a doctor thinks he or she is looking at something pathological, in 85 percent of cases doctors cannot pinpoint the exact source of the pain. Often the result then is unnecessary treatment, sometimes even superfluous surgery.

This is why a rule of thumb of smart doctors is: No imaging during the first six weeks of back pain, provided there are no serious warning signs such as paralysis. We can only advise utmost caution if your doctor emphatically recommends any imaging tests – that is, if he or she wants to do an X-ray, MRI, CT or other scan of your back. And, as it happens, studies have shown that orthopedists are more likely than other doctors to want to do so. Even though an in-depth consultation and physical examination of the patient are more than enough for diagnostic purposes when back pain has only been present for a short period of time (less than six weeks).

Also be extremely wary if your doctor pronounces the words “injection,” “immediate effects” and “completely harmless, even though the needle is so long.” An injection into the back is always associated with the potential side effect of infection. Other things can also go wrong, especially if the doctor is not particularly well versed in handling long, sharp objects. Despite this, many doctors are very fond of injections; some have even developed their very own cocktails of local anesthetic and anti-inflammatory substances that they like to extol. But are they really effective? Probably not. But no one really knows for sure; unfortunately, studies intended to examine their benefits do not tell us much because they are not particularly conclusive. Even so, many patients will feel an effect when their doctor gives them an injection – because we cannot underestimate the placebo effect, especially for such an impressive and elaborate procedure.

The same is true of physiotherapy and massage, which *have* to help, even if only to justify the effort, contortions and painful pinching and kneading they involve. But, for both of these forms of therapy, existing studies do not show conclusively whom they benefit more, the patient or the healthcare professional. After all, the latter get money from health insurance companies for providing these treatments.

However, one thing needs to be stated clearly here: When it comes to acute back pain, the advice not to do anything only applies to seeing a doctor or other healthcare professional and not to physical activity. Treating the pain by staying in bed and doing nothing doesn't help your back – that much, at least, experts today agree on. It is better to remain active, if necessary with the help of painkillers, to prevent the muscles that are so essential to supporting the spine from atrophying. Because that happens faster than you think.

So, for acute back pain, you can be your own doctor for a while without concern. If, however, you are still suffering after more than six weeks because the discomfort has not improved significantly, you should definitely go see a doctor. Because at some point the pain can also become chronic, which is to be avoided. At that point it may also make sense to have an imaging study done of your back. Because it is worth keeping in mind that, while back pain may have an up to 90 percent rate of self-recovery, that still leaves 10 percent of cases in which it does not simply go away within six weeks. One possible cause: a herniated disc.

[...]

“No one leaves here without antibiotics”

Internal medicine/General medicine

Colds

We already mentioned it briefly earlier: Colds may be unpleasant, but they don't pose a serious threat. Even so, for many people, they are the reason they go see their doctor – and the reason the latter does something wrong: namely, prescribe antibiotics. Because antibiotics simply aren't effective against viruses, which are responsible for 90 percent of colds – even obstinate and obtuse doctors should know that much. So we should ask ourselves what the point is, why antibiotics are still used so often against colds: According to a Forsa survey, in 2013, roughly one-third of those surveyed had been prescribed antibiotics and, of those, one-fifth because of a cold. Why do so many doctors so often prescribe medication they know to be ineffective? We can only speculate, but often it is probably a combination of conflict avoidance and inexperience. Conflict avoidance because we, as patients, go to the doctor so that he or she will do something, will help us – which we generally understand to mean something other than calmly stating the truth: “Your cold may be annoying and bothersome, but it will go away on its own – and there's nothing we can do anyway.” So, to avoid the inevitable discussion, he or she simply prescribes something – often antibiotics. And with good reason – at least from the doctor's point of view. Because who can say with certainty that his or her patient isn't maybe among the ten percent whose respiratory infection was triggered by a bacterium after all? Maybe the antibiotics will help. And, if not: no big deal either. After all, the doctor isn't concerned directly with the side effects; the patient has to deal with any gastrointestinal complaints on his or her own. But, to be honest: You really do have to be a bit inexperienced and stoical to prescribe something to your patients that almost certainly won't help their symptoms but could have both acute and serious long-term side effects. For, every time antibiotics are used, the risk increases that the bacteria will become resistant to the drug, making them immune to it. This may not matter initially, since these then antibiotic-resistant bacteria, as experts call them, aren't a problem for people with well-functioning immune systems, which constantly keep them in check. But people who take antibiotics again and again without any real need for them are bargaining for many more insidious long-term consequences: As more and more bacteria become resistant, they can then attack at moments when the immune system happens not to be in the best of shape – in old age, for example, or during a serious illness. And then there are no antibiotics that will help fight them, even though an effective treatment is especially vital for people in this situation. But the prescribing doctor usually only finds out about all of this when it is already too late and probably won't trace the problem back to the antibiotics he or she once prescribed (unnecessarily) to the patient.

So what's left for those of us suffering from a cold? The hope that we'll handle it better next time. Not asking for drugs that won't help anyway. In any event, no drug has been discovered yet that helps effectively before or during a cold. Echinacea? Doesn't appear to have any

significant effect. Vitamin C? Ditto. And Umckaloabo? No proven benefit. And all the drugs advertised on television also only alleviate the symptoms of a cold, at best: headache or nasal congestion. But to do that you really don't need to take any expensive drugs that combine multiple active ingredients and have the word "flu" somewhere in their name – all you need are inexpensive, decongestant nose drops and an anti-inflammatory analgesic like ibuprofen.

But is there really nothing you can do to treat a cold on your own? Yes: allow yourself to rest and be patient. Moreover, there is one particularly effective action we can take when it comes to preventing a cold in the first place: simply washing our hands. If you do that regularly and thoroughly and generally keep your hands out of your face, you have a good chance of being spared without much effort. Because it is above all via our hands that we become infected with such a wide range of viruses that our immune systems can't possibly prepare for them all, with the result that, even as adults, we come down with an average of up to four colds per year.

[...]

“If you don’t want to get sick, don’t get preventive check-ups”

Early detection/Prevention

Everything seemed to be going so well for Elizabeth Holmes: She was a student at California’s renowned Stanford University, an inventor, company founder and billionaire – and she had managed to achieve all this in just a few years. And then came the crash. But back to the beginning.

Elizabeth Holmes is an extremely talented student, who really stands out at Stanford. She is overflowing with ambition and drive when, back in the fall of 2003, she bursts into the office of her chemical engineering professor, Channing Robertson, and says: “Let’s start a company.” Robertson, who has been teaching at this elite university for decades, has seen and gotten to know many students, but this 19-year-old is truly special – that much is clear to him, even though Holmes has only been at Stanford for a year. She has her own special way of looking at complex problems, he later tells the American business magazine *Fortune*.

In Robertson’s seminar, Holmes has learned about how patches and contact lenses can be used to deliver drugs to the bloodstream. In of itself this already isn’t exactly the easiest of tasks, but Holmes takes it a step further: She shows Robertson a patent application for a patch that will also be able to monitor blood variables to see if a treatment is having the desired effect and if the dosage is right. Therapy and monitoring in one – an obvious but brilliant idea that had never occurred to Robertson in 30 years of work, as he himself admits.

Holmes does not stick it out much longer at Stanford. After one more semester, she drops out to dedicate herself fully to her company, which she has in fact founded in the meantime. With it, she intends nothing less than to create a completely new technology “that is aimed at helping humanity at all levels regardless of geography or ethnicity or age or gender,” as she tells Robertson. A sort of democratization of medicine.

She calls her company “Theranos,” a verbally evocative fusion of the words “therapy” and “diagnosis.” Holmes’s star rises quickly: In just a few years, she becomes the youngest self-made billionaire in the world. Not thanks to her special patch, however, but because of a blood test called Edison, after the inventor Thomas Alva Edison. What is revolutionary about Edison is that it can detect diseases like diabetes, AIDS and cancer using a sample just a hundredth to a thousandth the size of a normal sample. In other words, this test means it is no longer necessary to take several millimeters of blood by sticking a needle in a patient’s vein; a small, virtually painless prick to the finger is enough. What a relief for the many people for whom giving blood is pure torture!

But that isn’t the only advantage of the Theranos test: It also provides faster results – within just hours – and is significantly less expensive than analyzing a traditional blood sample. Holmes’s aim: to ensure that every person is in a position to test his or her blood at home, even for

diseases like cancer. She wants to create a world “in which no one ever has to say: If only I’d known sooner,” as she puts it, speaking at an event in 2014. Because analyzing your blood with her test gives you a chance to detect serious illnesses early on – and thus to still be in time to treat them.

Yet, before long, doubts about her blood test begin to emerge. In the *Wall Street Journal*, former employees report that Theranos’s own blood-analysis machines were almost never used, but rather conventional ones by other manufacturers. So does the test not actually work as well as she is claiming everywhere that it does? Does it even work at all? Holmes quickly loses her investors’ trust and, worse, that of the American regulatory agency that needs to approve her test. In July 2016, it revokes its approval and decides to ban Holmes from owning or operating any blood-testing company for two years. In October 2016, Holmes lays off almost half of her employees. For the time being, she is out of the business of tests for everyone; her revolution is over. Yet a number of experts say that what should have been viewed extremely critically wasn’t even her questionable testing procedure, but rather her attempt to make people healthier with more tests – a critique of the basic principle of early detection.

A principle that cuts such an elegant figure. That promises so many benefits. For what could possibly be better than detecting an illness so early on that all possible treatment options are still open? What could be smarter than achieving so much with so little expense and effort? What other method makes it so easy to detect illnesses and save lives? Ok, sure – there is one approach that is even more elegant and convincing: preventive check-ups. But aren’t preventive check-ups and early detection basically the same thing anyway? When you go in for a colonoscopy or mammogram, isn’t that also called a cancer check-up? Yes, it is – but mistakenly. But we’ll get to that later.

Early detection, at least, really should be incredibly straightforward. But it simply isn’t. Only a few principles in medicine are as controversial as early detection – of cancer, especially. Because what sounds so incredibly obvious is actually incredibly complicated. And that’s hard to understand. Because it sounds so logical at first, especially if you take early detection and run it through on a person from A to Z: A patient, in his prime, athletic and in excellent health, goes to see his general practitioner for a routine check-up. The doctor is happy to do it and really does discover something – a suspicious mole on the patient’s arm, let’s say. A really small one, but something about the mole strikes the doctor as odd. He sends his patient to a dermatologist for a closer look. Not wanting to rely on a visual diagnosis, the dermatologist takes action immediately, injecting local anesthetic into the skin around the mole, excising it generously and sending the tissue sample to a specialist, a pathologist, who examines it under a microscope. Turns out it really is early-stage skin cancer. Based on the tissue sample, the pathologist can also tell that his colleague, the dermatologist, has done a good job, using her scalpel so generously that the tumor has been removed completely and nothing has been left behind. But the dermatologist wants to make absolutely sure, so she orders additional tests to see if perhaps the tumor has spread. The

results reveal that the patient is lucky; no signs point to any other malignant tissue lying dormant anywhere else in his body that might make the cancer recur. So in this case we can quite rightly say that early detection saved this man's life. If he hadn't gone to the doctor, he might have died of cancer.

But let us now run through, in considerable detail, another example, very similar to the first. Once again, a man – as healthy and in equally good shape as the patient in our first example – goes to see his GP. Once again the reason for his visit is a routine check-up. And once again the GP discovers something suspicious and sends the patient to a dermatologist for a closer look. The previously perfectly healthy man is suddenly a sick patient – a dying one, even – at least that's how he feels. Several days pass during which our patient, waiting for his appointment with the dermatologist, is overwhelmed with concern and worries. What if it really is cancer? How much time do I have left? How will I tell my family? Then, finally, the day of the appointment with the dermatologist rolls around. Not wanting to rely on a visual diagnosis, the dermatologist takes action straight away. With a small syringe, he injects local anesthetic into the skin and begins to cut. But now something happens that no one expected: The patient reacts to the anesthetic – badly. He goes into cardiovascular shock, an emergency doctor is called in and an ambulance takes the patient to the hospital, where they manage to stabilize his circulation. As soon as he has recovered from the shock, the doctors in the hospital offer to remove the area – using a different anesthetic this time, of course. Since he's already in the right place anyway, he agrees – after all, he wants to find out once and for all what this mole is all about. This time the process is a bit more elaborate, since it isn't out of the question that the man might also react to this other anesthetic, even though it uses a different active ingredient. An emergency doctor from the hospital's intensive care unit stands by as a doctor injects the anesthetic into the patient's skin with a thin needle. Nothing happens – so far so good. Now the doctor generously excises the suspicious mole along with the skin around it and sends this tissue to the pathologist for a closer look. And what do you know: There are no cancerous cells to be seen! So it was a false alarm. One could say now that all the commotion was for nothing – but since it was more than just commotion, one could also ask whether any of it was really necessary. Because in this case early detection didn't save a life, but rather put one at risk.

Admittedly, it is extremely rare for someone to react as dramatically to local anesthetic as described in the second case here. But it also isn't very common for early detection to save someone's life. Unfortunately, it simply isn't as straightforward as one might think. Which is why it is so important to have the facts, based on which, as a patient, you can make decisions, especially when it comes to fighting cancer.

To do so, we need to begin by recognizing that cancer is above all a disease of old age. We should never forget this, even though of course there are also young people who become sick with cancer. But it is only since people on average have begun to grow really old that cancer has become a significant cause of death. It has always killed people, but that happened much more

rarely in the past than now. Before, infections were the primary cause of death, with tuberculosis and pneumonia carrying off people in droves and epidemics like the plague cutting swaths of destruction through entire regions. As a result, most people didn't live to be particularly old: As late as the early 20th century, the life expectancy for a newborn was just around 50 years. But increasing prosperity and better hygienic conditions have allowed people to live longer, as have advances in medicine such as the development of antibiotics. Today, the life expectancy for a newborn is around 80 years. So people have only been living long enough to get cancer in significant numbers for a few decades. More starkly put: While in 1905 only about four percent of people died of cancer, over a hundred years later, in 2010, this number was 26 percent. This makes cancer the second most common cause of death, with only cardiovascular disease killing even more people.

In other words, the rise in cancer isn't due, as many may think, to bad food (which actually isn't that bad) or the many harmful environmental factors (which actually aren't so many or so harmful), but simply because we grow old: About half of those who die of cancer are over the age of 75. So cancer is a kind of symptom of old age; whether or not we like it, it seems to be a part of life if you live to be old. And that will continue to be the case, no matter how many drugs and early-detection screenings are developed.

This is also true because there will always be cancers that metastasize quickly, spreading daughter cells throughout the body. It is these metastases – and not necessarily the so-called primary tumor, the original growth – that make cancer dangerous. Because these metastases are often very difficult to fight, whether with drugs like chemotherapy, radiation or surgery. Once a tumor has spread, it is often too late and there is no longer any benefit in discovering it. That means that if a tumor metastasizes early on, early detection is often ineffective and futile. Inversely, a tumor that is slow to spread can often still be treated well even if it is only discovered later on – and early detection is not necessarily essential to treating it effectively.

The American cancer researcher and epidemiologist H. Gilbert Welch offers a vivid explanation of cancer's aggressiveness, comparing it to animals living on a farmyard from which they are not allowed to escape. First, there are the turtles, who are so slow and staid that there is no danger of their running away. These turtles are like a cancer that metastasizes late and can be treated very effectively. No elaborate dragnet operation is required to detect it – and, like the turtles, it wouldn't cause any problems anyway. Then there are bunnies on the farmyard, already significantly more vivacious than the turtles. They can hop somewhere else at any moment – like the aforementioned cancers that can spread throughout the body. But as long as you keep an eye on them you can catch these animals in time. Applying this to cancer means: Keeping on the lookout for it regularly can be worthwhile, but doesn't necessarily have to be. Put another way: Early detection can save lives, but doesn't necessarily have to. The third type of animal Welch draws on for his comparison are birds, so fast and flighty that they are impossible to catch. Some birds you can hardly even keep track of with your eyes, that's how quickly they disappear – like a

tumor that spreads to the rest of the body so quickly that it doesn't make sense to expend a lot of effort to find it. Welch's point is: The success of early detection depends very much on the type of cancer in question.

An example from South Korea also shows this. There, the rate of papillary thyroid carcinoma has risen sharply in just a few years, and it is now the most frequently diagnosed cancer. How did this happen? Through a screening program introduced by the government in 1999: Since then, South Koreans have been screened for a wide variety of cancers, with the aim of detecting breast, colon, liver and cervical cancer as early as possible. And if people are already seeing an expert anyway, why not take a quick look at their throat with the ultrasound machine to see what the thyroid is up to (since it is located relatively close to the surface there)? Why not, indeed, is what many South Koreans have said, happily paying the equivalent of 30 to 50 euros to allow their doctor to check for thyroid cancer. And what do you know: They really have found something. Within just 15 years, the number of diagnoses increased fivefold; every year, over 40,000 South Koreans became cancer patients from one day to the next. What hadn't changed over those 15 years, however, was the number of people who actually died of the tumors. That number remained and continues to remain consistently low, at 300 to 400 per year. The cause of this phenomenon is clear: a type of thyroid cancer that results in overdiagnosis – in other words, a cancer that grows very slowly and probably never would have caused any problems or become apparent if no one had looked for it. As it is, it causes problems for many thousands of South Koreans: In addition to the burden of having to live with a cancer diagnosis, they go under the knife, getting their thyroids removed either completely or at least partially. They then have to replace the hormones their bodies can no longer produce by taking medication for the rest of their lives and check regularly to make sure that the levels of these hormones in their blood are in the normal range. Two percent of those who get surgery suffer from a far more dramatic consequence of the operation: vocal cord paralysis.

Screening for thyroid cancer is also popular in other countries and leads to many cases of overdiagnosis – that is, diagnosis of diseases that wouldn't have played any role in the lives of those affected anyway. In a 2016 study, researchers from the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO), estimated that there were 65,000 cases of overdiagnosis in Italy, 46,000 in France and 36,000 in Japan. A significant number – especially considering that we've already known for decades that about one-third of adults have areas with cancer cells in their thyroids that never end up posing a threat to most of them.

Such a large number of cases of overdiagnosis certainly isn't the rule, but it does reveal one of the major problems of early detection: It is extremely overrated. There are many reasons for this. One, if not the most important, reason is that it just sounds so logical in principle, as we already mentioned above: Diagnosing cancer early enough to ensure it can still be treated effectively – that definitely sounds extremely appealing. And then, it is so temptingly easy, too:

Just lie down on the examination table for a quick test and, presto, you've averted the threat.

Yet the language used, in Germany at least, is also to blame for the generally uncritical attitude towards early detection. In Germany, we talk about having a "preventive check-up" when what we're really doing is getting an early detection screening. In a survey carried out by the Bertelsmann Foundation and the health insurance company Barmer GEK, only 22 percent of participants said that the following statement is false: "A cancer check-up and early detection screening are the same thing" – even though the two terms refer to two very different things. Check-ups, also called prevention, aim to prevent illnesses from developing. Early detection, on the other hand, as the name indicates, is only about diagnosing an illness early on in order to slow down or, in the best-case scenario, halt its progression. And yet, the two terms are often used synonymously. It's not surprising then that, considering the difficulty so many people have with these terms, there is so much enthusiasm for early detection, with 95 percent of survey participants judging the following (incorrect) statement to be true: "People who get early-detection cancer screenings don't get cancer."

But early detection also has such a tremendous reputation because of the information brochures about it, which primarily mention the benefits of the tests and play down the risks – if they even mention them at all. For years, not to say decades, now, many studies have shown this imbalance – and for almost all types of cancer and in almost all brochures. The situation has improved recently, with one pamphlet or another now providing more balanced and realistic information. But you still get the feeling that it is taboo to call into question the reputation of this allegedly elegant and smart method. One could perhaps compare it with diesel engines, which have been discredited in recent years. In the case of diesel engines, too, everything had to be done to prevent something that consumes less, is so inexpensive and so widely used from falling into disrepute. The fact that cars equipped with these motors expel massive amounts of harmful exhaust fumes? For a long time, no one really paid much attention to that.

In fact, though, things are a bit more complicated when it comes to early detection, not least because it is much more directly a matter of life and death. Objectivity is necessary to explain the disadvantages to people. But how can you be objective when people report that early detection saved their life? What should you say in response to statements like, "If I hadn't gone in for a mammography, I would be dead now"? One – admittedly not entirely simple – option: You have to leave out individual examples and use numbers to argue your case. But we all have our problems with numbers – ideally, we'd rather not hear or read anything about them. Which is another reason why, when it comes to early detection, we hear almost exclusively about the advantages. Even though it isn't all that difficult to use numbers to, for example, take a look at how good a test really is. Because that is actually relatively easy to calculate.

So let's do it! Let us assume that a test detects a tumor in 90 percent of people who have it but don't know that they do, and that it is correct in 95 percent of these cases – that is, when it works and detects a tumor, 95 percent of the time the person in question really does have one. Both numbers, 90 and 95 percent, are realistic assumptions for an early detection screening. Not quite as realistic in our game of numbers is the specification that this test is supposed to detect a tumor that two percent of the population has – because that is quite a large number of affected people. But never mind; it makes it

easy to calculate, so let's use it: Two out of 100 people have the tumor – or, scaled up, 20 out of 1,000. Let's take a closer look at these 20: We've said that the test discovers the tumor in 90 percent of those afflicted, in other words the test would show that the tumor is present in 18 of these 20 people. For the other two of these 20, however, the test fails to work, even though they have the cancer too – and these two people then continue to live with the conviction that they are cancer-free.

Let us now turn to the other 980 people, those who are cancer-free. We've said that the test is accurate in 95 percent of cases – so in 5 percent of cases it is wrong. Five percent of 980 is 49 (you don't have to double-check the math; just trust us blindly here). So these 49 people (or 5 percent) are mistakenly given a cancer diagnosis, even though they don't have a tumor. So now we have a total of 67 people who have been given a cancer diagnosis, 18 correctly and 49 incorrectly. And now it's time for the decisive, the key, number, which we'll express as a percent value: Only 27 percent of the test results that indicted the presence of a tumor were right, 73 percent were wrong. Without our having cheated, a test that initially seemed so reliable and precise (after all, it was right 95 percent of the time and detected 90 percent of tumors) has become a flawed procedure of rather questionable informative value. But if you don't do the math yourself like we just did here, you will continue to believe in the reliability of the test and won't recognize its flaws.

As a matter of principle, it should be said that errors occur with every test; that's just how it is. For an early detection screening, the two hypothetical error rates of 5 and 10 percent are entirely realistic, as we already mentioned above. There are even technical terms for these two values. If a test doesn't detect a tumor even though it is present, we call this a false negative result. If it shows that someone is sick even though he or she doesn't have a tumor, we call this a false positive. Now you know both terms – in case you want to get into a little expert discussion about the value of tests with your doctor.

Because that is something you really should feel free to do sometime. Which is precisely what we hope you will take away from this section. Early detection screenings are not foolproof. They turn people into cancer patients who are in fact cancer-free. They turn people into cancer patients who do in fact have a tumor, but one that never would have caused them any problems – a tumor they would have died *with*, and not *from*. They turn people into cancer patients who do in fact have a tumor, but one that can't be treated – people whose life thus can't be prolonged thanks to the diagnosis, but who simply find out sooner that they are sick. But of course they also turn people into cancer patients who really do benefit from treatment – thereby saving their life. That simply isn't the case as often as you would think.

And since it just isn't as straightforward as it may initially seem – and as relatives, friends, formerly afflicted celebrities and doctors may also tell us – we shouldn't take the easy route with tests like these, but rather be critical, talk to our doctor, ask about the risk-benefit ratio and maybe even let someone calculate it for us. We will take a closer look next at the early detection screenings for the most common cancers among women and men – breast and prostate cancer. These once again show, very concretely, the odds and risks of this seemingly so elegant method.

But we also have some good news here, but only for the smokers among you: By giving up cigarettes, you can increase your life expectancy by up to ten years (this also takes into account the

positive effects on your cardiovascular system) – a roughly one-hundred-times greater effect than you can hope to achieve with the best early detection methods.

[END OF SAMPLE]