

A few years ago, I broke into my own house. I had just driven home, it was around midnight in the dead of Montreal winter, I had been visiting my friend, Jeff, across town, and the thermometer on the front porch read minus 40 degrees -- and don't bother asking if that's Celsius or Fahrenheit, minus 40 is where the two scales meet -- it was very cold. And as I stood on the front porch fumbling in my pockets, I found I didn't have my keys. In fact, I could see them through the window, lying on the dining room table where I had left them. So I quickly ran around and tried all the other doors and windows, and they were locked tight. I thought about calling a locksmith -- at least I had my cellphone, but at midnight, it could take a while for a locksmith to show up, and it was cold. I couldn't go back to my friend Jeff's house for the night because I had an early flight to Europe the next morning, and I needed to get my passport and my suitcase.

几年前，我闯入了自己的家。我开车回到家，在蒙特利尔的寒冬，大约午夜时分，我开车从城镇一边到另一边，去看望我的朋友Jeff，门廊上的温度计显示零下40度——不需要知道是摄氏度还是华氏度，到了零下40度，两个温度显示都一样——天气非常冷。当我站在门廊，摸索着我的口袋，发现找不到钥匙。实际上，我透过窗户能看到我的钥匙，我把它们留在了餐桌上。我赶紧围着房子转，找能进去的门和窗户，而它们都被锁紧了。我想到打电话给锁匠，至少我还有手机，但在午夜，锁匠要过来可能需要一段时间，并且天气真的很冷。当晚我又不能回朋友Jeff的家，因为第二天我要坐早班机到欧洲，必须要进屋里拿护照和行李。

So, desperate and freezing cold, I found a large rock and I broke through the basement window, cleared out the shards of glass, I crawled through, I found a piece of cardboard and taped it up over the opening, figuring that in the morning, on the way to the airport, I could call my contractor and ask him to fix it. This was going to be expensive, but probably no more expensive than a middle-of-the-night locksmith, so I figured, under the circumstances, I was coming out even.

因此，在绝望和寒冷中，我找到一块大石头，打破了地下室的窗户，清理了玻璃碎片后，我爬进屋里，找到了一块硬纸板，用胶带把它封贴在打破的窗户上，我想着早晨去机场的路上，可以打电话给承包商，请他来修理窗户。修理费会很昂贵，但不会比在午夜时找锁匠来开锁更贵，所以我觉得，在这种情况下即使打破了窗户，也还划得来。

Now, I'm a neuroscientist by training and I know a little bit about how the brain performs under stress. It releases cortisol that raises your heart rate, it modulates adrenaline levels and it clouds your thinking. So the next morning, when I woke up on too little sleep, worrying about the hole in the window, and a mental note that I had to call my contractor, and the freezing temperatures, and the meetings I had upcoming in Europe, and, you know, with all the cortisol in my brain, my thinking was cloudy, but I didn't know it was cloudy because my thinking was cloudy.

我是一个职业的神经科学家，我大概知道在压力下大脑是如何工作的。大脑会释放皮质醇引起你的心率加速，它调节你的肾上腺素水平并阻碍你的思维能力。第二天早晨，我醒来的时候严重睡眠不足，还在担心窗户上打破的洞，心里想着必须打电话给承包商，还有，天气非常寒冷，在欧洲有个会要开，还有，因为我大脑释放的皮质醇，我的思维变得混沌，但我没觉察到它很混沌，因为我的思维很混沌。

(Laughter)

(笑声)

And it wasn't until I got to the airport check-in counter, that I realized I didn't have my passport.

直到我在登机手续办理柜台时，才意识到我忘了带护照。

(Laughter)

(笑声)

So I raced home in the snow and ice, 40 minutes, got my passport, raced back to the airport, I made it just in time, but they had given away my seat to someone else, so I got stuck in the back of the plane, next to the bathrooms, in a seat that wouldn't recline, on an eight-hour flight. Well, I had a lot of time to think during those eight hours and no sleep.

于是，我在冰天雪地中用了40分钟赶回家，拿了护照后，又赶回机场，刚好赶上了飞机，但他们已把我的座位给了别人，我不得不坐在飞机最后一排，紧挨着洗手间，在八个小时的飞行中，我的座椅都不能往后倾。于是我就有了很多时间去思考，因为我在八小时中无法睡觉。

(Laughter)

(笑声)

And I started wondering, are there things that I can do, systems that I can put into place, that will prevent bad things from happening? Or at least if bad things happen, will minimize the likelihood of it being a total catastrophe. So I started thinking about that, but my thoughts didn't crystallize until about a month later. I was having dinner with my colleague, Danny Kahneman, the Nobel Prize winner, and I somewhat embarrassedly told him about having broken my window, and, you know, forgotten my passport, and Danny shared with me that he'd been practicing something called prospective hindsight.

我开始想，我能做些什么，有什么切实可行的方法，可以防止不好的事发生呢？或者至少，就算不好的事情真的会发生，也能把损失降到最小。所以，我开始思考这个问题，但我没有想出来，直到一个月后，我和同事，也是诺贝尔奖获得者 Danny Kahneman 去吃晚餐，我有点尴尬地告诉他，我打破窗户爬进屋里，还有忘记拿护照的事，而 Danny 和我分享了 他一直在练习的 称为“预测后见之明”的东西。

(Laughter)

(笑声)

It's something that he had gotten from the psychologist Gary Klein, who had written about it a few years before, also called the pre-mortem. Now, you all know what the postmortem is. Whenever there's a disaster, a team of experts come in and they try to figure out what went wrong, right? Well, in the pre-mortem, Danny explained, you look ahead and you try to figure out all the things that could go wrong, and then you try to figure out what you can do to prevent those things from happening, or to minimize the damage.

这是他从心理学家 Gary Klein 那里学到的。Gary 前几年已经写了这个理论，也称为“事前剖析”。你们都知道事后剖析是什么意思。每当有灾难，一个专家小组就会前去调查，尝试找出导致灾难的原因，对吧？而 Danny 解释，在事前剖析中，你要预测，尝试想出可能出错的所有事情，然后你要尝试可能的方法来防止这些错误发生，或将损失降到最小。

So what I want to talk to you about today are some of the things we can do in the form of a pre-mortem. Some of them are obvious, some

of them are not so obvious. I'll start with the obvious ones.

所以，今天我想和你们谈谈关于 在事前剖析中， 我们能做的一些事情。 有些方式是显而易见的， 而有些则不那么明显。 我先谈显而易见的方式。

Around the home, designate a place for things that are easily lost. Now, this sounds like common sense, and it is, but there's a lot of science to back this up, based on the way our spatial memory works. There's a structure in the brain called the hippocampus, that evolved over tens of thousands of years, to keep track of the locations of important things -- where the well is, where fish can be found, that stand of fruit trees, where the friendly and enemy tribes live. The hippocampus is the part of the brain that in London taxicab drivers becomes enlarged. It's the part of the brain that allows squirrels to find their nuts. And if you're wondering, somebody actually did the experiment where they cut off the olfactory sense of the squirrels, and they could still find their nuts. They weren't using smell, they were using the hippocampus, this exquisitely evolved mechanism in the brain for finding things. But it's really good for things that don't move around much, not so good for things that move around. So this is why we lose car keys and reading glasses and passports. So in the home, designate a spot for your keys -- a hook by the door, maybe a decorative bowl. For your passport, a particular drawer. For your reading glasses, a particular table. If you designate a spot and you're scrupulous about it, your things will always be there when you look for them. 在家里，指定一个地方， 放容易丢失的东西。 这听起来就像是常识，也的确是， 但这符合我们空间记忆的工作原理， 有很多科学依据支持这一点。 在我们大脑里， 有一个叫海马体的结构， 已经进化超过数万年了， 它可以追踪重要东西的位置—— 例如，水井的位置， 能够发现鱼的地方， 果树的位置， 以及友好物种和敌对物种 分别居住在哪里。 海马体是大脑的一部分， 伦敦出租车司机的 海马体结构通常比常人要大。 松鼠能找到坚果， 也要归功于它们大脑的海马体。 你们可能对这点感到疑惑， 但有人确实做了一个实验。 他们切掉了松鼠的嗅觉器官， 松鼠仍然能找到它们的坚果。 它们不是用嗅觉， 而是用大脑的海马体， 这个进化完美的大脑机制 是用来找东西的。 但只是对找固定的东西比较有效， 找会移动的东西却不是很管用。 这就是为什么我们会常常找不到 车钥匙，老花镜和护照。 所以，在家里指定一个 地点存放你的钥匙—— 门上的挂钩，或是一个装饰碗。 在一个特定的抽屉存放你的护照。 你的老花镜要放在特定的桌子上。 如果你指定了特定的地方， 并且一丝不苟地做这些事， 当你寻找它们时， 这些东西总是会在那里。

What about travel? Take a cell phone picture of your credit cards, your driver's license, your passport, mail it to yourself so it's in the cloud. If these things are lost or stolen, you can facilitate replacement.

关于旅行呢？ 用手机拍下你信用卡的照片， 还有你的驾照和护照， 把这些照片发到你的电子邮箱， 储存在数据云端。 如果一旦丢失或被盗了， 你可以很方便地用电子件代替它们。

Now these are some rather obvious things. Remember, when you're under stress, the brain releases cortisol. Cortisol is toxic, and it causes cloudy thinking. So part of the practice of the pre-mortem is to recognize that under stress you're not going to be at your best, and you should put systems in place.

这些是一些显而易见的 事前剖析方法。 记住，当你有压力时， 大脑会释放皮质醇。 皮质醇是有毒的， 它会导致思维不清晰。 所以，做事前剖析的练习， 是要认识到在压力下， 你不是在最佳状态， 你还应该把事情做到井然有序。

And there's perhaps no more stressful a situation than when you're confronted with a medical decision to make. And at some point, all of us are going to be in that position, where we have to make a very important decision about the future of our medical care or that of a loved one, to help them with a decision.

不过也许没有什么 比你来做医疗决策 更紧张的情况了。 有时，我们都会经历这种事情，我们必须做出一个很重要的决策， 为我们自己或自己爱的人 做医疗决策。

And so I want to talk about that. And I'm going to talk about a very particular medical condition. But this stands as a proxy for all kinds of medical decision-making, and indeed for financial decision-making, and social decision-making -- any kind of decision you have to make that would benefit from a rational assessment of the facts. 所以，我想谈谈这个话题。 我要说一个非常特殊的医疗情况。 但它代表了各种决策： 医疗决策， 当然还有财政决策和社交决策—— 任何你必须做的决策， 可以让你从理性的事实评估中受益。

So suppose you go to your doctor and the doctor says, "I just got your lab work back, your cholesterol's a little high." Now, you all know that high cholesterol is associated with an increased risk of cardiovascular disease, heart attack, stroke. And so you're thinking having high cholesterol isn't the best thing, and so the doctor says, "You know, I'd like to give you a drug that will help you lower your cholesterol, a statin." And you've probably heard of statins, you know that they're among the most widely prescribed drugs in the world today, you probably even know people who take them. And so you're thinking, "Yeah! Give me the statin."

假设你去看医生，而医生说，“我刚拿到你验血结果， 你的胆固醇有点高。” 你们都知道，胆固醇高 会增加患心血管疾病， 心脏病和中风的风险。 所以，你会想 高胆固醇不是一件好事， 那么医生会说：“我给你开点药， 帮助你降低胆固醇， 他汀类药就可以。” 你可能已经听说过他汀类药物， 现如今是医生开的 最多的处方药之一。 你甚至可能认识服用这药的人。 于是你想，“好吧，给我他汀类药。” 但这个时候，你必须问一个问题， But there's a question you should ask at this point, a statistic you should ask for that most doctors don't like talking about, and pharmaceutical companies like talking about even less. It's for the number needed to treat. Now, what is this, the NNT? It's the number of people that need to take a drug or undergo a surgery or any medical procedure before one person is helped. And you're thinking, what kind of crazy statistic is that? The number should be one. My doctor wouldn't prescribe something to me if it's not going to help. But actually, medical practice doesn't work that way. And it's not the doctor's fault, if it's anybody's fault, it's the fault of scientists like me. We haven't figured out the underlying mechanisms well enough. But GlaxoSmithKline estimates that 90 percent of the drugs work in only 30 to 50 percent of the people. So the number needed to treat for the most widely prescribed statin, what do you suppose it is? How many people have to take it before one person is helped? 300. This is according to research by research practitioners Jerome Groopman and Pamela Hartzband, independently confirmed by Bloomberg.com. I ran through the numbers myself. 300 people have to take the drug for a year before one heart attack, stroke or other adverse event is prevented.

一个许多医生不愿谈论， 制药公司更不喜欢谈论到的 一个统计数字。 这个统计数字就是， 治疗所需人数。 这是什么意思呢， 治疗所需人数（NNT）？ 它是指多少人服用了某种药，

或接收了手术或其他任何治疗方式，才会有1人收益。你心说，这是哪门子统计数字？这数字应该是1啊，如果这药对我没有帮助，那医生就不会开给我。但实际上，医疗实践不是这样运行的。这不是医生的错，如果是某些人的错，那就是像我一样的科学家的错。我们还没有想出足够好的运作机制。但据葛兰素史克制药公司（Glaxo Smith Kline）估计，90%的药品只对30%到50%的人有用。所以，这种最广泛的处方药的治疗所需人数，你们猜是多少？多少人要服用它才会出现一个受益的人？300。这是根据研究工作者 Jerome Groopman 和 Pamela Hartzband 做的研究得出的数据，这项研究由Bloomberg.com 权威网站独立证实过。我自己想了一下这个数字。必须有300人服用此药一年，才能预防一起心脏病，中风或其他疾病。现在你可能在想，Now you're probably thinking, "Well, OK, one in 300 chance of lowering my cholesterol. Why not, doc? Give me the prescription anyway." But you should ask at this point for another statistic, and that is, "Tell me about the side effects." Right? So for this particular drug, the side effects occur in five percent of the patients. And they include terrible things -- debilitating muscle and joint pain, gastrointestinal distress -- but now you're thinking, "Five percent, not very likely it's going to happen to me, I'll still take the drug." But wait a minute. Remember under stress you're not thinking clearly. So think about how you're going to work through this ahead of time, so you don't have to manufacture the chain of reasoning on the spot. 300 people take the drug, right? One person's helped, five percent of those 300 have side effects, that's 15 people. You're 15 times more likely to be harmed by the drug than you are to be helped by the drug.

“好吧，还有300分之1的机会可以降低我的胆固醇。为什么不服用呢？医生，给我开这个药。”但是你应该问医生，有关这药的另一个统计数字，那就是，“告诉我这药的副作用。”对吧？那么针对这种药，副作用会发生在5%的患者身上。这些副作用包括一些可怕的情况——肌无力，关节疼痛和肠胃不适——但你可能觉得：“才5%的比例，不太可能发生在我身上，我还是会服用它。”但是，请等等。记住在压力下，你可能思维混乱，不能考虑清楚。所以，要提前思考一下你该如何做，这样你就不用事到临头时再去进行一连串的推理了。300人要服用这药，才会有一个人受益，对吧？300人中5%的人会受到药物副作用的影响，也就是15人。你受药物副作用伤害的可能性是你受益于药物的15倍。我并不是想表明你该不该服用他汀类药物。

Now, I'm not saying whether you should take the statin or not. I'm just saying you should have this conversation with your doctor. Medical ethics requires it, it's part of the principle of informed consent. You have the right to have access to this kind of information to begin the conversation about whether you want to take the risks or not.

我只是说，你应该咨询你的医生。医德要求我们这样做，这是知情同意原则的一部分。你有权力要求知道这类信息，有权和医生谈你是否愿意承担这样的风险。现在你可能会想Now you might be thinking I've pulled this number out of the air for shock value, but in fact it's rather typical, this number needed to treat. For the most widely performed surgery on men over the age of 50, removal of the prostate for cancer, the number needed to treat is 49. That's right, 49 surgeries are done for every one person who's helped. And the side effects in that case occur in 50 percent of the patients. They include impotence, erectile dysfunction, urinary incontinence, rectal tearing, fecal incontinence. And if you're lucky, and you're one of the 50 percent who has these,

they'll only last for a year or two.

我为了制造震撼的效果 凭空捏造了这个数字，但实际上，这个治疗所需人数 是相当具有代表性的。对于50岁以上的男性，做的最多的手术是为治疗 前列腺癌而切除前列腺，治疗所需人数是49。是的，49个患者做了手术 才会出现一个受益的人。而这种情况手术的副作用 会发生在50%的患者身上。这些副作用包括阳痿，勃起功能障碍，尿失禁，直肠撕裂，大便失禁。如果你“有幸”成为了50% 受副作用影响的人中的一个，这些副作用通常只会持续1-2年。所以，事前剖析是要提前想好

So the idea of the pre-mortem is to think ahead of time to the questions that you might be able to ask that will push the conversation forward. You don't want to have to manufacture all of this on the spot. And you also want to think about things like quality of life. Because you have a choice oftentimes, do you I want a shorter life that's pain-free, or a longer life that might have a great deal of pain towards the end? These are things to talk about and think about now, with your family and your loved ones. You might change your mind in the heat of the moment, but at least you're practiced with this kind of thinking.

你想问医生的问题，这样会深入推进你和医生的对话。毕竟你不想事到临头 再来思考所有事情。而且你也需要考虑一下生活质量。因为通常你是有选择的，你想要较短的没有痛苦的人生，或想要较长的最终 要承受巨大痛苦的人生呢？这些都是现在需要 谈论和思考的问题，和你的家人，爱人一起。你可能会在事发时改变你的想法，但至少你练习了这种思维方法。请记住，我们的大脑 在压力下会释放皮质醇，

Remember, our brain under stress releases cortisol, and one of the things that happens at that moment is a whole bunch on systems shut down. There's an evolutionary reason for this. Face-to-face with a predator, you don't need your digestive system, or your libido, or your immune system, because if you're body is expending metabolism on those things and you don't react quickly, you might become the lion's lunch, and then none of those things matter. Unfortunately, one of the things that goes out the window during those times of stress is rational, logical thinking, as Danny Kahneman and his colleagues have shown. So we need to train ourselves to think ahead to these kinds of situations.

在那一刻发生的一件事是 你整个思维系统似乎停工了。这里有一个进化方面的原因。和一个捕食者面对面时，你不需要你的消化系统，性欲或者免疫系统的帮助。因为如果你的身体忙着在 这些事情上进行新陈代谢，你就不能迅速作出反应，那么你可能会成为狮子的午餐，然后那些事情也就不重要了，不幸的是，在紧张时，其中一件会出错的事情是 理性地，有逻辑地思考。Danny Kahneman和他的同事 已经证明了这点。所以，我们需要培养 自己超前思考的习惯，去面对这类事情。这里很重要的一点是，要认识 到我们所有人 都不是完美的。

I think the important point here is recognizing that all of us are flawed. We all are going to fail now and then. The idea is to think ahead to what those failures might be, to put systems in place that will help minimize the damage, or to prevent the bad things from happening in the first place.

我们都会不时地经历失败，事前剖析就要超前思考 可能的失败会是什么，井然有序地做事 有助于 把伤害减到最小，或者在第一时间 防止糟糕的事情发生。说回到我在蒙特利尔 那个冰天雪地的晚上，

Getting back to that snowy night in Montreal, when I got back from

my trip, I had my contractor install a combination lock next to the door, with a key to the front door in it, an easy to remember combination. And I have to admit, I still have piles of mail that haven't been sorted, and piles of emails that I haven't gone through. So I'm not completely organized, but I see organization as a gradual process, and I'm getting there.

当我从欧洲返程回到家时，我的承包商在门旁边安装了密码锁，还有一把钥匙以及一个简单易记的密码。我不得不承认，我还是有一堆没有分类的信件，以及一堆没有处理的邮件。所以，我还没能完全做到井然有序，但我把井然有序做事看成是一个渐进的过程，也正在慢慢实现这个目标。谢谢。

Thank you very much.

(鼓掌)