

## **Anorexia Nervosa: A Guide for Anorexics and their Loved Ones**

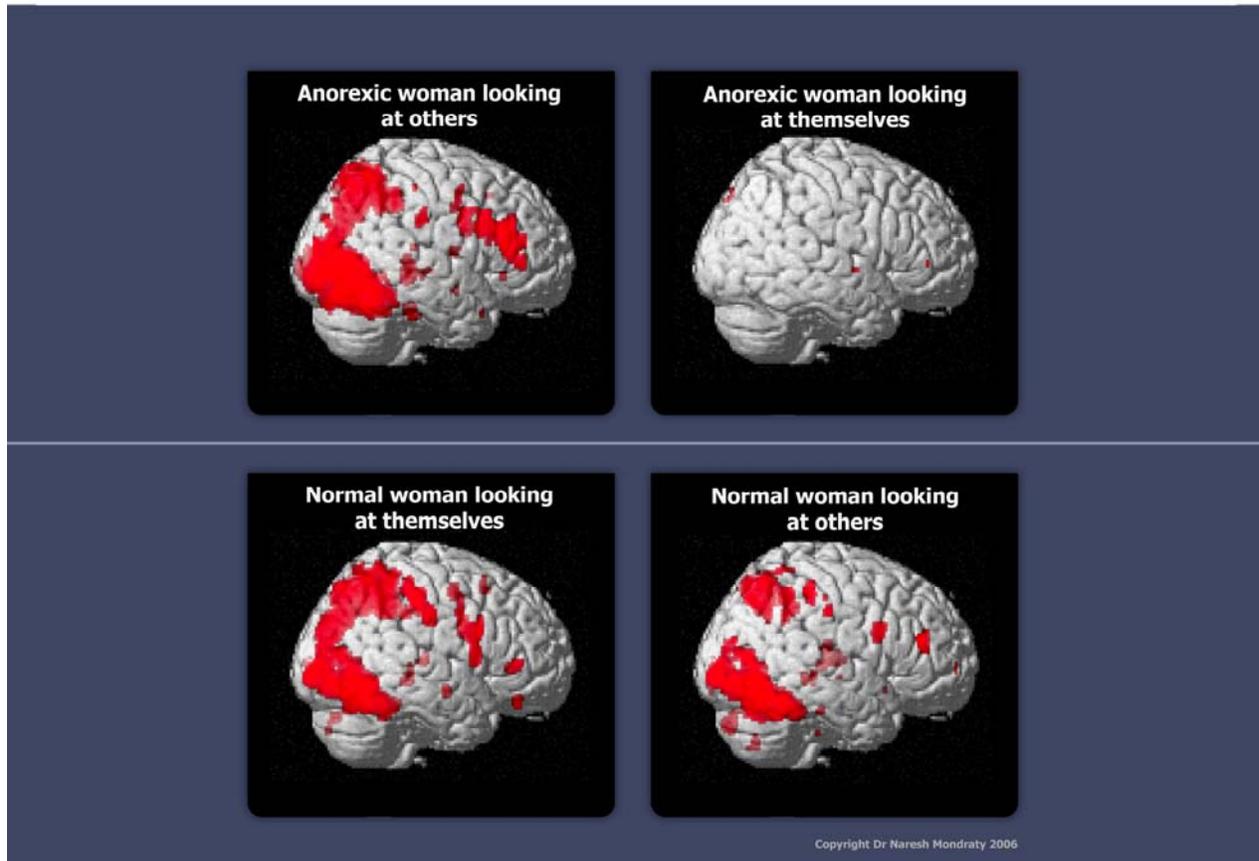
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In order for me to explain anorexia nervosa, I must first let you know that it is not what it appears to be. For the person with the illness, anorexia seems to be one thing. For loved ones it seems to be another thing entirely. As an evolutionary psychologist who treats patients with anorexia I have a different perspective. My view of this illness is one that can offer you both hope and dignity. I want to show you how guilt, blame, and shame have no place in this illness. In fact, patients with anorexia nervosa are the descendants of the heroic Joan of Arc. And loved ones, armed with modern knowledge, can help save Joan from the fire.

### **Blind to their own bodies**

As strange as it may seem, when people first develop anorexia nervosa they may not be aware that something is wrong because their bodies send them false signals. Although at least 15% below normal weight, anorexics feel energetic and reject foods that used to tempt them. Most remarkable, underweight anorexics literally cannot see that they are too thin. This brain-imaging picture shows the pattern of activation of the visual cortex when women look at other's bodies and when they look at themselves(1).

## Body Image Processing in Anorexic Patients: An fMRI study



As these pictures dramatically illustrate, when people with anorexia tell us “I just can’t see that I’m too thin” they are telling the truth—the visual cortex is literally blinded to their own body contours while the brain region responsible for one’s body image is hyperactive, seamlessly filling in the blank with a fattened up version. This odd blindness happens only for an anorexic’s own body and only when he or she is underweight(2).

### **What is the anorexic brain doing?**

The puzzle doesn’t end there. Deep in the brain an ancient region, called the hypothalamus, does something very odd in anorexia. Normally the hypothalamus monitors nutritional status and manipulates our appetite to get us to eat. When people are

starving, it turns up hunger signals so the person can think of little else, and it keeps satiety (fullness) signals low so that, if food becomes available, they can gorge.

But if the starving (or dieting) person has anorexia nervosa, the hypothalamus turns some hunger signals down and increases satiety signals so that anorexics feel repelled by food and get full after small meals. Yet, at the same time, two of the master hunger signals in the hypothalamus are also turned up as in normal starvation, so that people with anorexia find themselves thinking constantly about food that they cannot bring themselves to eat.

Normally when people are starving, the brain rewards for eating are tuned extremely high to encourage and reward the search for food. For example, the body turns up opiate receptors, making eating feel like an addict's fix. It enhances cannabinoid receptors making food taste like you're stoned. Dopamine, the brain chemical that plays a key role in orgasm and in addictions, surges when a starving person eats. If it sounds like eating when starved releases a veritable pharmacopoeia of street drugs, you are right. Many addictive drugs exploit reward systems that first evolved to insure that animals eat.

While some brain changes increase the rewards for eating, others change what we decide to do. We assume that we are in control of our eating, but dieters know there is more to the story. Like hunger for air or water, hunger for food can irresistibly alter the will so that eventually a starving person will decide to eat.

But this system is altered in those with anorexia nervosa making starving people decide not to eat. It accomplishes this by making changes at every level of the body's powerful energy regulation system(3). In the gut satiety signals are turned up so that people with anorexia get full quickly. In the brain opiates, cannabinoid enhancers, and dopamine reward receptors are turned down so that food tastes flat and eating is unrewarding. In the brain's emotion circuits, anorexia produces fear and guilt about eating and pride when resisting hunger, and makes people with anorexia believe that it is vitally important to control their appetite.

### **Is anorexia caused by psychological issues, or by weight loss?**

Anorexic attitudes and feelings have long been seen by doctors and therapists as dieting run amok. According to the *Diagnostic and Statistical Manual of Mental*

*Disorders*, anorexia nervosa is the result of a “relentless *pursuit* of thinness” and “*refusal* to maintain a normal body weight” (italics added). Anorexics are assumed to be vain and neurotic-- “starving for attention” or “on a hunger strike” -- and their families are branded as controlling and critical. There is no scientific evidence for those assumptions (4).

Researchers have not found evidence for emotional problems in their families, and the typical anorexic, before the illness, was hard working, high achieving and conscientious.

There are a number of other facts that do not square with the idea that anorexia nervosa really is caused by “nervosa”, that is, psychological illness. The symptoms of anorexia are strikingly similar across historical era, sex, age, and culture (5). The only thing that has changed about anorexia is the beliefs of society and theorists about “father hunger” and “fat phobia” and “the only thing she can control.”

What anorexics are able to do is very remarkable. It is normally impossible for individuals to keep their weight 15% or more below normal for long. Any dieter can attest to that. Have you ever wondered how 14-year-old girls can willfully resist hunger when adults cannot? After all, the part of the brain that helps us delay gratification and exert self-control is not fully mature until people are in their mid-twenties. How can they exert such self control? When people with anorexia try to recover they find that their body and mind fight them. They find, as Kari Chisholm wrote in *Hungry Hell*, “It took a lot of self-control to lose the weight, but even more to gain it back.”

Genetics researchers have identified multiple genetic changes that are linked to anorexic attitudes and to altered appetite and activity regulatory molecules, genes that kick in when body weight drops (6). Without anorexia genes underweight people cannot effortlessly maintain a very low weight; they do not see fat on their emaciated bodies, and they won't feel like exercising on 500 calories a day. But why do some of us carry these genes? Evolution is the most likely explanation. At one time in human history the symptoms of anorexia nervosa must have been a useful response to the threat of starvation.

### **Adapted to flee famine**

Usually starving people eat eagerly. They realize they are malnourished and they try to conserve energy. Under what conditions would natural selection favor the anorexic's response to starvation?

The odd symptoms of anorexia make sense if we consider the challenges that faced our hunter-gatherer ancestors in the Pleistocene. When nomadic foragers had depleted local food and mountain ranges, oceans or deserts barred further travel, normal responses to starvation -- lethargy that conserved energy and the hunger that motivated single-minded search for food -- would have interfered with making a difficult and frightening journey.

The adapted-to-flee-famine hypothesis (AFFH) proposed that individuals who were able to ignore their hunger and energetically move, the ancestors of today's anorexia patient, could have scouted ahead for better lands for the tribe (7). For them, self-deception about body image, fat stores, and about how depleted their bodies really were, could have provided the optimism to travel. Personality traits of conscientiousness and self-control could also have kept someone going even on desperate journeys with little hope of success.

But, is there any evidence that prehistoric people really did travel long distances? Yes. In fact, in the last 50,000 years humans flooded the globe. Before historic times humans were already more widely distributed than any other mammal. Furthermore, these early modern humans were such effective hunters that they repeatedly overhunted native prey populations. This led to local famine and the need to migrate in search of new food (8). Only those people and groups who migrated colonized new worlds.

Most prehistoric hunter-gatherers did not make it to the next continent. As few as 500 of the people who left Africa gave rise to the modern populations of the rest of the world. According to molecular genetics research, the founding population of American Indians may have only been 70 individuals (9). And, bands with anorexic members were apparently among the founders. Anorexia nervosa is extremely rare in Africans, it is more common in Europeans and Asians, and appears to be most common in Native Americans who have traveled the furthest from Africa (10).

But how could traits be passed on if they also served to decrease fertility and could even kill the carrier? Evolutionary adaptations are makeshift and may be dysfunctional outside the ecological context in which they evolved. For example, researchers believe that the ability to store extra fat is another adaptation for surviving famine. While in today's society these traits can cause ill health they were selected in the past for at least part of the community.

### **The March of the Penguins**

The adapted-to-flee famine may sound like an idea that is impossible to prove, but many kinds of evidence support it. Nature has given many species the ability to turn down hunger when it competes with crucial life tasks. If you saw the movie, *March of the Penguins*, you know that Emperor penguins must become anorexic to breed; males may lose half their body weight while incubating! Other species stop eating to migrate, hibernate or while defending a breeding territory.

Like humans, rats and pigs evolved as omnivorous foragers and they also become anorexic and energetic when starving. If given exercise wheels, starving rats ignore their food to run. Although rats normally run less than a mile a day, these frantic animals clock up to 12 miles a day as though they were trying desperately to get somewhere. If allowed, they eventually die of self-starvation.

Animal researchers attribute this behavior to starving animals' instinctive attempts to leave food depleted areas (11). Researchers have examined anorexic rat's brains have identified neuroendocrine changes that cause them to stop eating and start running. They found that anorexia symptoms are triggered by low body fat. *Refusal* to eat and over-activity come *after* weight loss. Perhaps breeding penguins and starving rats also feel it is important to control their appetite.

### **Extreme Sport**

Anorexics report feeling they (but not others) are not supposed to eat. They feel ashamed of giving in to hunger. It feels right to them when they restrict food and exercise. Although these behaviors seem chosen, patients talk of being "taken over" by the anorexia, and it is remarkably difficult to reason with them about their beliefs. People

as different from each other as reservation Indians, middle school girls, underweight boys, and elderly women all express the same thoughts and feelings.

These anorexia attitudes seem illogical to non-anorexics, but we accept, and even laud, athletes who express similar dogged commitment to their sport. Although it is no longer necessary to gathering food or defending one's family, people still feel compelled to practice athletic skills and to encourage others to practice. Our attitudes toward sports are probably a holdover from a time when one person's prowess in throwing or running could save an entire tribe from starvation or in battle (7). We even call excellent athletes "heroes." I suspect that both anorexics' attitudes toward hunger and exercise, and athletes' attitudes toward practicing skills are hardwired in human genes.

But, why would these anorexic attitudes get triggered today, when there is plenty of food? We might as well ask why some people become obese now when there is no need to store extra fat. The hypothalamus, which sees to eating and the other basics of survival, has dealt with famine for hundreds of millions of years. It has changed so little over the history of mammals that research on human diabetes and obesity can be done with mice. The hypothalamus doesn't get information from the thinking part of the brain, but rather by measuring blood levels of a hormone produced by fat. Then, according to rules dictated by evolution, the hypothalamus initiates changes in physiology, behavior, attitudes and thoughts to get the body what it needs when it needs it.

If your ancestors survived frequent famine by storing fat in the good times, the hypothalamus can make your body store extra fat despite your conscious awareness of plenty. This powerful energy regulation system is the reason dieters eventually regain their lost weight. We can tell ourselves there is no reason to store this extra fat, but the hypothalamus can't hear us. Similarly, if your ancestors survived famine by migrating, the hypothalamus reads very low body fat as the signal to pull up stakes and move. It then deceives you about your fat stores, compels you to control your appetite, and gives you restless energy.

### **Why do anorexic females outnumber males?**

It is commonly assumed that girls and women are more susceptible to anorexia because they are trying to look like anorexic-level thin models. Although our culture's

idealization of unhealthy levels of thinness certainly causes most women dieting misery, and it starts some on the path to anorexia and other eating disorders, it turns out that thin standards are not the primary reason for the sex difference. In fact, until the 1930s historical accounts did not even describe a “pursuit of thinness” as the motivator for anorexia nervosa. Historically, fasting was associated with piety, not appearance. Diaries and other firsthand accounts show that many people considered holy in history (then also mostly women) displayed typical anorexia symptoms of food restriction, over-activity, and denial of starvation, although they did not express modern anorexics’ fear of fat (12).

Historically female anorexics have always outnumbered males -- even when thin was not in. Female rats also develop anorexia sooner than males. Before puberty, although quite rare, as many boys as girls develop anorexia. After puberty the ratio is 9 female anorexics for every male. This has been attributed to adolescent girls’ interest in dieting, but researchers have found a genetic mutation on an estrogen receptor that turns on the capacity to develop anorexia at puberty (6). This specific genetic change indicates that, when this gene was selected, it was more adaptive for reproductive females than for girls, boys or men to develop anorexia.

Again, the life of nomadic hunter-gatherers may explain why. If a man and woman encountered another band while looking for food, the woman was less likely to be killed. Even if she were captured she could survive to reproduce. This grim fact is probably part of the reason molecular genetic research has found that females migrated farther than males in our evolutionary past.

### **She gave everything**

But is it really likely that hunter gather bands would allow young women to scout for food? Weren’t those cultures even more sexist and rigid about females’ roles and activities than our own? According to anthropologists, hunter-gatherer societies today and in the past are more egalitarian and open to women’s full participation than agricultural and state societies – girls and women have always helped to provide food for their families.

But, I think the most compelling evidence that young women could have led their starving bands, is the story of Joan of Arc. She was an illiterate peasant girl, and

thirteenth century France was a feudal, patriarchal culture. Yet, princes and generals followed her. Historians now believe that Joan had anorexia nervosa.

Joan of Arc was athletic, tough and courageous. “She came from nowhere and gave everything,” biographer Mary Gordon observed. Because “she knew herself right and fully able and the chosen of the Lord” she was able to convince the French Dauphin to give her command of a troop of soldiers. According to biographer Marina Warner, her “glorious recklessness” inspired men to follow her. She ignored hunger and fatigue, and she drove herself to punishing physical activity. To lift the siege of Orlean, Joan and her soldiers traveled 350 miles in eleven days, crossing six rivers while eluding their enemies. During the first battle, when she was shot above the breast by an arrow, the French commander assumed the battle was over. But, Joan refused to retreat. She prayed briefly, remounted her horse, and took up her standard. The English fell back in awe; the French soldiers rallied to take the town.

Joan of Arc’s extraordinary courage, even when wounded and outnumbered, inspired her followers to a string of improbable victories. Gordon tells us, “The effect that Joan had on the weak and vacillating Charles is a kind of metaphor for her effect on the whole kingdom of France. Like its leader, the realm was demoralized, depressed, and divided against itself. ... Suddenly, a young, brash creature appeared from the countryside.” In those desperate times France needed a fearless leader whose zealous belief could inspire hope.

Joan of Arc’s physical energy probably came from her anorexia. She understood her extraordinary abilities in the context of God’s will for France, while Pleistocene foragers might have understood theirs in the context of scouting for food. Today’s anorexics understand them in terms of pursuit of thinness, a “hunger strike,” or control.

### **Burned Alive**

People with anorexia nervosa can run for miles on very little food. Can anorexics somehow defy the first law of thermodynamics, pulling energy from nowhere?

No. Although anorexics feel strong and fat, this is an illusion. If anorexia nervosa becomes chronic, modern sufferers, like St. Joan, are eventually burned alive. Over time their body cannibalizes its own muscles, heart and organs. They become shrunken and

wasted. Their bones, drained of calcium, are so fragile that one woman I worked with broke her hip throwing a bowling ball; another's ankle snapped when she stepped off a curb. Anorexics suffer kidney failure, heart failure or seizures, all the while explaining that they cannot bear to eat. Even in the short run anorexia nervosa compromises health. If the disorder persists over four months it diminishes a growing child's height.

If anorexia nervosa goes on too long, most people eventually begin bingeing and purging. Researchers used to think that distinctly different personality types led to bulimia or to anorexia, but it now appears that bulimia often accompanies or follows anorexia, probably because normal adaptations to starvation -- ravenous hunger and ability to gorge -- break through from time to time and people find themselves binge eating. If the anorexic then vomits, fasts or exercises to undo the binge, these remedies perpetuate the neuroendocrine signals that cause uncontrollable hunger.

When anorexia becomes chronic people exhaust their medical insurance benefits, their friends, families, and themselves. Active anorexia nervosa ultimately leads to such a miserable life that the risk of suicide is 50 times normal. In 1991 a Dutch court dismissed charges against a physician who had assisted in the suicide of 25-year-old woman with a 16-year history of anorexia because they concluded "the woman had been suffering unbearably with no prospect of improvement."

Anorexia demands that everything be sacrificed -- friends, spouses and children take second place to the need to exercise, avoid eating, or to purge food already eaten. Loved ones take relapses personally, while explanations invoking anorexic's "need for control" make families back away. The assumption that victims *refuse* to maintain a normal weight contributes to their isolation. In today's society, anorexia nervosa makes its victims secretive, lonely, and frail.

### **Trapped by ANA**

A typical first-time anorexic is a 14-year-old girl who has always been lean and active. Why are 14-year-old girls more vulnerable? At puberty girls have attained their adult height but have not filled out. They are typically leaner than at any other time in their lives. Now, like the lean-bred pigs described above, these "beanpoles" are at risk of developing anorexia nervosa if they lose weight for any reason, whether from illness,

athletics, or dieting. Some of my young patients are adamant that they do not have anorexia nervosa because they were never trying to lose weight. But, sadly they have all the other psychological and neuroendocrine symptoms, including inability to see how thin they are, difficulty eating, and drive to exercise. Anorexia traps some for years.

However, anorexia is not confined to youth. If you have the genetic ability to develop anorexia, it can be triggered whenever body fat drops too low. Dangerous times occur around life transitions that disrupt eating or that inspire dieting -- early puberty, the first years of college, pregnancy and childbirth, school reunions, divorce or death of a spouse, and old age.

Because anorexia imbues an ordinary mortal with seemingly supernatural powers, it can also reassert itself when one's sense of self is threatened. If a person feels out of control in his or her job, marriage, or parenting, dieting to an anorexic weight can make the person feel in charge again. Anorexic thoughts and attitudes get assimilated to whatever psychological issue the person has; this is probably the reason that eating disorders specialists have stayed so convinced that psychological issues cause the disorder.

### **“Parents are the worst attendants”**

In 1874 Frances Gull, the physician who gave *anorexia nervosa*, its name, noted that when patients returned home they often lost the weight they had gained in the hospital. He concluded that “parents are the worst attendants” for their anorexic children. This pattern of blaming parents continued. The most important twentieth century theorist of AN, Hilde Bruch wrote that anorexics were “engaged in a desperate fight against feeling enslaved and exploited” by their mothers. Clinicians advised “parent-ectomies.” Parents were to stop putting pressure on the child to eat and let the professionals do the work. Even today, most clinicians still assume that food “refusal” represents a struggle for independence. Clinicians often suspect that an absent father drives his daughter to “starve for attention,” or that a mother is so controlling that food is the only thing her daughter can control.

Blaming parents turned out to have cruel and even deadly effects. Some families were torn apart and some children died. In *Slim to None: A Journey through the*

*Wasteland of Anorexia Treatment* Gordon Hendricks used his daughter's journals to chronicle the treatment that ended with her death. The father's love was labeled incestuous, the mother's competitive and they were counseled to keep their distance. The therapist was so convinced that Jennifer's symptoms were symbolic that she undermined the work of the dietician. After ten years battling the illness, Jennifer died alone.

Parents have clearly been exonerated. Genetics researchers have established, by studying identical and fraternal twins, that family environment had a "negligible" effect on whether a child would develop anorexia (13). Parents of anorexics run the gamut of parenting abilities and attitudes, but as a group they are no more controlling, critical, or absent than other groups of parents. In fact, parents can no more make their children anorexic than they can make them autistic or schizophrenic.

But why were parents supposedly bad at taking care of their children with anorexia? One reason may be the fact that the parents are doing what good parents do: they listen. Learning to read your baby's cues about being hungry or full is one of the first skills good parents develop. Forcing more food on a sated infant is normally bad parenting. An illness that tricks a child into believing that she is full puts the parent in the unnatural position of not listening. Like E.T. and Eliot, a their hearts beat as one. I think that parents can be "bad attendants" exactly because they are so sensitive to their child's anguish, and for the person with anorexia, eating can be excruciating.

Anyone who has tried to beg, coax, and cajole an anorexic to eat knows anorexia's certainty, misery, and intellectualization. Loved ones get the full brunt of anorexia's desperation. We are dealing, after all, with the kin of Joan of Arc, descendants of people who -- with self-control and single-mindedness -- ignored their hunger and survived. Who could stand against Joan of Arc? Not her mother or father. Her brothers joined her cause.

Still, if your child were terrified of shots but needed of them, you would be able to soothe and support her while getting the shot. Recovered anorexics say that eating through their fear was the hardest thing they have ever done. When a loved one has anorexia, our job is to help her or him tolerate the acute distress of defying the anorexic body's demands. We acknowledge their anxiety and applaud the courage it takes to eat despite it.

### **It takes a village**

Humans are deeply social and when anorexia evolved, people lived in groups bound together by ties of blood and responsibility. Anorexia nervosa was probably more easily “switched off” in that group context. Hunter-gatherer societies share food, when more food becomes available after famine, thanksgiving and ritual feeding of one another accompany breaking the fast. Because anorexia evolved in the context of interdependent groups, the help of friends and family may be vital to recovery –part of the process of anorexia that our modern world has forgotten.

The likelihood that anorexics were a minority in most groups (this is based on its current prevalence) could have worked to everyone’s advantage. When resources were depleted and the tribe despaired, an anorexic’s energy, optimism, and grandiosity could mobilize the other members to heroic marches. When a starving tribe reached a new hunting/gathering ground, support by the non-anorexic members would in turn have helped the anorexic member(s) to begin eating again. Indeed, most recovered anorexics today attribute their recovery to their loved ones’ support.

### **My body is trying to migrate**

I find the story of our ancestral anorexics is powerful as a tool for recovery. For 800 years sufferers of anorexia nervosa have been mistakenly believed to be seeking control. For the anorexic saints Joan of Arc and Catherine of Siena, it was control of bodily appetites. For Victorian anorexics it was control of sexuality. In the last half of the twentieth century it is control of body size.

But for you, struggling with this illness in your family today, this focus on control is not helpful. You can replace the mantra “It’s the only thing I can control” with “My body is trying to migrate” and with this new insight learn to heal and remain well throughout a full and productive life. Patients and their families are not helpless against the power of anorexia; in fact, with knowledge of the illness they have the tools to beat it.

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