



Dr. ALLAIRE

Reconnecting Men to Life



Professor Eric Allaire, MD, PhD

www.drallaire.com

1. Introduction

Introduction – Why Erections Matter

“Men are prone to erection problems—minor or major, imagined or real. Often, anxiety is not about the loss itself but about preserving or improving good erections over time. Quickly, these problems create anxiety and damage self-esteem. For many men with erectile dysfunction, it means losing sexual desire—and, more broadly, a loss of appetite for life.

Why are erection issues so intrusive in men’s minds? After years spent fighting to restore natural erections in so-called ‘impotent men, I have concluded: erections connect humankind to its very existence. Our brain is wired in such a way that when erections fail, our entire perception of life and the future is shaken. It’s an ancient issue, going back to the time of the goddess Ishtar, 4,000 years ago. This is what patients, and their partners tell me in consultation—through their words, their stories. Sometimes—20% of patients I have operated on for venous leakage — erection problems have even triggered suicidal thoughts. This is the full meaning behind *Reconnecting Men to Life*: a summary of what I want to offer to every man facing erectile difficulties.

Oddly enough, although men supposedly hold sway over world affairs, they receive very little attention and care when it comes to their erections. I believe men bear much of the responsibility for this situation—because they often avoid recognizing their own vulnerabilities. But there is another issue: erections lie at the intersection of psyche and body. In medical terms, they sit between knowledge of psychological disorders and knowledge of physical diseases. Navigating between these two domains of medicine creates many challenges. In practice, confusion, misjudgments, and misinterpretations are common—even among healthcare professionals.

The consequences of such failures to help patients are enormous: men may legitimately feel abandoned in a critical aspect of their lives. Opportunities to improve their overall health—and perhaps extend their longevity—are missed. The average time between the onset of erection problems and the surgery I have now performed in over 500 men is 11 years. In between: distress, degraded self-image, unsatisfying sex, lost chances at fatherhood, divorce, loneliness, heart attack, stroke.

Let’s change this. Our expectations for life are high—we benefit from exceptional longevity in good health. My goal is that within ten years, men will have easy access to trustworthy, well-trained professionals who can address their erection problems. This is the mission of the NeoHominis Academy. Let’s make *Erectile Health* the next frontier for men and couples. How to improve erections? How to preserve them? How to detect and solve erectile dysfunction?

This Guide aims to provide curious men and women with a roadmap to take control: to understand how erections work and fail, how to access tools to assess their condition, how it connects to overall health, and what can be done to restore their connection to Life.

I wish you a good reading,

Professor Eric Allaire

Key Statistics

Erectile dysfunction is one of the most common symptoms. Men who experience erection problems should not feel alone, even at a young age. Erectile issues affect not only sexuality but also overall health.



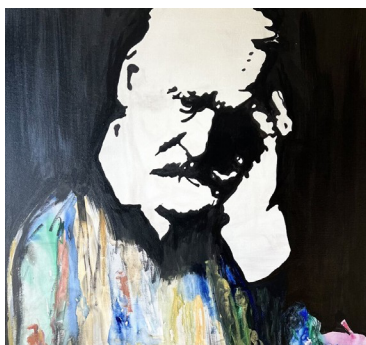
2% of young men under 25 cannot have erections good enough for penetration during sexual intercourse because of **venous leakage**, a vascular disease resulting in penis inability to retain blood for firm erections to develop and maintain.

(Ludwig W et al. Organic causes of erectile dysfunction in men under 40. Urol Int. 2014;92(1):1-6

Rastrelli G et al.. Erectile dysfunction in fit and healthy young men: psychological or pathological? Transl Androl Urol. 2017;6:79-90

Allaire E et al., Erectile dysfunction resistant to medical treatment caused by cavernovenous leakage: an innovative surgical approach combining pre-operative work up, embolization and open surgery. Eur J Vasc Endovasc Surg. 2021;61(3):510-517

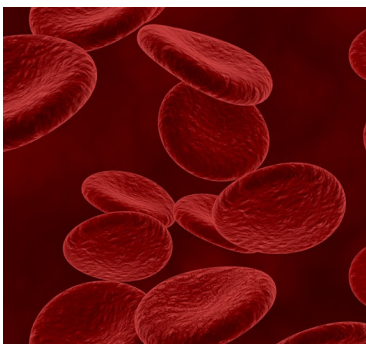
Allaire et al. Ligation and embolization in one procedure for caverno-venous leakage in 171 patients with drug-resistant erectile dysfunction. Annals of vascular Surgery 2025;121:664-672)



70 is 70%

The odds of having an erectile dysfunction increases with age. It reaches 70% at 70 years. However, erections can be improved at all ages.

(Aytac IA. The likely worldwide increase in erectile dysfunction between 1995 and 2025 and some possible policy consequences. British Journal of Urology 1999;84:50-56). Image credit: Muriel Deumié.

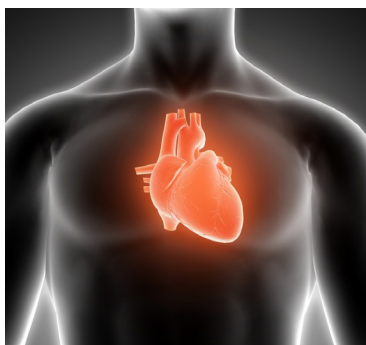


50%

Half erectile dysfunctions resistant to erection pills are caused by diseases of veins and arteries controlling blood circulation in the penis. By large, venous leakage is the most frequent cause.

(Wespes E et al. Sildenafil non-responders: haemodynamic and morphometric studies. Eur Urol. 2005;48(1):136-9

Allaire E. Nosology. Epidemiology, socio-economic aspects of vascular erectile dysfunction. Phlebologie 2021, 74, 4, p.14-22)



X2

The onset of an erectile dysfunction multiplies by 2 the risk of heart attack or stroke. The onset of an erectile dysfunction is an opportunity to increasing longevity.

(Uddin SMI et al. Erectile Dysfunction as an Independent Predictor of Future Cardiovascular Events The Multi-Ethnic Study of Atherosclerosis. Circulation 2018; 138:540-542

Piegza M et al. Sexual and cardiovascular health. J Vasc Health Risk Manag. 2025;21:51-60)

2. Understanding Erections

Anatomy of the Penis

What you see: the penis. Inside the penis: the two corpora cavernosa, that extend in the lower part of the pelvis (*Figure 1*).

On a cross-section (*Figure 2*), they appear side by side. Each corpus cavernosum contains the erectile tissue, a sponge that becomes full of blood during erection.

This is the part of the penis that gets hard during erection.

The corpus spongiosum, with the glans penis at its distal end, is located beneath the corpora cavernosa. It surrounds the urethra, through which urine and sperm are expelled. It swells during erection but does not become as hard as the corpora cavernosa.

Critical for understanding: erections occur because the penis is connected to the general circulation. By arteries that bring blood into it, and by veins that drain and convey blood back to the general circulation for erections to resolve (*Figure 3*).

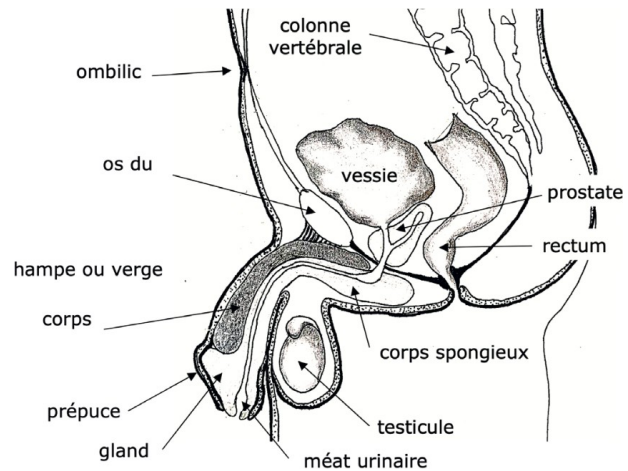


Figure 1

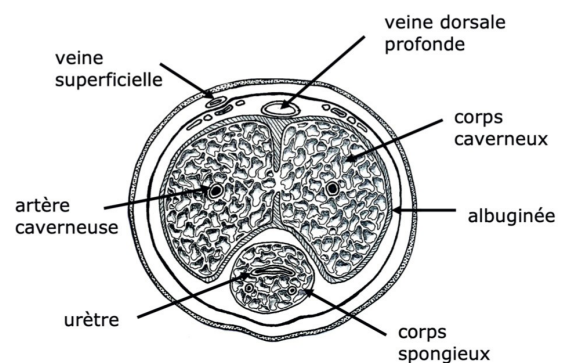


Figure 2

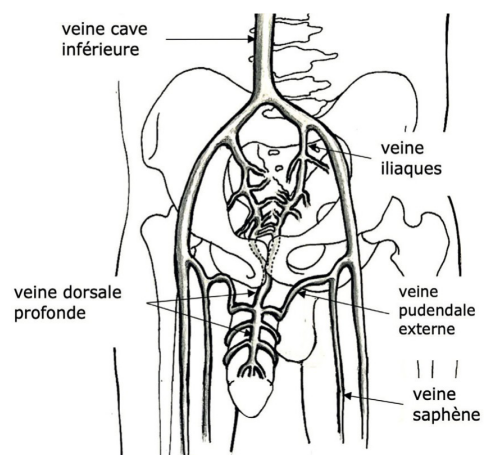


Figure 3

How Erections Work

Blood accumulation in the penis generates erections

Erections develop because blood moves from the general circulation into the penis and stays in the penis during the erection.

Sexual desire in the brain triggers the arrival of blood into the penis through the pudendal arteries.

At the end of the erection, for instance after ejaculation, the 50 to 80 ml of blood trapped in the penis during the erection goes back to the general circulation through other vessels, named veins.

Very thin arteries bring blood to the penis

The pudendal arteries through which blood arrives into the penis are very narrow (diameter: 1.5 to 2.5 mm).

These small vessels can be susceptible to damage (or occlusion, stenosis, narrowing) due to various factors, including tobacco use, diabetes, high cholesterol levels in the blood, hypertension, stress, or trauma.

Because of penis artery damage, blood cannot flow sufficiently for satisfactory erections to develop.

At the end of erections, veins convey blood back to the general circulation

As long as the penis is fully rigid during the erection, veins retain blood trapped in the penis. At the end of the erection, blood quits the penis to return to the general circulation and the penis becomes limp. When veins fail to retain blood in the penis, as the result of venous leakage, erection cannot develop. The penis remains limp. Venous leakage is the most frequent cause of erectile dysfunction. It is responsible for severe erectile dysfunction in 4.4 million men in the United States.

Neurobiology and Psychological Factors

Brain computes multiple influences to create desire and erections

Desire, arousal, erotic pulsion, exciting sensory perceptions, hormones, neurotransmitters. Inhibition, fear, stress, repression, morality, interdiction. Knowledge, ignorance, fear.

These factors can influence individuals, couples, laws, social behaviors, medicine.

Erections are governed by a number of biological, psychological, behavioral, religious, social factors. The human brain integrates these multiple influences and stimulations to generate or repress erections.

Success or failure in achieving and maintaining an erection can be viewed as the endpoints of an interplay of these factors. Performance anxiety, low desire and fear can all contribute to erectile dysfunction.

From brain to penis

Signals from the brain that regulate erections travel through the spinal cord and nerves in a complex pathway to reach the penis. Any damage to these structures such as trauma, compression, diabetes, excessive alcohol consumption, or neurological diseases can impair erectile function.

Nocturnal and morning erections triggered by the autonomous nervous system

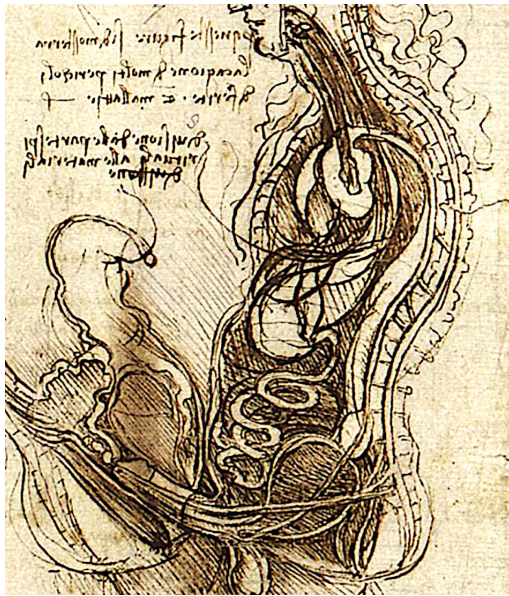
Erections are also governed by the autonomous nervous system, a key player in the human body that regulates organ functions in a non-conscious manner. It is subdivided into the sympathetic nervous system, which is activated in response to danger or by stress, and the parasympathetic nervous system involved in relaxation.

As a result of the parasympathetic autonomous nervous system activation, healthy men experience erections during sleep, in 3 to 5 episodes of 30 to 60 minutes each night during phases of paradoxical sleep. This unconscious phenomenon is referred to as nocturnal erections. When awakening, morning erections are a conscious consequence of the parasympathetic autonomous nervous system activity. This is a sign of good health.

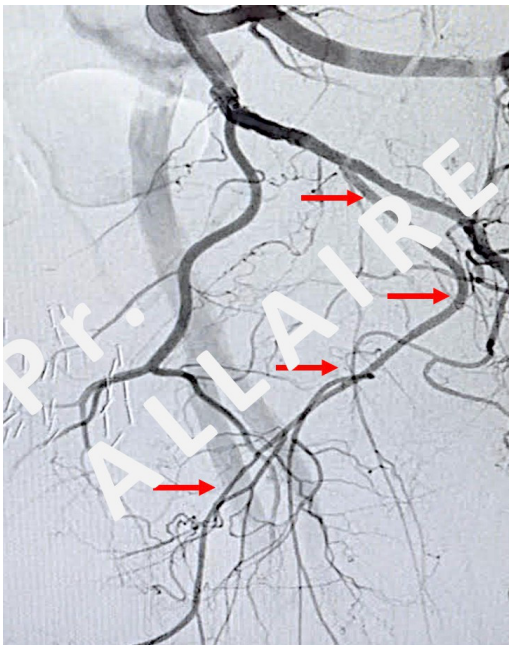
It is important to note that nocturnal and morning erections are not indicative of desire or sexual stimulation. When not sleeping, men have perceptions of the effects of autonomic nervous system activation: they recognize relaxation and stress, playing opposite roles on their erections. The disappearance of morning erections is a worrying sign, as it can indicate a decline in erectile function and, more broadly, a deterioration in overall health.

Hormones

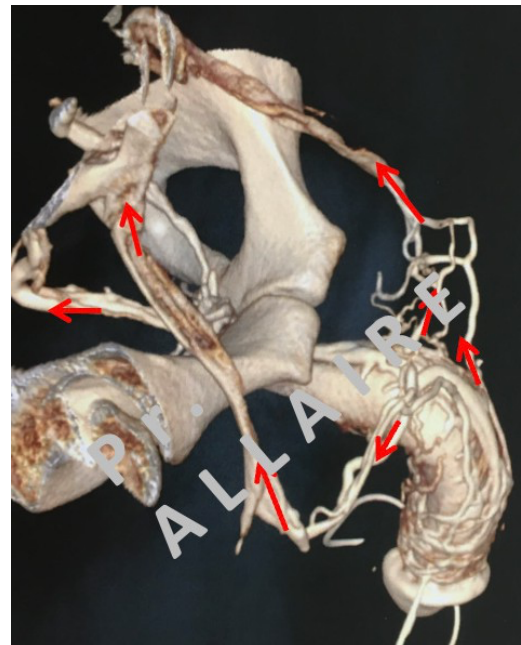
Hormones are molecules that circulate in the blood. There are many types, each playing important roles in both physical and mental functions. Testosterone is the most well-known hormone associated with masculinity. Contrary to popular belief, testosterone does not directly affect erections. However, low testosterone levels can reduce sexual desire and, over time, may alter the structure of erectile tissue.



Coition of a Hemisected Man and Woman. Leonardo da Vinci. Royal Collection Trust, UK. Wikimedia. Interestingly, Leonardo has represented all erection players: brain, spinal cord, nerves, vessels. He was the first to speculate that erections result from blood accumulation in the penis.



Arteriography showing a pudendal artery (red arrows) bringing blood to the penis.
(Pr. Allaire, personal collection)



3D reconstruction of cavernous computed tomography, showing venous leakages from the penis (red arrows). Note that the penis is limp due to venous leakage. (Pr. Allaire, personal collection)

3. Causes of Erectile Dysfunction

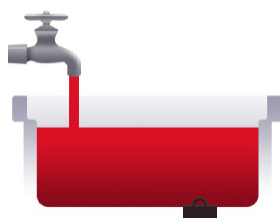
Why Erections May Not Work

John Hunter, a London-based surgeon in the 18th Century, and one of the pioneers of vascular surgery (notably performing the first ligation of the aorta), proposed that the causes of male impotence could be divided into two categories: (1) those resulting from the body inability to generate erections (somatic causes), and (2) impotence by imagination (psychological causes). Let's begin with somatic causes. Vascular issues, diseases of the arteries and veins, are by far the most common, accounting for about 50%. Other somatic causes are neurological and hormonal, along with various less frequent conditions.

Understanding how vein and artery damages cause erectile dysfunction

If you imagine the penis to be a bath-tube, the erection can be likened to the bath-tube filling with water. The artery through which water (blood) arrives into the bath-tube (penis) is the tap. For the bath-tube to remain full of water (the penis full of blood, with an erection that is fully rigid), the plug must retain water (the penis must retain blood).

Normal erections



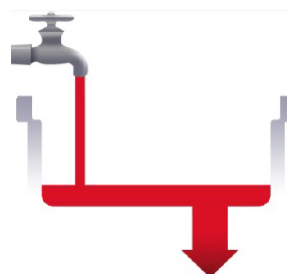
The bath tube fills with water after the tap is turned on (similarly to how blood flows into the penis through the arteries). The plug retains water in the bath-tube.

Erectile dysfunction due to damaged arteries



Water does not arrive through the tap. It is not possible to fill the bathtub.

Erectile dysfunction due to venous leakage



Water is supplied through the taps but is not retained because of the faulty plug.

Arteries bringing blood to the penis can become clogged

The most common cause for penis arteries to become clogged is atherosclerosis, a process triggered by tobacco use, diabetes, hypertension, stress, hypercholesterolemia.

One other cause is trauma of the pelvis that can interrupt these arteries.

Venous Leakage Explained

When veins fail to retain blood in the penis, erection cannot develop. The penis remains limp. This condition is referred to as venous leakage (or caverno-venous leakage).

Venous leakage is the most frequent cause of erectile dysfunction. It is responsible for severe erectile dysfunction in 4.4 million men in the United States. It is also by far the first cause of erectile dysfunction in adolescents and men under 30.

Venous leakage can result in incomplete erections, reduced rigidity, and/or erection instability (repeated sudden loss of erections). In the most severe cases, medications intended to induce erection may prove ineffective.

The root cause of venous leakage remains unclear. It can be a contributing factor to severe erectile dysfunction in men since adolescence (primary erectile dysfunction), as a result of malformation. Venous leakage can also occur after a long life with satisfactory erections after 40 (secondary erectile dysfunction). Rarely, venous leakage can be triggered by trauma to the penis, Lapeyronie disease, prostate surgery or penis trauma.

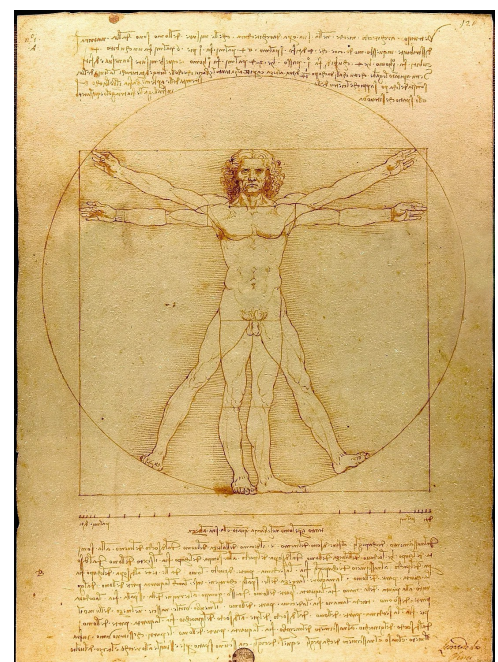


3D reconstruction of cavernous computed tomography, showing venous leakage from the penis (red arrows). Note that the penis is limp due to venous leakage. (Pr. Allaire, personal collection)

Non-Vascular Causes of Erectile Dysfunction

There are multiple somatic reasons why erections can be deteriorated. They are less frequent than vascular ones:

- Neurological: any alteration of nervous connections between brain and penis.
- Pain, chronic inflammatory diseases.
- Hormonal dysregulation (Hthyroid,)
- Medications: anti-hypertensive, medications for depression, etc., can cause erectile dysfunction.
- Surgery for prostate, bladder, rectum or colon diseases can cause erectile dysfunction.
- Penile diseases.



The Vitruvian Man, Leonardo da Vinci, Academia gallery, Venice.

Is the problem in my mind?

The psychological aspect

It is completely normal to ask this question when erectile dysfunction appears: is it in my head, or in my body?

In most cases, the reality is mixed: a physical cause (for example, vascular) usually triggers performance anxiety or loss of confidence, which in turn worsens the erection problem.

It is important to understand that the presence of performance anxiety, which feels psychological, does not exclude an organic (physical or somatic) cause. The key to finding the right solution is to distinguish between the two: is performance anxiety *primary* — that is, the initial cause of erectile dysfunction?

Or *secondary* — meaning the consequence of a disease affecting the “erection machine”?

Performance Anxiety: a vicious circle

Whether primary or secondary, performance anxiety is well recognized by men. “I will not succeed.” – “I will lose my erection.” Every man experiences this fear at some point in his sexual life, and when this thought becomes constant, it can lead to performance anxiety.

Performance anxiety usually follows this pattern:

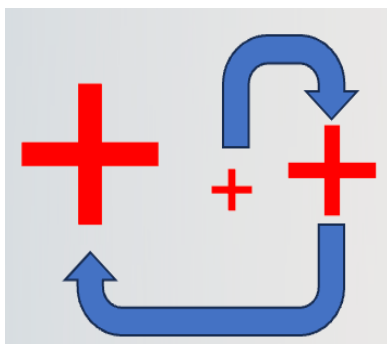
- An erection fails during intercourse for the first time, often for a simple reason (fatigue, stress, alcohol, relationship tension) or due to an erection disorder.
- The man keeps a negative memory of the event, associated with fear of failure, especially if hurtful remarks were made.
- During subsequent encounters, the stress focused on “fear of failure” activates the sympathetic nervous system, which inhibits erections.

This anxiety sustains itself: fear activates the sympathetic nervous system, triggering the release of **adrenaline**, the stress hormone.

Adrenaline reduces blood flow to the penis, leading to loss of erection — an *arterial manifestation of stress*.

The self-reinforcing loop of failure

Performance anxiety maintains erectile dysfunction, whatever its cause.



Fortunately, some clues can help determine whether performance anxiety is *secondary* to an organic erectile dysfunction or *primary* — that is, the main cause of the problem.

Recognize when performance anxiety is primary

The psychological origin — performance anxiety — may be predominant.

This is likely when:

- Nocturnal and morning erections are present and normal,
- The problem occurs in some situations but not in others,
- An erection is possible alone but not with a partner,
- The onset of the problem was sudden (after an event, a comment, or a breakup).

These situations often reflect:

- Stress or pressure to perform, sometimes linked to hurtful comments,
- Feelings of guilt,
- Fear of failure,
- Loss of desire related to routine, conflict, or emotional distance in the relationship,
- Or a personal vulnerability.

Recognize when performance anxiety is secondary

A physical cause is more likely when:

- Erections are progressively weaker,
 - Morning erections have disappeared,
 - Other cardiovascular symptoms are present (fatigue, exertional pain, shortness of breath).
- Performance anxiety is **always** present in these cases.

How to overcome performance anxiety?

- Is there a disease of the “erection machine”?

A precise analysis of the erectile dysfunction is required — what I call the *semiology of erection disorders* (literally, the analysis of signs and symptoms experienced by the patient).

Based on these signs and the patient’s history, medical examinations can determine the somatic causes of erectile dysfunction:

- A **penile duplex ultrasound** to analyze blood flow and detect arterial disease or venous leakage,
- An **electromyogram** to identify neurological causes,
- A **blood test** to detect hormonal causes.

Rebuilding confidence

To escape this vicious circle, the first step is to treat the physical cause.

Then, confidence must be rebuilt — sometimes with behavioral therapy, sex therapy, or a combined approach with temporary medical treatment.

Are psychological causes of erectile dysfunction limited to performance anxiety?

Certainly not. Psychiatric disorders themselves can cause erectile dysfunction. These situations are complex and require distinguishing between the various contributing factors: the psychological condition itself, the medications used to treat it, and the personal or societal beliefs surrounding sexuality.

And one must always keep in mind that a disease of the “erection machine” may also be contributing.

Cardiovascular Risk Link

Is erectile dysfunction a risk for other health problems?

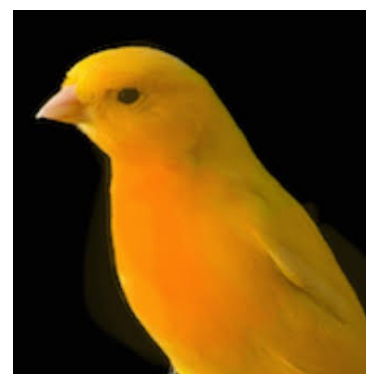
THE CANARY IN THE MINE

Atherosclerosis is the same disease that causes clogging of penis arteries and erectile dysfunction, and myocardial infarction (heart attack) and stroke.

Studies have shown that erectile dysfunction multiplies the risk of heart attack and stroke by a factor of 2 over the next three years.

Why erectile dysfunction may appear years before heart attack and stroke? This is mainly because penile arteries are so narrow (diameter 1.5 to 2.5 mm) that they are the first to be clogged, before the larger arteries that bring blood to heart (diameter of coronary arteries: 4 to 5 mm) or brain (diameter of carotid arteries: 5 mm).

Once penile duplex sonography (see below) has revealed that erectile dysfunction is due to damage to the penile arteries, we initiate a global cardiovascular workup, focusing on the coronary (which supply blood to the heart) and carotid arteries (which supply blood to the brain). Before treating penile arteries, we make sure that any risk of heart attack or stroke has been identified and corrected. A cardiovascular risk factor management program is initiated to diminish the risk of heart attack and stroke in the next years.



Canaries were vital to coal-miners safety, as they were very sensitive to toxic gas in mines. Dead Canary meant toxic gas around!

4. Sexual Function and Self-Assessment

What is “normal”?

Penis length: Flaccid (no erection): 7 to 10 cm. (2.8 to 3.9 in.)

Erect: 12 to 16 cm (4.7 to 6.3 in). The average erect length is around 13.2 cm. (5.2 in.)

Penis circumference:

Average Flaccid Circumference: 9.3 cm (3.7 in.). Average Erect Circumference: 11.7 cm. (4.6 in.)

Average time between vaginal penetration and ejaculation: 5 to 6 minutes.

End of erection after ejaculation: usually within 2.5 minutes.

Ejaculation volume: average: 25 mL. Volume can vary with frequency of ejaculation (more frequent, less volume), hydration, aging and health factors.

Refractory time (time between ejaculation and next erection): Young men: 15.30 minutes. Older men (50+): may take several hours or longer. Varies widely with age, arousal, and physical health.

How many intercourses a week: Average: 1.3 times/week (in stable relationships). Young couples may have more frequent intercourse; frequency often declines with age or relationship duration. How many ejaculations a day: 0 to 2 per day. There is no strict normal; ranges vary with age, libido, and lifestyle. Some may ejaculate daily, others just a few times a week or month. Very frequent ejaculation (5+ times per day) is uncommon and may reflect behavioral factors.

Penis curvature: mild curvature causing no prejudice in sexual intercourse is frequent.

Ageing and erections: older men can have good erections. Older men can recover good erections!

Premature Ejaculation & Erections

Premature ejaculation (PE) is when ejaculation occurs sooner than desired, often within one minute of penetration. Erectile dysfunction (ED) and PE often occur together. ED can cause performance anxiety, triggering PE. Likewise, men with ED may rush intercourse out of fear of losing their erection, reinforcing PE.

Masturbation: foe or ally?

Masturbation is a normal and healthy sexual activity for most people. When practiced in moderation, it can relieve stress, improve sleep, and enhance sexual awareness. However, excessive or compulsive masturbation may interfere with daily life or partnered sex. Particularly in the context of pornography addiction. Like many things, its impact depends on balance, context, and individual mindset.

5. Diagnosis and Evaluation

How to evaluate your erections by yourself?

Erection self-evaluation is possible! You can analyze your situation more accurately than many Doctors who have not been trained to do it.

In my consultations, I use a scale to evaluate hardness, the EHS (Erection Hardness Scale), from 1 to 4 (4 is the hardest). I have modified the phrasing to be fully understandable by all men:

Grade 1. Penis size increases, but less than total length, and penis remains limp.

Grade 2. Penis size increases to full length, but hardness is insufficient for penetration.

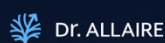
Grade 3. Penis is hard enough for vaginal penetration but can be bent.

Grade 4. Penis hardness is like wood.

This is a universal language, understood by men from all continents. I have experienced this in my consultations.

Grade 4 is the normal. Grade 3 allows for sexual intercourses with penetration.

I use EHS to diagnose erectile dysfunction and evaluate results of surgery and other treatments. You will find more details on our website and guidance to perform self-evaluations.



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Dr Eric Allaire

Advanced Care for Erectile Dysfunction

WELCOME

The most frequent causes of erectile dysfunction are vascular. We provide specialized care including advanced vascular diagnostic evaluation, targeted treatment and personalized treatment strategy based on objective findings.

[TEST YOUR ERECTIONS](#)

Examinations to Identify the Causes

Which examinations for identifying causes of erection problems?

Diagnosis of erectile dysfunction is a four-step process.

First step: a precise description of the erection problem is performed during a consultation or video consultation. A detailed medical history is taken.

Second step: a penile duplex sonography with a pharmacological test is performed to detect arterial damage or venous leakage.

Third step: complementary tests are performed to detect other medical conditions affecting erection. (hormonal and neurological workups, etc.)

Fourth step: imaging examinations (vessels and penis computer tomography) are performed to choose the best intervention options.

Penile duplex sonography with pharmacological stimulation

This examination is fundamental. It assesses the blood flow in the arteries, the expansion of the erectile tissue in the cavernous bodies to increase the volume of the penis, and the ability of the penis to retain blood for a sustained erection.

The results will also provide information on the rigidity of the erection after intra-penile injection of drugs to induce an erection.

How is penile duplex sonography with pharmacological testing performed?

The doctor will use a probe to assess the flow of blood in the patient's penis arteries.

The doctor will then use a very thin needle to inject a drug into the penis to induce an erection (this is painless. A local anesthesia may be used if the patient is under stress).

The doctor will then record the arterial flow in response to the drug injection and detect any premature leakage of blood from the penis through the veins (venous leakage).

The doctor will also monitor the hardness of the patient's penis.



Probe used for the exam

Ensuring Quality Testing

How to be confident the quality of a penile duplex sonography is good?

Penile duplex sonography must be performed according to precise rules, otherwise it is useless. It is therefore important to choose the right doctor.

The report should include the following information:

- The drugs injected and the dose used.
- The hardness of the penis at least 10 minutes after the injection and the evolution of the hardness over the next 30 minutes.
- The quality of the blood flow in the two arteries (one on the right, one on the left), 2 to 5 minutes after the drug injection.
- The speed of the blood at the end of the diastolic phase of the cardiac cycle. (End Diastolic Velocity).
- The blood flow 10 minutes after the drug injection in the deep dorsal vein and in the superficial veins: mandatory.
- Resistance to blood flow in the penis can also be recorded.

The end of the exam

Before leaving the doctor's office, it is important that the penis is in a flaccid state (limp or no erection) and not in a rigid erection. If the penis remains hard, the doctor may give you an injection of a drug to reduce the erection.

Complementary tests to detect other medical conditions affecting erection.

Depending on patient profile, other tests may be needed. Most of these can be done in your country. They will be ordered by Pr. Allaire at the end of the first consultation, and/or after results of the duplex sonography.

- Hormonal and other blood tests. (usually performed in your country)
- Penile electromyography. (usually performed in Switzerland)
- Cardiac and vascular workup. (usually performed in your country)

Vessel and penis Computer Tomography for choosing the best intervention options.

In case of venous leakage diagnosed by penile duplex sonography, Computed tomography of the penis (caverno-CT) is mandatory before surgery. Its purpose is to provide a precise map of the leakages to guide embolization and/or surgery. This is done in Switzerland before the operation.

In case of arterial damage, arterial computed tomography will be performed for guiding the intervention. It will be performed in Switzerland.

Treatment Options

Medication as First-Line Treatment

Once causes of the erection problems have been identified, treatment options can be presented and best option chosen.

Depending on causes, risks for global health must be assessed and corrected.

As discussed earlier, erectile dysfunction is associated with a two-fold increase in heart attack (myocardial infarction) and stroke. Identification of erectile dysfunction should be regarded as a unique opportunity to curb this risk.

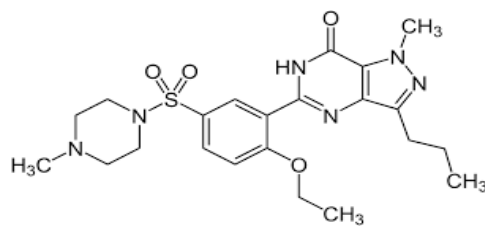
We do it by performing an extensive cardiovascular work-up to assess existing threats, and managing cardiovascular risk factors, including those usually neglected.

Should erection medications be tested as a first treatment?

Yes. They are in first line. Among solutions that can be discussed to improve erections, pills are the easiest to use. The most commonly used pills to help with erections belong to the family of phosphodiesterase-5 inhibitors. Viagra (sildenafil) was the first approved on the market in 1998. Cialis (tadalafil) and Levitra (vardenafil) came later on market.

Which one to choose? How to use it efficiently? Are there risks and contra-indications?

What can be expected? What options if they have side effects (20-30%)? If they are inefficient (40%)?



Viagra – Sildenafil molecule.

Options When Pills Don't Work

What are options when medications for erections are not a solution?

The meaning of pill inefficiency must be interrogated. Desire issues? Venous leakage?

There are many other options, when pills, or association of pills, are not efficient or have side effects.

Each approach for recovering erections has pro and cons, from self-injections of medications into the penis, to penis vacuum pumps, but also psychotherapy to tackle performance anxiety, Kegel exercises, and in case of failure, a penile prosthesis. Everything is on the table.

Our experience shows that there is always a solution, depending on patient individual psychologic profile, expectations, and willingness to solve the problem.

6. Vascular Interventions

Past and present

Venous leakage has a reputation for being untreatable. According to the European and North American Societies of Urology, surgical or embolization procedures are not advisable.

Treatment in the past used only one of these two techniques alone, with very poor and variable results reported in the medical literature.

(Salonia A et al. European Association of Urology Guidelines on Sexual and Reproductive Health-2021 Update: Male Sexual Dysfunction. European Urology 2021;803:333-57)

Our philosophy

In view of the limitations of either embolization or surgery performed alone, we have developed a new approach to treatment of venous leakage: all leaks must be closed to restore durably erections. If leaks remain after embolization or surgery, they will grow over time and erections will become limp again.

Our approach uses both surgery and embolization in a coordinated way, during a same procedure to achieve this goal.

(Allaire et al. Ligation and embolization in one procedure for caverno-venous leakage in 171 patients with drug-resistant erectile dysfunction. Annals of vascular Surgery 2025;121:664-672)

Our techniques

Pr. Allaire uses surgery, microsurgery and various types of embolization techniques, all combined in a precise sequence to optimize results. All the possible options are proposed. Probability of success of either embolization alone, surgery alone or a combination of the two are exposed. The choice is left to the patient according to his priorities.

Embolization as the only treatment

Because it requires only percutaneous punctures, embolization alone is attractive to many patients. In our experience, in rare cases, embolization alone can effectively treat all leaks, depending on their location as determined by pre-operative work-up.

More frequently however, embolization alone is not sufficient to permanently treat venous leakage. Results reported in the medical literature lack post-procedure evaluation by penile duplex sonography to document real efficiency. The choice is the patient after discussion with Pr. Allaire.

A rigorous post-operative assessment

A control penile duplex ultrasound sonography is performed three months after the procedure (not earlier, as this delay is necessary for the venous system to reach a new equilibrium) to assess the success.

How venous leakage treatments are performed

Pre-operative workout

This step identifies all possible causes of erection failure and provides a precise map of venous leakages.

The procedure

In most cases, the procedure is performed under general anesthesia for the patient's comfort. A control of venous leakage occlusion is performed at the end. There is no pain when awaking, as a local anesthesia is given at the end of the procedure.

Hospitalization

The patient usually stays in hospital for one night. It can be an outpatient procedure.

After the operation

In case of embolization, air travel is possible only 5 days after the operation within Europe, up to 14 days for long flights (transatlantic 10 days). There is no limitation for train transportation. Telephone contact with Pr. Allaire is made possible if necessary.

The one-month post-operative video consultation

The aim is to make sure that everything is optimal and to advise patients according to their personal situation. The resumption of physical and sexual activity is discussed.

The three-month post-operative control Penile Duplex Sonography

This checkup is organized according to the patient's country of residence. It is necessary to document that all leakages have been occluded using a penile duplex sonography.

Beyond surgery

Depending on their situation and expectations, patients are offered additional follow-up services.

Treatment evaluation for venous leakage

Venous leakage treatment MUST include a quality-control penile duplex sonography to evaluate whether all leakages have been occluded. It helps the patient to be confident about his erections.

This control penile duplex sonography must be done three months after the embolization or surgery, not before. Because it takes three months for the penile venous system to reach a new equilibrium. Any evaluation before this delay is inaccurate.

Results of Combined Treatment

Statistics based on more than 500 hundred procedures for venous leakage by combination of embolization and surgery, with systematic control penile duplex sonography after three months show disappearance of any significant leakage in 70-80% of patients. This result is stable over time.

(Allaire E et al., Erectile dysfunction resistant to medical treatment caused by cavernovenous leakage: an innovative surgical approach combining pre-operative work up, embolization and open surgery. Eur J vasc endovasc surg. 2021;61(3):510-517

Allaire et al. Ligation and embolization in one procedure for caverno-venous leakage in 171 patients with drug-resistant erectile dysfunction. Annals of vascular Surgery 2025;121:664-672)



At the end of each procedure, before the patient awakes, a cavernography is performed to check that leaks have been closed. Note that the penis is in a full, hard erection. Pr. Allaire personal collection.

Can erections worsen after venous leakage treatment than before?

When the erection problems had started after the age of 31, all patients had better erections or at least no worsening after treatment. When the erection problem had started at 30 or younger, even since adolescence, erections after treatment were less rigid than before in 5% of patients. 95% had better or similar erections after treatment.

For this reason, Pr. Allaire never operates on patients when drugs for erections are effective when the erectile dysfunction had started before the age of 30.

Arterial Blockages and Angioplasty

Treatments when arteries bringing blood to the penis are clogged

The most frequent cause of arterial damage to penile arteries is atherosclerosis due to smoking habit, diabetes, hypertension, hypercholesterolemia, stress, etc. Atherosclerosis narrows arteries by an accumulation of fat and fibrosis where blood should normally circulate (clogged arteries). As a result, blood cannot reach the penis easily for erection to develop.

Our technique

We use techniques to debulk the penile arteries (called pudendal arteries) and allow easy blood access to the penis.

The procedure is performed through a puncture in the groin (no skin incision) and uses ultra-thin “angioplasty balloons” coated with molecules delivered to the arterial wall, as used in the treatment of coronary arteries. The diameter of the balloons (which are actually cylinders) ranges from 1.5 to 2.5 millimeters, depending on the diameter of the pudendal artery.

We rarely use stents as lesions to be treated usually expand on several centimeters.



Image of the balloon (red arrows) inflated in a penile artery during a procedure. Pr. Allaire, personal collection.



Angioplasty balloon used to open blood flow in the penile arteries. The surface of the balloon is coated with a drug that adheres to the artery at the end of the procedure. The diameter of the balloon is between 1.5 and 2.5 mm. The inflation pressure is 16 atmospheres. Credit Biotronik.

Penile Trauma and Vascular Injury

Treatments when penis trauma has caused erection loss

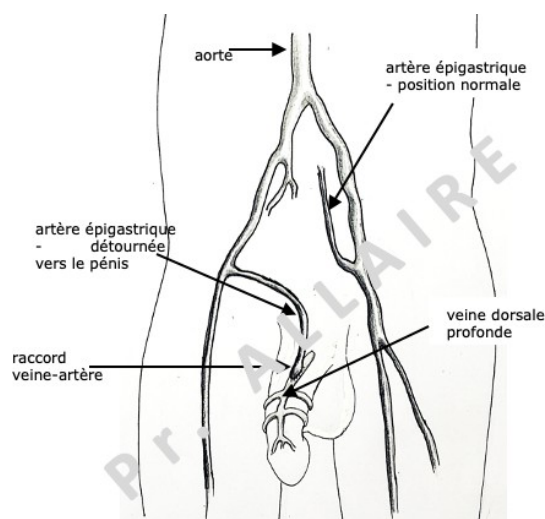
Trauma to the penis and the pelvis can damage arteries and veins and cause erectile dysfunction.

A direct trauma to the penis usually causes a penile arterio-venous fistula (abnormal communication between arteries and veins), but also venous leakage, arterial occlusion or a combination of all.

In these situations, erection nerves may also be damaged.

These situations are usually complex and require precise pre-operative workout to identify injuries and decide how to resolve the erection problem. Potential pelvic nerve damages must also be documented.

We use an array of techniques depending on pre-operative exams: embolization, bypass, etc.



Bypass performed by Pr. Allaire in patients after penile vessel occlusion to bring blood to the penis, according to R. Virag technique. In Le guide de l'impatient, Pr. Allaire, Amazone.



Arterio-venous fistula (red arrow) caused by a direct trauma to the penis. Pr. Allaire, personal collection.

7. Other Therapeutic Approaches

Many solutions help restoring natural erections. Once the cause of erectile dysfunction has been identified, if pills for erections or interventions are not efficient, other options can be proposed.

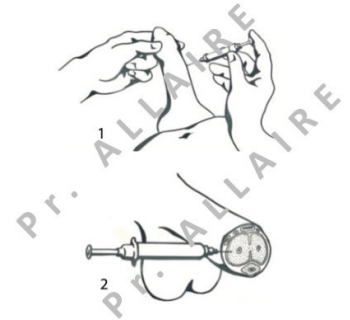
Self-Injections

We teach patients how to safely perform self-injections into the penis, how to choose the appropriate combination of molecules (Prostaglandin E1, Alprostadil or Vitaros, Edex, -, Bimix, Trimix) and dosage.

We also teach patients how to antagonize the effect of drugs in case of priapism.

Self-injection protocols are defined with the patient according to his erectile profile. Limitations and risks are explained.

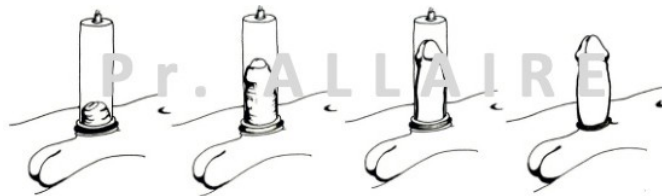
Linnet OI. Efficacy and safety of intracavernosal alprostadil in men with erectile dysfunction. The New England Journal of Medicine 1996;334: 873-7



Learning how to perform and use safely self-injections.
In Le guide de l'impatient, Pr. Allaire, Amazon.

Vacuum Devices

We teach patients how to use safely a vacuum pump, the risks and what to expect from this approach.



How to use the penis vacuum pump. In Le guide de l'impatient, Pr. Allaire, Amazone.

Other options

Many other treatment options are assayed all over the world. They usually raise high expectancies and hope. This includes new medications, low-energy extracorporeal shock-wave therapy, injection of PRP (Platelet-rich Plasma), etc.

We use only approaches with proven efficacy assessed by clinical research.

We provide advices to patients who consider penis enlargement, penis lengthening, micropenis treatment. Is there a real question about length and diameter in comparison to normal? What are your expectations?

Penile Implants

When a penile prosthesis is a reasonable option?

Our commitment is to help men to recover their sexual life and connection with the life they expect. Sometimes, there is no reasonable option to recover natural erections.

We believe that a penile implant in these situations is an excellent solution. Pr. Allaire collaborates with skilled urologists who master penile prosthesis implantation.

Penile prosthesis implantation is an irreversible procedure. We collaborate with urologists to provide state-of-the-art services.



Psychological Recovery – Dealing with performance anxiety and recovery of sexual performances

Experiencing erectile dysfunction, mild or severe, can be a traumatizing experience. Performance anxiety is a constant sequel in these situations.

Psychologists and sexologists, carefully selected for long-term collaboration, provide help and advises.

We guide patients in their journey to reconnect them to life with a powerful and committed network in a collaborative spirit, centered on the needs of our patients.

How to improve and maintain over time good erections

Having erections is a function of the human. As running, thinking, performing art or sport.

As such, erections can be improved. As such, maintaining over time satisfactory erections needs care.

Personal behavior, diet, training, coaching, good relationships, all contribute to a personal vision and project.

8. Philosophy of Care

Our beliefs

- Erection is not only about sex, but also deeply rooted into general health and vision of life.
- Silence, isolation and resignation are the worst enemies.

Our commitments

- Listening to every patient with respect.
- Offer every patient strict confidentiality.
- Find the best personalized solution for each patient coming to us.

Confidentiality

Pr. Allaire and team preserve anonymity for all patients. We communicate with the secured swiss Proton mail platform. You can also use Proton mailing platform for exchanging mails with Pr. Allaire by creating an account (<https://proton.me>), in order to benefit from end-to-end encryption.

Upon request, we propose a communication protocol by which your name will not appear in our exchanges by mail and phone.

You can use a pseudo for communicating with Pr. Allaire and his team.

Optimizing treatment results

In all circumstances, in our experience, performance anxiety needs to be addressed for ultimate success. A follow-up with consultations or video consultations can be suggested. Pr. Allaire works with carefully selected psychologists/sexologists to guide patients on the road to full recovery.



Passion, dedication, respect and teamwork

9. Resources

Glossary

- **Anejaculation** – The complete absence of semen emission during orgasm despite normal sexual stimulation.
- **Artery** – A blood vessel that carries oxygenated blood away from the heart to the tissues.
- **Atherosclerosis** – A disease in which fatty deposits build up inside arteries, narrowing and stiffening them.
- **Autonomous nervous system** – The part of the nervous system that controls involuntary functions such as heart rate, digestion, and erection.
- **Carotid artery** – A major artery in the neck supplying blood to the brain, neck, and face.
- **Caverno-CT** – A specialized CT scan performed after injection into the penis to assess venous leakage.
- **Coronary artery** – An artery that supplies blood to the heart muscle itself.
- **Corpus cavernosum** – One of the paired erectile bodies of the penis that fills with blood during erection.
- **Corpus spongiosum** – The erectile tissue surrounding the urethra, ending in the glans penis.
- **Ejaculation** – The release of semen through the urethra during orgasm.
- **Embolization** – A minimally invasive procedure that blocks blood vessels by injecting particles or agents.
- **Erectile dysfunction** – The persistent inability to achieve or maintain an erection sufficient for satisfactory sexual activity.
- **Erectile tissue** – Vascular tissue capable of filling with blood and expanding, producing erection.
- **Erection instability** – The tendency of an erection to weaken or collapse before or during sexual activity.
- **Heart attack** – Damage to the heart muscle caused by sudden blockage of a coronary artery (myocardial infarction).
- **Hormone** – A chemical messenger secreted into the bloodstream that regulates body functions.
- **Intra-cavernous injection** – Direct injection of a drug into the corpora cavernosa to induce erection.
- **Kegel exercises** – Pelvic floor muscle contractions used to strengthen urinary and sexual function.
- **Lapeyronie disease** – A condition where fibrous plaques develop in the penis, causing curvature and painful erections.
- **Nocturnal erections** – Spontaneous erections that

normally occur during sleep, especially in REM phases.

- **Parasympathetic nervous system** – The branch of the autonomic system that promotes relaxation, digestion, and erection.
- **Penis** – The external male sexual organ involved in urination and reproduction.
- **Penile duplex sonography** – An ultrasound test using Doppler to measure penile blood flow and venous leakage.
- **Penile electromyography** – A test measuring electrical activity of penile muscles and nerves.
- **Performance anxiety** – Anxiety about sexual performance that interferes with erection or satisfaction.
- **Phosphodiesterase-5 inhibitors** – A class of drugs (e.g., Viagra (sildenafil), Cialis (tadalafil), Levitra (vardenafil)) that improve erection by enhancing penile blood flow.
- **Premature ejaculation** – Ejaculation that occurs sooner than desired, often within one minute of penetration.
- **Pre-operative workout** – A program of physical preparation designed to improve outcomes before surgery.
- **Priapism** – A prolonged, often painful erection not related to sexual stimulation.
- **Psychogenic erectile dysfunction** – Erectile dysfunction caused primarily by psychological factors such as anxiety or depression.

- **Pudendal artery** – The main artery supplying blood to the penis and perineum.
- **Refractory period** – The recovery phase after orgasm during which a new erection is temporarily impossible.
- **Resistance to erection pills** – Reduced or absent response to phosphodiesterase-5 inhibitors despite proper use.
- **Sexology** – The scientific study of human sexuality, behavior, and relationships.
- **Somatic erectile dysfunction** – Erectile dysfunction caused by physical disorders affecting blood vessels, nerves, or tissues.
- **Stroke** – Sudden brain damage caused by interruption of blood supply or bleeding.
- **Sympathetic nervous system** – The branch of the autonomic system that triggers alertness, stress response, and inhibits erection.
- **Testosterone** – The main male sex hormone responsible for sexual function, muscle mass, and secondary sexual traits.
- **Vein** – A blood vessel that carries deoxygenated blood back toward the heart.
- **Venous leakage** – A condition where blood flows out of the penis too quickly, preventing stable erection.

Contact & Consultation

Let's talk about it and find solutions

Pr. Allaire welcomes patients in Genolier Clinique, Nescens Center, located between Geneva and Lausanne close to the lake of Geneva, Route du Muids 3, 1272 Genolier Switzerland.

A first video consultation is advisable

Contact

By Mail: dr.ericallaire@neohominis.swiss

By Phone – assistant: +41 79 812 8000

From Monday to Friday, Coordinated Universal Time: 10:00 – 16:00

Website: www.drallaire.com

Social media

YouTube channel: <https://www.youtube.com/@DrAllaire>

Linkedin: <https://www.linkedin.com/in/eric-allaire-851112a9>

Instagram: <https://www.instagram.com/pr.eric.allaire/>

Organization of diagnosis and treatment for travelling patients

For patients residing farther away, a first video consultation provides precise enough information to determine which exams will be necessary and whether embolization, surgery or percutaneous angioplasty, or other options will be considered.

Upon request, we organize exams and treatment during one single stay. Alternatively, we can offer diagnosis and treatment during two different stays.

Following the initial consultation, a detailed cost estimate of exams and treatment will be provided, based on the anticipated medical condition and complexity, with different options for housing.





Dr. ALLAIRE

About Dr. Eric Allaire

Dr. Eric Allaire is a professor of vascular and endovascular surgery, board-certified by the European Society of Vascular and Endovascular Surgery.



He is also a member of:

- The French National Academy of Surgery
- The European Society of Vascular and Endovascular Surgery
- The European Society of Sexual Medicine.
- And a post-Doctoral Fellow at the University of Washington in Seattle, USA.
- He has a PhD in Vascular Biology and Surgical Sciences.

He is the author of more than 120 scientific publications and book chapters in the fields of vascular surgery and vascular biology, as well as innovative endovascular gene and cell therapy applied to vessels.

To have access to all publications by Pr. Allaire:

<https://pubmed.ncbi.nlm.nih.gov/?term=Allaire+eric>

Currently:

He dedicates his medical and surgical activities to diagnosing and treating erectile dysfunction and related disorders.

He has developed innovative techniques for treating venous leakage and has performed more than 400 procedures.

He teaches innovative techniques for treating erectile dysfunction.

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Dr. ALLAIRE

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