Forma 5

SEMICIRCULAR LIPOATROPHY

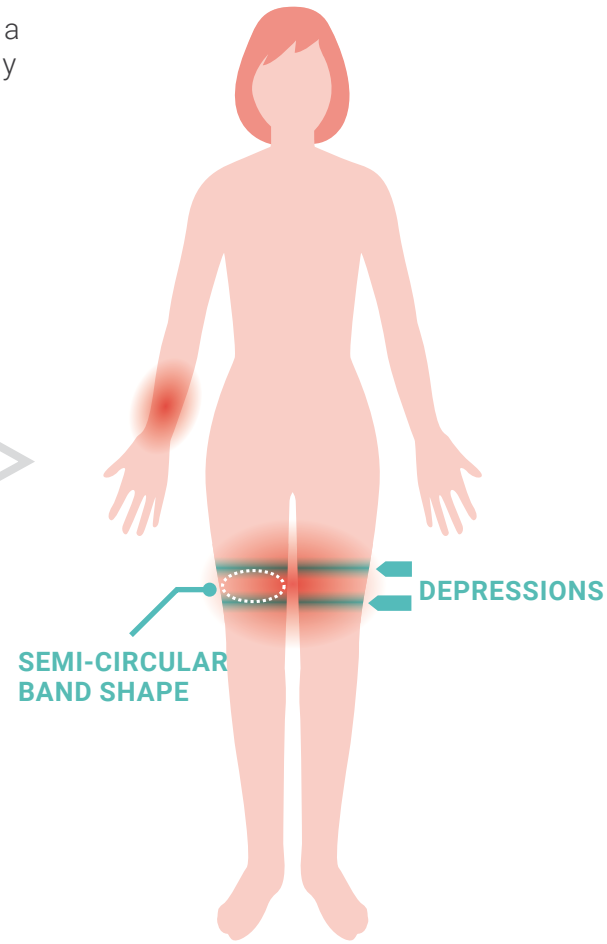
A hidden risk in the office

03/2025

What is Semicircular Lipoatrophy?

Lipoatrophy is the medical term for a heterogeneous group of congenital or acquired skin diseases that cause a loss of fatty tissue. Among them is the so-called Semicircular Lipoatrophy, a benign disease associated with work environments, specifically office work.

Semicircular Lipoatrophy is defined in the medical literature as an alteration or disorder of the subcutaneous adipose tissue (the fat under the skin) that ***consists of a very localised reduction of fat.*** *The Department of Health of the Generalitat de Catalunya defines Semicircular Lipoatrophy as* ***'a localised atrophy of the subcutaneous adipose tissue characterised by the appearance of depressions in the form of a semicircular band on the skin surface, which mainly affects the thighs and forearms. In most cases, these lesions present without accompanying symptoms'****.*



It is benign because **it does not cause pain** but **it can be annoying**, its symptoms are reversible in 95-100% of cases and it does not produce sequelae. Although we will detail the symptoms later, this disease manifests itself with elongated marks that sink mainly in the front of the thighs although, in some cases, they have also been diagnosed on the arms, belly or buttocks. **The indentation is similar to that produced by socks that press too hard on the leg**.

Another of its characteristics is that it appears in endemic outbreaks (occurring at a specific time and place), i.e. if it appears in a workplace, it is advisable to study the rest of the workers as it is very likely that more will be affected. This is why studies have focused on workplaces and working conditions.

A large part of these studies consider it to be a rare or infrequent disease although, increasingly, experts are warning of its growing incidence due to increased exposure to risk factors. In addition, workers often do not go to the doctor when symptoms appear or the disease is not diagnosed correctly.

In Spain it is not classified as an occupational disease but **it is usually considered an occupational accident without sick leave and the Autonomous Communities are drawing up protocols for action** in the event of new outbreaks.

History

1974 It was first described by the German doctors Gshwandtner and Munzberger in 3 patients and in 8 more the following year.

1981 Two dermatologists, Karkavisas and Millar, from a London hospital report new cases.

1995 The first massive case occurs in Brussels with 900 affected bank branch workers. For the first time, doctors speak of a pathology that is much more common in women than in men.

2005 The first report of the Risk Observatory, created by *the European Agency for Safety* and *Health at Work (OSHA)* mentioned it as an emerging risk.

2007 In Spain, the problem appeared in 2007 at the headquarters of the company Gas Natural in Barcelona, which was widely reported in the media. It was followed by cases in companies such as *Agbar, La Caixa, INSS, the Social Security Treasury, Telefónica, Caprabo, the Provincial Prison of Las Palmas, Banco Sabadell, the Medical Emergency Service, the Provincial Council of Guipúzcoa...*

Symptoms

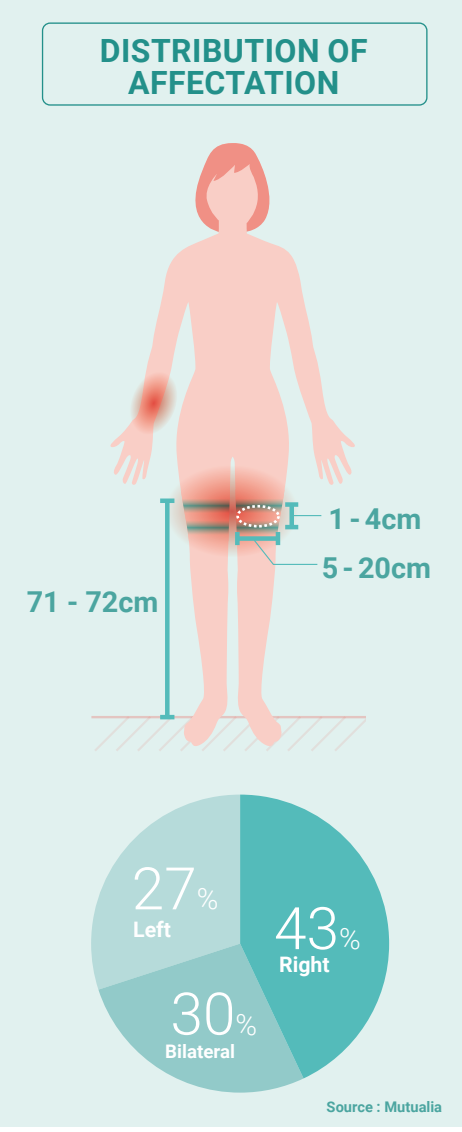
As we have already outlined in the first section, the main symptom of Semicircular Lipoatrophy is **a disorder of the fat under the skin that produces a sagging** of the anterior aspect of the thighs in most cases. Patients with semicircular lipoatrophy have also been found on the forearms, abdomen, buttocks and even the face. Different studies attribute this to postural causes.

The lesions, unilateral or bilateral depending on the case, are **visible** to the naked eye and **measure 1 to 4 cm thick**, with a **depth of 1 to 10 mm** and a **length of 5 to 20 cm**. **They usually occur at a height of 71 to 72 cm from the ground** (average desk height). They are semi-circular in shape, hence the name of the disease.

The disease **does not affect the skin and does not cause pain, itching or discolouration**, although some patients complain of heaviness in the legs and others experience a high degree of fatigue, burning, itching or tingling.

At present there are no specific tests for the diagnosis of this disease and health workers must rule out other causes such as injections, other skin diseases or antiretroviral drugs.

Although the effects of semicircular lipoatrophy are mainly aesthetic, its appearance in outbreaks and its mediatic incidence often create panic and insecurity in the workers of the affected centre. Some authors suggest the use of ultrasound, where atrophy of the adiposolocalised adipose tissue can be evidenced, as with the MRI protocol of action of the Generalitat de Catalunya of 2015 (clinical examination).

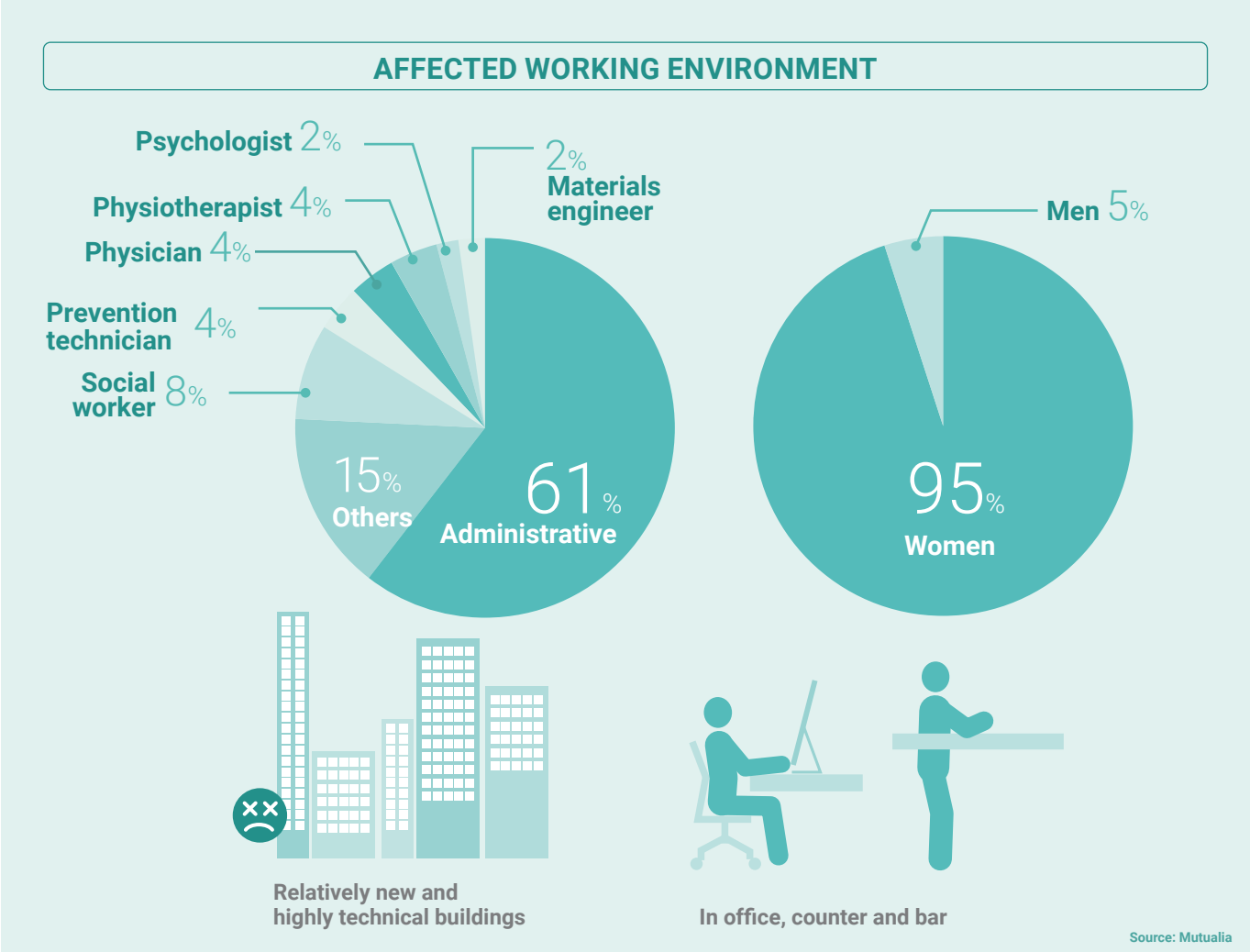


Who suffers from it?

It is a disorder **associated with the working environment, mainly in the office**, although people who work standing behind a desk, counter or bar can also suffer from it.

Although cases have been described in men, it is a disease that **mainly affects women** (between 85% and 100% of the cases appearing in each outbreak) due to the different composition of their fatty tissue. **It usually affects between 20% and 30% of employees in an affected workplace**. Women sufferers are usually **in their 30 and 40 years old**. While in men it accounts for 15-20% of their body weight, in women it varies between 20-25%, and the structure of the subcutaneous adipose tissue is also different. While in women, the fibrous septa separating the adipose tissue from the hypodermis are arranged perpendicular to the skin, in men, the septa are arranged obliquely, which would make the structure more resistant. No cases have been reported in children to date.

Semicircular Lipoatrophy is **often associated with sick building syndrome**. Most cases have been detected in relatively new and highly technical buildings.



Sick building syndrome

Some studies relate Semicircular Lipoatrophy to what the WHO calls 'Sick Buildings', which are buildings with specific characteristics that affect the health of more than 20% of their occupants. Some researchers disagree, as the WHO has not yet identified this disease as a consequence of these buildings, possibly due to a lack of definition of its causes. The WHO speaks of two types of diseased buildings, those that are permanently diseased due to their structural characteristics and others that are temporarily diseased, which are usually new buildings, whose effects are reduced or eliminated with the passage of time or by improving their installations. Semicircular Lipoatrophy could fall into this category.

What causes it?

As a relatively new disorder, first detected just over 40 years ago, and with a rare but emerging incidence, there is as yet no concrete evidence as to what causes Semicircular Lipoatrophy, although **medical and occupational studies point to a combination of several personal and environmental factors** that are present in most of the cases and outbreaks studied. In addition, certain congenital pathologies also seem to play a role in the occurrence of this disorder.

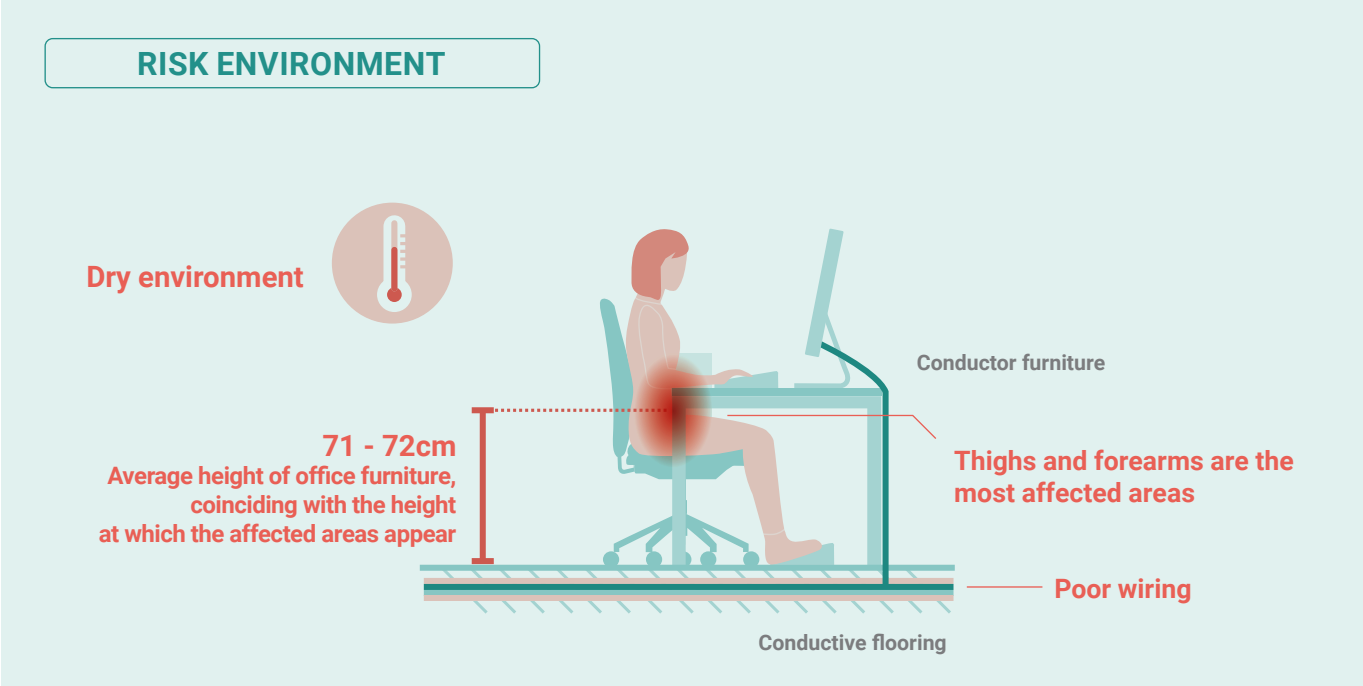
1. Personal

Different studies have shown that in the same work environment there are people who get sick and others who don't, which is why we talk about personal factors that can predispose people to suffer from Semicircular Lipoatrophy. We have already mentioned that being a woman working in an office with a high electromagnetic load and being between **30 and 40 years old** is a risk factor.

One of the most important elements that seem to play a role is the postural habits that **can produce micro-traumas caused by the pressure of the chair, table tops and edges of work tables** that produce tissue rupture.

Wearing tight clothing, synthetic fibres, silk, rayon or wool are other factors that have been pointed out. In general, habits that can produce an electrostatic energy charge are a risk factor such as shuffling, wearing acrylic fabrics, wearing shoes with rubber soles...

Poor personal hydration also appears to be related to the onset of symptoms.



2. Environmental

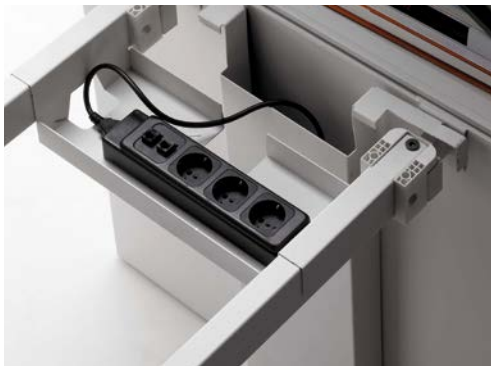
Average high temperature 24º

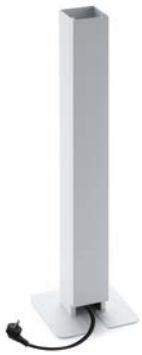
Low relative humidity 40 -60%.

Although personal habits predispose to the development of Semicircular Lipoatrophy, the most recent studies point to environmental factors as the most important cause for the development of this type of Lipoatrophy. **This is evidenced by its appearance in outbreaks in workplaces that are usually new buildings, with an abundant use of technological elements**. Experts point mainly to the high incidence of electromagnetic fields, **low relative humidity and often to areas with a high ambient temperature above 24ºC.** Both humidity and exposure to electrical appliances have an influence on electrostatic energy, which seems to be the key to the onset of this disorder.

Electromagnetic fields or currents are generated by the presence of electrical installations or computer equipment. According to a report by Alejandro Úbeda, a researcher at the Ramón y Cajal Hospital, *'the magnetic field can cause a significant decrease in the amount of fatty acids synthesised by exposed cells'*. Úbeda conducted research with stem cells derived from adipose tissue by subjecting some of them to exposure to electromagnetic fields, obtaining this conclusion that seems to prove the relationship with the disease.

It is true that nowadays it is a factor that is difficult to eliminate 100% as the office environment combines elements such as computers, mobile phones, screens, telephony, fluorescent lights, air conditioning units, etc. **But a correct design of the wiring and furniture seems to lower the levels of exposure**.



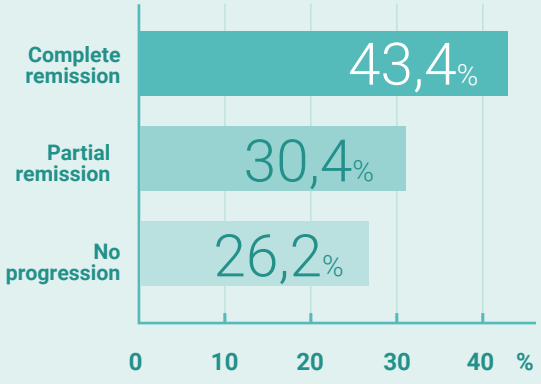


Relative humidity, on the other hand, is defined as the amount of water vapour present in the air and is measured in percentages. A relative humidity below 30% or 40% is a constant in buildings where injury has been described while **the ideal in terms of health should be between 40% and 60%**. Low relative humidity may be due to the continued use of electronic air conditioning units. The solution lies in the use of humidifiers.

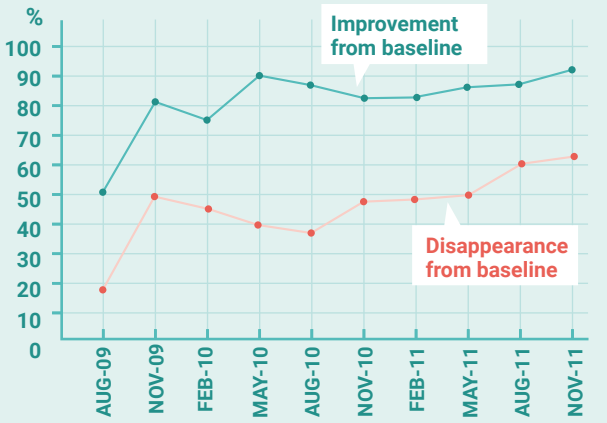
Forecast

As explained above, Semicircular Lipoatrophy is a benign disorder that reverses in 95-100% of cases when the causes are eliminated. In fact, it has been found that when affected women retire or go on maternity leave, the symptoms disappear. However, if they return to the same centre under the same conditions, the symptoms also return, and it does not seem to interfere with pregnancy, breastfeeding or fertility.
There is also no evidence of an increase in the cancer rate.

EVOLUTION IN 3 MONTHS



EVOLUTION IN 2 YEARS AND 3 MONTHS



Semicircular Lipoatrophy and office furniture

There is every indication that Semicircular Lipoatrophy is directly related to the design of the workplace and the choice of office furniture and seating and its components. **The accumulation of electrostatic energy generated by the furniture is one of the most widely accepted hypotheses as to the cause of Semicircular Lipoatrophy**.

According to Radiansa Consulting, a company dedicated to the measurement and protection of ionising and electromagnetic radiation, the synthetic table tops incorporated in work tables usually have a low conductivity, which prevents the accumulation of charges on the work surface but is sufficient to generate a variable electric field over time due to their coupling with conductive materials (the electrification under the table, the metallic structure...). Normally this field is concentrated at the edge because electric fields tend to concentrate at points with a small radius of curvature. The usual height of work tables is between 70 and 75 cm, the most frequent height at which symptoms appear.

It should also be noted that the fact that electric shocks are not felt does not mean that they are not received.

As an element that is permanently in contact with the body and produces friction, seating tends to generate electrostatic energy. **Its intensity also varies depending on the clothing worn by the user, the upholstery, the bases, the wheels, the shape of the seat or even the floor.**

EXAMPLE OF ELECTROSTATIC VOLTAGE	Moisture content	
	10 - 20%	65 - 90%
Walking on carpet	35.000 V	1.500 V
Walking on vinyl floor	12.000 V	250 V
Operator in upholstered chair	18.000 V	1.500 V
Vinyl document holder	7.000 V	600 V
Plastic bag	20.000 V	1.200 V

Thus, the design of the workplace should try to avoid the accumulation of electrostatic fields in order to prevent the disease and, to this end, a series of guidelines are recommended in the design of the workplace.

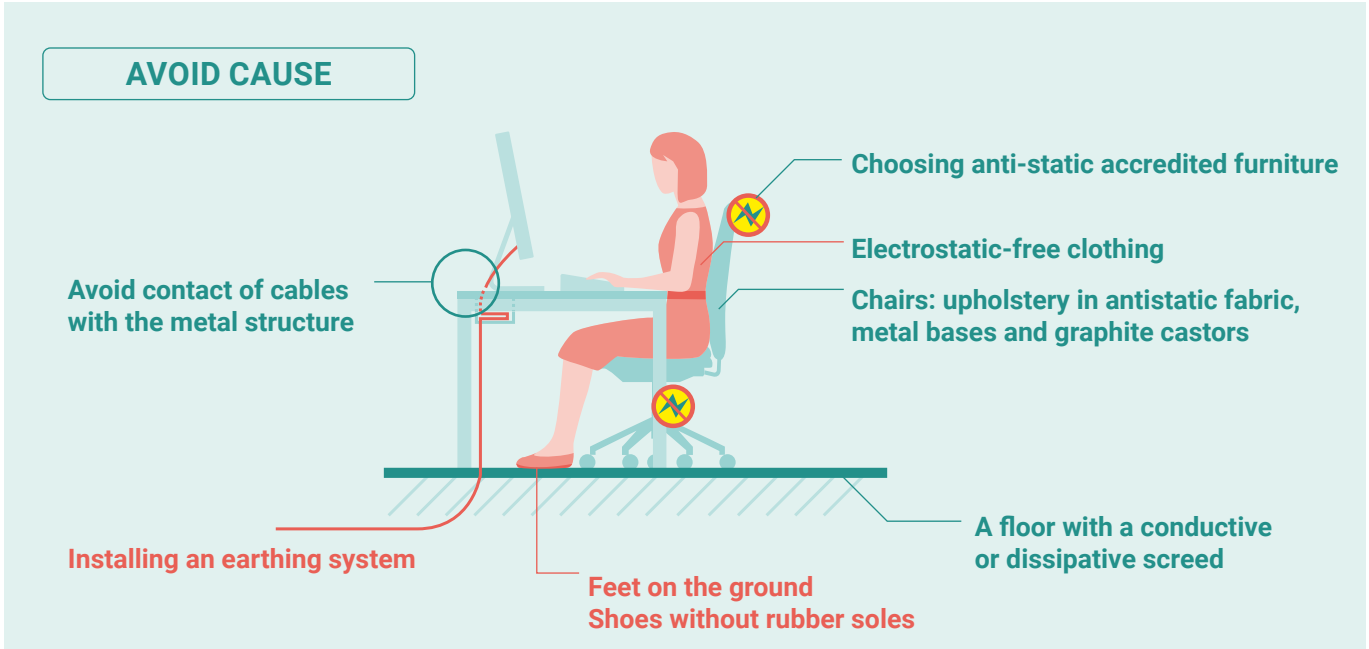
Try not to use all-metal furniture and choose furniture made of materials that do not become charged with static electricity. **Such furniture should have wide edges and a thick edge**. The table should have sufficient legroom.

When wiring workstations, **try to avoid contact between the cables and the metal structure of the table and even install an earth connection**. It is also recommended that protected cables be braided, that chairs be upholstered in antistatic fabric and that they be ordered with metal bases and graphite castors.

Excessive use of footrests should be avoided and **the user should try not to place their feet continuously on the base**, as the easiest way for electricity to dissipate is by placing their feet on the floor.

For chairs, **it is advisable to upholster them in antistatic fabric and to request them with metal bases and wheels made of graphite**. **Excessive use of the footrest should be avoided** and try to ensure that the user does not permanently place their feet on the base, as the easiest way for the electricity to dissipate is by placing their feet on the floor.

In general, using furniture accredited as antistatic ensures that it meets the necessary requirements to reduce the risk of Semicircular Lipoatrophy. Finally, **choose a floor with conductive or dissipative flooring**, avoiding vinyl flooring or continuous synthetic flooring such as carpets or platforms made of PVC. As a rule, the less synthetic flooring the better.



Form 5 Solutions for the prevention of Semicircular Lipoatrophy

In 2014, Forma 5 commissioned a report from the consultancy firm Electrostatica, specialised in the discipline of static electricity, on the conductivity of some of the tables and chairs in our portfolio to check whether they were suitable for preventing circular lipopatrophy. The study revealed satisfactory results selecting our product as follows:

TABLES

- 30 mm table top
- 3 mm edge
- Single beam structure

CHAIRS

- 65 mm antistatic castor
- Antistatic piston
- Hi-tech anti-static upholstery or Gaja Antistatic
- Connecting cable between upholstery and mechanism
- Aluminium base

The series available with antistatic solutions are marked in the price list with this icon:

For anti-electrostatic solutions, please ask us the conditions.

Download the document here.

AVAILABLE PROGRAMMES: FURNITURE

On special order:
- Single-beam structure
- 30 mm board and 3 mm edge.

This series is good for its distance from the person at the top and for its tubular profile portal.

M10

On special order:
- Single-beam structure.
- 30 mm board and 3 mm edge.

F25

On special order:
- Standard single-beam structure
- 30 mm board and 3 mm edge.

It is good because it has a narrower cross-section and because the lower foot prevents contact as it cannot pass underneath.

V30

On special order:
- Single-beam structure.
- The single-beam structure is a standard feature of the series.

ZAMA NEXT

On special order:
- 30 mm board and 3 mm edge.

LOGOS

Due to the special characteristics of these products, the viability of the chosen model will have to be studied and your order will be processed as a special order, with a special delivery time.

PROGRAMMES AVAILABLE: ANTI-ELECTRO-STATIC AND ERGONOMIC CHAIRS


DOT.PRO


SENTIS


SENSE

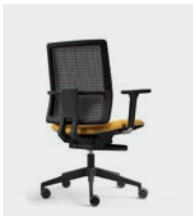

EBEN


KINEO


3.60


TOUCH


2K8


SPOT


SENFOR


PLURAL

ANTI-ELECTRO-STATIC SOLUTIONS:

Anti-electro-static solutions look for materials that dissipate electricity effectively.

- **Polished aluminium base.**
- **Special wheels ø65 mm with antistatic properties**. Hard nylon wheels or soft polyurethane wheels. Antistatic <100,000 Ω.

- Fabrics:

1. **Hi Tech of Camira**. Composition: 60% Polypropylene, 29% Wool, 10% Viscose, 1% Carbon fiber. Certified BS EN 61340-5-1: Annex A:2007 - Resistivity (OHM) (see other technical specifications and finishes on the supplier's website).
2. **Gaja Antistatic of Gabriel**. Composition: 4% New Zealand wool, 4% polyamide, and 2% steel fiber. Certified BS EN 61340-5-1 (See other technical specifications and finishes on the supplier's website).

- **Double connector** cable to conduct electricity from the seat to the mechanism and down the piston to the ground.
- **Chromed antistatic piston** that helps to dissipate electricity.
- **In the case of the Plural fixed chair, it has a single cable and antistatic fabric.**

All anti-electro-static chairs are delivered assembled as they are checked for optimal conditions before shipment. The height of the chair may change due to the piston change.

ERGONOMIC SOLUTIONS:

- Mechanisms:

1. **Atom mechanism:** rotation of the backrest relative to the seat with the centre of rotation above the seat surface for an optimal mechanism. The backrest tension automatically adapts to the weight of the user. To learn more about this mechanism click here.
2. **Motion mechanism:** 24° backrest tilt and 10° seat tilt. Backrest tilt and seat swivel at a fixed ratio of 2.4:1. Infinite backrest tension positions for optimum adjustment. To learn more about this mechanism click here.
3. **Motion 3.60 mechanism**: This mechanism is the result of combining the properties of the motion mechanism with the Side 2 Side movement. It benefits from the floating position of the seat and allows us to move the body's centre of gravity away from the axis of the chair to adopt complex postures without losing support surface, neither in the seat nor in the backrest, while maintaining a high degree of comfort. click here.

- Optional seat **depth** adjustment.

- **Optional armrests**. Recommended **3D adjustable armrests** (height, depth and swivel) or **4D adjustable armrests** (height, depth, width and swivel).
- **Mesh, upholstered mesh or upholstered injected foam** backrest.
- Seat with injected **polyurethane foam** of 62kg/m^3, 65kg/m^3 or 68kg/m^3, depending on the chair.
- Optional **lumbar adjustment**. Different systems depending on the chair.

Conclusions

Semicircular Lipoatrophy is a **disorder of the adipose tissue under the skin that causes an indentation in the skin that is almost always visible in women**. Although it is benign and disappears when the person is no longer in contact with the risk factors, **it can be bothersome** and manifests itself in outbreaks (affecting 20-30% of the workforce).

The specific causes have not yet been established, but it has been confirmed that it is a disorder related to the working environment, although it seems that certain personal characteristics also play a role. All indications also suggest that **the key is the accumulation of static energy in the furniture generated by electromagnetic fields from wiring, low relative humidity and high ambient temperature generated by electronic devices**.

For prevention, it is necessary, on the one hand, to train workers to adopt healthy postures, try to promote the use of loose-fitting clothing made of natural fabrics and avoid the use of rubber-soled shoes. On the other hand, the design of the workplace is fundamental both at the architectural level (avoid synthetic floors, carpets, upholstered wall panels, etc.) and at the furniture level.

Forma 5 offers antistatic solutions for its series that minimize the risk of Semicircular Lipoatrophy.