



IMPGA 3000

USER'S MANUAL



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INTRODUCTION

Thank you for the trust you placed in us and in the equipment you just acquired. With it you will be able to bring the most **advanced technology** in **electro-aesthetics** and to introduce a tool that will become essential to secure good results.

This equipment provides you with an advanced option of body remodelling. User-friendly, this equipment has been conceived to fully satisfy the requirements of the most demanding users. This machine has been subject to tests on different subjects and facial and corporal areas to guarantee its quality and results.

Our company also provides practical and advanced courses in facial treatment technique. This new service aims at giving the user the best knowledge possible in order to obtain high quality results. Information on our courses is available in our web pages (www.ema.es).

Before starting up the equipment, please **READ CAREFULLY this MANUAL**. Failing to do so could turn out to be dangerous and provoke damage to third parties.

We invite you to contact us or our distributor for any doubt or query. We would be delighted to assist you.

Yours sincerely,

The Management

SAFETY STANDARDS

This equipment complies with the **safety standards** in force at the time of manufacturing. However, the following safety recommendations should be observed:

1. Before handling the equipment, read carefully this manual.
2. The machine must be connected to an earth plate provided with an **earth conductor**. Never connect to a system deprived of a differential switch.
3. Do **not** use on customers with a **pacemaker or any other active implant**, for the risk of interference with this device.
4. This appliance produces direct (galvanic) currents always flowing between the point of application and the "return" metallic electrode. The **heart** must **not** be found on the path of the galvanic current.
5. There must not be **metallic elements** (e.g.: osseous prosthesis) and/or cables in the area subject to the treatment.
6. Always place the accessories when the power button indicates **zero**.
7. This equipment must be used following the instructions of **qualified personnel** (for example, graduated beauticians).
8. The client's electrical safety is ensured by a double insulation from the mains. Do not however connect to a socket deprived of an earth connection.

GENERAL POINTS

IMPGA 3000 is a passive exercise appliance based on a low frequency alternating current that combines in one machine the simultaneous movement of passive gymnastics with galvanic and microgalvanic current.

IMPGA 3000 has eight outlets allowing to connect 16 plates in corporal mode and four in facial mode. Meters located on each output indicate the passing of current and allow to adapt the electrical movement to the sensitivity and characteristics of each person. User-friendly, it personalises each treatment and gives maximum comfort to the customer throughout the session.

The variety of electric signals makes body work treatments easier both on superficial and deep plans and constitutes an ally for body remodelling treatment. The improvement of muscle tonus helps the circulation, valuable qualities of the beauty treatment with IMPGA 3000 for people with venous problems.

The intelligent combination of these two currents contributes to the high level of the results. While Passive Gymnastics work at muscle level, galvanic current helps anaesthetising the muscular contraction, introducing active ions and activating the metabolic reactions through galvanisation. The complementarity of the signals gives the necessary stimulus to carry out various treatments among which those linked with peripheral circulatory troubles, body remodelling and cosmetic product penetration.

WARNING:

This equipment is not a medico-sanitary product, not aiming at diagnosing, controlling, monitoring or relieving any disease, injury or deficiency.

Always use cosmetic products complying with the law in force.

In case of doubts concerning the application on a specific client, consult a specialist.

TECHNICAL FEATURES



Output characteristics of passive exercise currents

- Independent power control for each outlet, independent from the galvanic currents.
- Controls for the rhythm, frequency (from 100 Hz to 300 Hz), *stop* and *intensive/ mild*, common to all outlets.
- Duration of the tension per outlet for a movement of 2 microseconds.
- Output voltage for the body: (- 60 V + 60 V), that is to say 120 V.
- Output voltage for the face: (-30 V + 30 V), that is to say 60 V.



Output characteristics of galvanic currents

- Independent power control for each outlet, independent from the passive exercise currents. The application of the current can be seen on a pointer indicator with a zero centre.
- 3-position inverter (*normal, stop, reversed*), common to all outlets.
- Body output current: from 0 to 10 mA.
- Facial output current: from 0 to 1 mA (microgalvanic).
- Load resistor: permissible maximum power of 3,2 K for a right reading of the current. When charges of greater resistance are connected, the current is less than that indicated, for better safety.

General characteristics

- Supply voltage: 230 V (110V on request)
- Input: 85 W
- Weight: 10 Kg
- Dimensions: 470 x 360 x 160,5 mm
- Ground connection: the machine is provided with a ground connection through its mains cable. Connect to installations equipped with that connection.
- Safety: the machine remains insulated from the mains through a coil transformer.



This symbol indicates an established risk. The voltage applied to the outlet is over 10 KHz. This symbol aims at dissuading the use of the apparatus by personnel non qualified or newly introduced to its use, warning of the possible adverse effects that an improper use could provoke on the client.



This equipment provides a special protection rate against electrical discharge, particularly in relation with the authorised leakage current and the reliability of the earth connection. However, the part applied to the client is insulated from all other parts of the equipment with a protection rate higher than that established for the classification of the machine as BF type



PROTECTION SYSTEM AGAINST MAINS FAILURE

This machine includes a protection system against mains failure. In case of power outage, the machine will stop. Once the current has been restored, the protection circuit will be activated. The machine will then block the outlets, interrupting the treatment, and the orange pilot light will light up.

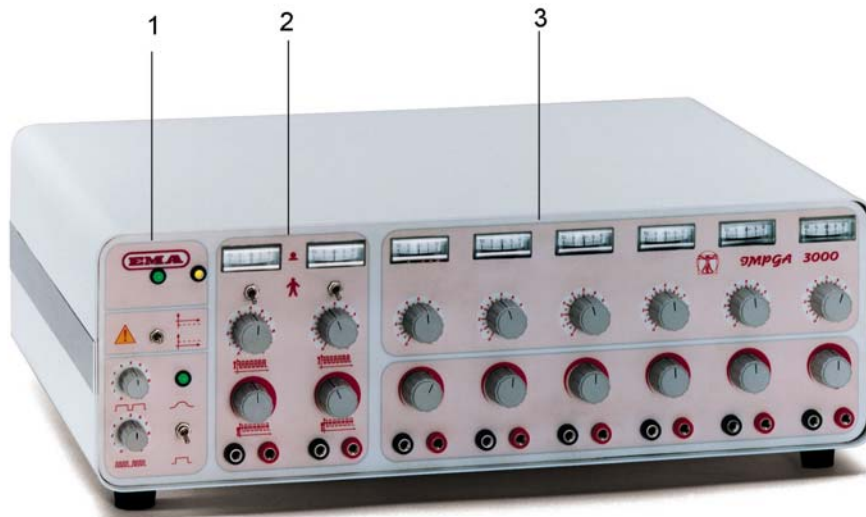
To resume the treatment, put all power controls to zero. Once the protection circuit has been deactivated, the orange pilot light will go out and the green light will light up again.

ACCESSORIES

<u>REF.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
-5111058	Oval silicone plate 1 inlet.....	16
-5111085	Large spontex cover 12x12.....	16
-5151060	Red-black banana cable set	8
-5111042	Movement-microgalvanic handles	2
-5111038	Microgalvanic roller electrode	2
-5111039	Microgalvanic-stimulation flat electrode	2
-5111040	Microgalvanic-stimulation ball electrode.....	1
-5111041	Microgalvanic-stimulation pen electrode	1
-5111029	Grey elastic band 40 cm.....	2
-5111030	Grey elastic band 60 cm.....	4
-5111028	Grey elastic band 80 cm.....	2
-210056	Normal mains cable	1

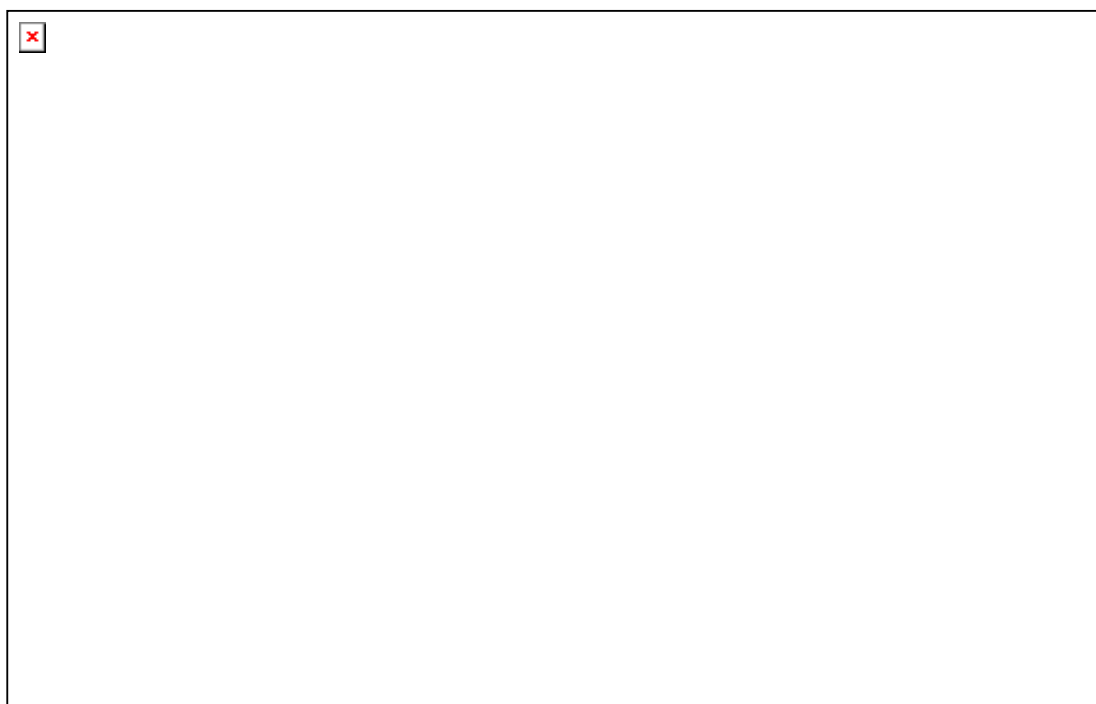
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	5111040	Microgalvanic-stimulation ball electrode	1
	5111041	Microgalvanic-stimulation pen electrode	1
	5111029	Grey elastic band 40 cm	2
	5111030	Grey elastic band 60 cm	4
	5111028	Grey elastic band 80 cm	2
	210056	Normal mains cable	1

GENERAL DESCRIPTION OF THE CONTROLS



IMPGA 3000 includes 3 basic windows.

1. **FIRST WINDOW:** This window includes the elements common to all the outlets of the equipment.
2. **SECOND WINDOW:** This window is common to all the machine for facial and body treatments. It has two independent outlets (red and black), controlled by two switches located at the top and allowing to choose between **facial and corporal**. The potentiometers set the current outlets below. It is possible to choose one current (passive gymnastics), the other (galvanic) or both simultaneously (passive gymnastics + galvanic) using the red and black connections of the cables.
3. **THIRD WINDOW:** This window is used **exclusively** for **body** treatments. Each meter controls the red and black outlets located below. The operation of the outlets for the body is the same as for the potentiometers of the second window.



0. Fuse.

1. Main **switch**.



2. Main **switch** for the **galvanic currents**: three positions: (galvanic negative, total stop, galvanic positive).

3. **Indicator** of the contraction rhythm movement.



4. Main **control** to stop the **rhythm** and the transmission of the movement current.

Rhythm control:

- Sets the duration of the **contraction/relaxation** time.



5. Main control **switch** for the *mild/intensive* **contraction** of the movement current.



- This switch increases the power on each outlet button of the movement current. In **mild** position, the intensity control has a spectrum going from 1 to 10 units of power. In the **intensive** mode, it goes from unit 11 to 20. Doubles the intensity autonomy of each outlet with this switch, to adapt to the requirements of greater contractions.

6. **Frequency** main **switch** for movement currents (*comfort* button by choosing the **frequency**)



7.- Pointer **register** for the galvanic current.

a. On the first two outlets:

- This button shows +10 mA at the bottom of the indicator scale if the selector (8) is in **corporal** position. If this selector is in **facial** position, the bottom of the indicator's scale will show 1 mA to be used as microgalvanic.

b. In the rest of the outlets:

- This button shows +10 mA continuously, since these outlets are exclusively used for **body** treatments.



8. - **Facial/corporal** selector.

- Only the first two outlets have this button. In *corporal* position, these two outlets are identical to the other six. In *facial* position, these outlets become microgalvanic (1 mA more) and reduce the power of the maximum movement by half in corporal mode.



9. - **Power** control for the **galvanic** current.

- In the first two outlets, this button controls the microgalvanic current if the selector (8) is in *facial* position ().



10.- **Power** control for the **movement** current.

- In the first two outlets, this button controls the micropulse current if the selector (8) is en *facial* position ().

11.- **Positive** plate connexion: galvanic + movements (**red**).

12.- **Negative** plate connexion: galvanic + movements (**black**).

13. Pilot lamp indicating the passing of the **current**.

- Lights up when the main switch is turned on. Indicates that the equipment receives power supply.

14. Safety pilot lamp.

If the orange pilot lights up, this means that there is a problem. (*Safety circuit*: usually solved by placing all potentiometers on zero and turning off and on the machine)

START UP

1. Before starting any treatment, check that the main switch of the equipment (1) is off and that all output power controls (9, 10) are on zero, beyond the *click* of the incorporated switch. It is very important to follow this procedure before placing the plates on the client, for if all controls are not on **zero** and the plates are put, the client may feel a sensation of tear in the muscles when turning on the main switch, because of the uncontrolled transmission of the electric signal. Such an imprudence may also lead to damage them the more the button of the relevant outlet is turned towards the right.
 - If the orange pilot lamp (14) lights up, check that all potentiometers are on zero. Otherwise put them in that position.
2. Select the type of treatment you wish to perform and connect the plates to the client, according to the treatment chosen, adapting them with the relevant elastic bands.

For passive gymnastics:



- a. **Facial option:** the movement is programmed for treatments in the facial tissues and muscles.



- b. **Corporal option:** the movement is programmed for treatments in the body tissues and muscles.

The professional can perform a **passive exercise** treatment, a **galvanic beauty treatment** or a combination of both.

The treatment area also determines the application format of the **electrodes**.

- Mobile electrodes or fixed plates – smaller than those used for the body – can be used for **facial** treatments.
- For **body** treatments, we use oval rubber plates covered with a sponge sheath.
- In one exclusive session of **passive gymnastics**, it is possible to use only the rubber plates with a thin layer of conductor gel. However, to apply simultaneously **galvanic** current, it is essential to introduce the plates in

sponge covers soaked in water and in the product to penetrate by ionisation. While rubber plates covered with spontex can be used for the galvanic beauty treatment and for passive gymnastics, **rubber plates on their own cannot be used for the galvanic beauty treatment.**

3. Connect the **cables** to their respective outlets (9, 10). Prepare the client by applying **conductor gel** on the plates and placing them on the motor points corresponding to the muscles to be treated using elastic bands or inserting the plates into the dampened **spontex** covers. It is advisable to place the elastic bands on the body first and then slide the plates onto the motor points. Last, connect the **cable** to the **plate**.
4. Check that the **pressure** and **adaptation** of the bands is correct.
5. Turn on the switch (1). Check that the green light (13) flashes.
6. Turn on the rhythm button (4) turning it to the right.
7. Turn on the power controls of the movement outlets (10).
 - Start with a low level to observe the client's reaction to the passing of the electrical movement. After a few minutes, turn the intensity up progressively so that the muscle does not get used to the same type of contraction, and repeat the operation throughout the session. The muscular contractions must be intense but not painful. The indicator (3) will show the rhythm of transmission of the movement current.
 - If the client feels a slight tickling, gently move the plate until the sensation disappears, since we are working on two or more motor points at the same time.
8. Choose the intensity of the electrical movement using the **MILD** or **INTENSIVE** switch (5), following professional criterion. It is recommended to begin with MILD and observe the person's tolerance threshold:



- a. **Mild option:** the electric signal stimulates preferably superficial muscles.



- b. **Intensive option:** the electric signal stimulates preferably in depth muscles. The *intensive* option is also advised in people with abundant adipose tissue in the area to be treated.

- If the motor point of the muscle is located in depth as a result of the presence of adipose tissue, select the **INTENSIVE** position using the button (5). The square modulation of the current triggered by this converter has a greater penetration power than the exponential modulation activated on the MILD position. Before choosing the INTENSIVE position, put all power controls (9, 10) to zero and, once the square modulation is activated, increase slowly and progressively the power of each outlet.
 - Once the client's muscles are used to the programmed contraction, gradually **increase** the power of each outlet so that the intensity of the contraction will be higher but painless for the client. At the same time, adapt the parameters of RHYTHM (4) and FREQUENCY (6). People used to doing sport will adapt to the electrical movement more easily than those who do not do sport regularly. Setting the parameters of **intensity**, **rhythm** and **frequency** takes 10 minutes on average.
 - The **rhythm** must be slow at the beginning and becomes more intense as the session goes, always remaining comfortable for the client. The progressive variation of the rhythm will avoid the habituation of the client to the train of movements that tend to *expect* the contraction, and will improve the effects of the current on the muscular tonus.
 - On the other hand, the **frequency** must be medium to give the client the most comfort possible in relation with the passing of the current.
 - Therefore, it is convenient to keep the **power** control on number 5 and activate it following the client's indications.
9. Adapt the parameters of **RHYTHM** (4) and **FREQUENCY** (6) to the client's sensitivity and comfort, using the corresponding controls. The pilot lamp will light up with the passing of current indicating visually the rhythm and frequency of the movement received by the client.
-  a. **RHYTHM:** The rhythm allows to control the level of the client's power consumption.
- To stimulate **volume reduction** in a defined area of the client's body, induce a degree of caloric combustion similar to that which would be produced if the client was doing aerobics (**jogging** for example). Choose a rapid rhythm with little muscle contraction in tetany. Using this option, the muscle is induced to create an

activity rhythm maintained around 120 pulsations per minute, lasting a minimum of 30 minutes approximately and stimulating the combustion of the fatty tissues of the treated area.

- If the aim of the client is muscle **firming** and **toning**, the rhythm must be slow with a long phase of contraction in tetany. This way, muscle fibres are stimulated to increase their resistance and become stronger and more intense. A good comparison for this type of beauty treatment is muscular training with **weights**. This type of exercise works more intensely on specific groups of muscles with powers higher than any aerobic exercise. The time of treatment can be less than during aerobics since the muscular surcharge is greater. The recommended time is 20-30 minutes.

It is important for the beauty professional to define his **objective** and **personalise** as much as possible the performance of the IMPGA 3000 to the concrete objective of the client.

-  **b. FREQUENCY:** frequency is a parameter of **comfort** for the client. It enables to adjust the electric sensation to the tolerance and sensitivity threshold of the person receiving the beauty treatment. It is also interesting since it enables to **deepen** the muscle treatment without altering or modifying the location of the passive exercise plates. Increasing the frequency of the electrical movement can induce the activation of myofibril from lower groups of muscles that lower frequencies do not activate. When choosing the frequency, it is interesting to ask the client what sensation is produced in the various planes when modifying the frequency. This subjective information helps the professional assess which muscles are most interesting to work on as target in the treatment.

The **dialogue** with the client is very important in order to obtain the best results possible during the treatment. Everyone has specific individual parameters (hydric composition, percentage of fat, localisation of motor points, etc.) which can lead to a mediocre, acceptable or spectacular result. The professional must **find out** these parameters and use them correctly to personalise the use of the equipment.

10. Once the function of **passive gymnastics** is activated, turn on the **galvanic** current.

- To do this, activate the power controls of the galvanic current outputs (9) once the ionising product has been applied.
- The intensity of the galvanic current and the application time are data given by the manufacturer of the product, since the machine in this case is a simple vehicle conducting the product.
- First, choose the function of the first two outlets through the galvanic and microgalvanic switches located above. For a facial treatment, make sure that this switch (8) is in *microgalvanic* position. However, for a body treatment, turn on the *galvanic* position.

For the galvanic current:



A. Facial option: the galvanic current is programmed for treatments in the facial tissues and muscles (microgalvanic).



B. Corporal option: the galvanic current is programmed for treatments in the body tissues and muscles (galvanic).

- Turn the switch (2) from its central **stop** position to **normal** or **reversed**. If the product's manufacturer indicates that the polarity of the product to penetrate must be changed, the switch will have to be put on *reversed* halfway through the treatment. The pointer registers located on each output (7) will show the intensity applied to the client. With the risk of chemical burn, be extremely cautious when applying this current in terms of intensity, duration and sensitivity of the client at facial and body level.
11. When the time given by the manufacturer is over, the session with galvanic current is considered to be completed. Reduce **slowly** and **progressively** the power of each output using the relevant galvanic current controls (9) until reaching zero. The treatment of cosmetic product penetration through galvanic currents is then over.

When the application time of movement currents has passed, **reduce slowly** and **progressively** the power of each outlets using the relevant buttons (10) until reaching zero. Also turn down the rhythm (4) and frequency (6) controls. The *passive exercise* treatment with currents is thus considered as completed. Bear in mind that, although the application of one treatment benefits the other, two treatments of a different nature are used simultaneously. Listen to the *click* confirming that the potentiometer has been completely shut.

- Although passive exercise currents do not have important contraindications for a lengthy application except maybe some stiffness, the galvanic current has **abrasive properties** once it has penetrated the whole product. For this reason, **the duration of each session where galvanic current is applied must be controlled strictly and independently.**

12. Turn off the main switch (1).

13. Afterwards, remove and clean the plates.

N.B. WARNING: THE HEART OR METALLIC ELEMENTS must not be found on the way from one plate to its pair.

IMPORTANT

All plates used in every treatment must be **carefully washed** with soap and water at the end of each session. When removing the plates, a slight reddening of the skin can sometimes be observed, due to the transfer of fluid particles of the tissues concentrating near the cathode (phenomena called *endosmosis*). This reaction is normal and disappears after a short time.

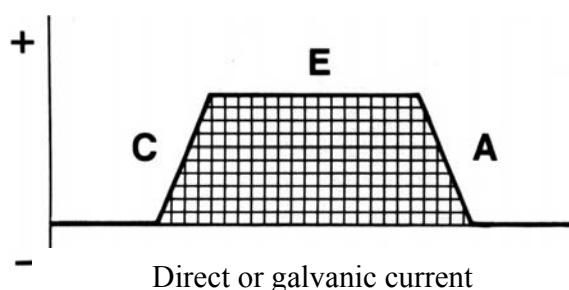
The client can feel a sensation of heat in the treated area (thermal rise) during the session. Reduce this sensation as much as possible, using all the useful surface of the plates for the treatment. If a small part of the total available on the plates is used, all the heat concentrates in a single point, which may produce a chemical burn. On the contrary, if the whole surface is used, the heat produced is distributed throughout the area of the skin in contact with the plate. Hence the importance of a proper adaptation of the plates by means of the bands, so that the **pressure** exerted by the bands is **homogenous** in the whole surface of the plates.

The skin is the most resisting organ of our organism. In order for the current to go inside, a **contact gel** has to be applied between the passive exercise plates and the skin. This contact gel can be **neutral** and without specific properties. A gélolide product with firming or reducing properties can also be applied without altering the treatment.

GALVANIC CURRENT



Galvanic current is a type of uninterrupted low-tension direct current, normally comprised between 60 and 80 volts, with an intensity that can reach up to 200 milliamperes. Also called constant current, it keeps the same intensity during all its application time. However, when the circuit closes at the beginning of the application and opens at the end, the intensity suffers a progressive rise and fall.



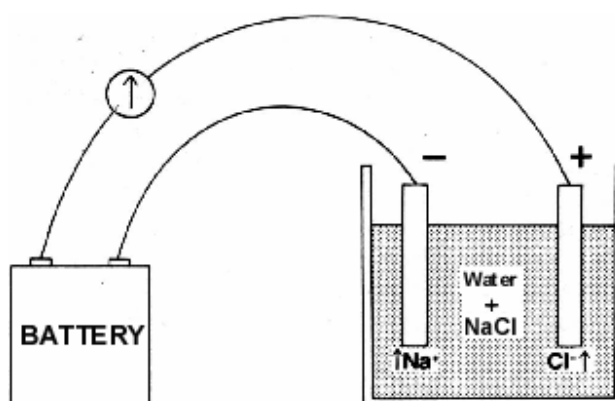
The behaviour of this current is established in the way shown in the above graph: C is the shutting period, when the passing of the current is initiated; E is called the state period, the useful period constituting the application of the treatment; and A is the opening period, when the treatment is over and the circuit opens to stop passing current. Among these three different states, the shutting and opening ones are called **variable states**, because in them the intensity varies, going up and down.

The state period E is also called constant state, because the current retains a fixed and constant value and is, as we previously stated, the application period of the galvanic current.

PHYSICAL AND CHEMICAL EFFECTS

Galvanic current produces a series of physical and chemical phenomena at the basis of its effects and application of cosmetological use. Its most interesting effects are those that occur when the direct current go through **electrolyte solutions**.

An electrolyte solution contains ions, that is to say dissolved salt dividing in its corresponding positive and negative ions. Here is an example:



Taking a container in which we put distilled water and immerse two conductive electrodes connected to the positive and negative poles of a direct current source such as a volt battery, we place a galvanometer in this circuit, that is to say a machine capable of measuring the passing of the current. The current is interrupted because the electrodes are immersed in *non-conductive* distilled water; it is enough to add a pinch of salt, i.e. sodium chloride to transform this distilled water into a *electrolyte solution*, sodium chloride solution in water, which dissociates the common salt or sodium chloride into *negative chlorine ions and positive sodium ions*, which, like all ions, have their own electric charge.

From the moment the sodium chloride is introduced in distilled water and has dissolved, we can see how the galvanometer pointer indicates the flow of electric current.

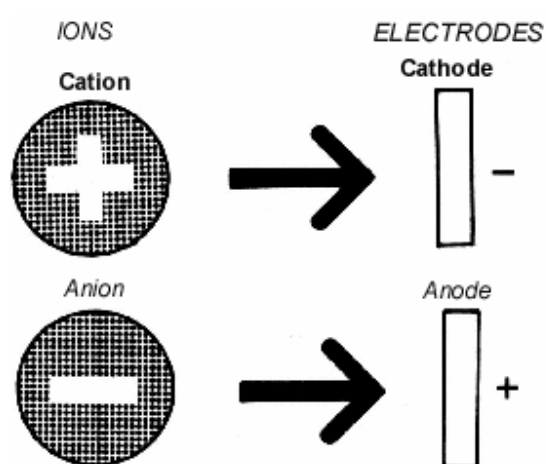
What happened? Simply, the sodium ions positively charged have moved towards the negative electrode of the battery, seen that opposed charges attract each other and that chloride ions with a negative charge, for the same reason, have moved towards the positive pole of the battery. These ions have closed the circuit and a current of electrons has been established between the two poles. This is why the galvanometer indicates a flow of current.

The displacement of ions has a constant character and always follow the same direction. This is a very important factor: the electric current must not change polarity. It is called **direct** or **galvanic current**.

COSMETIC PRODUCT PENETRATION

Ionisation uses the property of the galvanic current to mobilise ions in order to introduce them into the organism and to produce the effects characteristic of its chemical structure.

In Aesthetics, ions with a cosmetological action are mobilised, reason why this technique is called **cosmetodynamic ionisation**.



Before going any further, we will explain more about cosmetic product penetration.

At the beginning, it was believed that the current was going from the highest – positive – to the lowest – negative, and for this reason, since the Greek *Anas* means **up**, *catas* **down** and *ion* means **traveller**, ions with a negative charge have been called **anions**, and ions with a positive charge **cations**.

Since opposed charges attract one another and negative anions go towards the positive pole, this positive pole or electrode has been called **anode**. On the other hand, since cations or positive ions move towards the negative electrode, the latter is called **cathode**.

EFFECTS OF DIRECT OR GALVANIC CURRENT

We are now going to analyse the effects of the galvanic current in its constant state.

The human body can be seen as a container with electrolyte solutions distributed in innumerable microscopic vessels like in the above-mentioned drawing, with permeable walls, the cells.

When the current flows, each cell loses positive ions, which go towards the negative electrode, and negative ions, moving away towards the positive pole. Each cell replaces its ions by other similar from the neighbouring cell in such a

way that, although there has been a movement of ions and the current is fluctuating as it passes, there are no chemical phenomena but only ionic exchanges between the neighbouring cells. They become more evident as we get closer to the poles, that is to say the electrodes, where after some time the ionic concentration of the current is modified, and these changes are called *polar effects*.

These *polar effects* reach their highest intensity in the electrode contact areas. Humid electrodes, also called baths, can be applied, or small metallic electrodes directly on the skin.

In the first cases (humid electrodes or baths, the current determines a specific ionic situation while passing, conditioning what is called neighbouring polar effects around the poles.

These polar effects vary from one pole to the next. The chloride ion, with a negative charge, goes to the **positive pole** and reacts with tissue water by producing **hydrochloric acid and oxygen**. The reaction at pole level is therefore **acid**. When the electrode is spongy and big, the acidity is little and only produces a local irritation, however if the electrode is small, its effects are more intense and can lead to destroy the organic tissues by protein coagulation, due to the high acidity.

An eschar forms, produced by acids: dark, hard, dry, sticking to the tissues, with little tendency to bleed, a good and easy scar healing, but retractile and adhering to the electrode.

Electrolysis products, hydrochloric acid and oxygen can also attack the material forming the electrode, producing metal oxides and chlorides that can also act on the tissues, giving way to various phenomena.

We are now going to see what takes place in the **negative pole**. Sodium goes towards that pole, reacting with water by giving **soda**, that is to say **sodium hydroxide** with release of **hydrogen**. The reaction is **alkaline** due to the sodium hydroxide. With a small electrode, as before, organic tissues can be destroyed by protein liquefaction, due to the excessive alkalinity, making hydrogen bubbles.

The ulceration is soft, humid, bleeds easily, does not adhere to the nearby tissues or the electrode, cicatrization is slow and the remaining scar is smooth, soft and a bit retractile.

One of the applications of these polar effects in the negative pole is electrical depilation. The alkaline reaction and the burn produced by liquefaction destroy the hair bulb. The small foam forming is due to the release of hydrogen mentioned above.

Interpolar effects

The galvanic current in its constant state produces, as well as the effects on the application area, the polar effects, other effects while going through the application electrodes. These are called **interpolar**, and the most important among them are a peripheral and trophic vasomotor action. The passing of direct current through the tissues provokes a light reddening that can persist a few hours after its application.

This reddening is the result of an increase in the superficial circulation and can last from 10 minutes to over an hour following the application, and becomes apparent through the reddening of the area in which the electrodes were applied.

When going through an area with an altered and delayed circulation, the galvanic current reduces this circulatory trouble by helping to absorb the swelling. We can also observe an improvement of the general circulation and a decrease in the blood pressure and a normalisation of the pulse if the latter was altered.

Effects of the galvanic current

Physical and chemical effects of galvanic current are of two types. The chemical reaction in the electrodes called electrolysis is called polar effect. The physical movement of the ions in the organism is an interpolar effect.

Action on the peripheral nervous system

Direct current flow usually goes with a feeling of tingling, itch and heat under the electrodes, that seems to be more pronounced under the negative pole, which seems to have an irritating action. As the current passes, these sensations lessen and disappear.

In addition, the galvanic current has an evident antalgic action on painful states of neuralgia and neuritis. This very efficient analgesic action becomes apparent mainly when the electrode covering the painful area is connected to the positive pole. A painful nerve seems to have an excess of negative electrical charge, which explains the sedative action of this method, which attracts these negative charges and discharge the sore nerve.

The sensitivity to the current is specific to each subject, so much so that the responses to the current do not have an absolute value. Great differences can be observed in the intensities required for each treatment.

The degree of sensitivity varies from one individual to the other. If the intensity of the current goes up to a certain limit, the client can experience a painful sensation around the electrodes. He can be reassured though, because that limit, called *threshold of pain*, corresponds to figures much higher than those used in the cosmetological practice.

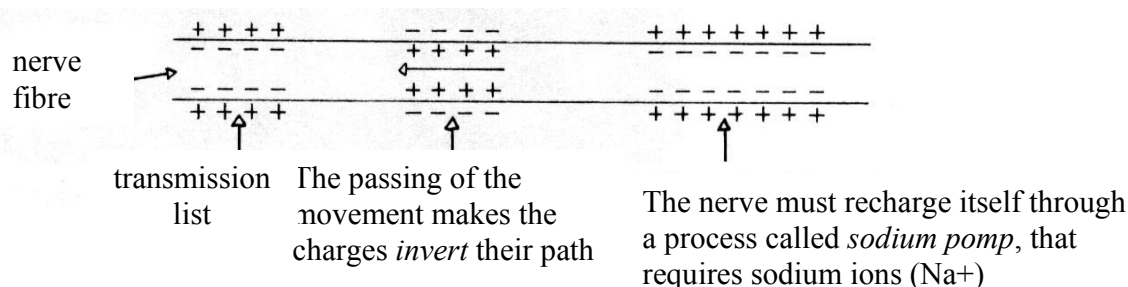
The galvanic current also has specific effects on the senses. For example, the negative pole gives a metallic taste on the gustatory nerve, and the positive one, acrid, with more secretion of saliva. This can be observed when applying galvanic current on the face.

Electrotonus

Electrotonus is a term used to sum up the *stimulating* and *soothing* effects of the galvanic current. This is produced by the effect of the current in the transmission of nervous pulses along the nerve.

The movement transmission is the result of the discharge of electric charges along the nerve fibre. After the movement has passed, the nerve has to recharge itself before being able to transmit the following movement, the one affected by the galvanic current.

Under the active cathode (-), sodium ions accumulate, thus recharging the nerves. This factor stimulates the nerves. Under the active anode (+), sodium ions are disseminated and consumed, inhibiting nerve recharge. Hence the soothing effect. We must be careful about this effect, since an excess of current could lead to the loss of sensitivity in the area, which means that the treatment area would temporarily lose any tactile sensation.



TRANSMISSION OF A NERVE MOVEMENT

Thermal effect

When passing through the tissues, the galvanic current does not produce a large quantity of heat and therefore is not used to this end. The temperature of the skin and of the areas where galvanic current passes increases by **2 or 3 centigrades**, due to the peripheral circulatory activation produced and to the vasodilation and increase in the blood flow, which, as we said, improves the trophism and alleviates painful sensations.

In any application with galvanic current, the following factors have to be considered. Firstly, the generator, the conductors carrying the current and the application electrodes to be placed on the client.

The polarity of the output terminals, where the lead cables are connected to take the current to the electrodes, is indicated because, even though in some applications, the connection pole (positive or negative) is often indifferent, it can in other circumstances be at the basis of the application. It is also convenient from time to time to change the polarity of the electrodes while applying galvanic current. This manipulation can be achieved changing the location of the conductors in the output terminals, but this would cause a loss of time, interrupting the treatment. The direction of the current has to be inverted without changing the electrodes or cables, by means of a device called inverter.

The conductors, cables conducting galvanic current from the IMPGA 3000 to the application electrodes, are made of twisted copper wire forming a kind of cord that has to be thick and with many wires in order to show less resistance and a minor risk of fracture. These cables are covered with an insulating or impermeable plastic or rubber layer, they are from 1.5 to 2 metre long approximately, with one of the extremities banana-shaped for its connection to the output terminals and the other one that has to be connected to the electrode.

Any electrical current is applied on the human body using conductors especially conceived to that end, whose generic name is **electrodes**.

Electrodes

Generally, in galvanic current applications, these electrodes, usually made of metal or of conductive rubber (graphite), can be used in two different ways: directly over the skin – immediate mode – or interposing a material preventing a direct contact between the metal and the skin.

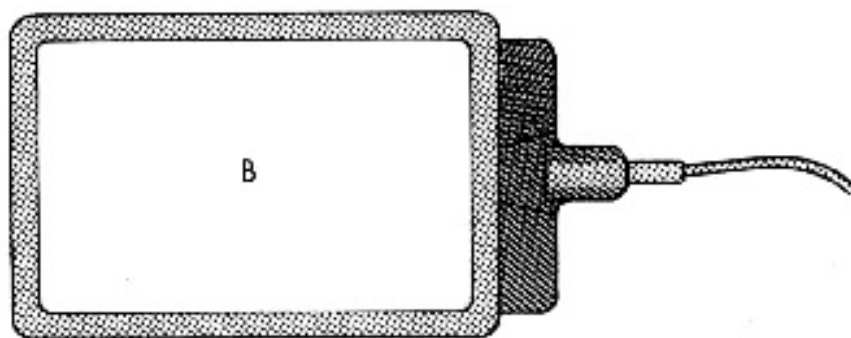
If we use the immediate mode for galvanic current, the polar effects on the skin and electrodes will be more pronounced, and the smaller the electrodes, the more intense these effects will be, this is why this type of application is only used when caustic or electrolytic effects are aimed at, like for electrical depilation.

Electrodes are usually made of metallic zinc sheets, tin, copper, aluminium, lead, etc., various-sized and shaped depending on the surface to treat. They are made by cutting an appropriate sized and shaped surface in a thin metallic sheet. Generally, the thickness of the electrodes varies between 0,2 and 1 mm. Conductive rubber can also be used.

To avoid contact between the electrode and the skin, place between them a pad made of a thick fabric, absorbent cotton or a spongy fabric folded, from 0.5 to 1 cm thick, and a minimum of 0.5 cm more than the metallic sheet. This pad must be dampened with water, warm if possible, in order to increase its electrical conductivity – which can also be achieved by adding common salt.

Since modern equipments keep a constant intensity regardless of the resistance, this requirement can sometimes be unnecessary, though there is no objection in using it.

Below is an example of application electrodes, active, passive and indifferent. The electrodes are 0.35 mm thick and all go with insulating sheaths to avoid direct contact between the metal and the skin.

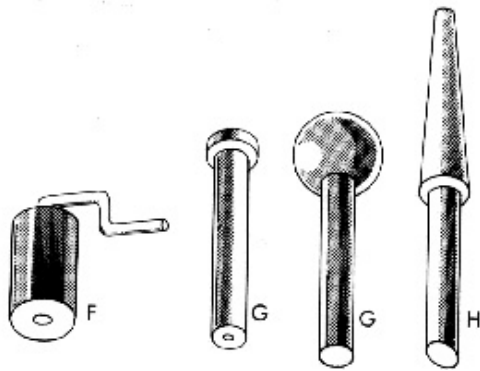


**Applications elements.
Active electrodes.**

(b). Legs, arms, thighs, stomach. Surface: 100 cm², unit.

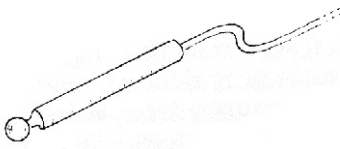
Rectangular electrodes are appropriate for the legs, arms, thighs and stomach, with a surface of 100 cm² each.

For facial application, mobile electrodes can be used for descaling and for treating blackheads and skin impurities (f), for facelifts and against wrinkles (g), and for other large surfaces (h).



Application elements. Active electrodes.

- (g) Descaling accessory for blackhead and skin impurities (flat or round extremity).
- (h). Pencil shaped accessory for facelift and against wrinkles.
- (f). Roller for larger surfaces (flabbiness, depilation, etc.).



As *active* electrode, the carbon or metal ball can be used, optionally wrapped in cotton soaked in a saline solution or a ionising lotion.



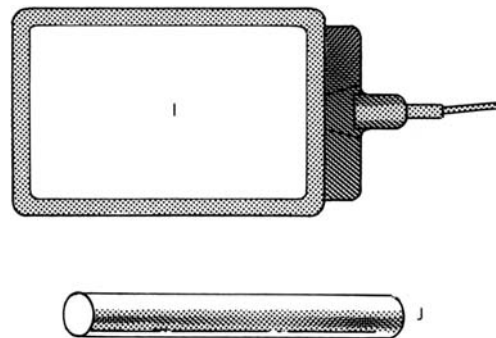
Metallic rollers can also be used, covered with viscose or without any fabric covering them. Roller electrodes are often used in pairs, one connected to the positive outlet and the other one to the negative outlet.

Indifferent or passive electrodes attract cosmetological ions located in the active plates or electrodes. The surface of the indifferent or passive electrode we are going to use should always be about 10% larger than that of the active electrode: these plates measure approximately 110 cm² each (i). There is also a bar that the client holds in his/her hand, acting as an indifferent or passive electrode for descaling or facial treatments.

Elastic bands made from crepe, rubber or any other elastic material are used to hold the active or passive plates and electrodes onto the skin.

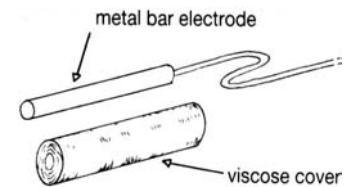
Application elements. Indifferent electrodes.

- (i) Plates. Surface: 110 cm², unit.
- (j) Bar. Descaling and skin impurities. Facial treatments in general.



To form an electricity flow circuit through the customer, two electrodes are required. The first one, the anode, is connected to the + outlet, and the other one, the cathode, to the – outlet of the galvanic current circuit.

In most treatments, the *active* electrode is used for treatment. The other electrode only serves to complete the circuit. It is called *indifferent* electrode.



Metallic plates are usually used as electrodes, indifferent or not, to carry out galvanism throughout the body. The metallic plate must be covered by a sponge or gauze that has a minimum thickness of 1.25 cm to prevent reactions of electrolysis in the electrode in contact with the skin. It is normal to use a gauze soaked in salt water that covers the treatment electrode nine times. Nowadays, sponges are used. A plate is slipped into a spontex cover and the other is placed between the electrode and the skin.

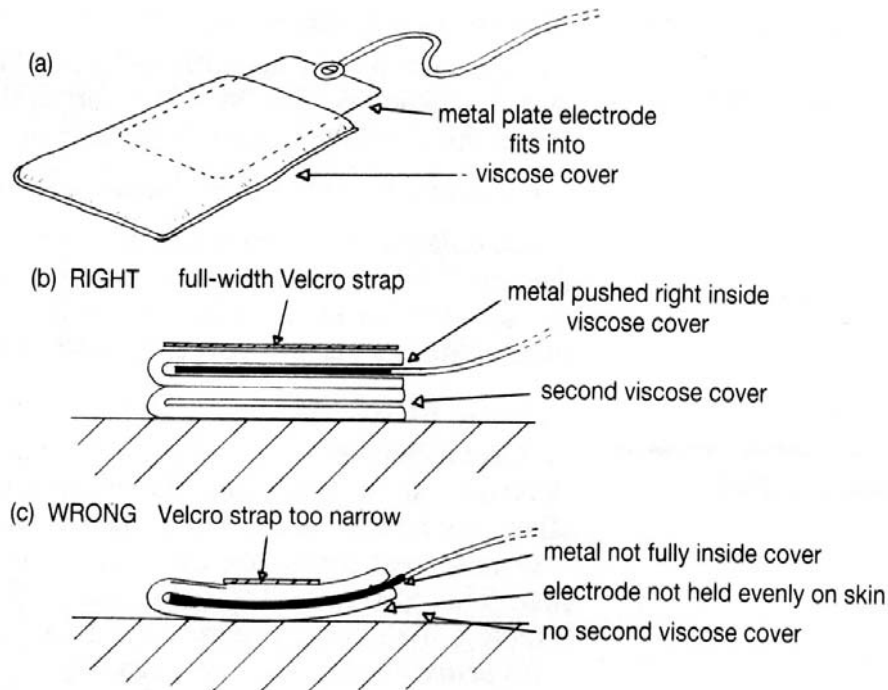
These electrodes *must* be well and regularly held to the skin in all their extension.. The safety straps must hold the whole area of the electrode in contact with the skin. The elastic straps usually have velcro fasteners.

An alternative type of indifferent electrode is a bar of metal or carbon covered by a spontex tube that the client must hold in his/her hand.

Preparation of the electrodes

The electrodes must be prepared *exactly* as each treatment requires. For facial treatments, the active electrode must be covered by a small gauze in salt solution or ionisation lotion. After soaking the gauze homogeneously, any excess water must be shaken off, and the gauze applied over the electrode in a level manner in all its points. No part of the electrode can be accidentally put in contact with the skin, because the risk of current concentration in that point could cause a burn.

It is important to cover *indifferent electrodes* and current electrodes with a thick sponge. The gauze must be applied *uniformly* on the electrode and remain well fixed with no folds, and the body plates well fixed to the skin so that the current is introduced into the body through the whole contact surface of the plate.



GALVANIC BEAUTY TREATMENT

Direct current in the beauty treatment

The effects of the galvanic treatment come from the transmission of a direct electric current through the body.

The ion movement, or direct current, is used in *direct galvanism through the body* and in ionisation.

In **galvanism through the body**, the movement of the ions stimulates the activity of the tissues subject to the treatment.

In **cosmetic product ionisation**, the "active ions" of specific cosmetics are penetrated into the skin by electric current.

Chemical reactions that take place in the electrodes are also used in galvanic treatments, particularly the *alkaline* effects around the *cathode*. These occasional treatments are called cathiodermy.

Descaling: removal of excess sebum from the skin.

Skin peeling or desquamation: elimination of excess layers from an excessively thick stratum corneum.

The original method of **electrical epilation** called galvanic epilation uses these chemical reactions to destroy hair follicles. The electrical-chemical destruction is called *electrolysis*. The term electrolysis is commonly used to mean electrical epilation. The more modern method, depilation with blend system, combines galvanic with short wave or radiofrequency currents, destroying the follicle chemically and physically.

Galvanic current

For the galvanic beauty treatment, a soft and direct current is required. It must flow smoothly without interruptions, pulses or waves that could stimulate the motor points of the muscle and cause their contraction. Due to the *stratum corneum*, the outer layer of the epidermis is low in water and is covered by a fat layer. Its resistance is therefore high, which means a high tension to allow the current to flow through. Once penetrated in the *stratum corneum*, the current flows easily through the organism.

Galvanic and microgalvanic current unit of the IMPGA 3000

The galvanic unit of IMPGA 3000 is located in the fourth window of the equipment. This module allows to carry out neck treatments using galvanic current (measured in amperes) and facial applications with microgalvanic current (measured in mA). One milliamp (mA) is a thousandth of an amp.

The outlets to which the cables are connected are also characteristic, since one uses red as universal colour (positive pole) and the other one black (negative pole). The module is equipped with an inverter (15), in charge of the polarity changes. When pressing it, the electrode connected to the red terminal (initially positive) becomes negative and the electrode connected to the black terminal (initially negative) becomes positive.

Use of polar effects in the treatment

Treatments using alkaline reactions under the active cathode are usually called *cathiodermy*. Traditionally, the sponge is soaked with a saline solution (sodium chloride) so that the *physical* effects of the treatment are the consequence of the production of alkaline sodium hydroxide production in the cathode. Now salt or similar substances can be found in the form of special gel or fluids in phials, but its action essentially remains the same.

Descaling

Elimination of excess sebum from greasy skins. Sodium hydroxide is emulsified and gets rid of the sebum. The treatment must not be repeated too often; it can stimulate a higher production of sebaceous glands. This factor induces a counterproductive result.

Skin-peeling

This technique uses sodium hydroxide to dissolve keratin scale layers from an extremely greasy *stratum corneum*. The skin can become greasy from being excessively exposed to open air and sun UV radiation. Reduce its size gives more smoothness and flexibility to the skin.

A skin affected by blackheads and impurities can also benefit from the peeling technique. By removing the outermost layers, the blackheads are softened and easier to remove.

Irritations

If the skin reddens and gets irritated during treatment, it means that it is suffering, being attacked. Should this happen, the treatment has to be stopped. The current must be applied in the opposite direction for a short period of time. This will neutralize the chemical waste that remains in the skin and will alleviate the irritation.

Cosmetic products to penetrate

A wide range of specific cosmetic lotions and gels are available on the market. These lotions, usually provided in single dose sealed glass phials, must be soaked onto the spontex sheath before the treatment with the active electrode. Gels, usually found in little sealed envelopes, must be directly applied on the part of the skin to be treated. A gel is basically like a lotion, but it has been thickened by a thickening agent such as methyl cellulose. This makes the product more controllable on the skin but does not affect its conductivity or its chemical action.

The active principles of these cosmetics are ionised. In ionisation, the current is used to drive these ions into the skin, following the principle that "*similar charges repel each other*".

Each lotion or gel is marked with a (+) or (-). This shows the polarity of the active electrode to be used. Make sure that the correct electrode is used.

A lotion or gel marked (+) will have active *cations* (+), for example, the aluminium ions (Al^{3+}) of an astringent. These will be propelled into the skin by an active *anode* (+). This process is called *cataphoresis*.

A lotion or gel marked (-) will have active *anions* (-), an example is a peroxide skin bleach (O_2^{2-}). An active *cathode* (-) will drive these into the skin. This process is called *anaphoresis*.

The terminology being somewhat confusing, please be careful when using either term.

The intensity of the current and the time of treatment are both critical. Too little of either will not push the ions far enough. Too much for too long will push them clear through the skin and they will be dispersed in the bloodstream. Read the instructions and follow them thoroughly.

Galvanisation through the body

Galvanisation through the tissues uses the ion movement to *stimulate* tissue activity. This movement of ions *stirs up* the cell contents and helps the passage of substances in and out of the cells through cell membranes. Stimulating the activity gives a "feeling of well-being" in the treatment area. This effect, together with the stimulation of the peripheral nervous system makes of the galvanic current a valuable preparation to passive gymnastics. There are machines available such as Impga 3000 that combine both treatments (galvanic and passive gymnastics).

COSMETOLOGICAL APPLICATIONS OF THE GALVANIC CURRENT: COSMETIC PRODUCT PENETRATION

Cosmetical applications of the galvanic or constant current are conditioned by the effects we already dealt with.

The current is sometimes used only for the beneficial effects produced in the organism, interpolar effects. This application is what we call galvanisation.

Polar effects are the basis of the methods called cosmetic product penetration and electrolysis.

In ionisation, galvanic current is used to introduce cosmetological ions into the organism through the skin.

In electrolysis, destruction of tissues is produced around the electrodes. The local caustic polar effects are used for the systematic and regulated destruction of different tissues.

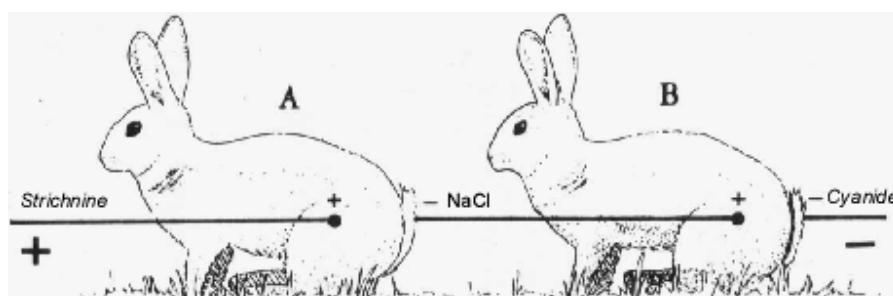
Apart from galvanisation and electrolysis techniques, we are going to focus on ionisation techniques. This is the already studied mechanism of orientation and displacement of ions from the poles, according to their charge, since the ions do not only take a specific direction with the passing of the current, but are also the ones in contact with the electrodes.

Negative ions can also be used, located on the cathode, i.e. the negative electrode, to reject them towards the anode, positive electrode, and this repulsion mechanism pushes them through the skin. For the same reason, those with a positive charge are located in the active electrode, under the positive pole or anode, and are attracted by the indifferent electrode or cathode, due to the repulsion from the active electrode. Furthermore, cataphoresis and anaphoresis phenomena occur, as we will study further on.

The fundamental condition is to find the cosmetics to be used in ion form, that is to say, electrolytes containing positive or negative electric charges.

Although in theory and practice, many substances can penetrate the skin by means of a direct current, there are limits to this procedure in comparison with other modes of administration: the dosage is not very precise, and many substances get lost in the electrodes.

In an experiment carried out by Leduc, two rabbits are placed in the same circuit. The current enters rabbit B through an electrode soaked in potassium cyanide connected to the negative pole and, from this rabbit, the current leaves by an electrode soaked in salt solution and leaves this rabbit through an electrode soaked in strychnine sulphate solution.



Leduc's experiment

If the current passes in such circumstances, rabbit A dies from strychnine poisoning, with its typical contractions, while rabbit B dies from the symptoms of cyanide poisoning. If we repeat this experiment with the same disposition of the electrodes, but changing the polarity of the machine, the current passes without causing any damage to any of the two rabbits, which shows that the penetration of the ions has been achieved thanks to the direct current and to the action of polarity, that the penetration is not done by contact: the ions are not spontaneously absorbed through the skin. It also shows that an ion introduced by the mechanism of ionisation has the same effects as if it was introduced by any other means of administration (oral, parenteral, etc.)

In any ionisation treatment, a series of **requirements** must be taken into account.

Apart from these requirements, that apply to any ionisation treatment, we will also tackle the application and position of the electrodes, active and indifferent, to get the best techniques of use of the galvanic current in the different cosmetological treatments on which we can depend nowadays.

TECHNIQUES OF COSMETIC PRODUCT PENETRATION

We have seen how the direct current can mobilise ions and introduce them into the body.

We are now going to see what are the fundamental techniques of cosmetic product penetration and their practical applications are.

In all these techniques we must always take into account the following **mainlines**:



Best way of applying
the ionising product
during a body
treatment

1. The client who is going to receive the ionisation must take off all the **metallic objects** in contact with his body (watches, bracelets, rings, necklaces etc.). Presence of a dental appliance must also be taken into account, as well as metallic contraceptive devices; the beautician will have to assess those factors.

2. If the **skin** to treat is very **greasy**, the grease will have to be removed with a cotton soaked in a neutral soap. This will not be necessary in cases where a previous cleansing of the skin would have been carried out, as occurs, for example, in descaling treatments. In these cases an appropriate cleansing milk must be used (oil in water emulsion with few fats and electrolytes).
3. When preparing the ionising product, if it comes in ampoule format, break the two ends and pour the content into an appropriate container, where it is diluted with distilled water. In case of a gel or an electrolytic solution, take the quantity indicated by the manufacturer. With your fingertips, moisten the areas to be treated with the ionising solution, particularly for facial treatments.
4. If there are injuries, erosions, spots, etc. in the places of application, these parts must be covered with little pieces of paraffin paper before placing the electrodes.
5. Place some pieces of double gauze, previously cut according to the shape and size of the active electrodes and soaked in the ionising solution, on the areas to treat. Once the gauze impregnated with the ionising solution are placed, put the active electrodes above, protected with spongy tissue covers.
6. These active plates covers will have previously been soaked in distilled water. Parasite ions are not introduced with distilled water, so the current intensity will only introduce cosmetological ions soaking the gauze. In addition, since the distilled water is hot, it will favour peripheral blood flow and avoid an unpleasant contact with the skin. On the other hand, the conduction of electricity is favoured precisely by this same water heating.
7. The sheaths covering the indifferent plates or attracting electrodes have to be soaked with a conducting solution. This solution may be tap water, due to the salts that it contains. However, sometimes because of the chemical treatment that the waters of the network undergo, they can contain ions that are not too convenient and that may produce alterations or allergies in the skin. For this reason it is preferable to use a conductive solution to soak the sponges of these plates or indifferent electrodes, for example, sodium chloride at 9 x 1,000, i.e. a physiological solution, buffered or not, Ringer's solution or, better still, a special solution composed of salts of weak acids and bases, duly buffered.
8. When placing the plates, active and indifferent electrodes with their corresponding soaked bands must be well fastened over the surface of the skin and in the areas indicated according to the treatment to carry out. For

a correct fixing, elastic bands intended for that purpose must be used, perfect adaptation to the relief of the surface of the skin must be ensured, making sure that no metallic part is in contact with the skin and that no corner of the electrodes is folded and that there is no space between the skin and the plate.

9. Choose a colour of cable for each type of electrode, for example, as is established conventionally, black for the active and red for the indifferent. Before connecting them to the appliance, fix the banana extremity to the metallic or rubber plates.

Very important: before connecting the cables to the machine, check that it supports the voltage of the current available (125 or 220 volts) and that the power control is set to the minimum, and to which terminal the positive and negative polarities correspond.

10. Connect the cables to the appliance following the instructions of the corresponding technique and turn on the machine with the operating handle.
11. Slowly turn the control of each outlet to the right until reaching the intensity indicated by the technique.
12. Sometimes a burning or tickling sensation may occur with a moderate intensity, which can be the result of an inadequate moistening of the sheaths, a bad positioning of the plates on the skin or a direct contact between a metallic and the skin.
13. Intermittently, and during the treatment, check the work intensity of the appliance, outlet by outlet, since the resistance that the body to the passage of the current often reduces and the amperage could go up more than is required. This increase in the intensity can also take place after a few minutes of direct current, that is when the cosmetologic ions have begun to orientate themselves and move towards the opposite electrode, which facilitates the passing of the current, reducing the resistance and increasing the intensity.

$$I = \frac{V}{R}$$

However, the appliances that are available nowadays like IMPGA 3000 have anticipated this circumstance, in such a way that once the work intensity of each of the outlets has been fixed, a special mechanism prevents the intensity from varying, even though the resistance of the human body decreases.

14. This is due to a possible variation of the tension, and if we remember the formula:

$$I \text{ (intensity)} = \frac{T \text{ (tension)}}{R \text{ (resistance)}}$$

15. We can perfectly check that when the resistance varies, if there is an automatic, compensable variation of the voltage, the intensity can be maintained constant. This, however, is within some limits, and there are some fluctuations of tens of milliamps that can be insignificant. Therefore, in these cases, with these type of appliances, constant watch can now be spread out more.
16. At the end of the session or when the technique indicates that a change of polarity is necessary before cutting the passing of the current or before working the inverter, the intensity of each outlet must be gradually reduced to zero.
17. Once the treatment is over, with the controls to zero, the appliance can be disconnected and the electrodes removed.
18. Once the electrodes have been removed, a slight reddening of the skin may appear in the treated area. This is completely normal and shows that there has been a real ionisation that will disappear after a short time.
19. At the end of the session, wash carefully covers and electrodes with soap and water.

WORK INTENSITY AND DURATION OF THE TREATMENT

The manufacturer of the ionising product must indicate the work intensity and the duration of the treatment. However, here are a few indications.

1. In the first place, the intensity to apply must be calculated according to the surface of the electrodes that we are going to use, and always starting from the basis that *the **minimum** intensity will correspond to 0.02 milliamps per cm² of active electrode and the **maximum** 0.05 milliamps per cm² of active electrode* (so that if an electrode has a surface of 100cm², the minimum work intensity with this electrode will be 0.02 by 100: 2 milliamps, and the maximum 0.05 by 100, 5 milliamps).

These minima and maxima depend on the resistance to the passing of the current, specific to every individual.

2. Another consideration is the following. An ionisation treatment using a current of 1 milliamp for 10 minutes lets penetrate half the number of ions introduced in a 10-minute treatment of 2 milliamps with the same product. Although this seems to indicate that the greater the intensity applied, the easier it will be to ionise the product, we must take into account that there is a limit in the minimum and maximum previously mentioned.
3. When using small electrodes, for example during facial treatments, the current is ten times lower, and minimum intensities will be used in case of descaling and facelift. With this type of electrodes (roller, pencil, ball, etc.) work intensities vary between 1 and 2,5 mA.
4. The treatment does not lose its efficiency if we work at a lower intensity for a longer time, that is to say, if we reduce the flow of ions and leave it applied for longer. A 15-minute treatment with an intensity of 2 milliamps produces the same effect than a 30-minute treatment of 1 milliamp. Logically, it is necessary to take into account that these considerations are different according to each type of ion, since the ionic velocity, characteristic of each ion, plays a very important role.

Safety in the galvanic beauty treatment

Galvanic beauty treatment is very easy to perform, but in the hands of an untrained or incompetent operator, it can cause intolerable and permanent damage to the client. It is very important to take all the precautions for an effective, comfortable and *safe* treatment.

Limits in the current intensity

For a better safety, the current must be limited to a *maximum* of:

0,3 milliamperes per square centimetre of contact electrode
(2 milliamperes per square inch).

The *total* of the current for:

Facial treatment must not exceed 3 milliamperes.
Body treatment must not exceed 8 milliamperes.

With the *proper* flow of current the client should feel a tickling sensation under the electrodes. IMPGA 3000 has an automatic control circuit for the current, limiting it to these values.

Always start a treatment with a current *lower* than the maximum tolerated, until the resistance of the skin has stabilized by itself. The current is then progressively increased to the *working level*.

Exceeding an excessively high current can result in a *burn*. *Alkaline burns* under the electrodes are very ugly, unpleasant and take a long time to heal. They can leave a mark for life.

Worse still are the *burns* of the *bones*. An excess of current going through the bone can carbonise it. A bone burn is very painful and slower to heal.

At the end of the beauty treatment

As we move towards the end of the treatment, the current must be *gradually reduced* to allow the completion of the chemical effects and prevent any chemical waste from remaining on the skin. Alternatively, reverse the current for the last moments of the treatment to *neutralise* the chemical waste.

Finally, if the client notices that the treatment produces an unbearable irritation in the skin, *stop* the treatment and reverse the current to neutralise the cause of the irritation.

CONNECTING THE ACTIVE ELECTRODES TO THE GENERATOR ACCORDING TO THE POLARITY OF THE IONISING PRODUCT TO APPLY

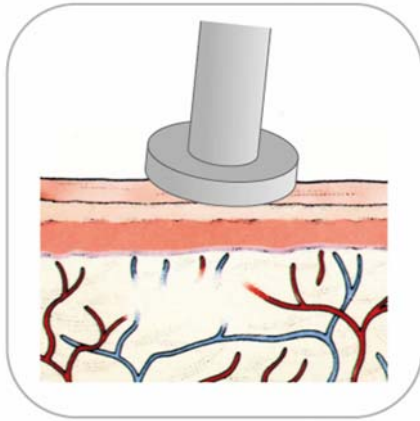
Although it is up to the manufacturer of the cosmetic to indicate the polarity of the product, in other words, if it is ionizable positive, ionizable negative or bipolar, always follow the fundamental, basic rule that is: ***Polarity of the product, electrode of the same active polarity, and the electrode of opposite polarity, indifferent or passive.***

For example, an ionising solution whose active ion has a negative electrical nature must be applied under an electrode connected to the negative pole of the appliance and the indifferent electrode, to the positive pole. The table below shows these points on intensity and polarity in graphic form.

Ionising product	MOISTENING		CONNECTION	
	Distilled water + ionising product in:	Tap water or conductive solution in:	Active electrode on:	Indifferent electrode on:
ACTIVE NEGATIVE ION -	ELECTRODE -	ELECTRODE +	POLE -	POLE +
ACTIVE POSITIVE ION +	ELECTRODE +	ELECTRODE -	POLE +	POLE -
BIPOLAR PRODUCT	ELECTRODES + and -		Indifferent, reverse the polarity half-way through the treatment	
Intensity		Minimum	Maximum	
active electrode		from 0,002 mA to 0,005 mA x cm2		
Mobile electrodos for the face		between 1 mA and 2,5 mA		



FACIAL DESCALING TREATMENT



We will begin giving specific instructions for a **descaling** facial treatment.

Descaling is advised for excessively greasy skins. Essentially, descaling is an ionisation allowing to get rid of the excess of embedded fat. This deep cleansing of the skin comes from the **saponification** of **fatty acids**, important components of the retained sebum, by means of sodium, magnesium and potassium ions as well as anions, above all carbonic, containing the ionising solution. It also enables to reduce the diameter of excessively dilated pores.

How to proceed

1. Put the ionising solution in an appropriate container.
2. Cover the metallic bar or indifferent electrode with cotton soaked in a conductive solution, drain it and give it to the client who will hold it firmly in his/her hand or place the indifferent plate on the arm with a conducting solution or tap water.
3. Moisten the client's face with cotton soaked in the ionising solution, especially in the areas with a greater quantity of grease and open pores.
4. Dampen the active mobile electrode with the descaling solution. If using the ball electrode, cover it with cotton.
5. Once the appliance has been checked in the way described previously, connect the cable of the indifferent electrode, that is to say the one the client will be holding in his/her hand, to the positive pole of the apparatus and the cable of the active electrode to the negative pole.
6. Place the active electrode on the client's forehead, connect the machine and turn the potentiometer control to the right until the milliammeter indicates an intensity included between 1 and 2 milliamps, without any trouble for the client. If the client tolerates it, it can be raised up to 3 milliamps.
7. Once the circuit is established, move the active electrode consistently and making circles around its axis, following the client's face and the direction of

the facial muscles, without separating it from the skin. Do not go near the eyes or the temples. Concentrate on the areas with more dilated pores and an abundance of grease.

8. The session must not last more than three or four minutes.
9. Finally, slowly slide the electrode towards the neck, below the ear, while slowly reducing the intensity of current down to 0 miliamps with the other hand.
10. Afterwards, disconnect IMPGA 3000 and remove the electrodes.
11. Later, apply the appropriate beauty treatment to reestablish the pH.

Important notes

Do not perform descaling more than once a month. If the cutis is extremely greasy, it can be carried out a maximum of twice a month. More sessions could cause the so-called *reactional fat secretion*: the skin feeling excessively cleaned off its grease, the sebaceous glands will produce a hypersecretion of sebum causing the opposite effect to that desired. Always end descaling with a pH balancer to avoid a reactional fat secretion.



BEAUTY TREATMENT OF BLACKHEADS AND SKIN IMPURITIES

This trouble of the sebaceous follicles is characterised by a regional eruption in adolescence, possibly caused by a state of sensitivity of the pilosebaceous system due to many possible causes:

- Superficial hyperkeratosis closing the pilosebaceous orifice.
- Hyperplasia of the stratum corneum surrounding the pilosebaceous follicle.
- Inflammatory process originated by the intrinsic composition of the blackhead.
- Excessive production of sebum.
- Presence of impurities.
- Presence of staphylococcus albus.
- Bacterial lipases of the previous microorganisms that develop irritating fatty acids.
- Endocrine factors.

Sick follicles are characterised by:

- Follicular canals dilated and full of keratinolipids and microorganisms.
- Presence of impurities in the skin.
- Presence of hair making the cleansing of the follicle difficult.

In this type of follicles two different forms of blackheads can appear:

- Those that can be expelled to the exterior by mechanical means, due to the fact that the mouth of the follicle is dilated (pimples).
- Those that are contained inside the follicle and can not be expelled to the exterior (sebaceous microcysts).

Although the doctor must be the one to diagnose and treat skin imperfections, especially with respect to the hormonal and antibiotic medication, it is well known that beauticians collaborate very effectively in keeping the skin clean.

There is a common point between the different cabin treatments: the use of keratolytic substances and/or regulating the sebaceous gland. Among the substances we can mention sulphur, used for centuries. Its drawback is its insolubility in cosmetic solvents and its action is therefore limited to its superficial keratolytic effect.

However, there is a method allowing the passage of the sulphur through the follicular canal up to the altered sebaceous gland.

We will proceed as follows:

1. Clean the skin with a lotion not containing any mineral oil.
2. Apply vapour with antiseptic aromatic substances (rosemary, sage, etc.).
3. Apply ionisation as described for descaling but using an electrolyte solution with a predominance of sodium thiosulphate, since the thiosulphate anion will penetrate through the negative pole, with the client holding the positive pole in his/her hand. The intensity is comprised between 1 and 2 milliamps.
4. Take care not to pass the electrode over the inflamed areas (papules, pustules). The client will notice the characteristic smell of sulphur liberated by ionisation. The session must last from 3 to 5 minutes and should take place twice a month at the most. When treating impurities, ionisation replaces descaling.

5. Afterwards, extraction of blackheads is carried out as is normal. To complete the effect of the sulphur, a face mask can be applied.
6. Finally, disinfect the area and apply a lotion or azulene cream.



FACELIFT

Another treatment where facial ionisation can be used is the facelift, cosmetic or electronic. For this type of treatment ionising products will be used for a cosmetic facelift or electrical current for an electronic one.

The electrodes vary also: needle, ball, roller, etc., each one with a specific application.



FACIAL DEHYDRATION TREATMENT

Dehydration process

Someone once said that our ageing is due to the inability of living tissues to retain water.

Indeed, with the passing of time, the water content in our tissues and organs decreases, causing a lack of turgescence and a minor capacity to eliminate toxins and catabolites: this is **ageing**.

Logically, the skin is not excluded from this process and also suffers the consequences of time passing, this circumstance being aggravated by its condition as barrier of separation between our body and the hostile and dehydrating external environment.

However, our skin has certain mechanisms that tend to limit the loss of internal water by evaporation and transpiration, without which the *loss* of water through the skin would be massive and fatal. These mechanisms are various:

- *Cutaneous lipids*. Due to their hydrophobia, they exercise a physical-chemical barrier to the flow of water through the epicutaneous emulsion in both directions.
- *Keratinous layer*. The special disposition of the horn cells and the characteristics of its membranes, as well as the maintenance of the keratin at the most of its isoelectric point, help to maintain a water content of between 12 and 15% in this external epidermic area.

- *Natural hydration factor.* It is formed by a little-known mixture of various substances produced by the cutaneous biological reactions, whose mission of retaining water is due to its hydrophilia. These substances include amino acids, sugars, organic acids, mineral ions, urea, etc.
- *Fibroblasts.* These cells situated in the dermis make the collagen and the mucopolysaccharides composed by fibres and the fundamental substance of the subcutaneous tissue. For their marked hydrophilia they are an important water reserve with 65 to 70% water.

Natural hydration process

We have seen how the dehydration process of the skin takes place. Now let's see what the natural hydration process of the skin is:

- *Internal factor.* Water continually reaches the epidermis from the deepest layers of the skin.
- *External factor.* A percentage of the water lost by sweating is reabsorbed, the epidermic water with keratinous structures and components of the natural hydration factor.
- Water absorbed by *capillarity* in the keratinous layer microstructure, called imbibition water, that performs a lubricating and plastic role with respect to the keratin, and confers a uniform appearance to the epidermis, smooth and elastic.
- United water remains relatively fixed in the epidermic structures, but the same does not happen with the absorbed water, easily evaporated by action of various external factors.

Factors contributing to dehydration

1. *Climatic.* They are very important, especially the summer dry atmosphere, high mountain, exposure to the sun and wind. The dry environment of houses and offices heated in winter or air-conditioned is also an important factor of cutaneous dehydration.
2. *Chemical.* The skin dries easily with the contact of organic solvents, alkaline soaps and detergents normally used.

- a. The use of inappropriate cosmetics to clean the skin can lead to the elimination of the hydrolipid film, the modification of the permeability of the stratum corneum or the disappearance of natural hydration factors. In this case, elimination of water is accelerated and the epidermis dries.
3. *Age*. With age sebaceous productions decrease, the cutaneous biological reactions slow down, lowering the rate of natural hydrating factors, and the fibroblasts produce less collagen and mucopolysaccharides. In short, the keratinous layer loses its water retention capacity with age, and on the other hand, the water coming from inside becomes less and less because of the degeneration of the water reservoir of the subcutaneous tissue.
4. *Diet*. Due to pathological factors or reductions.



Beauty treatment of dehydrated skins

This type of skin is mainly characterized by a rough aspect, for cracking or scaling easily, for being fragile and/ or irritable, not being very elastic and presenting a sensation of tautness.

As for beauty treatment, it is necessary to differentiate the **preventive** and **repairing dermohydrating** ones.

Preventive treatment. Apart from avoiding, where possible, very dry environments and excessive exposure to the sun, as well as contact with detergents and cosmetics, the beautician will recommend the use of cosmetic products preventing the lack of water in the skin.

These hydrating cosmetic products can act in different ways.

- **Direct action.** On the superficial layers of the skin by means of hydrating preparations containing hydrophilic substances capable of strengthening the natural hydration factors: amino acids such as glycine, hydroxyproline, arginine, etc; sugars, sodium salt from carboxylic pyrrolidin acid, sodium or glyceryl lactates, urea, etc.

Hygroscopic or moistening substances are often added, whose role consists in retaining the water in the stratum corneum the longest possible. Many have been tested, but the glycerine has been discarded; the most effective are Sorbital and mucopolysaccharides, among them hyaluronic acid which, thanks to its ability to retain water and its affinity with cations helps to maintain the water content in the *active principles appropriate for cutaneous dehydration treatment*.

Using zinc and titanium oxide is also advocated for their covering capacity and protection against solar radiation.

The excipient of these hydrating creams with direct action is generally an emulsion of external aqueous phase, and is applied during the day.

- **Indirect action.** Works on the epidermis, protecting it from evaporation by means of covering or occlusive preparations. They are unctuous like vaseline type ointments or emulsions of external oil phase, with an abundance of non-absorbable mineral oils such as paraffin and lipophilic substances that halt dehydration. Due to its greasiness, it is advised to apply this type of preparation at night, although it is not inconvenient to use it during the day on some extremely dry skins.

Face masks are also mentioned in this chapter, since they form an occlusion over the skin in a way that, by impeding transpiration, the water vapour reverts to the keratinous layer, hydrating it at the expense of the water lost by evaporation. However, this type of cosmetic must not be used for more than 15 days, except if there is a risk of excessive maceration of the horn cells with a loss of the protective capacity of the keratine. Incorporating hydrating substances in these masks is recommended: for example, amino acids, sugars, urea, etc. In a same formula both effects can be obtained, which is why products perfectly adapted to the needs of each type of skin can be obtained.

Although principles with a direct action (such as water and moisturizers) are desirable in every case, it is different with oils and other fat substances of indirect action, more indicated for the treatment of dry skins than of greasy complexions.



Hydrating refreshing treatment

When an important dehydration takes place because of the unfavourable factors already mentioned, we have to act in a more vigorous and remedial way. The occlusive and hydrating techniques of the epidermic surface are not enough, we have to act at the level of the water reservoir, that is to say, of subcutaneous tissue.

We have seen how the skin in senescence is poor in collagen, amino acids and mucopolysaccharides, and particularly in hyaluronic acid. Supplying these elements in depth is made difficult by their molecular complexity; it is then when the ionisation techniques can help us to achieve their penetration.

Indeed, using the technique of marked molecules, it has been shown that, after the ionisation, these elements are found in the depths of the skin, many of them even forming part of complex molecules (collagen fibres and mucopolysaccharides) originated from much simpler elements (hyaluramine amino acids, etc.). Due to their polyanionic nature, many of these molecules, get abundantly hydrated, causing a greater nutrition of the dermis and favouring the elasticity and the young and hydrated aspect of the skin.

Conductive excipients

Once the ionising active principles have been chosen, they must be incorporated to an excipient conducting the electrical current.

- Aqueous solutions.
- Polyethylene glycol creams.
- Carboxymethyl cellulose gels.
- Carbomer gels.
- O/A Emulsions with under 10 % fat.
- Gelicrem (O/A emulsion with a gelified aqueous phase).

IMPGA 3000: Appropriate equipment

The unit of galvanic and microgalvanic current of the IMPGA 3000 is the perfect tool for the beauty professional wanting to carry out a deep facial rehydration treatment:

Technique:

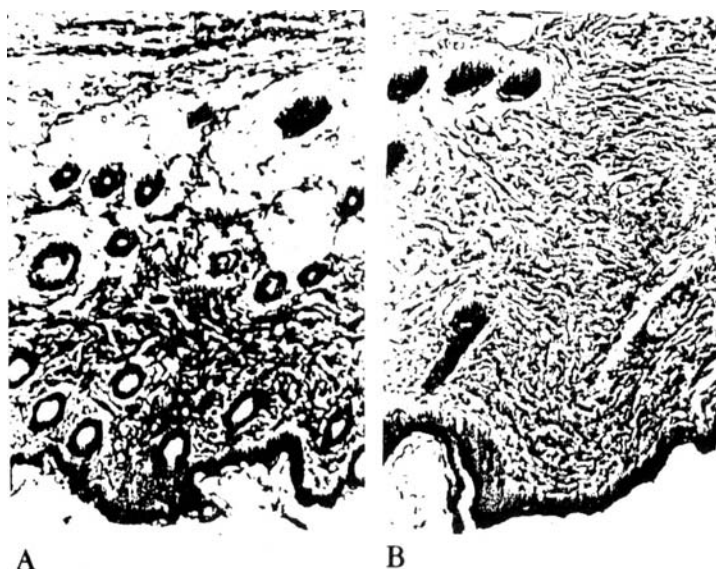
1. Clean the face with a makeup remover low in fats.
2. Apply water vapour with ozone, intermittently for 10 minutes.
3. Perform a soft peeling. If there are any blackheads, extract them a few days preceding the treatment, to avoid irritating the skin.
4. Moisten the skin with an isotonic conducting solution to increase conductivity.
5. Extend the deep hydrating repair cream chosen over the area to treat.
6. Slowly slide the roller electrode, connected to the negative pole, over the treatment area for 15 to 20 minutes with a work intensity included

between 1 and 2 miliamps. If it is necessary to put product over the skin again, stop the supply of the current momentarily.

7. Remove the surplus cosmetological product.
8. Spray a decongestive lotion made from marigold or chamomile, letting it dry over the skin. Massage with essential oils since the massage will facilitate the penetration of ions. The muscular stimulation can also be reached using passive gymnastics current, following the facial muscles.
9. Apply a mask with amino acids for 15 or 20 minutes.
10. Remove the mask with lukewarm water and apply a hydrating cream appropriate to the type of skin being treated.

This dermohydrating repair treatment must follow the following pattern:

- *In cabin.* One session every 5 or 8 days.
 1. Frequency: One or two treatments per year, one of which without fail after the summer.
- *At home.* Maintenance on alternate days, at night, alternating with nutritive creams and without forgetting the day protective hydrating base. With a galvanic pencil 5 minutes of ionization on alternate days will be enough. Apply a mask of amino acids every two weeks.



In animal experimentation with rat skin, the effect of 15 ionisation sessions with a collagen gel, amino acids and mucopolysaccharides can be observed.

Microphoto A: cut of skin of a witness animal without treatment.

Microphoto B: cut of skin of the treated animal. We can observe a better turgescence of the tissues and the formation of new fibres.

Ionising products with a hydrating effect

The table below shows a series of ionising products with an hydrating effect: polarity, applicable intensity in facial treatments and recommended duration.

PRODUCT	POLARITY	INTENSITY FOR THE FACE	DURATION
Hyaluronic acid hexosamine	"-"	1 to 2 mA	3' to 25'
Hyaluramine	"-"	1 to 2 mA	3' to 25'
Mucopolysaccharide sulphuric polyester	"-"	1 to 2 mA	20' to 25'
Collagen, elastin or amino acids	"-+"	1 to 2 mA	3' to 25'

Note that proteins of collagen, elastine and amino acids, due to the amino and carboxylic groups that they represent, have an amphoteric nature, and therefore their polarity depends on the pH and isoelectric point.

Certain amino acids such as hydroxyproline do not have a polar nature and thus cannot be ionised. Others, on the other hand, like glycine, arginine, lysine, etc. have positive (+) or negative (-) polarity, depending on the pH in which they are found.

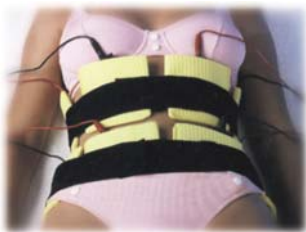
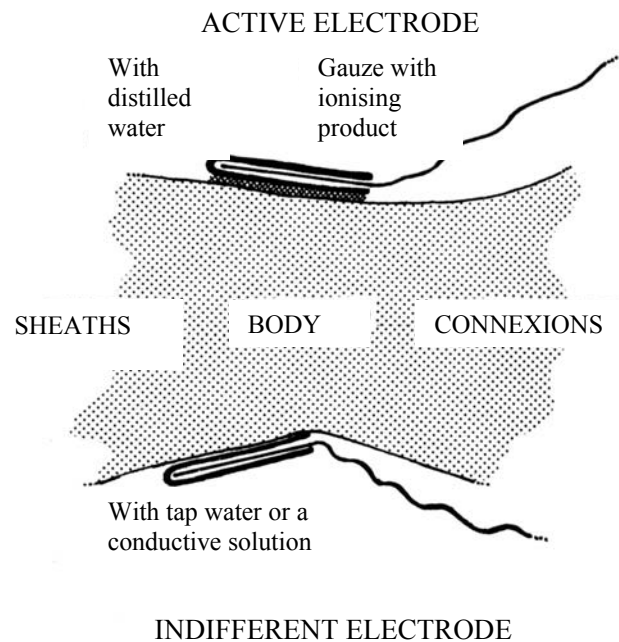


BODY TREATMENTS

Application of the electrodes in corporal mode

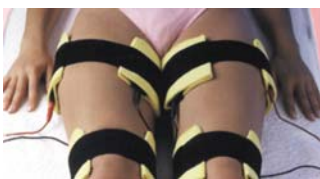
In body treatments, depending on the parts of the body we are going to work, dealing with cellulitis, flabbiness, overweight, etc., the plates will be put one way or another on the body.

As a general rule, we can say that they are two different ways of applying the active and indifferent plates.



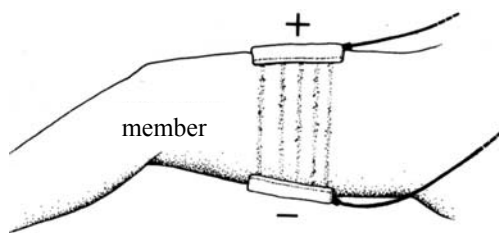
Juxtaposition

One of them is called **juxtaposition**, creating a field of current by electronic contraposition. In the image above we can observe how the positive and negative plate (opposed electrodes) are placed in such a way that the galvanic current goes through a large part of the body, arm, thigh or abdomen from side to side.

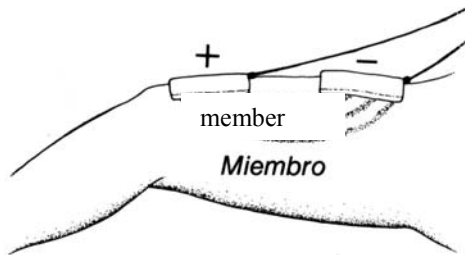
Lateral
positioning

Another type of application of location of opposed electrodes is called **lateral positioning**. The following figure shows how both plates, positive and negative, are placed on the same side of the member, conveniently separated and using subcutaneous microcirculation to shut the galvanic current circuit.

About the intensity to use in corporal treatments, always bear in mind the size of electrodes supplied by the manufacturer of the machine. Calculating this size and multiplying by the cm^2 of plate, for **0,02 milliamps** as **minimum dose** or **0,05 milliamps** as **maximum dose**, we will obtain the current intensity to be applied to each electrode.



JUXTAPOSITION



LATERAL POSITIONING

Generally, we can say that it goes from **2 to 5 milliamperes** for electrodes of **70 to 100 cm²**, and the number of electrodes is included between **4 and 8**.

The duration of body treatments is usually of **25 to 35 minutes** per session.

Among body treatments, those of the **breast** must be distinguished. Manual active electrodes are used due to the sensitivity in that area, always leaving the nipple and areola free from any contact with the ionising product and direct electricity.

The **indifferent electrode** is placed on the outside upper arm and connected to the pole of current opposed to the active. The intensity must be lower than that used for other types of body treatments. It is usually of **2 to 4 milliamperes** and lasts between **20 and 30 minutes**.

Next are some examples of **electrode positioning** for a correct penetration of cosmetic products in several body treatments.

- A corresponds to the active electrodes connected to the pole corresponding to the polarity of the product.
- I corresponds to the indifferent electrodes connected to the opposed pole.



FIRMING AND/OR ANTI-CELLULITIS TREATMENT

Among all body treatments, that of **cellulitis** is the most requested for women, since statistically, it has been shown that it affects **80 %** of women.

Cellulite or **orange peel** is the common name for a dystrophic affection of the dermal connective tissue and of what is medically referred to with various names, due to non clearly defined clinical, histological and histochemical characteristics of this syndrome: edematous fibrosclerotic panniculopathy, retroperitoneal fibrosis, panniculosis, lipodystrophy, etc.

Everything seems to indicate that cellulitis is closely related to vascular and hormonal disorders (estrone and progesterone, responsible for the hydric balance at dermal level) and, although it must not be confused with overweight, it also influences the alterations of adipocyte cells composing the subcutaneous adipose panniculis.

Circulatory irregularities, micro haemorrhage and the transudate are explained by sclerotic alterations in endoarterial formations that regulate blood flow.

It has been acknowledged lately that the activity of adipose cells is very intense and that the adipose tissue has an abundant peripheral blood flow; the eutrophic state of the subcutaneous tissue is linked with its normal functioning.

Without going into details within the etiology of this connective disease with anti-aesthetic consequences, we will only say that it comes from the intoxication of the area due to hereditary and hormonal factors, a poor quality of life, physical inactivity, contraceptives, etc., that entail a circulatory stasis (peripheral sanguineous), a formation of a nodule from a change in the constitution of adipose cells, a rupture of their membrane and an excess pressure produced by water retention from mucopolysaccharides of the connective tissue, all of which can cause lumps, nodules, orange peel and areas painful to touch.

To treat cellulitis, it is essential to change radically one's way of life with an appropriate diet, toxin elimination (tobacco, alcohol, etc.) and controlled exercise, all that being even more necessary if there is a hereditary conditioning.

Knowing this first conditioning, valuable results may be obtained with treatments of massage, balneation, meso-treatment, laser treatment, penetration of cosmetics or combinations.

In local cellulitis treatment, the **penetration of cosmetic substances** aims at directing the chosen product towards the cellulitic connective tissue, which will produce a normalisation effect and contributes to a better microcirculation.

Treatment:

1. Ionisation through the negative electrode "b", ten 25-minute sessions.
2. Applications with a manual massage "a".

A relation of ionising active principles appears at the end of this manual, including the appropriate ones for cellulitis treatment.

A comparative study of some anticellulite methods is included for your consideration.

COMPARATIVE STUDY OF SOME ANTICELLULITE METHODS

COMPARATIVE STUDY OF SOME ANTICELLULITE METHODS					
	Product composition	Polarity	I	Duration	umber of session
A	Water-soluble derivative Rockweed extract (alga)	–	Minimum 5 mA	20' to 25'	20 to 25 2 x week
B	Silicium organic derivative Manuronate (alga)	–	4 to 6	30'	5 to 20 2 x week
C	Hyaluronic acid Heparin sulphate Vegetal ivy extract Vegetal alga extract	– pH 6,7 ph 7,3			
D	Mare's tail (Si) Arnica Birch	+ y -			
E	Birch Marine algae Biological substances	–	Máxima 4	20' to 25'	20 2 x week
F	Alga concentrate Trace elements	–	5 mA	30'	
G	Alga extract Trace elements	+ pn=6	0,02 to 0,05 mA/cm ²	15' to 20'	20 2 or 3 weeks

The penetration of cosmetic substances must be considered as a technique against the pathology of cellulitis, but must go jointly with other methods since, as a single beauty treatment, the results are usually quite discreet. Although the objective of this manual is to inform you on the proper way to use galvanic current in Aesthetics, we will not look down on other treatments that, added to penetration of cosmetic substances, actively contribute to obtain the good result looked for.

Before performing a treatment of cosmetic product penetration, it is necessary to differentiate the type of cellulitis we are going to treat. A customer sheet must be filled in, with the following:

- How long this alteration has been present
- Whether it is painful
- Whether there is family history with the same problem
- Whether there are varices
- Whether the client holds a sedentary function
- Whether there are defects in the dorsolumbar column or any other static problem (flat feet, knock-knee)

With this information we can assess the success of our treatment.

1. For the **first step** of cellulitis, **swelling** (peripheral venous congestion), the treatment will be achieved alternating cosmetic substance penetration with a cryo-treatment (cold bands) that, due to its vasoconstrictor effect, reduces the inflammation, provokes an easier exudates resorption and improves microcirculation. The rhythm to follow is two sessions of cosmetic substance penetration and one session of cryo-treatment every week.
2. For the **second step** of cellulitis, **swelling and fibrosis** (the typical swollen tissue starts to form), the cosmetic product penetration will be combined with the aesthetic application of fango or clay with alga extracts or flour. Clay and alga applications absorb the liquid accumulated in the flooded tissues eliminated through ducts of sweat glands or activating the renal (diuretic) function.

The proportion of clay and crushed algae will be the same. The same quantity of iodised potassic salt and a phial of a cellutic compound (organic silicium or fucus and kelp extract, a variety of alga) will be added to this mixture. A homogenous paste, similar to a mask, will form, to extend on the area to treat and then wrap with a disposable plastic and cover with a thermal blanket or let it work under an infrared lamp, for half an hour. Afterwards, remove everything in the shower and start massaging, in this case for toxin elimination.

If the client suffers from varices, do not carry out this treatment. However, cryo-treatment is indicated. The frequency of this treatment will be three times weekly: penetration – cataplasma – penetration. A hydromassage session (spa) will be carried out once a week following the parafango.

3. During the **third step** of cellulitis, where real nodules are present as well as **flabbiness**, the ideal beauty treatment is CEYA:

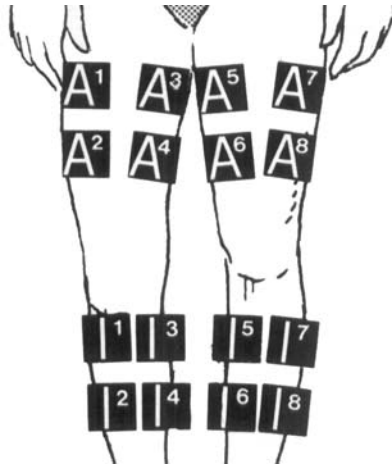
CEYA biological effects are:

- a direct action on the formation of tropocollagen
- a better cellular regeneration
- contribution to microcirculation
- normalisation of the membrane potential
- improvement of the absorption of interstitial liquid
- muscular toning by a direct action on the acupuncture energy points.

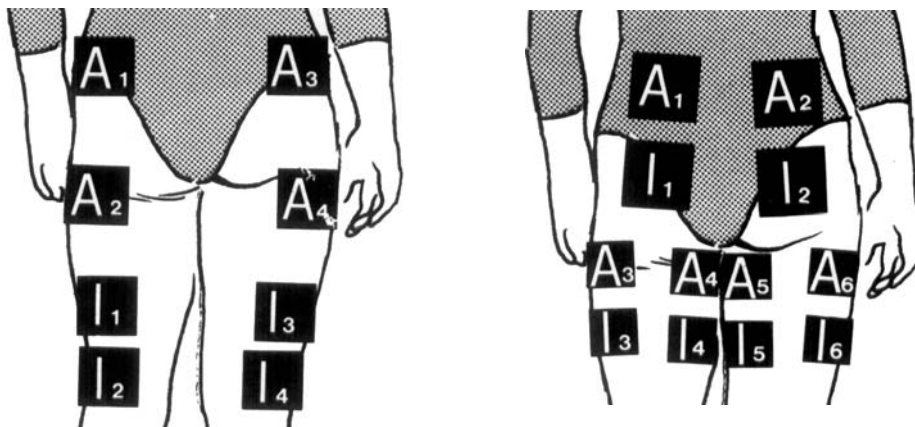
The rhythm to follow is three weekly sessions, CEYA and massage in the first one, penetration of cosmetic substances in the second one and again CEYA and massage to finish. There must be a total of 30 sessions, of which 20 CEYA and 10 of cosmetic product penetration. The work intensity must be tolerable for the client at all times.

Besides these treatments, the client must follow a diet and do some physical activity (gymnastics or walking) to avoid flabbiness and activate muscle tonus. Always drink 1 ^{1/2} a 2 litre of water a day between meals. Attend to possible constipation. Use an anticellulitis cream daily at home.

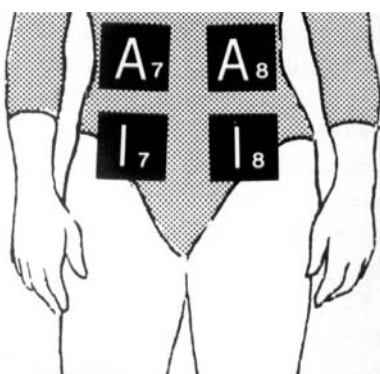
The location and connexion of active or indifferent plates to the apparatus producing galvanic current, the work intensity and application time depend on all the information mentioned before and to the corresponding figures.



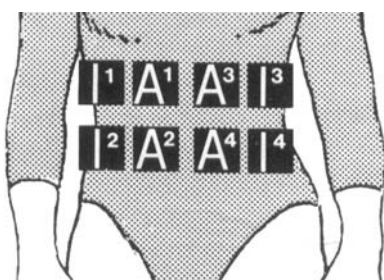
Firming and/or anticellulitis treatment of the legs, with a machine, including 8 outputs.



Firming and/or anticellulitis treatment of the thighs and buttocks



Firming and/or anticellulitis treatment of the abdomen.



Location of the plates for a treatment of the abdomen



TREATMENT OF SKIN INAESTHETICISMS

Treatment of skin inaestheticisms, together with the breast, is, without a doubt, the most complex to treat in cabin, since the final results are difficult to assess, seen that most customers, seeing its slowness, do not go on with the treatment.

Apart from its difficulty, the penetration of cosmetic substances and CEYA are two good allies of Aesthetics and with them very acceptable aesthetic effects can be achieved, depending on the type, the time of formation and the age of the client.

The products used in cosmetic substance penetration are not medicine: they have a typically cosmetological action, that is to say, hygienic and protective. On the other hand, CEYA has a refreshing function on the skin thanks to its biological effects among others.

The **beauty** treatment will be the following:

- 1º. Perform a **soft peeling** in every session to eliminate damaged cells that hinder the renovation of new cells for lack of tissue oxygenation.
- 2º. Apply the active product on each mark with a small brush. In this case centella asiatica can be used, stimulating the capacity of the fibroblasts, in charge of the tropocollagen formation, which will help to form the granulation tissue.
- 3º. Once the product has been applied, perform ionisation using the anti-wrinkle pencil electrode and work on each inaestheticism one by one, for a total of 20 minutes, with an intensity of 2 mA and the polarity indicated by the manufacturer of the product. In this particular treatment, it is applied on the positive pole. Afterwards, we will apply a compound based on hyaluronidase and glycine (enzyme and aminoacid respectively), which function is to potentiate the penetration of substances within the skin and improve its aspect, since glycine is a component of collagen. Apply 4 fixed plates during 15 minutes.
- 4º. Using CEYA would be very helpful since the energy would multiply the effects of the treatments and the results would be very interesting.

Apply a high (but tolerable) power and follow its path. Finishing by wiping lightly on the surface with inaestheticisms.

If we work properly with CEYA, the sequential treatment order will be the following: peeling, penetration of cosmetic products with fixed plates and with the pencil electrode mark after mark, CEYA and massage.

The frequency of the treatment will be **2 or 3 applications** per **week** with a total of **20 to 30 sessions**, according to the evolution of the case.



TREATMENT OF THE BREAST

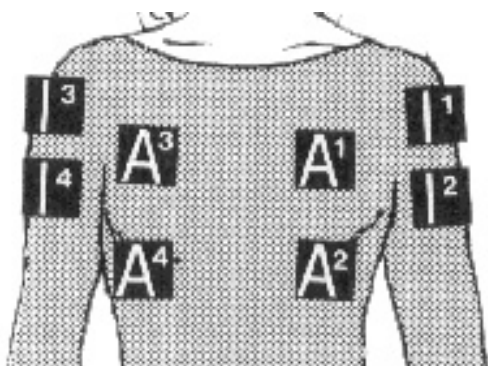
In breast treatment, the cosmetic products to use vary according to the effects wanted. For example, if we want to reduce voluminous breast, it is recommended to use preparations containing vegetal extracts of fucus and ivy for its reducing effects, while applying plasma proteins for a regenerating and astringent effect.

If the breast is small, fucus and ivy extracts will be replaced by collagen hydrolysate and placenta extracts, aminoacids whose nutritive action will improve the skin tegument, and mare serum, that has a nutritive and tensor effect.

Next is an example of how to carry out a **breast treatment** in which we will use **ionisation**:

- 1°. If there are no cutaneous imperfections in the breast, only carry out a **peeling** when starting the treatment. Clean the area treat wit ha neutral soap without any synthesis detergent to respect the natural equilibrium of the skin as much as possible.
- 2°. Once half of the ionising product has been **manually** applied, soak sterilised gauzes with what is left of the preparation and place 4 fixed plates in semi-circle; place the two active electrodes on the higher part of the breast and indifferent ones on the lower part and keep the current at an intensity of 3 mA for 15 minutes, always taking into account the size of the electrode used.

If the client is sensitive to the current, mobile electrodes (rollers) can be used for ionisation, in which case the time of penetration of cosmetic substances will be twice as long, a total of 30 minutes. The indifferent electrode will then be located one on each arm or just one on the stomach.



Treatment of the breast

3°. Later, to make the most of the same semicircular plate positioning than those used for ionisation, perform **passive gymnastics**, and to treat the wide dorsal, rhomboid and infrapinatus muscles, as shown on the figure.

4°. In this phase, the beauty professional with a CEYA apparatus at her disposal can use this beauty treatment locally around the mammary gland.

If the beautician does not have CEYA, a UVA session can be done to supply Vitamin D and activate the melanin.

5°. Next a massage will be performed with toxin elimination and smoothing manipulations, using essential oils. If the CEYA is not used, apply high frequency for five minutes.

12. To finish, use an ampoule with a mare serum base to serve as a protective base.

TRANSCUTANEOUS ABSORPTION

We know that the transcutaneous absorption process is the passage of an exterior element through the epidermic barrier to get to receptive areas of our skin.

We know it is difficult to introduce specific cosmetics through the keratinous layer and the electrophysiological barrier of Rein and so we always look for the way to manage to act on the deep parts of our skin with active elements, with principles that bring us a cosmetological advantage.

In this sense, we must also say that there are some obstacles to the penetration of the ionising products or electrolytes.

BEHAVIOUR OF A SUBSTANCE GOING THROUGH THE SKIN

1. The substance "rushes" to the pores.
2. The substance "forms a deposit" in the deep layers of the skin.
3. The substance "passes" to the bloodstream.

First, the keratinous layer makes the passing of the current difficult due to the fats that cover it, to the keratin that forms the horn cells and to the scarcity of water and electrolytes. Therefore, this layer presents a difficulty to the passage of the ions.

Our skin offers an area of orifices or solutions of continuity as the sweat glands or the pilosebaceous follicles can be. The electrical current will use these structures to transport the cosmetological ions inside the skin. Once this initial obstacle is cleared, the ions spread across the glands and the periglandular orifices, towards the cells of the Malpighian layer and the dermis.

With regards to the cells, their wall, due to its scarce water content and fatty composition, offers great resistance. The current will preferentially pass through the intercellular spaces and through the flows of the connective tissue where there are few partitions.

In the greater or lesser penetration of an ion, its size is important, although the experiences are sometimes contradictory. For example, the salicylic ion, of high molecular weight, can pass easily. What matters, as we will see later, is that it does not lose its nature of ion, i.e. its electrical charge. Thus there are ions that remain in the same pores of the skin, for example, the manganic ion, which forms thick grains with the pores, which remain fixed in the epidermis. The phenomenon of cataphoresis, which we already mentioned, is also very important. We have seen how water accumulates in the negative pole and the cathode. Many substances such as the alkaloids, saccharose, etc., are transported to the cathode the same way.

The fact that electrophoresis is not more effective with concentrated solutions than with diluted solutions indicates the importance of cataphoresis, since it is more intense in these circumstances. The importance relating to each factor is not well studied, but it seems that, when we deal with the movement towards the cathode, both mechanisms – ionisation and cataphoresis – join, thus contributing to the penetration of substances from the anode.

Bear in mind that the majority of cosmetological ions have a negative electrical charge and must therefore be introduced into the body by applying the cathode, or negative electrode as active, when the major penetration is obtained with ions through the anode.

As a conclusion, we could say that positive ions penetrate more easily through the skin than negative ions.

Once the ions have penetrated the body, they do not seem to reach very great depths. From this point of view, the ions can be classified in two groups: those that stay in the place where they penetrated and remain there without spreading (these are called **non-diffusible ions**, like for example coloured ions, etc.), and others that, introduced in the body, through the body. These are called the **diffusible** ions, as occurs with strychnine and iodine, as the most typical.

When an ion enters the organism it comes in contact with the blood, lymph, humoral liquids, interstitial liquid between the cells rich in electrolytes, and these dispossess the introduced ions of their electrical charge, depriving them of their ionic state, with which the journey has ended. They can combine and exercise the effect characteristic of their chemical composition. If these are heavy metals, for example, as they remain with no ionic character, they

combine with the proteins of the plasma and the tissues to form insoluble compounds that remain fixed. Other ions move without fixing, moving within the organism: they are what we call diffusible ions.

Apart from that, the ions are introduced in very small quantity. Each one of them moves at a speed determined by the intensity of the current, increasing when this intensity grows, and by the distance to cover: the more an ion travels within the electrolyte, the slower its velocity is. The interruptions of galvanic reduces the journey and the ionic velocity, since each time the current stop passing, ion has to overcome inertia when the current starts flowing again, which makes its journey through the tissues much slower.

At the same time, this ion movement constitutes the substrate of the electrical current, and as the ions that travel fastest are, among the positives, hydrogen ions and among the negative, hydroxyl ions, most of the current is carried by these two types of ions. In addition, these ions are more abundant in organic liquids, and because of this the cosmetological ions are introduced in the organism in very small quantity. The most normal is that the ions act at low depth and, because of this, they are generally used locally and very rarely for a general treatment.

However, the existence of a general action has been confirmed even for non-diffusible ions, which shows that physical experimentation cannot always be literally applied to practical use.

This local action is enough to justify ionisation. The peculiar character of ionisation lies in the accumulation of ions in the superficial layers of the skin, where more or less stable combinations and unions form with the elements of the tissues, generating a deposit expanding these ions, which work little by little and later move to the general circulation. There are different forms of action:

1. **Immediate local action** of ion penetration and activation in the first layers of the skin.
2. **General action** on the whole body.
3. **Deferred** or delayed **action**, by liberation of the previously fixed ions.

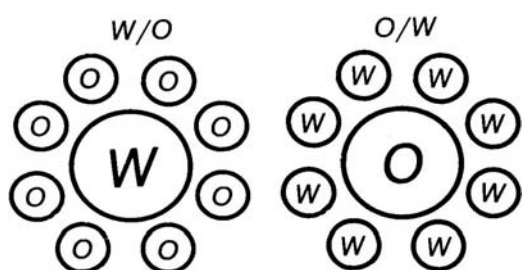
Ions are eliminated, as any cosmetic, by natural ways, according to the nature of the ion. The first proof that the ions were really introduced into the organism was the verification of its presence in the urine, as Lavatud did, demonstrating lithium elimination by studying its spectral line in the urine.

Studying ionic velocity is very important, and every formulator of ionising cosmetics should be aware of the speed with which cosmetological ions move, so that the beautician can precisely know the time of application and the intensity that must be given to the treatment.

TABLE				
IONIC VELOCITY				
Meaning Interest of its knowledge		Areas to treat	Time required	Specific intensity
Electrophoretic method. With dioximethylcellulose gel + Ci NA.				
SUBSTANCE	INTENSITY	POLARITY	TIME	DISTANCE
Iodine	2,5 mA	-	15'	1.2 cm.
Escine	2,5 mA	-	15'	2,- mm.
Benzidamine	2,5 mA	+	15'	2,- cm
Mucopolysacchari	2,5 mA	-	15'	0.5 mm.
Alphachymotrypsi	2,5 mA	+	15'	1,- mm.

ESSENTIAL REQUIREMENTS

A product can be ionised if it has a defined electrical charge, negative or positive. For this reason ionising products must be electrolytic solutions. When a substance, when dissolving in water, produces ions, some charged positively and others negatively, they can be introduced through the skin by means of direct or galvanic current. The charge polarity or sign of the cosmetological ion must also be indicated by the manufacturer of the ionising solution.



W → Electrolytes

O → Dielectric medium

For example, ointments or creams of external oily phase cannot be ionised. On the other hand, gels can be ionised, being colloidal substances swelling in water, containing electrolytes dissolved in that water. As for creams of external aqueous phase, due to the fact that the continuous phase is the aqueous phase, they have or can theoretically have a certain ionising power, though we must always bear in mind that the fat phase

although internal, will oppose the passing of electrical current.

From the wide range of ionising products available, we must only focus on those having a significance for the skin, or, to phrase it differently, when choosing ionising products, we must be aware that not all ionic compounds interest the human organism, although they come from organic fluids and are easily diffusible, and neither are interesting the substances that, applied uncontrollably, can cause reactions of rejection or toxicity at cellular level.

In general terms we can say that only water-soluble active chemical compounds with defined electrical charges, that are not toxic and whose ionic forms possess adequate size and structure for its passage through the epidermis can be used in aesthetic ionisation.

There are innumerable substances and mixtures of these suggested for ionisation. We will later show the relation between all ions with a cosmetological effect, and in this relation we will indicate wherever possible, the polarity, the intensity with which the treatment must be applied, the duration time, the number of sessions, the cosmetological activity of the proposed ion and the use for which it is intended.

This is a non-exhaustive relation, and we are not going to indicate the mixtures or combinations that can be made with some of these ionising products. The manufacturers of the ionising products who have tested the efficiency of these mixtures are the ones who must suggest their use for specific treatments.

To remember what are the indispensable parameters to be able to work and obtain results with a particular ionisation treatment, we must observe the following rules:

1. The product must be of pure to allow its movement. In case of a mixture, all its components must satisfy this condition and, besides they must not interfere with each other.
2. A thorough cleansing of the area to treat is necessary, degreasing it with neutral soap.
3. Choose the appropriate electrodes, both in shape and size, according to the treatment to carry out.
4. Be familiar with the exact polarity of the product to ionise and place it under the electrode connected to the same polarity as the product.
5. Be familiar with the exact intensity to apply in the treatment, being able to distinguish a facial from a body treatment, a treatment of the breasts, etc. That intensity must be gradually increased until its

maximum value and then to maintained during the whole treatment without apparent variations.

6. Establish the duration of each session, closely linked with the ionic velocity and the applied intensity. As a reference, an approximate time of 15 min. minimum and 30 min. maximum for body treatments.
7. The number and frequency of sessions are other parameters to establish. This is closely related with the ion cosmological activity or the mixture of ions and with the experience of the good results obtained.

ESSENTIAL REQUIREMENTS

- 1. Purity of the product to ionise.*
- 2. Skin cleansing.*
- 3. Size and shape of the electrodes.*
- 4. Polarity.*
- 5. Intensity.*
- 6. Duration of the session.*
- 7. Number and rhythm of the sessions.*

DANGERS AND CONTRAINDICATIONS OF IONISATION

Although the machines used for the application of galvanic current are supplied with an appropriate and therefore minimum voltage, we cannot take it for granted that using this type of electrical current is totally harmless, and the beautician must bear in mind the **dangers** and **precautions** to adopt to avoid them.

In general, we can say that the dangers and contraindications of the ionisation are due to three main factors:

1. **Those that can be derived from the ionising product.** The beautician will have to must trust the manufacturers on this point, who will have assured that, firstly, that product cannot be an important allergen, and secondly, that it is not toxic for the human organism. If it is the case, the dangers that can be derived from this product are already controlled.
2. The problem of **burns** that in 90% of the cases are of a *chemical* type due to the electrolytic products formed under the poles of application.

These burns are almost always produced by a disproportion between the intensity applied in the treatment and the surface of the electrode used.

If we perform a treatment and we make a mistake when calculating the intensity, that must be included between **0.02 to 0.05 milliamps x cm² of electrode**, this will provoke an excess of intensity; this is when there is a risk of burn.

Although the calculation of the intensity to apply is correct, a burn can occur because of the bad distribution of electricity in the electrode, that can be due to the fact that the electrode is deficient (rusty, badly adapted, with greater resistance to the entry of the current than in the rest of the plate) or because of the direct contact between the metallic part of this electrode and the skin (for example, a part of the plate coming out of the cover). The electricity thus concentrates in that point and a burn can take place.

As it is the ionising product that conducts the electricity, the gauzes that we place under the electrodes must be uniformly soaked with the product, and we must always take care that this moistening is constant. Then we have to make sure that the electricity, the intensity applied, is spread out equally in the whole electrode, avoiding a risk of chemical burn.

In the same way, it is important to soak the plate sheaths with a conductive solution without any acid salts or strong bases to avoid a possible burn under the electrodes.

There is also the possibility of producing internal burns in those people wearing metallic elements in their bodies. Assuming that we are treating a thigh and that, due to an accident, there is a metallic pin in its femur to support the fracture. If the current that circulates from one plate to another comes across a good conducting element, this can produce an internal burn.

In metallic dental appliances, since we work with very low intensities and usually with mobile electrodes, there is no burn but a somewhat unpleasant and a metallic or sour taste, according to the electrode used at that time.

While mentioning metallic objects in the body, it is necessary to pay great attention as to whether – and we must always ask the client – they use a metallic IUD system as contraceptive. If so, all types of abdominal treatments are banned in these people. If the DIU is made of plastic, ionisation can in some cases be applied with the plates placed sideways.

3. Another danger of the galvanic current is not due to the ionising effect but to the effect of movement that it can have at times. This occurs when the controls are not on zero when connecting the electrodes. A sudden

movement of the current thus takes place, which will, although it is a direct current, produce an unpleasant muscular excitation. Even more serious is the shock produced when the inverter is pressed without having set the controls at zero.

This problem has been completely removed from IMPGA 3000, since it includes an electrical protection mechanism that prevents a sudden circulation of current when an output is open. To carry out the treatment, it is indispensable that the outlets of IMPGA 3000 be on zero.

In general, it is dangerous to put the plates in a position where the current will find the heart on the way from one plate to another, and great care must be taken when lowering the controls to zero before pushing the inverter when working in the area of the thorax. Producing a contraction out of synchronisation with the heart can be very serious.

OTHER POSSIBLE INCIDENTS LINKED WITH IONISATION

Ionisation has contraindications as well as incidents in its application, due to defects in the technique. The main contraindications are:

- Application over injured skin.
- Ionisation of varices because they are very good conductors of the current.
- Use of tap water in solutions (for the chemical effect of the ions of the added products in the water from the network).

CONTRAINDICATIONS

- Pregnancy (even recent).
- Postpartum (quarantine).
- Troubles of the skin.
- Cardiovascular anomalies.
- Mammary pathology.
- Precaution in cases of hepatitis, diabetes, external and internal scars.
- Do not use on people with **pacemakers or any other active implant**, for the risk of interferences with this device.

CLIENT'S GENERAL STATE

During and before any ionisation treatment, the beautician must enquire on the client's general state and refrain from performing any type of treatment unless otherwise specified by a medical prescription in the following cases.

For **pregnant women**, even recently. With women in the postpartum period, and before regularised menstruations. In people that suffer skin diseases of an irritating nature especially if these affections are located in the areas where the electrodes must be applied (special attention must be paid to people who, although they are healthy, have been exposed to artificial sun, UVA.) We must also bear in mind that ionisation cannot be performed on those persons who suffer **cardiovascular affections**, nor in the area of the thorax, where they are completely forbidden.

Ionisation cannot be performed on people suffering or having suffered from **hepatitis**, diabetic, women with **internal** or **external scars**, and with regards to the breasts, ionisation is totally contraindicated on women with any type of mammary pathology.

Speaking of breast, ionisation is also forbidden when the **product** to ionise is of **estrogenic** type, in women under 20 or in post-menopausal women.

Preparation of the client

Besides the usual contraindications, the *sensitivity* of the area to treat must be observed. It is essential that the client be capable of responding to the sensation experienced during the treatment. This means that the treatment must not be carried out in any area in which there is a lack of sensitivity, that is, an *anaesthetised area*.

The treatment area must be inspected to discover signs of cuts, scratches or injuries. The damaged epidermis could have a greater *water* content, and therefore, be *more conductive* than the skin that surrounds it. That could cause an excessively high current channelled through the affected area. These injuries will have to be isolated by means of a covering of soft paraffin or petroleum jelly.

As a preparation to galvanisation of the organism, the areas of the body where the electrodes or plates are going to be applied must be carefully washed and dried. This is performed in order to remove the sebum and to level any variation of the resistance of the skin. This procedure must also be followed when the indifferent electrode is applied.

However, this process needs not be carried out before *cathiodermia*, since one of the effects of the *active cathode* is to eliminate the excess of sebum. It must be remembered that, on producing this effect, the *resistance of the skin will be less* and therefore, the flow of the current across the skin will tend to increase. It could rise above the safety level, this is why a great attention should be paid to the so you should pay attention to the milliammeter.

Warn your clients about the *taste*, especially when working on the face. If they have fillings, the current will slightly dissolve the metal, enough to produce a metallic taste in the mouth.

Ensure your clients that their fillings are not going to disintegrate, but if the taste becomes intolerable, be ready to stop the treatment.

PRODUCTS

- a. The function of the products used to impregnate the plates in passive gymnastics is to improve the electrical contact plate-client. The product should be in gel format for a more effective transmission of the electrical movement.
- b. The products used in galvanic treatments can have properties applicable in the field of aesthetics. As ionising products, they can be introduced by ionisation through the positive or negative pole, depending on the nature of the product supplied by the manufacturer. To avoid mistakes, always put the product in the positive (red) electrode.

Ionising products through the positive pole



- If the product is ionised through the positive electrode, the inverter (15) must be in the *normal* position (product on the red “active” electrode).

Ionising products through the negative pole



- If the product is ionised through the negative electrode, the inverter (15) must be in the *inverted* position (product on the red “active” electrode).

Product on the “passive” electrode (the electrode without product)

The “passive” electrode is in this case that which is connected to the black cable. There is no need for a treatment product on this electrode, since the surface of the body under this electrode does not receive treatment.

Nevertheless, it is necessary to put some solution on this electrode so that the current circulates. NEITHER TAP WATER NOR SALT WATER MUST BE PUT IN THIS ELECTRODE. These options could produce chemical burns.

Unfortunately, distilled water is not a valid option either since it conducts the current poorly. The ideal is to put a chemically neutral aqueous solution remaining neutral even after the current has passed, typically a product that is chemically a BUFFER. This type of product can be found in gel or solutions. Without such products, the passive electrode, the black one, could produce chemical burns.

The use of a buffer solution is unnecessary, logically, when working with bipolar products.

If you do not have the appropriate product for the "passive" electrode, you can work as follows:

- Put active product ON BOTH ELECTRODES.
- CARRY OUT THE TREATMENT AS IF IT WERE A BIPOLAR PRODUCT.

This second option prolongs the time of treatment, but only the parts of the body covered by BOTH plates receive the treatment.

NB. The procedure described is not the only one, but it is the easiest to use and the least prone to mistakes.

Bipolar products

There are products in which both positive and negative ions can be used. In this case, the areas of the body under the positive (red) electrode and the (black) negative electrode receive the effects of the treatment.

The procedure to observe is the following:

- Put product on **both** electrodes.
- Start the first phase of treatment with the inverter on position **normal**.
- Lower the intensity until reaching zero and wait 5 minutes before starting the second phase (*see note*).
- Put the inverter (15) in the **inverted** position.
- Rise the intensity again to the value selected and start the second phase of treatment.

Note. It is recommendable that the second step of the treatment be of the same or less duration than the first. The interval of five minutes between the

first step and the second is given as an orientation. Consult the manufacturer of the product for any doubt.

DESCRIPTION OF DIFFERENT TYPES OF PRODUCTS FOR IONISATION:

- A) Ionising products with a defined polarity.
- B) Products with an undefined polarity.

A) Ionising products with a defined polarity:

IONISING PRODUCTS WITH A DEFINED POLARITY				
Product	Concentration	Polarity	Duration	Indications
Adrenaline	2%	+		Peripheral circulatory troubles
Alpha chymotrypsine	3 U x 10 c.c.	+	30'	Cellulitis
Benzidamine CIH	0,5 %	+	30'	Cellulitis
Bromelain	0,040 x10 c.c.	-	30'	Cellulitis
Sodium carbonate	0,1%	-		Descaling of greasy skins or impurities
Chloramphenicol sodium succinate	10%	-	5'	Skin imperfections
Zinc chloride or sulphate	1%	+		Disinfectant
Escine	0,1%	-	3	Rosacea - Cellulitis
Fibrase	10%	-	35'	Cellulitis
Phytosterol (alpha and beta)	0,5%	-	20'	Breast flabbiness
Alkaline phosphatase	0,1%	-	5' à 30'	Skin aging

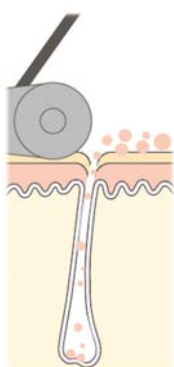
Hyaluronic acid hexosamine	0,2%	-	3' à 25'	Cutaneous flabbiness
Hyaluramine	0,1%	-	3' à 25'	Cutaneous flabbiness
Indometacine C	0,5%	-	35'	Cellulitis
Potassium iodide	1%	-		Anti-arthritis Overweight
Mucopolysaccharides sulphur polyester	250 Ux10 c.c.	-	25'	Cutaneous flabbiness
Magnésium thiosulfate	10%	-	3'	Cutaneous imperfections
Thiomucase	100 U. TRU x phial	-	35'	Cellulitis

IONISING PRODUCTS WHICH POLARITY DEPENDS ON THE Ph OF THE SOLUTION OR OTHER FACTORS

A) Vegetal extracts from	Polarity	Main component	Use
Algae (rockweed)	- o amphoteric	Iodine	Cellulitis
Arnica	amphoteric	Arnicine	Circulation activator
Birch	Amphoteric	Tannin	Diuretic
Calendula	Amphoteric	Carotenes	Sedative
Chestnut	Amphoteric	Glucoside and tannin	Vasoconstrictor
Mare's tail	Amphoteric	Silicium and aconite acid	Diuretic, anticellulitis
Hammamelis	Amphoteric	Tannin	Astringent
Ivy	Amphoteric	Glucoside (Hederin)	Lypolitic
Hypericin	Amphoteric	Ceryl alcohol	Cicatrizant
Hop	Amphoteric	Terpenes and tannin	Estrogenic effect
Mallow	Amphoteric	Mucilage	Emollient
Chamomille	Amphoteric	Azulene	Anti-inflammatory
Rosemary	Amphoteric	Essence	Yellow clover
Sage	Amphoteric	Terpene and tannins	Estrogenic effect, yellow clover
Centella asiatica	Amphoteric	Asiaticoside	Cicatrizant
etc...			

B) Products with an undefined polarity: proteins and aminoacids. Due to its amino and carboxylic groups, they have an amphoteric nature and their polarity depends on the pH and isoelectric point.

Complexes:	USE
Extra placental collagen Amniotic fluid etc.	<i>These organic ionising produced are introduced into the skin to improve the cutaneous trophism, since aminoacids make up the protein matter, responsible for the turgescence and elasticity of the skin.</i>
Singles:	Use
Arginine Threonine Alamine Tryptophane	Wrinkles Flabbiness



<i>Acide aspartique</i> <i>Valine</i> <i>Acide glutamique</i> <i>etc...</i> <i>Cystine</i> <i>Fenilalanine</i> <i>Glycine</i> <i>Glycocolle</i> <i>Histidine</i> <i>Hydroxiprolin</i> <i>Hydroxylysine</i> <i>Isoleucine</i> <i>Leucine</i> <i>Lysine</i> <i>Methionine</i> <i>Ornithin</i> <i>Proline</i> <i>Serine</i>	<i>Cutaneous imperfections</i> <i>Dehydration</i>
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MICROGALVANIC CURRENT START UP

As prior precautions, the beauty professional must ensure that the intensity controls are on zero and the electrodes are well cleaned and disinfected. Avoid areas of continuity on the client's skin. The treatment must focus on the area

to treat, the ionisation substance desired, the polarity to apply (or change of polarity), intensity and time. Prepare the solution before starting the treatment.

1. Check that the equipment is connected.
2. Activate the on switch (1).
3. Put a gauze, filter paper or sponge or apply the product directly on the skin.
4. Put the static electrode on top or adjust the electrode-holder handles with their corresponding roller accessory if you wish to use the microgalvanic. To this end, the electrode holders must be connected to the relevant outlets (11, 12), and the microgalvanic switch (8) must be on.
5. Connect the polarity selected on the relevant switch (2).
6. Turn the intensity control of the galvanic current (9) and increase slowly up to the value chosen. Maintain the same treatment time and change the polarity half way through the treatment if it is convenient.
7. At the end of the treatment, slowly reduce the intensity to zero and turn the switch (9) to its off position. Remove the electrodes and clean them.
8. Turn off the main switch (1).

IMPORTANT

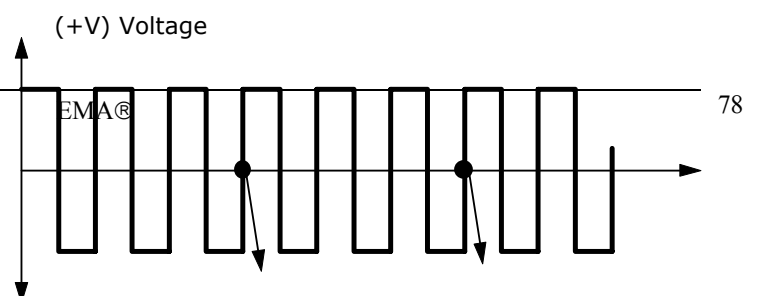
- To avoid mistakes when starting a new session, always make sure that the inverter (2) is always off and on its normal position when finishing a treatment.
- Thoroughly clean all electrodes and covered used in each treatment with soap and water at the end of the session.
- In some cases a certain reddening of the skin can be observed when removing the electrodes. This phenomenon, known as *endosmosis*, is caused by the movement of fluid particles of the tissues that are concentrated in front of the cathode. This reddening is perfectly normal and disappears after a short period of time. Likewise, due to the movement of the ions, the client can feel a sensation of heat in the treated area. We must try to reduce this heat production, using the whole surface of the electrodes. When only a small part of the total surface of the plates is used, the heat generated concentrates in that area and there is a risk of burn. However, when using the whole surface of the electrodes, the heat produced is spread throughout the surface of the skin in contact with the plate. To make sure that this contact is perfect and that the electrical conduction of the current is optimum, the covers and cotton wool that cover and protect the electrodes must always be moistened.

- It has to be mentioned that ionisation produces a certain effect of hardening in areas close to the anode, which is used for firming treatment. This phenomenon comes from the change of permeability of the skin as a result of the movement of ions and fluids.
- In the description of descaling and acne treatments the negative ions have been considered as the active ones. If on the other hand the active ions of the product used were the positive ones, the inverter at the front of the machine (2) would have to be pressed.



PASSIVE EXERCISE CURRENTS

Passive exercise currents are alternating currents of different forms, presenting a variation of intensity in relation to time.



(-V) Voltage 1 second 2 seconds

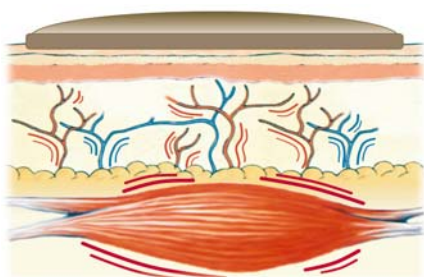
(+V) Voltage

(-V) Voltage 1 second 2 seconds

The characteristics of this machine allow to use muscular excitation in order to achieve the maintenance of muscle **tone** and muscular resistance with **aesthetic** ends.

This technique is known as ***passive gymnastics***, and its base is the production of muscle contractions similar to those of active exercise for body maintenance, as much of the muscle system as of health in general for the cardiorespiratory stimulus that they provide.

Exercise has a very definite action on **reduction** by three different forms of application:



- it increases energetic expenditure;
- it increases basal biological reactions;
- and it reduces appetite.

The aim of passive gymnastics currents is to act on the muscle fibres and cause their contraction.

First, we see an intuitive image of natural muscle contraction. We are going to limit ourselves to the **voluntary muscular** contraction, since there are also muscles that contract independently from the subject's will (as for example the heart).

The motor muscles are made of groups of cells called **muscle fibres** that have the possibility to contract. The contraction of these clusters of cells is produced when it is *ordered* by the nerve in contact with each muscle fibre, in a message sent by the brain. This order is translated into an electrical tension generated by the body in a natural way. Nevertheless, can this nervous pulse be reproduced artificially? The answer is yes.

The technique gives us the possibility to induce the contraction of a muscle through the application of a current produced by a machine. If the machine produces the adequate electrical signal, this will be dealt with by the muscle in a similar way to the *order* of contraction that the nerve conveys in a natural movement.

The muscular mobilisation produced by this appliance, nevertheless, has differences with the natural functioning of the muscle. These differences are the following:

Firstly, the appliance is far less precise than the natural functioning. Instead of having thousands of minute electrodes over each muscle fibre as nerve endings do, we only have several pairs of plates acting as larger electrodes and connected externally to the skin.

From these differences between the natural functioning and the movement of the appliance, we can deduce that the **client's characteristics** are essential to the approach of the treatment, since the passive gymnastics current produced by the machine does not act directly on the muscle. The nervous pulse crosses the layer of subcutaneous adipose tissue, which is an insulant, and therefore more or less power is needed to really reach the muscle's motor points. Besides the fat, there are **other factors** to consider such as the type of epidermis, bone structure...

Another important factor to consider in order to obtain good results in passive exercise is the **position** of the **plates**. These electrodes must be placed over the desired motor point(s) with precision so as to excite only those fibres of the motor branch that we are interested in. In general, **only one muscle** is excited if the plates are placed on the muscle's **extreme** motor points. **The entire muscle mass** is excited if the plates are placed **transversally** to the cluster of muscles.

In order to locate the motor points, consult the corresponding graphs, since these points vary from one subject to the other. For this reason it is best to locate them in an individualised way for each client using the diagrams.

The **pressure** exerted by the plates on the skin's surface during the treatment is vital for results. If they are too loose, the resistance that the contact surface presents increases and efficiency is reduced. However, as the objective of the application of the trains of movement is to improve blood flow, if too much pressure is exerted the circulation is obstructed. The plates acting as electrodes must meet certain conditions in order to exert good electrical contact, adapt themselves well to the body, be hygienic, etc.

There are many types, each with its advantages and drawbacks. Rubber plates have a resistance of several ohms, which means that the power supplied on each point of contact with the treated surface reduces as the distance between the plate's point of contact and the treated surface increases. This factor shows how important it is to place the plates correctly and makes them suitable for use in *passive exercise* treatments. They cannot, however, be used for an unlimited length of time because the inside of the rubber contains carbon particles which gradually disappear. For this reason the rubber gradually becomes insulating and the worn out plates must be replaced with new ones.

Finally, another factor undoubtedly effecting the results in passive gymnastics is the type of **electrical signal** produced by the machine. In this sense, IMPGA 3000 widely complies with the safety standards regarding insulation and the range of rectangular movements for which each train of movement produces a contraction. The modulation of trains of movement allows to carry out an "intensive" or "mild" treatment. The user can choose the rhythm of contraction as well as the frequency of the pulses contained in each train of movement to the value resulting the most comfortable.

EFFECTS OF VARIABLE CURRENTS

The main **action** of these currents is represented in its **effect** on **muscle mobilisation** although, logically, they have other application effects that can broaden their operative range. What we are mostly interested in is the mobilisation effect.

Effect of movement

All living tissues are capable of reacting both to external actions and to modifications of the internal environment. Irritability is a general characteristic of living matter. Among all the tissues, the nerve and muscle tissues are the most suitable to receive excitations and react, this reaction being the **contraction**.

They are called excitable, which means that they have excitability or are capable of responding to an energetic variation of the environment by an inner change; this variation is called **stimulus**. The relationship between the action of peripheral factors and the reaction of tissue is called *state of excitability* or *state of excitation*.

Normally the nerve cell is put into action by a **single excitant**. There are several excitants capable of stimulation: **mechanical, thermal, chemical** and **electrical**.



Electrical current is the best of these excitants. Electrical excitation, indeed, presents many **similarities** with the majority of **excitants**: it is easy to measure, does not cause permanent changes in the elements that it crosses and, above all, puts into action minimal amounts of energy.

Other important effects of the variable currents, apart from muscular excitability, are:

- **Improvement** of the peripheral **return circulation**, which helps to eliminate waste products.



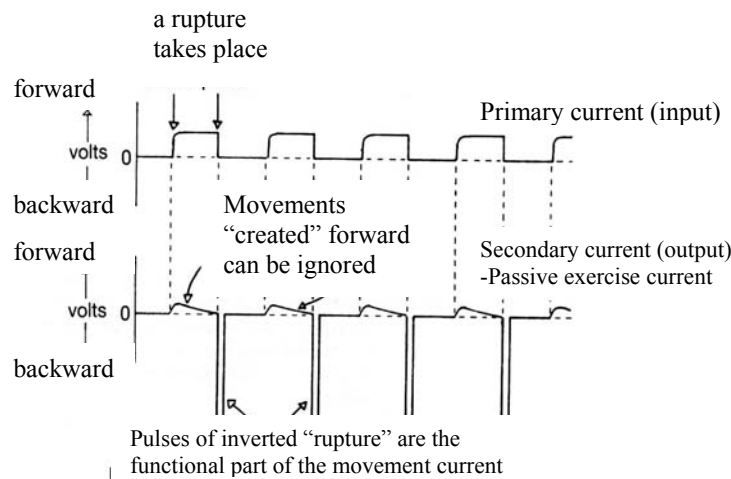
- Stimulation of the **local biological reactions**, where the muscular excitation takes place, with which overweight, cellulites, flabbiness, etc. can be treated.

Passive gymnastics through electrical currents

When an intense and sharp electrical movement passes through the body, the muscles in its way contract in response. An electrical current flowing as a not too fast *series of pulses* will make the muscles *contract and remain contracted* during the time that the current flows.

1. A direct interrupted current in the form of a series of small, sharp pulses through the body is called ***passive exercise current***.

Sinusoidal beauty treatment



Current as shown on
an oscilloscope

How the sinusoidal current contracts the muscle

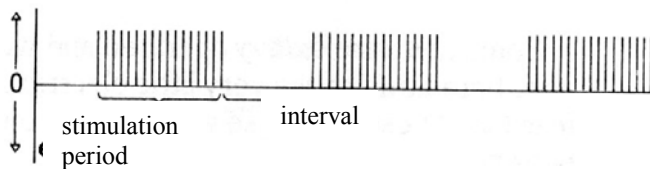
When we consciously decide to move, the brain sends electrical messages through ***motor nerves*** to those muscles that will be contracted to create movement. The electrical messages from the brain consist of a series of ***electrical pulses***.

As soon as *external* electrical pulses of the same type of frequency (up to 100 pulses per second) are introduced in the organism, they must also be captured by the *motor nerves* and generate a muscular contraction.

Nevertheless, *nature* conscientiously tries to prevent this factor. The high resistance of the skin prevents our bodies controlling other people's bodies merely by touching. Also, each nerve is *isolated* by a fat *myelin sheath*.

This means that, first, ***exterior pulses*** must have a fairly high voltage in order to cross the skin and, secondly, they must be directed to the *motor points* of the muscle so that this detects them easily. The *motor point* is the point of the muscle where the motor nerve enters. The electrodes must be carefully placed so that the flow of current through the body is produced in this motor point.

While the current passes, the muscle contracts and remains contracted. The current decreases and the muscle relaxes. The muscle can be stimulated so that it contracts and relaxes alternately through the adjustment of the current.



Owing to the high resistance of the skin, applying a sufficient current to develop an effective treatment can generate a characteristic sensation in the client.

Electrodes

In order to complete the circuit through the client, the passive exercise current is applied through electrodes.

Plate electrodes

Electrodes need a conducting agent to transmit the current through the skin. Modern body electrodes are made of *plastic impregnated with carbon* that makes them electrically conductive, with no need to apply water or salt as it was done in the past. A thin layer of **conductor gel** must be applied between the plate and the skin in order for the current to overcome the electrical resistance of the skin and penetrate inside.

Locating the plates on the client

Most equipments using movement current are *multi-output* machines that can work with several pair of electrodes simultaneously. Electrodes must be used jointly with their **homologous pairs** to obtain complete circuits. Nevertheless, there are a number of methods of application of these pairs of plates:

In *duplicate motor* plate location, the pair of electrodes is placed in the motor points of **two adjacent muscles**. The current only has a short path through the body from one electrode to the other. Another pair of plates is normally applied in the corresponding muscles in a different part of the body.

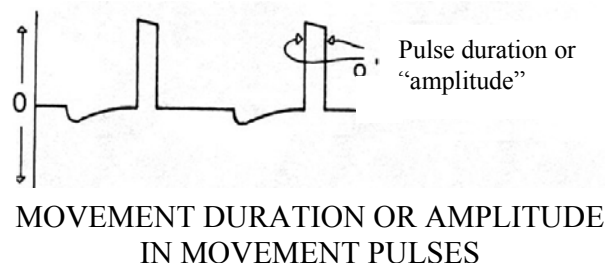
In *separated plate* location, one plate is put on the **motor point of a muscle** and its homologous pair is placed on the equivalent muscle on the **other part** of the body. This method is not recommended.

Longitudinal plate location is useful where the motor point of a muscle is not easy to locate. One plate is placed near its origin and the other near the insertion of the *same* muscle. The current *has* to pass the motor point.

On the face, where a number of motor-points are close together, conventional plate application is not possible, or at least, difficult.

Duration of the movement pulse

Normally, every brief and intense passive exercise pulse lasts 0,3 milliseconds (about 3/10.000 of a second). Some machines have a control system for the duration or amplitude of the movement allowing maximum control of the electrical pulse.



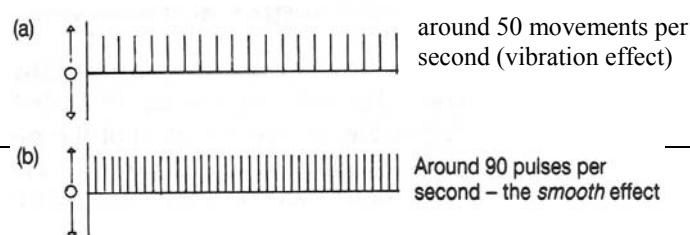
Frequency of movement pulses

Many appliances include a button allowing to control the *frequency* included between 40 and 120 approximately.

Alternatively, there is also a *mild/intensive* switch. Controlling this buttons and switches, different sensations can be produced in the client. The numbers correspond to the frequency of pulses per second.

A pulse frequency of 40-60 pulses per second produces a **vibratory contraction** of the muscle. This is known as ***incomplete tetany in the muscle*** or ***vibratory effect***. The muscle vibrates because it has time to *relax* a little before the next contraction.

Turning up the frequency to around 90 pulses per second produces a **steady contraction**, a ***complete tetany*** or a ***smooth effect***. The muscle does not have time to relax between one pulse and the next.

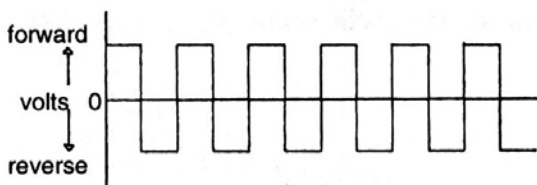


For some time, physiotherapists have considered movement currents not completely effective in muscle treatment. Recent investigation and research have shown the structure and the control of the motor nerve of a muscle to be much more complex than was thought. around 90 movements per second (smoothing effect) **three types of fibres.**

The motor nerve that controls each type of fibre **communicates** with **different frequencies** of pulses.

- **Slow oxidation:** non-fatigable stamina fibres - constitute up to 50% of a muscle and are stimulated by frequencies of 6 to 15 pulses per second.
- **Fast glycolytic oxidation:** the main *strength* fibres with a tendency to fatigue and tiredness. Constitute up to 50 per cent of a muscle and are stimulated by frequencies of 20 to 45 pulses per second.
- **Fast glycolytic:** fibres with *explosive power* fibres for sprinting, jumping and high intensity activities. Tire easily and are stimulated by frequencies of 50 to 70 pulses per second.

This obviously means that the machines providing a range of 40 to 120 pulses cannot fully stimulate all muscle fibres. Some of the appliances using new generation movement currents have widened the range of low frequencies up to one pulse per second, which means that they can create programs of various pulses and frequencies to work on *all* fibres of a muscle.

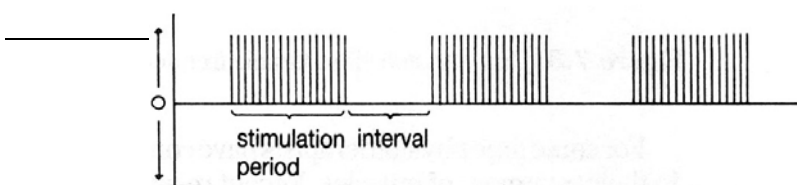


At a maximum of 120 pulses per second, muscle stimulation is far less effective. The motor nerves cannot transmit pulses much faster than this. However, because higher frequencies pass through the skin more easily and with less discomfort, some machines are made using

much higher frequencies of 400, 600 and even 800 pulses per second. With these frequencies, it has been shown that the passive exercise current has no effect. Instead they use an *alternating square wave current* that has been shown by experiment to be effective.

Timing the movements and intervals

Most machines control the length of the *stimulation period* and *interval*. Analysing the signal of the current in an oscilloscope, we can observe which are the stimulation periods and the intervals, as the following image shows.



These parameters can be personalised using **rhythm** and **frequency** controls (stimulation period and interval), and it is interesting to observe its effect.

In practice, the control of the periods of passive gymnastics is enough to give a good contraction and the control of the interval enough to fully relax the muscle. More time is really a waste of time in the treatment.

All muscles are programmed to contract and relax in synchronisation.

Program or control mode

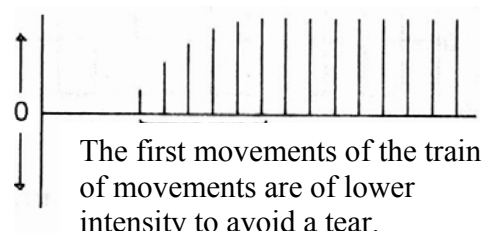
Some clients consciously or unconsciously dread the session and fight against the contraction, which affects its full effect. Program control or mode creates a differentiated and random transmission of current making it difficult for the client to anticipate the moment of the next contraction. It is convenient to **vary** and intensify the frequency and rhythm **parameters**.

Train of movements

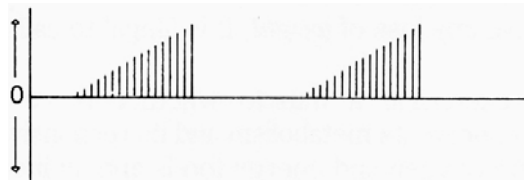
The series of pulses producing movements or a stimulation period is known as **train of movement**. The nature of the contraction can vary according to the individual strength of the pulses creating the train of movements.

A train of movements too abrupt and aggressive with pulses of the same intensity tends to create an unpleasant feeling of heartrending contraction. This happens because the first few pulses of the same intensity move more freely through the skin, for its intensity gradually builds, and for this reason they are more effective at the time of contraction.

Therefore, the first pulses of each train of movements are of lower intensity and gradually increase. This effect can be observed by means of an oscilloscope.

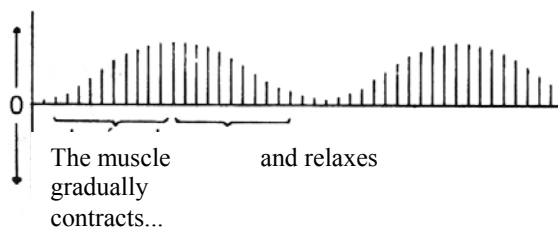


Passive gymnastics equipments can produce an increasing train of movement to contract the muscle more and more along the train of movements - and suddenly relax when the train of movements stop.



Triangular train of movements as shown on an oscilloscope

Other machines produce a gradual train of movement based on the progressive intensification and a mild decrease, contracting and relaxing the muscle.



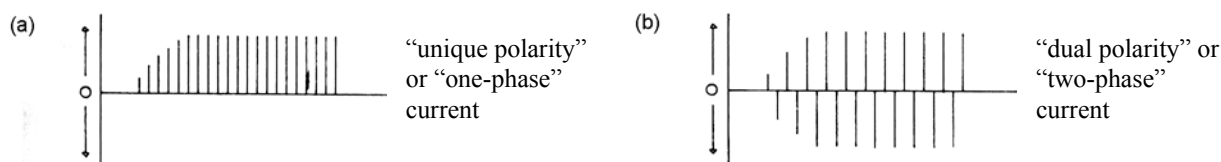
A movement current with a real train of movement

Polarity control

As mentioned before, the greatest obstacle to the passing of the current through the body is the *resistance* of the skin. This resistance produces a **sensation** in the skin when the currents go through it. For some customers this sensation is unpleasant, sometimes unbearable, when a sufficient amount of current passes to give satisfactory contractions.

Many units of movement current have a *polarity* control in *mono* or *duo* (*one-phase* or *two-phase*). In the position *one* or *two-phase*, a normal current of movement flows. If changed to *dual* or *two-phase*, each alternating pulse is inverted and the ions vibrate easily forward and backward. The resistance is less and therefore the **sensation is reduced**.

MOVEMENT CURRENTS WITH UNIQUE AND DUAL POLARITY



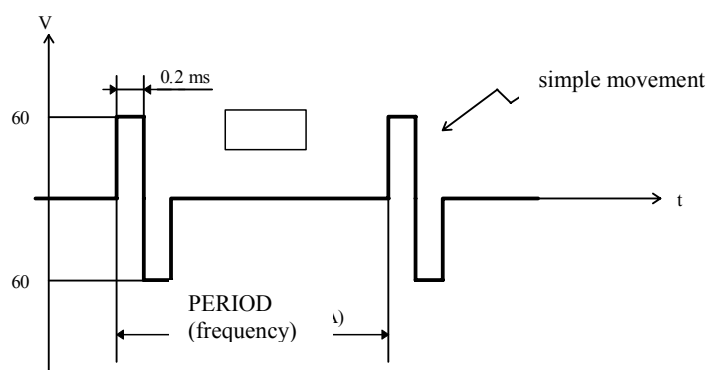
Normal movement pulses all follow the same direction. The movement of the ions - the current - only takes place in one direction. The first *pulse* of a *train of movements* moves the ions easily, it is a bit harder for the second one and so on as the resistance increases. In *dual* or *two-phase*, each alternating pulse is *inverted* and the ions vibrate easily forward and backward. The resistance is less and therefore the **sensation is reduced**.

IMPGA 3000 parameters

The **IMPGA 3000** equipment is a passive gymnastics apparatus based on a low frequency alternating current with particular characteristics concerning the pulse amplitude, the duration of the train of movements and the modulation.

SIMPLE MOVEMENT: of a rectangular type with a fixed semi-duration of **0,2 milliseconds (ms)**. It has a small exponential of rise and fall.

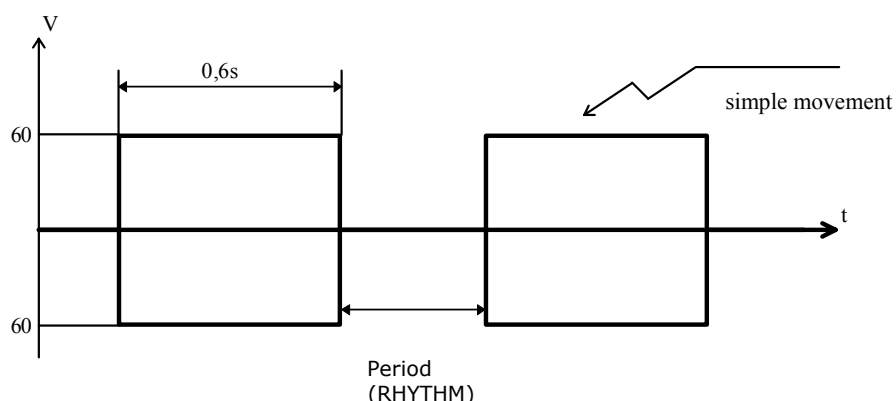
With the exterior potentiometer of the FREQUENCY control panel, we can measure the period between each simple movement between **3** (FREQUENCY control at the maximum) and **10 ms** (FREQUENCY control at the maximum).



SIMPLE MOVEMENT: rectangular
Fixed semi-duration: 0, 2 ms
FREQUENCY: variable between 3 and 10 ms

CREATED MOVEMENTS: The movements produced are chain groups of simple movements and can be found in each output of the apparatus.

These movements are rectangular with a fixed duration of **0,6 s**, with the following format:

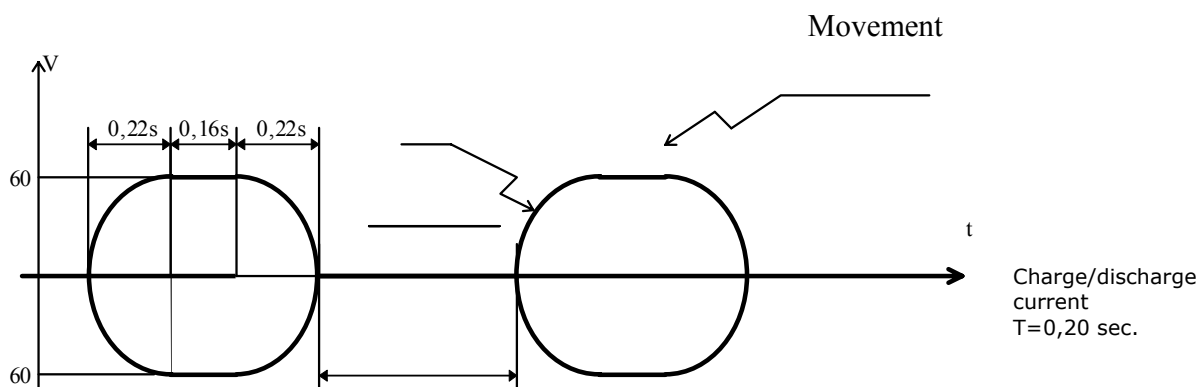


CREATED MOVEMENTS: rectangular
Fixed duration: 0,6 ms
RHYTHM: variable between 0,44 s and 1,4 s

The **RHYTHM** potentiometer situated on the outside control panel sets the period between created movements in a range of values included between a minimum of **0,44 s** (RHYTHM control at the maximum) and a maximum period value of **1,4 s** (RHYTHM control at the minimum).

INTENSIVE/MILD switch: when the switch is on **INTENSIVE**, the movements are applied step by step. The created movements have the shape of the aforementioned graph.

When the switch is on **MILD**, the movement is applied progressively: the created movements are shaped accordingly to the following graph.



Period
(RHYTHM)

INTENSIVE: Movements step by step
MILD: Progressive movements

Summary

SIMPLE MOVEMENT: rectangular
Fixed semi-duration: 0, 2 ms
FREQUENCY: variable between 3 and 10 ms

CREATED MOVEMENTS: rectangular
Fixed duration: 0,6 ms
RHYTHM: variable between 0,44 s and 1,4 s.

INTENSIVE: Movements step by step
MILD: Progressive movements

Passive gymnastics and *galvanic* appliances have been used for years in the field of aesthetics. Both equipments being well known to professionals, we will only give an insight of the characteristics of both.

This description will serve as an introduction to the characteristics of IMPGA 3000, since this new machine enables to carry out both treatments simultaneously, using the same plates, the electrodes: it allows to **apply simultaneously galvanic and passive exercise currents** while keeping the efficiency of a treatment even if it is used simultaneously with another one.

On the opposite, applying galvanic currents contributes to the efficiency of passive gymnastics treatments. This happens because galvanic currents introduce ions inside the skin throughout the treatment. This penetration of ions in the epidermis reduces the electrical resistance of the skin and the subcutaneous fat, helping the passive exercise current to reach the muscle. Applying passive gymnastics produces a local rise in the bloodflow that intensifies the effect of the active product dragged inside by the galvanic current.

The simultaneous application of movement and galvanic currents reduces the time that the client has to be connected to the apparatus since two treatments of different characteristics but compatible are combined. For this reason, IMPGA 3000 obtains very important results from the first sessions.

Mobilisation technique with *passive gymnastics*

Passive gymnastics treatments aim at contracting specific muscles through the application of two electrodes in the appropriate position. Each pair of electrodes stimulates determined muscles according to the person.

IMPGA 3000 has **8 pairs of electrodes**. The type of current used is produced by *groups* of small movements. With voluminous muscles and/or muscles covered by fat layers, the power of those movements must be increased in order to produce a contraction. Although it highly depends on personal characteristics, facial muscles usually require a much lower power than body muscles. For this reason, IMPGA 3000 is provided with two outputs with a option especially conceived for the face and a facial-corporal power minimiser.

Galvanic current technique with cosmetic product penetration

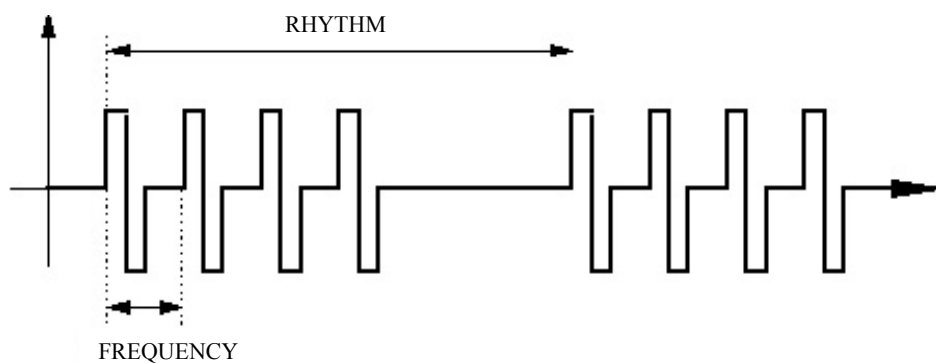
In a galvanic beauty treatment, **cosmetics** are dragged inside the skin or the subcutaneous layers. In order for this to happen, the products must have specific characteristics and the apparatus must generate a constant current with a determined negative and positive pole.

Combining passive exercise currents and galvanic beauty treatment

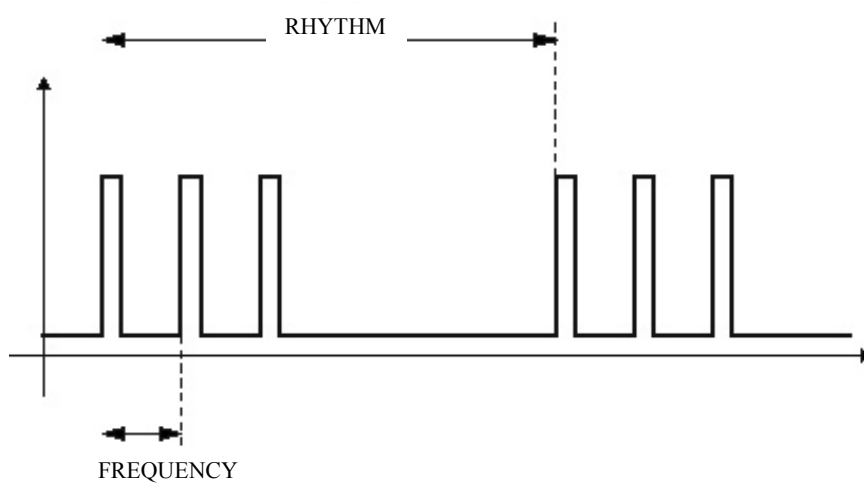
However, passive exercise currents are not constant, while galvanic beauty treatment currents are. The **combination** of both is not constant and thus the principle will not be appropriate for the galvanic beauty treatment. As a matter of fact, to avoid harming the galvanic treatment when adding passive gymnastics to the galvanic beauty treatment currents, passive exercise currents must have a value of zero.

IMPGA 3000 achieves this by adapting the electrical transmission in such a way that passive exercise currents do not modify the passage of ionising

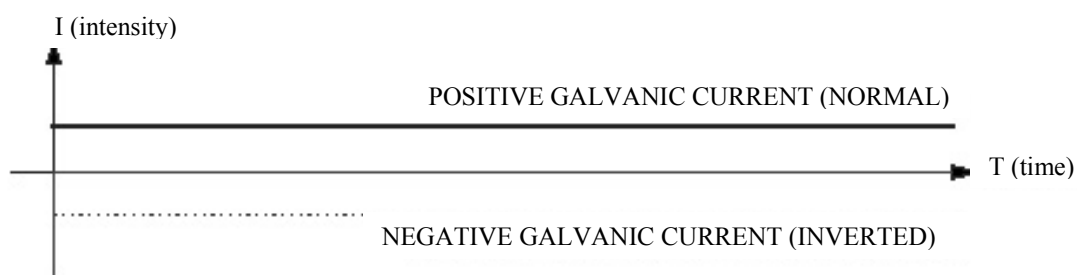
products. In addition, it includes two optional outputs for galvanic current to carry out facial treatments thanks to the action of a current minimiser, which increases the versatility and applications of this equipment.



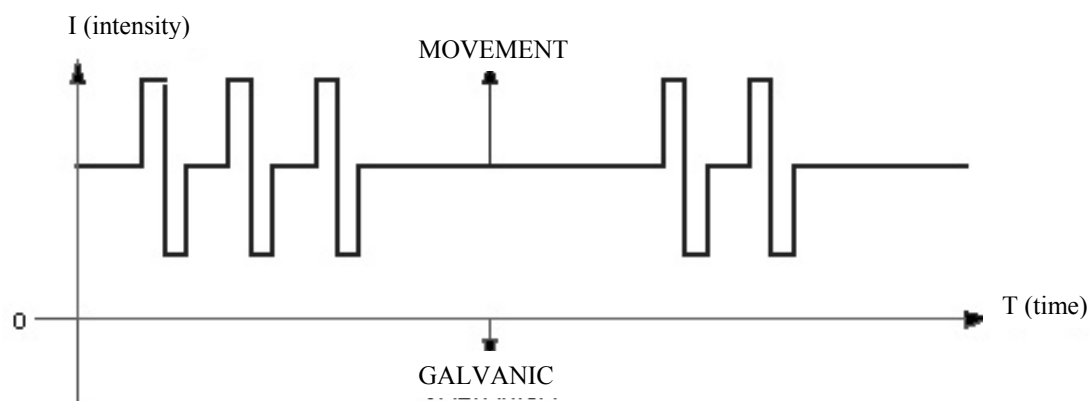
Current of movement for a beauty treatment at zero (appropriate to add to a galvanic). Represents an outlet of IMPGA 3000 with the movement control on zero.



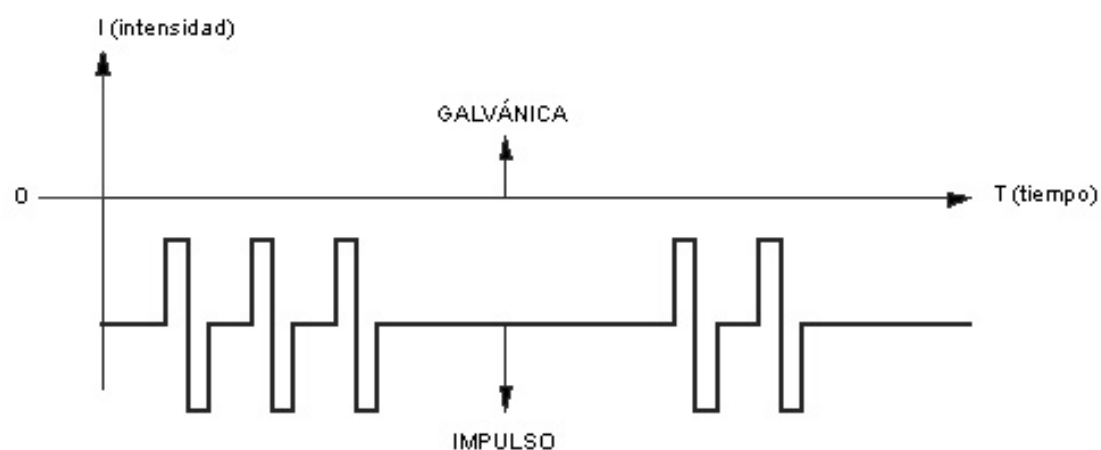
Current of movement for a beauty treatment different from zero (not appropriate to add to a galvanic).



Current for a galvanic beauty treatment. This graph shows an outlet of IMPGA 3000 with the galvanic control on zero.



This graph shows the combination of galvanic currents in **normal** position and movement currents of the IMPGA 3000 equipment.



This graph shows the combination of galvanic currents in inverted position and movement currents of the IMPGA 3000 equipment.

I (intensity)

GALVANIC

Physical effects of the treatment with movement T (time)

Simply, the purpose of beauty treatments using movement currents is to cause muscles to **contract** and **relax** alternatively, to exercise them with no physical effort on the part of the client. Hence the terms **passive exercise** or **passive gymnastics**.

Since no movement of the body or limbs occurs, it is an **isometric** exercise.

Its purpose is **figure-control** by improving muscle **tonus**. Because of their lifestyle, most people make little use of their body muscles, particularly those of the upper arms and shoulders, the abdomen, buttocks and thighs. The **underused** muscles gradually stretch and when relaxed, hang slack, which results in a deterioration of the figure and adds extra centimetres to the measurements. This, together with a lack of response due to a reduced rate of the biological reactions within the muscles, causes a *lack of tonus*.

An exercised muscle will remain under a certain tension even when relaxed. That is when we can say that its tonus has **improved**.

By toning up flaccid muscles this way, it is possible to **reduce** the measurements of the waist, the hips, the thighs and the upper arms, and generally to firm and shape the figure.

Similarly, toning up the muscles of the **face** and **neck** improve the facial features. Many clients find it difficult to exercise their facial muscles themselves.

The effect of deliberately exercising a muscle whether by voluntary contraction or passive gymnastics is to improve its biological reactions and its responsiveness. This creates a **demand** for extra **oxygen** and energy foods and an increased output of cellular respiration waste, which causes the dilation of the muscle capillaries and increases the **blood** supply. The alternate contraction and relaxation of the muscle increases the movement of waste through the pumping action on the veins and lymphatic vessels.

Using modern machines such as IMPSEC 3000, peripheral venous circulation and toxin elimination of a leg can be stimulated by locating the plates specifically and by the **sequential contraction** of the muscles from foot to thigh.

Movement current in combination with other treatments

Usually, movement beauty treatment is used as **part** of a **programme** of treatments for the client. More than one type of equipment can be included in the programme. For instance, *galvanism through the body* might be used as a preparation to **movement beauty treatment**. By stimulating the biological reactions, galvanism improves the response to the current of **movement**. Machines are available which send both **galvanic** and **movement** currents (IMPGA 3000) in the same pair of plates or separated electrodes. After galvanism, the current of movement is connected and will go on after the

galvanic current has ended. It is also interesting to combine Passive Gymnastics with the application of the CEYA technique.

Time of treatment

The duration of a beauty treatment using movement is not critical. For the method of plate location, the treatment can last **20 minutes** or so. The manual method using passive gymnastics handles should produce at least 12 contractions in every muscle treated to be of any real value.

SUGGESTIONS OF BEAUTY TREATMENT

INDICATIONS

- Overweight.
- Circulatory problems: swelling, heaviness...
- Flabbiness.
- Physical maintenance.

Phases of reduction through exercise

Physical exercise is said to be a good means of reduction, but that it is not as fast as that obtained only by some diets. However, once attained, it is much more lasting than a diet. We are going to study the evolution of the reduction achieved through exercise. We will note two clear phases: what we call **aesthetic reduction** and **ponderal** reduction.

During the first week, maybe fortnight, the person doing passive or active gymnastics seems slimmer and slimmer, but however they do not lose weight. What happens in the organism? Muscle toning **forms muscles** while reducing energy supply (fat). It is said that for each kilo of fat lost, a kilo of muscle forms, which is why there is no ponderal reduction. But as fat weighs less than muscle, there is on the other hand a loss of volume. The person doing exercise loses weight progressively, which can be seen if we measure the round of the arms, waist, hips, thighs, which will experience a progressive reduction, even if a loss of weight has not been detected.

Furthermore, passive gymnastics tones up the muscles, which and gives a more aesthetic impression thanks to the back straightening, reduction of the abdomen contour and elevation of the buttocks it provides. Therefore the name we gave to that first phase, ***aesthetic reduction***.

Once the muscle is toned up, the ponderal reduction really starts, with a discreet pattern of weight loss (from half a kilo a week), but with a maintained loss and progressive stabilisation of the figure. We must bear in mind that, compared to the reduction by diet, which only removes a few kilos, ***reduction by physical exercise*** has other important advantages for maintenance:

- It **tones up** the muscles (which, as we said, is important to adopt a correct position). It is also positive in cellulitis treatment, since subjacent muscles are usually hypotonic.
- It **stimulates** the peripheral bloodflow due to muscle contractions, which is useful in peripheral circulation troubles, swelling, heavy legs and cellulitis.
- It produces **relaxation** and a whole series of muscle contractions and physical exercises. In people with insomnia, passive gymnastics help to sleep better.
- Finally, it shares the general **advantages** of the **exercise** such as the feeling of well-being, euphoria, strengthening, general functional improvement of the organism.

Application time

As mentioned in the previous paragraph, passive gymnastics represents an alternative to traditional physical exercise, but with a local application. The application time of the **IMPGA 3000** equipment is conditioned by the client's characteristics and particularly its physical situation.

For this reason, the professional must **assess** each case individually and control the client's evolution until possibly recovering muscle tonus. Since muscle fibre has memory, faster results will be obtained in people doing sport, toning or exercise. However, consistency and a good diet are the indispensable allies for better results.

Passive gymnastics sessions must last about **20-30 minutes** for the **body** and **10-15 minutes** for the **face**.

The intensity of the current used must **increase** progressively throughout the session to prevent the muscle from getting used to the electrical movement and to act as a stimulus for a greater toning of the muscle, but without a painful perception of the current for the client.

The sessions must take place **two or three times** per **week** for a treatment of **15 to 20 sessions**, or can even be followed everyday.

The professional opinion at individual level is decisive to determine the duration of a treatment. Passive gymnastics can also be applied to retain good results once the treatment is over or for physical maintenance in general.

Reduction and firming treatment (passive gymnastics)

- Duration of each session: 30 minutes.
- Frequency of the sessions: 2-3 sessions per week.
- Duration of treatment: 15-20 sessions.

Locating the plates and the contact gel



Applying **IMPGA 3000** is achieved locating plates on the areas of the body to tone up, depending on the problem to treat. Apply a thin layer of conductor gel on the plates on the plates for a better transmission of the current to the human body.

SPECIFICATIONS

The effect of **IMPGA 3000** on the tissues, muscular and others, can be observed from the first weeks of application. An example is the reduction of a few centimetres, and volume reduction, although it is not only accompanied by a weight loss. This volume reduction without weight loss is explained by the transformation of fat into muscle. With the **IMPGA 3000** equipment, the muscle fibre is stimulated in such a way that it ends up replacing the spaces occupied by fat. However, this conversion has a paradoxical effect on the human body, since muscle is heavier than fat.

To control the results achieved, the clients must be measured previously to the session of treatment. Five outlines must be selected to this end: breast, waist, hips, thighs and upper knee.

Real loss of weight or volume in between sessions is a variable parameter that depends on the characteristics inherent to the client, his/her way of life and the food he/she eats. Therefore, the difference between one session and the next is considered as weight or volume loss, knowing however that there is always some recovery of the loss.

As a complement to the treatment, it is recommended to urge the client to follow a proper food style according to their daily activity. On the other hand, products with a collagen action can also be applied, capable of increasing the activity of the triglyceridolipase of the adipose cells, whether through meso-treatment, penetration of cosmetics, CEYA or other known techniques.

Contraindications and precautions

The contraindications of the treatment of movement are the same as for a general treatment. An additional precaution is that you should avoid applying the treatment in an area close to the heart. The current could act as a pacemaker and effect the cardiac contraction.

Also be careful when you put the plates on the client and begin the treatment. Always make sure that all the intensity controls are at zero before switching on the machine. Afterwards, gradually increase each control until the client feels a slight tingling sensation under each pair of plates. IMPGA 3000 is provided with a safety device not allowing its operation until all the intensity buttons are on zero (safety electric circuit).

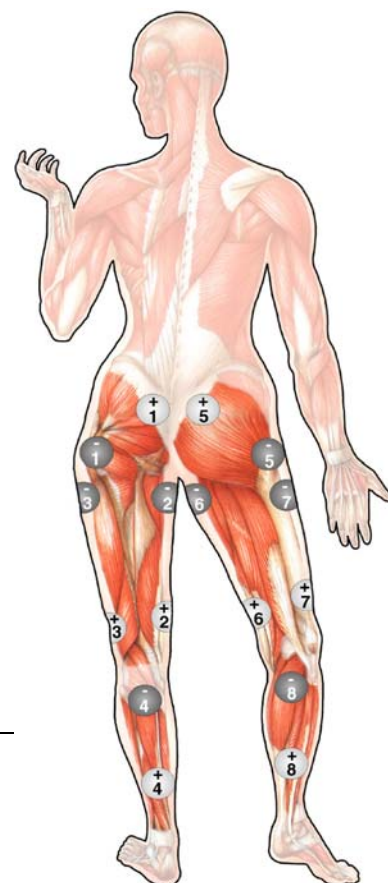
CONTRA-INDICATIONS

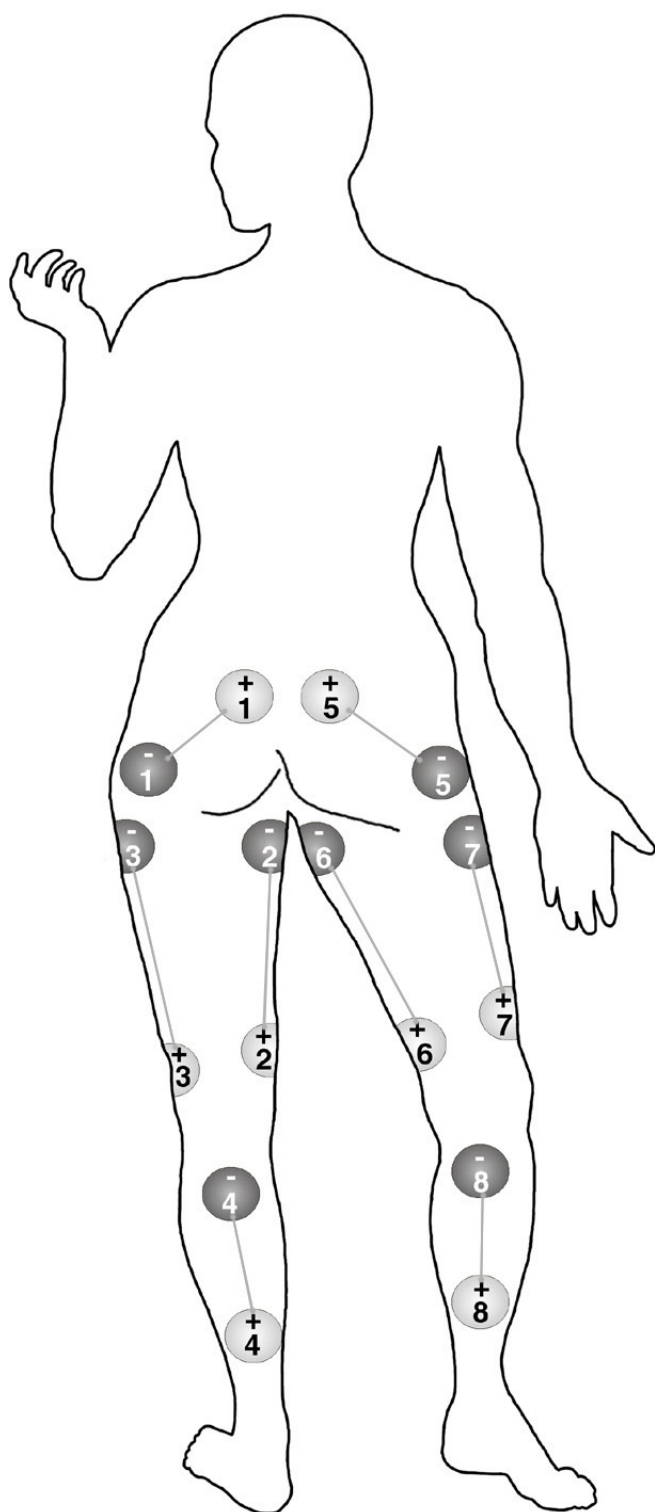
- People with a pacemaker.
- Any type of muscle injury.
- Do not apply on the abdominal region of pregnant women.
- Do not apply on the hepatic zone of people with hepatic dysfunctions or lithiasis problems.
- Serious or non-compensated circulatory troubles: phlebitis, thrombophlebitis, important varices...
- The intensity of the contraction must never be painful. Contractions being too intense may produce tears and muscle injuries.

TREATMENT GUIDE

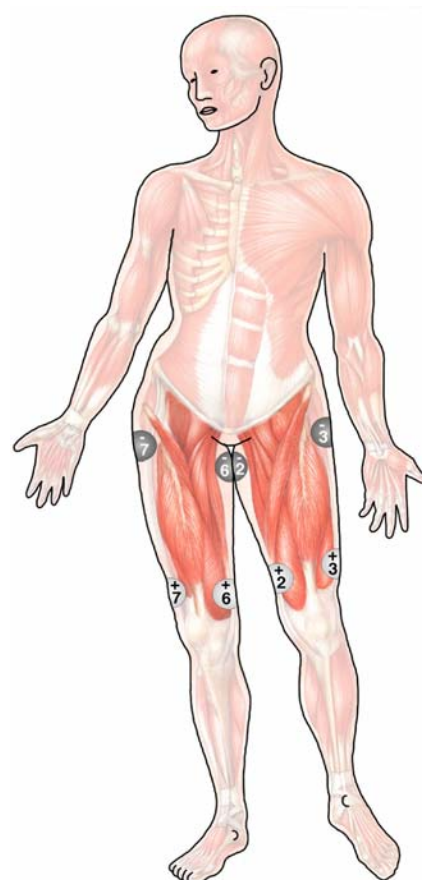
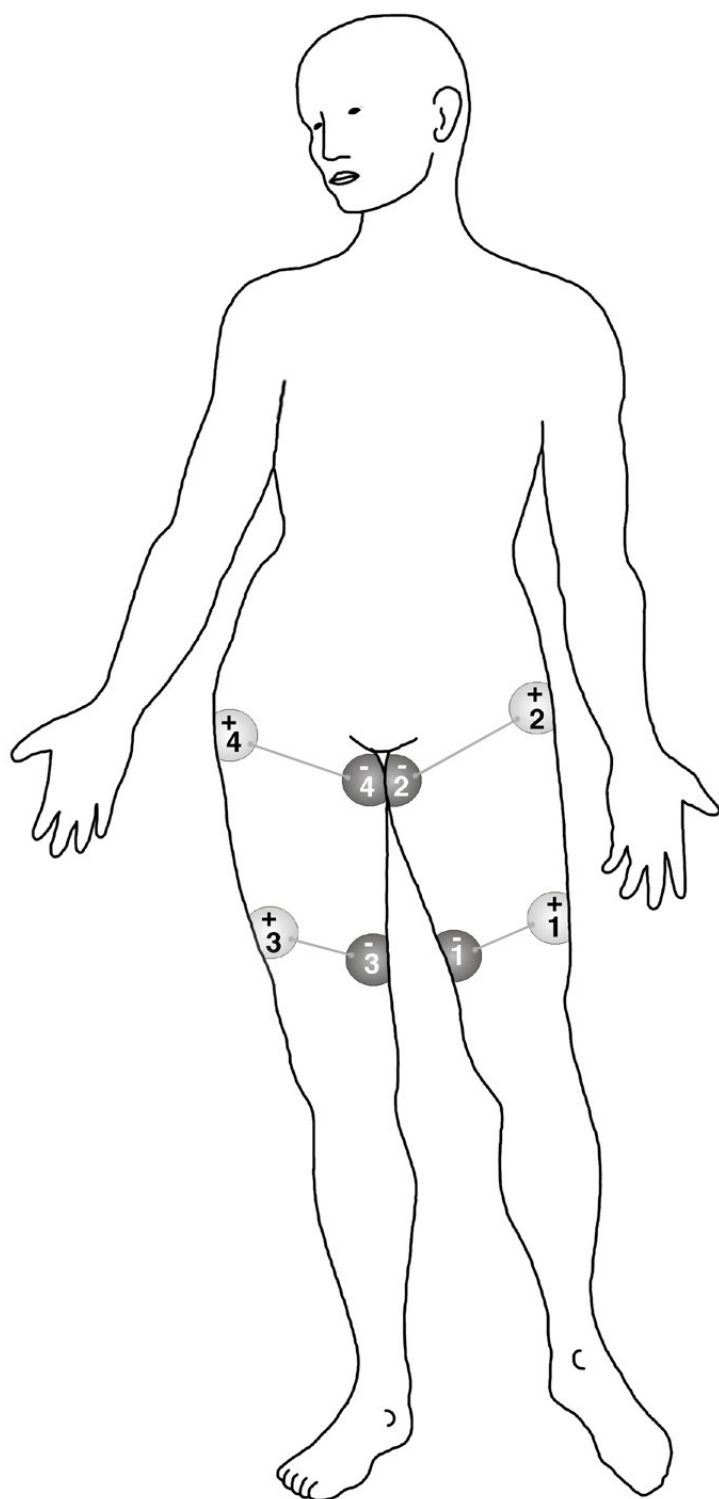
1. Treatment of legs and gluteus
2. Treatment of gluteus and thighs
3. Treatment of arms, thorax and breast
4. Post-partum treatment
5. Treatment of abdomen and waist
6. Treatment of abdomen and gluteus

TREATMENT OF LEGS AND GLUTEUS

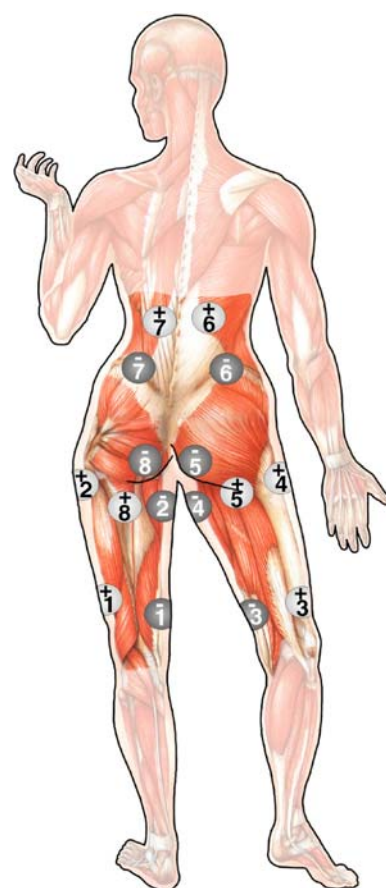
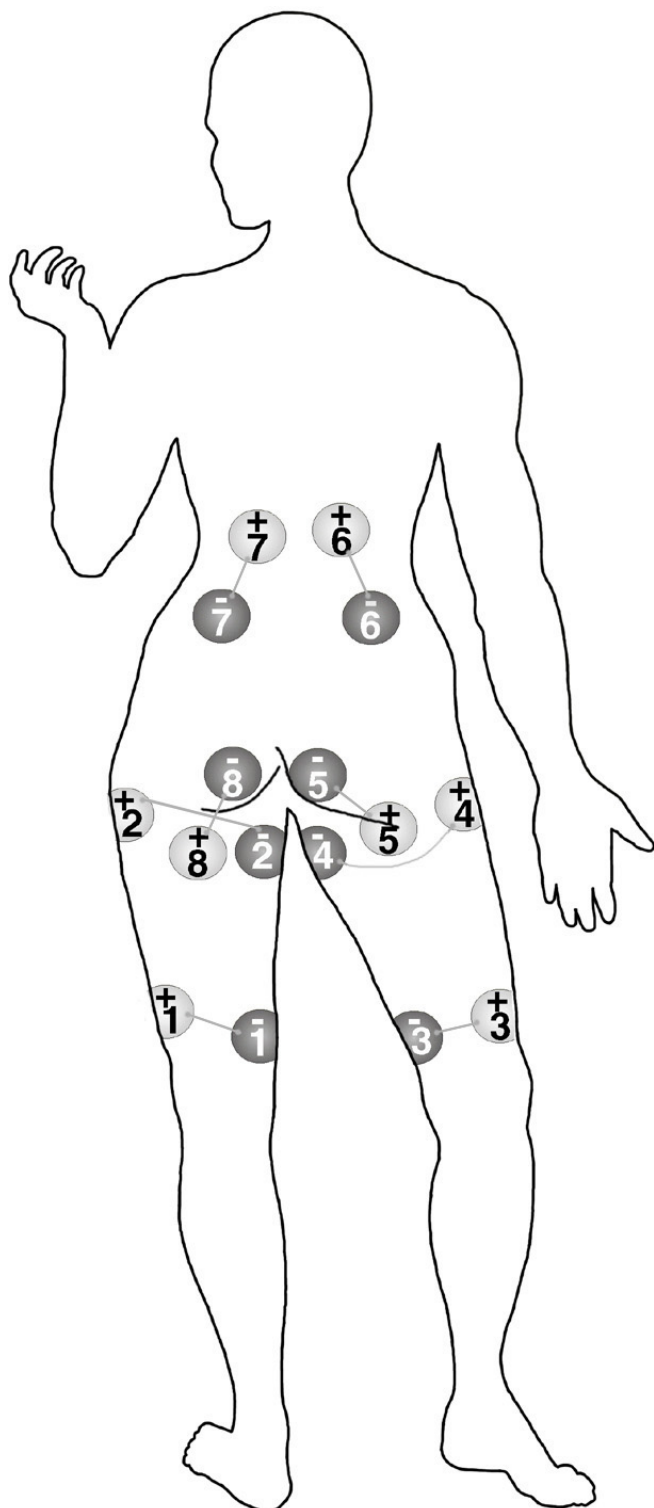


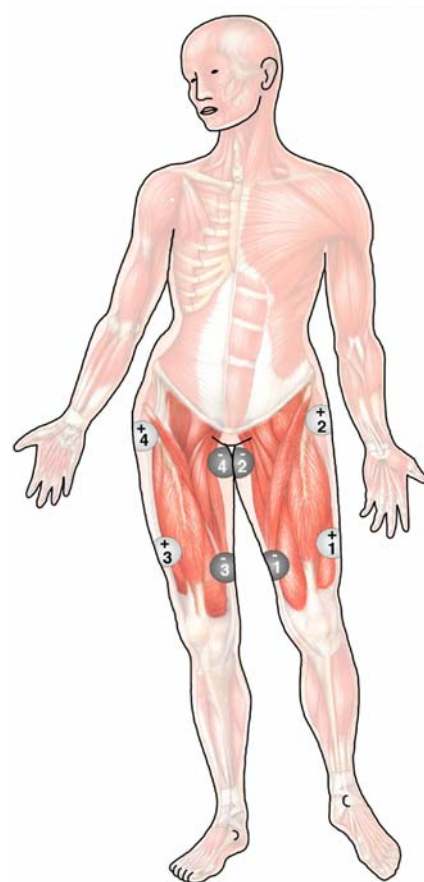
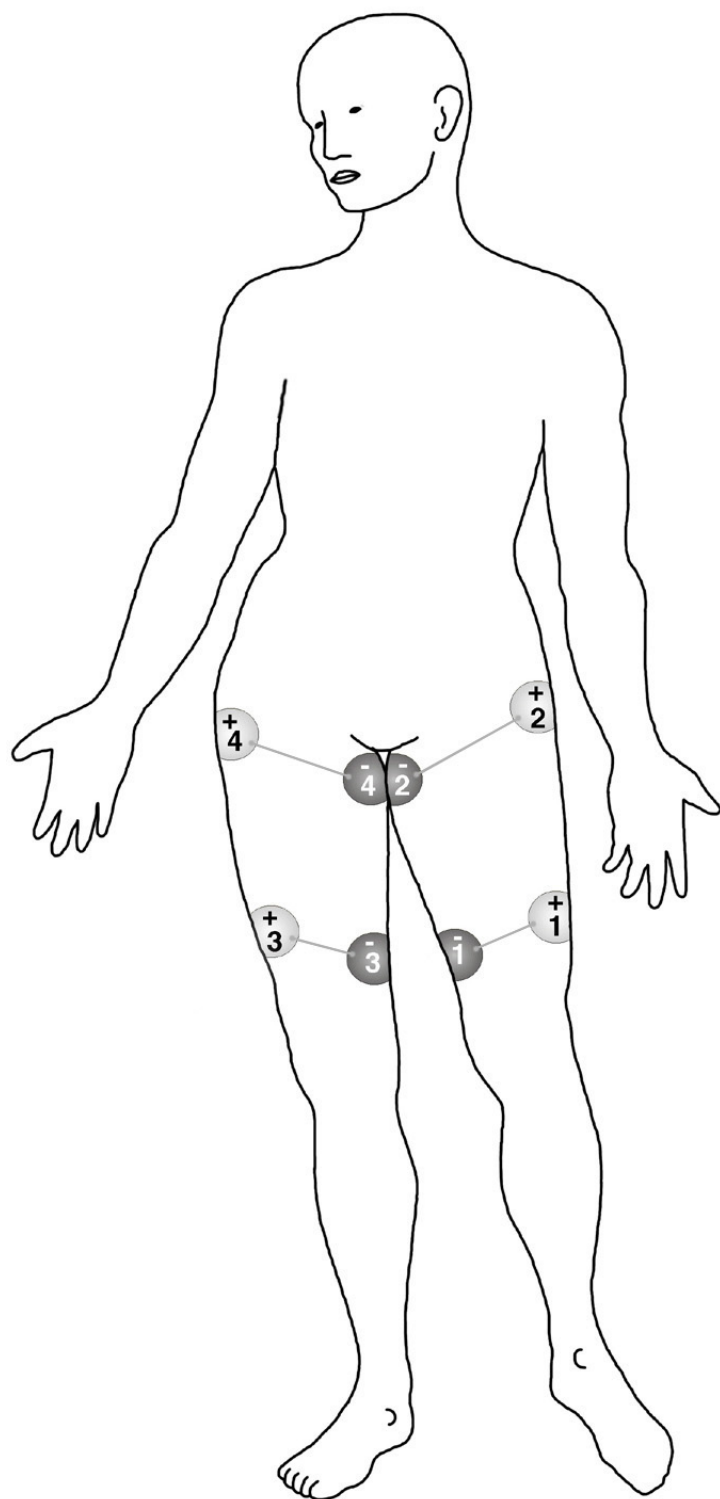


BACK VIEW

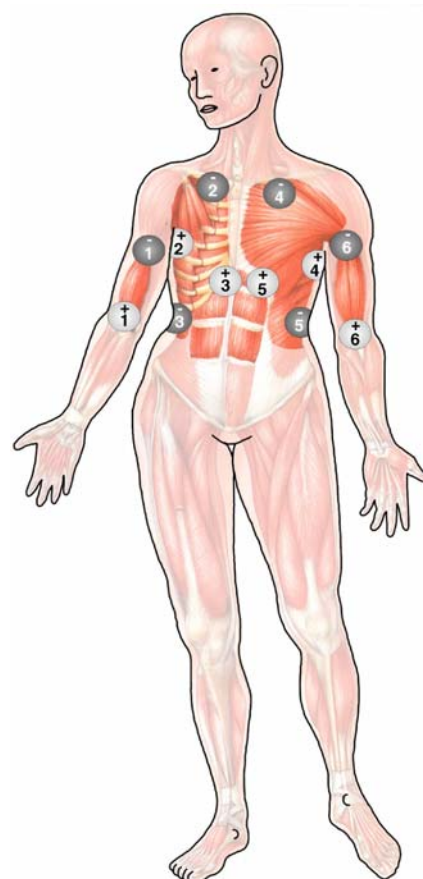
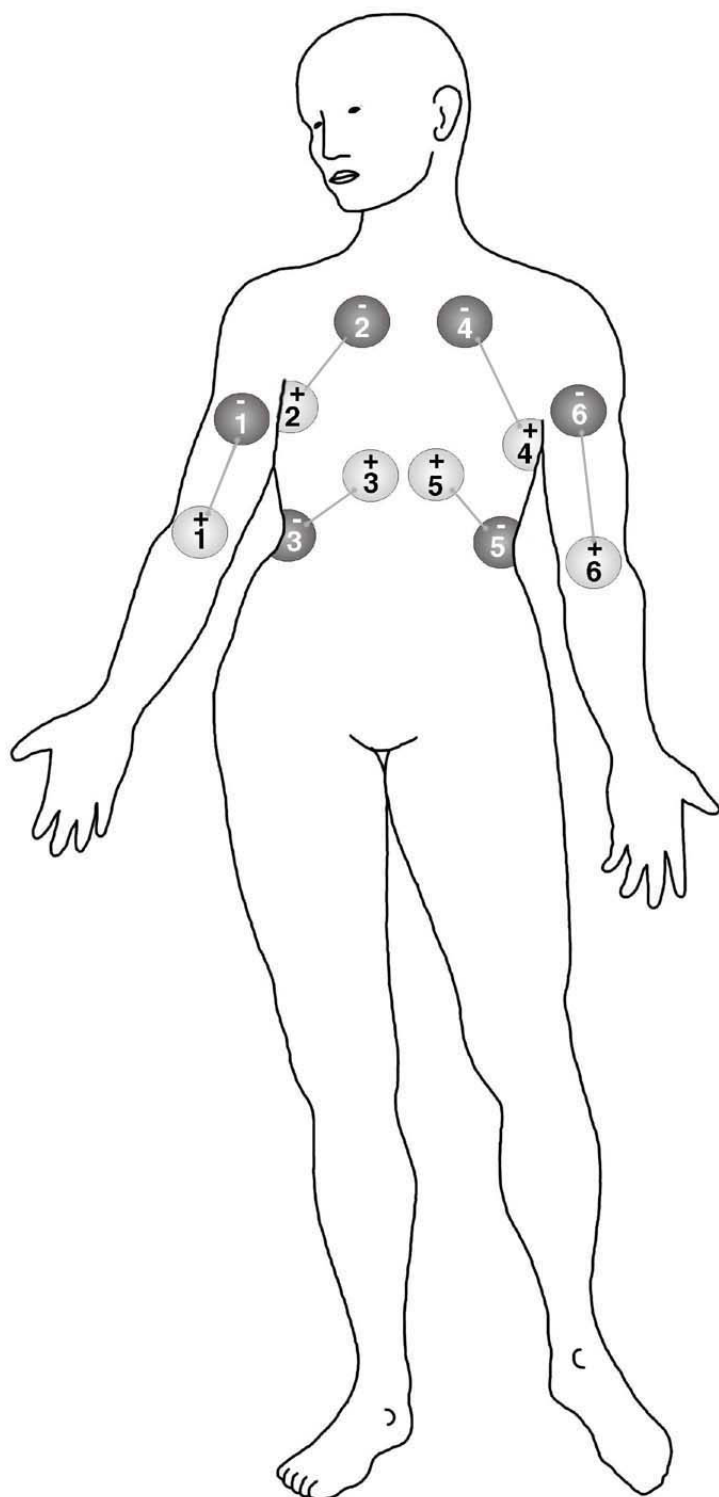


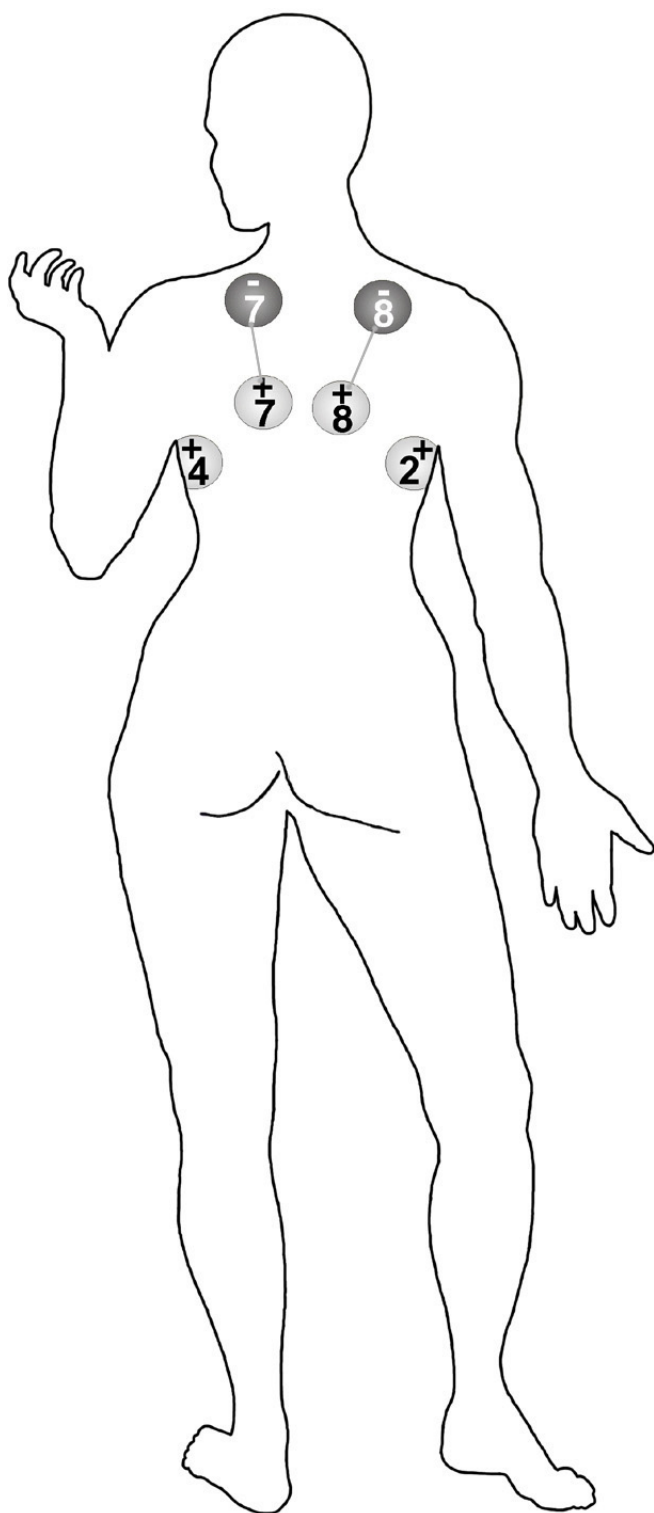
FRONT VIEW

TREATMENT OF GLUTEUS AND THIGHS**BACK VIEW**

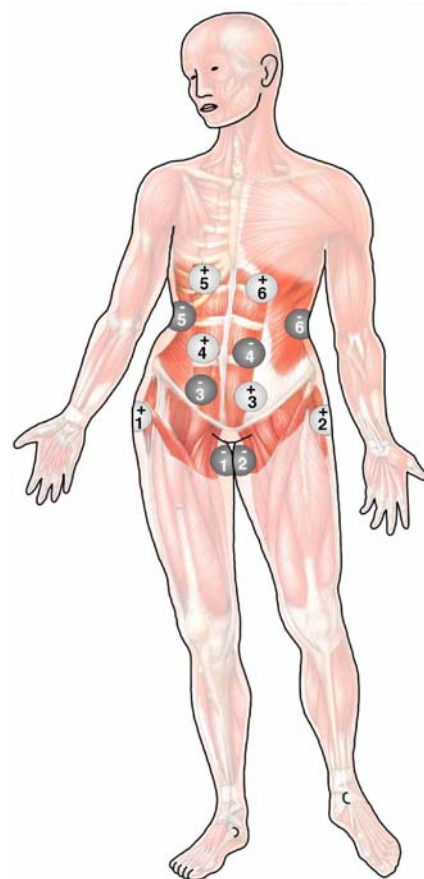
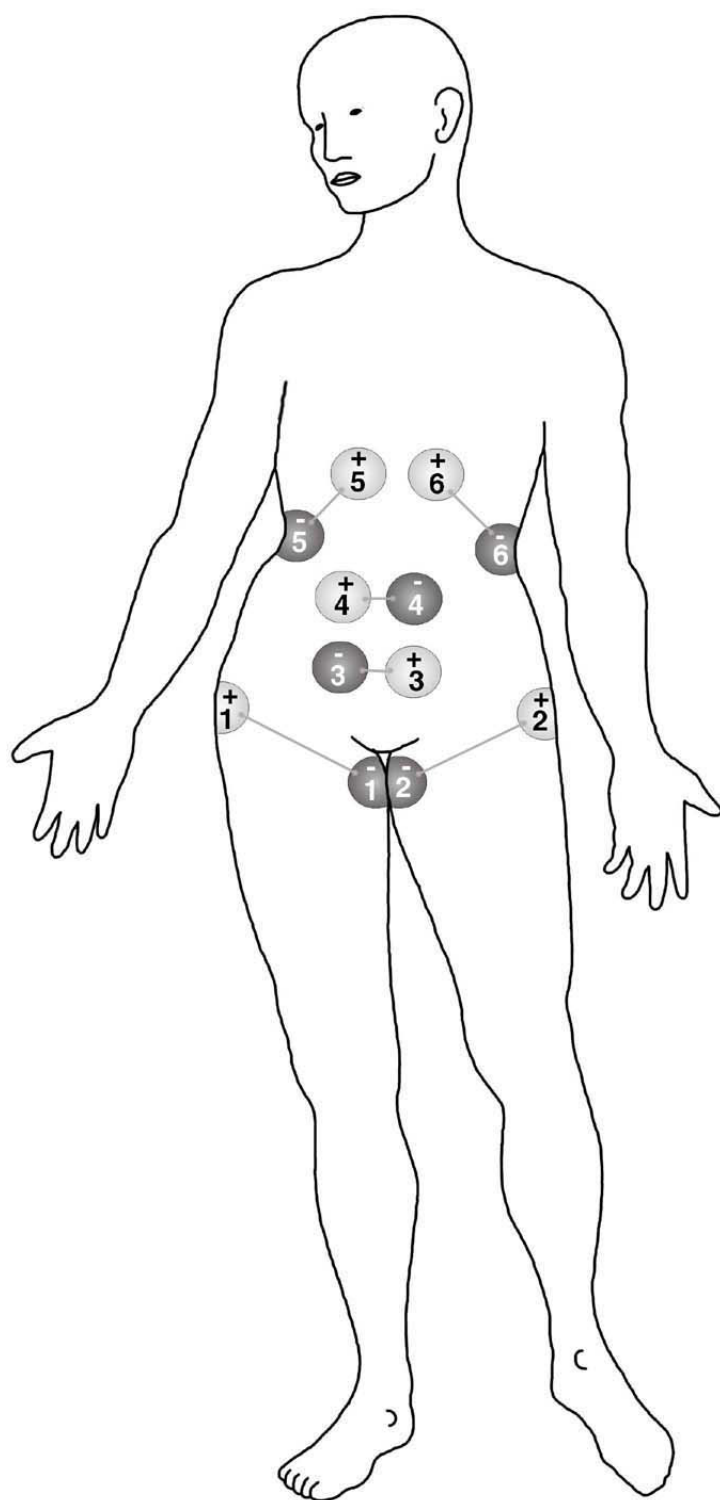


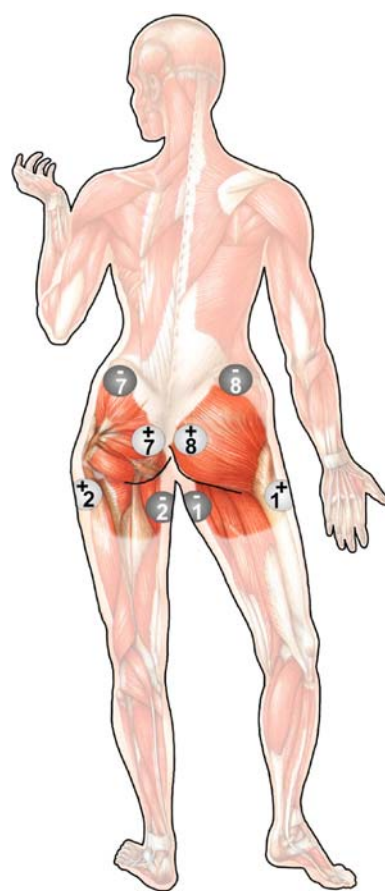
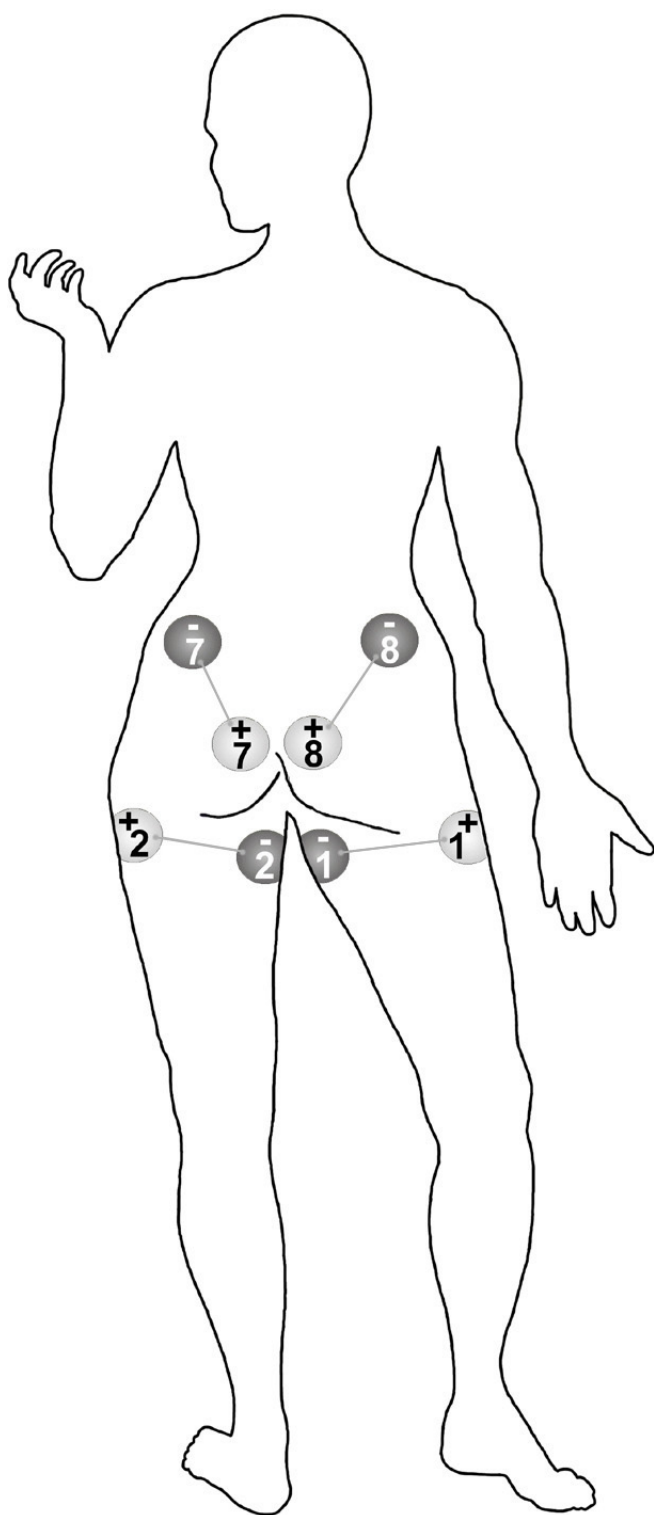
FRONT VIEW

TREATMENT OF ARMS, THORAX AND BREAST**FRONT VIEW**

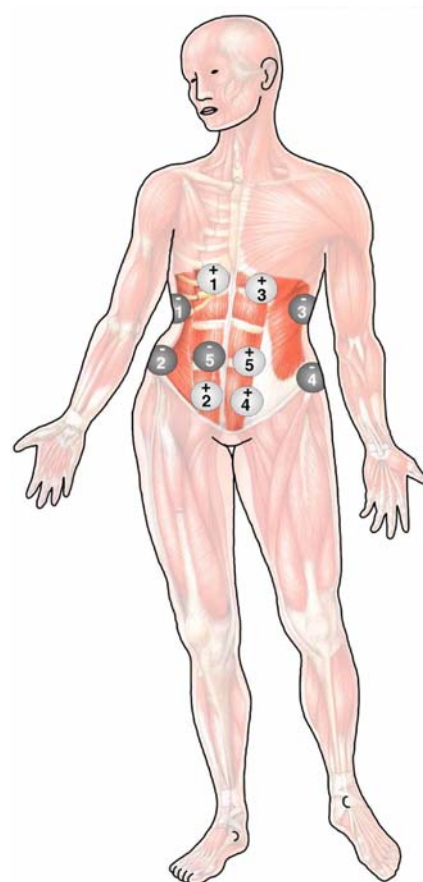
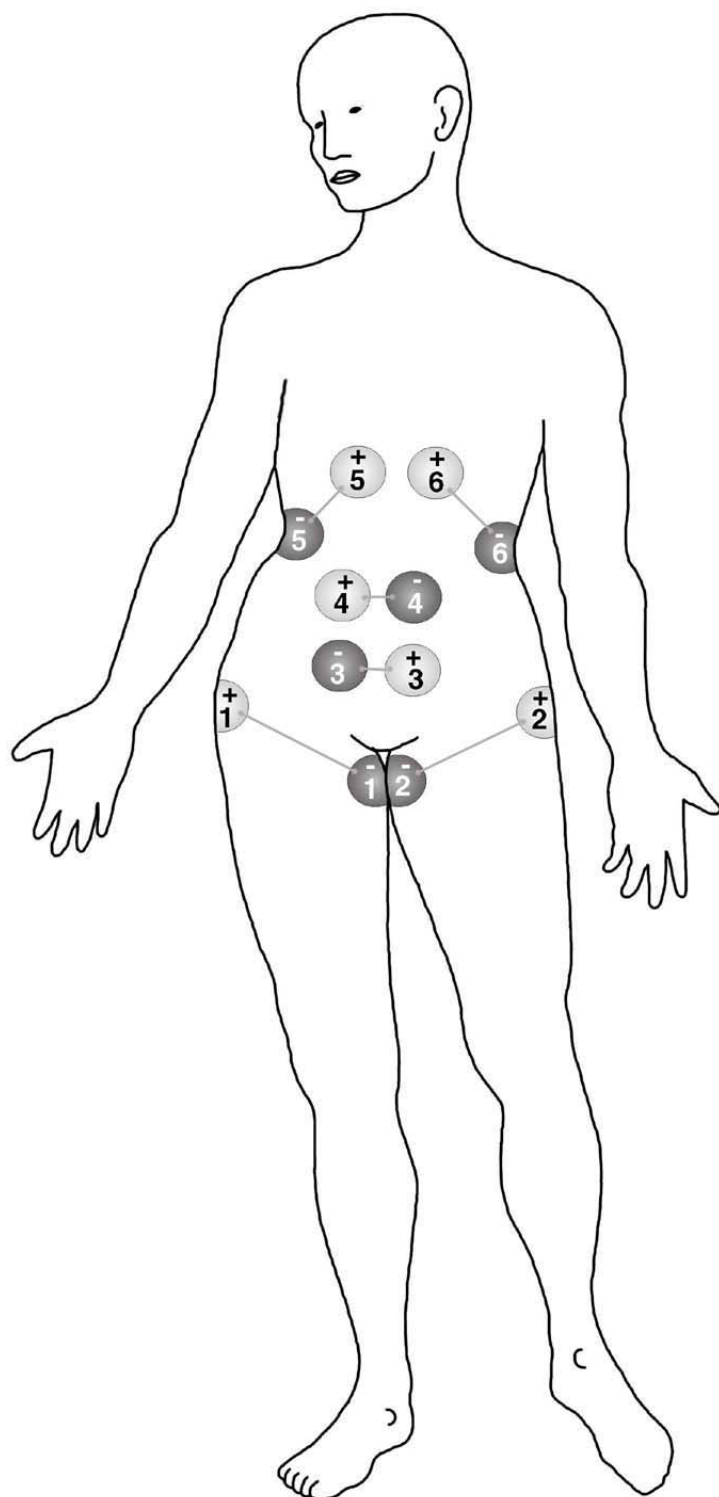


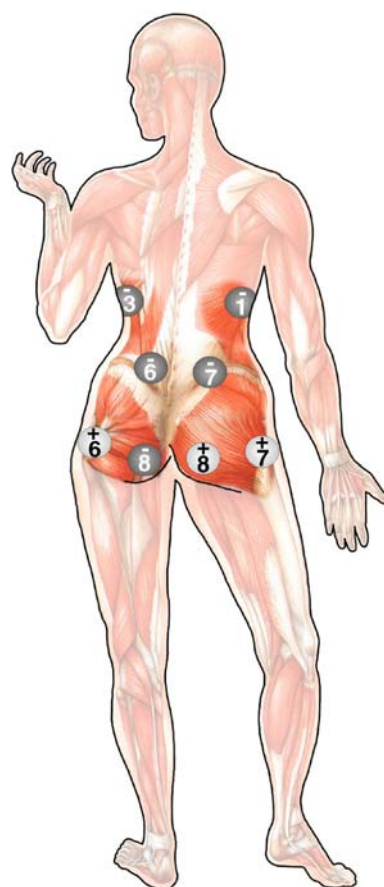
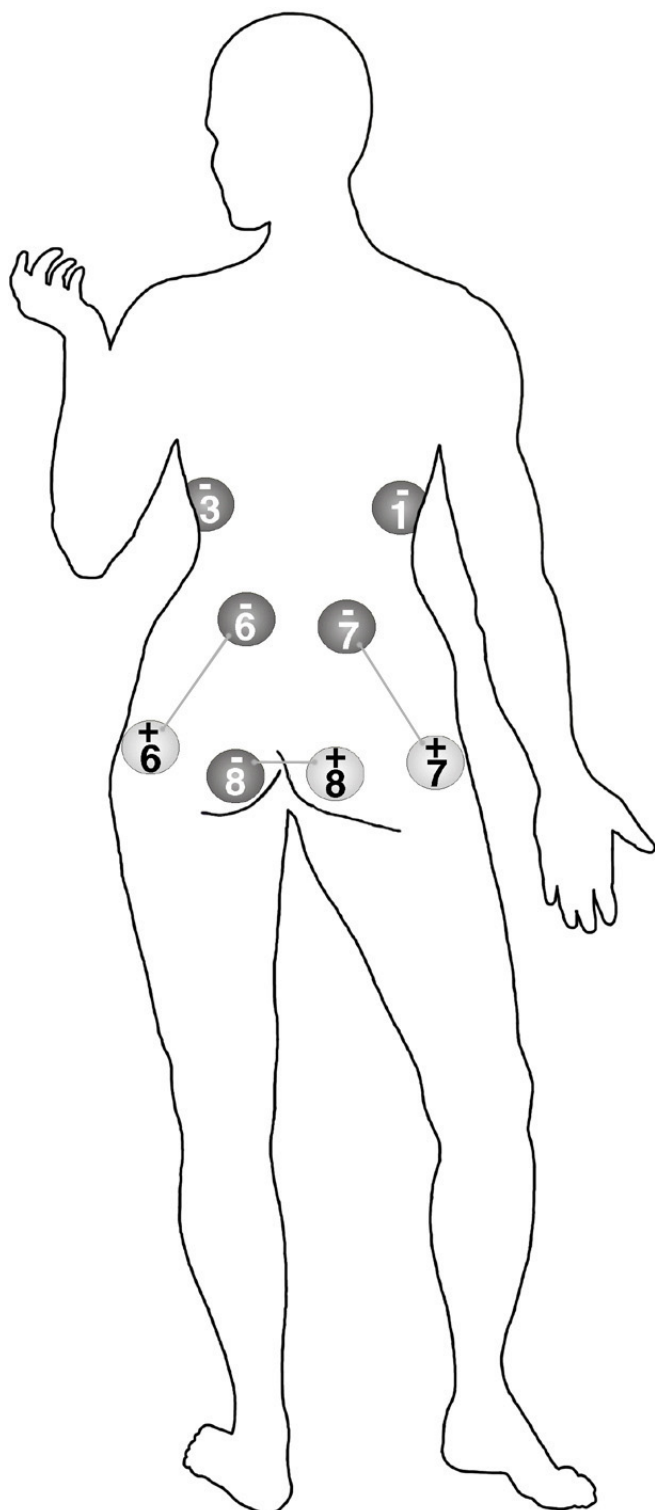
BACK VIEW

POST-PARTUM TREATMENT**FRONT VIEW**

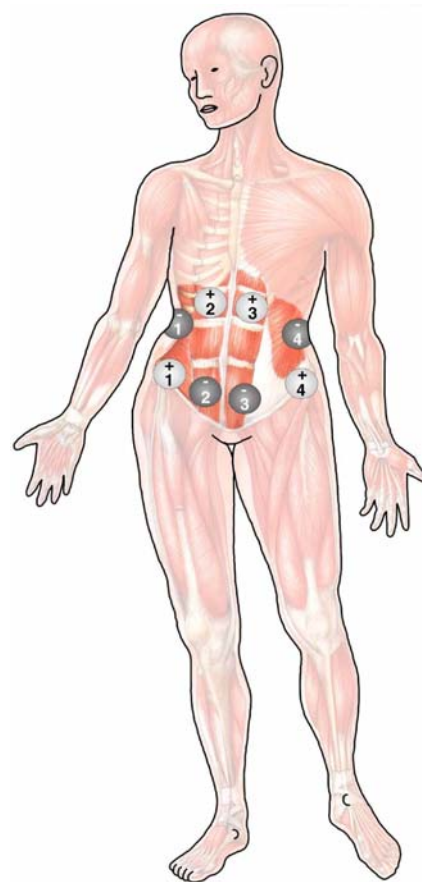
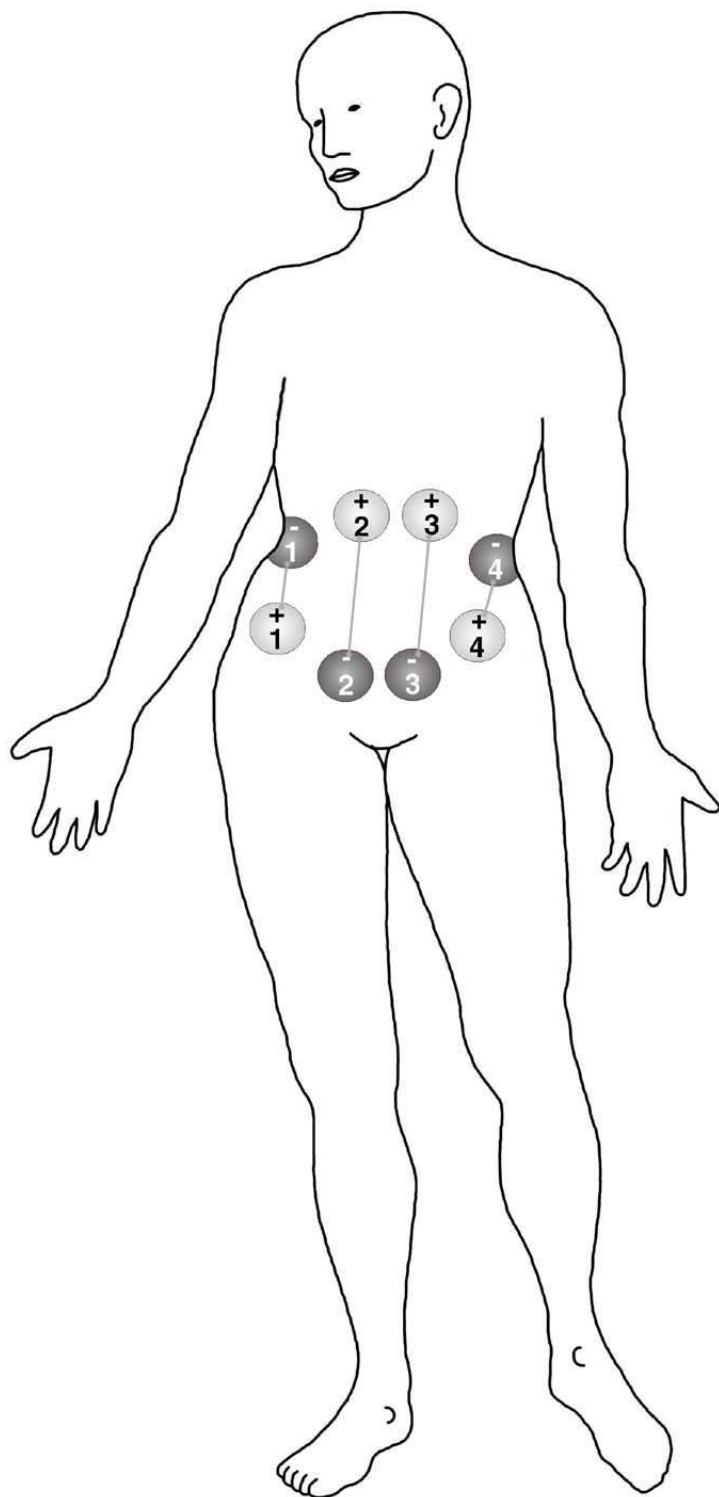


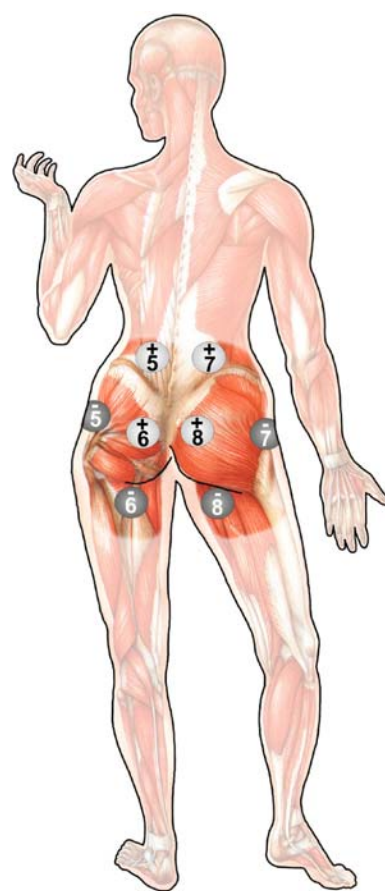
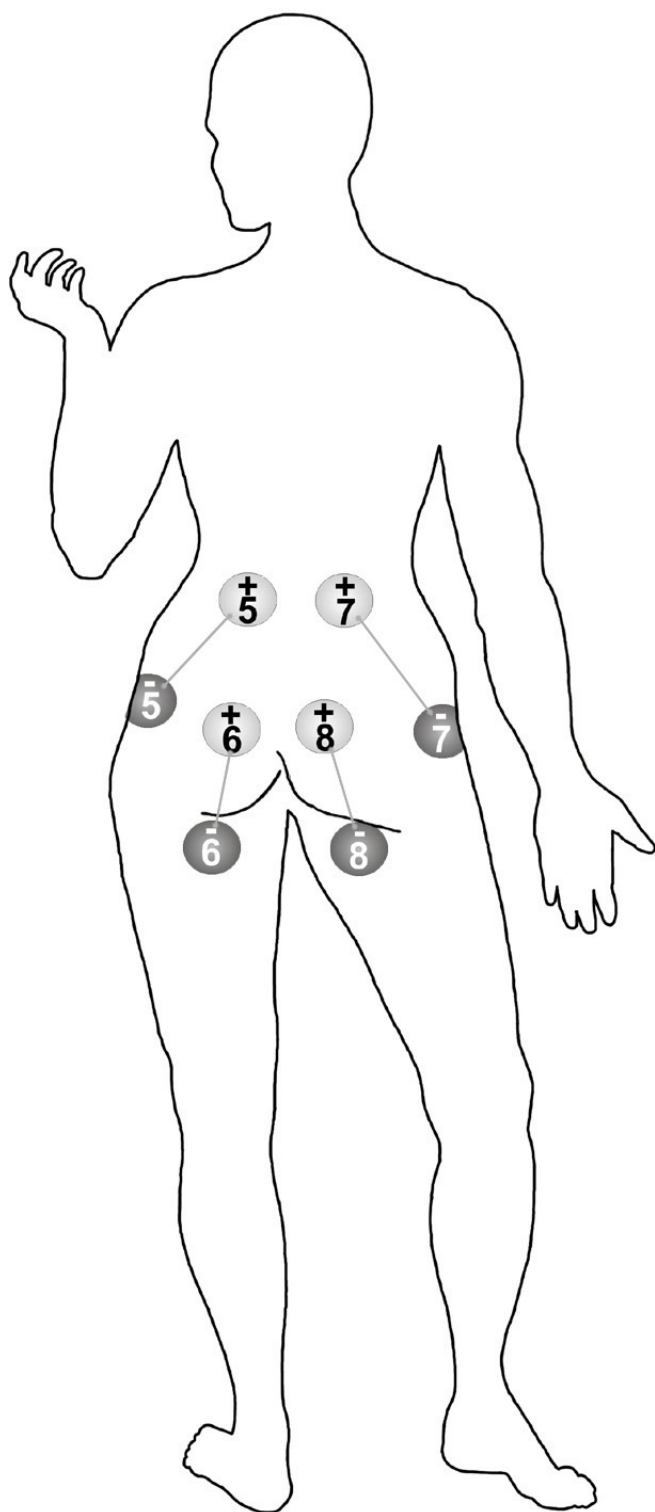
BACK VIEW

TREATMENT OF ABDOMEN AND WAIST**FRONT VIEW**



BACK VIEW

TREATMENT OF ABDOMEN AND GLUTEUS**FRONT VIEW**

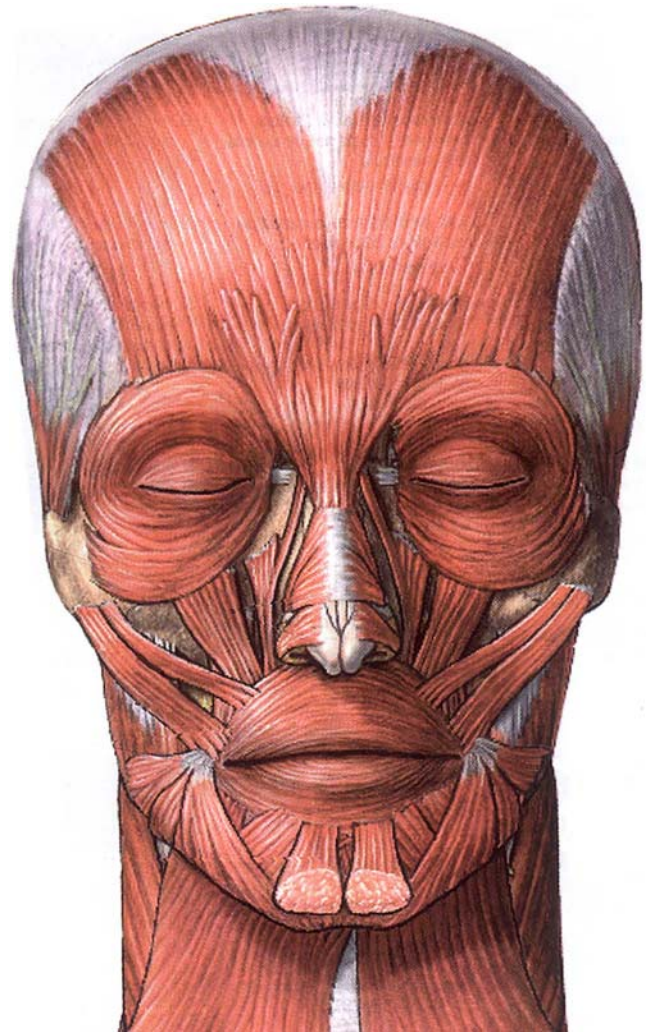


BACK VIEW

FACIAL ANATOMIC ATLAS

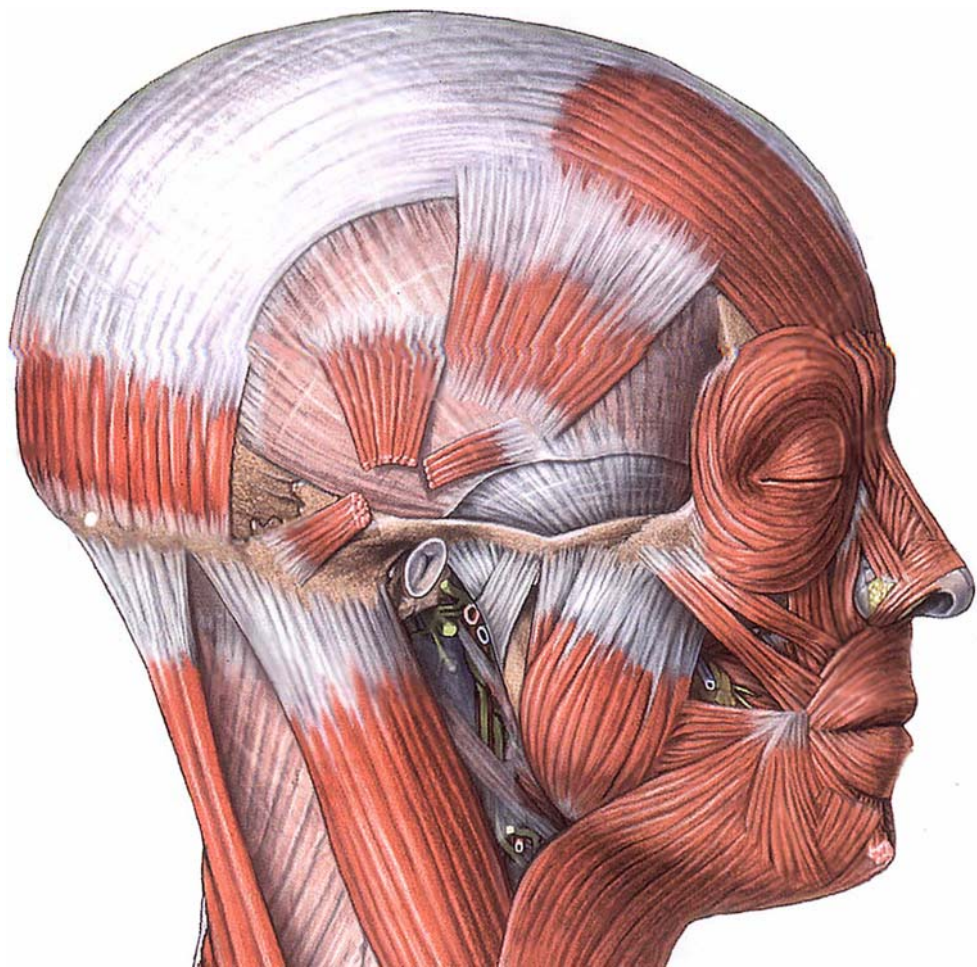
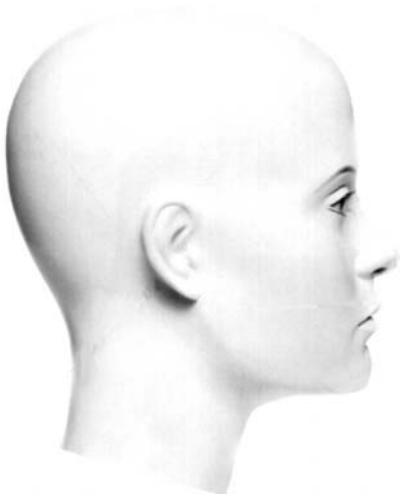
- **Front view**
- **Side view**

FACIAL ANATOMY ATLAS

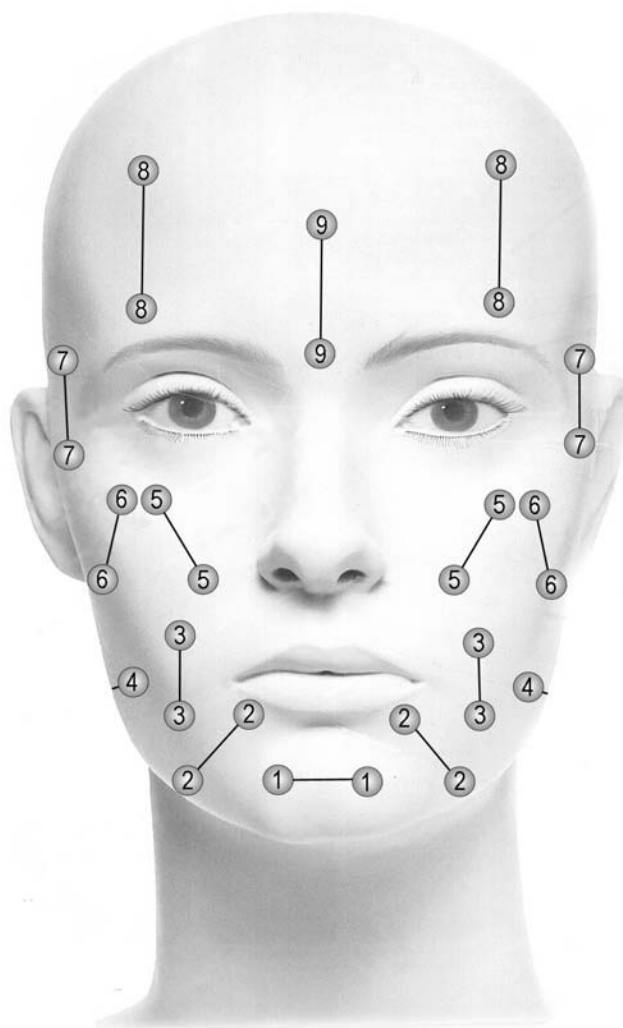


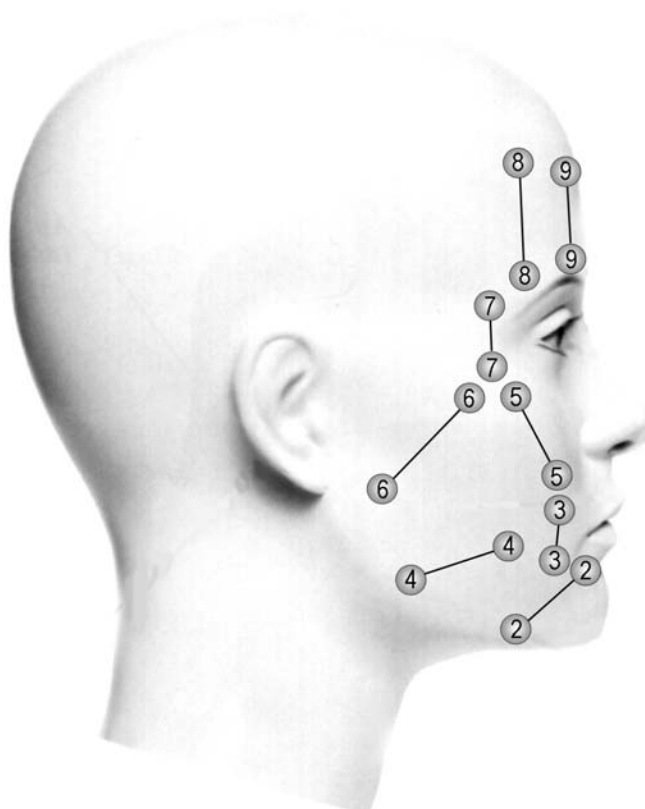
FRONT VIEW

FACIAL ANATOMIC ATLAS

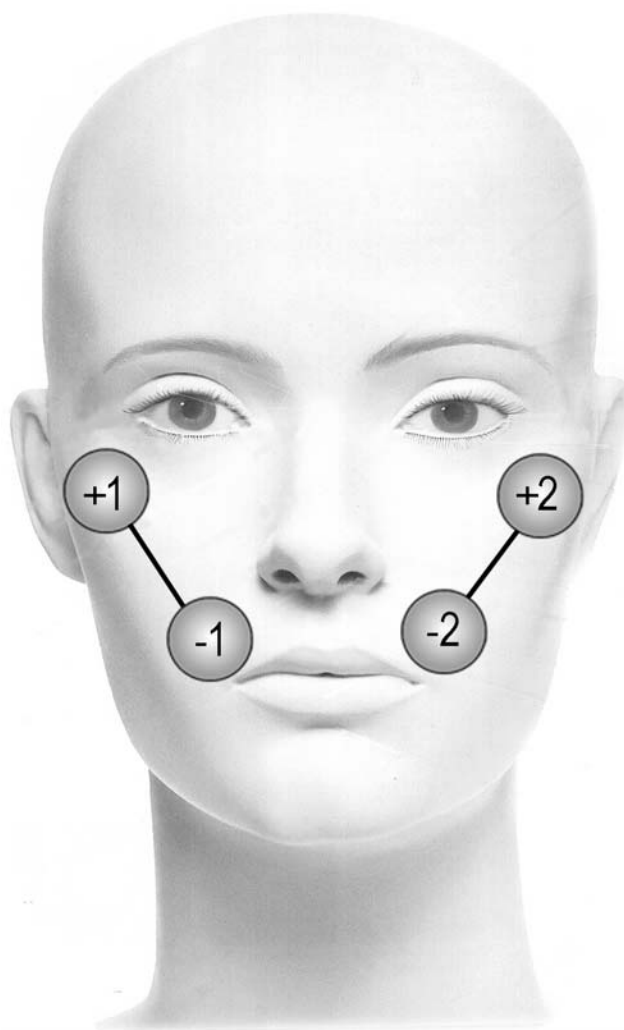


SIDE VIEW

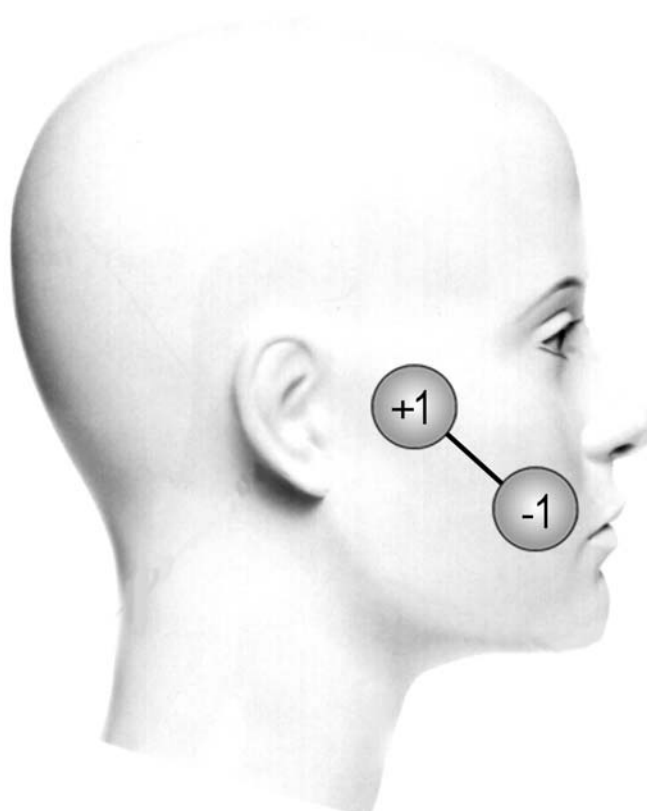
FACIAL FIRMING TREATMENT**FRONT VIEW**

FACIAL FIRMING TREATMENT

SIDE VIEW

**FACIAL FIRMING TREATMENT
(automatic plates)**

FRONT VIEW

**FACIAL FIRMING TREATMENT
(automatic plates)**

SIDE VIEW

POSSIBLE TECHNICAL PROBLEMS

1. The machine is not working. Why?

It can be a power cut or the treatment may be temporarily stopped, eliminating the supply of current to the apparatus. As the outlets are open, IMPGA 3000 activates a safety mechanism that lights up an orange pilot lamp. This light shows that the current is completely stopped until all outlets have been shut and put to zero. This safety system guarantees the total peace of mind of the professional against unexpected power cuts in the electricity supply, safeguarding above all the client's safety.

Also check that the plug is connected properly and that tension reaches the appliance (you can check the presence of current with another equipment). Verify the rear connector and the reliability of the mains cable, using it to connect another appliance. It thus indicates that the problem does not come from the mains cable. Once these verifications are made, the protection fuse may be examined to see if it has not melted. Finally, make sure that the mains voltage corresponds to that of the equipment.

If the pilot light is on but the machine is not working, check with this start up manual that the operation process is the right one. If the problem persists, consult the technical department.

90% OF TECHNICAL PROBLEMS COME FROM A LACK OF ATTENTION WHEN HANDLING THE BUTTONS AND FROM THE NATURAL WEAR OF THE ACCESSORIES. For this reason, please check all these details before contacting your nearest technical service.

2. An outlet is not functioning. What is happening?

If an outlet is not functioning properly or not functioning at all, it can mean that the cable has been cut internally, which blocks the current output. The problem is solved by replacing the cable by a new one.

3. The client has no electrical sensation. What can it be?

Make sure that the plates are correctly soaked with conductor gel and are homogeneously adapted to the client's skin. The lack of a proper contact can produce the absence of electric transmission.

GUARANTEE AND SAFETY

1. The manufacturer is not responsible for an improper use of this machine, nor for the consequences derived from it. Any use not included in this instruction manual can be dangerous. We therefore ask you to consult your nearest authorised distribution centre for any doubt.
2. Our wish to include possible improvements in our appliances compels us to reserve the right to modify the characteristics of our equipments without prior notice.
3. All equipments are provided for a **mains voltage** of 230 volts. If you require a voltage of 125V, notify it to your provider at the time of the order.
4. As MANUFACTURERS we offer a 24-month **guarantee** on our equipments against any manufacturing fault.

In order for this guarantee to be efficient, the following technical **specifications** must be taken into account:

4.1. Minimum specifications in the electrical installation:

- The equipment must always be connected to the electrical current by means of a voltage regulator with ground point, whose output voltage must be included between 110 and 120 volts, in the case of installations with this voltage (particularly in Latin-American countries) or 220 and 230 volts in European countries.
- The socket where the equipment is connected must be in perfect conditions.

4.2. This guarantee **becomes invalid** if:

- A. The equipment is used **improperly**.
- B. The electrical installation or the regulator connected to the equipment are **defective**.
- C. The equipment is exposed to **overloads**, short-circuits, electrical discharges, floods or other similar unforeseeable circumstances.
- D. The equipment is **handled** or **repaired** by staff non authorised by EMA.

DECLARACIÓN DE CONFORMIDADDECLARATION OF CONFORMITY
DECLARATION DE CONFORMITÉ89/336/CEE
73/23/CEE**MARZO 2003**
MARCH 2003
MARS 2003

Electroestética & Mobiliario

**Nombre del Fabricante:** BIOINSIDE INVESTIGACIÓN Y TECNOLOGÍA, S.L.

Manufacturer's name:

Nom du fabricant :

Dirección del Fabricante:

Manufacturer's address:

Adresse du fabricant :

Sant Martí de l'Erm, 22
E 08970 – Sant Joan Despí
BARCELONA - SPAIN**Declara que el producto:**

Declares that the product:

Déclare que le produit :

Electrocosmético**Electrocosmetic**

Electro-cosmétique

Nombre del producto:

Name of the product:

Nom du produit :

IMPGA 3000

Marca:

Brand:

Marque :

EMA

Cumple con la normativa:

Complies with the norm:

Est conforme à la norme :

Seguridad Eléctrica:

Electrical Security:

Sécurité électrique :

CLASS I TYPE BF

UNE EN 60601

Compatibilidad Electromagnética:

Electromagnetic Compatibility:

Compatibilité électromagnétique :

EN 61000-3-2, EN 61000-3-3, EN 50081-1, EN 55011, EN-5002-1, EN 61000-4-2, EN 61000-4-2, EN 61000-4-3 + ENV 50204, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11.

Signed: Pilar Sánchez

MANUFACTURER'S NOTE:

Our wish to offer to the aesthetic sector equipments that keep adapting to the requirements of this young profession leads us to conceive new equipments and to try and improve those already existing. For this reason we are compelled to reserve the right to modify these specifications without prior notice.

All equipments are intended for a mains voltage of 230 V. If you require it for a voltage of 125 V, please inform your supplier at the time of order.

The inappropriate use – not included in this instruction manual – from the beauty professional can have undesirable results. The manufacturer is not responsible for the results derived from an improper use of the machine.

SUGGESTIONS:

Your opinion is important to us. You can send your comments and suggestions to get a better service day after day. You can write at the following address:

EMA

BIOINSIDE INVESTIGACIÓN Y TECNOLOGÍA, S.L.
REGISTRATION No: B60829793

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NOTES AND COMMENTS

EMA

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