

The Electronic Needle

A **portable**
medical device for
transdermal drug
delivery by **skin**
electroporation



Transdermal Electroporation

Transdermal drug delivery offers several advantages over conventional routes but in spite of the advantages only a small percentage of drugs can be delivered due to the barrier properties of the skin. Moreover transport of most drugs across the skin is very slow and lag times.

Transdermal electroporation is a technology based on a momentary creation of small pores in cell membranes by applying an electrical pulse to the skin.

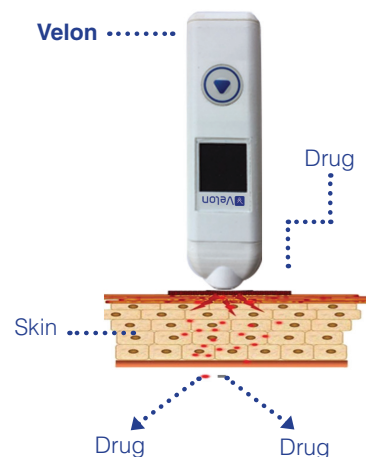
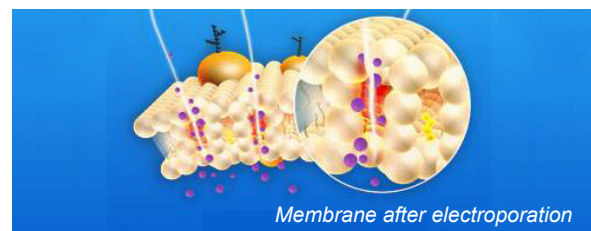
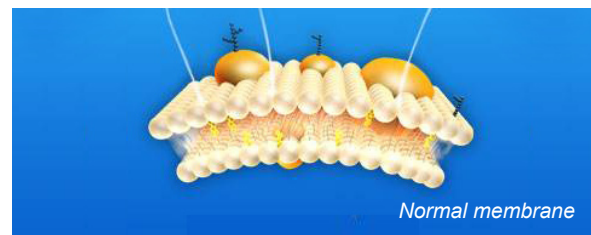
With appropriate electrical pulses, electroporation creates a transient permeabilized state that can be used to deliver a large variety of drugs through the skin.

Velon is an innovative portable device that exploits transdermal electroporation allowing effective topical drug administration.

It is important to note that it is the drug that makes the therapeutic action.

To reach steady achievement of a therapeutically effect is therefore difficult without enhancing skin penetration.

Transdermal drug delivery by **electroporation** is a useful alternative to the conventional routes of administration such as oral or injectable routes.



Velon does not have any healing function but only on the transport of molecules.

Advantages

Topical drug administration by means of Velon has many advantages over oral or injectable routes

Non invasive

Velon electroporation pulse sequence ensure that less energy is used to electroporate eliminating risk of inducing damage. Unlike an intravenous infusion, delivery is non-invasive.

No impact on gastro intestinal metabolism

Electroporation avoids “first pass” degradation or metabolism in the gastro intestinal tract or liver.

Convenient

The compact portable design allows patient to operate Velon anywhere in a quick and easy manner.

Rapid response

The active ingredients come directly to cellular receptors. Lag times can be substantially reduced.

Efficient

Higher uptake of the drug with reduction of dosing frequency. Once absorbed, hepatic circulation is bypassed, thus avoiding another major site of potential degradation.

Effective

Electroporation pulse protocols have been shown to increase, accelerate and broaden transdermal drug delivery.

Controlled

Tissue resistance drops due to increased membrane permeability. Velon constantly adjusts the electroporation signal limiting possible tissue damage and heating.

Patient Compliance

Velon full programmability allows the patient to easily comply to the prescribed treatment regimen.

Velon

Velon is an innovative hand-held device that combines all the features normally available in a bulky electroporation system.

Portable Easy to Use

Velon is compact, very easy to use and designed to accommodate pre-programmed Electroporation Pulse Protocols for better patient convenience.



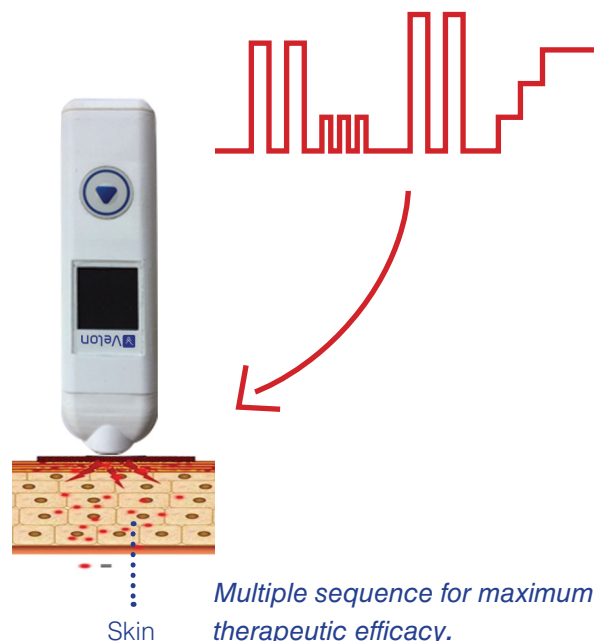
Micro electroporation

As opposed to high voltage pulses, Velon generates low level controlled pulses to ensure that less is used to electroporate which eliminates risk of inducing damage.

Multiple Pulsing

Electroporation is often carried out with a single pulse or a series of equal pulses, however some cell types may require multiple pulses of different segments to achieve optimal transfection rates.

Velon makes use of multiple pulsing method. This method is critical for maximum delivery effectiveness and minimum impact on tissues.



Skin resistance measurements

The tissue resistance during electroporation can vary dramatically. Velon constantly measures skin complex resistance and in real time adapts the output to the changing conditions in the tissue.

Fully Programmable

Pre-programmed delivery sequence

The use of multiple pulsing requires the optimization of key electrical parameters, including:

- Resistance measurements
- Field strength
- Pulse duration
- Number of pulses
- Interval between pulses

Velon is a fully programmable microprocessor controlled device able to store electroporation pulsing protocols.

Personalized Pulsing Protocols

Velon is programmed via a dedicated Console able to offer:

- Pulsing protocol personalization
- Protocol downloading
- Pulsing protocol storage
- Therapy annotation
- Editing feature

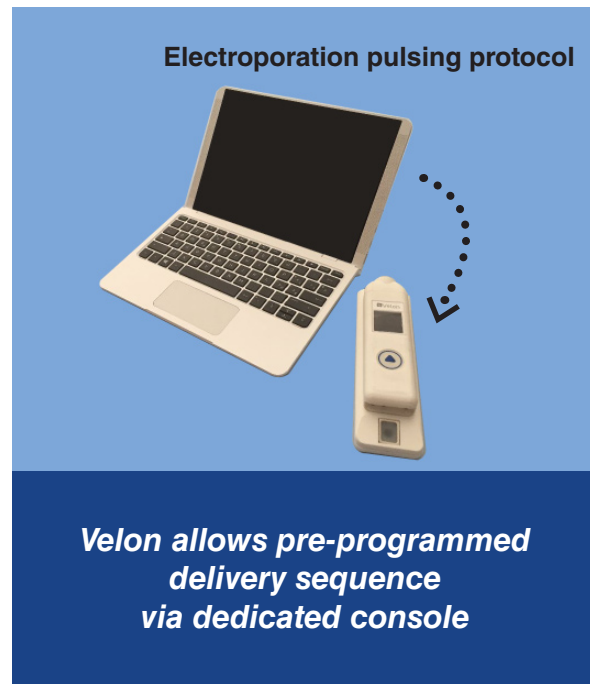
The benefit of using Velon Console is that it doesn't need to connect to an external computer.

Remote Update

For easy remote update Velon Console supports different connectivity types. Firmware update of portable Velon-E is also supported.

Full data protection

Full data protection is achieved thanks to TLS protocol implementation.



Remote pre-programmed sequences may be downloaded via Internet

TMS Library

Electroporation Pulsing Protocol

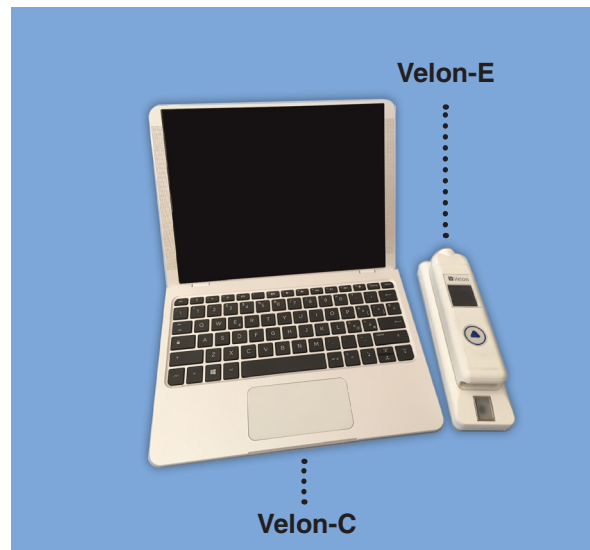
Efficient electroporation outcome will only be gained by fine tuning the appropriate electric field parameters according to the application needed.

TMS Library

Numerous electrical pulsing sequences designed for various topical medications are stored in Velon Console.

ETP

Once patient's data and the appropriate TMS are entered, Velon Console will automatically generate ETP, Electroporation therapy protocol that will be loaded on portable Velon-E.



By means of Velon console is possible to program Velon-E, based on patient's data, pathology and prescribed related treatment.

Main Applications

Electroporation is a technology with multiple medical applications. Current knowledge about electroporation suggests that it is applicable in many fields including but not limited to:

Dermatology

Urology

Senology

Endocrinology

Oncology

Pain Therapy

Orthopedics

Physiatry

Naturopathy

Homeopathy

Velon is very easy to use

- 1.**
**Power on Velon
and select therapy**



- 2.**
**Apply Topical Medication
to skin**



- 3.**
Start therapy button



- 4.**
Massage for few minutes



- 5.**
**A message of end therapy
appears automatically on
Velon screen together with
an acoustic signal.**



Velon Components

Velon-E



**Portable for the Patient
and Specialist**

Velon-C



Velon-N

Console and Nest

Main Specifications

Velon-E		Velon-C	
Electrical	Full electrical protection	Screen	10.1" Display
Electronics	Microprocessor controlled	Wi-Fi	802.big
Power Supply	Battery powered	Bluetooth	v 4.1
Operation	Long lasting autonomy	Power Supply	110-220 Vac - 50/60 Hz
Data protection	Full data encryption	Dimensions (mm)	261 x 175 x 19
Bluetooth	v 4.1	Weight (gr)	900
Charge	Wireless or external power supply	Velon-N	
Dimensions (mm)	155 L, 42 W, 25 T	Power Supply	From console or ext P.S.
Weight (gr)	140	Dimensions (mm)	185 L, 55 W, 23 T
		Weight (gr)	110
		Velon-E Charge	Wireless

Certifications

Velon meets the following requirements:

CE Mark

International Safety Standards:

EN 60601-1 EN 60601-1-6 EN 14971 EN 1041
 EN 60601-1-2 EN 60601-2-10 EN 980 EN 10993-1