

The story of my Journey to modernising injections

Since Francis Rynd's first intradermal injection in 1845, the operation till this day has always been done by exerting pressure by the thumb onto a plunger. We have come a long way since 1845 in how syringes are designed, however the limiting factor still remains the humans' ability to exert a constant pressure in order to guarantee the desired flow rate.



On the 12th of January 2012, Bernard Pierre Legrand and Stefanos Konandreas started the Juvapen project with a vision to bring modern technology in injections.

It is well accepted that injection interventions in sensitive tissues is a task that even experienced doctors have a hard time performing. Today more and more non-surgical operations are done manually through injections of fluids such as Cortisone, Platelet-rich plasma, Hyaluronic Acid, Botulinum toxin, and even intraocular lenses.

We created Juvapen to be the first handheld lithium device (under 50g) that allows doctors to inject fluids and objects into the body even in the sensitive areas with great ease and pain reduction. The device is activated in a very similar manner to a computer-mouse, and at the click of a button the doctor has as much power and fluid control as they desire when injecting viscous fluids or lenses.

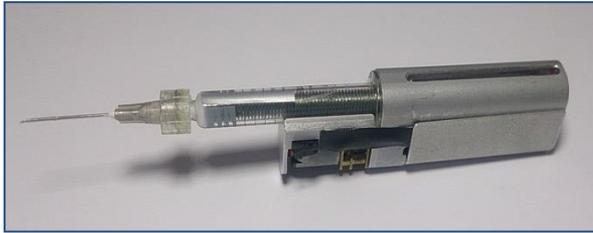
How much technology could you fit
in the space of a regular lighter ?



You would be surprised...

It has been a long Journey

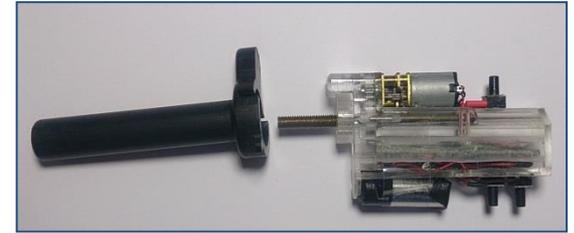
February 2012



March 2012



May 2012



October 2012



November 2012



March 2013



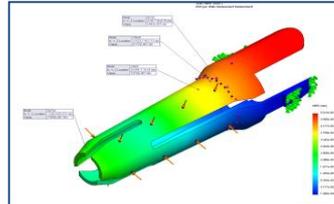
August 2013



March 2014



Over 2'000 R&D hours were necessary to create this patented syringe holder



Force-sensitive activation button developed in-house

9 step manufacturing process to get the finish just right

Powerful: Can push up to 15 Kg (limited to 9 Kg for safety precautions)

Connector-free 4 layered RigidFlex Printed Circuit Board

Lithium-powered

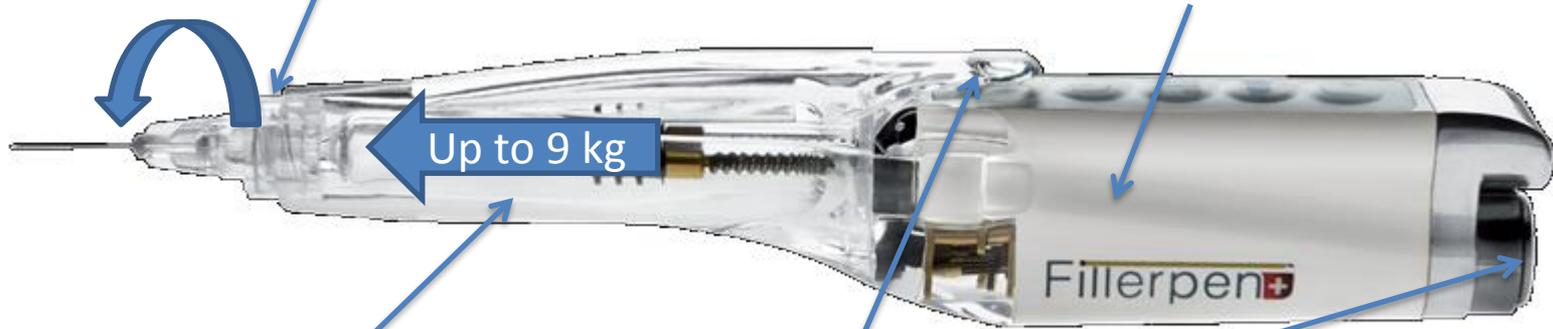
- ↑ more power
- ↑ consistent power delivery
- ↓ less weight
- ↓ less volume

Patented anti-rotation of syringe

- allows for easy needle changing during operation
- avoids pop-off

ONLY 41 g

Thanks to Finite Element Analysis



Force feedback technology

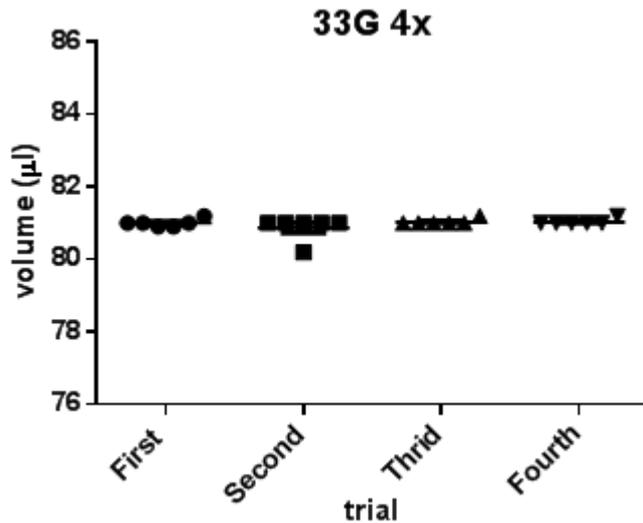
- Avoids drop-off
- Avoids pop-off
- Reduces latency
- Automatically optimizes flow rate
- **Reduces patient's pain**

Up to 9 Kg of **Pressing Force** while user only needs to apply 200 g on the syringe cover or on the back button to activate the system

2 years of ergonomics development by a team of specialists to allow for various handling postures

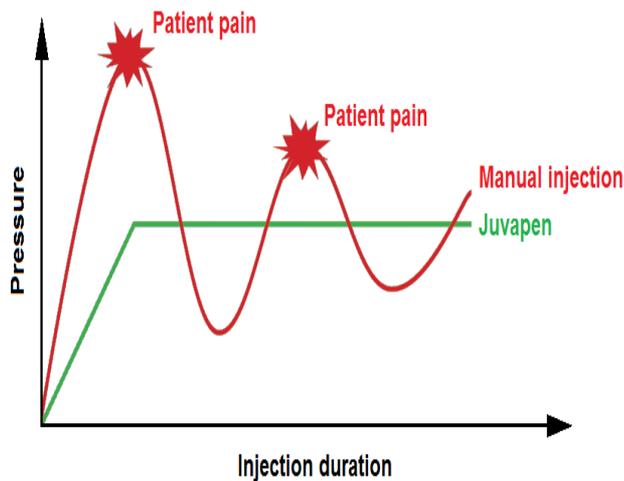
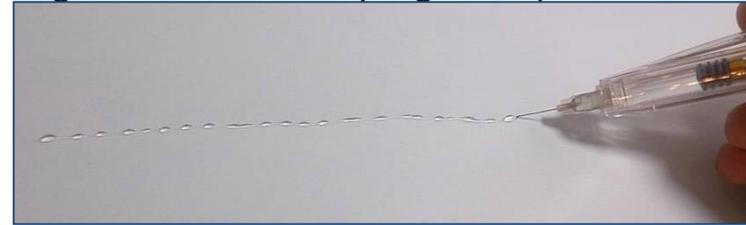


statistically impossible to do by hand



Drop mode

Ordinary one-way ANOVA and multiple comparisons were performed after measurements to assess statistical significance within different trials of each test. No significant difference was observed (N=6, * $p < 0.05$, ** $p < 0.01$). This level of accuracy is impossible to achieve through current manual syringe manipulations.

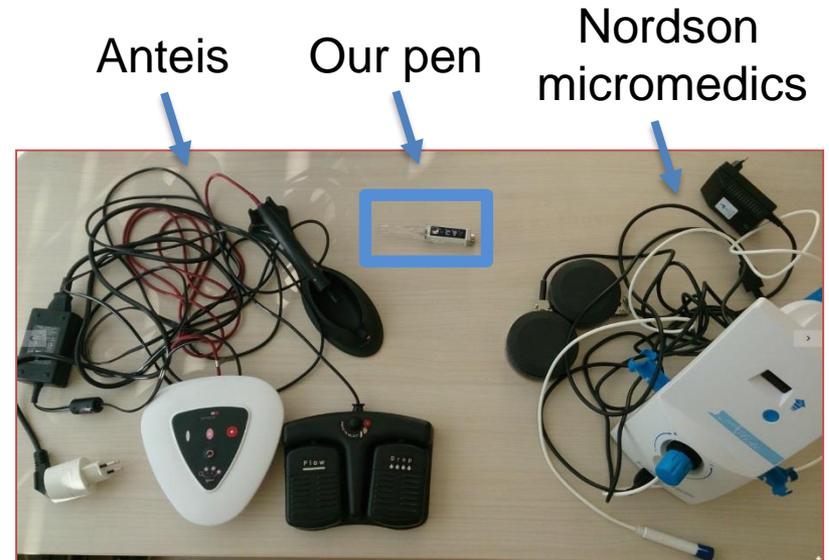


Flow mode

When placed on a dynamic dynamometer (model ESM301), the variance of force delivered by the Juvapen at a given speed was inferior to 5% of the total resulting pressure. This constant delivery of viscous fluid results in minimal peaks of pressure which in turn results in greatly reducing the patient's pain.



Market competition
when started 2012



Market competition
In 2017

