



European Society of  
Regional Anaesthesia  
& Pain Therapy

**ESRA ITALIA**

ESRA Italian Chapter

# XXVIII CONGRESSO NAZIONALE

PRESIDENTE  
DEL CONGRESSO  
Luciano Calderone





**NON-DISCLOSURE**

**IVRA, ENS ED ECO**



# BACK TO BASICS





GOING BACK TO THE BASICS  
WILL STRENGTHEN YOUR FOUNDATIONS



BACK ← IN → TIME

**BACK IN GERMANY**



[www.ahahq.org](http://www.ahahq.org)

**JOURNAL OF  
ANESTHESIA  
HISTORY**

**Anesthesia History Association**



COCAINE

**1884 – KARL KOLLER**



**COCAINE**



# 1885 – LEONARD CORNING

## classics in neurology

### James Leonard Corning and the early history of spinal puncture

NEUROLOGY 1987;37:672-674

Philip B. Gorelick, MD, and Donna Zych, PhD

Spinal puncture was introduced in the late 1800s. In 1891, Wynter<sup>1</sup> performed paracentesis of CSF in children with tuberculous meningitis by introducing a Southey's tube and trocar into a lumbar interspace. Six months later, Quincke<sup>2,3</sup> reported relieved intracranial pressure in children with hydrocephalus by inserting a needle with a stylet into the lumbar subarachnoid space. The first direct spinal puncture in a living person was credited to Corning in 1885, after experiments to determine the effects of cocaine on the spinal cord.<sup>4,5</sup> It has been debated, however, whether Corning's needle ever entered the subarachnoid space. We have reviewed Corning's role in the development of this procedure.

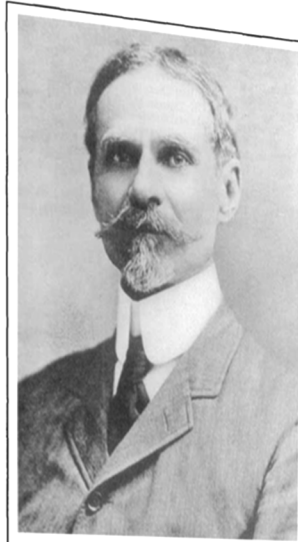


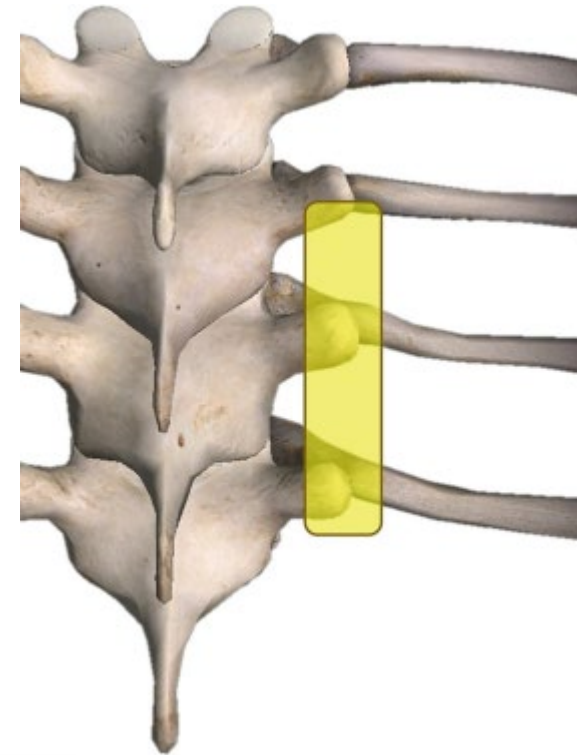
Figure A. James Leonard Corning (1855-1923) (from Keys TE, The history of spinal anesthesia, 1945. Courtesy of Schuman's, Publisher, New York).

**James Leonard Corning** (figure A) was born in Stamford, CT, in 1855.<sup>6</sup> His maternal grandfather, Frederick Deming, had been president of the Union Bank of Wall Street in New York City. His paternal grandfather, Edwin Corning, was a hardware merchant, and Corning's father, a graduate of Yale College, was a minister.

Corning completed his primary education at the River View Military Academy. At the outbreak of the Civil War, his family left the United States and settled in Stuttgart. In Germany, he studied chemistry at the Stuttgart Polytechnic Institute under von Fehling, physiology at the University of Heidelberg under Kuhne, and pathology in Würzburg. He received his medical degree in 1878, left Germany, and toured the medical institutions of Vienna, Paris, and London. Returning to the United States, he specialized in diseases of the mind and nervous system and held positions in the larger asylums of New York. He wrote five books and 40 articles on neurologic and psychiatric topics, including experiments on the local anesthetic properties of cocaine.<sup>7</sup>

Corning was a frequent observer at the Roosevelt Hospital, where, in 1884, Halsted and Hall had demonstrated the technique of conduction anesthesia with cocaine.<sup>3,7</sup> Corning<sup>8</sup> had experimented with cocaine and discovered a means of prolonging the local anesthetic effects in a limb by arresting the circulation with a tourniquet. He wondered whether local anesthetization of the spinal cord was within range of practical achievement.

Corning planned his experiments of 1885<sup>9</sup> based on Harley's belief<sup>10</sup> that strychnine, when applied to the spinal cord of animals, caused convulsions—not by direct contact with the cord, but through the intermediation of blood vessels. Corning proposed to inject cocaine in the vicinity of the spinal cord and predicted that it would be absorbed by small overlying veins (venae spinosae) and transferred by the blood to the substance of the cord.



# COCAINE

From the Department of Neurology (Dr. Gorelick), Michael Reese Hospital and Medical Center, and the Department of Neurology (Dr. Zych), University of Illinois, College of Medicine, Chicago, IL.

Presented in part at the thirty-seventh annual meeting of the American Academy of Neurology, Dallas, TX, May 1985.

Received March 7, 1986. Accepted for publication in final form June 6, 1986.

Address correspondence and reprint requests to Dr. Gorelick, Department of Neurology, Michael Reese Hospital, 29th and Ellis Avenues, Chicago, IL 60616.

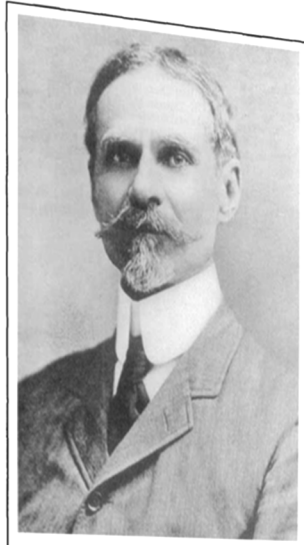
NEUROLOGY 37 April 1987

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# James Leonard Corning and the early history of spinal puncture

Philip B. Gorelick, MD, and Donna Zych, PhD

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# 1886

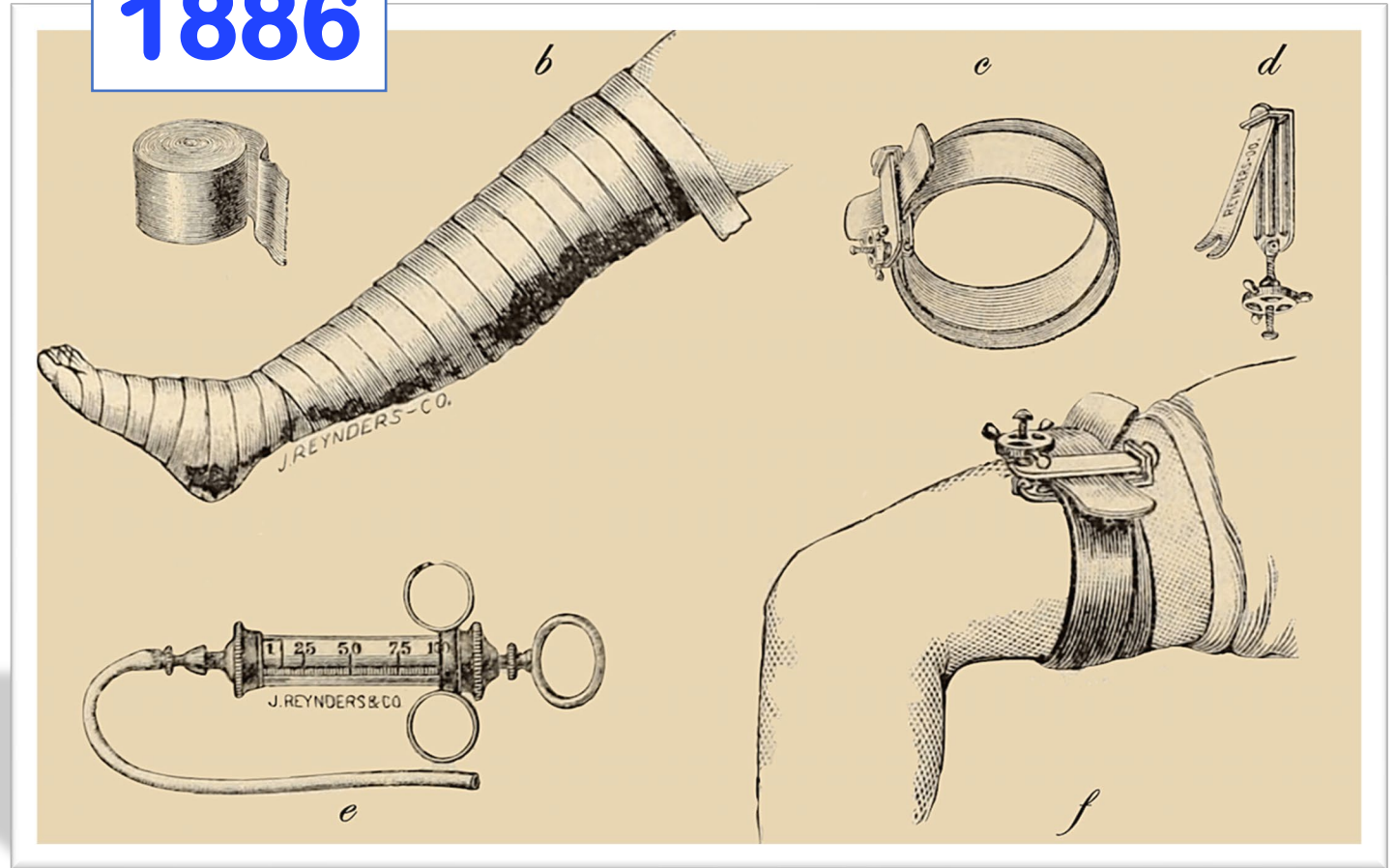
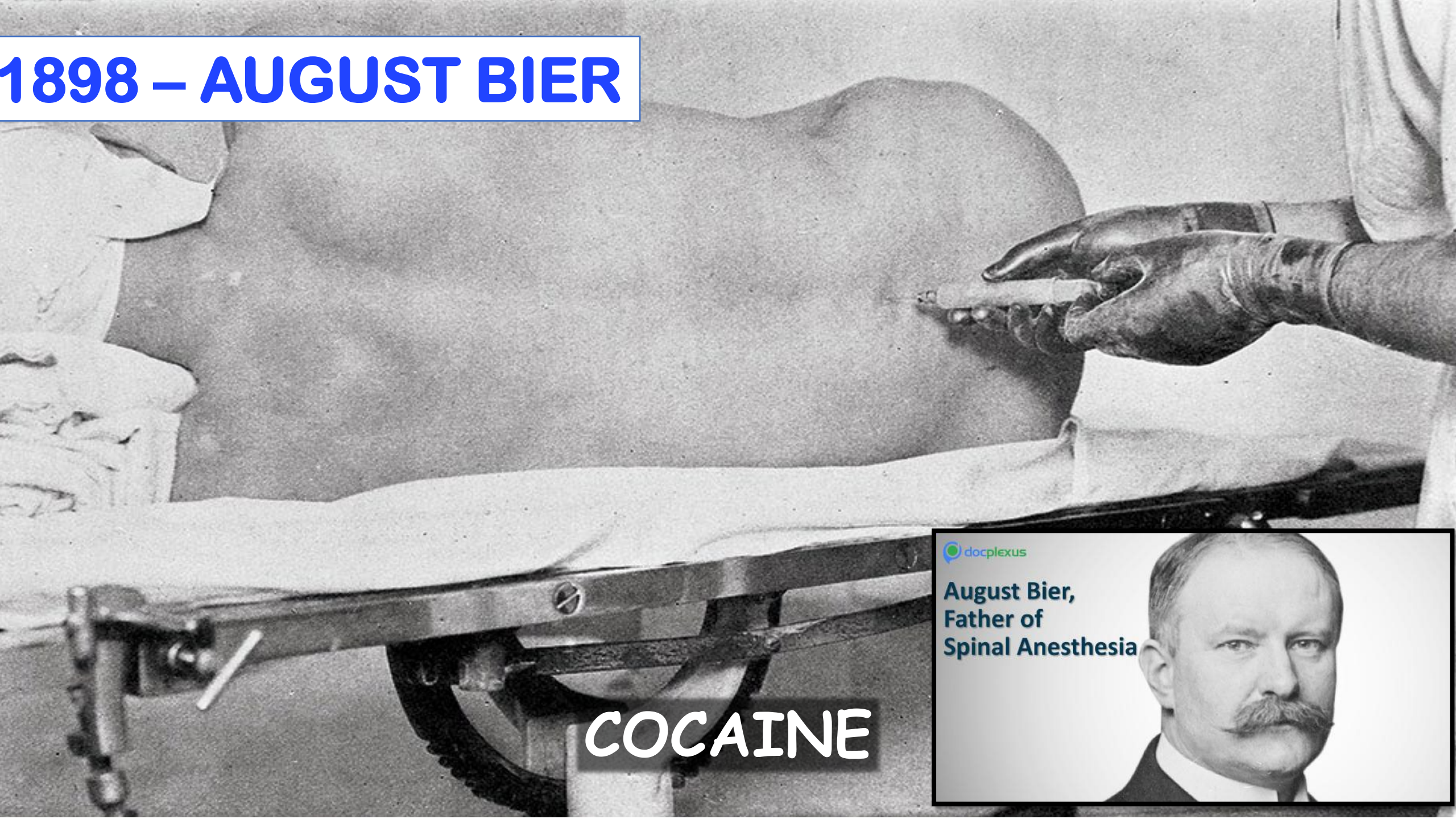


Figure A. James Leonard Corning (1855-1923) (from Keys TE, The history of spinal anesthesia, 1945. Courtesy of Schuman's, Publisher, New York).

# COCAINE



**1898 – AUGUST BIER**



**COCAINE**

 docplexus

**August Bier,  
Father of  
Spinal Anesthesia**





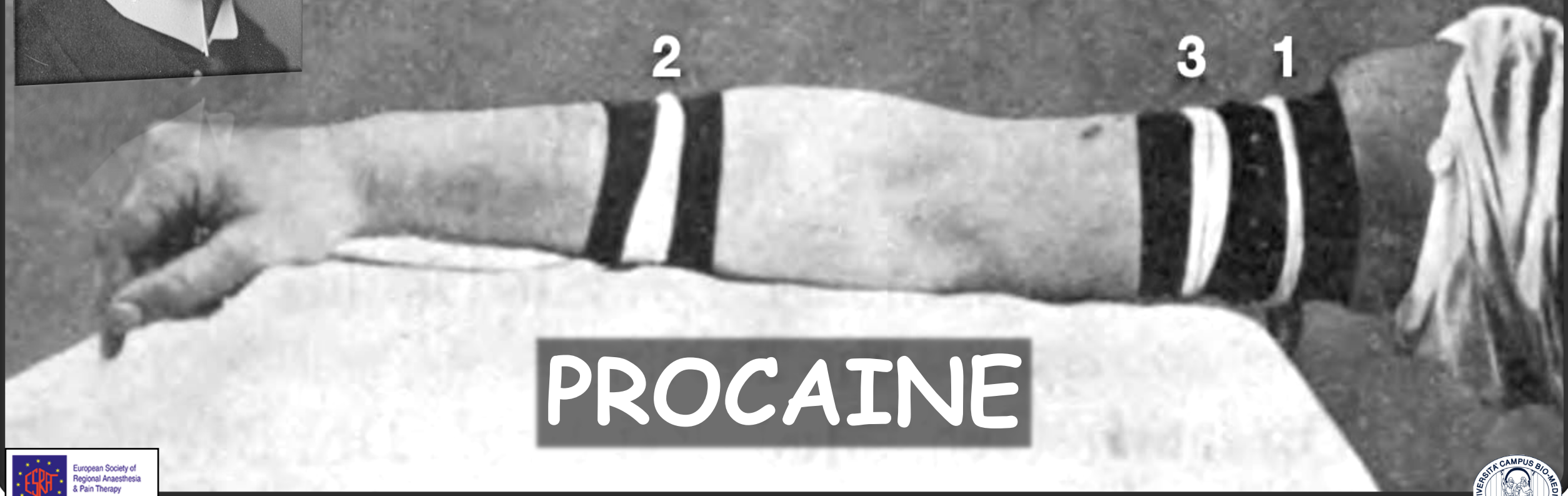
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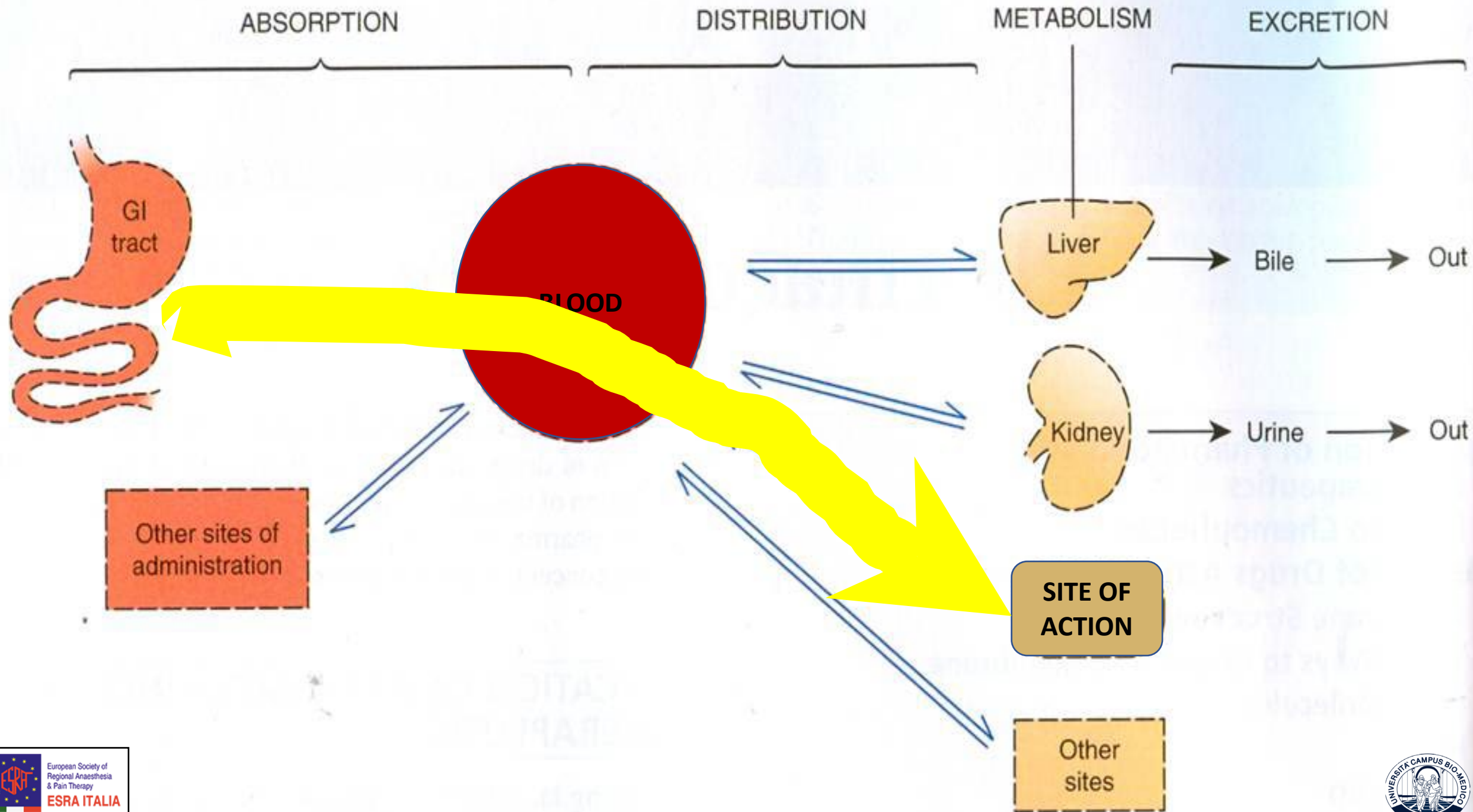


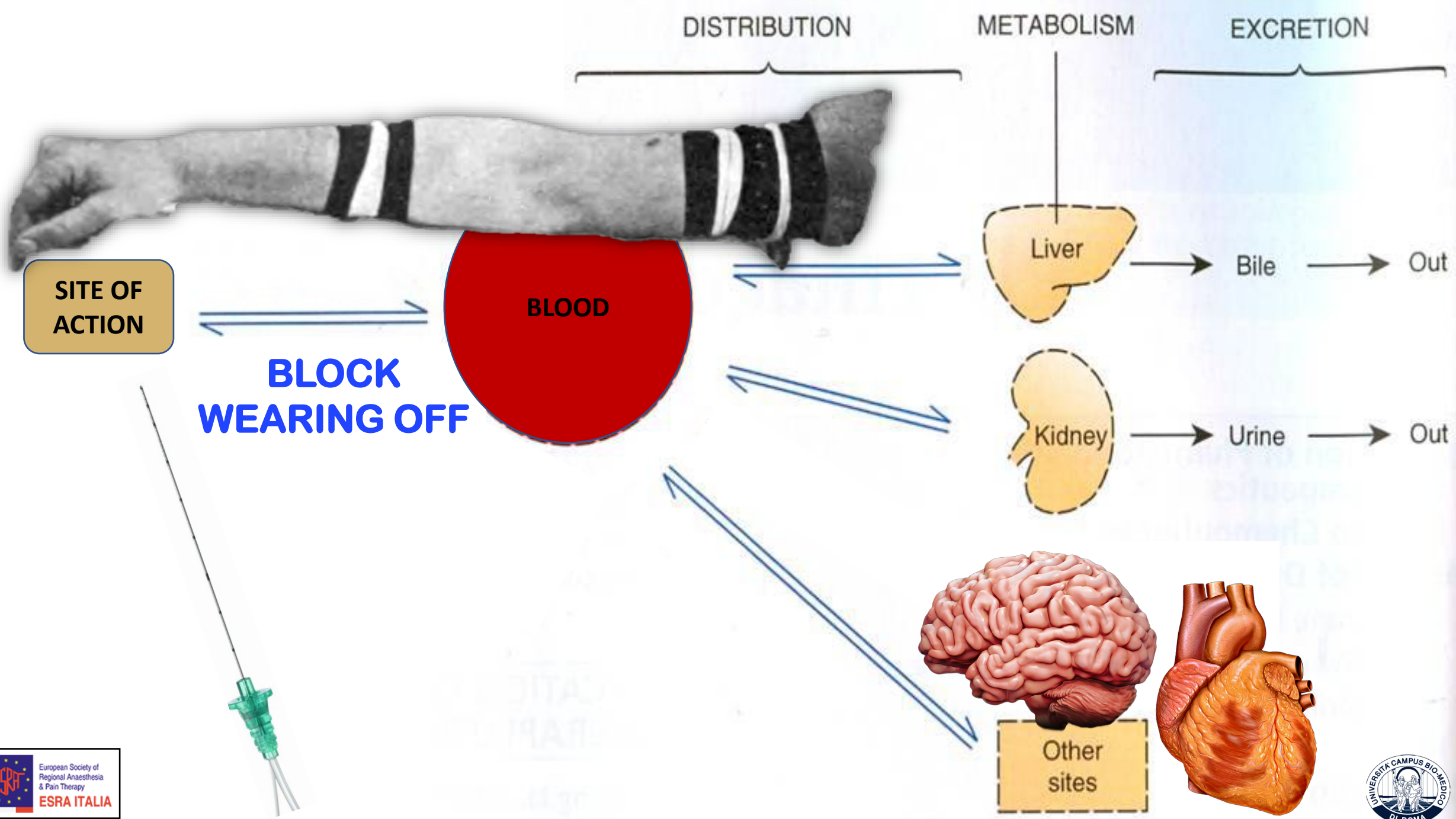
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## 1908 – AUGUST BIER









*Corning*

**STOP**

DISTRIBUTION

METABOLISM

EXCRETION

SITE OF ACTION

BLOOD

Liver

Bile

Out

**BLOCK NOT WEARING OFF**

Kidney

Urine

Out

Other sites



*Bier*

DISTRIBUTION

METABOLISM

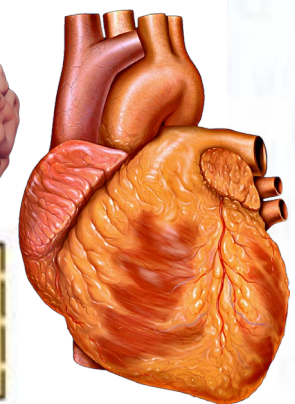
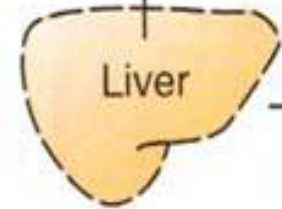
EXCRETION



SITE OF ACTION

BLOOD

STOP



Liver

Kidney

Other sites

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Urine

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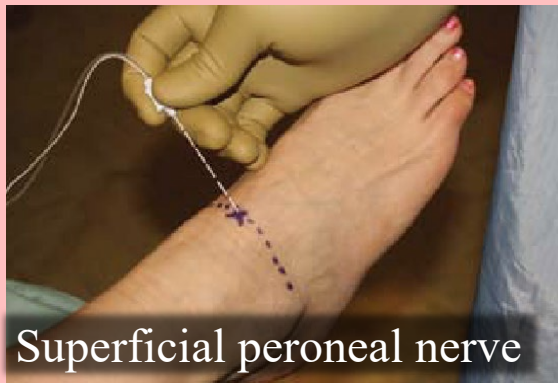
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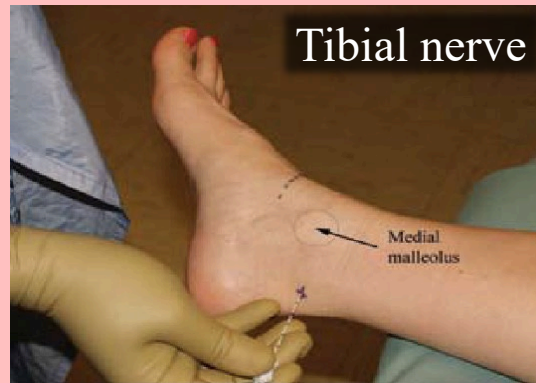
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Superficial peroneal nerve



Tibial nerve

Medial malleolus



Deep peroneal nerve



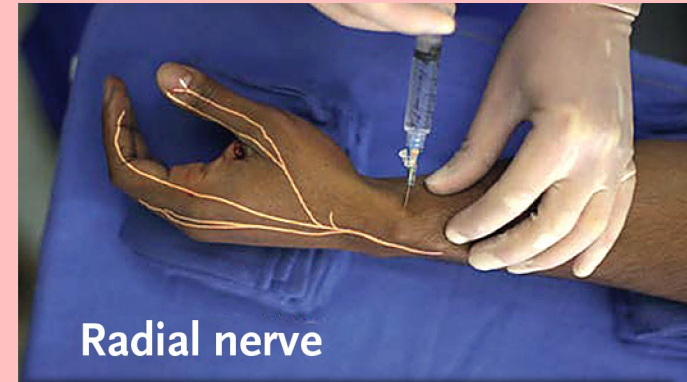
Sural nerve



Saphenous nerve

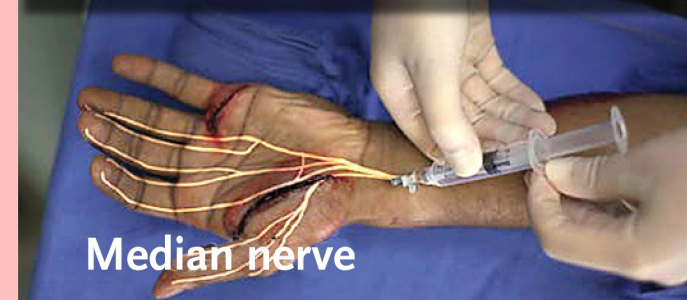
**ANKLE BLOCK**

**I.V.R.A.**



Radial nerve

**WRIST BLOCK**

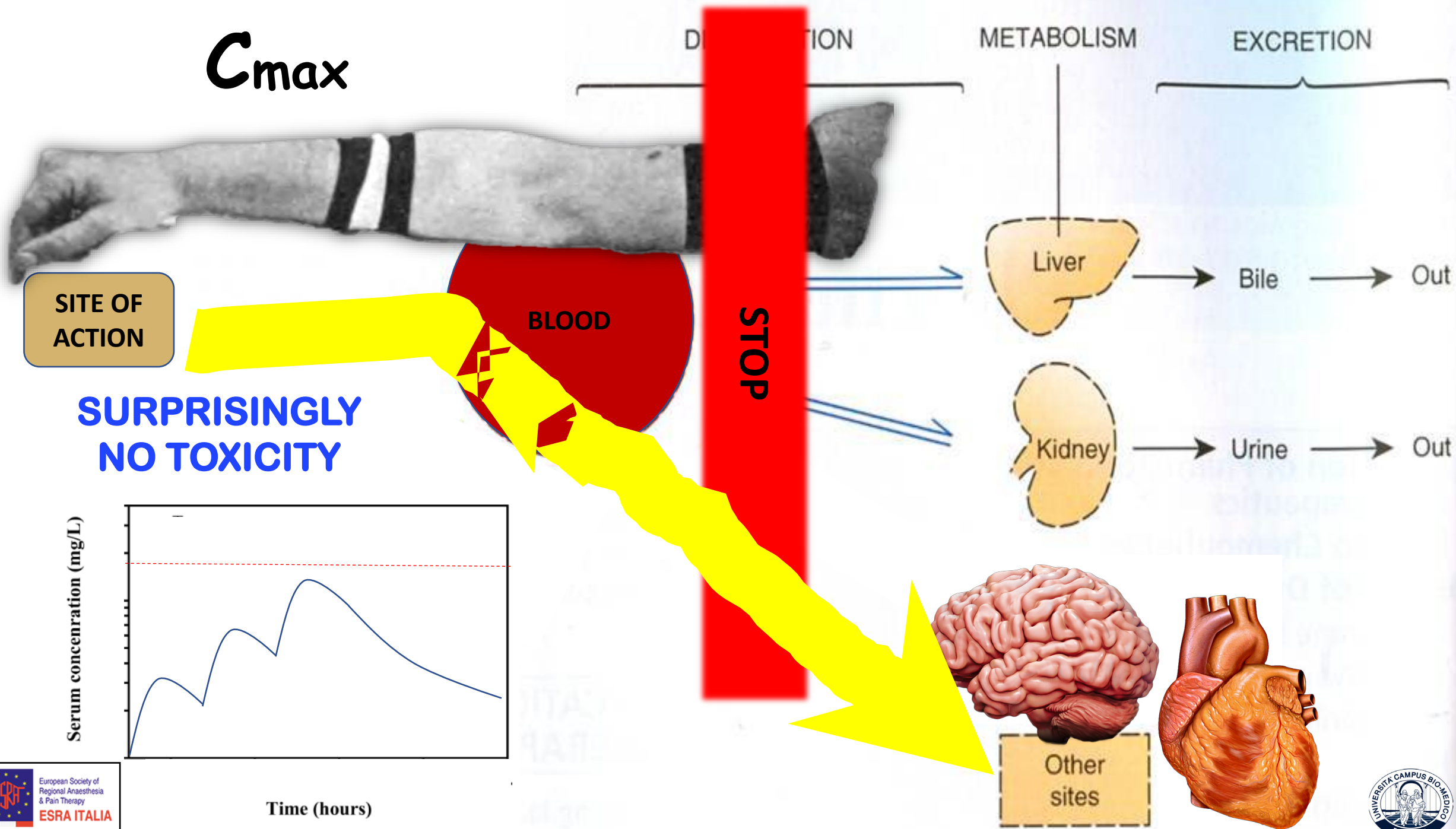


Median nerve



Ulnar nerve

# $C_{max}$



SITE OF ACTION

**SURPRISINGLY NO TOXICITY**

BLOOD

STOP

METABOLISM

EXCRETION

Liver

Bile

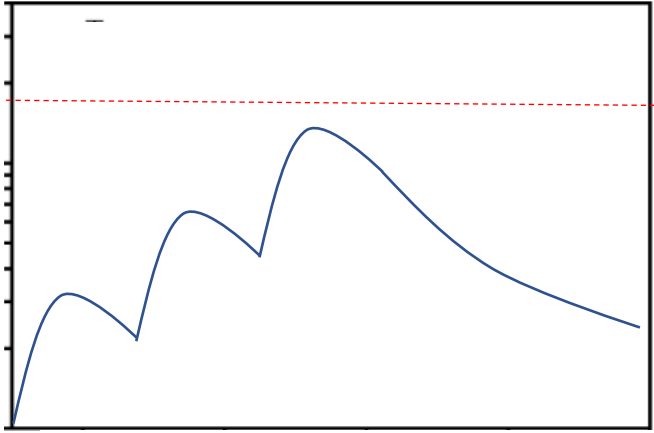
Out

Kidney

Urine

Out

Serum concentration (mg/L)



Time (hours)

Other sites



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BYE BYE, I'M GOING HOME!! HOW WAS YOUR NERVE BLOCK?



YOU'RE NOT FUNNY!!





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**NO RESIDUAL MOTOR BLOCK**

**OPIOID FREE**

**RAPID RECOVERY**

**ERAS<sup>®</sup>**





**ONLY HISTORY???**

**COMPLEXITY**





**FEAR OF TOXICITY**

**NO ANALGESIA**



PAIN MANAGEMENT, AHEAD OF PRINT | SHORT COMMUNICATION

**Mini-dose Bier's block vs systemic analgesia in distal radius fractures:  
a promising reduction in emergency department throughput time**

Mehdi Nasr Isfahani , Keivan Naseh  & Keihan Golshani  

**SEP 2023**

Published Online: 18 Sep 2023 | <https://doi.org/10.2217/pmt-2023-0030>



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**NO PARESTHESIA**

**NO ANESTHESIA**

**1911 – KULENKAMPF**



Kulenkampf, D. (1911) Anesthesia of the Brachial Plexus.  
Zentralblatt fur Chirurgie, 38, 1337-1350.

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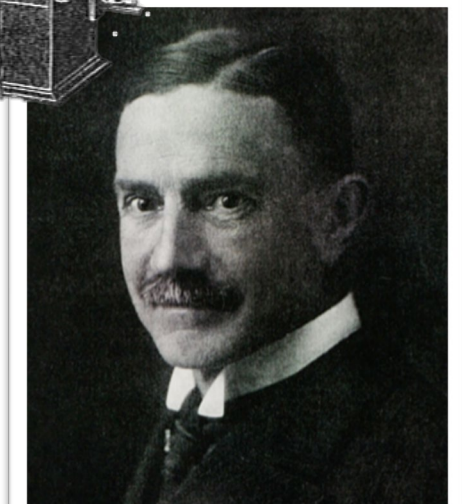
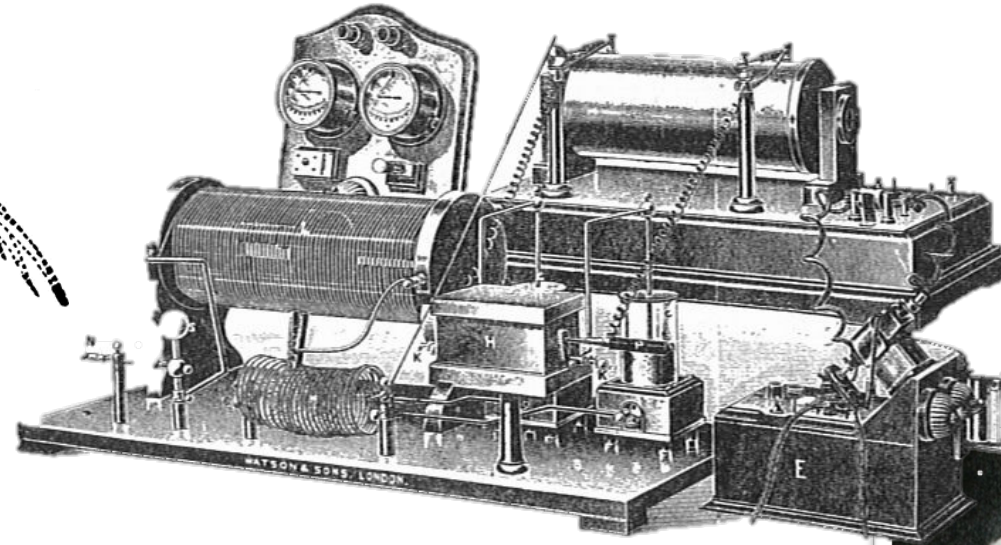
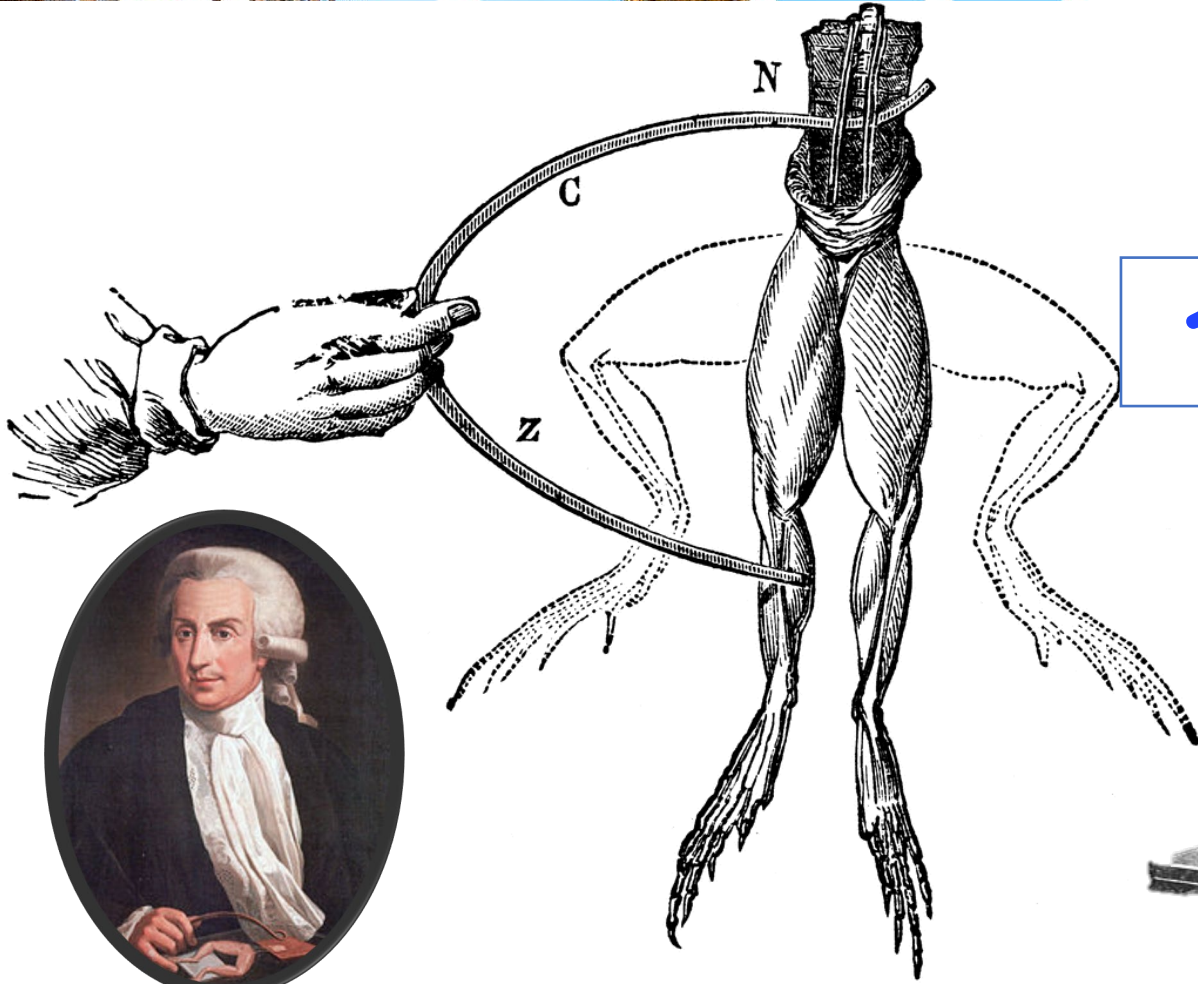
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# 1912 – GEORG PERTHES



History Article

## Georg Perthes—The Man Behind the Technique of Nerve-Tracer Technology

M. Goerig, M.D., and K. Agarwal, M.D.



# NEEDLE TO NERVE DISTANCE

• **COULOMB'S LAW:**  $E = K(Q/r^2)$

where, **E** is the stimulus intensity

**K** is a constant

**Q** is the minimum current from the

needle tip

**r** is the distance of the stimulus

source from the nerve.

Electrical nerve stimulation in regional anesthesia is a method of using a low-intensity (up to 5 mA) and short-duration (0.05 to 1 ms) electrical stimulus (at 1- to 2-Hz repetition rate) to obtain a defined response (muscle twitch or sensation) to locate a peripheral nerve or nerve plexus with an (insulated) needle

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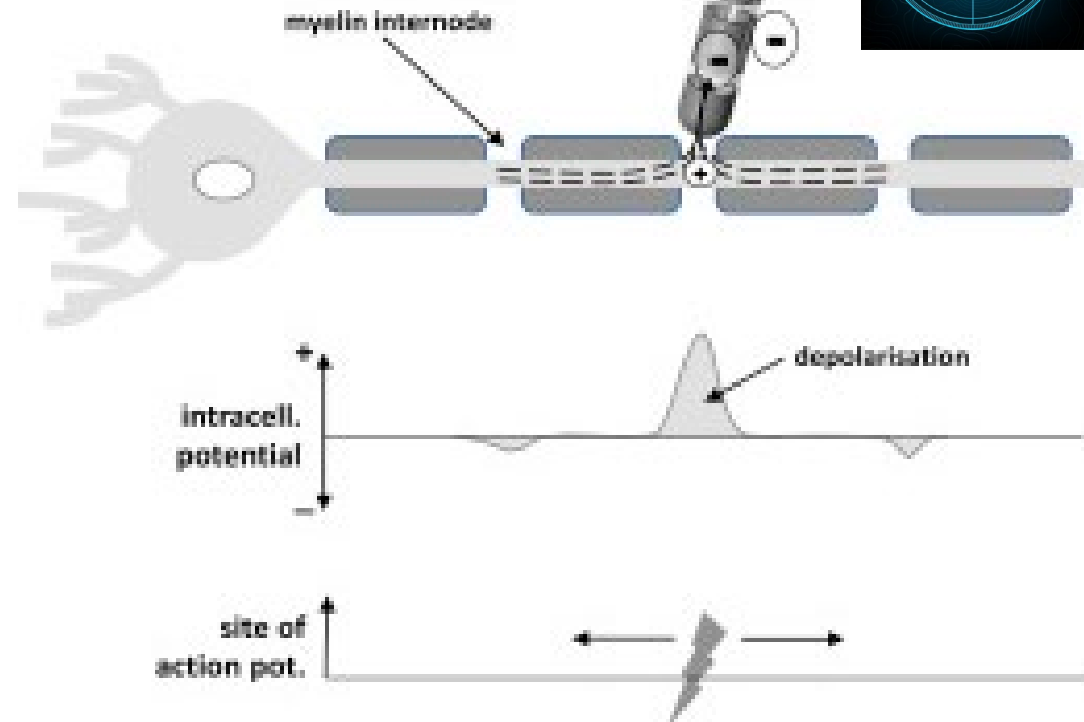
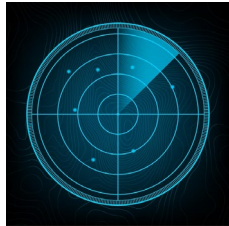
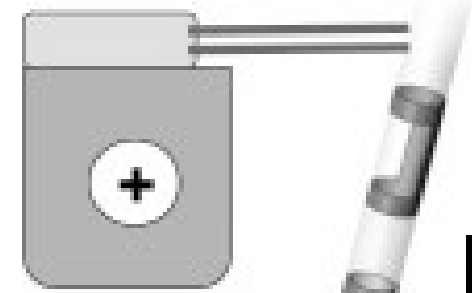
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**Background**

Peripheral nerve stimulators aim to deliver adequate electrical energy to motor nerves

to reduce the resting negative intracellular potential across the nerve cell membrane to reach the threshold level and unleash an action potential

**Volume**

**Frequency (Hz)**

**Pulse width (usec)**

**Stimulus amplitude (mA)**

**Impedance (kΩ)**

two types of peripheral nerve stimulator, those that

- assess the degree of neuromuscular blockade
- identify the location of peripheral nerves to aid accurate needle placement in regional analgesia/anaesthesia

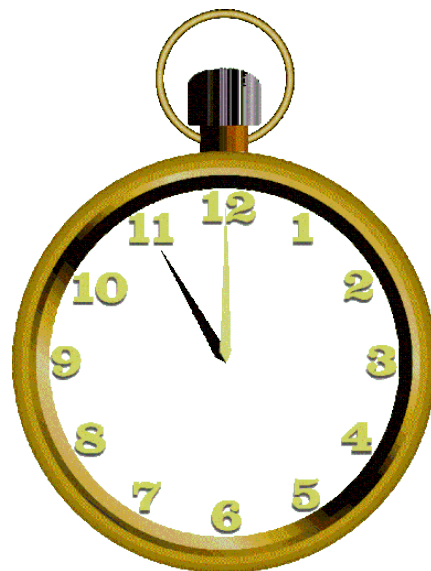
PNBs were initially performed by surgeons under direct vision

Subsequently, PNB were performed 'blind' using surface landmarks to guide percutaneous approaches

In the 1990s, electrical peripheral nerve stimulation was developed to aid in nerve localization

although USG guided PNB is now commonplace, peripheral nerve stimulator is still useful for

- supplementary confirmation of needle placement
- safety device to monitor for needle-nerve contact or intraneural injection



Best Practice & Research Clinical Anaesthesiology  
Vol. 19, No. 2, pp. 153-174, 2005  
doi:10.1016/j.bpa.2004.11.002  
available online at <http://www.sciencedirect.com>



## Nerve stimulation in regional anesthesia: theory and practice

Jose De Andrés\* MD, PhD  
Associate Professor of Anesthesia, Val of Anesthesiology and Critical Care; E

Jose Miguel Alonso-Iñigo  
Staff Anesthesiologist  
Department of Anesthesiology and Critica

Xavier Sala-Blanch MD  
Staff Anesthesiologist  
Department of Anesthesiology and Critica

Miguel Angel Reina MD  
Staff Anesthesiologist  
Department of Anesthesiology and Critical Care, Móstoles Hospital and Madrid Montepíncipe Hospital, Madrid, Spain



# Needle Nerve Stimulator-Locator:



**NERVE BLOCKS WITH A  
NEW INSTRUMENT FOR  
LOCATING NERVES**

**GORDON M. GREENBLATT, M.D.\***  
**J. S. DENSON, M.D.†**  
**Los Angeles, California**

**U**NSUCCESSFUL REGIONAL nerve blocks are most often due to variations in anatomical landmarks. Pearson<sup>1</sup> and Sarnoff<sup>2, 3</sup> have located motor nerves by electrical stimulation with an insulated needle. The instruments they used were a heavy transformer, vacuum-tube stimulator and an electrophrenic stimulator.

A small (4" x 3" x 1½") portable transistorized nerve stimulator has been

The negative pole is a clip which fastens to the metal Luer-Lok of a standard syringe. A standard needle, of the size desired, insulated with plastic paint except at the tip, completes the circuit.

### TECHNIC

Utilizing a standard approach, the insulated needle is placed in the vicinity of the nerve to be blocked. The needle is then used as a stimulator probe with



# 1962 – GORDON M. GREENBLATT





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**SPECIAL NEEDLES**



**EXPENSIVE DEVICES**





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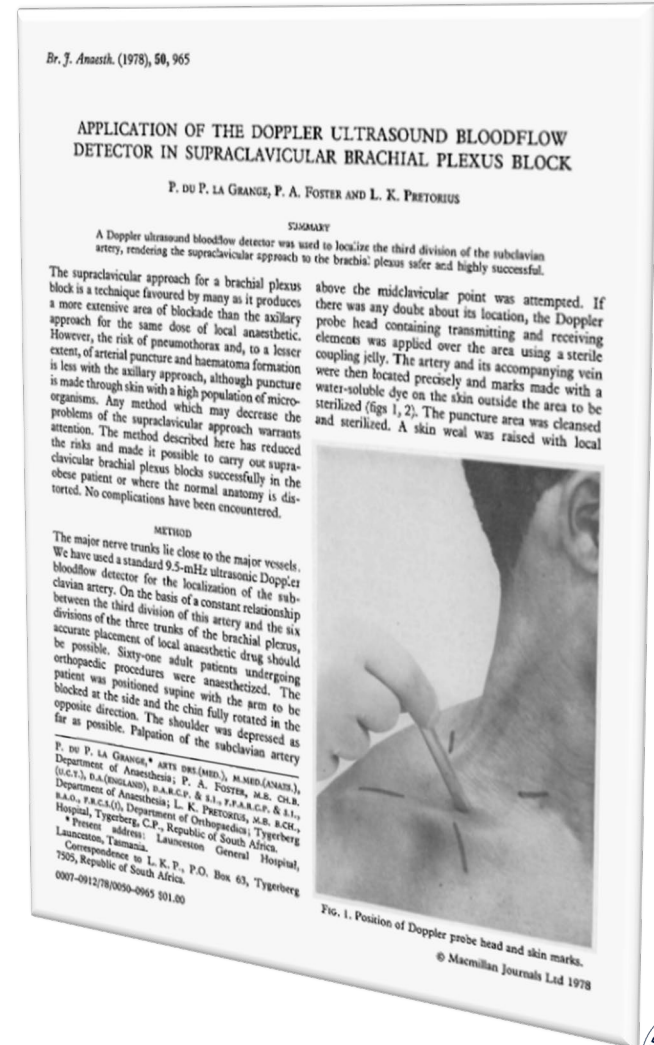


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# 1978 – LAGRANGE

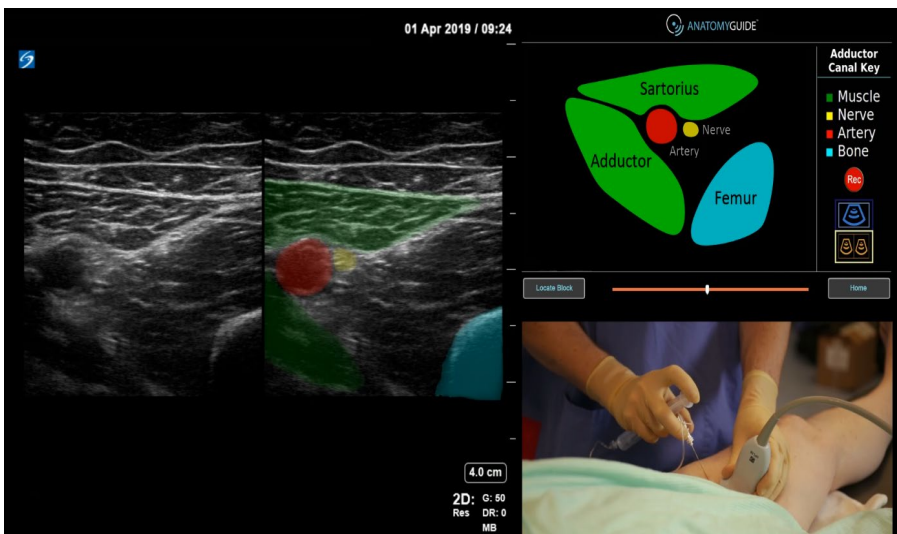
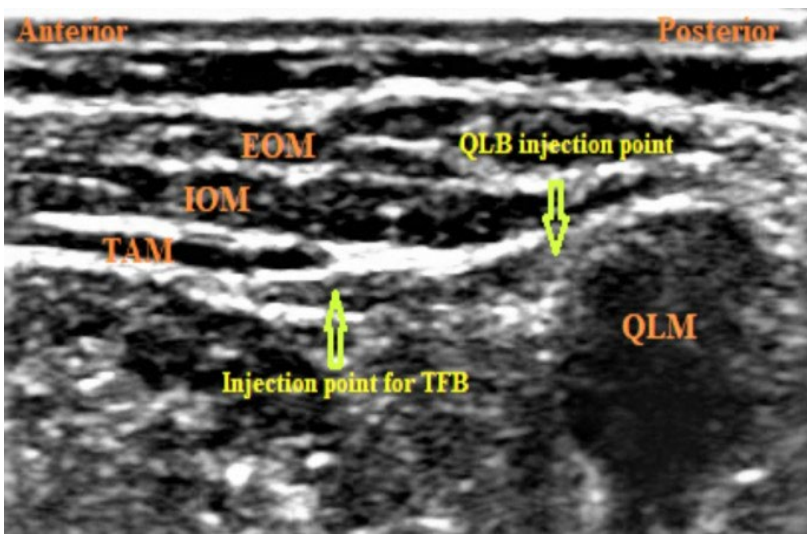
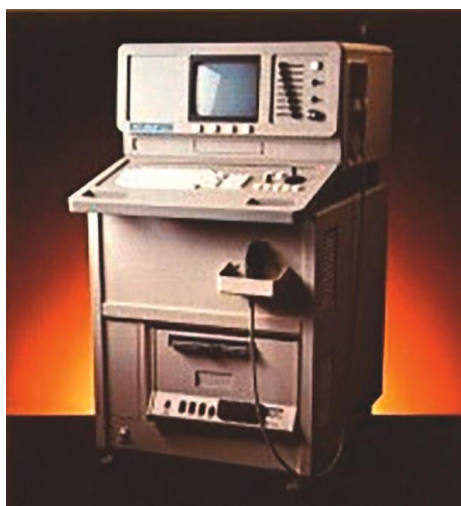
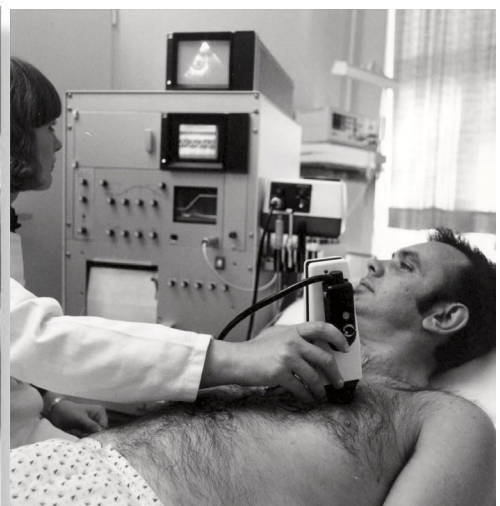
La Grange P, Foster PA, Pretorius LK. Br J Anaesth. Vol. 50. London, England: Macmillan Journals Ltd.; 1978. Application of the Doppler Ultrasound Blood Flow Detector in Supraclavicular Brachial Plexus Block; pp. 965-967

**US COMING**





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**1990 - 2000**

**2000 - 2010**

**2010 - 2020**

**2020 ->**

**ULTRASOUND SPREAD**

**US vs ENS**

**ULTRASOUND BETTER**

**ULTRASOUND + OTHER  
SAFETY MEASURES**



**ENS**

vs

**ULTRASOUND**

**FASTER PERFORMANCE**

**FASTER ONSET**

**LESS TRAUMATIC AND PAINFUL**

**LESS FAILURES**

**LESS A.L.  
LESS VASCULAR PUNCTURES  
NO LAST**

**FASCIAL PLANE BLOCKS**

**LESS NERVE INJURIES**







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**ENS**

vs

**ULTRASOUND**



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**ENS + ULTRASOUND**





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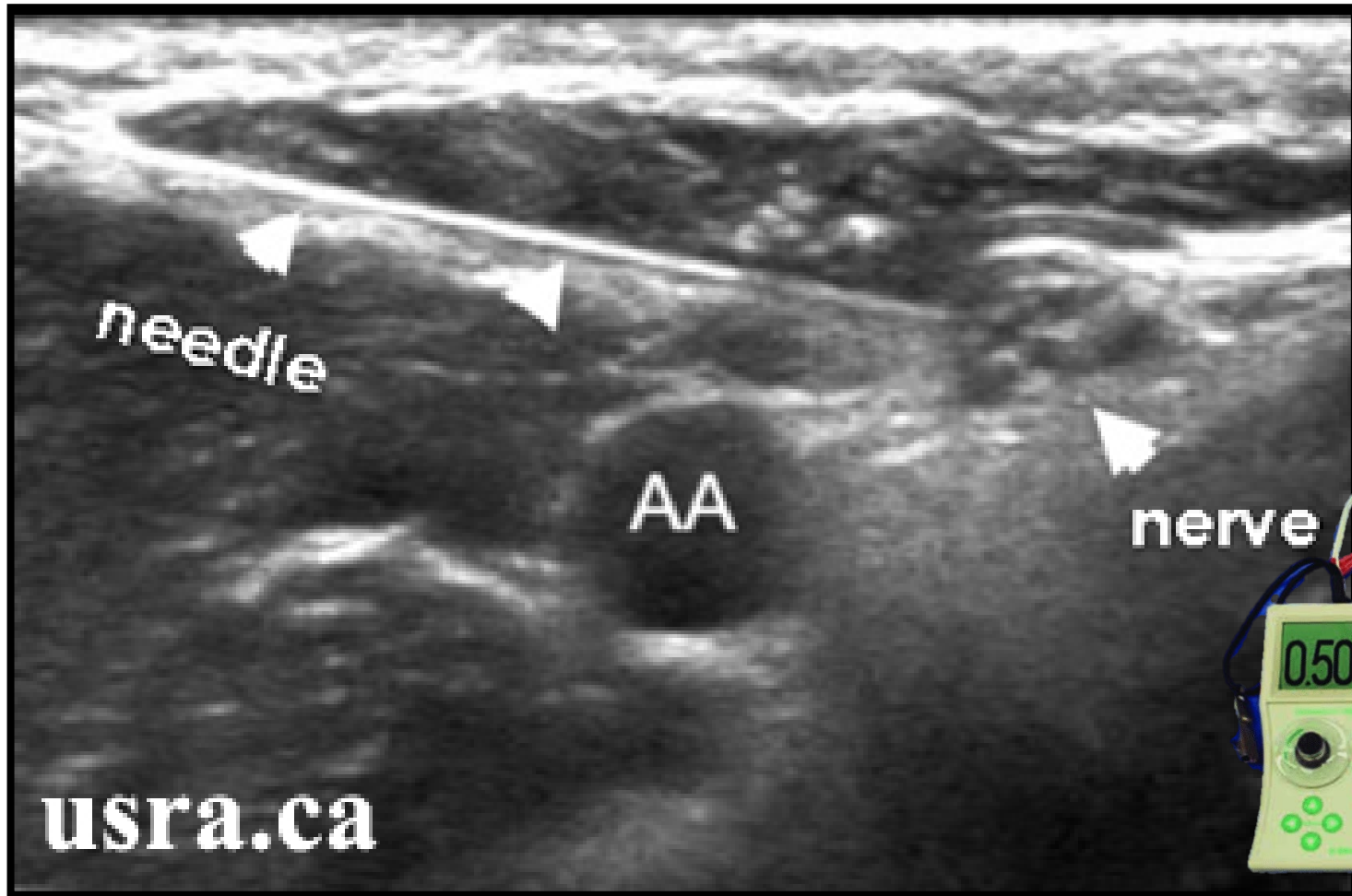
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**0,5 mA twitch**

**0,5 mA no twitch**





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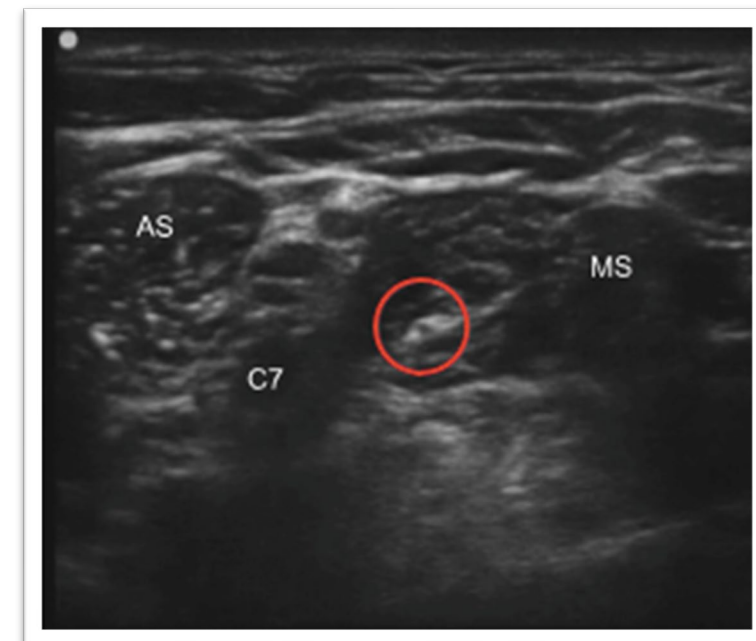
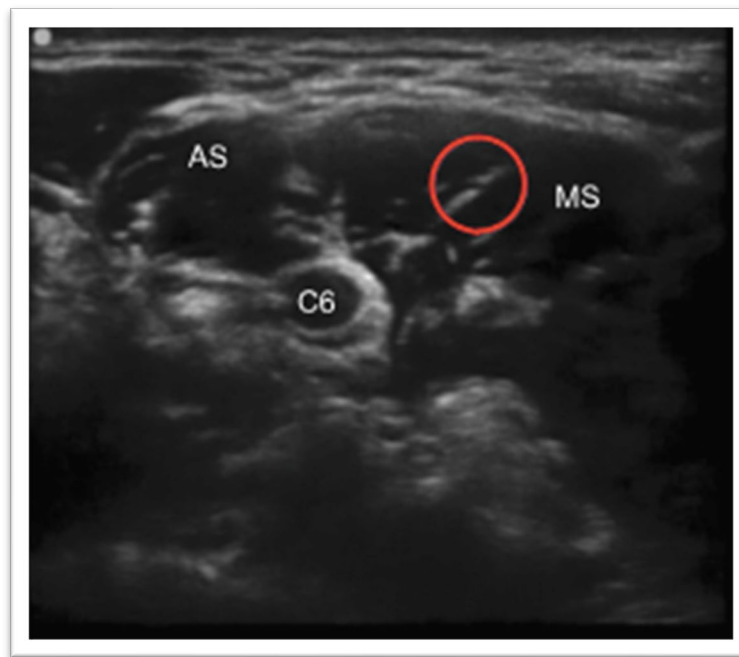
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## A Confirmed Case of Injury to the Long Thoracic Nerve Following a Posterior Approach to an Interscalene Nerve Block

Accepted for publication: February 28, 2013.

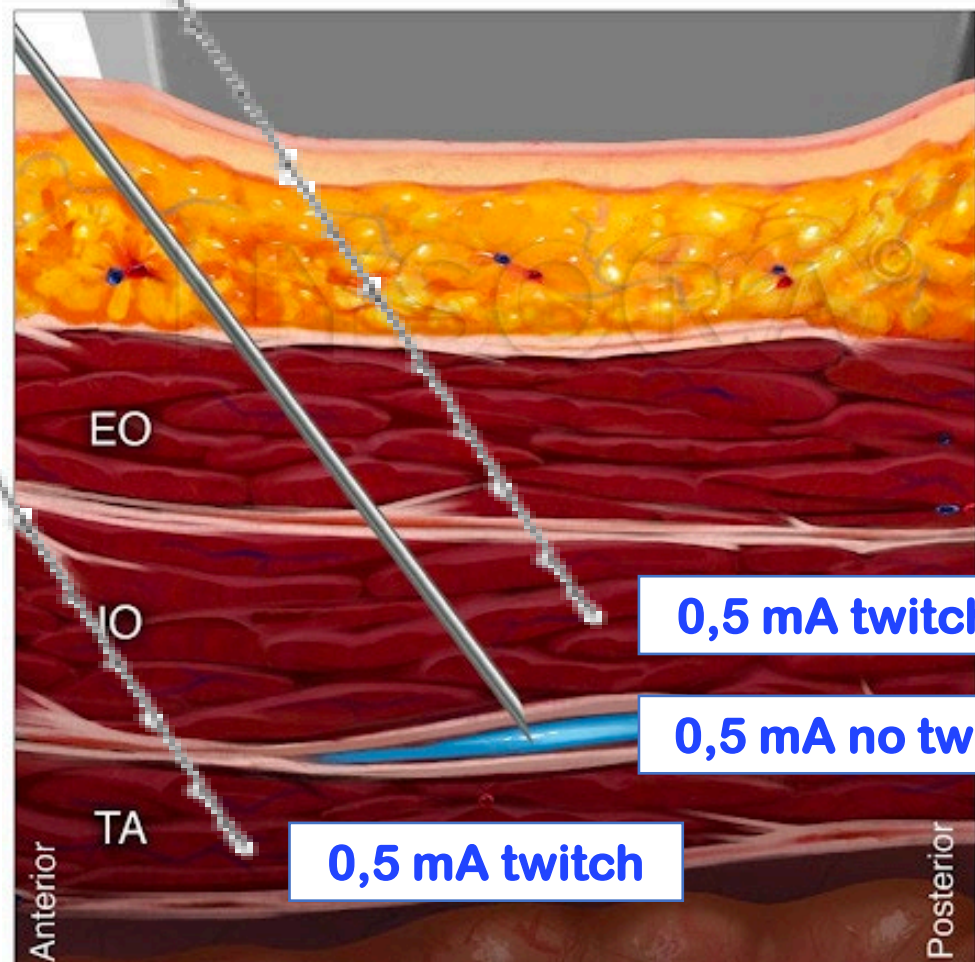
*To the Editor:*

We read with great interest Drs. Hanson and Auyong's article<sup>1</sup> regarding the identification of the dorsal scapular and long thoracic nerves during ultrasound-guided interscalene nerve block. As a busy orthopedic ambulatory surgery center, we perform a large number of interscalene perineural cath-





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# FASCIAL PLANE BLOCKS



ENS

**MUST BE REALLY EXPERT**







Basic Principles ?

# BACK TO BASICS?

## Basic Principles ?

Sections

Characteristics of Ultrasound >

Generation of an Ultrasound Wave

Generation of an Ultrasound Image

Ultrasound Tissue Interaction

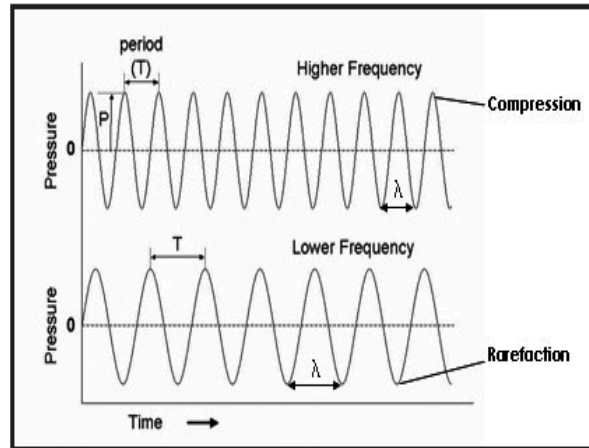
Echo Reflection and Scattering

Tissue Echogenicity

Image Resolution

### Characteristics of Ultrasound


Ultrasound is a form of mechanical sound energy that travels through a conducting medium (e.g., body tissue) as a longitudinal wave producing alternating compression (high pressure) and rarefaction (low pressure). Sound propagation can be represented in a sinusoidal waveform with a characteristic pressure (P), wavelength ( $\lambda$ ), frequency (f), period (T) and velocity (speed (c) + direction).



START FROM BASICS?

# Ultrasound-Guided Peripheral Nerve Blocks - Technical Tips and Tricks (Part 1) (Part 2)



 [gasgenie@gmail.com](mailto:gasgenie@gmail.com)

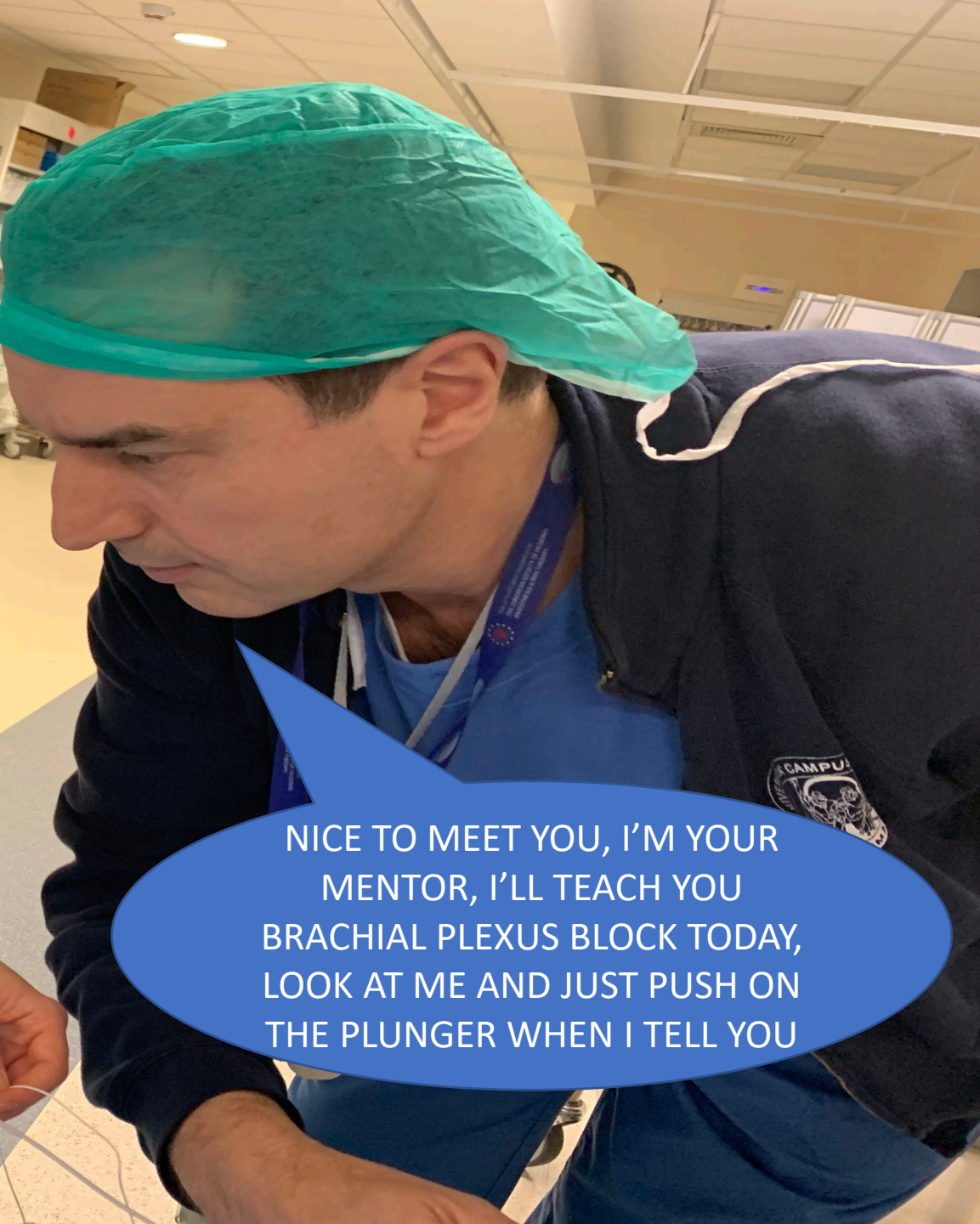
 [@KiJinnChin](https://twitter.com/KiJinnChin)

Ki Jinn Chin, MBBS (Hons), MMed, FRCPC  
Dept of Anesthesiology & Pain Medicine  
Toronto Western Hospital, University of Toronto





HI, I'M A 1° YEAR  
ANESTHESIA RESIDENT,  
NICE TO MEET YOU



NICE TO MEET YOU, I'M YOUR  
MENTOR, I'LL TEACH YOU  
BRACHIAL PLEXUS BLOCK TODAY,  
LOOK AT ME AND JUST PUSH ON  
THE PLUNGER WHEN I TELL YOU



Basic Principles ?

HI, LOOK WHAT I DO.  
YOU'LL DO NEXT PIECE



Basic Principles ?

YEAH!! COOL!!!



HEY!! HOW DO I TURN  
THIS THING ON??



PALERMO 5-7 Ottobre

# XXVIII CONGRESSO NAZIONALE



European Society of  
Regional Anaesthesia  
& Pain Therapy  
**ESRA ITALIA**

# RUSH!!



ULTRASOUND GUIDED  
REGIONAL ANESTHESIA

# VIDEO GAME

TECHNIQUES, INDICATIONS

SONOANATOMY

ANATOMY

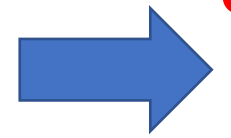
SAFETY SKILLS





ANATOMY  
PHYSIOLOGY  
PHARMACOLOGY

**SCIENCE**



**SCIENCE**

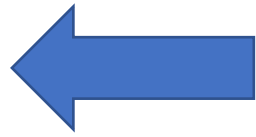
PRINCIPLES OF ULTRASOUND AND SONOANATOMY  
PRINCIPLES OF NERVE STIMULATION  
EQUIPMENT (NERVE STIMULATOR, ULTRASOUND, NEEDLES)

# BACK TO BASICS



**SCIENCE**

SAFE AND EFFECTIVE  
ULTRASOUND GUIDED  
REGIONAL ANESTHESIA



TECHNIQUES, INDICATIONS  
TACTILE FEEDBACKS (INJECTION PRESSURE)

**EXPERIENCE**



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**SCIENCE**

# REGIONAL ANESTHESIA





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**ESRA ITALIA**

**ART**



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**ESRA ITALIA**



THANK YOU

**IVRA**



**ENS**



**US**

