

PÉCSI TUDOMÉNYEGYETEM
EGÉSZSÉGTUDOMÁNYI KAR



ÁPOLÁSTUDOMÁNYI
TANSZÉK



Medicaments

Administering Injections

University of Pécs Faculty of Health Sciences
Institute of Nursing Sciences, Basic Health Sciences and Health Visiting

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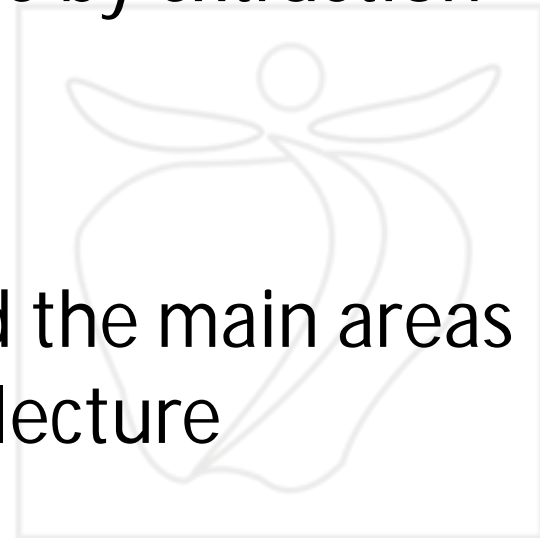
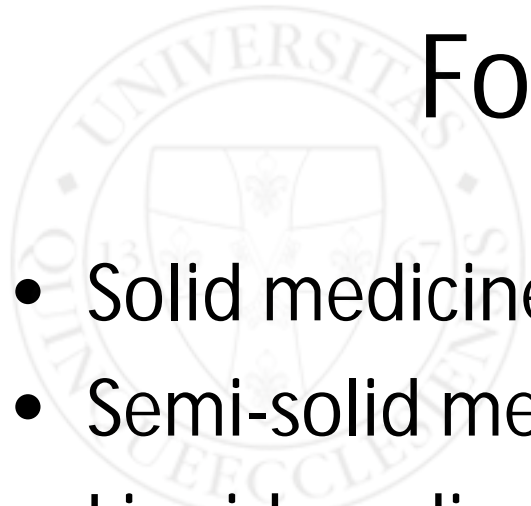
² assistant professor, deputy head of the department

³ subject teacher

Forms of medicine

- Solid medicines
- Semi-solid medicines
- Liquid medicaments
- Pharmaceutical preparation made by extraction
- Other pharmaceutical forms

Main principles, main concepts and the main areas of pharmacology – not within this lecture



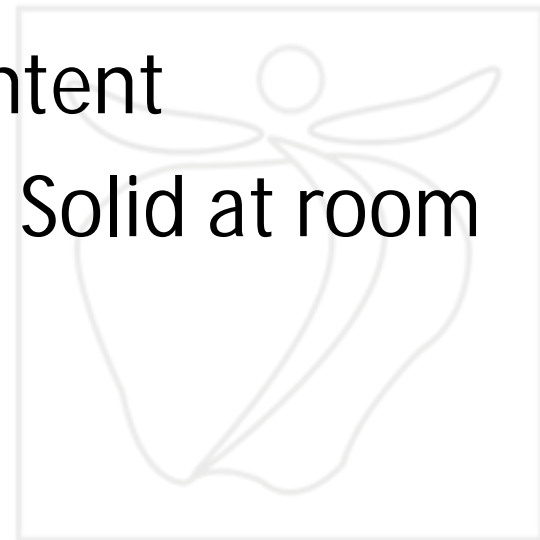
Solid medicines

- Teas – whole, chopped, filters
- Powders, body powders – internal-external use
- Pills, tablets – the most frequently applied medications
- Capsules – must not be opened



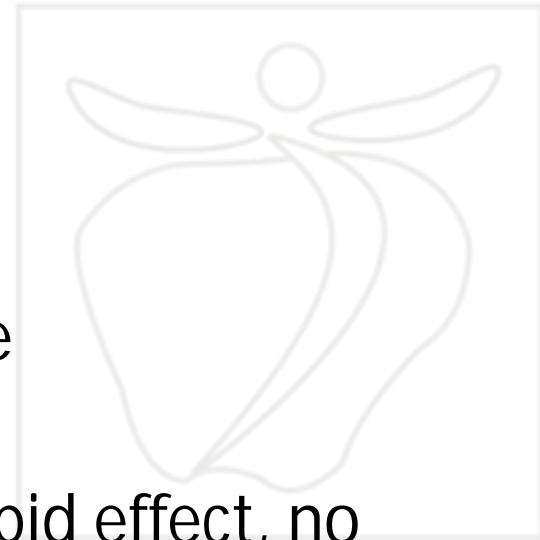
Semi-solid medicines

- Ointment - for treatment of the skin and mycoderm
- Creams – soft ointments with large water content
- Paste – with a high powder content
- Rectal and vaginal medicines - Solid at room temperature
- Pellets - out-of-date



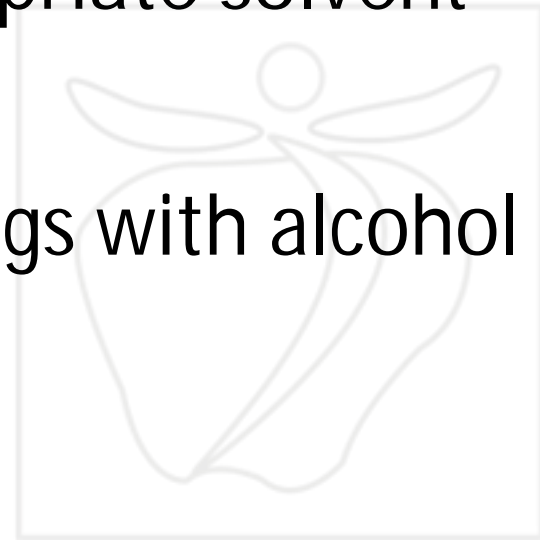
Liquid medicaments

- Solutions – For internal or external use
- Liquid medicines for external use – eyedrops, ear drops, nosedrops
- Ingested liquid medicine forms - syrup
- Other liquid forms of medicine
- Emulsion – have to be shaken before use
- Solutions for parenteral use – sterile, rapid effect, no absorption



Pharmaceutical preparation made by extraction

- Decoction - from loose-structure parts of plants
- Extract - extraction with appropriate solvent
- Tincture - from phytogenic drugs with alcohol or ether



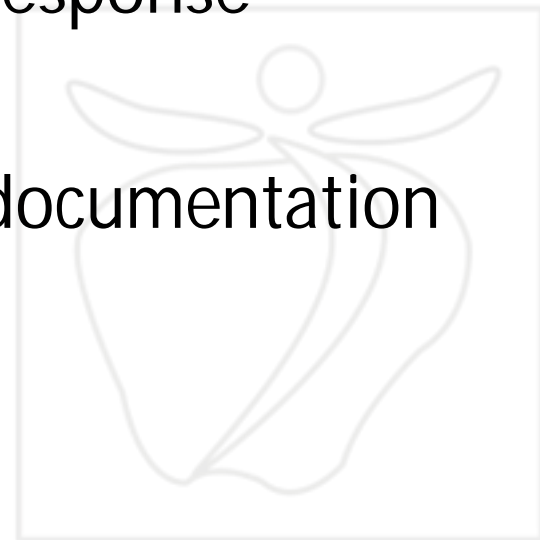
Other pharmaceutical forms

- Aerosol - 0,001-100 μm particles
- Transdermal Therapeutic System (TTS)–
avoiding first pass effect



Guidelines in medication

- right patient
- right drug
- right time
- right dose
- right route
- right form
- right action
- right response
- right documentation

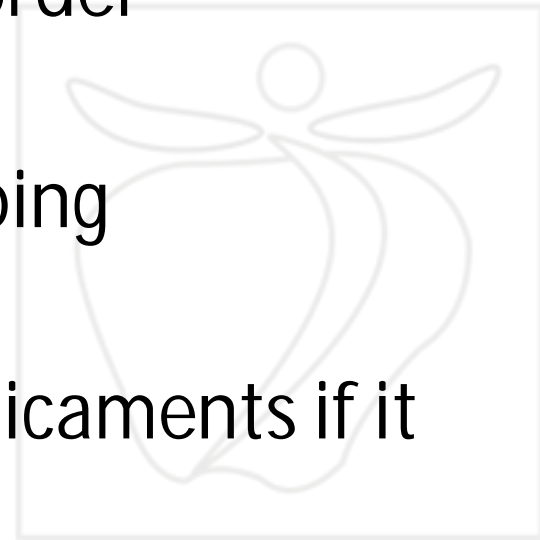


Medicine storage in healthcare institutions

- separated room, in locker, 15 - 25°C
- fridge only for medicaments (3-7 °C)
- infusion solutions, disinfection solutions, bandages, flammable and explosive materials – separated room
- physician and nurse responsible for the medicaments

Medicine storage in healthcare institutions

- storage of narcotics, opiates:
 - in a strong-box within a locker
 - strict registration – uncorrectable
- storage of medicaments in ABC order
- storage within the original wrapping
- prohibited to wrap back the medicaments if it was delivered to the patient



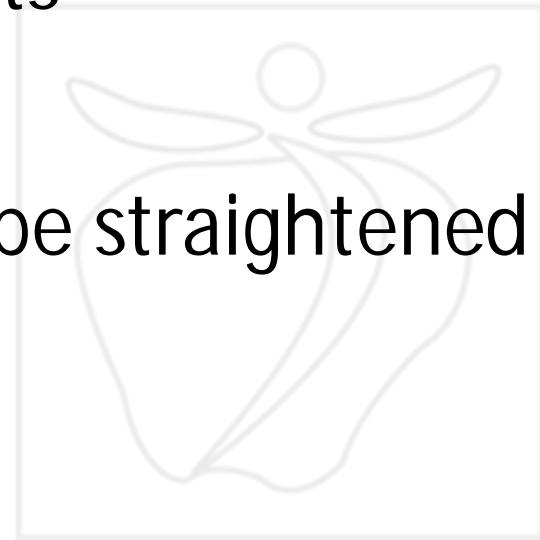
Oral (Per os) administration of medicine

- cooperation, swallowing properly
- appropriate amount of liquid
- appropriate body position
- sublingual
- buccal



Otological treatment

- external auditory passage
- ear drops, aerosol sprays, ear powder, ear rinse liquids
- only body temperature products
- positioning the patient
- external auditory passage can be straightened



Vaginal treatment

- vaginal suppository
- vaginal pill
- vaginal capsule
- vaginal solution
- vaginal emulsion
- vaginal suspension
- vaginal foam
- tablets for vaginal solutions or suspensions
- semi-solid vaginal preparation
- medicated vaginal tampon

Aquatus system is a Hungarian invention

Use of the applicator

Vaginal suppository

Positioning the patient

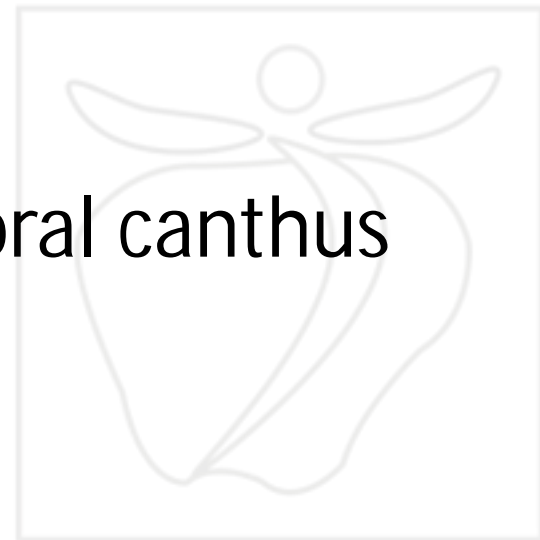


Nasal administration

- high permeability of the nasal membrane
- large surface for absorption
- local or systemic effect
- first pass fails to come
- free airways are needed
- disadvantage: condition of the nasal membrane, diseases (rhinitis) can alter the absorption; elimination is fast
- oily solutions should be avoided > pneumonia
- drops and sprays
- powders, ointments, gels
- positioning the patient

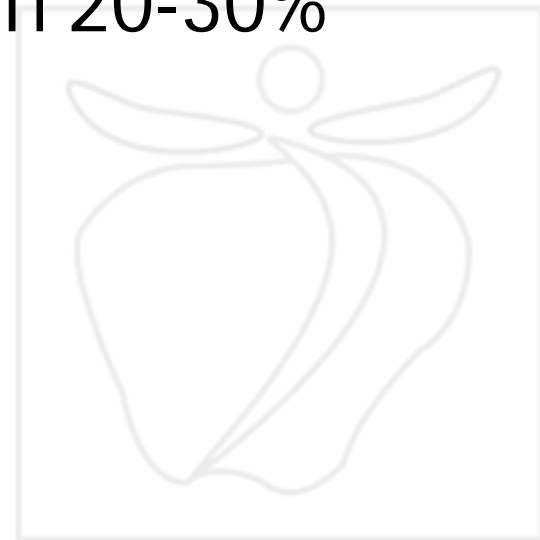
Ophthalmologic treatment

- sterile preparations exclusively
- liquid solutions, solid or semi-solid preparations
- positioning the patient
- drop in the temporal canthus
- ointment- from nasal to temporal canthus



Rectal treatment

- local and systemic effect
- for therapeutic and diagnostic purposes
- first pass fails to come
- unreliable dosage (dosages with 20-30% more)
- positioning the patient



Transdermal patches

Consistent drug level-
continuous absorption

No first pass

Comfortable, simple

Local side effects

Water, local warmth

nitro-glycerine

- Introducing nitrate free periods in order to avoid tolerance
- Applying the patches

contraceptive patches

- Three patches in a period
- placement

opioids

- 48-72 hours
- varied plasma level

Aerosol therapy

part of the Oxygen therapy lecture



PTEETK



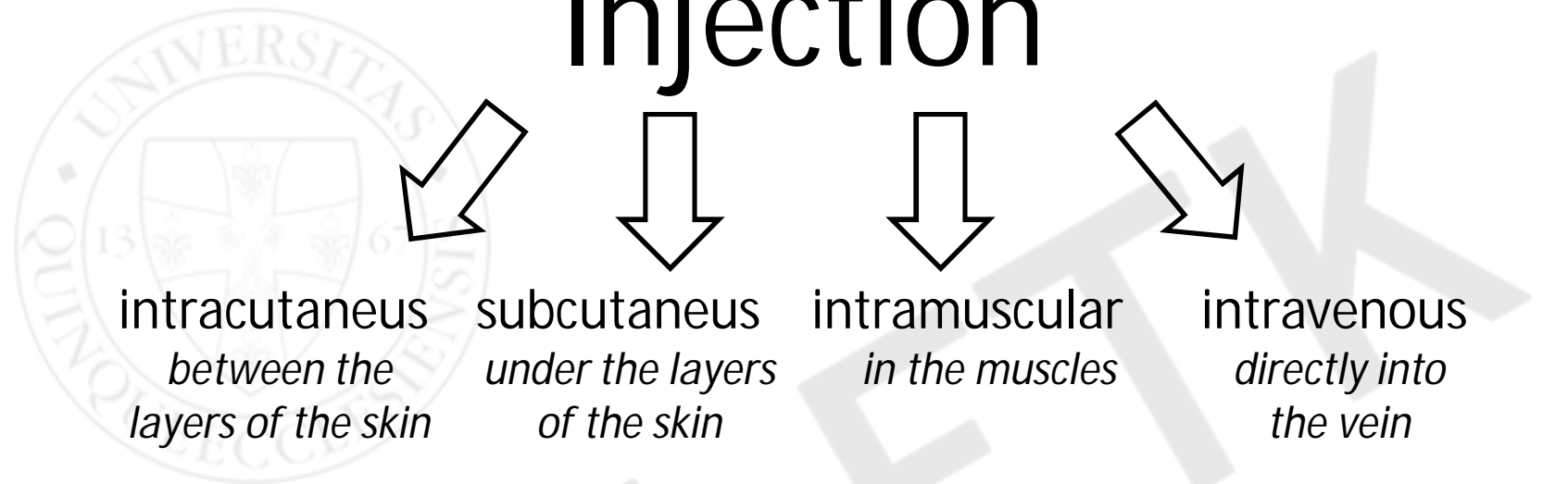


Administering injections

PTEERK



Injection



- it is a parenteral administration of medicine
- invasive technique
- with or without syringes
- choosing the site for injection
 - General characteristics of the patient
 - State of skin and tissues
 - State of circulation (chimino shunt)



Syringes

disposable - re-usable

centric - Eccentric cone

Luer-Slip and Luer-Lock types





two-part - three-part





Low-dose syringes, high capacity syringes
Calibration scale (0.25-450ml)

Tools for administering injection

Syringes

- Hypodermic syringe
- Oral syringe
- Vaginal, rectal syringes

Safety Systems – *Infusion therapy lecture*

- safety needles
- safety syringes





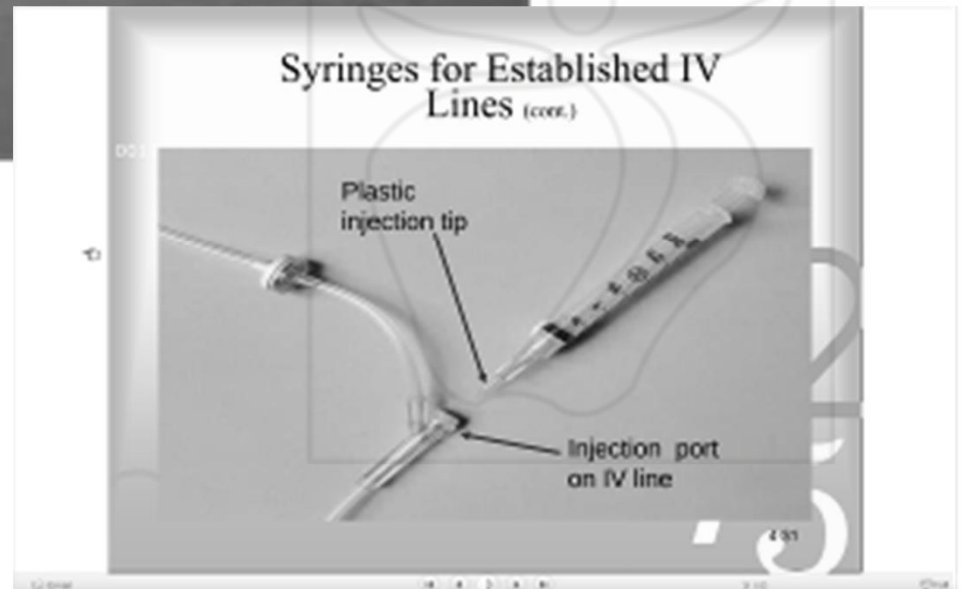
Prefilled syringes

For intravenous catheters:

Generally physiological saline

Needle is needless

Anticoagulants

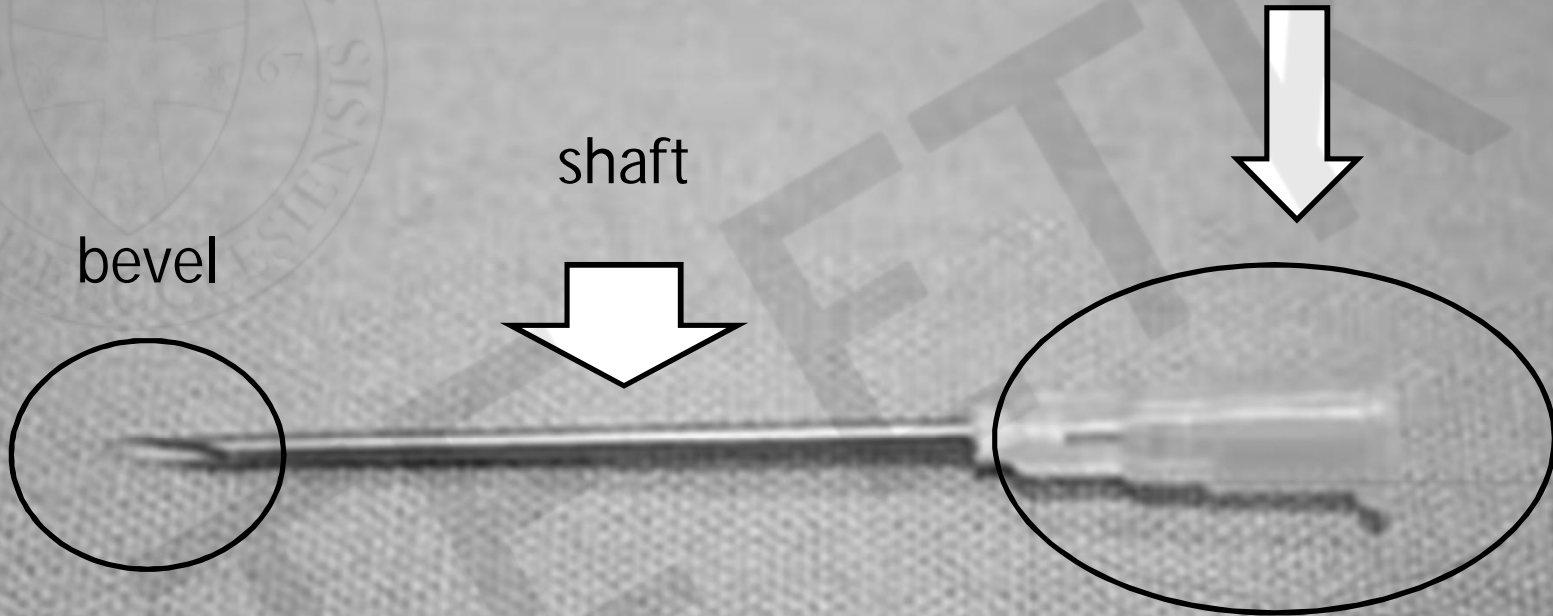


Needle

cone

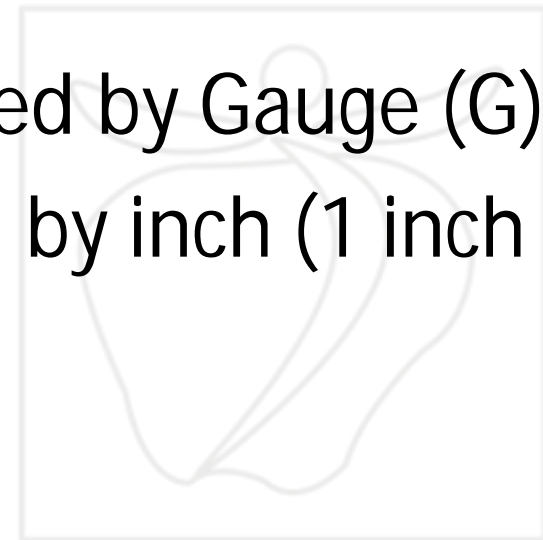
shaft

bevel



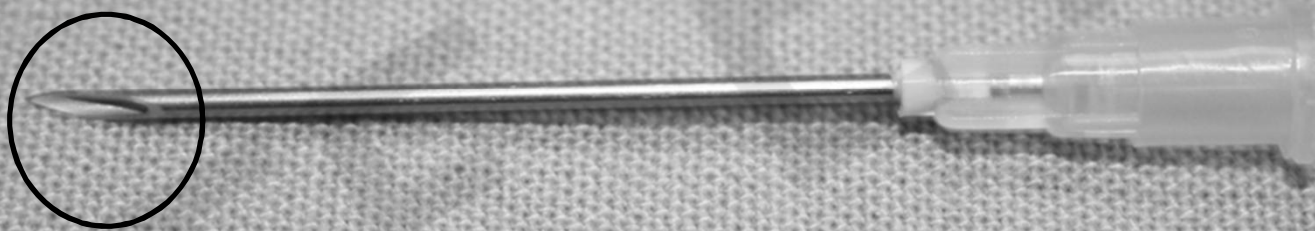
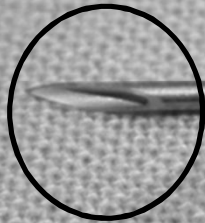
Needle

- risk of needlestick injuries
- place the plastic covering on the needle after the intervention???
- needle inner diameter measured by Gauge (G)
- length of the needle measured by inch (1 inch = 2,54 cm)



Short and long bevels Cone tips and blunt tips

bevel



Way of administering injections	Lumen of needle	Length of needle inch (mm)
Intracutaneous/ intradermic	25 G - 27 G	$\frac{1}{4}$ inch/6mm - $\frac{5}{6}$ inch/21mm
subcutaneous	25 G - 26 G	$\frac{1}{2}$ inch/13mm - 1inch/25mm
Intramuscular	21 G - 23 G	$\frac{5}{8}$ inch/16mm - 2inch/50mm
Intravenous/ venipuncture	21 G - 23 G	$\frac{3}{4}$ inch/19mm - 1 $\frac{1}{2}$ inch/38mm

Choosing the suitable needle:

- Fat tissue
- Gender
- Site of administration



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- for insulin administration – but not exclusively
- comfortable, simple, discreet



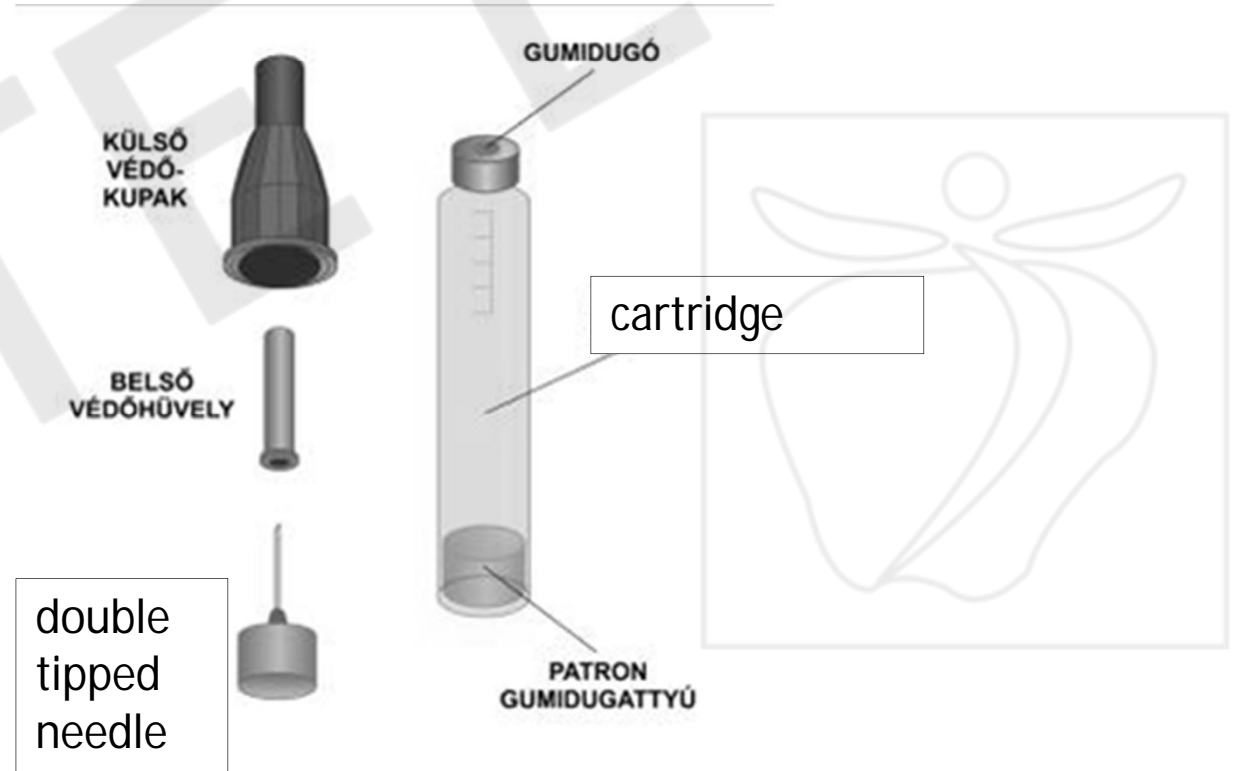
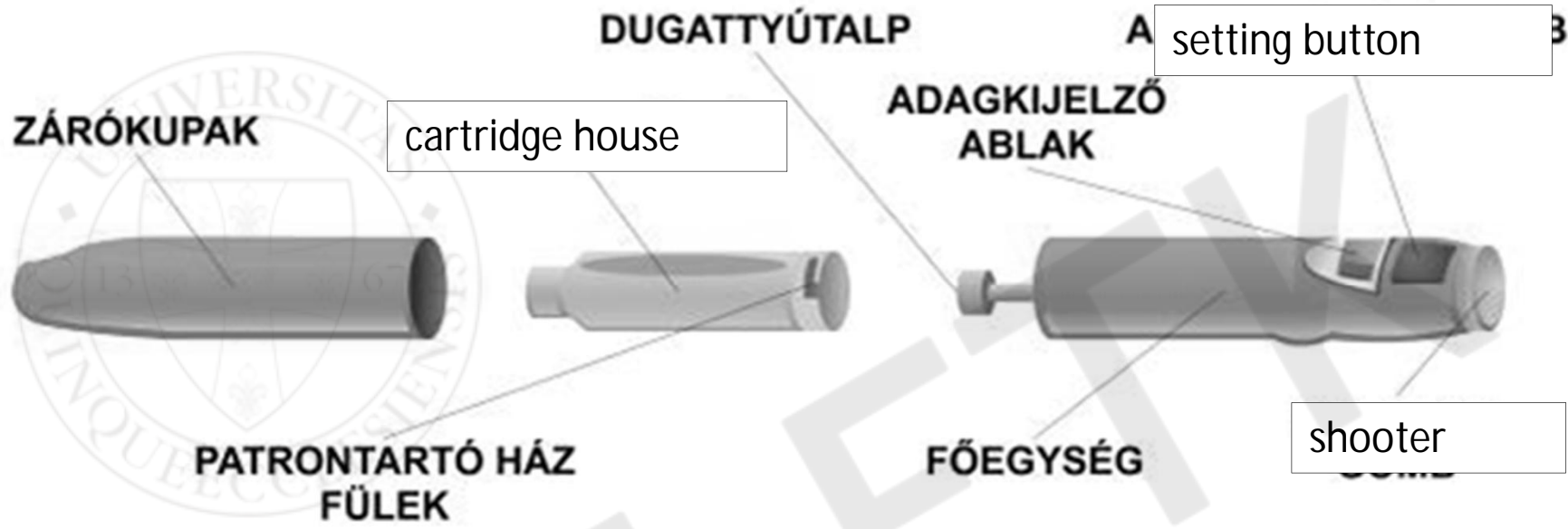
re-usable - disposable
choosing the suitable device

- dosage
- right-left handedness
- patients with poor eye-sight
- possibilities of correction



new needle for each administration
storing the cartridges





Administering injections without needles

- not so common
- in case of needle phobia
- simple, comfortable
- high pressure liquid jet (spring power)
- intramuscular use is possible
- opening with lumen 200 μ at the end of ampoule
- infectious previously

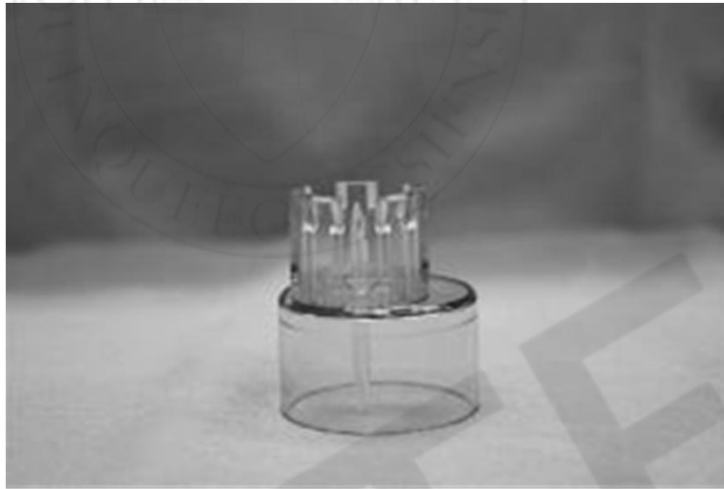


Tools for drawing up medicine

- filter needle
- wheel/syringe filter
- filter connector
- filter aspiration



Tools for drawing up and mixing medicine



transfer cup

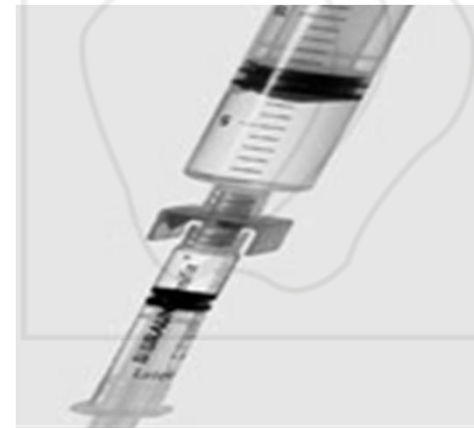


spyke



passing spyke

syringe connectors



Tools for drawing up and mixing medicine



syringe closing cap



closing cone



syringe cone



aspiration straw

Drawing up medicine

- from an ampoule



Drawing up medicine

- from an injection bottle

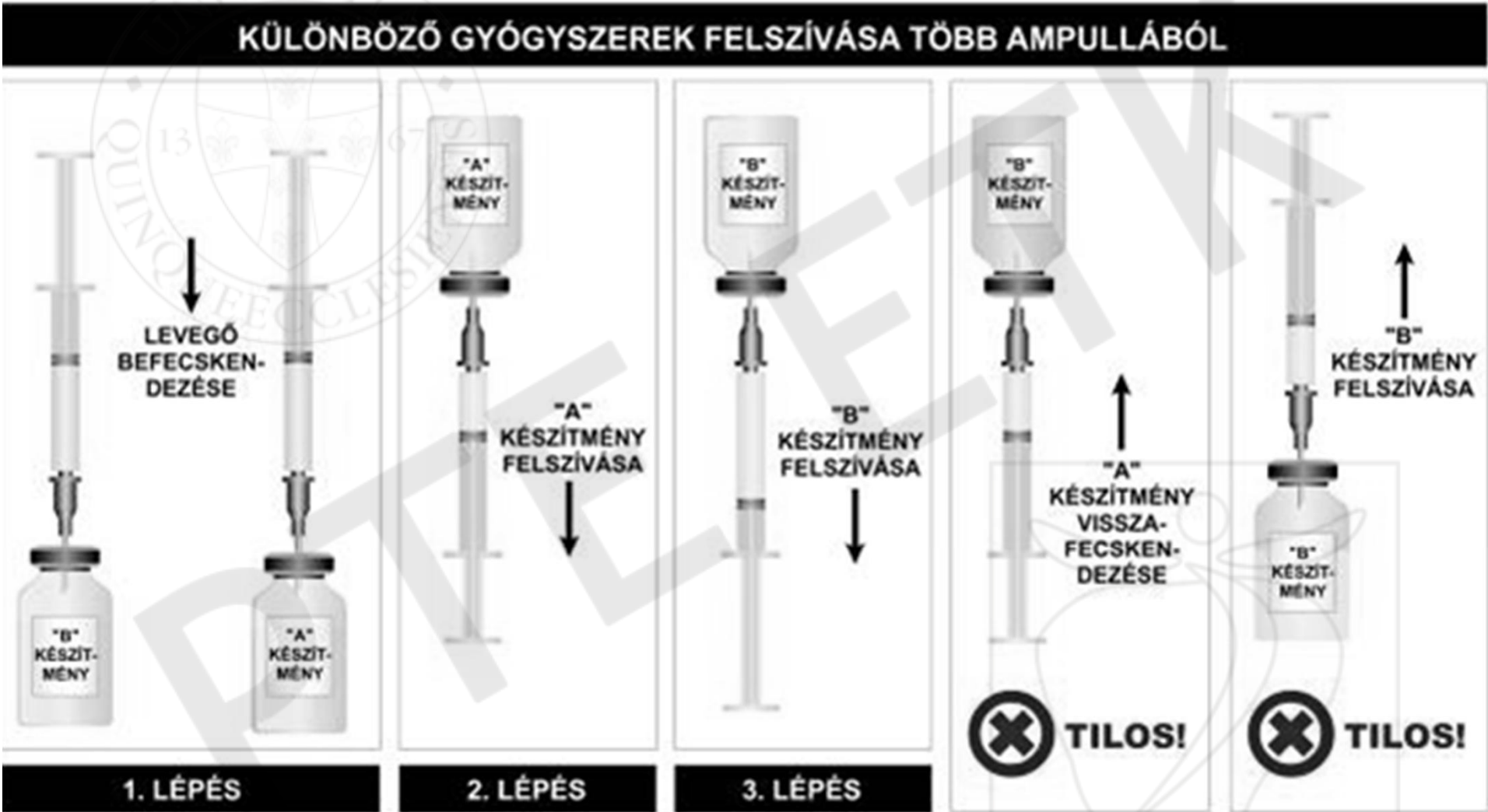


Drawing up medicine

- from an ampoule with powder



Mixing different medicines in an injection



inject air

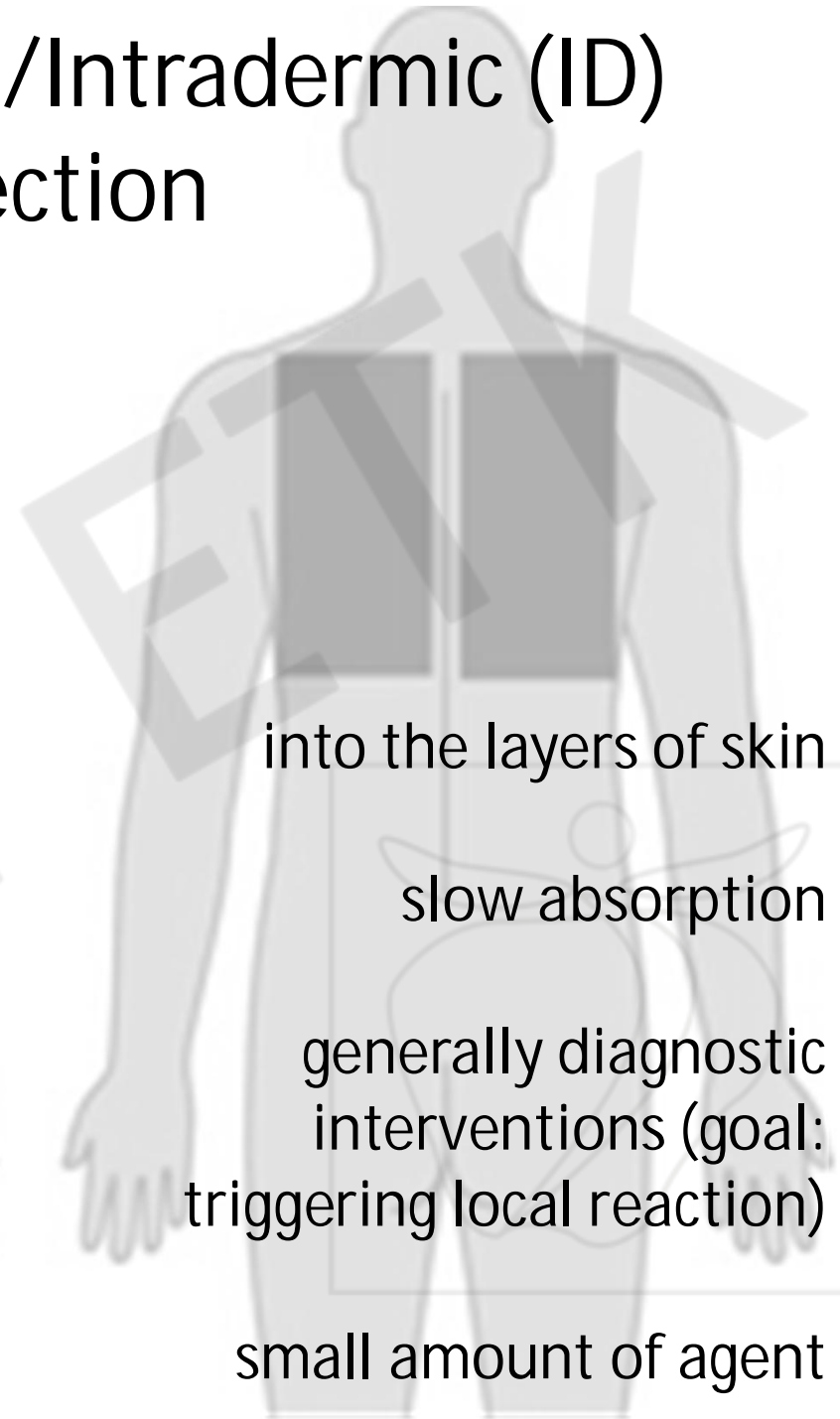
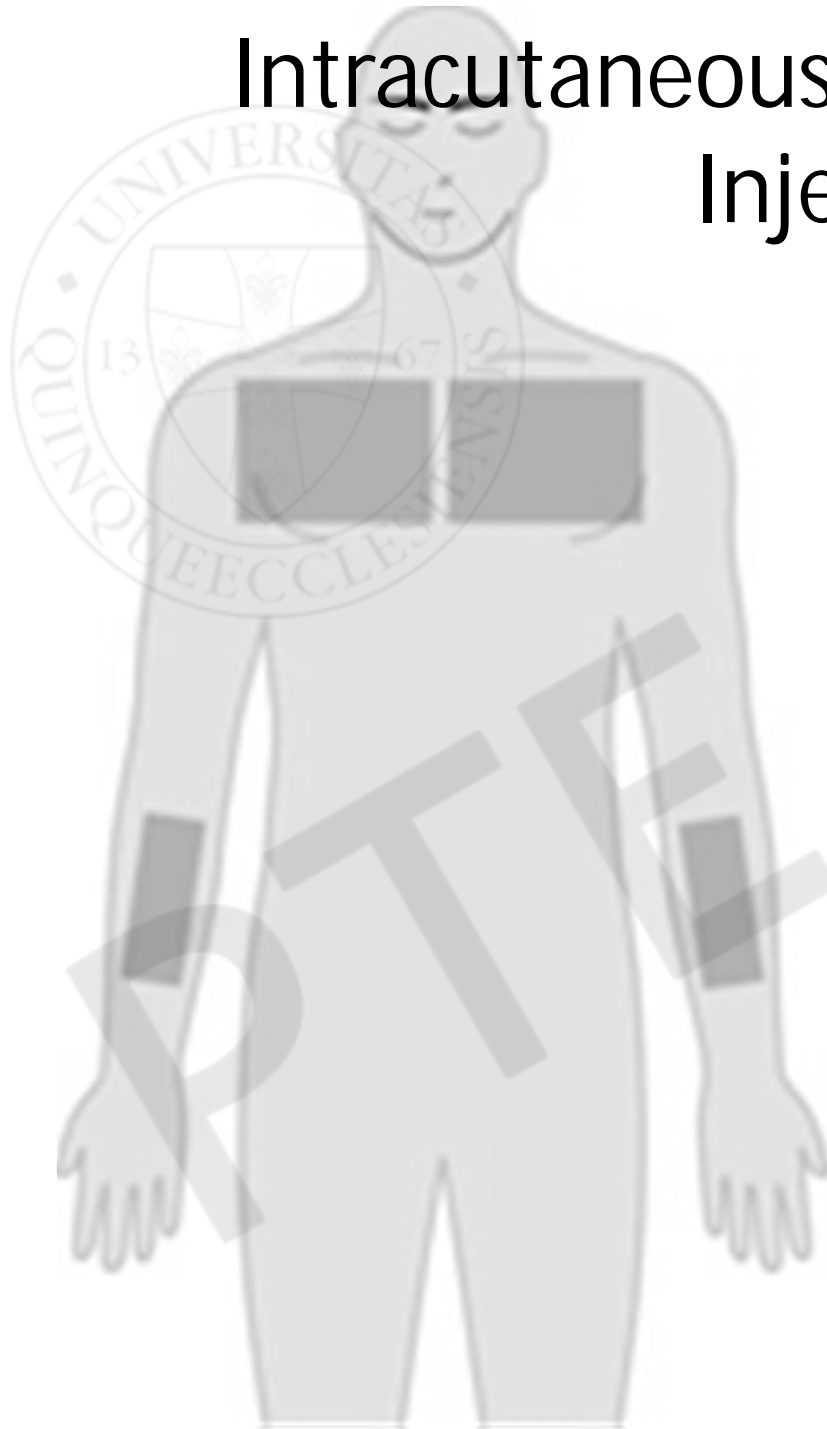
draw up „A”
medicine

draw up „B”
medicine

never inject
back med.
„A” into „B”

always turn
ahead
ampoule

Intracutaneous/Intradermic (ID) Injection



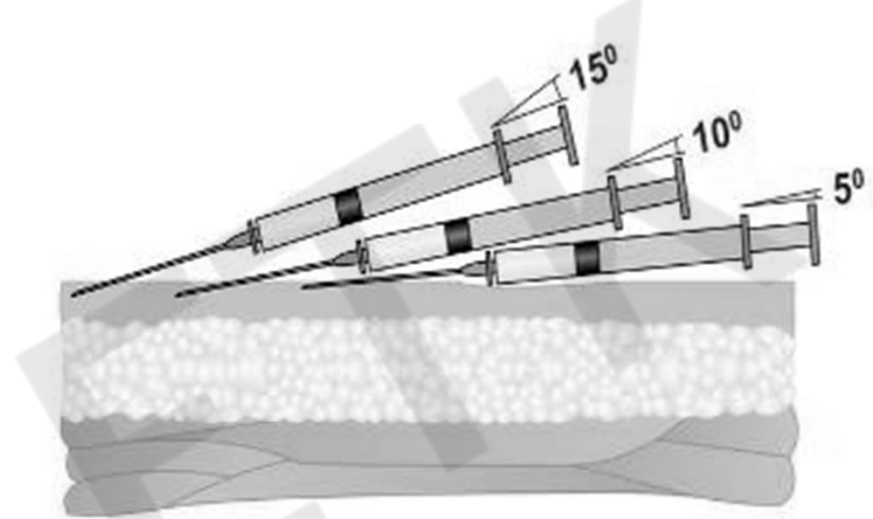
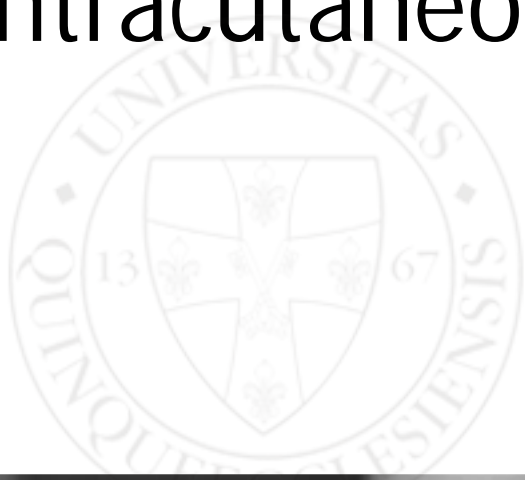
into the layers of skin

slow absorption

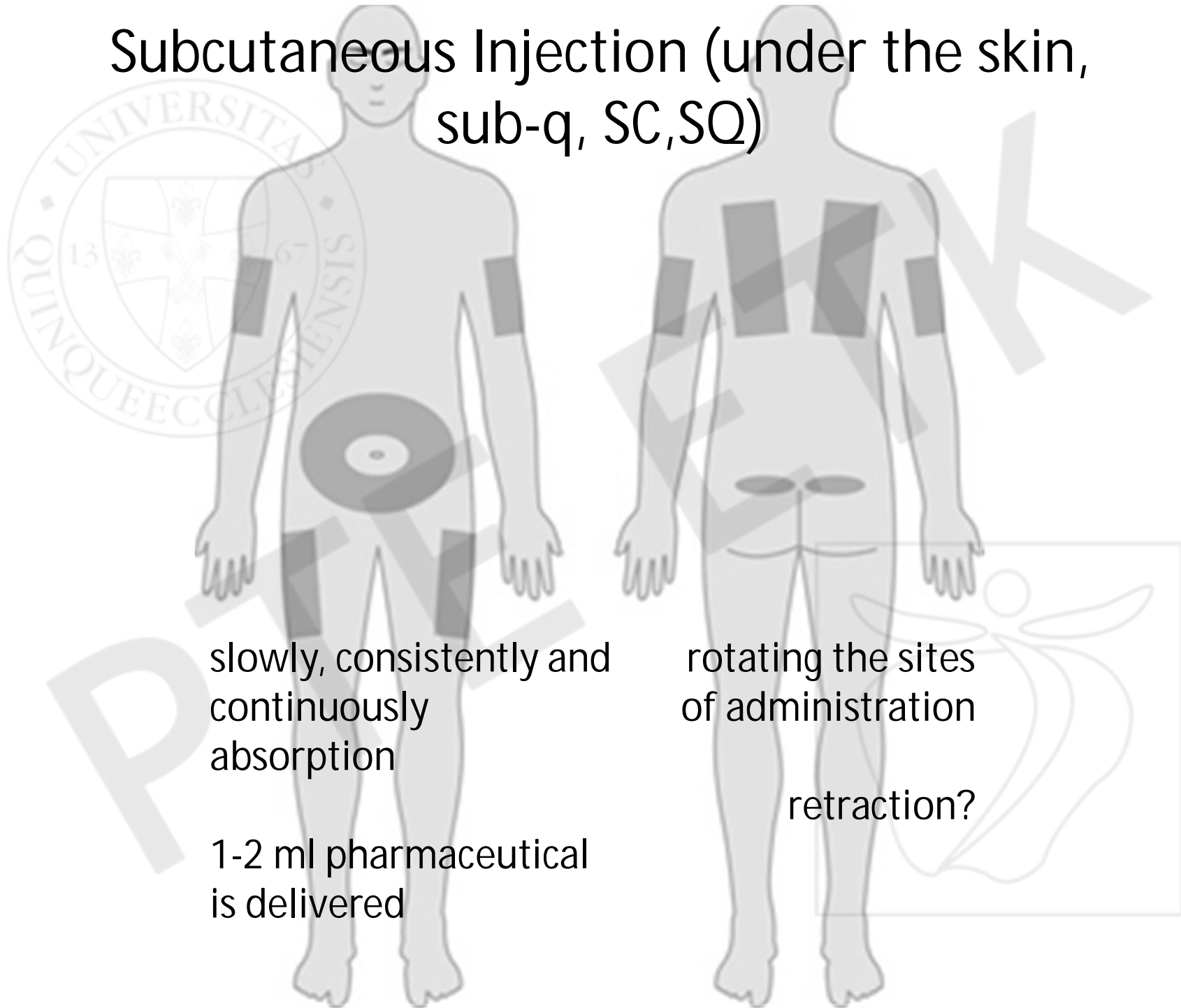
generally diagnostic
interventions (goal:
triggering local reaction)

small amount of agent

Intracutaneous/Intradermic (ID) Injection



Subcutaneous Injection (under the skin, sub-q, SC, SQ)

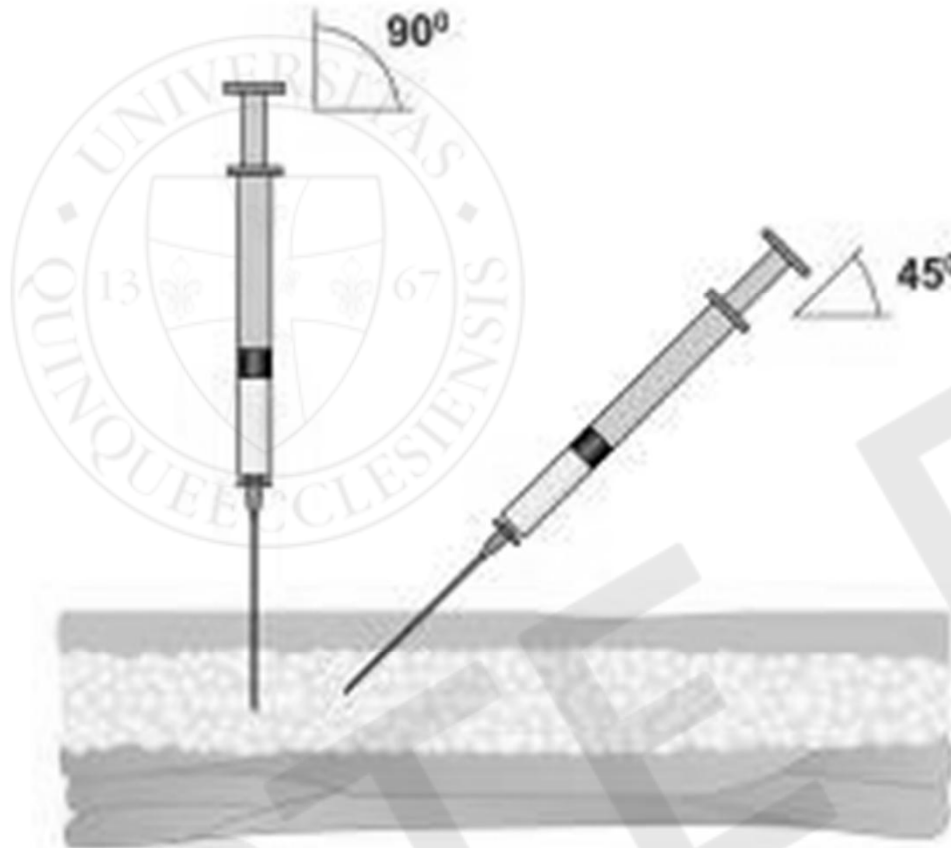


slowly, consistently and continuously absorption

1-2 ml pharmaceutical is delivered

rotating the sites of administration

retraction?

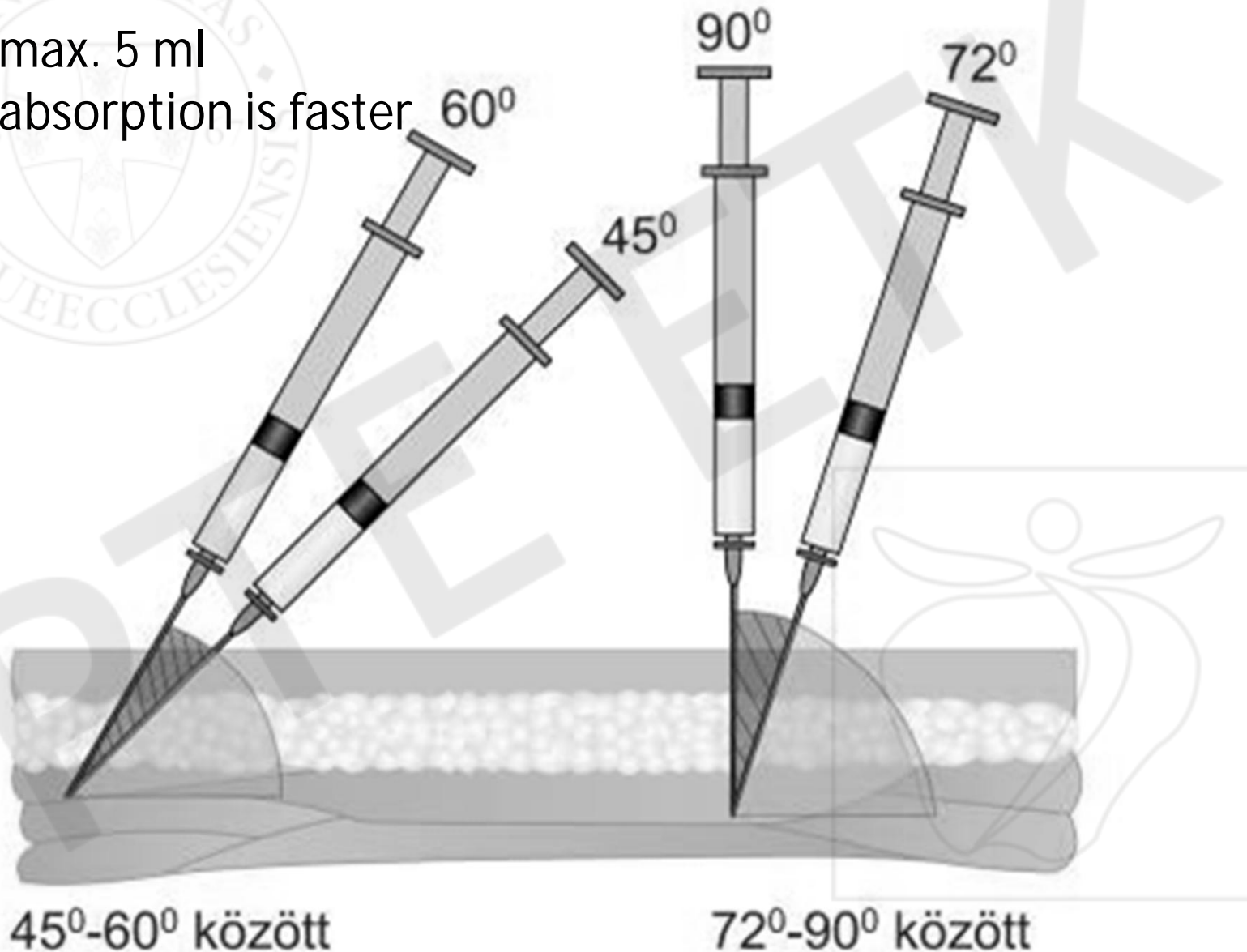


insulin, vitamins, heparin, vaccins,
interferon, narcotics



Intramuscular Injection (IM)

max. 5 ml
absorption is faster

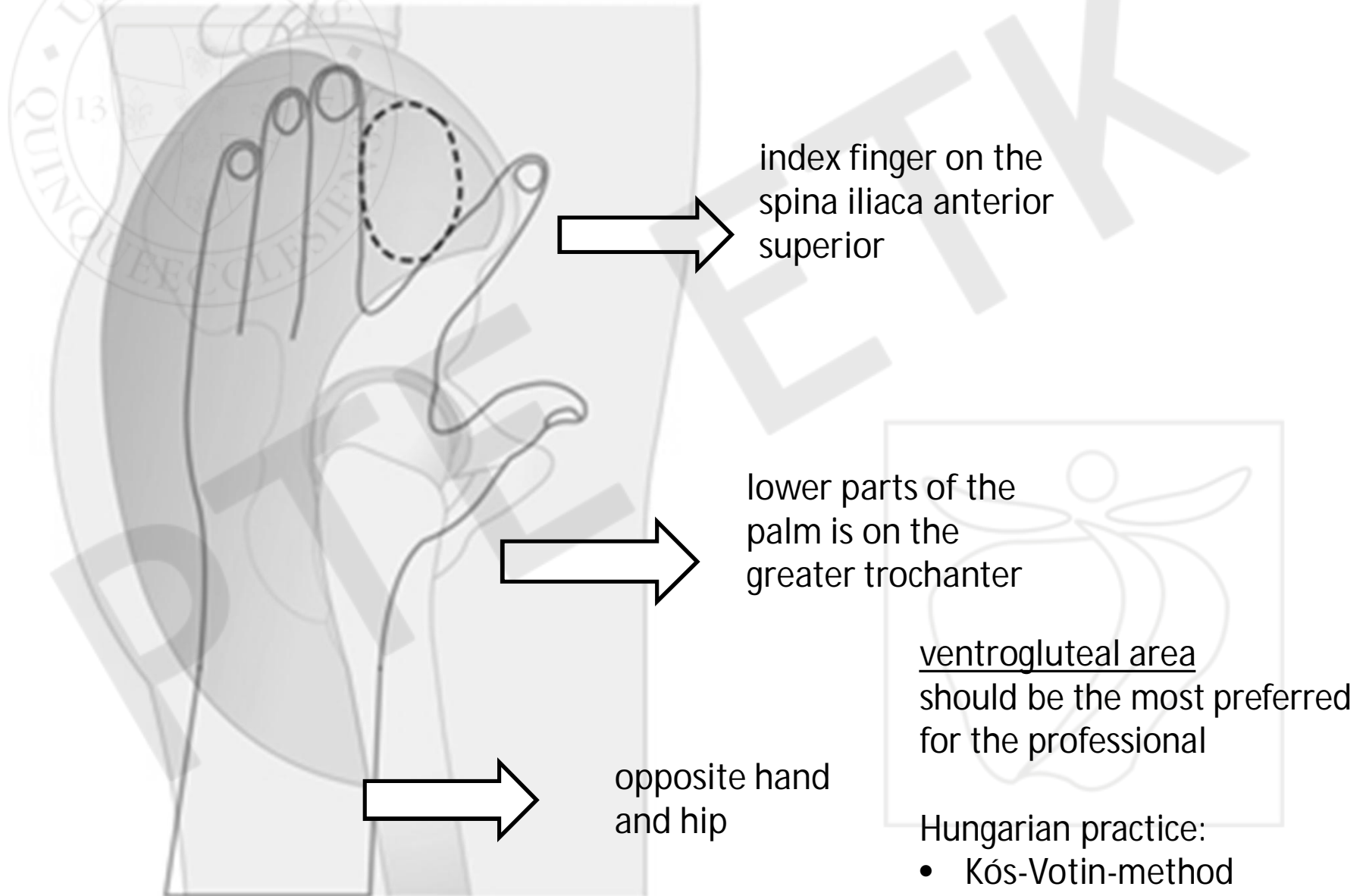


Intramuscular Injection (IM)

- Obese patients (Site of injection? Length of needle?)
- Site of injection: advantages-disadvantages
- Adult or child?
- Appropriate body position
- Dorsogluteal -> more complications
- Ventrogluteal -> less complications

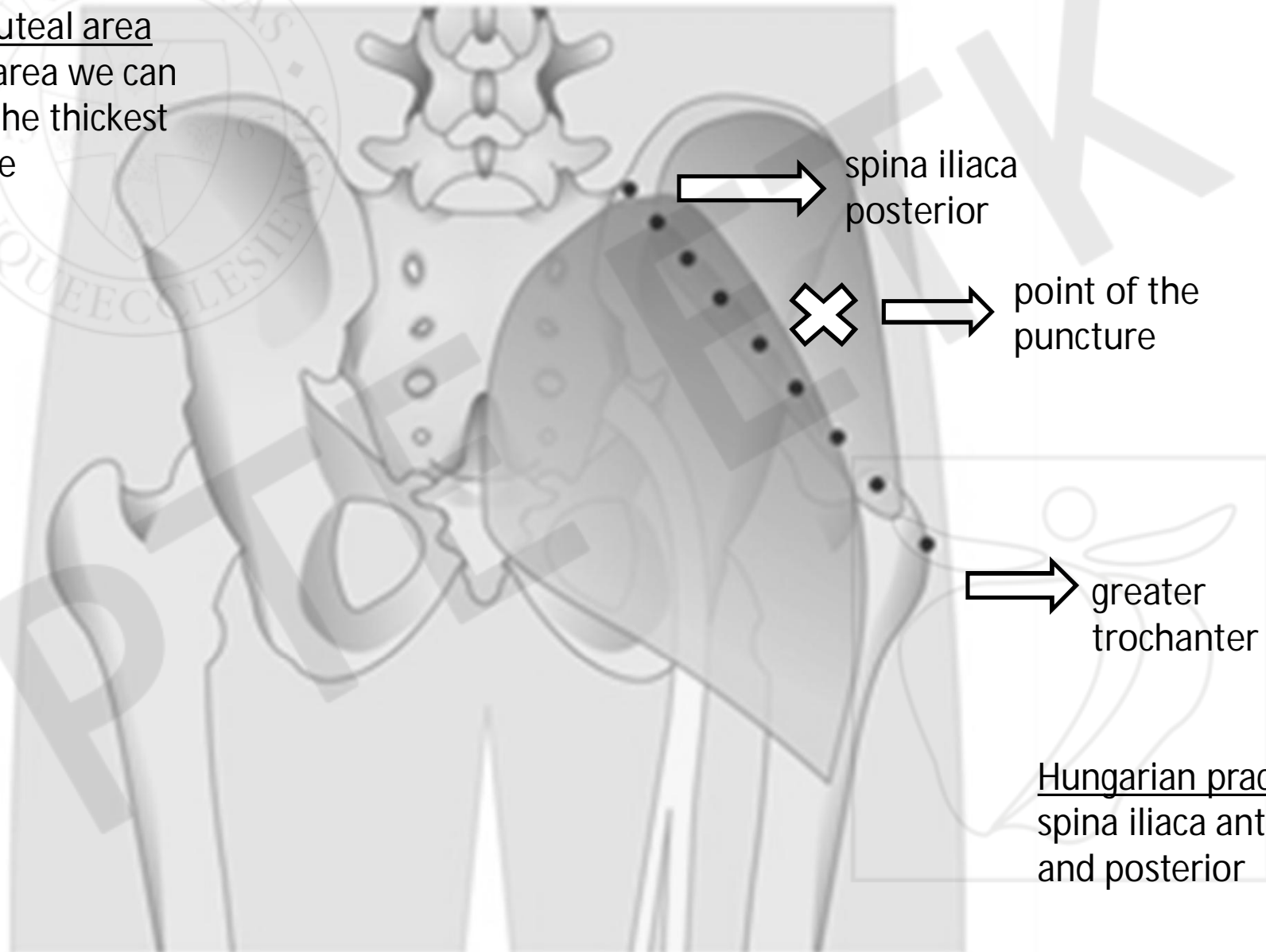


Intramuscular Injection (IM)

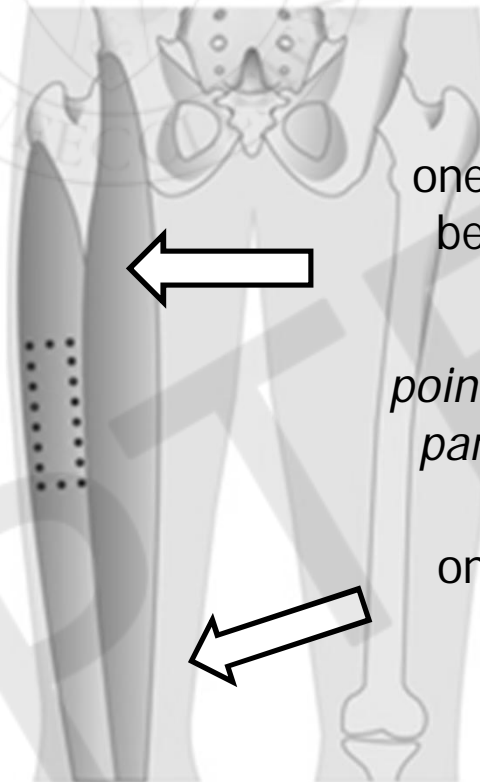


Intramuscular Injection (IM)

dorsogluteal area
on this area we can
expect the thickest
fat tissue



Intramuscular Injection (IM)

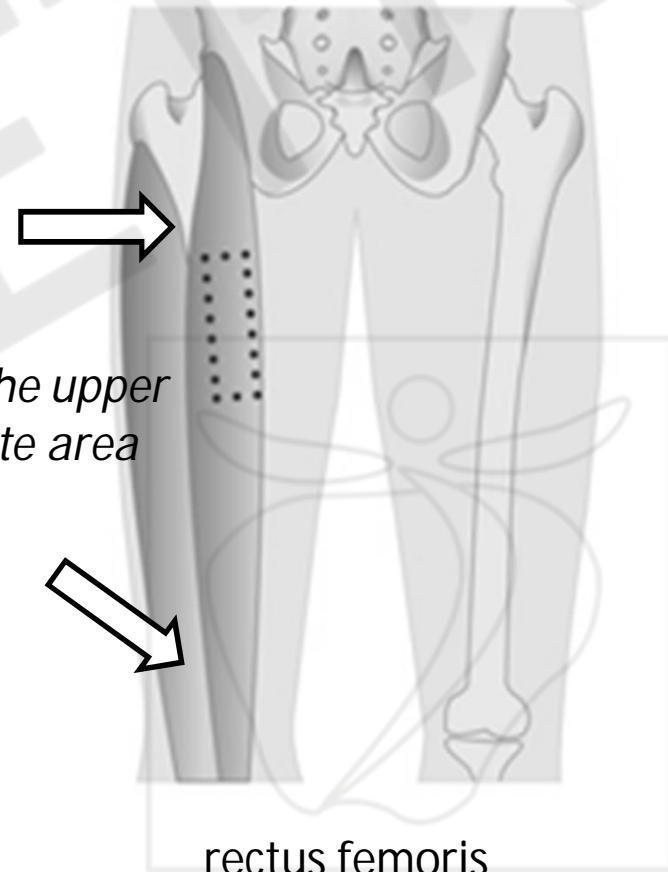


vastus lateralis
broad muscle

one palm transverse
below the greater
trochanter

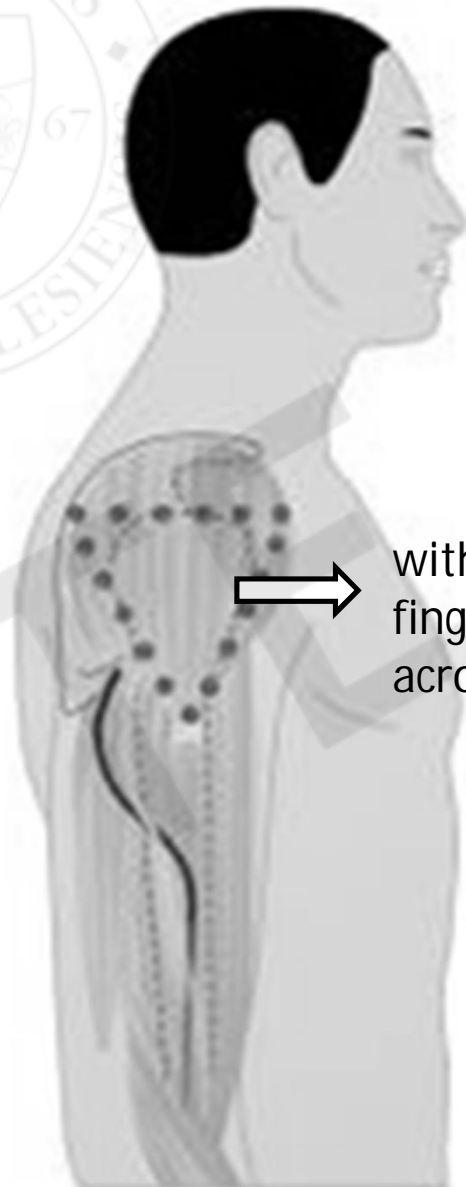
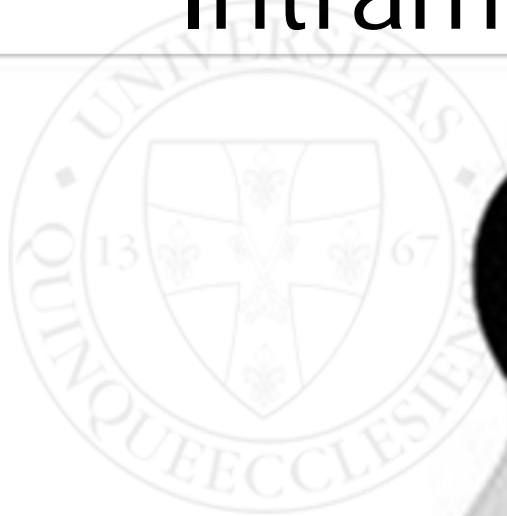
*point of the puncter is the upper
part of the intermediate area*

one palm transverse
above the knee



rectus femoris
in case of infants, small children
and self injection

Intramuscular Injection (IM)



with two transverse
finger below the
acromion



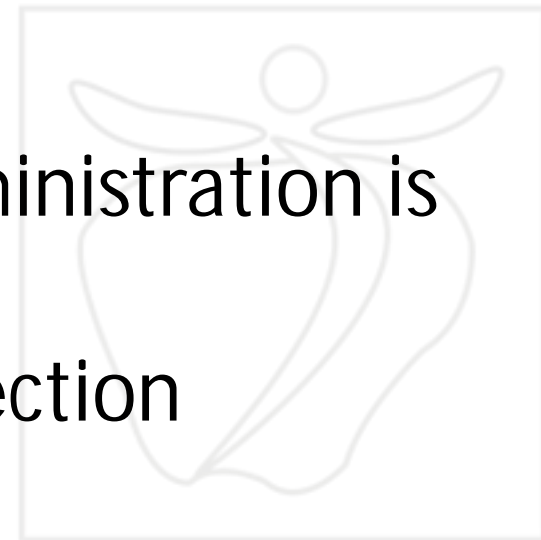
deltoid muscle
comfortable for the patient
and the professional too

max. amount – 2 ml

Intramuscular Injection (IM)

- Traditional method
- Air lock/ air bubble technique
- Z-track technique

- Retraction
- Recommended velocity of administration is 1ml/10 sec
- Do not massage the site of injection



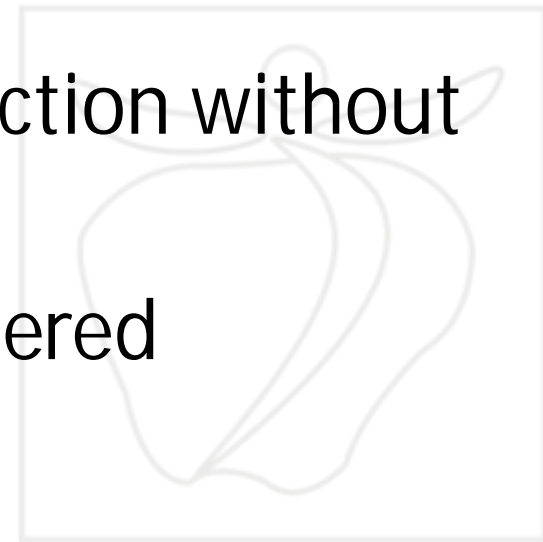
Injection complications

- pain
- redness of the skin
- swelling
- itching
- infection
- nerve injury
- bleeding
- change of colour of the tissues
- abscess resulting from injection
- injection site fibrosis
- allergic reaction
- breaking of the needle between the tissues
- Nicolau syndrome



Reducing pain

- Communication
- Applying manual pressure on the site of injection
- Appropriate body position
- Appropriate tools (needle, injection without needle)
- Amount of fluid to be administered
- Angle of administration



Intravenous Injection (I.v.)

- through secured venous access or without it
- the drug is delivered directly to the blood circulation
- we cannot talk about absorption
- immediate effect
- risk of overdosing
- medicine must be injected slowly



Intravenous Injection (I.v.)



30° - 45° között

