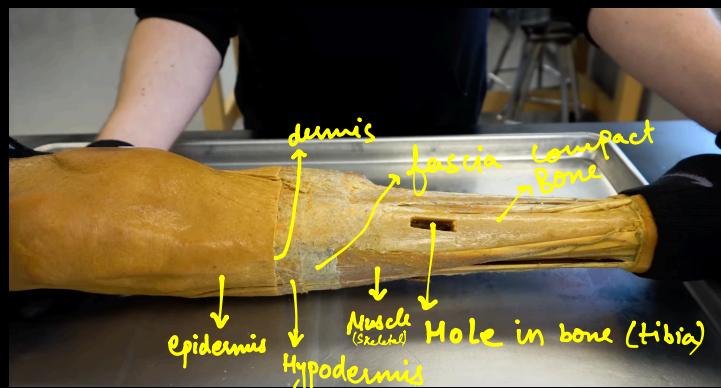
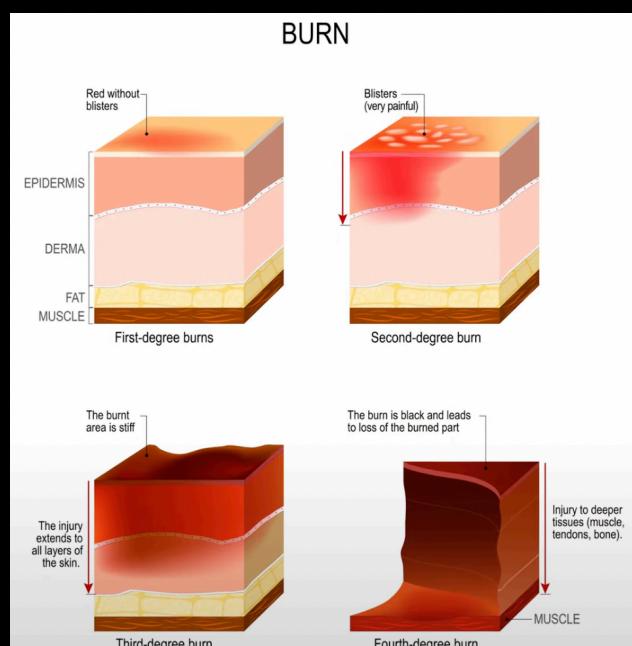
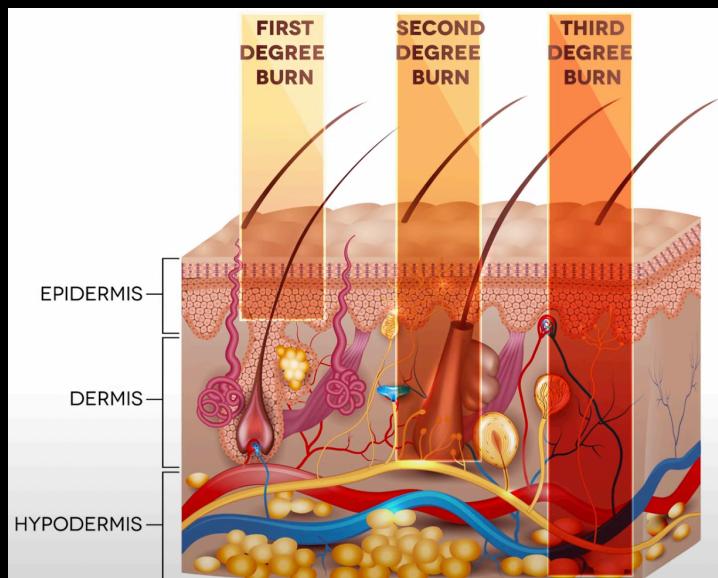


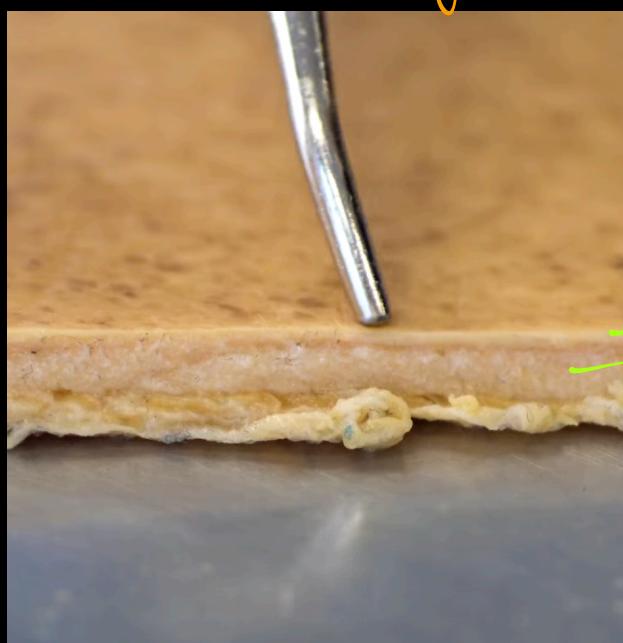
Burns



Lower leg cur at mid thigh
Step dissection



Sometimes goes to 6 degrees

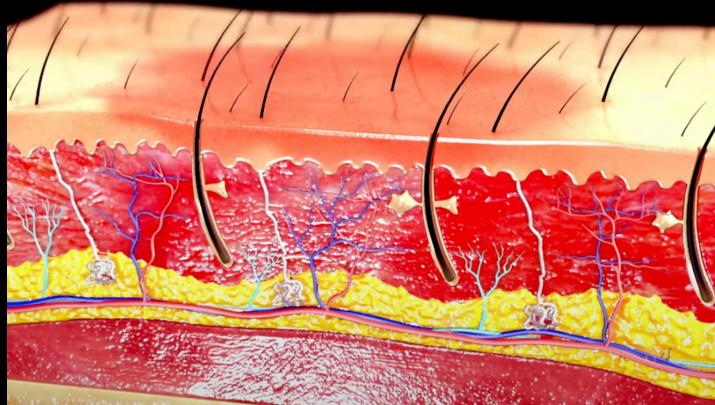


the probe points to the superficial most layer of the integumentary system i.e. epidermis; that is also damaged in 1st degree burns

Epidermis (first degree burns)

→ protects from friction and abrasion, so it is "AVASCULAR"

↳ No blood vessels in epidermis

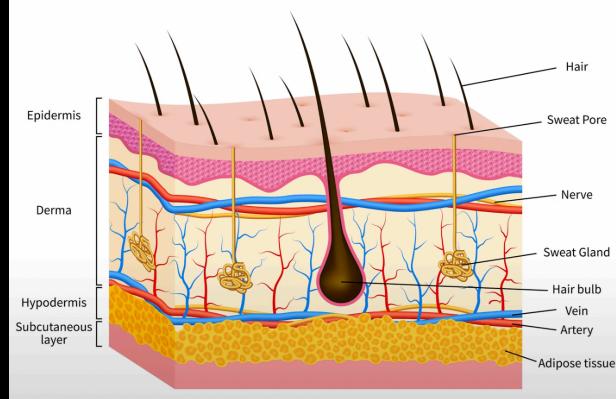


→ The dermis will send blood to epidermis to replace the burned epidermal cells, which results in redness on the burnt area. and after a while we will get flaky skin bcoz of dead cells/tissues.

* first degree burns just accelerates the process of dead skin peeling off, and are not that harmful, and does NOT cause scars

Dermis (second degree burns)

SKIN ANATOMY



→ Since there are a lot of stuff in the dermis, it's going to hurt a lot, and leave scar and blisters.



Around the second degree burns(the blister) there are first degree burns(the reddish area)

Hypodermis (aka sub cutaneous tissue) 3rd DEGREE BURN

↳ filled with adipose cells

* very severe burn, bcoz we burns:-

→ epidermis

→ dermis (sweat glands, blood vessels, hair follicles and NERVE ENDINGS)



Eschar

→ Clump of dead tissue (not a clot!)

Since the nerve endings gets burnt, 3rd degree burns are not as painful as 2nd " "

(it can become infected)



if the burn (3rd) is huge
Skin graft: putting skin of some other area at some another area.
 partial / full thickness :- depending upon the damage

Fascia (4th D.B.)

↳ bunch of collagen proteins, that wrap and compartmentalize the skeletal muscles

4th D.B = Burning fascia, skeletal Muscle tissue, surface of bones,

periosteum tissue (made of same stuff as fascia, it just wraps the bone), tendons, ligaments

Anything deeper than hypodermis is a 4th D.B.



Causes of burns

1.) Thermal burn

> 68°C or due to ice (ice burn)

2.) Chemical Burns

household cleaners → Ammonia

hair dye

acid peel → intentional burns (skin treatments)

3.) Electrical burns

it may look like a 2nd degree burn, but the effect might be deeper, which can be really severe, especially when shocked on the face or torso

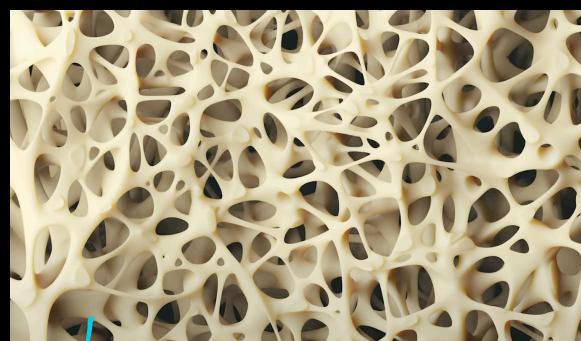
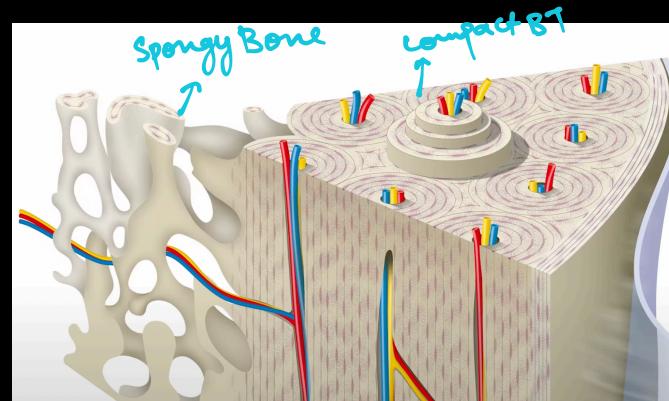
Infection is very likely !!

4) Radiation Burn

- sun burn (UV rays) (burning of skin happens)
 - Radiation therapy
 - over exposed to X-rays or gamma rays
-

- Astronauts returned from flights with 20% reduced bone density (in some cases)
 - Bones are constantly changing (based on environment like O₂)
(use it or lose it situation) → shape and internal arch.
 - exercise - maintains or inc⁺t Bone density (BD)
-

→ Compact and soft bone tissue



Trabeculae :- tiny
beams of bone
literal translation: little
beam

Real spongy bone (aka Trabecular bone)

Not random :- Aligned to stress that bones experience on daily basis
(like building beams - except they keep changing)

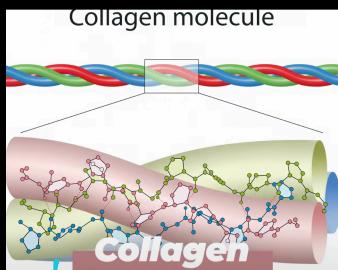
exercises that both push and pull the bone ⇒ compressive and tensile forces

2 substances in bones

① organic substance

→ tensile strength

→ Collagen



→ string-like proteins that resist being pulled apart

→ like a microscopic rope

bond and form intimate relationship with hydroxyapatite

② inorganic substance

→ compressive strength

→ Hydroxyapatite - hard, crystal like

→ made of mostly Calcium and phosphate.

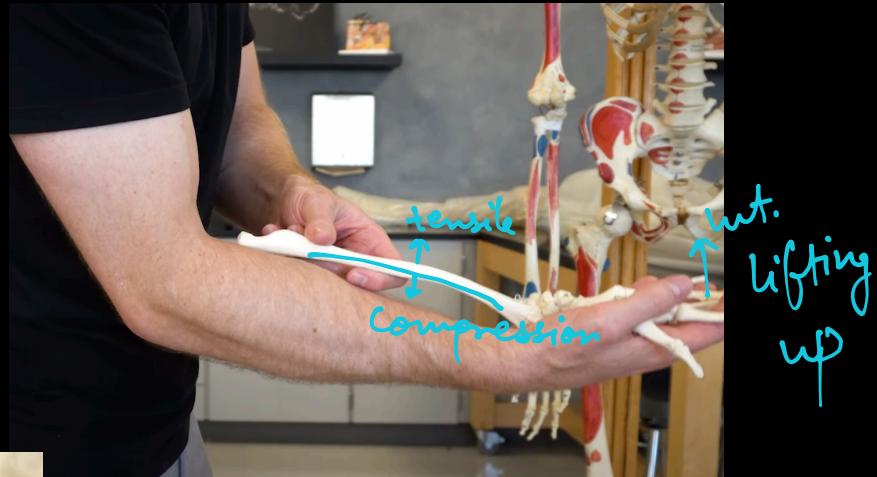
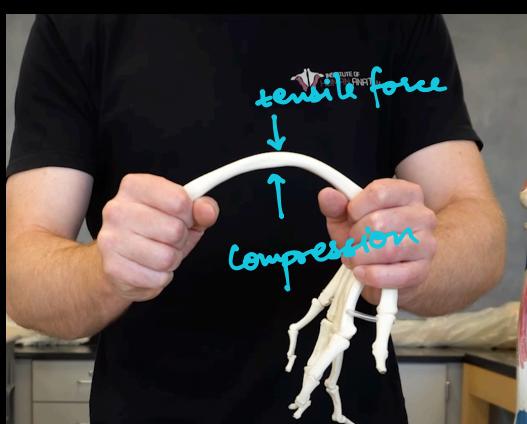
→ gives bone its hard characteristic and ability to resist pushing and compressive forces

Exercise

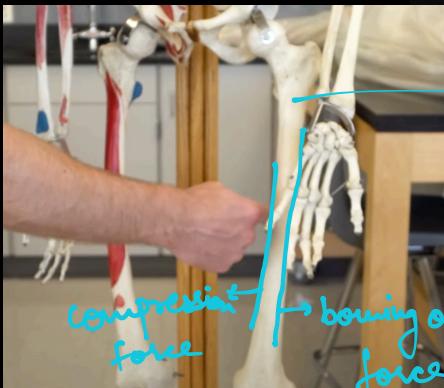
compressive :- walking, jumping

tensile :- resistive exercises, push ups, int. lifting

compressive + tensile \Rightarrow easy



Running



→ femur angled inward (more in female)

Running → great bone density in lower limbs

→ alternatives:- squats, deadlifts (contracting limb muscles)

Wt. training, cycling (doesn't ^{do} compression but still contributes in good bone density)

Remaking bones

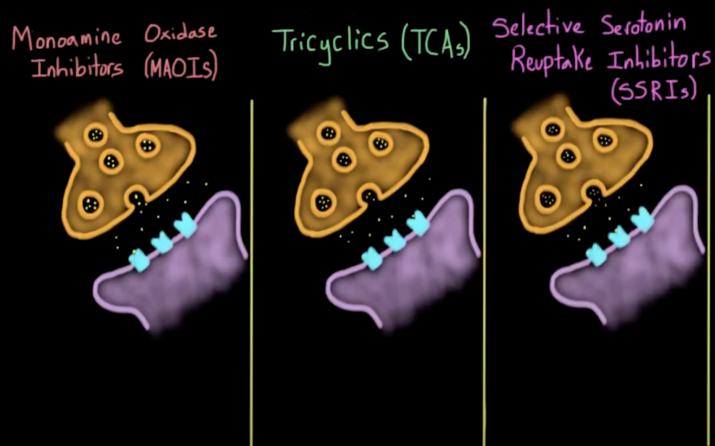
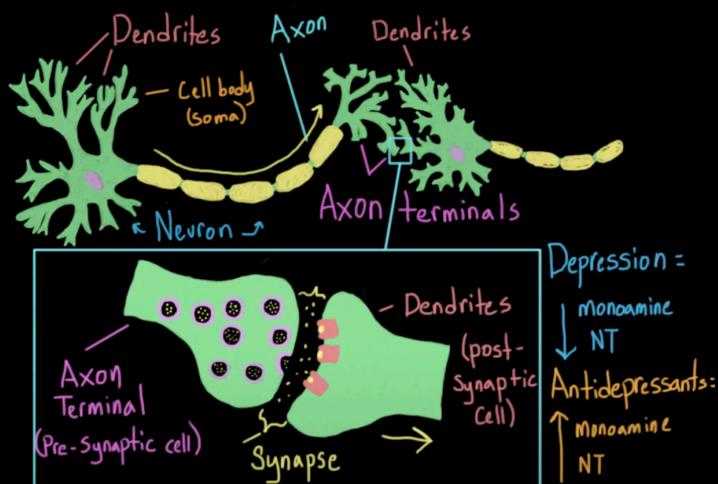


(*) estrogen inhibits osteoclasts (at menopause estrogen goes down so osteoclasts inc↑ and hence the bone density reduces, causing osteoporosis)

Treating depression with antidepressants

to generate Action potential

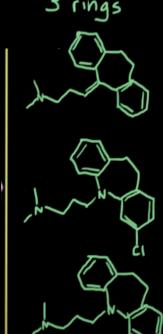
Depression → caused by → low level of monoamine N.T.



MAOIs

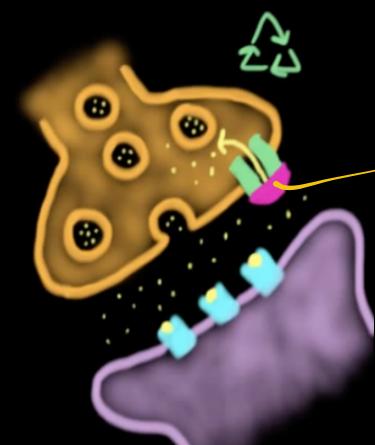
- Monoamine oxidase is an enzyme that breaks down N.T.s, that isn't stored in vesicles (cellular housekeeping)
- Monoamine oxidase Inhibitors reduce the action of " ", and so when N.T. are not broken down, so then they are transmitted and that inc[↑] the amount of N.T. at the synaptic junction SO, an action potential gets generated.

TCAs



→ inc[↑] level of 2 N.T.s i.e. norepinephrine and serotonin

→ Reuptake (another housekeeping mechanism) : the excess N.T. in synapse is taken up by the pre-synaptic cell by reuptake channels, and then recycled into vesicles and released again

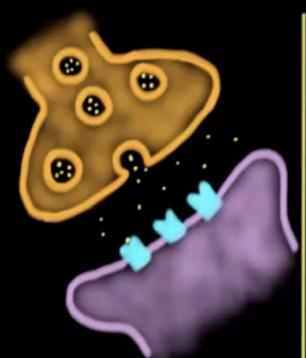


→ TCA (blocking the reuptake channel) \Rightarrow now the N.T. will remain longer in the synapse and that increases the likelihood of N.T. getting docked on the receptor of the post-synaptic neuron and trigger an action potential!

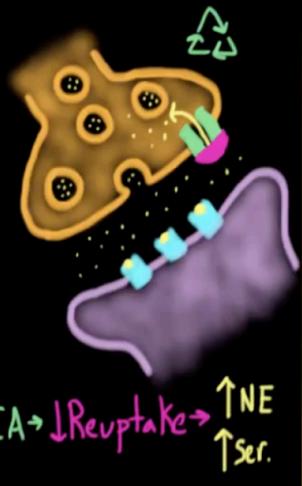
SSRIs

→ like TCAs, but only block reuptakes for serotonin and only for very specific serotonin receptors.

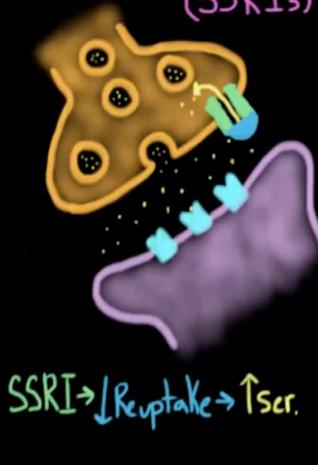
Monoamine Oxidase Inhibitors (MAOIs)



Tricyclics (TCAs)



Selective Serotonin Reuptake Inhibitors (SSRIs)



→ most commonly known
→ this includes fluoxetine
(aka Prozac)

\uparrow MAOI \rightarrow \downarrow MAO \rightarrow \uparrow NT

TCA \rightarrow \downarrow Reuptake \rightarrow \uparrow NE
 \uparrow Ser.

SSRI \rightarrow \downarrow Reuptake \rightarrow \uparrow Ser.

↳ 3 classes of antidepressants!

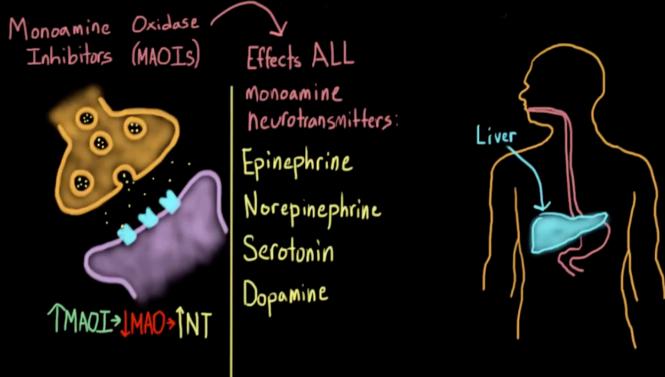
Which one to Prescribe?

→ whatever works the best! But all are equally effective A·D.

→ Side effects?

→ MAOIs and TCA_s are old and are called 1st generation A·D. and have more side effects than SSRIs (new, 2nd gen. A·D.)

→ MAOIs not just inc't N.T. in brain but in entire body!



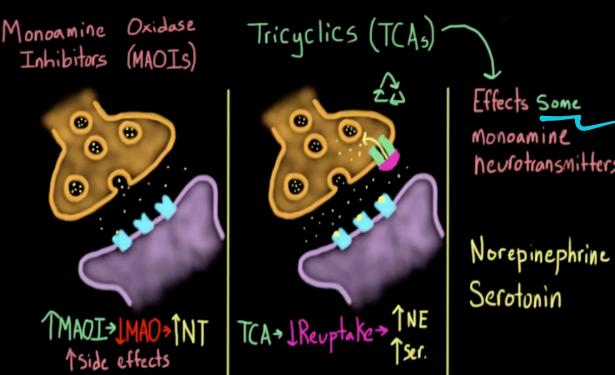
→ Side effects of above:-

① inhibits a process in the liver that helps metabolise medications! (Drug interactions)

* if these drugs don't break down properly, these can built up and lead to a potentially life-threatening situation.

② They prevent breakdown of certain foods as well.
eg:- fruit, meat, diary, alcohol.

∴ MAOIs are not a very popular choice!!



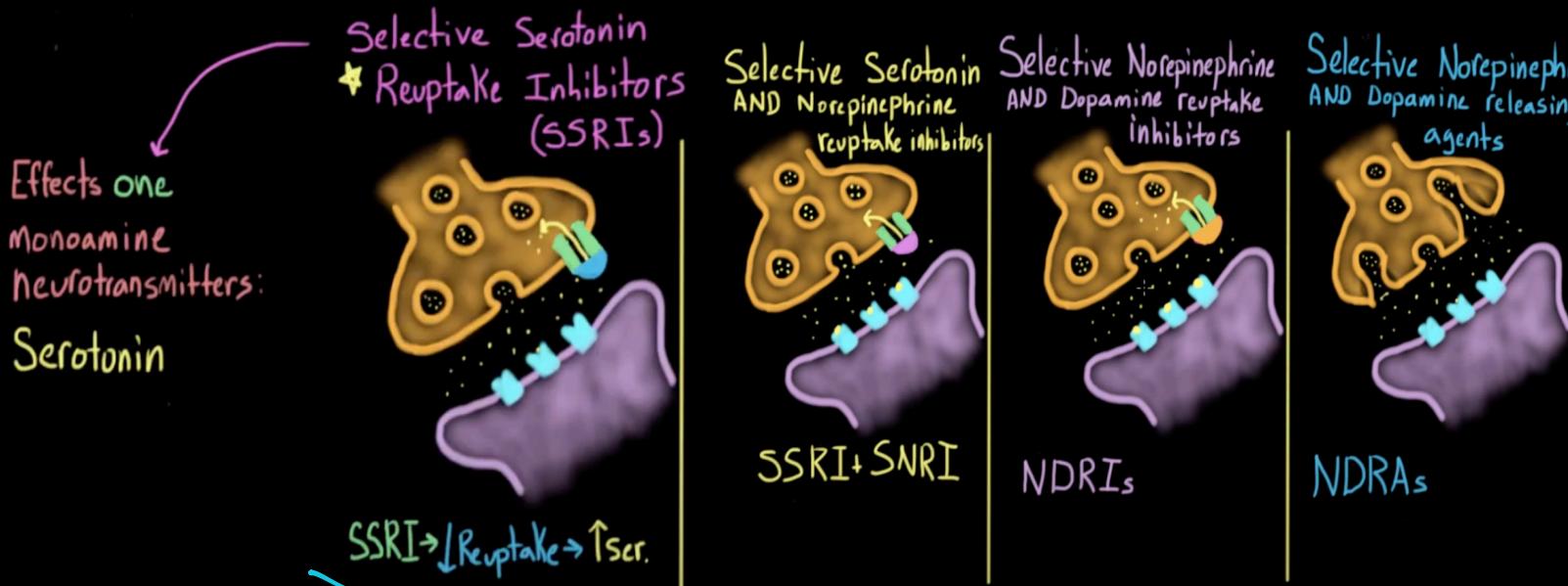
so they have fewer side effects since they effects less } \Rightarrow but these effects can be severe :-
 ① they can effect histamines which can lead to fatigue and sluggishness

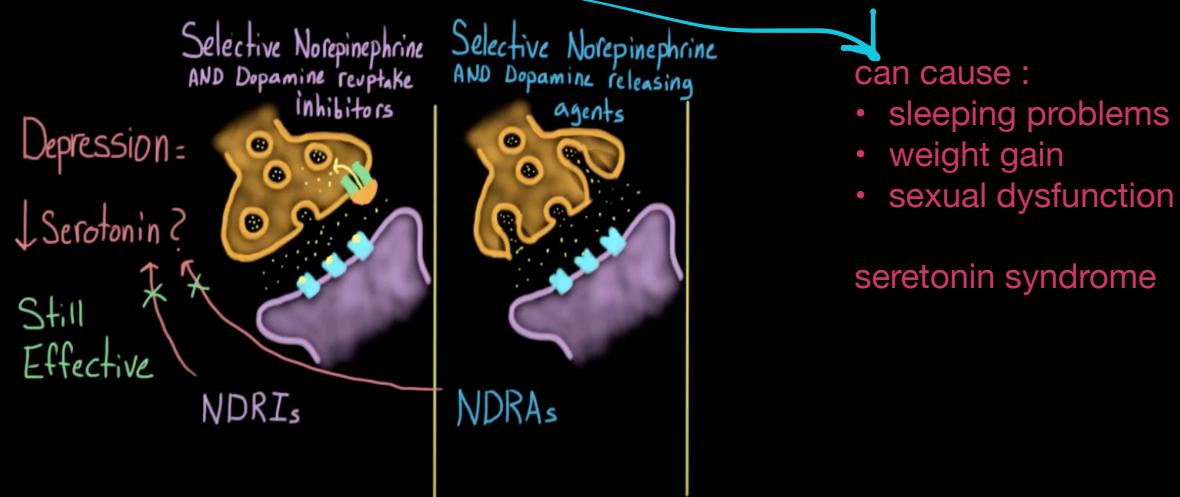
② TCAs are very toxic at higher levels, and someone

can go into cardiac arrest if they accidentally or purposefully overdose on them.

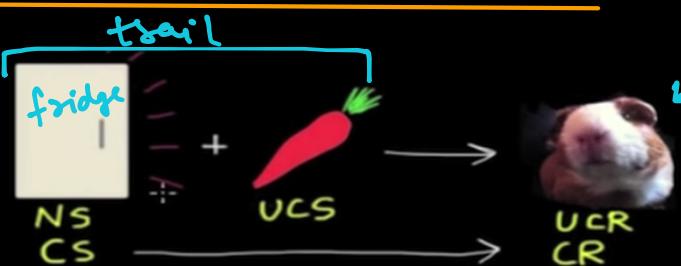
\therefore TCAs are not the first choice!

\rightarrow Bipolar disorder (TCAs + Lithium) \Rightarrow bcoz SSRIs can cause manic episodes in Bi. people, sometimes, so, TCAs are safer options





Classical conditional (1)



Drawer's opening sound
(Generalization) \Rightarrow similar stimulus

NS \rightarrow Neutral stimulus (sound of fridge's door opening)

CS \rightarrow Conditioned stimulus (NS becomes CS)

CR \rightarrow conditioned response (guinea pig excited on the sound)
 \rightarrow learnt response

(tendency for stimulus similar to CS to elicit a response similar to the CR) \Rightarrow Generalization

Discrimination \Rightarrow guinea pig does not respond to smooth drawer opening sound.

When a human or any other type of animal learns to make a particular response to some stimuli but not to others (Adaptive value)

sound of drum
 V_s " gunshot

Extinction \Rightarrow when we don't give carrot after fridge's sound, after a while the guinea pig will stop responding excitedly to the " ", and it's called extinction.

Used to cure phobias.

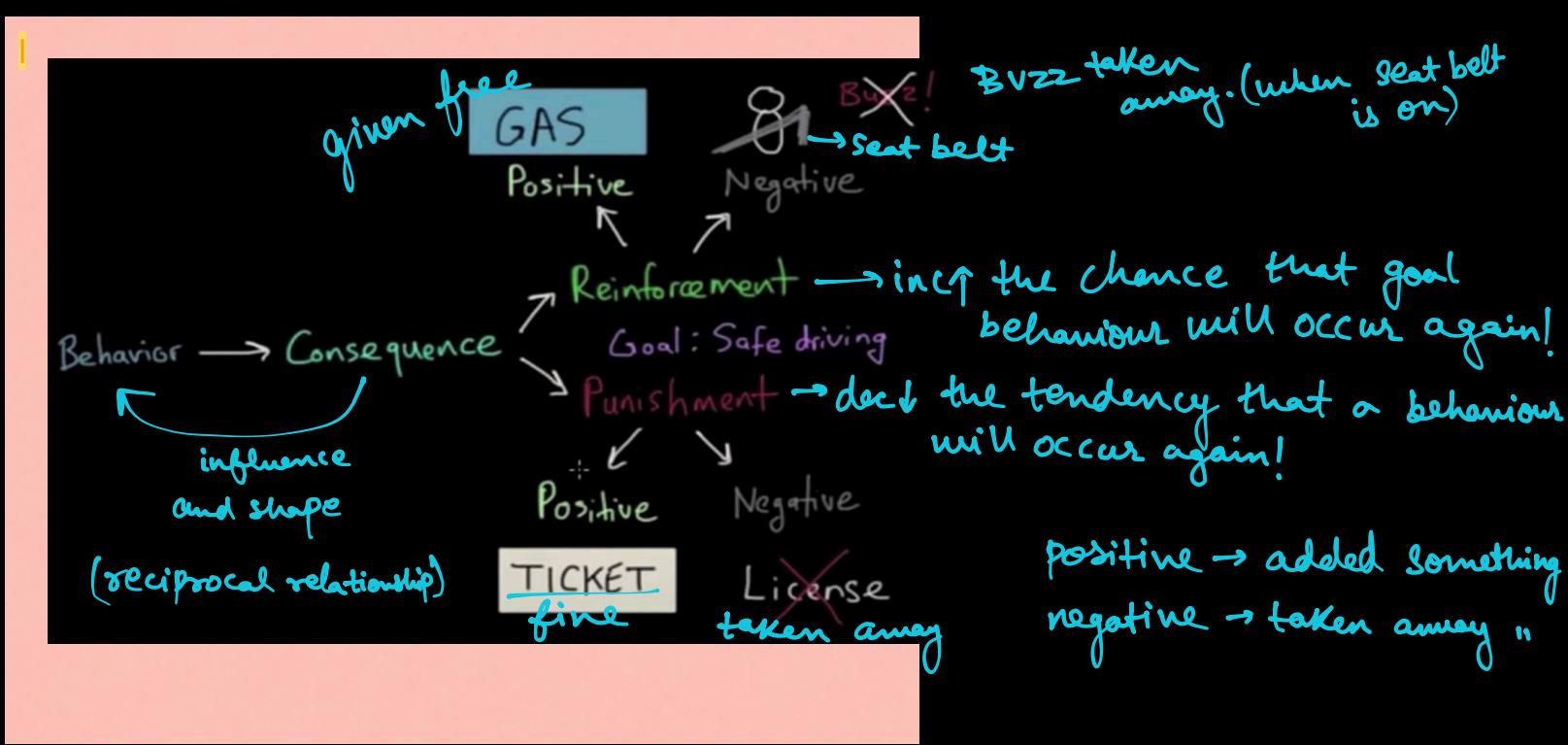
Spontaneous Recovery \Rightarrow one day guinea pig response to the fridge sound out of nowhere, not very strong and doesn't persists.

Classical conditional (2)

UCS → unconditioned stimulus (no body trained guinea pig to get excited by carrots!) (physiologic response)
 ↓
 happens naturally

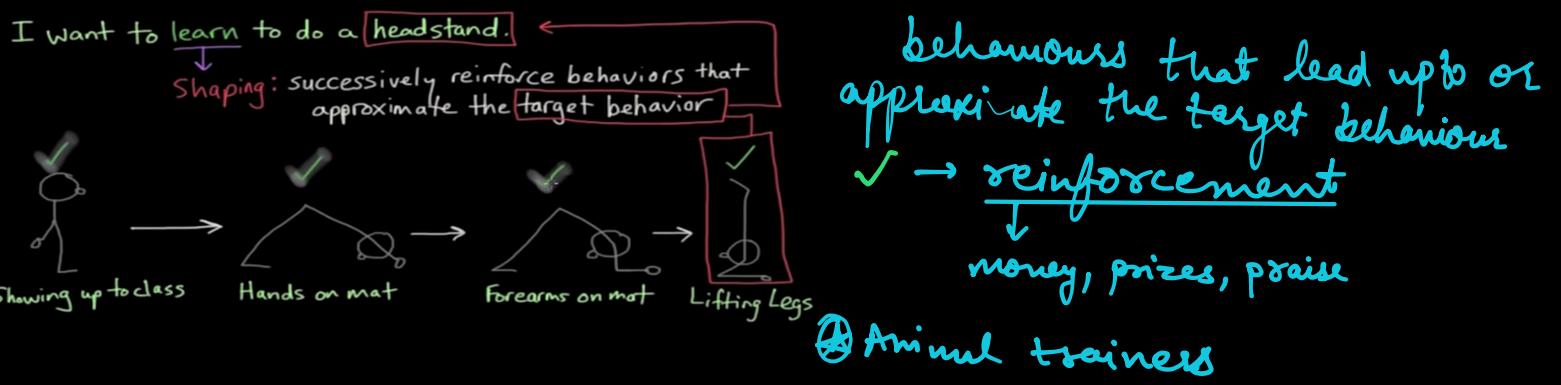
Conditional → learnt

Operant conditioning (Positive-and-negative reinforcement and punishment)



Operant conditioning (Shape)

- learning facts → through repetition, revision
- learning skills → through practice → shaping ↳ successively / gradually reinforce



operant conditioning (Schedules of reinforcement)

