

# An Overview of Spasticity and Hypertonicity

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# Disclosures

- None

# How Common is Spasticity

- Very common
- Likely in the range of 40-70%

ESTIMATED PREVALENCE OF SPASTICITY AND PROBLEMATIC SPASTICITY IN THE UNITED STATES			
Condition	Estimated U.S. Patients	Prevalence of Spasticity <sup>a</sup>	Prevalence of Problematic Spasticity <sup>a</sup>
Stroke	6,500,000	1,495,000 (23%)	448,500 (30%)
TBI	5,300,000	NA	NA
CP	764,000	649,400 (85%)	382,000 (50%)
MS	400,000	268,000 (67%)	152,000 (38%)
SCI	259,000	172,040 (68%)	83,490 (33%)

# What is Spasticity?

Academic= Increased muscle **tone** in a **velocity** dependent manner to passive motion due **hyperreflexia**

Clinical= many manifestations

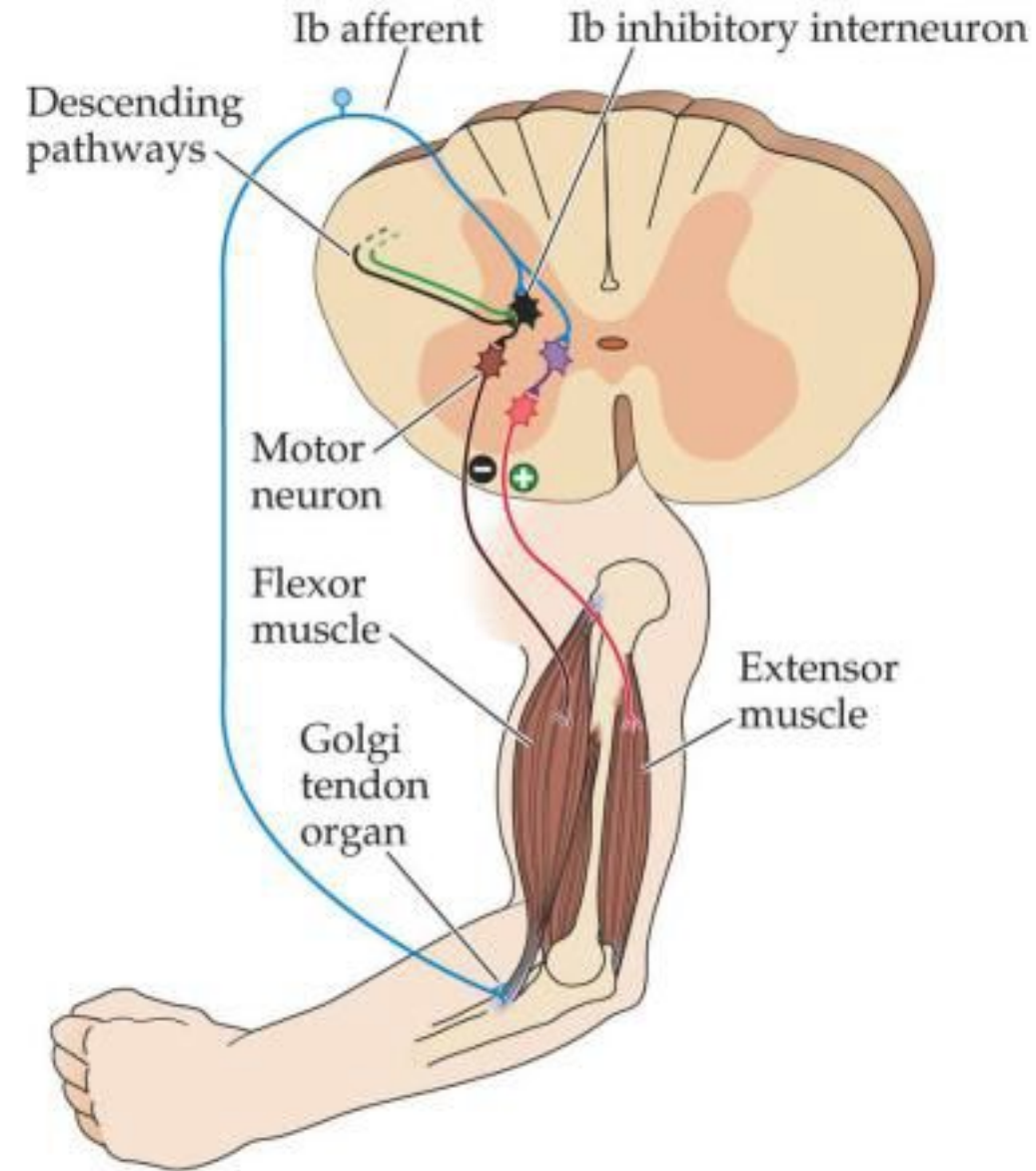
Tonic (stiffening in place)

Phasic (movement of limb with spasm)

Can occur with or without weakness.



Supplement to Arch Neurol. doi:10.1001/archneurol.2012.112. ©



# Overview

Goals of Spasticity Management

How to we evaluate it

What are common patterns

Oral medications

Injections

Devices/Surgeries

# Goals of Spasticity management

Many reasons, a few:

- Decrease pain associated with spasticity
- Prevent contractures
- Improve quality of life
- Improve function/mobility
- Improve hygiene, less skin breakdown





## Not all Spasticity Impairs Function

-UT SW

-Compensates for muscle  
weakness



## Not all Spasticity Impairs Function

- UW
- Using extensor spasms to transfer.



# How to we evaluate Spasticity?

- What are the **goals**?
- What helps **you**? (functional impairment)
- What is the pattern of spasticity (focal, regional, systemic)

## DEFINITION OF ASHWORTH, MODIFIED ASHWORTH, SPASM FREQUENCY, AND REFLEX SCORES

### Ashworth score

1	No increase in tone
2	Slight increase in tone, giving a "catch" when affected part is moved in flexion or extension
3	More marked increase in tone, but affected part easily flexed
4	Considerable increase in tone; passive movement difficult
5	Affected part rigid in flexion or extension

### Modified Ashworth score

0	No increase in tone
1	Slight catch and release, or minimal resistance at end range
1+	Catch, followed by minimal resistance throughout the remainder (less than half) of the ROM
2	More marked increase in tone through most of the ROM
3	Considerable increase in tone; passive movement difficult
4	Affected part(s) rigid in flexion or extension

### Spasm frequency score

0	No spasms
1	Mild spasms induced by stimulation
2	Infrequent full spasms occurring less than once per hour
3	Spasms occurring more than once per hour
4	Spasms occurring more than 10 times per hour

### Reflex score

0	Reflexes absent
1	Hyporeflexia
2	Normal
3	Mild hyperreflexia
4	3 or 4 beats clonus only
5	Clonus

# How to we treat spasticity?

- **First Step: Address the Triggers**

**Examples:**

- Painful stimuli
- Avoid infections
- Avoid stressors
- Avoid heat

- **Second Step:**

Physical therapy

Range of Motion

Behavioral

PT/OT

Oral medications

Local  
injections/treatments

Surgery/ Pumps

# Classical Spasticity Patterns in the Upper Limb

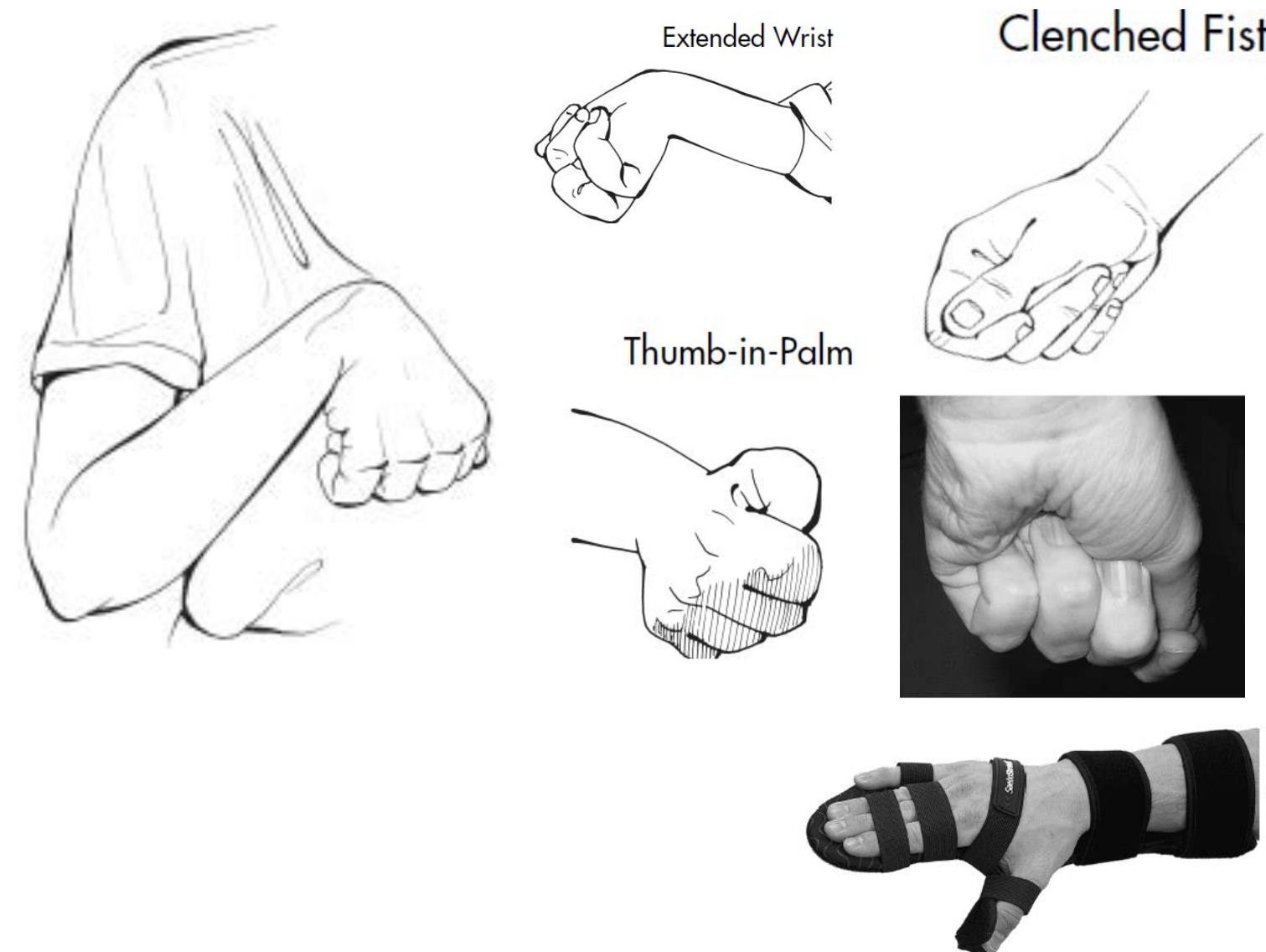
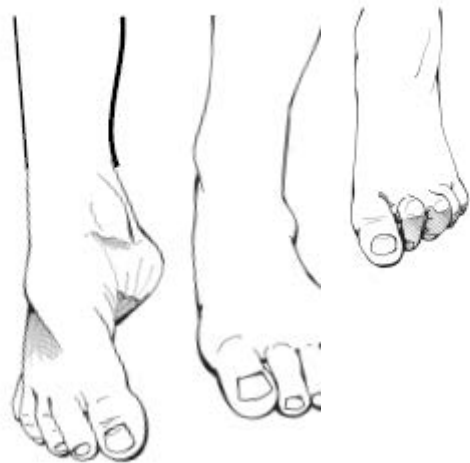


FIGURE 15.1 Saebo Stretch splint.



# Classical Spasticity Patterns in the Lower Limb

Equinovarus Foot



Flexed Toes Extended (Stiff) Knee



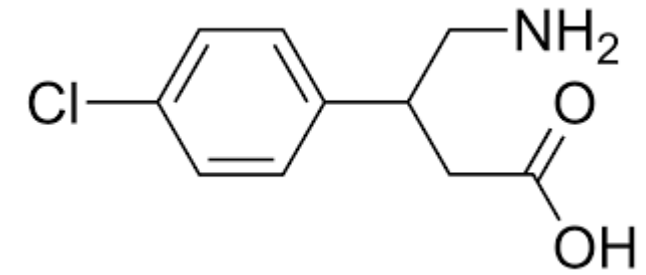
Flexed Hip



Adducted Thigh



# Oral medications: Baclofen



- Calms the reflex circuits
- Maybe more effective for spasticity of spinal cord origin
- Dosage = Three times to four times a day, total up to 160 mg/day
- Side effects=
  - Drowsiness
  - concentration difficulties
  - Sexual side effects
  - If taken for a long time at high doses, talk to your doctor before stopping.
- Need to monitor LFTs

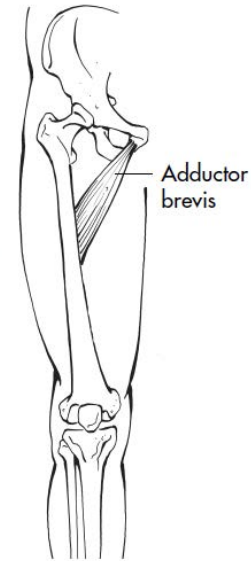
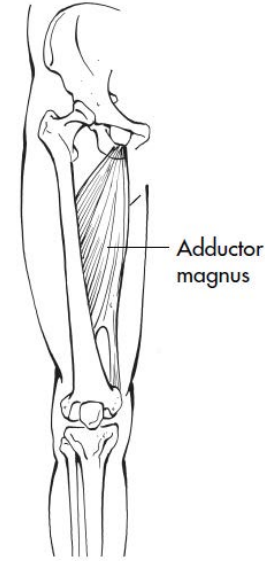
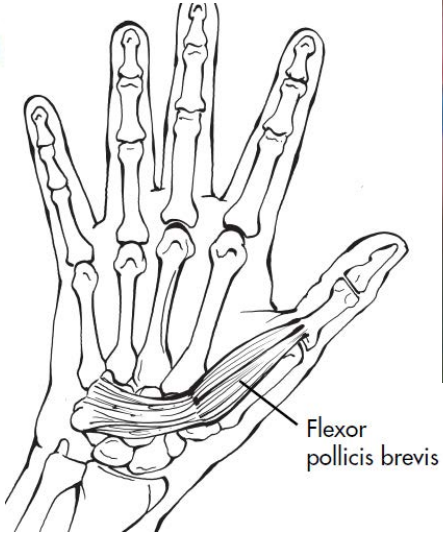
# Oral medications: Tizanadine

- Works on polysynaptic pathways
- Dosage: at night or as needed, up 12 mg QID, **needs slow titration**
- Less weakness than other antispasticity agents
- Side effects:
  - **drowsiness**, dizziness
  - elevated LFTs, platelets
  - **Avoid with antibiotic called Ciprofloxacin**
  - Avoid abrupt withdrawal due to **rebound high blood pressure**



# Botulinum Toxin injections

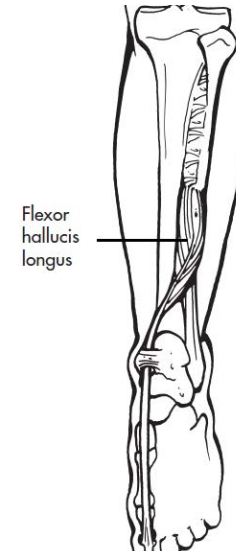
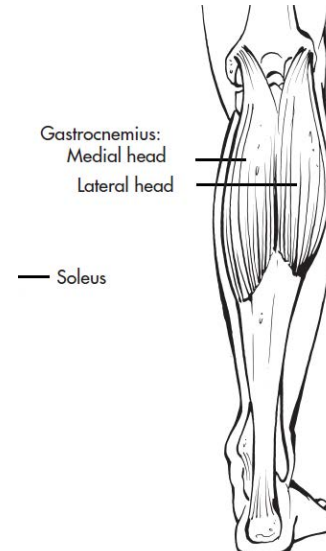
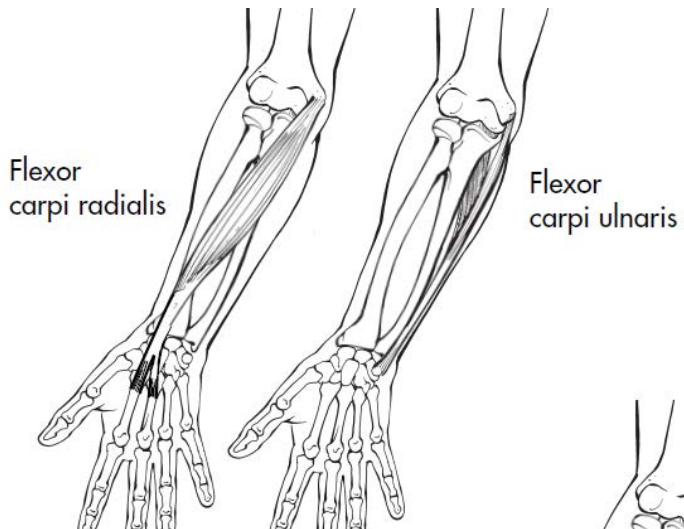
Thumb-in-Palm



Adducted Thigh



Flexed Wrist



Equinovarus Foot 1/3



# Baclofen pump

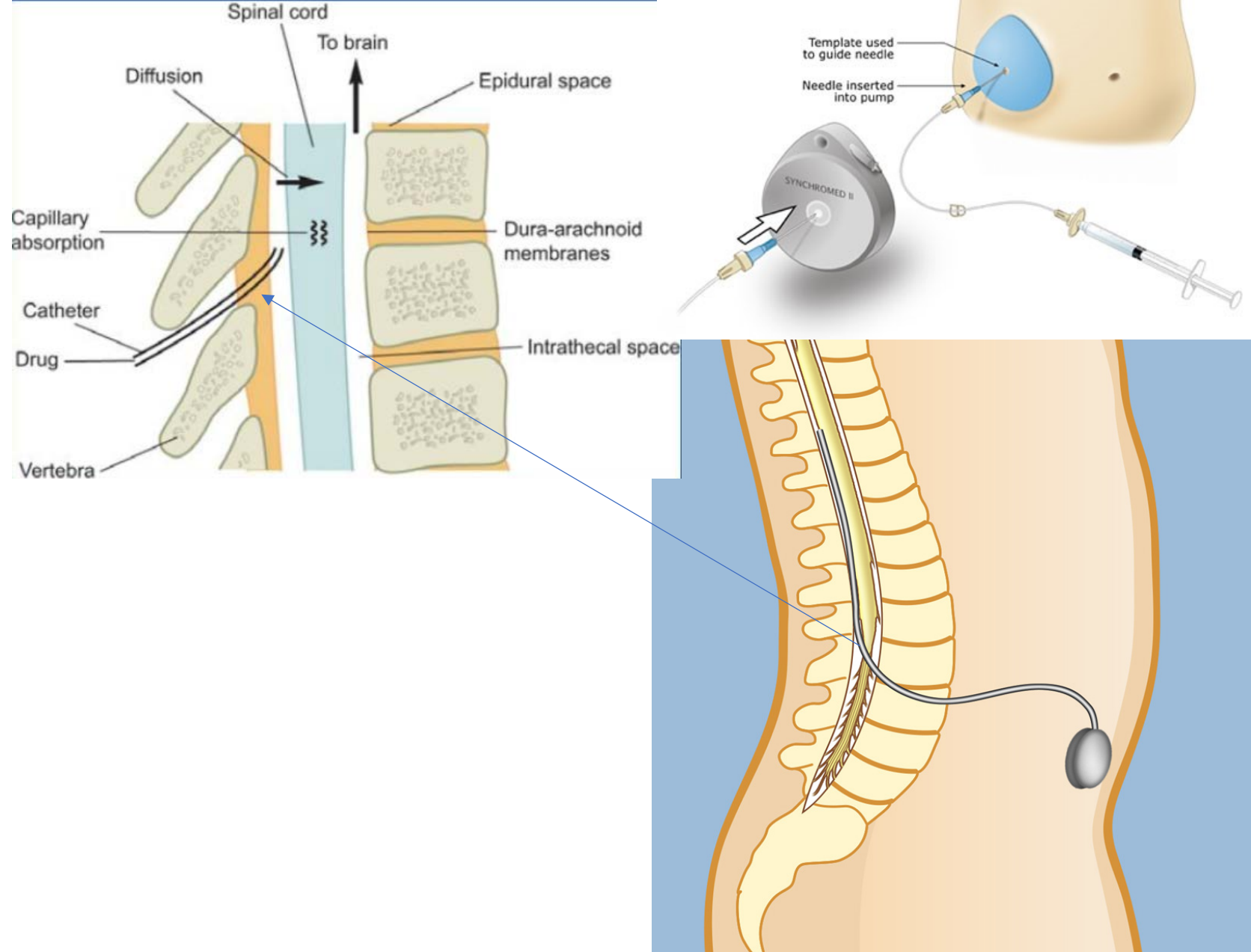
Directly delivered to CSF

Lower dose

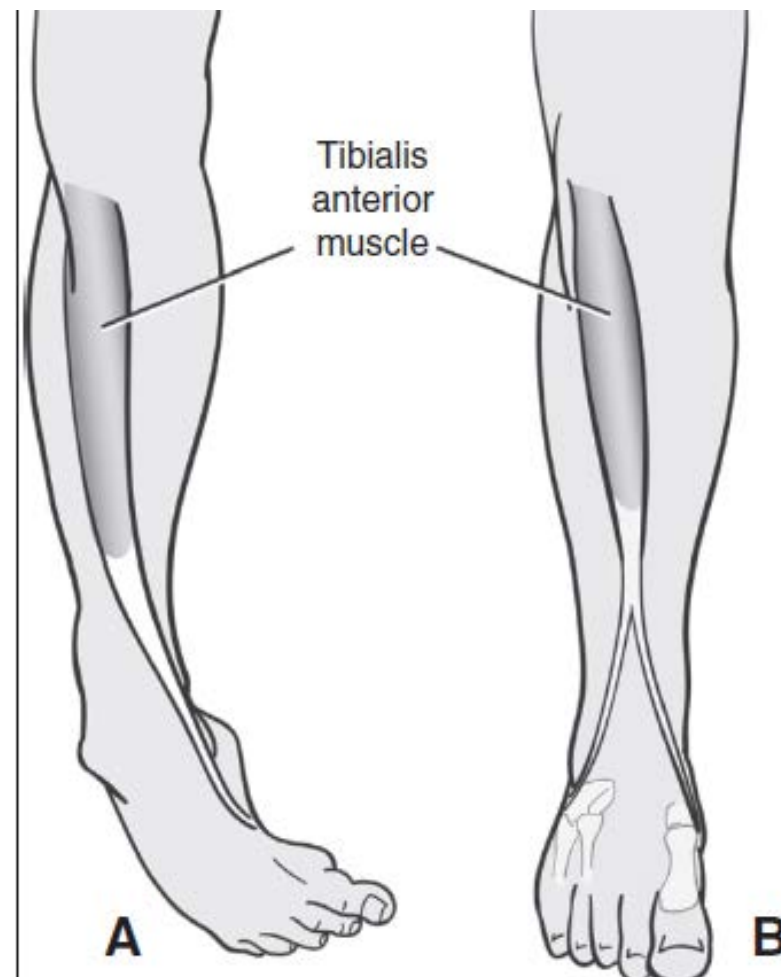
Fast onset

Need surgery and refill

Can malfunction



# Surgeries



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