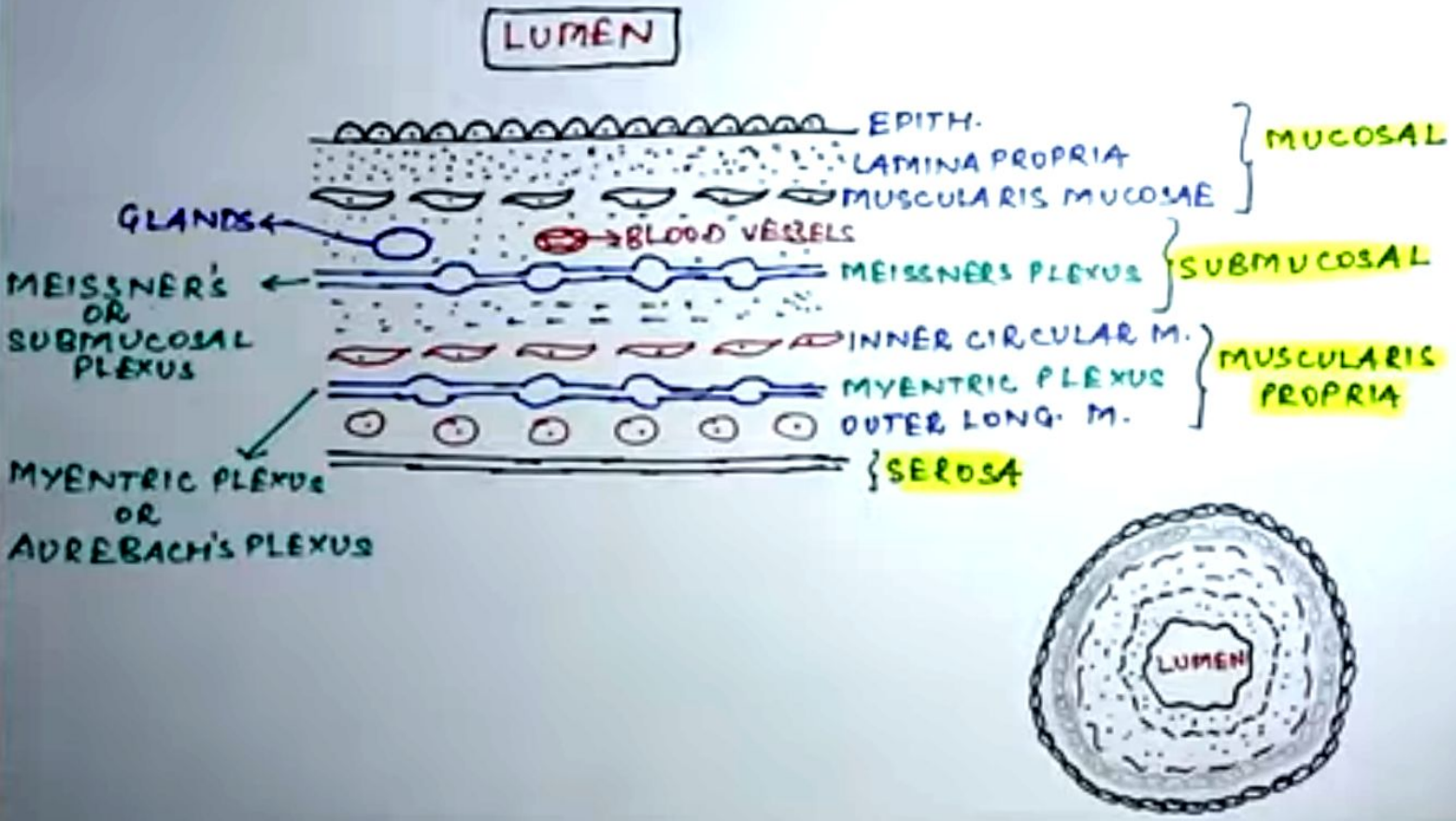
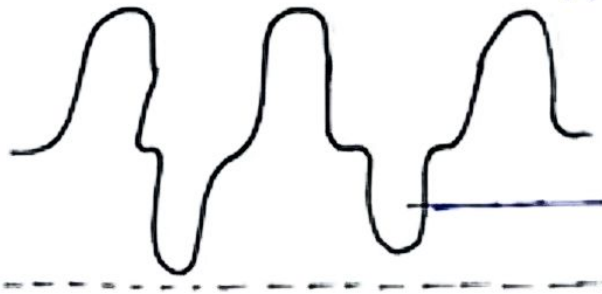
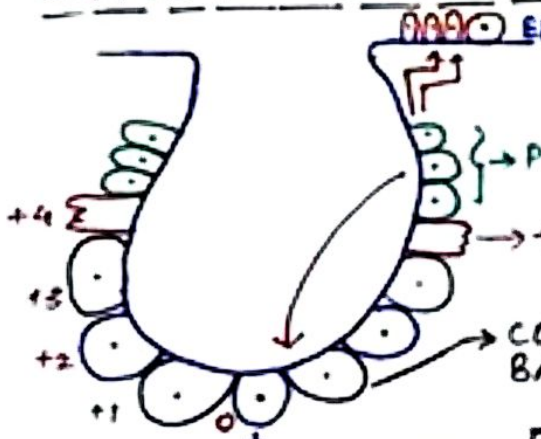
ANATOMICAL LAYERS IN GIT :-



IN SMALL INTESTINE :-



"CRYPTS OF LIBERKUHN" :-



GIT SMOOTH MUSCLE AS "SYNCITIUM"

TYPES OF SMOOTH MUSCLE

MULTIUNIT S.M.

→ DISCRETE, SEPERATE FIBRES

→ EACH FIBRE IS INNERVATED BY SINGLE N. ENDING

→ E-10 FIBRE OPERATES INDEPENDENTLY OF OTHERS.

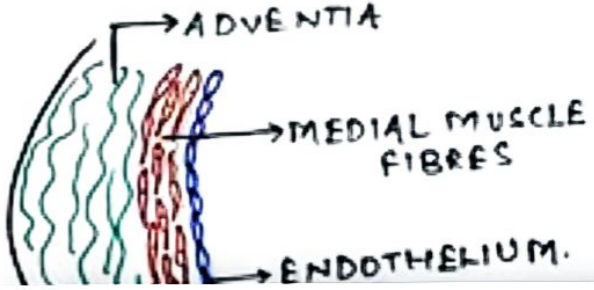
→ EG:- SKELETAL MUSCLE

UNITARY S.M

→ ALSO K/A 'SYNCITIUM' SMOOTH MUSC OR 'VISCERA' SMOOTH MUSCLE

→ MASS OF 100-1000 FIBRES CONTRACT TOGETHER AS SINGLE UNIT.

→ EG:- VESSELS, GIT SMOOTH MUSCLE



MOTILITY OF GIT :-

1. ELECTRICAL MOTILITY → IN FORM OF BASAL ELECTRICAL RHYTHM (BER)

2. MECHANICAL MOTILITY
   - FED STATE
     - PERISTALSIS {IN L.INTESTINE, MASS MOVEMENT}
     - SEGMENTATION {DOMINANT MOTILITY IN FED STATE}
   - FASTING STATE → MMC {MIGRATORY MOTOR COMPLEX}

ELECTRICAL MOTILITY OF GIT [SLOW WAVE & SPIKE POTENTIAL]

- RESTING STATE OF GIT

RMP OF SMOOTH MUSCLE ⇒ "SLOW WAVE"

⇒ RMP NOT STABLE {ACTS AS SLOW WAVE B/W -65mV to -45mV}

⇒ SLOW WAVE GENERATED D/T :-

PACEMAKER CELLS OF GIT
(INTERSTITIAL CELL OF CAJAL)

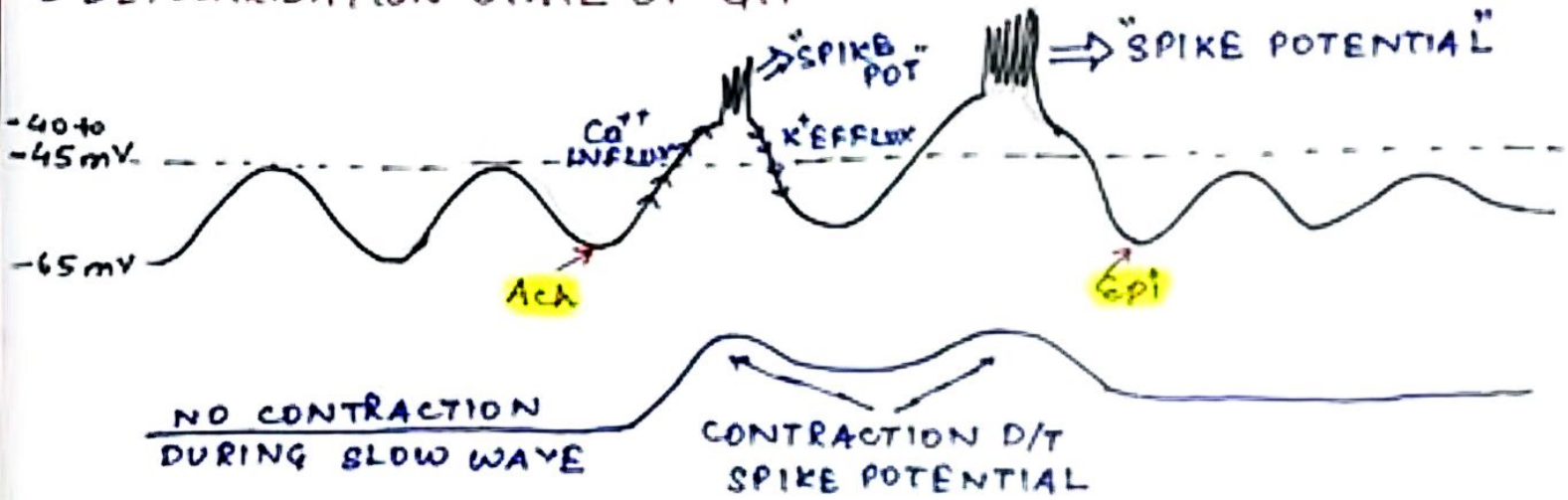
→ WITHIN SMOOTH MUS
→ START APPEARING FROM PROXIMAL BODY OF STOMACH
⇓ TO
ANAL CANAL

⇒ SLOW WAVES CANNOT CAUSE CONTRACTION.

⇒ RATE :-

DUODENUM → 12/min
JERJENUM → 11-12/min
ILEUM → 8/min
COLON → 6/min
STOMACH → 2-4/min
CAECUM → 2 min

● DEPOLARISATION STATE OF GIT



⇒ ARE TRUE A.P.

⇒ OCCURS WHEN RMP CROSSES THRESHOLD OF -40 mV.

⇒ HIGHER THE SLOW WAVE POTENTIAL RISES

⇓

GREATER IS THE FREQ. OF SPIKE POTENTIAL (1-10 SPIKES/SEC)

* FACTORS FOR DEPOL. AND HYPERPOL.

WHEN POTENTIAL BECOMES LESS NEGATIVE

⇓

K/A DEPOLARISATION OF MEMB.

⇓

MUSCLE FIBRE BECOMES MORE EXCITABLE.

- FACTORS THAT DEPOLARIZE MEMB

(i) STRETCHING OF MUSCLE

(ii) STIMULATION OF PARASYM. N. RELEABING Ach

(iii) GI HORMONE

WHEN POTENTIAL BECOMES MORE NEGATIVE

⇓

K/A HYPERPOLARISATN OF MEM

⇓

MUSCLE FIBRE BECOMES LESS EXCITABLE

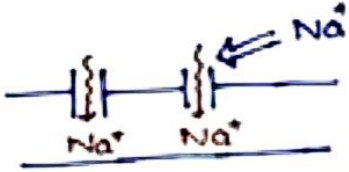
- FACTORS THAT HYPERPOLARI ZE MEMBRANE

(i) STIMULATION OF SYMP. N. RELEASING NOREPINEPH -RINE OR EPINEPHRINE

* ACTION POTENTIAL (NERVE FIBRE V/S GI SMOOTH MUSCLE)

IN NERVE FIBRE

A.P. GENERATION



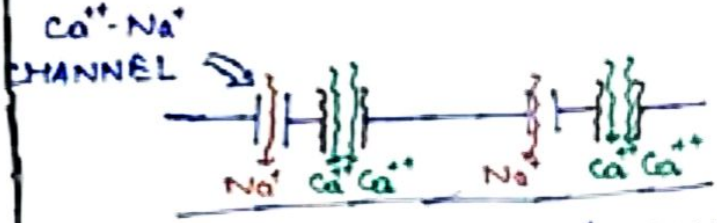
D/T RAPID ENTRY OF Na^+ LEADS TO DEPOL. (AP)

⇓

Na^+ VGC OPENS FASTER. SO DURATION OF AP IS LESS.

IN GI-SMOOTH MUSCLE

SPIKE A.P. GENERATION



D/T ENTRY OF Ca^{++} IONS (MAINLY) & SOME Na^+ IONS

⇓

Ca^{++}-Na^+ CHANNELS OPENS SLOWER. SO, DURATION OF AP. IS MORE

* ENTRY OF Ca^{++} IONS CAUSES CONTRACTION DURING SPIKE WAVES.

SUMMARY OF SLOW WAVES V/S SPIKE POTENTIAL

SLOW WAVES	SPIKE POTENTIAL
➡ RHYTHMICAL WAVES	➡ OCCURS WHEN RMP ≥ -40mV
➡ NOT TRUE A.P.	➡ ARE TRUE A.P.
➡ SLOW UNDULATING CHANGES IN RMP	➡ ARE A.P.
➡ FREQ. RANGES FROM 3-12/MIN.	➡ 1-10 SPIKES/SEC
➡ DOES NOT CAUSE CONTRACTION	➡ CAUSES CONTRACTION