DEFECATION REFLEXES

DEFECATION REFLEXES

1. Intrinsic defecation reflex

- Enteric nervous system – Myenteric plexus
- Weak reflex – fortified with Parasympathetic defecation reflex

2. Parasympathetic defecation reflex

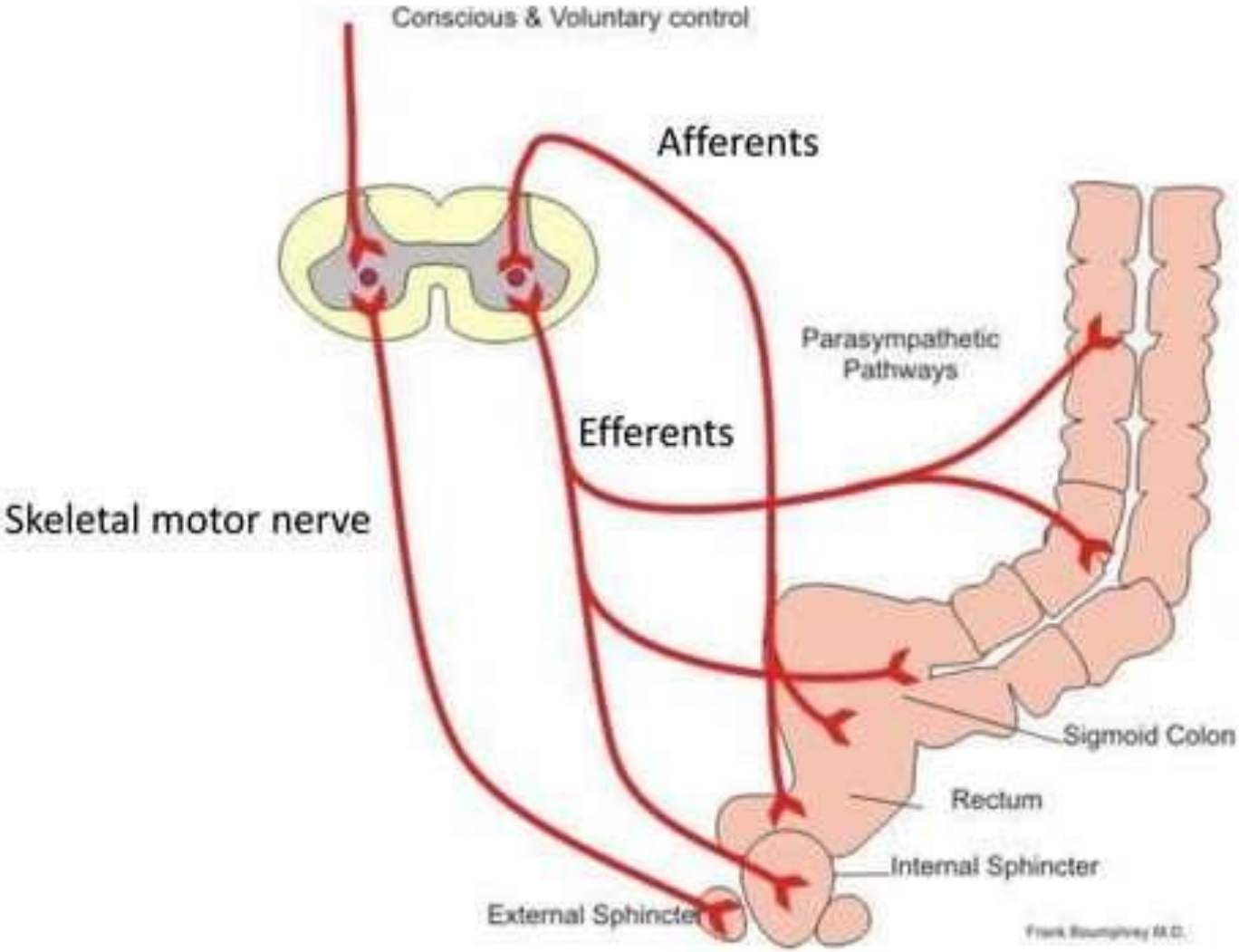
- Autonomic nervous system – Parasympathetic fibers of pelvic nerves

INTRINSIC DEFECATION REFLEX

ENS
MYENTERIC PLEXUS

STIMULUS	Feces enter the rectum – distention of rectal wall
RECEPTORS	Stretch receptors in the rectal wall
AFFERENTS	Sensory fibers terminating in MYENTERIC plexus
CENTER	MYENTERIC plexus
EFFERENTS	Motor signals to smooth muscles
EFFECTORS	Smooth muscle cells of Descending , Sigmoid colon & Rectum
RESPONSE	Peristaltic waves forcing feces towards rectum – Relaxation of internal anal sphincter

PARASYMPATHETIC DEFECATION REFLEX

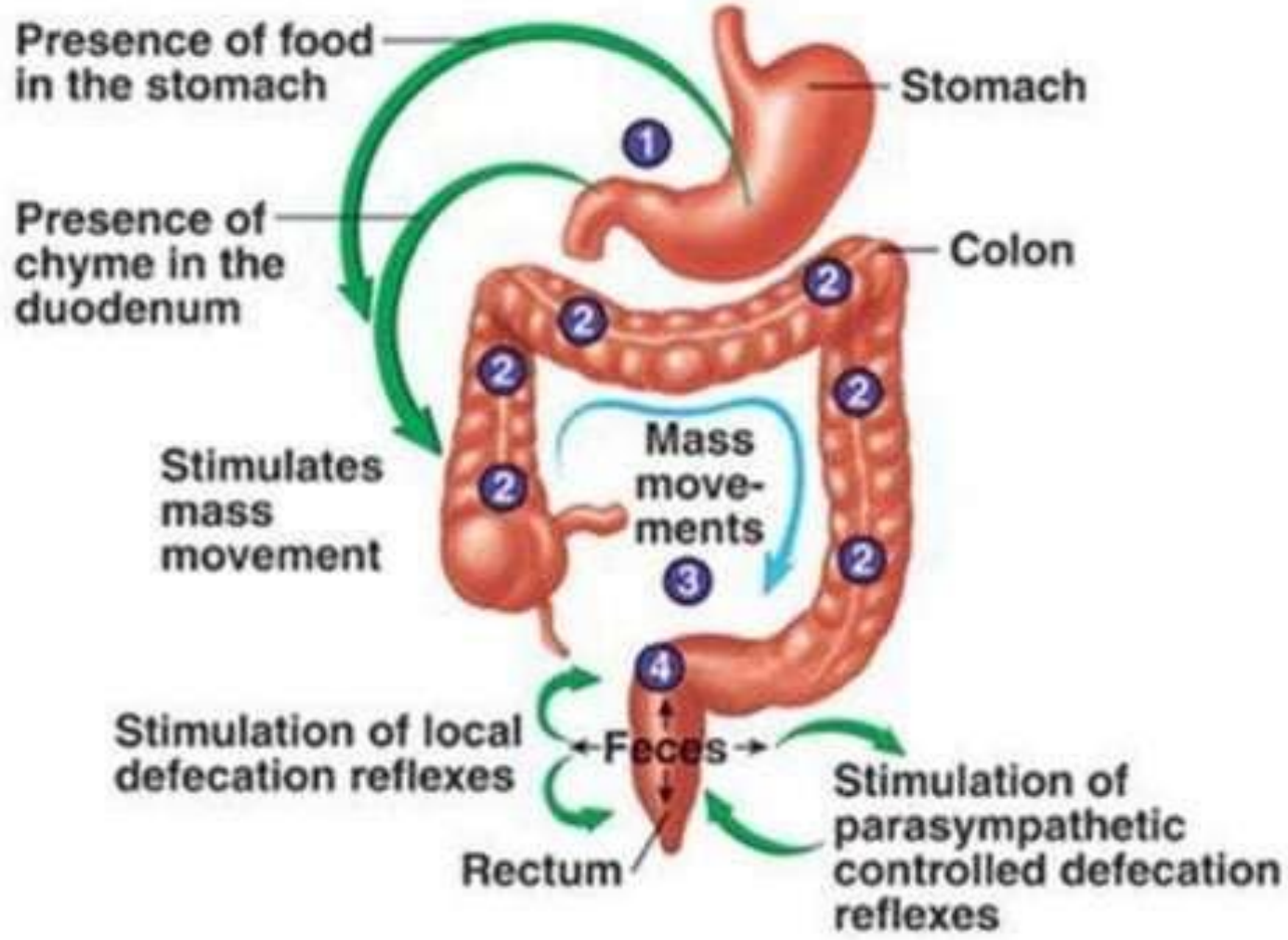


PARASYMPATHETIC DEFECATION REFLEX

PARASYMPATHETIC PELVIC NERVES

STIMULUS	Feces enter the rectum – distention of rectal wall
RECEPTORS	Stretch receptors in the rectal wall
AFFERENTS	Sensory fibers terminating in S2 – S4 cord level
CENTER	S2 – S4 spinal cord segments
EFFERENTS	Pelvic Parasympathetic nerves
EFFECTORS	Smooth muscle cells of Descending , Sigmoid colon & Rectum
RESPONSE	Peristaltic waves forcing feces towards rectum – Relaxation of internal anal sphincter

DEFECATION – INTEGRATED REFLEXES



DEFECATION

1. Combination of intrinsic & Parasympathetic defecation reflexes
2. At convenience – Valsalva maneuver
   - Closure of glottis
   - Deep inspiration
   - Abdominal contraction
3. Inhibition of external anal sphincter via PUDENDAL NERVE (voluntary control)

RECAP

1. INTRINSIC (MYENTERIC) DEFECATION REFLEX

- Stimulus – Distention of rectum
- Receptors – Rectal wall stretch receptors
- Afferents – Sensory fibers
- Center – Myenteric plexus
- Efferents – Motor output to smooth muscle of the descending, sigmoid colon and rectum
- Response – Weak peristaltic wave that forces feces towards anus and relaxes the internal anal sphincter

2. PARASYMPATHETIC DEFECATION REFLEX

- Stimulus – Distention of rectum
- Receptors – Rectal wall stretch receptors
- Afferents – Sensory fibers terminating in S2 – S4
- Center – Spinal cord level S2 – S4
- Efferents – Motor output to smooth muscle of the descending, sigmoid colon and rectum
- Response – Strong peristaltic wave that forces feces towards anus and relaxes the internal anal sphincter

3. VOLUNTARY INHIBITION OF EXTERNAL ANAL SPHINCTER

APPLIED PHYSIOLOGY

1. THE RECTUM REMAINS DEVOID OF FECES MOST OF THE TIME ? PHYSIOLOGICAL BASIS

- At the juncture of the sigmoid colon and rectum
  - A weak physiological sphincter exists.
  - There exists a sharp angulation at this juncture

2. HOW IS CONINUAL DRIBBLE OF FECAL MATTER FROM THE ANUS, PREVENTED?

- Internal anal sphincter is a several cm long thickness of smooth muscle lining the anus
- External anal sphincter is under voluntary control

APPLIED PHYSIOLOGY

3. THE RECTUM OF SMALL CHILDREN AND PATIENTS WITH SPINAL CORD TRANSECTION EMPTIES AUTOMATICALLY ?
PHYSIOLOGICAL / PATHOPHYSIOLOGICAL BASIS?

- Inhibitory inputs from higher control centers to the spinal cord segments S2 – S4 are not fully developed in small children, whereas they are interrupted in case of spinal cord transection above this level, as result of which, the rectum in these cases empties automatically purely on initiation of intrinsic and parasympathetic defecation reflexes.