

PELVIS

PELVIC GIRDLE

BONES

- Inner aspect only (outer aspect in lower limb)

Pelvic Inlet	Pelvic Outlet
Sacrum (promontory & Ala) R & L linea terminalis ¹	Pubic arch Ischial tuberosity Inf margin of sacrotuberous ligament ² Tip of coccyx

¹ Arcuate line, pectin pubis, pubic crest
² btwn coccyx & ischial tuberosity

Weakest Points

- Pubic rami
- Acetabular & surrounds
- Sacroiliac joint
- Ala of ileum

Greater Pelvis	Lesser pelvis
<ul style="list-style-type: none"> • Above pelvic inlet • Boundaries: Iliac Alae, S1 • Contain abdominal viscera 	<ul style="list-style-type: none"> • Between pelvic inlet and outlet • Houses true pelvic viscera

JOINTS AND LIGAMENTS

Sacroiliac Joint

Type	Anterior synovial/posterior syndesmosis
Movements	Limited mobility (slight gliding and rotation)
Articular Surfaces	Sacrum → ilium
Ligaments	<p>Sacrospinous ligament: posterior ilium & lateral sacrum & coccyx → ischial tuberosity</p> <ul style="list-style-type: none"> • Forms sciatic foramen <p>Sacrospinous ligament: lateral sacrum & coccyx → ischial spine</p> <ul style="list-style-type: none"> • Splits sciatic foramen into greater and lesser foramina <p>Sacroiliac Ligament: transfers axial weight to ilia then to femur¹ or ischial tuberosity²</p> <p>Subdivisions</p> <ul style="list-style-type: none"> • Anterior: thin, ant jt capsule only • Interosseous: main weight bearer³ • Posterior: cont of Interosseous³ <p>Iliolumbar ligament sits superior to jt as an accessory support</p>

¹ Standing | ²Sitting

³Interosseous/posterior fibres run obliquely upwards/outwards ∴ ↓ force → ilia squashing sacrum

Pubic Symphysis

- **Superior pubic ligament:** sup pubic bodies as far as pubic tubercle
- **Inferior pubic ligament:** inferior
- Rectus abdominus & ext oblique tendons reinforce jt

Lumbosacral Jt

- L5/S1 anteriorly and at facet joints bilaterally
- Iliolumbar ligaments reinforce stability

Walls & Floor

Sacrococcygeal Jt

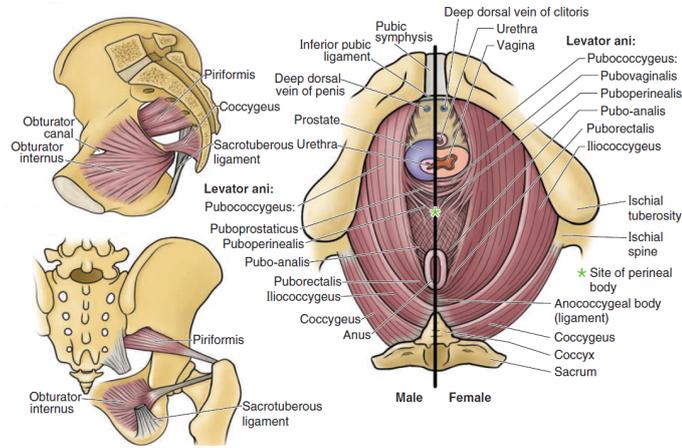
- Secondary cartilaginous joint
- Sacrococcygeal ligaments reinforce

Wall	Content
Ant/Inf	Pubic Bone (body & rami) Pubic symphysis
Lateral	Hip bones Obturator internus + membrane + fascia
Posterior (and roof)	Sacrum/Coccyx Piriformis/Sacral plexus deep to piriformis
Floor	Pelvic diaphragm (coccygeus, levator ani, fascias)

PELVIC CAVITY

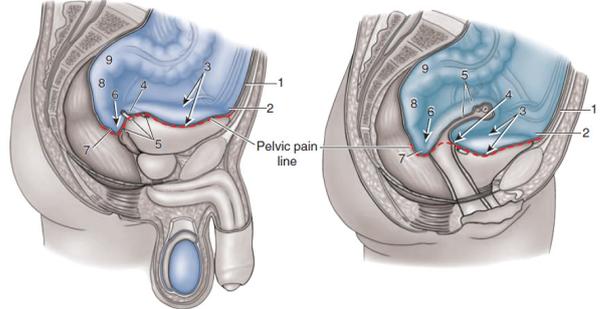
Muscles of Pelvic Floor

Obturator Internus	Ilium/Ischium (pelvic surf) Obturator membrane	N to obt int. (L5-S2)	Lateral rotation Hold head of femur
Piriformis	S2-4 (pelvic surf) > sciatic notch (sup bord) Sacrotuberous ligament	> Trochanter Ant Rami S1,2	Lateral rotation Abduction Hold head femur
Coccygeus	Ischial spine	Inf end of sacrum/coccyx	S4,5 Pelvic Diaphragm Flex coccyx
Levator Ani			
Puborectalis	Body of pubis	Around anus and back to contralateral pubis	N to levator ani (S4) Inf anal Coccygeal plexus
Pubococcygeus	Body of pubis (post aspect) Ant tendinous arch	Coccyx and contralateral muscle to form anococcygeal body	Pelvic diaphragm Faecal continence
Iliococcygeus	Post Tendinous arch of Obturator fascia	Anococcygeal body	



PERITONEAL FOLDS

Male	Female
(1) Descends on ant abdominal wall loosely top allow bladder to expand (1)	
(2) Reflects onto bladder as supravesicular fossa (2)	
(3) Dips lateral to bladder then ascends posterior pelvic wall creating Paravesicular fossa (3)	Reflects onto uterus creating vesicouterine pouch (4)
(5) Laterally folds over gonadal ducts	Reflects over uterus/Thickening lat as broad ligament (5)
(6) Descends post to bladder onto rectum creating rectovesicular pouch	Descends post to uterus onto rectum creating (6) rectouterine pouch (of Douglas)
(7) Rectovesicular/Rectouterine pouch extends laterally to form perirectal fossa (7)	
(8) Ascends on rectum: subperitoneal → retroperitoneal → intraperitoneal (8)	
(9) Engulfs sigmoid (9)	



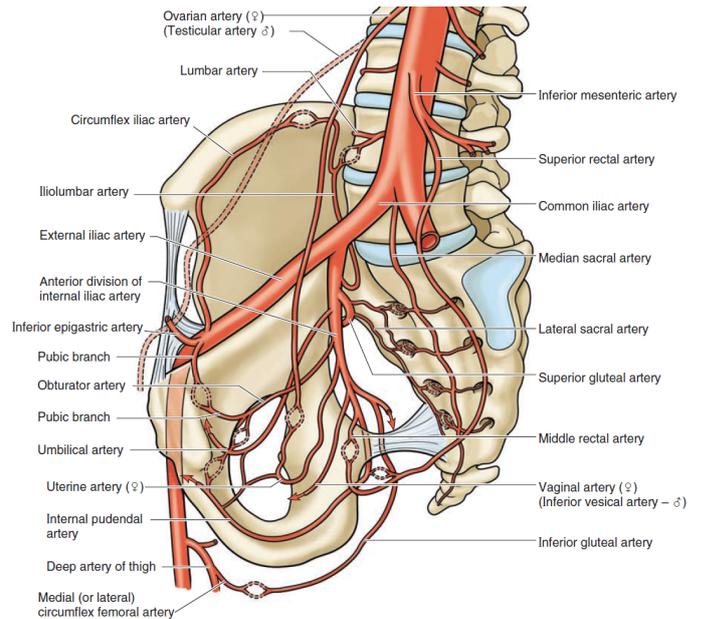
NEUROVASCULAR STRUCTURES

- Lateral → medial = nerves, vein, arteries

Male	Female
Internal Iliac x2	Internal Iliac x2
Median Sacral	Median Sacral
Superior rectal	Superior rectal
	Ovarian x2

Pelvic Arteries

Artery	Origin	Distribution
Superior rectal	Inf mesenteric	Sup ½ rectum
Median Sacral	Bifurcation of Ao	Lower L/S/C-spine
Internal Iliac		
L Umbilical	Mostly remnant and forms med umbilical fold	Sup urinary
L Obturator	Btwn Obturator nerve & vein Ascends onto pelvic surface to anastomose with self and Ext iliac	Pelvic muscles Nutrient to ilium Head of femur Medial thigh muscles
L Inferior Vesicular	Vaginal equivalent	Inf bladder/Ureter (pelvic)
L Uterine	Passes sup to ureter in pelvic viscera	Uterus/ass lig/Uterine tube Ovaries/Sup Vagina
L Vaginal	Surface	Vagina/ Bladder fundus Adj rectum
L Middle Rectal	Multiple anastomotic possibilities	Inf rectum
L Int pudendal artery	Exits through >, re-enters through < Obt foramen	Seminal glands/Prostate
L Inferior gluteal	exits via > sciatic foramen	Perineum (chief) Pelvic diaphragm
L Post division int iliac		
L Iliolumbar		Pelvic wall & gluteal region Psoas major, iliacus, quad lumborum, cauda equine
Lateral sacral		Piriformis, erector spinae
L Superior gluteal		Piriformis, gluteal muscles (all) Tensor fascia



PELVIS

NODES

- External iliac/Internal iliac/Sacral/Common iliac nodes
- All nodes interconnect ∴ lymph flow not specific (nor is cancer mets)

Pelvic Nerves

- Sacral & coccygeal plexus** (sit on piriformis and coccygeus muscles)
- Lumbosacral trunk** (L4&5) → **sacral plexus**

Sacral plexus

Sciatic Nerve

- L4-S3 roots converging on piriformis
- Through sciatic foramen and goes posterior
- Innervates post thigh, leg, foot

Pudendal nerve

- Exits via > sciatic foramen
- Re-enters via < sciatic foramen → perineum

Superior gluteal

- Exits through > sciatic foramen btwn piri & coccygeus

Inferior gluteal

- Exits through > sciatic foramen inf to piri

Coccygeal Plexus

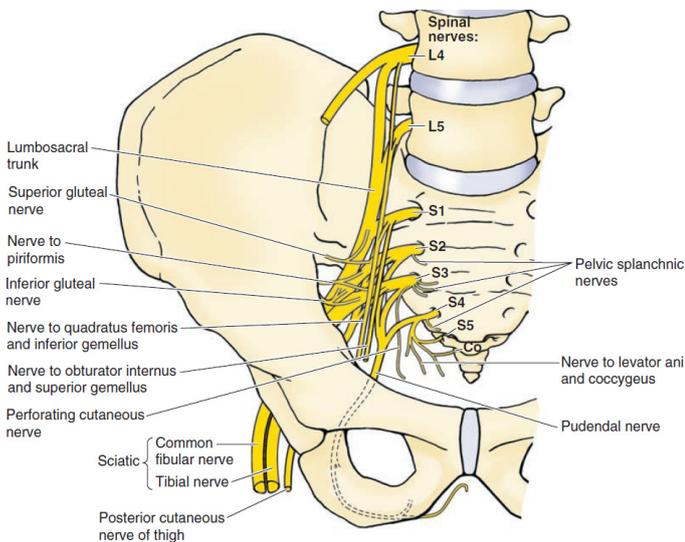
- S4 & 5 supplies coccygeus, levator ani, SC joint

Pelvic Autonomic Nerves

- Sacral symph trunk (sympth to lower limbs)
- Periarterial plexus (super rectal, ovarian, int iliac) dist: vasomotor on arteries only
- Hypogastric symph & visceral afferent
- Pelvic splanchnic symph/para/visceral | para to pelvic viscera, desc and sigmoid colon S2-4

Visceral afferents

- Pelvic pain line is level with end of peritoneum



PELVIC VISCERA

Ureters

- Inf end surrounded by **vesical venous plexus**
- Male: **ductus deferens crosses anterior** (otherwise adherent to peritoneum)
- Female: descends medial to uterine a. which then **crosses ureter at ischial spine**
- Arterial supply variable from common/internal iliac, ovarian arteries (most constant is **uterine artery or inf vesicular artery**)
- Innervation: retrograde to T11-L1 ie above pelvic pain line

Bladder

- Held to ant wall via pubovesicular lig and tendinous arch
- Wall contains **detrusor muscles** (and internal urethral sphincter in males)
- Trigon bladder**: ureteric orifices + internal urethral orifice

Artery	Origin	Distribution
Sup vesicular	Internal iliac	Ant/sup aspect
Inf vesicular (male)	Internal iliac	Fundus, neck
Vaginal (female)		+ post

Small contributions from **Obturator and inferior gluteal a.**

Venous

Male

- Vesicular venous plexus (encompasses fundus)
- inf vesicular vein
- int iliac or/
- sacral vein
- internal vertebral venous plexus

- Also receives from prostate venous plexus (which also receives from deep dorsal penis)

Female

- Vesicular venous plexus
- vaginal or uterovaginal plexus

Innervation

- Sympth: **hypogastric plexus** → **vesicular plexus**
- Parasympth: pelvic splanchnic nerves and inf hypogastric plexus → detrusor
- Afferent: follows parasympathetic origins except superior surface (superior to pelvic pain line)

URETHRA

Male

- Arterial by prostatic branch of inf vesicular & middle rectal
- Innervated by prostatic plexus

Female

- Arterial by vaginal a. and internal pudendal
- Innervated by vesicular & pudendal plexus

RECTUM

- Starts as S3 → tip of coccyx (Anorectal flexure – formed by Puborectalis)
- Sacral flexure follows sacrum
- Lateral flexures (right side = middle, left = sup/inf)
- Peritoneum covers sup 1/3 ant/lat surface and ant middle 1/3

Rectal Artery	Distribution
Superior	Cont of IMA, dist: proximal
Middle	Internal iliac, dist: middle, inf
Inferior	Internal pudendal, dist: anorectal jcn & anal canal

- Anastomoses occur btwn sup/inf but not middle

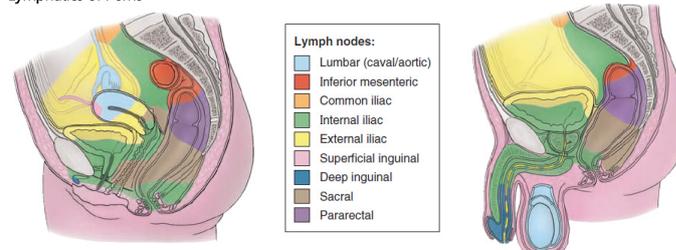
Venous

- Sup/mid/inf rectal
- Portal (sup)-systemic (mid/inf) anastomosis
- Rectal venous plexus
 - Internal: deep to mucosa of AR jcn
 - External: subcut

Innervation

- Sympth: from lumbar via lumbar splanchnic, hypogastric/pelvic plexus, peri-arterial plexus of IMA and Sup Rectal
- Para: S2-4 via pelvic splanchnic, L&R inf hypogastric plexus
- Afferent shares with para only

Lymphatics of Pelvis



PERINEUM

Pudendal canal

- Horizontal passage btwn obt internus & ant fascia
- Contents: internal pudendal artery, vein , nerve
 - Branches include inf rectal a.n. and terminates as perineal a.n./dorsal a.n. of penis/clitoris

Pudendal nerve

- From sacral plexus
- Branches as inf anal + perineal + dorsal nerve of penis/clitoris
- Perineal branches as superficial & deep
- Superficial → posteiorr scrotal