

Sure Success MAGIC

Maximum Advantage Guide for Integrated Course Study

Most Useful Book with Very High Success Rate in Recent Exams* !

NEET PG 2018: > 150 questions
JIPMER Nov 2017: > 100 questions
PGI Nov 2017: > 75 questions
AIIMS Nov 2017: > 50 questions

Readers' Reviews of previous editions

<p>Thank you for your wonderful Sure Success MAGIC. It helped me in revision during the critical phase of exam preparation (Dr Arun B Gowda, Rank 614, NEET PG 2017)</p>	<p>I had purchased this book 3 months before NEET PG exam and I must say, it is the best quick revision book that I have read. Many questions were direct one-liners from your book. Mnemonics also helped me huge (Dr. Siddhanth Shah, Rank 1110, NEET PG 2017)</p>	<p>Sure Success has helped me a lot in revising in last months of preparation. Your book really worked like a MAGIC. I will strongly recommend this book to my juniors (Dr. Rait Patel, Rank 318, AIPGE 2016)</p>	<p>Many more such awesome and inspirational reviews from PG aspirants are available on the Sure Success MAGIC Facebook group</p>
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About the Author
Dr B Ramgopal has been a top ranker in the AIPGEE, AIIMS, PGI, JIPMER, KCET and CMC exams. He believes in making the journey of PG entrance preparation 'uncomplicated' and 'stress free'. Sure Success MAGIC lives up to his motto of "Maximum Information in Minimum Time". He is actively involved in mentoring PG aspirants through his exclusive Sure Success MAGIC Facebook group which has more than 15,000 members.



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* (Number of questions that appeared in these exams from the topics in Sure Success MAGIC, 10th edition; Data based on recall and feedback by various PG aspirants)

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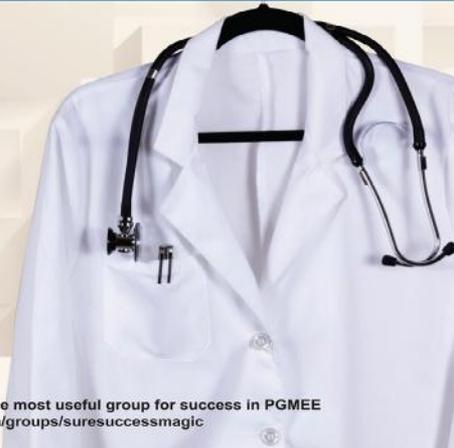
Maximum Advantage Guide for Integrated Course Study

The Ultimate 'All-in-One' guide for PG MEE
For NEET-PG, AIIMS, PGI, JIPMER, DNBCET and FMGE

B Ramgopal



Read
remember
recall



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Embryology

GROWTH FACTORS AND GENES IN EMBRYOGENESIS

Growth factors/ Genes	Functions
NODAL	<ul style="list-style-type: none"> Formation of <i>primitive streak</i> Formation of <i>mesoderm</i>
Lefty	<ul style="list-style-type: none"> Determination of body <i>asymmetry</i>
Sonic Hedgehog (SHH)	<ul style="list-style-type: none"> <i>Neural tube</i> formation <i>Somite</i> differentiation Organizes limbs in <i>anteroposterior axis</i> due to expression of SHH from the <i>zone of polarizing activity</i> (through <i>vitamin A</i> production) SHH mutations can lead to <i>holoprosencephaly</i>
WNT-7	<ul style="list-style-type: none"> Development of <i>midbrain</i> Organizes limbs in <i>dorso-ventral axis</i>
Homeobox (HOX)	<ul style="list-style-type: none"> Organizes structures in <i>cranio-caudal</i> direction Mis-expression of <i>HOXB8</i> gene <i>alters</i> the position of the forelimbs during development
Bone morphogenic factors (BMP 1-9)	<ul style="list-style-type: none"> Bone formation Cell division and cell migration <i>Apoptosis</i>
PAX	<ul style="list-style-type: none"> <i>PAX6-lens vesicle</i> differentiation <i>PAX2 over-expression</i> causes failure of eyes to separate resulting in <i>cyclotors</i> (single median eye)!
Fibroblast growth factors (FGF)	<ul style="list-style-type: none"> <i>Mesoderm</i> differentiation <i>Angiogenesis</i> Growth of axon Limb <i>lengthening</i> Development of brain Outgrowth of <i>genital tubercle</i>
Transforming Growth factor (TGF B1-B5)	<ul style="list-style-type: none"> Formation of <i>extracellular matrix</i> Epithelial branching Myoblast proliferation
Mullerian Inhibiting Factor	<ul style="list-style-type: none"> Regression of <i>paramesonephric</i> duct
Insulin-like Growth Factors (IGF)	<ul style="list-style-type: none"> IGF-1: Bone growth IGF-2: Fetal growth

SPERMATOGENESIS

- This refers to formation of spermatozoa (sperm) from primordial germ cells (*spermatogonia*)—it occurs in *seminiferous tubules* of the testes.

Spermatogonia undergo *Mitosis* to form *Primary spermatocytes* (*Diploid, 46 chromosomes, 4N*)

↓
These undergo *Meiosis* to form *Secondary spermatocytes* (*Haploid, 23 chromosomes, 2N*)

↓
These undergo *meiosis* to form *spermatids*

- Mnemonic: 'Mighty PleaseD Meiting Sec(v)y Happy girl!'**
- 'N Number' has been explained below under 'Extra Edge'.
- In spermatogenesis *independent assortment* of paternal and maternal chromosomes occurs during *primary* to *secondary spermatocyte* stage.
- Time for *spermatogenesis* = 74 days.
- Spermatogenesis requires a *temperature lower than core temperature* (5°C lower); hence, *testes* are maintained at 32°C.
- The *number of spermatids* formed from a single *spermatogonium* is 512.
- Spermatids do NOT divide further BUT undergo morphologic changes to form mature spermatozoa = *spermiogenesis* (i.e. it is last step of spermatogenesis)—takes place in the *Sertoli cells* of testes.
- Pathway of sperms: Seminiferous tubules (*spermatogenesis* takes place here) → straight tubules (tubuli recti) → rete testis → efferent ductules → *epididymis* (here they *acquire motility*) → vas deferens → ejaculatory duct → prostatic urethra.
- Capacitation means the physicochemical changes that occur in the sperm to make it capable of fertilizing the ovum.
- It occurs in the *fluid media of the female genital tract* and takes about 7 hours.
- Only the capacitated sperms can penetrate the *zona pellucida*. Capacitated sperms move to *ampulla of Fallopian tube* where *fertilization* takes place.

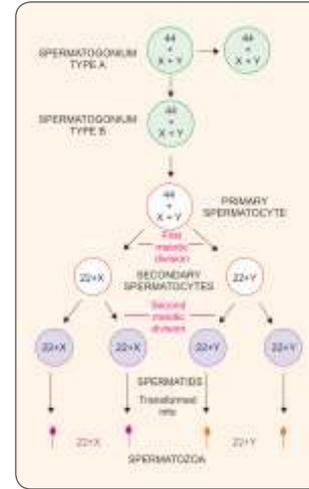


Fig. 1.1: Stages in spermatogenesis. Note the number of chromosomes at each stage

Spermatozoa (Sperm)

- Mature sperm is 55 to 65µm in length.
- Sperms Food = Fructose.
- Sperms move at about 3 mm/minute.
- Fertilin - a protein of ADAM family present on sperm head, helps in sperm penetration through zona pellucida.
- Sperm parts:
 - > Head (contains *acrosome* derived from *Golgi apparatus*)
 - > Neck (has *centrioles*)
 - > Tail (*flagellum*) has three parts: Middle piece derived from *Mitochondria*; Principal piece and End piece

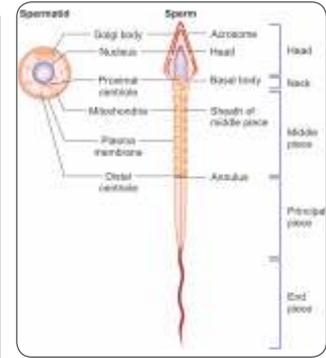


Fig. 1.2: Process of spermiogenesis in which different cell organelles of spermatid give rise to different parts of a sperm

OOGENESIS

- Oogenesis refers to development of a mature ovum from primitive germ cells (*oogonium*)—it occurs in the *ovaries*.

Oogonia undergo *mitosis* to form *primary oocytes* (*diploid, 46 XX*) →

↓
these primary oocytes enter a *prolonged prophase I* (*diploene/dictyotene* stage) and remains in this stage until puberty

↓
At *puberty just before ovulation*, the *first meiotic division is completed* and *secondary oocyte* (*haploid, 23 chromosomes*) and *1st polar body* are formed

↓
Sec. oocyte immediately *begins second meiotic division* but this division *stops at metaphase* and is *completed only if the mature ovum (ootid) is fertilized with the sperm*. At that time *2nd polar body (polocyte)* is extruded and *fertilized ovum* proceeds to form a new individual.

- **Spina bifida Occulta:** MC type of spina bifida; mild form, evidenced by tuft of hair; skin is intact, NO disability.
- **Spina bifida cystica:** Cystic swelling on back is seen. 3 types are:
 1. **Meningocele:** Meninges protrude through vertebral defect; a sac of fluid that protrudes through an opening in the back but spinal cord not involved
 2. **Myelomeningocele:** Second MC type of spina bifida and more severe form of spina bifida; spinal cord tissue forms a part of the sac.
 3. **Rachischisis:** Most severe; spine lies wide open and often a/w anencephaly; paralysis from the level of defect downward.

Detection and Prevention of NTDs

NTDs are detected by **elevated maternal serum AFP** and prenatal U/S; can be prevented by use of **folic acid** during pregnancy.

Brain Development Anomalies

Holo-prosencephaly	a/w mutation in <i>sonic hedgehog</i> gene: Decreased separation of hemispheres across midline: results in cyclopia: a/w Patau's syn. and severe fetal alcohol syndrome.
Porencephaly	Cyst or cavity in the cerebral hemisphere lined by white matter; can be detected by skull translumination in infancy.
Lissencephaly	= smooth brain, absence of sulci and gyri in the brain.
Schizencephaly	Splits or cleft in cerebral hemisphere lined by heterotopic grey matter



Fig. 1.7: Spina bifida occulta: Lumbar sacral hypertrichosis



Fig. 1.8: Occipital encephalocele: newborn infant with massive occipital encephalocele. It is a neural tube defect that involves extrusion of cranial contents through a bony defect



Fig. 1.9: Myelomeningocele: symptoms vary depending on the level of the lesion: Thoracic myelomeningocele



Fig. 1.10: Anencephaly: The lack of normal development of the brain, skull and scalp. Diagnosed prenatally by maternal AFP screening and foetal ultrasonography

TONGUE DEVELOPMENT

Anterior 2/3	Posterior 1/3	Posteriormost part
From lingual swellings from 1st branchial arch	From cranial end of hypobranchial eminence (cupola of Hb) of 3rd branchial arch	From 4th branchial arch
Taste by Chorda Tympani (branch of CN VII). General sensation by Lingual N. (branch of CN V3-mandibular N)	Both taste/general sensation by CN IX	Both taste/general sensation by CN X. (Internal laryngeal N-a branch of superior laryngeal N-a branch of vagus)

Extra Edge

- Overall for tongue, Taste: CN VII, IX, X (*solitary nucleus*)
- Overall for tongue, General sensation, pain: CN V3, IX, X
- Overall for tongue, Motor: CN XII
- Tongue muscles are derived from *occipital myotomes*.

MORE IMPORTANT EMBRYOLOGY TOPICS

Cleft Lip and Palate

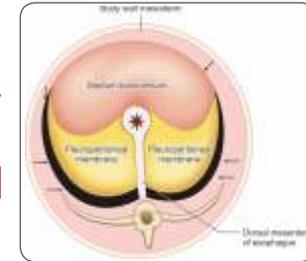


Fig. 1.11: Developmental sources of diaphragm (arrows indicate contribution of body wall mesoderm). The muscle of the diaphragm develops from cervical myotomes; hence the nerve supply by phrenic nerve

Embryology of Diaphragm

- Diaphragm is formed by the fusion of
 - Dorsal esophageal mesentery.

Thyroid Gland Development

- Develops from **thyroglossal diverticulum**, which pushes out from the tongue at the foramen caecum.
- MC site of **ectopic thyroid** = tongue.

	Omphalocele Vs. Gastroschisis	
Location	<i>Omphalocele</i> Within umbilical cord	<i>Gastroschisis</i> Peri-umbilical (usually to right of cord)
Covering	Membranous sac	None (exposed viscera)
A/w prematurity	30%	60%
Surgical intervention	Not urgent	Urgent
Prognostic factors	Associated anomalies	Condition of the bowel
Associated conditions	More common <ul style="list-style-type: none"> • Congenital Heart Disease • Beckwith-Wiedemann syndrome • Trisomy 13, 18, 21 • Pentalogy of Cantrell • Exstrophy of bladder • Malrotation of GUT 	Rare <ul style="list-style-type: none"> • Intestinal atresia • Malrotation of GUT

Hot Images !



Fig. 33.1: Case of Hansen's disease—BT with patch on ear and enlarged greater auricular nerve (Courtesy: Dr Akshi)



Fig. 33.2: Axial section of computed tomography scan showing right ischemic stroke (arrow).



Fig. 33.3: Coronal section of computed tomography scan showing hyperdense area within sulcus—subarachnoid hemorrhage (arrow)

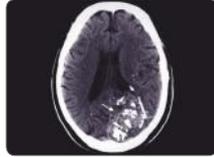


Fig. 33.4: Axial section of computed tomography scan showing left occipital arteriovenous malformation (AVM) (arrow)



Fig. 33.5: Axial section of computed tomography scan showing brain abscesses involving the left parietal region (arrow)



Fig. 33.6: Intravenous pyelography (IVP) of kidneys, ureters and urinary bladder showing hydronephrosis on right side



Fig. 33.41: Glomus tumour in finger tip—subungual region.



Fig. 33.45: Glomus tumour in finger tip—subungual region.



Fig. 33.42: Glomus tumour in finger tip—subungual region.



Fig. 33.46: Glomus tumour in finger tip—subungual region.

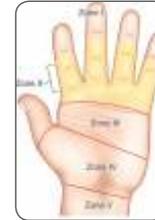


Fig. 33.43: Glomus tumour in finger tip—subungual region.



Fig. 33.47: Glomus tumour in finger tip—subungual region.



Fig. 33.44: Glomus tumour in finger tip—subungual region.



Fig. 33.48: FNAC vacuum creator with loaded syringe [FNAC gun: Cameco syringe (Sweden) holder]. (Courtesy: Dr Krishna Upadhy, MD, Nandikoor Laboratory, Mangaluru)

Most Recent Exams Roundup

Author's Note

- This section contains one-liners of various latest 2017 entrance exams. Also, one liners from previous years' state entrance exams have been consolidated and retained since these are high yield for upcoming exams also. Any further one-liners and updates will be on the Sure Success MAGIC Facebook group - you can join at www.facebook.com/groups/suresuccessmagic.

2018 NEET PG POINTS

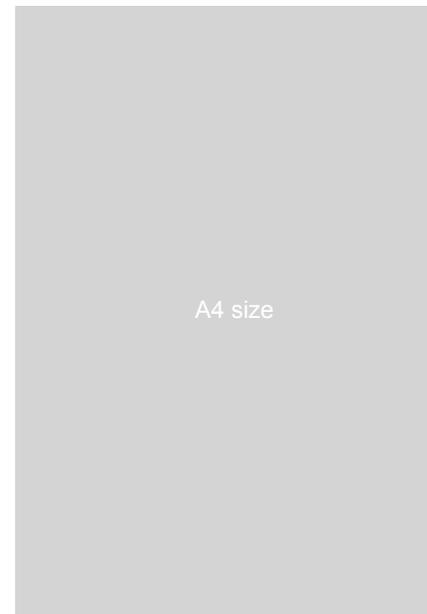
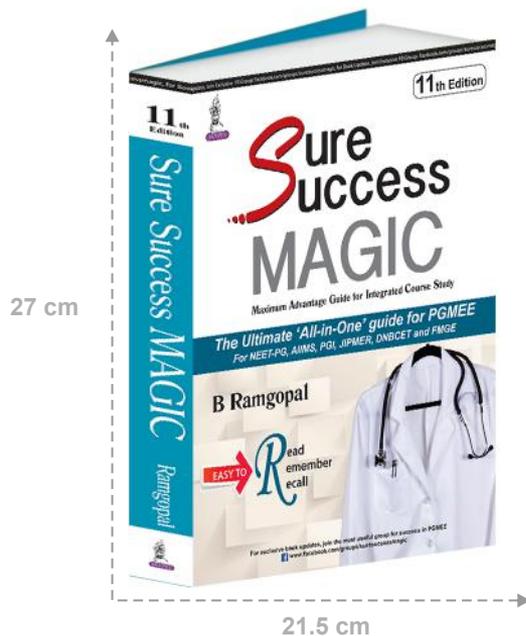
- Hypothyroidism** is a/w **AV block**.
- Alternative for epinephrine** used in ACLS earlier was **vasopressin**.
- VMA** is elevated in pheochromocytoma.
- C-wave** in JVP is due to **tricuspid bulging**.
- Drug used for prophylaxis of meningococcal meningitis is **ceftriaxone > ifampicin**.
- ICD** (Intracardiac defibrillator) is useful in Brugada syndrome; after acute MI in coronary artery disease; in arrhythmogenic RV dysplasia.
- Pseudo-Pneumonia** is seen in **hypokalemia**.
- Diagnostic criteria for ARDS (Pg 814).
- Wallenberg syndrome** involves **PICA**.
- DMT-1** (Divalent Metal Transporter-1) facilitates entry of iron into the cell.
- Flipping effect** is LDH1-LDH2 suggestive of acute MI.
- ABPA** (Pg 275): Also remember that aspergillus can colonise old cavity lesions in the lung.
- NFI** criteria (Pg 787).
- Neurogenic myocardial stunning is also known as Takotsubo cardiomyopathy.
- Gold criteria** for COPD (Pg 807).
- Cryoglobulinemia** is a/w Hepatitis C.
- Heller's** cardiomyotomy done for achalasia cardia.
- In **acute pancreatitis**, the **preferred** solution for rehydration/resuscitation is **isotonic crystalloid** (Ringer Lactate).
- Increased level of 5HAA is seen in Carcinoid tumors.
- MC cause of **chronic pancreatitis** is **alcohol**.
- Feline esophagus** is a/w **Gastro-esophageal Reflux** disease (as per most gastroenterology textbooks, although H/19th says its eosinophilic esophagitis).
- In **fasciotomy**, the layers that are opened are skin, subcutaneous tissue, superficial fascia and deep fascia.
- Chronic laxative abuse** can result in the formation of ammonium urate stones.

- Ideal material used for **femoropopliteal shunt** is **reverse saphenous vein**.
- False elevation of ABPI** is seen in **calcified** vessel wall.
- Abdominal aortic aneurysm** is operated when it exceeds **5.5 cm**.
- Catgut** is absorbed by phagocytosis and enzymatic degradation.
- Masstricht classification** of DCD (Donation after Circulatory Death) Donors - Pg 926.
- Rockall and Blatchford scores** are used for risk stratification in upper GI bleeding.
- Tennis racquet incision** for incising single lactiferous duct is used in **microdochectomy**.
- RET** proto-oncogene is a/w **medullary Ca thyroid**.
- Trilene** is degraded by **enzymatic degradation**.
- Struvite stone is caused by **magnesium**.
- The abdominal mass in pyloric stenosis in a neonate can be best palpated in epigastric area.
- Minimum interval between 2 live vaccines is **4 weeks**.
- Fontanelle last to close is **anterior fontanelle**.
- Dactylitis** is a/w sickle cell disease.
- Most serious and most vision threatening** neonatal conjunctivitis that can lead to blindness is **gonococcal conjunctivitis**.
- Acute PID** is a contraindication for D and C.
- MC twins after assisted reproduction is **dizygotic twins**.
- Drug contraindicated in PHH is **atenolol**.
- Fimbriectomy is done in the **Kroner's** method.
- Hyperprolactinemia is a/w prolactin levels above **200 ng**.
- Most common birth related nerve palsy is **facial nerve palsy**.
- Peripartum cardiomyopathy occurs between last month of pregnancy up to **6 months** postpartum.
- Establishment of fetoplacental circulation is seen at **20-22 days**.
- Anteversio** of uterus is maintained by **round ligament**.
- Tarus tubaris** the tubal elevation in lateral wall of nasopharynx.

- High tracheostomy** is done in laryngeal carcinoma.
- During acute tonsillitis, referred pain in the ear is due to **glossopharyngeal nerve**.
- Site of electrode placement in auditory brainstem implant is recess of fourth ventricle.
- Nasopharyngeal **chordoma** arises from **notochord remnants**.
- Chronic recurrent otomastoiditis is seen in **SAPHO syndrome**.
- In glaucoma, last field of vision to be lost is **temporal island of vision**.
- Roth spots** are seen in leukemia; anemia; infective endocarditis.
- Rhino-orbital mucormycosis** is common in diabetic ketoacidosis.
- Cutis marmorata** is due to exposure to cold.
- Ulnar nerve** is used for monitoring **neuromuscular blockade**.
- Raindrop skull pigmentation** is seen in **multiple myeloma**.
- Dream theory** of Sigmund Freud includes symbolism, condensation and displacement.
- Silbson's fascia** is also called **suprapleural membrane**.
- Insulin like growth factor is secreted by **Liver**.
- Among atypical antipsychotics, **risperidone** has maximum tendency to cause **hyperprolactinemia**.
- Severe rheumatic chorea** is treated with **haloperidol**.
- Anti-CD25 (IL-2 receptor)** antibody used in prophylaxis of acute organ rejection in adult patients is **basiliximab**.
- Atenolol** is NOT used in the management of PHH.
- Extramammary Paget's disease is seen in **breast**.
- Mullerian inhibiting factor is a/w **chromosome Y**.
- Order of putrefaction: Larynx and trachea (earliest) > stomach, intestine and spleen > brain > heart > kidneys > prostate/ovary > skin, muscle, tendon > bone.
- Entricribatine** has both anti-hepatitis and anti-retroviral activity.
- Earliest lesion in Crohn's disease is **aphthous ulcer**.
- Fatal lower level of BMI for **males** is **13** and for **females** is **11**.
- BRAF** is a/w Papillary thyroid Ca; Hairy cell leukemia; Langerhans cell histiocytosis.
- Newly erupted teeth is covered by **Nasmyth's membrane**.

2017 CENTRAL EXAMS NEW POINTS

- Structure between right ventricular inlet and outlet is **supraventricular crest**.
- Vidian nerve** is related to the **floor of the sphenoid sinus**.
- Retropharyngeal abscess** lies between buccopharyngeal fascia and alar fascia.
- Nerve passing between **posterior cerebellar and superior cerebellar artery** is **oculomotor nerve**.
- Vein of Labbe** drains into the **transverse sinus**.
- Maximum concentrating ability of kidney in preterm infant is **500 mOsm**.
- Mass cell degeneration** is suggested by rise in **serum tryptase** levels.
- Maximum thermic energy** is seen in **protein metabolism**.
- Phenylbutyrate** is used in **urea cycle disorders** since it increases renal excretion of ammonia.
- DNA gyrase** is **topoisomerase 2**.
- MC mutation of hyper-cholesterolemia—**LDL receptor mutations**.
- Protein involved in pathology of **Lewy body dementia—Alpha synuclein**.
- Gene mutations in **AML** a/w favorable prognosis are **CEBPA and NPM1**.
- ABCD1 mutation** is seen in **X-linked adrenoleukodystrophy**.
- DAX1 gene mutation** is a/w **congenital adrenal hyperplasia**.
- Function of **acetone free methyl alcohol** in staining is that it **fixes cells to the slide**.
- Erythropoietin** is secreted from **renal peritubular interstitial cells**.
- Tumor marker for lung adenocarcinoma is **TTF1 and cytokeratin 7**.
- Empirical drug for meningococcal meningitis** is **ceftriaxone**.
- All ACE inhibitors are **prodrugs** except **captopril and lisinopril**.
- Oltipant** is a **CGRP** (Calcitonin Gene Related Peptide) agonist in clinical trials for **migraine**.
- Septic shock is NOT staphylococcal toxin mediated.
- Rhinosporidium seeveri is an **acquired protozoan**.
- Mycobacterium tuberculosis** escapes immunity by **inhibition of phagolysosome fusion**.
- Pseudomonas** is bacteria that can **contaminate disinfectant solutions**.
- Hepatitis C** high efficacy testing in blood bank is by **NS3**.
- Haglund deformity** is associated with **ankle**.
- Suprachoroidal hemorrhage** is associated with **high IOP** (NOT hypotony).
- Landmark of **geniculate ganglion** in facial nerve decompression is **processus cochleariformis**.
- In a study, if patient serves as both case and control, it is called **cross over study**.
- APML differentiation syndrome** is treated with **deamethasone**.
- Scorpion and jelly fish** toxins are **neuro-excitatory**.
- Eye is NOT involved in **familial mediterranean fever**.
- Pollutant released by combustion of fossil fuels that exacerbates asthma is **sulphur dioxide**.
- Brockenborough effect** is seen in **HOCM**.
- Glycolastectomy is considered completely safe in stage Ia of choleladder carcinoma.
- MC location of congenital cyst in lung = **right bronchus**.
- Sevoflurane** is an inhalational anesthetic that can be used for **induction**.
- Intercalated discs of cardiac muscle contain all types of cellular junctions except **tight junctions** (zonula occludens).
- Trapezius** muscle is **triangular** in shape.
- Injury to pubococcygeus** can lead to rectocele, cystocele and urinary incontinence.



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