

Surgery

World of Revision

Marrow

© Marrow | sahoosatyajeet000@gmail.com

MARROW

Instructions

- Notes are to be used in conjunction with Marrow videos.

Please note:

- The information in this book has been printed based on the transcript of the Marrow videos. This book has to be used in conjunction with the Marrow videos and not as a standalone material.
- The information contained in this book is for educational purposes only. The content provided is not intended to substitute for professional medical advice, diagnosis or treatment.
- This book cannot be sold separately. It has been made available to only select eligible users who have an active subscription to Marrow videos.
- The text, images, slides, and other materials used in this book have been contributed by the faculty, who are subject matter experts. We have merely reproduced them as video transcripts in this book.
- The notes have been consciously designed in a way that is concise and revisable. To ensure this, we have intentionally added only the most relevant modules and images that are needed for you.
- The notes contain blank spaces primarily for labelling diagrams, completing cycles and more to promote active engagement and reinforce learning.
- Red icons, wherever present, serve as cues to faculty-emphasised sections, intended to guide focused learning.
- Reasonable care has been taken to ensure the accuracy of the information provided in this book. Neither the faculty nor Marrow takes any responsibility for any liability or damages resulting from applying the information provided in this book.

All Rights Reserved

No part of this publication shall be reproduced, copied, transmitted, adapted, modified or stored in any form or by any means, electronic, photocopying, recording or otherwise.

Contents

Surgery

General Surgery	1
Day care surgery • Patient safety, OT zones and surgical procedures • Surgical blades, cautery and harmonic scalpel • Drains, sutures and knots • Bowel anastomosis & staplers • Post operative complications • Wounds • Surgical nutrition • Enteral nutrition • Parenteral nutrition • Hypovolemic/hemorrhagic shock • Blood transfusion • Types of shock • Sepsis and septic shock	
Breast	23
Workup of breast disorders • Breast cancer • Breast cancer management : surgery • Chemotherapy, radiotherapy and hormonal therapy • Special breast neoplasms • Benign breast conditions • Nipple discharge	
Endocrine Surgery	36
Thyroid gland : Surgical anatomy & investigations • Thyroglossal cyst • Thyroidectomy • Thyroid cancers • MEN syndromes • Hyperthyroidism • Hypothyroidism • Goitre • Hyperparathyroidism • Adrenal incidentaloma • Phaeochromocytoma • Neuroblastoma • Carcinoids	
Oral Cancer & Salivary Glands	51
Oral cancers • Management of oral cancers • Benign conditions of salivary glands • Salivary gland tumors • Parotid tumors • Submandibular tumors • Neck swelling	
Gastrointestinal Surgery : Part 1	59
Esophagus : Foreign body & corrosive injury • Tracheoesophageal fistula (TEF) • GERD • Barrett's esophagus • Esophageal cancer • Esophageal leiomyoma • Zenker's diverticulum • Hiatal hernia • Esophageal perforation • Other benign esophageal conditions • Achalasia cardia • Distal esophageal spasm • Congenital hypertrophic pyloric stenosis (CHPS) • Peptic ulcer disease • Gastric reconstruction • Gastric cancer • Gastrointestinal stromal tumors • Gastric volvulus & trichobezoar	
Gastrointestinal Surgery : Part 2	79
Bariatric surgery • Mesenteric cyst • Upper GI hemorrhage • Portal hypertension • Bowel obstruction • Hirschsprung's disease & paralytic ileus • Mesenteric ischemia • Appendicitis • Appendectomy • Other conditions of appendix	
Gastrointestinal Surgery : Part 3	94
Ileostomy & colostomy • Faecal fistula • Short bowel syndrome • Diverticular disease • Angiodysplasia • Inflammatory bowel disease • Colorectal polyps • Colorectal cancers (CRC) • Pilonidal sinus • Hemorrhoids/piles • Anal fissure • Rectal prolapse • Anorectal abscess & fistula • Anorectal malformations	

Hepatobiliary & Minimally Invasive Surgery	109
Surgical anatomy of liver • Liver abscess • Hydatid disease • Benign liver tumours • Hepatocellular carcinoma • Surgical anatomy of gall bladder (GB) • Gall stones • Extrahepatic biliary atresia (EHBA) • Choledochal cysts • Pancreatic malformations • Acute pancreatitis • Pseudocyst • Chronic pancreatitis • Endocrine tumors of pancreas • Pancreatic ductal adenocarcinoma • Gall bladder cancer • Minimally invasive surgery	
Urology : Part 1	132
Kidney disorders • Renal stones • Bladder stones & VUR • Renal infections • Benign renal tumours • Malignant renal tumors	
Urology : Part 2	143
Prostate • Benign prostatic hyperplasia (BPH) • Prostatic cancer • Foley's catheter & bladder trauma • Bladder cancer • Hypospadias & ectopia vesicae • Urethral trauma • Posterior urethral valve • Phimosis, paraphimosis, peyronie's disease & priapism • Penile cancer • Undescended testis • Testicular torsion • Hydrocele & varicocele • Fournier's gangrene • Testicular tumors	
Trauma and Burns	158
Basics of trauma management • Advanced trauma life support (ATLS) • Abdominal trauma • Thoracic trauma • Neck trauma • Head trauma • Thermal injury/burns	
Hernia, Thorax and Skin	179
Hernia : Types and surgeries • Inguinal hernia • Other hernias • Congenital diaphragmatic hernia • Thorax • Lung cancer • Mediastinal tumors • Skin lesions • Soft tissue sarcoma	
Vascular Surgery	192
Deep vein thrombosis (DVT) • Varicose veins • Ulcers • Arterial occlusion • Buerger's disease and gangrene • Aortic aneurysm • Aortic dissection • Raynaud's phenomenon • Subclavian steal syndrome and carotid artery stenosis • Thoracic outlet syndrome • AV fistulae • Cystic hygroma • Lymphedema	
Speciality Surgery	207
Skin grafts • Flaps • Bed sores • Wound healing • Cleft lip/palate • Transplant surgery • Renal transplant • Liver transplant • Berry aneurysms • CNS tumors	

GENERAL SURGERY

----- Active space -----

Day Care Surgery

00:00:45

Terms used in Ambulatory Surgery :

Term	Description
Day/Same - day surgery	Admitted and discharged within 12 hours.
Overnight stay	23 hour admission and early morning discharge.
Short - stay surgery	Admission up to 72 hours.

Selection Criteria :

- ASA grade 1 and 2 : Eligible for standalone day care unit.
- Class 3 : Require integrated centres.

Other criteria :

- BP < 180/100 mmHg.
- In a diabetic : HbA1C < 8.5 (Skip morning dose of OHA).
- Eligible BMI (Kg/m²) :
 - < 40 → Surface procedures.
 - < 38 → Laparoscopic procedures.
- Well controlled case of epilepsy are eligible.

Post - Operative Complications :

- m/c complication (Post day care Sx) : Post-op nausea and vomiting.
- m/c complication requiring re-admission : Haemorrhage.
- Pain.

Discharge Criteria :

- vital signs stable (Atleast 1 hour) + oriented to time, place, person.
- Adequate pain control with oral analgesia.
- Has taken oral fluids, has passed urine (If appropriate).
- minimal wound discharge/bleeding.
- minimal nausea.

----- Active space ----- ERAS Protocol  :

ERAS : Enhanced recovery after surgery.

Preoperative	Intra-operative	Post-operative
<ul style="list-style-type: none"> Counselling. Avoid mechanical bowel preparation (D/t fluid + electrolyte imbalance). Permitted to take prior to Sx : <ul style="list-style-type: none"> a. Solids up to 6 hours. b. Clear carbohydrate rich liquids up to 2 hours. (Carbohydrate loading). 	<ul style="list-style-type: none"> Surgical approach : minimally invasive. Long acting local bupivacaine (↓ Post-op pain) Keep patient warm. Nausea + vomiting prophylaxis. (At least 2 classes of medications). Avoid intra-operative drains and Ryles tube. 	<ul style="list-style-type: none"> use NSAIDs, avoid opioids. within 24 hours : <ul style="list-style-type: none"> - Discontinue IV fluids. - Start regular diet. - Ambulate.

Patient Safety, OT Zones and Surgical Procedures 

00:05:28

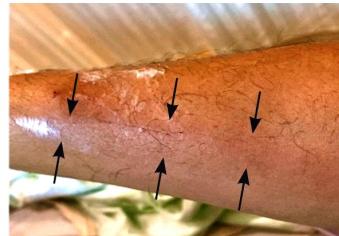
IV Cannulae :

Colour coding :

Color	Gauge	maximal flow rate (mL/min)
Violet	26 G	-
Yellow	24 G	13
Blue	22 G	31
Pink	20 G	67
Green	18 G	96
Gray	16 G	236
Orange	14 G	270

Superficial thrombophlebitis :

- m/c complication of cannula insertion.
- Presentation : Cord-like tender swelling at the site.



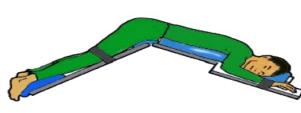
Superficial thrombophlebitis

Surgical Safety Checklist :

Sign in	Time out	Sign out
Before induction of anaesthesia. (Ward → OT)	Before skin incision.	Before patient leaves
<ul style="list-style-type: none"> Confirm : Patient identity, site, procedure. Written consent to be taken. Surgical site marking. Inquire about allergies. Confirm pulse oximeter functioning. Evaluate risk of aspiration. 	<ul style="list-style-type: none"> Team members introduction. Confirmation of : Patient, site & procedure name. Surgeon confirms : <ul style="list-style-type: none"> - Operative duration. - Anticipated blood loss. Anaesthetist : Antibiotic prophylaxis. 	Confirmation : <ul style="list-style-type: none"> Gauze + instrument count. Specimen labelling. Anaesthetist : Actual blood loss.

OT Positions :

----- Active space -----

Surgical position	uses	
1. Supine (m/c used)	Abdominal and breast surgeries.	
2. Trendelenburg	Pelvic surgeries.	 Foot end : ↑ Head end : ↓
3. Reverse Trendelenburg	upper abdominal surgeries. (E.g.: Laparoscopic cholecystectomy, bariatric sx)	 Head end : ↑ Foot end : ↓
4. Lithotomy	<ul style="list-style-type: none"> Obstetric, gynaecological, urological procedures. Common peroneal nerve injury : If legs not properly supported. 	
5. Lateral/kidney position	<ul style="list-style-type: none"> Thoracotomy, kidney surgeries. (E.g.: Nephrectomy) Brachial plexus injury due to overabduction of arms. 	
6. Prone	Spinal surgeries and pilonidal sinus surgeries.	
7. Sitting/Fowler's position	<ul style="list-style-type: none"> Posterior cranial fossa procedures. Advantage : Better exposure. Disadvantage : ↑ Risk of air embolism. 	
8. Jack - knife	Not preferred (D/t positional asphyxia)	

----- Active space -----

Note :**Air embolism :**

- 50 to 100 cc of air.
- Clinical scenarios :
 - a. During thyroid/head and neck surgery → vein nicked.
 - b. While operating in sitting position.
- mx of suspected air embolism : Durant's position/Left lateral (Right side up) + legs up.
- Significance : Air remains in right side of heart → Easy aspiration.
(Central line/Image guided)

Sudden
desaturation.

Surgical Blades, Cautery and Harmonic Scalpel 

00:13:10

Surgical Blades :

Surgical blades	uses
No. 11 (Pointed/stab blade)	<ul style="list-style-type: none"> • Incision and drainage • Arteriotomy
No. 12 (Curved blade)	Suture removal
No. 10, 15, 20, 21, 22, 23 (Blades with a belly)	making incisions

Blade Handling :

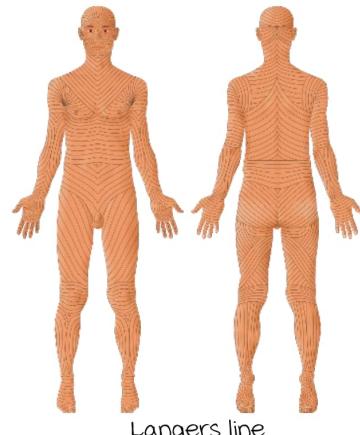
- Blades passed in a kidney tray to prevent injuries.
- Blades mounted on BP handle.



Bard Parker (BP) handle

Note :**Langer's lines :**

- Relaxed tension lines.
- Lines are perpendicular to action of underlying muscle.
- Incisions are made parallel to the lines (minimal scarring).



Langers line

Cautery:

----- Active space -----

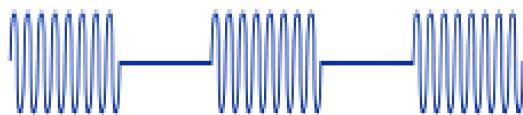
monopolar cautery	Bipolar cautery
<p>Flow of current :</p> <p>Tip → Body → Cautery pad → machine.</p> <p>Cautery pad :</p> <ul style="list-style-type: none"> Required for cautery to work. If small/improperly placed → Burns at site. <p>Disadvantages :</p> <ul style="list-style-type: none"> Thermal damage to nearby nerves & vital structures. (Avoided close to end arteries) Interference with cardiac conduction. (Avoided in patient with pacemakers) <p>-</p> <p>Can cut and coagulate</p>	<p>Flow of current :</p> <p>Prong 1 → Body → Prong 2</p> <p>No cautery pad required</p> <p>Advantage :</p> <ul style="list-style-type: none"> Safe to use with pacemakers. Can be used near vital structures. <p>Surgeries used :</p> <p>Thyroid, parotid, penile.</p> <p>Only coagulate</p>
	

Wave forms of cautery :

1. Cutting mode : Low voltage, continuous.



2. Coagulation mode : High voltage, alternating current.

Harmonic Scalpel :

- Working principle :
 - ultrasonic : coagulation without heat production.
 - Oscillatory blade (20,000 - 50,000 Hz oscillation).



Harmonic scalpel

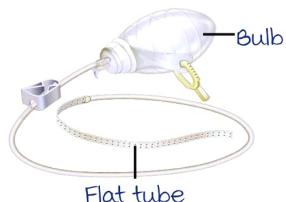
----- Active space -----

- Advantage :
- Precise cut.
- Can cut through scar tissue.
- Can be used close to vital structures.

Drains, Sutures and Knots

00:17:40

Drains :

Drains	Significance	
Corrugated rubber drain	<ul style="list-style-type: none"> • used in pus cavities. • Rarely used. 	
Romovac suction drain	<ul style="list-style-type: none"> • uses negative pressure. • used after mastectomy, thyroidectomy and neck dissection. 	
mini-vac drain	Smaller version of Romovac drain	
Jackson Pratt drain	<ul style="list-style-type: none"> • works on negative pressure. • Flat tubing and a bulb instead of a bag. 	
Abdominal drain	No negative pressure.	
under water seal bag	Connected to chest tubes. (End of tube is submerged under water)	