The Essential Handbook of General Surgery

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Abstract: Written by surgeons, clinical educators and medical students across stages of training, this surgical reference text combines clinical expertise with the student perspective and delivers complex surgical principles in accessible, substantial detail. Contributors have worked together to create a resource that addresses both theoretical foundations and practical application.
Full-colour illustrations and structured explanations guide readers through core surgical concepts, procedures and clinical reasoning. Each chapter builds understanding systematically, with visual aids that clarify anatomy, technique and decision-making. Medical students can use it to prepare for exams, enter surgical rotations or build foundational knowledge for practice. House officers and medical officers will find it equally valuable as they develop clinical skills and surgical judgment.
Beyond a reference textbook, it represents genuine collaboration within the surgical education community and serves as a reliable companion for both learning and teaching surgery. Its clear presentation and comprehensive coverage make it suitable for individual study, small group teaching, and bedside reference.

Keywords: Surgery, medical students, clinical, education.

NUMED SURGICAL SOCIETY
ESTABLISHED 2012

VOL. 1

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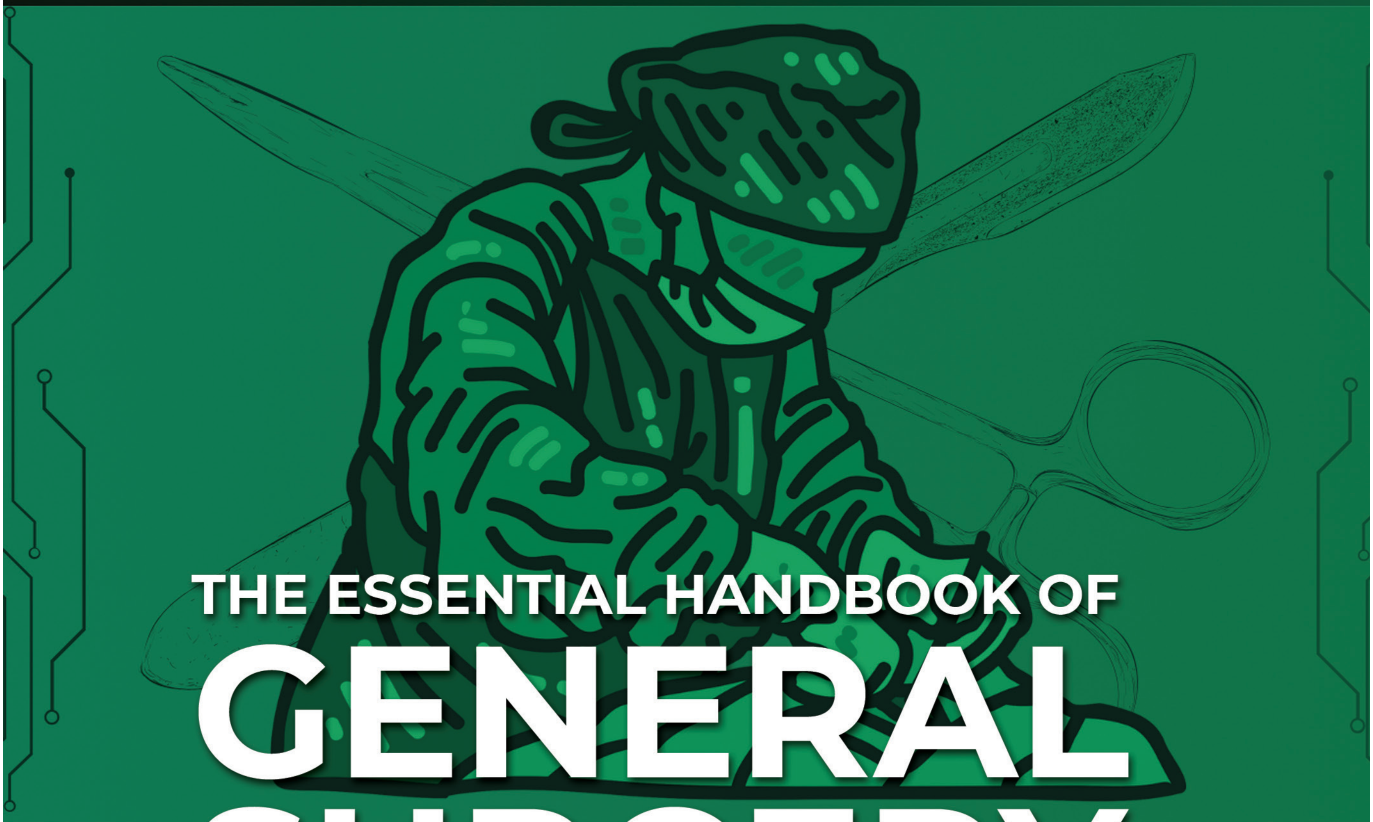

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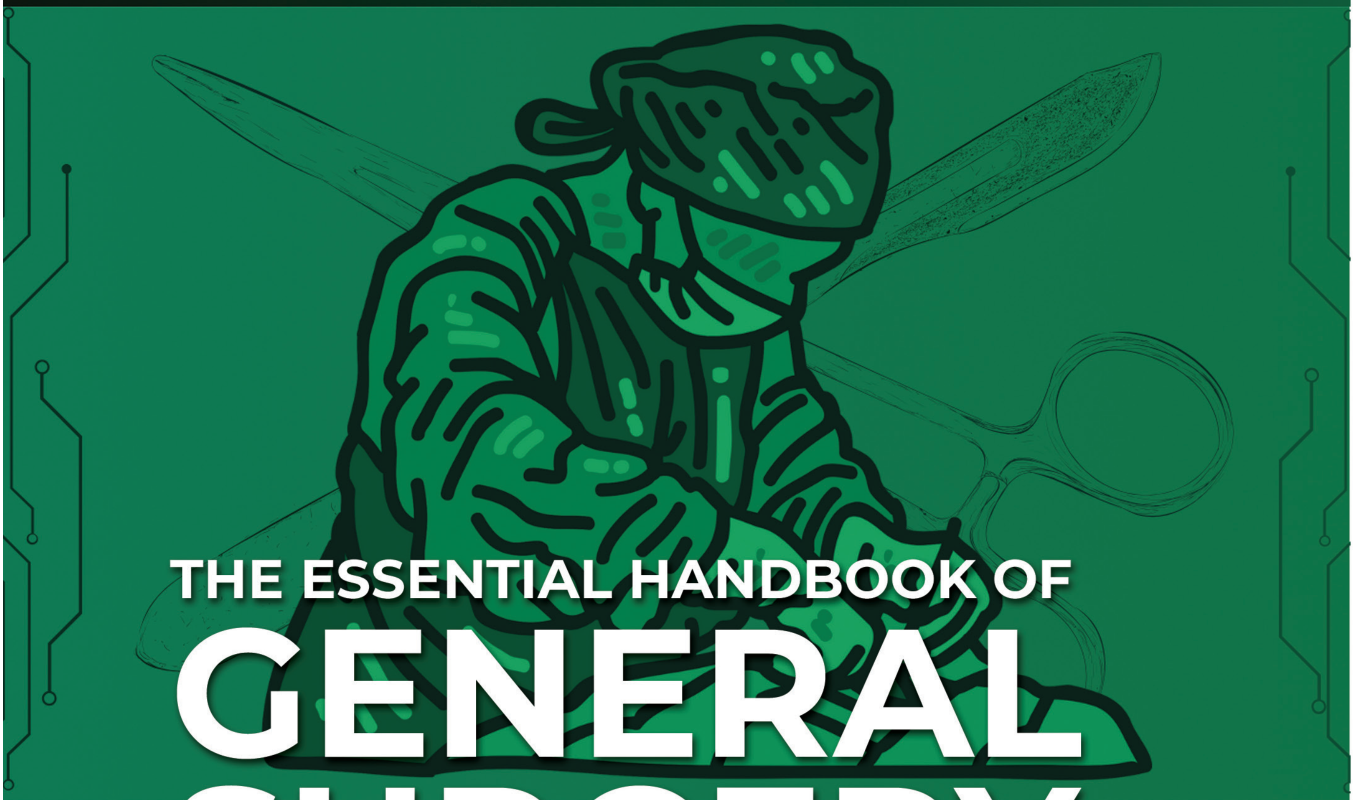

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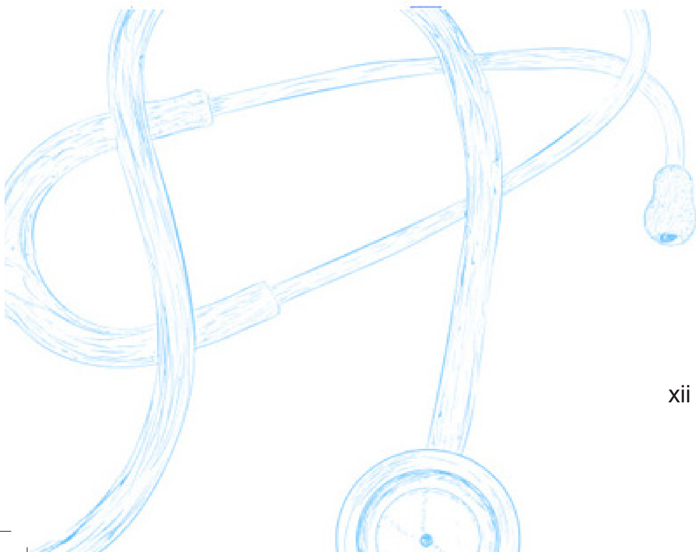

CONTENTS

ABBREVIATION LIST

5-ASA	:	5-aminosalicylic acid
ABCDE	:	**A**irway, **B**reathing, **C**irculation, **D**isability, **E**xposure / **E**verything else
ABG	:	Arterial blood gas
ACS	:	Abdominal compartment syndrome
AKI	:	Acute kidney injury
ASCA	:	Anti-saccharomyces cerevisiae antibody
ASIS	:	Anterior superior iliac spine
ATLS	:	Advanced trauma life support
BNF	:	British National Formulary
CCrISP	:	Care of the Critically Ill Surgical Patient
CBD	:	Continuous bladder drainage
CEA	:	Carcinoembryonic antigen
CECT	:	Contrast-enhanced computed tomography
CLD	:	Chronic liver disease
COX	:	Cyclooxygenase
CRP	:	C-Reactive Protein
CT	:	Computed tomography
CVD	:	Cardiovascular disease
CVL	:	Central venous line
CVP	:	Central venous pressure
CVS	:	Cardiovascular system
DIC	:	Disseminated intravascular coagulation
DPL	:	Diagnostic peritoneal lavage
ECG	:	Electrocardiogram
ESR	:	Erythrocyte sedimentation rate

FAST	:	Focused abdominal sonography for trauma
FBC	:	Full blood count
FIT	:	Faecal immunochemical test
GCS	:	Glasgow coma scale
GI	:	Gastrointestinal
H.pylori	:	Helicobacter pylori
IAH	:	Intra-abdominal hypertension
IV	:	Intravenous
LBO	:	Large bowel obstruction
LDA	:	Low dose aspirin
LDH	:	Lactate dehydrogenase
LFT	:	Liver function tests
MAP	:	Mean arterial pressure
MIBG	:	Metaiodobenzylguanidine
MRI	:	Magnetic resonance imaging
NAI	:	Non-accidental injury
NG	:	Nasogastric
NOD2	:	Nucleotide-binding Oligomerization Domain-containing protein 2
NOAC		Non-Vitamin K Oral Anticoagulants
NSAIDs	:	Non-steroidal anti-inflammatory drugs
P2Y12	:	P2Y purinoceptor 12
pANCA	:	Perinuclear anti-neutrophil cytoplasmic antibody
PCV	:	Packed cell volume
PO	:	Per oral
PR	:	Per rectal
RBC	:	Red blood cell
SBO	:	Small bowel obstruction
SIRS	:	Systemic inflammatory response syndrome
SOCRATES	:	**S**ite, **O**nset, **C**haracter, **R**adiation, **A**ssociated symptoms, **T**iming, **E**xacerbating & relieving factors, **S**everity
SPECT	:	Single-photon emission computed tomography
SPO_2	:	Peripheral oxygen saturation
SSRI	:	Selective serotonin reuptake inhibitor

STO	:	Suture-to-off
TAPP	:	Transabdominal preperitoneal
TBSA	:	Total body surface area
TEP	:	Totally extra-peritoneal
TNF	:	Tumour necrosis factor
TPN	:	Total parenteral nutrition
VMA	:	Vanillylmandelic acid
WBC	:	White blood cell

FOREWORD

It is with great pleasure that I introduce The Essential handbook of General Surgery, a book I believe will quickly become an indispensable companion for both those taking their first steps in the surgical world and experienced practitioners seeking a reliable, rapid-reference resource. For the medical student navigating the vast landscape of surgical principles, this book offers a clear, well-demarcated path. The chapters distill complex surgical concepts—from acute abdomen and trauma management to elective procedures—into their most fundamental and critical components. This concise structure is designed to support the initial mastery of core surgical knowledge, ensuring students can confidently approach their ward rounds and prepare effectively for examinations. It serves as an excellent scaffolding upon which deeper clinical knowledge can be built. The transition from student to active clinician is often the most challenging, and this is where Essentials of General Surgery truly shines for House Officers and Medical Officers. The text is structured to mimic the rapid-fire decision-making required in a busy surgical unit. When faced with a challenging differential diagnosis or a pressing need to understand a perioperative protocol, the book's clear, well-written chapters offer immediate clinical relevance.

The greatest strength of Essential Handbook of General Surgery is its dedication to being concise and well-written. In an era of information overload, the authors have meticulously ensured that every chapter focuses on high-yield information—the "must-knows" that dictate patient safety and quality of care. It respects the limited time of the busy clinician, offering maximum impact with minimum reading time. I highly recommend this book. It is more than just a textbook; it is a practical tool that promises to enhance surgical education and contribute to better patient outcomes for many years to come.

Associate Professor Kumar Hari Rajah

Taylor's University School of Medicine and Health Science
9/10/2025

PREFACE

The NUMed Surgical Society was founded with a clear mission: to inspire future surgeons. Over the years, members have worked together to share skills, organise workshops and open doors to the practice of surgery. This handbook has grown from that collaboration and reflects the energy and commitment of many contributors across the community.

The content represents more than lecture notes. Students created this collective resource with support from mentors and enrichment from those who have progressed through surgical training. Clear explanations and colourful diagrams work together to make surgical learning approachable and rewarding.

Sustained dedication made this handbook possible. Contributors gave time and expertise to shape the final work. It now supports study, clinical rotations, and early surgical practice.

The handbook also carries a wider message: surgery is learned best through shared effort. These pages provide a foundation, but deeper lessons emerge in clinical practice and through guidance from experienced practitioners.

Dr. Soh Kai Yi, MBBS(NUMed)

Vice President (Education), NUMED Surgical Society 2022
Student coordinator for Essential Handbook of General Surgery Volume 1 and on behalf of the authors and contributors

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Our committee for the
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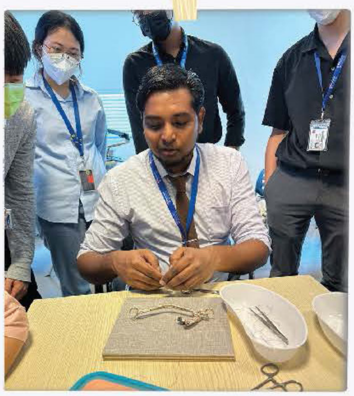


Junior Doctor Surgical Crash Course

CHAPTER 1

Acute Abdomen

Soh Kai Yi and Lau Siew Ping

1.1 DEFINITION (Tidy & Jarvis, 2019)

- Rapid and sudden onset of severe symptoms due to abdominal pathologies.
- Also known as abdominal pain of short duration that requires a decision regarding whether an urgent operation is necessary (Schein, 2000).

1.2 EPIDEMIOLOGY (Schein, 2000)

- Depends on the aetiology

1.3 PATHOGENESIS / PATHOPHYSIOLOGY

- Topological cues and aetiology to abdominal pain are depicted in Figure1.1 (Daley, 2019a, 2019b; Kendall & Moreira, 2023; O'Connell, 2018; The Acute Abdomen Presentations Needing Urgent Intervention Acute Bleeding, 2022; Tidy & Jarvis, 2019).
- Pathogenesis and pathophysiology depend on the organs involved. *(Some are discussed in other Chapters of this book)*

1.12 PROGNOSIS (Nakashima et al., 2020)

Depends on the pathology, surgical outcome, nutritional status

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CHAPTER 2

Intra-abdominal Bleed

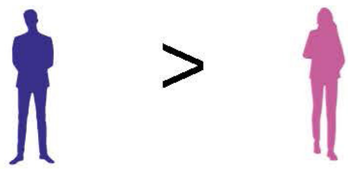
Jonathan Lee Ghee Meng, Lau Siew Ping, Calvin Thomas John, and Pang Jie Yun

2.1 DEFINITION

- Internal bleeding in which blood accumulates in the abdominal cavity either retroperitoneally or intraperitoneally.

2.2 EPIDEMIOLOGY

- Average age is 20 to 31 years old (Hui Gan et al., 2019; Wiik Larsen et al., 2022).
- More common in males.



- More common organ involved are liver followed by spleen and kidney (Chaudhari et al., 2022; Ranjan et al., 2023).

2.3 PATHOGENESIS / PATHOPHYSIOLOGY

- Aetiology (Subedi, 2014)
  - Ruptured organs or blood vessels
    - Secondary to trauma (most common cause)

2.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

2.12 PROGNOSIS (Arumugam et al., 2015; Behboodi et al., 2016)

- Depends on the pathology, surgical outcome, complication, comorbidities, nutritional status
- Mortality rate could be reduced by 50% with early intervention.
- One of the causes of mortality is abdominal sepsis in patients with comorbidities

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CHAPTER 3A

Abdominal Hernia (Non-Inguinal)

Lau Siew Ping and Lau Jin Ren

3A.1 DEFINITION (Rance & Jones, 2021; Rather, 2023)

- Bulging of the contents from the abdominal cavity through weakness of the abdominal wall.
- Also known as ventral abdominal wall hernia

3A.2 EPIDEMIOLOGY (Bittner et al., 2014; Köckerling & Sharma, 2018)

- Proportion of midline abdominal wall hernias, with a relative frequency of 19% for umbilical/par umbilical hernias, 9% for epigastric hernias, and 5% for incisional hernias.
- The incidence for incisional hernia is 10–20%,
- Symptoms develop for 33–78% of patients with a ventral or incisional hernia.
- Surgery is performed for 5–15% of patients with a ventral or incisional hernia because of an acute complication (obstruction/strangulation).
- Emergency repairs are associated with high morbidity.
- Umbilical hernias obstruct five times more often than other ventral and incisional hernias.

3A.9 COMPLICATIONS AND WHAT TO ANTICIPATE

- Recurrence
- Bleeding
- Infection
- Persistent pain (Osteitis pubis) and/or injury to nerve
- Seroma if the sac is left in situ
- Mesh complications

3A.10 FOLLOW UP

- Rule out hernia recurrence.
- Modify risk factors and optimize comorbidities that may cause hernia recurrence.

3A.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

3A.12 PROGNOSIS (Rance & Jones, 2021; Rather, 2023)

- Prognosis is good with timely diagnosis and repair.
- Morbidity due to:
  - delayed diagnosis
  - missing the diagnosis of the hernia
  - complications associated with management of the disease.
- Hernias with associated strangulation → 10% mortality rate.
- recurrence for incisional hernias ~ 30%.
- Addition of mesh decreases the incidence of recurrence.

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CHAPTER 3B

Abdominal Hernia (Inguinal)

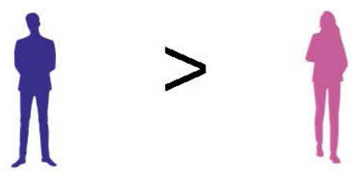
Lau Siew Ping, Lau Jin Ren, and Pang Jie Yun

3B.1 DEFINITION (Rather, 2023b)

- Bulging of the contents from the abdominal cavity through the inguinal canal.
- It could be indirect inguinal hernia or direct inguinal hernia

3B.2 EPIDEMIOLOGY (Brooks, 2022; Hammoud & Gerken, 2023; Jenkins & O'Dwyer, 2008)

- Lifetime prevalence is 27-43% for males; 3-6% for females.
- Indirect inguinal hernia (2/3) is more common than direct inguinal hernia (1/3).



3B.10 FOLLOW UP

- rule out hernia recurrence.
- Chronic pain
- modify risk factors and control comorbid that may cause hernia recurrence.

3B.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

3B.12 PROGNOSIS (Hammoud & Gerken, 2023)

- Generally good with early diagnosis and repair
- Mortality is usually due to development of complication of disease and delayed diagnosis
- Elective hernia repair - generally good with less than 10% reporting complication
- Recurrence rate is higher in suture repair compared to mesh
- Recurrence due to:
  - improper mesh size
  - missed hernia.
  - excessive tension on repair
  - tissue ischemia.
  - associated comorbidities such as chronic cough, diabetes, smoking, steroid use, and malnutrition

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CHAPTER 4

Appendicitis

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4.1 DEFINITION (NICE CKS, 2021)

Inflammation of the vermiform appendix.

4.2 EPIDEMIOLOGY (Kandasami et al., 2020; NICE CKS, 2021)

- Peak age of incidence: early teens - early 20s
- Most common cause of acute abdomen in the UK
- Most common surgical emergency in the world and Malaysia (43%)
- Can occur at any age

4.3 PATHOGENESIS / PATHOPHYSIOLOGY (Dahiya et al., 2024; Manueli Laos et al., 2024; NICE CKS, 2021)

- Obstruction of the appendix's lumen by fecalith, lymphoid hyperplasia, infection, fibrous strictures, or foreign bodies
- May result in localised ischemia, perforation, or generalised peritonitis

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CHAPTER 5

Intestinal Obstruction

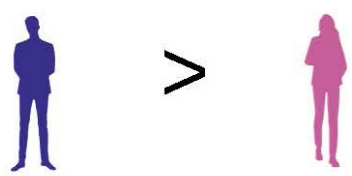
Pwi Jia Yee, Lau Siew Ping, Calvin Thomas John, and Pang Jie Yun

5.1 DEFINITION

- Intestinal obstruction happens due to the interruption of the flow of intestinal contents causing various symptoms.

5.2 EPIDEMIOLOGY

- The incidence rate of bowel obstruction is around 2-8% and remains as one of the most important causes for mortality and morbidity (Jackson & Vigiola Cruz, 2018).
- Small bowel obstruction (SBO) is more common which constitutes 80% of the cases and it is more severe than large bowel obstruction (LBO).
- The most common cause
  - SBO → Adhesions which is more common in operated abdomen
  - LBO → Tumour



- Wound dehiscence (Jeppesen et al., 2016)
- Wound infection (Jeppesen et al., 2016)
- Postoperative ileus (Jeppesen et al., 2016)
- Death due to delayed proper treatment

5.10 FOLLOW UP

- Limit strenuous exercise for 4-6 weeks
- Proper wound care at surgical site
- Decision on stoma ***(*more information on stoma - Refer Chapter 30)*** - if the stoma should be kept as permanent or temporary (also depends on the patient's operative findings, diagnosis, type of stoma, comorbidities, and prognosis).
- Proximal and distal colon are evaluated radiographically or endoscopically to rule out any colonic lesions that increase the risk for recurrent abdominal obstruction.
- Colonoscopy to detect dysplasia and/or colitis

5.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

5.12 PROGNOSIS (Bordeianou & Yeh, 2021; Hopkins, 2023; Ramnarine, 2024; Yeh & Bordeianou, 2023)

- Depends on the pathology, surgical outcome, complication, comorbidities, nutritional status
- SBO mortality rate 5-30%, while LBO is 10-20% (Paul et al., 2022)
- SBO with strangulation -8%,12 and 100% mortality if treated in <36 hours, >36 hours or left untreated respectively.
- LBO with perforation – increased mortality rate to 40%.

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CHAPTER 6

Ulcerative Colitis

Lau Jin Ren, Pwi Jia Yee, Lau Siew Ping, Kavin Raj Purushottaman, and Muthuthantrige Rishira Milan Marinus Fernando

6.1 DEFINITION (Basson, 2024; Lynch & Hsu, 2024)

An idiopathic inflammatory condition that affects the colon and causes superficial erosions on the colonic wall along with diffuse friability and bleeding.

6.2 EPIDEMIOLOGY

- More common in the Western and Northern hemispheres, low in Africa and East Asia (Basson, 2024).
- Equivocal finding of gender distribution, higher in females of the west and higher in males of the east (Basson, 2024).

- Prevalence from 0.5 to 31.5 per 100000 people each year (Burisch & Munkholm, 2013).

6.3 PATHOGENESIS / PATHOPHYSIOLOGY

Pathophysiology (Porter et al., 2020; Saez et al., 2023) to rule out colorectal cancer

- Extensive or Left-Sided Colitis → 1 or 2 yearly colonoscopies (depending on local guidelines/protocol)

6.12 PROGNOSIS (Basson, 2024; Matsuoka et al., 2018)

- Elderly patients with the disease → increased mortality.
- Mortality increases with shock, malnutrition and anaemia.
- Common cause of death of patients with UC is toxic megacolon.
- Chronic changes → precancerous changes (carcinoma in situ or dysplasia) and adenocarcinoma.

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CHAPTER 7

Diverticular Disease

Jonathan Lee Ghee Meng, Lau Jin Ren, and Kavin Raj Purushottaman

7.1 DEFINITION (Diverticular Disease: Diagnosis and Management NICE Guideline, 2019)

- Diverticular disease is an umbrella term for conditions involving diverticula (abnormal outpouchings of the colonic mucosa).
- Symptomatic diverticulosis: can be characterised by bleeding, perforation, stricture or fistula.
- Diverticulitis: Inflammation and infection of the diverticula
- Majority of the colonic diverticula are false diverticula in which the mucosa and muscularis mucosa layers are involved as the abnormal outpouchings
- True diverticula involve all layers of the of the bowel wall. There are rare and usually a congenital defect. An example of a true diverticula is a Meckel's diverticulum, which is normally located 2 feet proximal to the ileocecal valve

7.2 EPIDEMIOLOGY (Matrana & Margolin, 2009; Nair & Mayberry, 1994)

- Mainly affects the older population, with more than 50% affecting those older than the age of 80
- Up to 1 in 4 of those living with diverticulosis will develop diverticulitis

7.8 COMPLICATIONS & WHAT TO ANTICIPATE Linzay & Pandit, 2023)

- Colonic perforation
- Large bowel obstruction secondary to colonic stricture
- Abscess formation.
- Fistula formation (common to bladder, vagina and uterus)
- Bleeding

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CHAPTER 8

Anorectal Abscess

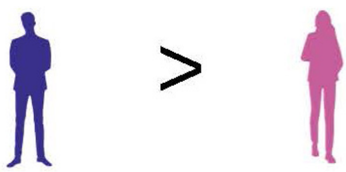
Jonathan Lee Ghee Meng, Lau Siew Ping, and Yethmi Nuhansa Ediriweera Wijesuriya

8.1 DEFINITION (O'Connell et al., 2022)

A pus-filled cavity that is developed in the spaces adjacent to the anorectal area.

8.2 EPIDEMIOLOGY (American Society of Colon and Rectal Surgeons, 2021)

- Sex: Male > Female (2:1)



- Age: Mean of 40 (Range between 30 and 50 years old)
- 30% of the patients with anorectal abscess may develop fistula-in-ano

8.3 PATHOGENESIS / PATHOPHYSIOLOGY (O'Connell et al., 2022)

Infection of the anal glands leads to ineffective drainage through the anal crypts into the anus. Vice versa, obstruction of drainage of the anal gland can also subsequently lead to infection of anal gland. This subsequently leads to abscess formation in the perianal area, which can then spread to several planes of the

8.11 SCREENING PROGRAM / SURVEILLANCE

Nonavailable

8.12 PROGNOSIS (Hebra, 2024)

- Mortality from anorectal abscesses is low
- Recurrence of abscess formation in approximately 10% of patients
- Chronic anal fistula development in approximately 50% of patients

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CHAPTER 9

Anorectal Fistula

Lau Siew Ping, Lau Jin Ren, and Yethmi Nuhansa Ediriweera Wijesuriya

9.1 DEFINITION (Bailey & Love's Short Practice of Surgery, 27th Edition, 2018)

An abnormal communication between an internal opening in the canal and one or more external openings on the perianal skin.

9.2 EPIDEMIOLOGY (Poggio, 2022)

The prevalence is unknow but the estimated incidence rate of anorectal fistula from anal abscess is reported to be ranging from 26%-38%. The male-to-female ratio is estimated to be 2:1.

9.3 PATHOGENESIS / PATHOPHYSIOLOGY (Poggio, 2022)

In most cases, fistula-in-ano is due to a previous anorectal abscess.

- Following draining in the perianal skin, a tract may be left behind, causing recurrence

Fistulas can also develop secondary to Crohn's disease, anal fissures, carcinoma, tuberculosis or trauma (e.g. foreign body insertion into the rectum)

- Recurrence of the fistula
    - Standard fistulotomy recurrence is 0-18%, and the rate of any stool incontinence is 3-7%
    - Seton use recurrence is 0-17%, and the rate of any incontinence of stool is 0-17%
    - Mucosal advancement flap rate of recurrence is 1-17%, and the rate of any incontinence of stool is 6-8%

9.10 FOLLOW UP

- To evaluate wound healing, stenosis and other complication
- Fistulogram for recurrence
- To address and optimise comorbidities that contributes to the fistula

9.11 SCREENING PROGRAM / SURVEILLANCE

Nonavailable

9.12 PROGNOSIS (Jimenez & Mandava, 2023; Mizrahi et al., 2002)

- Variable depending on aetiology.
- In general, a fistula that is treated should be entirely healed by 12 weeks.
- Smoking is a risk factor for failure of treatment with flap, as well as Crohn disease.

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CHAPTER 10

Anal Fissure

Lau Siew Ping, Wong Jing Wen, and Yethmi Nuhansa Ediriweera Wijesuriya

10.1 DEFINITION (Stewart, 2023)

A longitudinal tear of the perianal skin distal to the dentate line of the anal canal.

10.2 EPIDEMIOLOGY (NICE, 2023)

Affects male and female similarly

- Most common among young adults and middle-aged individuals
- Can occur on any age group, including infants and young children (often due to poor toileting)
- Annual incidence is around 1.1 per 1000 person-years
- The incidence is most probably underestimated as the public tends to misattribute anal discomfort to symptomatic hemorrhoids

10.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

10.12 PROGNOSIS (NHS, 2021; Poritz, 2024)

- Most patients will fully heal within 2 to 4 weeks after lateral sphincterotomy
- Post-sphincterotomy, approximately 1-6% will experience another anal fissure; recurrence rate is higher after a sphincter stretch

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CHAPTER 11

Haemorrhoids

Goh Rong Hao, Lau Siew Ping, and Len Shu Huei

11.1 DEFINITION

Normal vascular structures in anal canal, arise from channel of arteriovenous connective tissues that drains into superior and inferior haemorrhoidal veins (Sun & Migaly, 2016).

11.2 EPIDEMIOLOGY (Wald et al., 2021)

- Approximately 11% as only a fraction seeks medical treatment (Sheikh et al., 2020).
- Excessive straining due to chronic constipation or diarrhea, Benign Prostatic Hyperplasia (BPH), chronic cough
- Excessive periods of sitting – Sedentary lifestyle
- Other risk factors (Loder et al., 1994)
  - Pregnancy
  - Prolonged straining
  - Pelvic tumour
  - Older age
  - Smoking
  - Pelvic floor muscle dysfunction (Kebapçı et al., 2024)
  - Antiplatelet, anticoagulant usage

11.9 COMPLICATIONS AND WHAT TO ANTICIPATE (Grossi et al., 2022; Lohsiriwat et al., 2023; Sun & Migaly, 2016; Wald et al., 2021)

- Bleeding
- Secondary infection (*wound dehiscence*)
- Ulceration
- Abscess
- Recurrence (*rate varies from 3% to 50% with excisional having the lowest rate*)
- Acute urinary retention (*in excisional*)
- Pain (*more in excisional*)
- Faecal incontinence
- Stricture
- Rectovaginal fistula (*in stapler haemorrhoidopexy*)

11.10 FOLLOW UP

Re-examine and find for causes of portal hypertension, constipation, BPH

11.11 SCREENING PROGRAM / SURVEILLANCE

- FIT for colorectal cancer screening ***(*Refer Chapter 12)***
- Colonoscopy as outpatient if indicated ***(*Refer Chapter 12)***

11.12 PROGNOSIS

- Good prognosis if underlying cause is controlled
- Recurrence → See Complications

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CHAPTER 12

Colorectal Cancer

Elizabeth Chia Zhi Tong, Lau Siew Ping, Calvin Thomas John, Gursimran Kaur, and Muthuthantrige Rishira Milan Marinus Fernando

12.1 DEFINITION

Malignancy of the colon or rectum.

12.2 EPIDEMIOLOGY

- In the UK, colorectal cancer is the fourth most common cancer especially in those aged 50 and above (Cancer Research UK, 2023)
- In Malaysia, colorectal cancer is the second most common cancer, contributing to 13.5% of all the new cancer cases diagnosed in 2012-2016 (Ministry of Health Malaysia, 2021)

12.3 PATHOGENESIS / PATHOPHYSIOLOGY

Colorectal cancer is caused by acquired or inherited genetic mutations.

- Adenomatous polyposis coli (APC) pathway
    - The APC pathway is a major contributor the non-hereditary (sporadic) colorectal cancer which causes the presentation of adenoma to carcinoma
    - APC acts as a tumour suppressor gene to promote apoptosis and prevent cell proliferation
    - Mutation of the gene would result in development of malignant neoplasms such as adenomas

12.12 PROGNOSIS

- The prognosis of survival for 5 years or more after being diagnosed depends on the stage of cancer. In the UK the chance of survival depletes with each stage.
    - Stage 1: 90%
    - Stage 2: 85%
    - Stage 3: 65%
    - Stage 4: 10%
- Right sided tumor has better prognosis than left ones (Dekker et al., 2019)

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CHAPTER 13A

Upper Gastrointestinal Bleeding (Variceal)

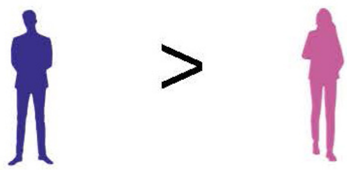
Lau Siew Ping and Lau Jin Ren

13A.1 DEFINITION (Meseeha & Attia, 2023)

Bleeding of the dilated submucosal veins found throughout the gastrointestinal tract.

13A.2 EPIDEMIOLOGY (Meseeha & Attia, 2023; Mohamed et al., 2007)

- More common in males than in female
- In Malaysia, gastrointestinal variceal bleeding accounts for 10-30% of upper gastrointestinal bleed and the prevalence in patients with cirrhosis is around 24-81%



13A.12 PROGNOSIS (Meseeha & Attia, 2023)

- Risk of rebleeding is around 70% and at least 30% of rebleeding episodes are fatal.
- Mortality rates are highest with surgical intervention and for acute variceal bleed.

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CHAPTER 13B

Upper Gastrointestinal Bleed (Non-Variceal)

Jonathan Lee Ghee Meng, Lau Siew Ping, and Muthuthantrige Rishira Milan Marinus Fernando

13B.1 DEFINITION (Kim, 2014)

- Gastrointestinal bleeding at which the source of haemorrhage is proximal to the Ligament of Treitz which is also known as the suspensory muscle of the duodenum.

13B.2 EPIDEMIOLOGY

- Occurrence ranges from 4.5 to 79.8 cases per 100,000 individuals annually in different countries,
- UK ~ 56 cases per 100,000 individuals per year.

- Factors that increased risk of mortality, re-bleeding, re-scope or surgery:
    - Age older than 60 years
    - Severe comorbidity
    - Active bleeding (eg, witnessed hematemesis, red blood per nasogastric tube, fresh blood per rectum)
    - Hypotension
    - Red blood cell transfusion greater than or equal to 6 units
    - Inpatient at the time of bleed
    - Severe coagulopathy

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CHAPTER 14

Perforated Duodenal and Gastric Ulcer (PDU/PGU)

Lau Siew Ping, Lau Jin Ren, and Calvin Thomas John

14.1 DEFINITION (Stern et al., 2023)

- Ulcer is a defect in the mucosal layers of the gastric or duodenum that extends through the muscularis mucosa into deeper layers of the wall. Perforation is the second most common complication of peptic ulcer disease and is a life-threatening condition as the mortality rate is nearly 30%.

14.2 EPIDEMIOLOGY (Stern et al., 2023)

- Incidence rate of 4-14 per 100,000 individuals per year in the United Kingdom.

14.3 PATHOGENESIS / PATHOPHYSIOLOGY

- **Risk Factors:**
  - Elderly
  - Obesity
  - Low socioeconomic groups
  - Untreated / misdiagnosed dyspepsia
  - Smoking
  - Steroids
  - NSAIDs
  - Traditional medicine

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CHAPTER 15

Gallstone Disease

Pwi Jia Yee, Lau Siew Ping, Calvin Thomas John, and Lee Yee Hau

15.1 DEFINITION

Gallstone disease consists of various conditions depending on the location of the gallstone and will manifest differently.

After stabilizing the condition

- Perform an urgent ultrasound hepatobilliary pancreas, CT scan, or MRCP (if feasible, indicated or needed) to find out the source
- The mode of treatment depends on the ultrasound findings – such as ERCP, conservative, percutaneous drainage, or surgery
- Utilize sepsis bundles such as "sepsis 6" when possible, (but usually it is based on case-to-case basis and more than the "3 in and 3 out" are needed in intense cases. Examples such as needing inotropes in addition to IV fluids in severe cholangitis with sepsis).

15.6.6 Hepatolithiasis (Abu-Wasel et al., 2012)

- Co-exist with recurrent cholangitis
- Commonly associated with bile stasis caused by:
    - Postoperative strictures
    - Sclerosing cholangitis
    - Caroli's disease
    - Neoplasms that cause bile stasis

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CHAPTER 16

Acute Pancreatitis

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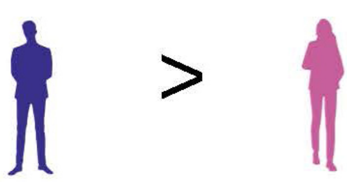
16.1 DEFINITION (Bhatia et al., 2005; CF Tang, 2021; Gapp et al., 2023)

- Inflammation of the pancreas that occurs acutely where the pancreatic enzymes produced autodigest the gland in the pancreas.

16.2 EPIDEMIOLOGY (CF Tang, 2021; Gapp et al., 2023)

- Occurrence ranges from 4.5 to 79.8 cases per 100,000 individuals annually in different countries, with the reported incidence in the UK being approximately 56 cases per 100,000 individuals per year.
- Prevalence higher in male than female. In male, more commonly due to alcohol related disease whereas biliary tract disease in female.



16.12 PROGNOSIS (CF Tang, 2021)

- Mortality rate higher in patient with biliary pancreatitis than in alcoholic pancreatitis
- Overall mortality in acute pancreatitis is 10-15%

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CHAPTER 17

Neck Lump

Pwi Jia Yee, Lau Siew Ping, and Lee Yee Hau

17.1 DEFINITION

- Neck lumps are swelling or enlargement between the inferior border of mandible and clavicle (Gupta et al., 2022).
- Neck swelling which can be classified into 3 types (most common) to investigate for the causes.
  - Anterior triangle swelling:
    - Solid: thyroid gland nodules/goitre, lymph node, lipoma, parotid or submandibular gland swelling
    - Cystic: carotid artery aneurysm, branchial cyst, dermoid cyst, paraganglioma
  - Posterior triangle swelling:
    - Solid: lymph node, lipoma
    - Cystic: abscess, cystic hygroma
  - Midline swelling:
    - Thyroglossal cyst
    - Dermoid cyst
- Lymphadenopathy (mnemonic- **LIST**)

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CHAPTER 18

Benign Breast Disease

Elizabeth Chia Zhi Tong, Lau Jin Ren, Pwi Jia Yee, Calvin Thomas John, and Dawood Dorez Abid

18.1 DEFINITION (NICE, 2023)

Unusual growths within the breast that are not cancer.

18.2 EPIDEMIOLOGY (Ajmal & Van Fossen, 2018; Bagenal et al., 2016; Bukhary, 2020)

- Fibroadenoma- most common benign breast lump in women aged 14-35 years of age with an estimated 10% of women having a fibroadenoma during their lifetime, both in the UK and Malaysia
- Around 30% of lactating women develop mastitis within 2-3 weeks postpartum worldwide
- In women with mastitis, 3-11% develop breast abscesses.

18.3 PATHOGENESIS / PATHOPHYSIOLOGY

- **Risk factors for breast lumps:**
  - Premenopausal
  - Nulliparity
  - Obesity
  - Trauma to the breast tissue

- Clinic
    - For recurring breast cysts, re-evaluation may be needed with a mammogram and/or ultrasound, every 6-12 months for 1-2 years with drainage if needed
    - For cystic breast lesions suggesting malignancy after the initial aspiration or biopsy, treatment includes surgical resection and adjuvant treatments such as hormonal therapy, chemotherapy, radiotherapy, immunotherapy, and biological agents

18.11 SCREENING PROGRAM / SURVEILLANCE

Self-breast examination program

Breast ultrasound and mammography

18.12 PROGNOSIS

Usually good except for suspicious mass

18.13 REFERENCES

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CHAPTER 19

Breast Cancer

Elizabeth Chia Zhi Tong, Pwi Jia Yee, Wong Jing Wen, Calvin Thomas John, and Dawood Dorez Abid

19.1 DEFINITION (Cancer Research UK, 2023)

Malignant growth of breast tissue.

19.2 EPIDEMIOLOGY (Azizah et al., 2019; Azizah Ab Manan et al., 2019; Cancer Research UK, 2023; Toh et al., 2008)

- Breast cancer is the most common cancer in the UK and Malaysia.
- Makes up ~ 20 % off all cancers in Malaysia.
- Half of the cases diagnosed in Malaysia are among those who are less than 50 years old
- Around 1 in 7 women will develop breast cancer in their lifetime.
- Around 40% of new cases are identified in Malaysia each year.

19.3 PATHOGENESIS / PATHOPHYSIOLOGY

Aetiology (Admoun & Mayrovitz, 2022)

Complex interaction between modifiable and non-modifiable factors ranging from genetics, environmental, nutritional, hormonal, heritable elements.

Risk factors (Admoun & Mayrovitz, 2022)

- Female
- Increasing age

19.12 PROGNOSIS (Cancer Research UK, 2023)

- Depends on stage and grade of disease, tumour characteristics and patient co-morbidities.
- Advanced age: Worse prognosis with 5-year survival in 70% women over age 80
- Late-stage disease: 26% survival rate at 5-years

19.13 REFERENCES

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CHAPTER 20

Haematuria

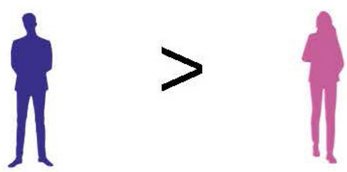
Soh Kai Yi, Lau Siew Ping, and Lau Jin Ren

20.1 DEFINITION (Ansorge, 2021; Knott, 2021; Perazella & O'Leary, 2021; Williams et al., 2018)

- Macroscopic haematuria (gross haematuria) is the presence of red or brown urine.
- Microscopic haematuria (non-visible haematuria) is the presence of blood or red cells which are only detectable on lab test (urine dipstick) or examination of the urine sediment by microscope.

20.2 EPIDEMIOLOGY

- The prevalence for microscopic haematuria is ranging from 0.19-21% and for macroscopic haematuria is 3-6% (Yeoh et al., 2013).
- Prevalence in females (Sarier et al., 2022).
- Prevalence in older man (Sarier et al., 2022).



22.10 FOLLOW UP

- Workup and find causes for gross haematuria as there are chaces for malignancy (Leslie et al., 2024; Peterson & Reed, 2019)
- treat underlying medical condition and opt for referrals/ co-management
- Kidney function test

22.11 SCREENING PROGRAM / SURVEILLANCE

Nonavailable

22.12 PROGNOSIS

Depends on the causative factor for haematuria

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CHAPTER 21

Benign Prostatic Hyperplasia (BPH)

Lau Siew Ping, Calvin Thomas John, and Noor Fadzillah Ahmad Farid

21.1 DEFINITION

A histologic diagnosis indicating the growth of glandular epithelial tissue, smooth muscle, and connective tissue within the prostate's transition zone (Berry et al., 1984).

21.2 EPIDEMIOLOGY

- The prevalence of histologically diagnosed BPH increases from (Berry et al., 1984):
  - 8% in men aged 31 to 40
  - 40 to 50% in men aged 51 to 60
  - Over 80% in men older than age 80
- Malaysia: The prevalence of symptomatic BPH is 35 per 100 men aged 50 years and older (MEDICAL MANAGEMENT OF SYPTOMATIC BENIGN Health Technology Assessment, n.d.).
- BPH is the commonest cause of bladder outflow obstruction in men more than 70 years old.

21.10 COMPLICATIONS AND WHAT TO ANTICIPATE (Deters, 2023; Diagnosis of Lower Urinary Tract Symptoms Resulting from Benign Prostatic Hyperplasia | The British Association of Urological Surgeons Limited, n.d.; McVary, 2023; Neal & Shaw, 2018)

- Complication with conservative management:
  - Acute or chronic urinary retention due to impaired bladder emptying
  - Renal insufficiency and hydronephrosis due to obstructive uropathy and backflow of pressure from the prostate blocking the urethra
  - Gross haematuria
  - Recurrent urinary tract infection
  - Bladder stone
  - Renal failure or uraemia
- Complication with surgical management
  - Retrograde ejaculation (65%)
  - Erectile impotence (5%)
  - Risk of reoperation (15%)
  - Morbidity rate (<0.5% death, 6% severe sepsis, 3% severe haematuria, 15-20% UTI)
  - TURP syndrome: A potentially life-threatening combination of fluid overload, dilutional hyponatremia, and neurotoxicity caused by the systemic absorption of irrigation fluids during the TURP procedure

21.11 FOLLOW UP (Sandhu et al., 2024)

- PSA yearly
- DRE

21.12 SCREENING PROGRAM / SURVEILLANCE (Sandhu et al., 2024)

- PSA

21.13 PROGNOSIS (McConnell et al., 2003)

- Favourable, with many experiencing at least moderate symptom improvement.
- 20% of patients will experience clinical progression, while combination therapy reduces the risk of progression by 66%.
- Medical treatment can have side effects, such as decreased libido and erectile function

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CHAPTER 22

Prostate Cancer

Lau Jin Ren, Lau Siew Ping, and Noor Fadzillah Ahmad Farid

22.1 DEFINITION (Belkahla et al., 2022; Bergengren et al., 2023; Prostate Cancer | Cancer Research UK, n.d.; Sekhoacha et al., 2022)

- Cancer of the prostate gland, which is part of the male reproductive system that is located at the base of the bladder.

22.2 EPIDEMIOLOGY

- Most common cancer among the male gender in the UK (Prostate Cancer | Cancer Research UK, n.d.)
- Account for 35% new cases from men aged 75 and over each year in the UK (Prostate Cancer | Cancer Research UK, n.d.)
- Sixth leading cause of death in men worldwide (Prostate Cancer - StatPearls - NCBI Bookshelf, n.d.)

22.3 PATHOGENESIS / PATHOPHYSIOLOGY (Prostate Cancer - StatPearls - NCBI Bookshelf, n.d.; Prostate Cancer: Practice Essentials, Background, Anatomy, n.d.)

Risk factors (Gann, 2002; Prostate Cancer - StatPearls - NCBI Bookshelf, n.d.)

- Radiotherapy: Proctitis, urethritis, cancer
- Hormone therapy: Gynecomastia, hot flushes

22.9 FOLLOW UP

- PSA yearly
- DRE

22.10 SCREENING PROGRAM / SURVEILLANCE

- PSA
- Among patients receiving conservative management, such as active surveillance, the Gleason score serves as the most dependable indicator of mortality (D'Amico, 1998)

22.11 PROGNOSIS (Lin et al., 2023)

- Early-stage prostate cancer has an excellent prognosis ~ 100% overall 5-year survival rate
- metastatic prostate cancer has a 5-year survival rate of around 30%

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CHAPTER 23

Abdominal Aortic Aneurysm (AAA)

Soh Kai Yi, Pwi Jia Yee, Lau Jin Ren, and Yethmi Nuhansa Ediriweera Wijesuriya

23.1 DEFINITION (NICE, 2020)

A focal dilatation in vessel wall diameter of more than 50%, typically with a diameter of more than 3 cm.

23.2 EPIDEMIOLOGY (NICE, 2020; Yii, 2003)

- In Asian population, incidence rate is 25.6/100, 000 and 7.6/100, 000 in male and female population respectively
- In the UK, prevalence rate is 1.3-12.7%, most commonly affecting elderly men

23.3 PATHOGENESIS / PATHOPHYSIOLOGY (V. Kumar et al., 2017; López-Candales et al., 1997; Norwood et al., 2004)

- Vessel dilatation occurs due to the degradation of the tunica media, and which is driven by factors including atherosclerosis, and activation of collagenases
- AAA is almost always a true aneurysm, but in 1% of cases may be a false aneurysm

23.11 SCREENING PROGRAM / SURVEILLANCE (NHS, 2021)

- In United Kingdom, the AAA screening programme is offered to all males aged 65 and over as a one-off abdominal ultrasound. Further surveillance is organised if the aortic diameter exceeds 3 cm
- Surveillance guidance is as follows:

Aortic diameter	Plan
<3 cm	Discharge at screening, no follow up
3 – 4.4 cm	Yearly surveillance
4.5 – 5.4 cm	3-monthly surveillance
≥5.5 cm	2 weeks wait referral to vascular services

23.12 PROGNOSIS (Dehlin & Upchurch, 2005; NICE, 2020; Takagi et al., 2017)

Asymptomatic	• Aneurysmal size is directly proportional with the risk of rupture • 2% of aneurysms measuring < 4 cm in diameter rupture over the subsequent 5 years • 75% of aneurysms measuring > 7 cm in diameter rupture over the subsequent 5 years
Post open repair	• Lower late graft related complications (0.4-2.3%) but higher perioperative complications
Post EVAR	• Higher rates of delayed complications requiring reintervention, such as endoleak
No intervention	• 80% mortality rate in symptomatic aneurysm • 100% mortality rate in ruptured AAA

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CHAPTER 24

Deep Vein Thrombosis (DVT)

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24.1 DEFINITION (Patel & Linda, 2019a)

Presence of the blood clot or thrombus in one of the deep veins that returns the blood to heart especially at the lower extremities.

It can be subdivided based on the anatomy:

- Proximal: veins up to the calf vein trifurcation such as femoral vein, profunda femoris vein and popliteal vein.
- Distal: veins beyond the calf vein trifurcation such as below the knee joint.

24.2 EPIDEMIOLOGY

- Prevalence of 30% for patients undergo surgeries (Patel & Linda, 2019a)
- Causcasian, African and Afro-Caribbean populations have higher risk compared to Asian and Hispanic (2.5-4 times risk higher) (Patel & Linda, 2019a)
- Drivers or after air travel with Immobilization of 6 or more hours have higher risk (2 times) compared to others (Dalen, 2003; Shenoy & Shenoy, 2019)
- DVT occurring during or soon after air travel is known as Economy class syndrome (Dalen, 2003)
- Age: Deep-vein thrombosis is rare in children, and the risk

24.10 FOLLOW UP

- Optimisation of warfarin or other anticoagulants (includes blood taking if needed)
- US liver, vein
- Optimisation of underlying cause of DVT and avoid future events

24.11 SCREENING PROGRAM / SURVEILLANCE

- No screening program available
- Surveillance done as per follow up

24.12 PROGNOSIS

- Risk of rebleeding is around 70% and at least 30% of rebleeding episodes are fatal
- Mortality rates are highest with surgical intervention and for acute variceal bleed

24.13 REFERENCES

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CHAPTER 25

Peripheral Arterial Disease

Lau Jin Ren, Pwi Jia Yee, and Grace Ong Kai Xin

25.1 DEFINITION (Zemaitis et al., 2023)

Reduction of blood flow through the arteries to the distal extremity due to the accumulation of atherosclerotic plaques that narrows the lumen.

25.2 EPIDEMIOLOGY (Zemaitis et al., 2023)

- Around 200 million adults worldwide are affected, and the incidence rate are increasing reaching to around 20% per year
- Global prevalence of peripheral arterial disease in 2019 was approximately 1.52% affecting 113 million people over 40 years old
- In Europe and North America, approximately 27 million individuals have peripheral arterial disease with an estimated number of 413,000 inpatient admissions annually due to the disease (Song et al., 2019).
- Largest proportion (70%) of people with peripheral arterial disease live in low to middle income regions of the world
    - 55 million individuals living in southeast Asia
    - 46 million individuals living in Western Pacific Region

25.9 COMPLICATIONS AND WHAT TO ANTICIPATE

- Amputation for those not wanting / unsuitable for any vascular intervention
- Related to reperfusion:
  - Reperfusion injury
  - Rhabdomyolysis
- Delayed perfusion
  - Compartment syndrome

25.10 FOLLOW UP

- Limb examination, pulse examination and ABPI during follow up as high risk for recurrence
- Lifelong aspirin with or without clopidogrel, or warfarin or NOAC's. Regular monitoring of liver function, kidney function, platelet and other coagulation parameters (when necessary)

25.11 SCREENING PROGRAM / SURVEILLANCE

- Not available

25.12 PROGNOSIS (Zemaitis et al., 2023)

- Prognosis of PAD is generally guarded (even with treatment).
- If the patient does not change his/her lifestyle, the disease is progressive
- Most patients have coexistence of cerebrovascular or coronary artery disease, which also increases the mortality rate
- Outcomes in women tend to be worse than in men, chiefly because of the small diameter of the arteries. Females are also more likely to develop complications and embolic events

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CHAPTER 26

Burns

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26.1 DEFINITION (Schaefer & Szymanski, 2024)

Traumatic tissue injury caused by thermal (heat), chemical, electrical, or radiation energy exposure

26.2 EPIDEMIOLOGY (Stylianou et al., 2015)

- In England and Wales, approximately 13,000 people need to go to the hospital each year for specialized burns care
- Burns account for 5% of all major trauma cases in England and Wales
- Of those who are hospitalized for burns, 1.51% die in the hospital

26.3 PATHOGENESIS / PATHOPHYSIOLOGY (Hettiaratchy & Dziewulski, 2004a)

Local response:

Burns cause tissue damage in three zones: coagulation, stasis, and hyperaemia (Hettiaratchy & Dziewulski, 2004b):

- The coagulation zone is the most severely damaged and cannot be repaired
- The stasis zone has the potential to be saved, but additional injuries, such as low blood pressure, infection, or swelling, can turn it into a coagulation zone

26.11 SCREENING PROGRAM / SURVEILLANCE

Nonavailable

26.12 PROGNOSIS (NICE CKS, 2023)

Superficial	Heal within 7 days	No scarring
Superficial partial thickness	Heal within 14 days	No scarring
Deep partial thickness	Heal >21 days, usually requires surgery	Some contraction and scarring
Full thickness	Rarely heal unless surgically treated	Considerable contraction and scarring

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CHAPTER 27

Sinus, Fistula and Ulcers

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27.1 DEFINITION (Williams et al., 2012)

Sinus	A blind-ended tract that extends from an epithelial surface to a cavity lined with granulation tissue (often an abscess)
Fistula	Abnormal connection between two epithelialized surfaces
Ulcers	Break in an epithelial surface in which the surface epithelium and granulating base are destructed progressively

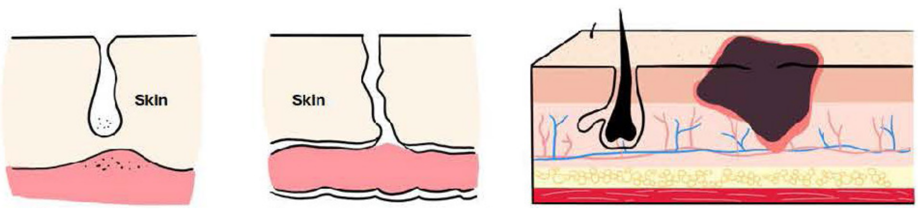

Figure 27.1: Illustration of sinus, fistula and ulcer

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CHAPTER 28

Pheochromocytoma

Lau Jin Ren and Pwi Jia Yee

28.1 DEFINITION

- A rare, catecholamine-secreting tumour that arises from chromaffin cells of the adrenal medulla and the sympathetic ganglia ("Correction to 'Pheochromocytoma and Paraganglioma: An Endocrine Society Clinical Practice Guideline,'" 2023; Lenders, Duh, Eisenhofer, Gimenez-Roqueplo, Grebe, Murad, Naruse, Pacak, & Young, 2014).
- 85% arises in the adrenal gland (pheochromocytomas) and 15% arises in the extra-adrenal chromaffin cells of the sympathetic paravertebral ganglia (extra adrenal pheochromocytomas, also known as paragangliomas) (Lenders, Duh, Eisenhofer, Gimenez-Roqueplo, Grebe, Murad, Naruse, Pacak, Young, et al., 2014).

28.2 EPIDEMIOLOGY

- Account for 0.1–0.6% of hypertensive individuals, with an overall prevalence of 0.05% in autopsy series
- The '10%' tumour (Conzo et al., 2014):
  - 10% of tumours are inherited
  - 10% extra-adrenal
  - 10% malignant
  - 10% bilateral
  - 10% occur in children

28.9 FOLLOW UP

- **Lifelong yearly biochemical tests** - to identify recurrent, metastatic, or metachronous phaeochromocytoma.

28.11 SCREENING PROGRAM / SURVEILLANCE

- Nonavailable

28.12 PROGNOSIS

- Non-malignant pheochromocytomas, 5-year survival rate > 95% (Hamidi et al., 2017).
- malignant pheochromocytomas, 5-year survival rate < 50% (Hamidi et al., 2017).
- Malignancy rate is 10%.
- Post resection recurrence is low ~ 3% (Holscher et al., 2021).
- The Endocrine Society Clinical Practice Guidelines recommend lifelong annual biochemical testing to monitor for recurrent or metastatic disease (Lenders, Duh, Eisenhofer, Gimenez-Roqueplo, Grebe, Murad, Naruse, Pacak, Young, et al., 2014).

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CHAPTER 29

Pneumothorax

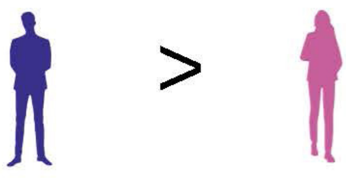
Lau Siew Ping, Calvin Thomas John, and Asila Shamirali Jiwa

29.1 DEFINITION (Daley, 2024; Jantz & Pierson, 1994)

A collection of air between the chest wall and lungs, known as the pleural space.

29.2 EPIDEMIOLOGY (Bobbio et al., 2015; Daley, 2022; Gupta, 2000)

- In the UK, the rate of presentation of pneumothorax per year in men is 24/100,000 and in women is 10/100,000.
- The mortality due to spontaneous pneumothorax is low in the UK, it is estimated to be 1.26 per million for men and 0.62 million for women per year.



29.3 PATHOGENESIS / PATHOPHYSIOLOGY

A. <u>Spontaneous Pneumothorax</u>

A spontaneous pneumothorax can further be divided into primary and secondary.

29.10 COMPLICATIONS & WHAT TO ANTICIPATE (McKnight & Burns, 2024)

- Severe hypotension
- Death
- Cardiac arrest
- Respiratory failure
- Empyema
- Pyopneumothorax
- Pneumopericardium
- Pneumohemothorax

29.11 FOLLOW UP

- Re-examine and treat the underlying cause such a pneumonia, TB or lung cancer.
- Follow up chest radiography should be obtained in 12-24 hours to check for further complications.
- Discharge the patient if the pneumothorax does not persist after 24 hours.
- Arrange for appointment with specialist regarding underlying lung disease.
- Advise the patient to rest as complete resolution of the pneumothorax can take up to 10 days.
- Advise the patient to stop smoking (McKnight & Burns, 2024).
- Avoid traveling by air or scuba diving until complete resolution of pneumothorax.

29.12 PROGNOSIS (Daley, 2024)

- Recurrence rate within 5 years is 28-32% for primary spontaneous pneumothorax and 43% for secondary spontaneous pneumothorax.
- Recurrence is common for patients who have COPD, AIDS, active smokers and have other underlying chronic lung disease.

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CHAPTER 30

Intestinal Stoma

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30.1 DEFINITION (Carlson & Epstein, 2018)

- Artificial opening of any segment of gastrointestinal tract to the surface of anterior abdominal wall, usually collected into a disposable bag (commonly known as stoma bag).

30.2 INDICATIONS (Carlson & Epstein, 2018)

- To relieve obstruction or to divert faeces.
- Indications of faecal diversion:
- To relieve obstruction
- To protect distal anastomosis
- To promote wound healing especially perineal wound
- To protect vascular graft especially at iliofemoral
- To assist in post-operative healing in complex perianal pathology (complex fistula in ano in IBD or complex sphincter injury repair)

- Most common form for urinary diversion by connecting the ureters to a portion of small intestine and allowing the urine to bypass the bladder and exit from the stoma
- Indications:
  - Post removal of bladder due to neurogenic bladder conditions, severe radiation injury or bladder cancer
  - Severe bladder symptoms due to chronic pelvic pain syndromes or intractable incontinence

30.8 FOLLOW UP

- Re-examine the stoma and check for signs of infection and bleeding after discharging home for the first time
- Re-evaluation of the stoma ***(Refer Examination)*** for sign of obstruction, parastomal hernia.

30.9 PROGNOSIS

Differs between cause of creation of stoma, type of stoma and potential reversal of stoma

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CHAPTER 31

Post-Splenectomy Care

Lau Siew Ping, Lau Jin Ren, and Len Shu Huei

31.1 DEFINITION (Yi & Lopez, 2023)

- Post splenectomy → The period following a surgical procedure to remove the spleen that is typically performed via open, laparoscopic or robotic-assisted techniques, to treat various clinical conditions such as hematologic disorders, trauma, and certain cancers.

31.2 EPIDEMIOLOGY (Dixon & Horgan, 2019)

- Average 5.8 elective and 4.2 unplanned splenectomies per year at UK district hospital setting.

31.3 ESSENTIAL ANATOMICAL LANDMARKS AND BASIC SCIENCES

- Traube space
- Castell's point
- Splenic artery and vein
- Splenic hilum
- Overwhelming post splenectomy infection (OPSI)

- Cold that lasts longer than usual
- Increased HbA1c: increased erythrocyte life span

- Vaccination - pneumococcal, Haemophilus influenza type b (Hib), and meningococcal vaccines (Coccolini et al., 2017).

31.9 PROGNOSIS

- For splenic rupture: → excellent, but increase the risk of fatal and debilitating infection for the remainder of their lives due to asplenia (Bjerke, 2022).
- Infections: the lifetime risk of OPSI is approximately 1% to 3% (Yi & Lopez, 2024)
- Patients without a spleen have a 200-fold increased risk of death from septicemia compared to patients with a normally functioning spleen (Yi & Lopez, 2024).
- Increased risk of cancer, as well as increased cancer-related mortality. The risk for cancer development is greatest during the first 2 to 5 years after splenectomy (Abduljalil et al., 2021).

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CHAPTER 32

Essential Scoring Systems & Classifications in Surgery

Goh Rong Hao and Lau Siew Ping

32.1 Alvarado score (Al-Tarakji et al., 2022)

Rationale / Reason for use:

To aid in diagnosis of appendicitis and to predict the severity of acute appendicitis.

Clinical Characteristic	Score
Migratory pain to right iliac fossa	1
Tender over right iliac fossa	2
Lower right quadrant rebound tenderness	1
Temperature more than 37.3 degree Celsius	1
Nausea or vomiting	1
Anorexia	1
Increased neutrophil count >75% with a shift to the left	1
Increased in leukocytes >10000 per uL	2

Cut off points / Interpretation:

Probability of appendicitis	Score
Low	1 to 4
Intermediate	5 to 6
High	7 to 10

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