Contents

Major Colorectal Surgery

- effects of major surgery:
  - neuroendorcine
  - metabolic
  - inflammatory
- problems:
  - pulmonary dysfunction
  - ↑cardiac demand
  - pain
  - nausea & vomiting
- end result:
  - ↓mobilisation
  - prolonged LOS
  - ↑M&M

ERAS

- key aspects:
  - bundle of care
  - MDT approach to planning of surgery, anaesthesia & recovery
  - preop iron supplements for anaemia
  - detail preoperative pt education, info & risk assessment
  - avoidance of prolonged starvation & dehydration:
    - clear fluids up to 2hrs prior,
    - CHO drink 2hr prior to surgery = ↓post op problems by 44% ie N&V, pain, diarrhoea, dizziness, wound healing problems
  - no premeds
  - no bowel prep ⟹ dehydration & diff fluid balance
  - avoid routine NGTs & drains
  - Abx given within 30min prior to incision
  - minimally surgical incisions
  - avoidance of hypothermia
  - fluids:
    - goal directed fluid approach (eg oesophageal doppler) = controversial
    - avoid fluid overload vital = every extra litre of fluid ⟹ ↑post op complications by 32% & extra 24hrs LOS
  - aggressive Rx of N&V
  - multimodal analgesia:
    - Regionals
    - single shot spinal vs epidurals
    - IV opioid PCAs
    - analgesia adjuncts - ketamine, lignocaine, gaba, clonidine
  - early removal of IDUC
  - early enteral feeding ⟹ ↓mm loss, ↓LOS +/-↓infection incidence
  - early mobilisation

Anaesthetic Course

Preoperative

- major issues to consider:
  - cachexia/weight loss
  - obstruction
  - diarrhoea
  - pain
  - malignant benign
  - large vs small bowel
  - open vs laparoscopic

- Assess ex tolerance - CPET
- ?invasive monitoring
- ?HDU/ICU required
- water & CHO drinks up to 2hrs prior to surgery

Perioperative

Induction

- regional plan:
  - epidural if required + test dose
  - single shot spinal with intrathecal opioid
  - wound catheters
- RSI if evidence of bowel obstruction

Maintenance

- active warming
- restrictive fluid management
- pressure area care
- FiO2 - controversial high vs low:
  - high = ?↓PONV, ↓wound infection & ?does not ↑atelectasis
  - low = ↓inflammation, ↓infection, ↓atelectasis
- invasive monitoring indications:
  - (minimally invasive) cardiac output monitoring: potential fluid shifts, CVS compromise, periop inotropes
  - A line - CVS or resp compromise, major blood loss, blood gas sampling
  - CVP - inotropes, post op PN required

End of case

- PONV prophylaxis

Postop

- measure urine output for at least 24 hrs
- replace losses

Analgesia

- options
  - local infiltration
  - TAP block
  - rectus sheath infiltration
  - wound catheters
  - spinal
  - epidural
  - PCA
  - oral analgesia

Epidural

Advantages

- improved pain relief vs IV opioids
- improved post operative respiratory function -> reduced respiratory failure
- improved GI motility
- decreased MI incidence (decreased stress response -> decreased HR, coronary vasoconstriction, myocardial work)
- improved patient mobility
- reduced thromboembolism
- reduced sedation
- reduced PONV

Disadvantages

- insertion related complications (PDPH, epidural haematoma and abscess)
- catheter misplacement (intrathecal, intravascular)
- perioperative hypotension
- failure - 20-30%
- pruritis
- urinary retention
- post op motor blockade ⟹ delayed mobility

- no change in morbidity or mortality (MASTERS Trial) vs PCA

Practical

- Site:
  - T10-11 lower abdo incision
  - T8-9 upper abdo incision
- test dose 3ml of 0.5% bupiv
- load intraop 10mls 0.5% bupiv in divided doses
- if expected bleeding delay LA into epidural until after
- for AP resection need Tx/Lx/sacral spread ∴ give lower conc higher volume
- post op infusion 0.125% bupiv + fentanyl 2-4mcg/ml at 0-12ml/hr

Temperature

- reasons for becoming cold:
  - loss behavioural response to cold
  - impaired heat preserving mechanisms
  - induced vasoD
  - exposure
  - cold IVF
  - dehyration hypovolaemia ⟹ poor periph perfusion & impaired heat distribution
- laparotomy ⟹
  - long procedure
  - open abdo
  - limited access for warming
- risks of even just mild hypothermia:
  - myocardial ischaemia & arrhythmias
  - ↑periop blood loss
  - ↑surg site infection
  - prolonged NDNMBs
  - ↑PACU stay
  - ↑LOS
- strategy:
  - only start if >36deg
  - active warming
  - warmed fluids
- hypothermia phases:
  - phase 1: rapid reduction 1-1.5deg 1st 30-mins due to loss of vasoC (REDISTRIBUTION)
  - phase 2: gradual ↓core temp 1deg over 2-3hrs due to radiation, convection, evaporation > metabolic rate (NET HEAT LOSS). Evap loss ↑ed in open abdo surgery
  - phase 3 = plateau heat loss = heat production.
    ↳ if epidural ⟹ longer to reach plateau with ↑ed drop
- Methods of heating:
  - cutaneous:
    - passive - space blanket ⟹ ↓loss by 30%. wrap head
    - active - heat mat or forced air warmer
  - internal:
    - airway humidification - <10% lost via resp tract
    - fluid warming - prevents conductive heat loss
    - invasive warming - CPB, peritoneal dialysis

Fluid Management

- important for maintenance of Q and O2 delivery
- effective IVF therapy can improve outcomes

Preoperative Management

- fluid reviews
- IVF
- monitor U+E

- remember N/G and 3rd space losses

Intraoperative Management

- during open abdomen crystalloid maintenance can vary between 1-30mL/kg/hr
- watch for bleeding
- remember third space loss from omental and bowel sequestration
- remember evaporative losses
- monitor U/O

Postoperative Management

- watch for ileus development:
    - multifactorial causes:
        - over hydration with salt containing fluid - strong association
        - physical manipulation at surgery
        - hormonal stress response
        - ↑SNS
        - pain
        - immobility
        - opioids
        - ↓K & electrolyte imbalances

- ongoing N/G loss
- monitor for blood loss
- monitor U+E

Oncological Surgery

General Considerations

- chemo cardiac effects:
    - direct drug effects eg
        - anthracyclines = doxorubicin:
            - related to total cumulative dose
            - may be irreversible with 30% mortality
            - ECG changes incl block
        - cyclophosphamide
        - fluorouracil
        - trastuzumab
    - stress of chemo on compromised heart
- other chemo effects:
    - vinca alkaloids eg vincristine:
        - periph neuropathy
        - SIADH
    - MTX: pneumonitis, hepatic impairment
    - cisplatin: periph neuropathy, electrolyte ↑↓
- pulmon toxicity - in 10% exposed to bleomycin:
    - fibrosing alveolitis
    - limit FiO2 to as low as poss
- hepatic veno-occlusive disease (HVOD) - physical effect of tumour
- tumour lysis syndrome -
    - normally lymphoma & high count leukaemia
    - 2nd to Rx eg steroids
    - mass cell death ⟹ lysis
    - chars = AKI, ↑K, ↑urea, ↑PO4, ↓Ca
- mediastinal masses:
    - airway collapse under anaesthesia even in asymptomatic
- SVC obstruction:
    - from direct tumour mass or vessel invasion
- paraneoplastic syndromes:
    - 10% of pts esp lung, lymphoma, breast, prostrate, ovarian, pancreatic

    - Examples:
        - Eaton Lambert = small cell lung Ca, breast, thymus & GI
        - Cushings - lung pancreas, thymus, ovary
        - PTH like secretions ⟹ ↑Ca
        - ↓Na & SIADH caused by SCLC, lymphoma, leukaemia, upper GI tumours
    - cachexia, ↓albumin are RFs for poor outcome
- Radiotherapy:
    - N&V
    - localised fibrosis - warning for airway
- Chemo
- VTE - in 15% of Ca pts

Anaesthesia Conduct

- avoid dex ⟹ cytotoxic effects & risk of lysis
- keep FiO2 low

Brachytherapy

- remote location
- 1.5-3hrs
- minimal blood loss
- post op pain may be a problem
- options = light GA or sedation or spinal/CSE

Acute Abdomen

- = sudden severe pain with unclear cause for duration <24hrs
- Consider medical & surgical causes

GI Syndromes

- prolonged vomiting
    - eg pyloric stenosis
- bowel obstruction - acute or chronic
- Malabsorption syndromes eg ileostomy, short gut, bowel prep, diarrhoea

Bowel Prep

Types

- osmotic cathartic ⟹ ↑complications but better tolerated
- Non-absorbed osmotic ⟹ big volumes ie litres of fluid
- stimulant laxative
- Combos

Complications

- Electrolyte disturbance esp ↑K
    ↳ osmotic cathartic ⟹ ↑Na, ↑Mg, ↑PO4, ↓Ca
- water intoxication/dehydration
- Post hypotension
- confusion/seizure/vomiting

By Surgery

Emergency Laparotomy

Preoperative Management

- quantify degree of organ dysfunction:
- CVS – vasodilation, requiring inotropes, myocardial dysfunction
- RESP – ALI, alveolar collapse, hypoxaemia, reduced compliance and FRC, increased WOB
- HAEM – DIC, coagulopathy, thrombocytopaenia, hypofibrinogenaemia -> supportive care
- RENAL – AKI
- METABOLIC – high BSL -> control with insulin
- HEPATIC – ischaemic hepatitis, hypoglycaemia, coagulopathy

- discuss probable diagnosis with surgical team and surgical plan
- quantify if there is time to resuscitate patient:
    - ongojng haemorrhage = immediate surgery
    - septic shock = surgery <3hrs
    - severe sepsis = surgery within 6 hrs
- investigations; FBC, U+E, Mg2+, Coags, CXR, X-match, ECG, ABG, lactate
- IV resuscitation
- Hb >70 as minimum
- prompt IV antibiotics
- vasopressors + inotropes
- may need preoperative admission to ICU
- give O2
- volume expand initially with crystalloid or blood
- insert N/G for bowel obstruction
- if in pain give IV opioids
- central venous oxygen saturation (ScvO2) >70%
- discuss with patient and family about possible morbidity and mortality associated with illness

Intraoperative Management

- place invasive monitoring prior to induction if possible
- aspirate N/G
- large bore access
- have pressors & vagolytics ready
- epidural siting =
    - controversial (can site but not use until haemodynamically stable)
    - other options eg wound catheters/RSC's
- RSI (induction agent dependent on patient and process, sux -> rocuronium)
- opioid titration
- induce in OT with surgeon ready
- CVS support:
    - noradrenaline - overcome vasodilated
    - adrenaline,
    - dopamine - if compromised systolic function but ⟹ ↑HR & arrhythmia
    - dobutamine - if low CO despite adequate fluid resus (if hypovolaemic ⟹ ↓MAP)
- maintain normothermia

Postoperative Management

- end of surgery:
    - assess lactate/base ratio
    - PF ratio
    - admission to HDU/ICU if
        - high risk, >10% predicted mortality (P-POSSUM)
        - lactate >4

    - PF <400
    - ↓temp 36
- keep intubated if indicated
- UO
- supportive care

Laparotomy for Intestinal Obstruction

- various causes:
    - paralytic ileus
    - concentric narrowing eg Crohns, neoplasm
    - kinking - adhesions
    - Twisting - volvulus
    - intussusception - spont, 2nd to polyp
    - FB - ingested or gallstone
    - pseudo-obstruction

Universal findings

Sequestration of fluid and gas proximal to obstruction
↓
Fluid leaks into peritoneum
↓
Irritation of peritoneum (peritonitis)
↓
Vascular shifts into peritoneal cavity
↓
Hypovolemia, shock, dehydration

Small Bowel		Large Bowel
Increased intra-abdominal pressure	Reverse peristalsis	Gas accumulation → Ammonia↑ → Alkalosis
↓	↓	↓
Pressure on diaphragm	Nausea, vomiting, anorexia	Abdominal distension
↓	↓	↓
Atelectasis	Poor nutrient intake	Bowel perforation
↓	↓	↓
Pneumonia	Malnutrition Dehydration	Bowel contents leak into peritoneum
	↓	↓
	Hypochloraemic alkalosis	Peritonitis → Sepsis → Septic shock

Preoperative

- 4 main features: pain, vomiting, distension & constipation
- large bowel obstruction assoc with vit K deficiency ⟹ coagulopathy
- full Pre-Ax of current clinical status incl exam, bloods, XRs, vitals, PMH, hydration
- careful consideration with surgeons on urgency of surgery:
    - 90% of obstruction 2nd to adhesions will resolve spontaneously
    - majority of cases can be done in next in-hours session
- adequate preop optimisation with inotropes & fluid for 4hrs in HDU ⟹ ↓mortality 17 to 3%

Perioperative

Induction

- NG tube - controversial whether to leave in place or remove pre intubation. Should aspirate
- RSI with double suction setup
- ??epidural - benefits vs risks

- avoid N2O

Maintenance

End of case

Postop

- HDU ideal place
- early establishment of:
  - CVS & resp monitoring
  - fluid balances
  - wound & Abx care
  - early enteral feeding
  - VTE prophylaxis
  - physio

Gastrectomy

Table 1 Functions of the stomach

Functions
Storage of food
Breakdown of solids into chyme after mixing with gastric secretions
Controlled release of chyme into small intestine, aiding efficient digestion and absorption
Defence: acidity kills bacteria
Secretion: intrinsic factor, pepsinogens

- blood supply to stomach from 5 anastomosing arteries - all from branches of coeliac artery
- ANS:
  - PNS from vagal nerve ⟹ acid secretion, closure gastro-oesophageal sphincter
  - SNS from coeliac plexus ⟹ delayed gastric emptying
- grading & staging:
  - TNM Grading:
    - T1-4, N0-3, M0-1
  - Stage 1-3 = curative
  - Stage 4 = any N3 (>15nodes) or mets

Preoperative

- any stage 1-3 should have periop chemo then gastrectomy with lymph node clearance
- chemo =
  - epirubicin ⟹ ↓LV function
  - cisplatin ⟹ nephrotoxicity
  - fluorouracil

  ↳ gastrectomy 3-6 weeks after completion of 3rd cycle then chemo again 6-12 weeks post surgery
- History:
  - IHD, HTN, resp pathology
  - nutritional assessment: BMI <18.5% or weight loss >20%, low albumin
- Ix:
  - PFTs: FEV1 ↓ed by >20% = ↑resp complications
  - CVS disease: ECHO, 350m shuttle test or stress testing
  - bloods - if ↓neutrophils then delay surgery for 3 weeks

Perioperative

Induction

- RSI

Maintenance

- epidural: MASTERS - no diff in outcome but ↓resp complications & ↓pain scores

Postop

- early feeding - placement of NJ tube

Special Points

- overall 5yr survival = 15% - 18% women

Laparoscopic Surgery

- benefits > laparotomy:
  - ↓tissue trauma, wound size & pain
  - ↑ed resp function
  - ↓post op ileus = earlier enteral feeding
  - earlier mobilisation ⟹ ↓LOS
  - ↑ed benefit in obese patients - where open access would be challenging anyway
  - ↑ed cosmesis

Physiological Effects of Pneumoperitnoeum

- Insufflation of CO_2 to av max 20mmHg
  - ↳ non combustible, colourless, non toxic, highly soluble
- Once intrabdominal pressure (IAP) exceeds physiological thresholds see organ effects

CVS Effects

- ↑SVR:
  - Mechanical compression of abdo aorta
  - ↑release vasopressin and activation of renin-angiotensin-aldosterone axis
- ↓CO:
  - Compression of IVC ⟹ ↓VR ⟹ ↓preload ⟹ ↓CO
    - ↳ especially if hypovolaemic
  - Cephelad displacement of diaphragm ⟹ ↑intrathroacic pressure ⟹
    - ↓VR (as above)
    - Compression pulmonary vasculature ⟹ ↑RV afterload

Resp Effects

- ↑IAP ⟹ ↓diaphragmatic excursion ⟹
  - ↑intrathroacic pressure
  - ↓compliance
  - ↓FRC
  - Atelectasis
  - Altered VQ relationships
  - Hypoxaemia
- Absorbed CO_2 ⟹ ↑PCO_2 which is worsened by VQ mismatching

GI Effects

- ↓kidney & liver blood flow - especially in mod/severe organ disease states
  - ↳ IAP 20mmHg = ↓GFR ≈ 25%
  - ↳ Mechanism thought to be ↓afferent flow (2nd to low CO) & ↓efferent flow (high venous pressure)
- IAP persistently >20 = ↓40% blood flow to mesenteric & GI mucosa ⟹ ↑acidosis

Neuro Effects

- ↑ICP ⇛ ↓CPP:
  - ↑IAP ⟹ ↑intrathroacic pressure ⟹ ↓cerebral venous drainage ⟹ cerebral oedema
    - ↳ despite ↑ed mean cerebral arterial pressure

Pathological Effects of Laparoscopy

- autonomic effects:
  - vagal stimulation ⇛ arrhythmia
  - SNS drive ⟹ HTN & ↑HR
- CO_2 effects =
  - ↑$PaCO_2$ & acidosis
  - may require CO_2 break if long surgery
- gas insufflation into tissues:
  - SC emphysema esp Nissen fundoplication ⟹ check neck
  - pneumomediastinum
  - pneumopericardium
  - pneumothorax
- venous gas embolism - less severe than with air due to ↑solubility

    - look for mill wheel murmur
    - ↑↓EtCO2 as CO2 insufflated
- trauma to organs/vessels - sometimes missed eg retroperitoneal

Effects of Steep Trendelenburg Positioning

- = Classic 45deg head down tilt

- CVS system
    - In healthy little long lasting effect due to quick compensation VD to overcome ↑VR
    - No RCT evidence to support trendelenburg position is of benefit in correcting acute ↓bp
    - In elderly or comorbidities with impaired vasomotor control may see ↑bp:
        - Capillaries and most of venous blood above heart
        - Incr VR ⟹ ↑preload ⟹ ↑stroke volume ⟹ ↑CO ⟹ ↑bp
          ↳ effect is marked in
            - deep inhalation: -ve pressure vent ⟹ ↑-ve intrathoracic pressure
            - high spinal/anaesthesia - sympathetic blocking ⟹ ↑VD ⟹ ↑VR
    - Possibility of ↓bp is also argued:
        - ↓VR 2nd to intraabdo and pelvic organs compressing IVC
    - Risk of adverse consequences in people with cormobidities:
        - Obese
        - Compromised RV EF ⟹ R heart failure
        - Pulmonary disorders
        - Head injuries
    - Well leg compartment syndrome - combination of:
        - ↓arterial perfusion to raised LLs
        - Compression of leg vessels by SCDs
        - ↓femoral drainage by +/- pneumoperitoneum
- Resp system:
    - Raised diaphragm with gravity and weight of abdo cavity organs:
        - ↓VC, ↓FRC, ↑risk basal atelectasis
          ↳ 20deg head tilt = ↓VC by 15%
    - Hypercarbia 2nd to shunt
    - Incr VQ mismatch: ventilation maximal at bases, perfusion maximal at apex 2nd to gravity
    - Endobronchial intubation - northward movement of pt with fixed position of ETT ⟹ relative southwards migration of tip of ETT further into lungs
    - Upper airway oedema 2nd to orthostatic forces (prolonged positioning)
- Airway/Positioning:
    - Movement of pt with gravity causing soft tissue damage to lips on ETT and tie
    - Danger of patient falling from surg table
- Digestive system:
    - Pooling of secretions in dependant part ie nasopharynx ⟹ ↑risk laryngospasm if not suctioning pre extubation
    - Increased risk of aspiration of gastric contents - if non secured airway
- Neuro:
    - Intra and extra cranial venous congestion ⟹ ↑ICP
    - ↑risk cerebral oedema
- Eye - ↑intraoccular pressure

Anaesthesia

Preoperative assessment

- generally accepted absolute CIs:
  - ↑ed ICP
  - severe hypovolaemia
  - known R ⟹ L cardiac shunts or PFO
- relative contraindications –
  - IHD,
  - hypovolaemia,
  - valvular disease,
  - severe CKD,
- all patients need to be considered for conversion to open procedure
- anaesthesia for the obese patient may need to be reviewed
- premedications; aspiration medications, anxiolytics and analgesics

Intraoperative management

- GA – ETT gold standard, may need NG tube, PEEP to prevent atelectasis, selected cases may warrant use of any LMA (short, non-obese, no reflux)
- avoid stomach insufflation; decompress bladder
- avoid N2O
- monitor and maintain normocapnia
- use of peripheral nerve stimulator advised
- PONV incidence high
- epidural -> requires very high block (T2-4)

Postoperative management

- ask surgeon to get rid of as much gas as possible
- local, local, local
- better spirometry post op
- less atelectasis
- shoulder tip pain ->
- shorter stay in hospital

HYPOXIA DIFFERENTIAL

- hypoventilation – pneumoperitoneum and head down
- reduced Q – IVC compression, haemorrhage, myocardial ischaemia, VGE, extraperitoneal gas
- V/Q mismatch – reduced FRC, endobronchial intubation, atelectasis, VGE, aspiration, pneumothorax
- subcutaneous emphysema -> find source

Laprascopic Cholecystectomy

- conversion to open ~5% due to:
  - unable to identify cystic duct
  - suspected common bile duct injury
  - uncontrolled bleeding from cystic artery
  - stones in CBD
  - acute inflam changes preventing adequate dissection

Preoperative

- classic = female, forty, fair, fat & fertile
- check for pancreatitis complications
- premed analgesia

Perioperative

Maintenance

- high risk PONV - double anti-emetics
- pain -
    - can be intermittently very painful
    - LA to gall bladder bed very effective

Laparoscopic Hemicolectomy/Anterior Resection

- laparoscopic colorectal surgery involves:
    - small incisions
    - extreme positioning
    - ↓post op pain but prolonged procedure
    - ↑risk of conversion to open

Preoperative

- routine pre op bloods
- likely steep head down - check no neuro problems eg ↑ICP, ICH

Perioperative

Induction

- A line asleep
- OG tube post induction
- careful positioning
- IV opioids - remi a good option for long case
- restrictive fluid strategy shown better than liberal
- careful eye protection in case gastric reflux ⟹ eyes when steep head down

Postop

- conjunctival oedema common

Appendicectomy

Preoperative Management

- find out whether laparoscopic vs open
- patients often young and fit
- in elderly may be presenting complaint of caecal adenocarcinoma -> right hemicolectomy
- check fluid status + replace
- if considering ilioinguinal block warn of possible femoral nerve block

Intraoperative Management

- RSI
- relax with short acting agent
- NSAIDS + paracetamol
- infiltrate with LA or ilioinguinal block or R TAP

Post operative Management

- simple analgesia
- PRN opioid
- anti-emetics
- IVF until tolerating PO fluids

Inguinal Hernia Repair

Preoperative Management

- usually fit young males or small children
- often done as a day case

Intra-operative Management

- supine
- blood loss not significant
- time 30-60min
- with use of mesh -> give prophylactic antibiotics
- can be performed under

1. LA infiltration with sedation
2. GA (ETT or SV with LMA)
3. Inguinal field block (use for high risk patients) - see regional anaesthesia page
4. Spinal

- need opioid if LA not used

Post operative Management

- discharge with paracetamol, NSAID +/- tramadol

Haemorrhoidectomy

Preoperative Management

- standard care

Intraoperative Management

- position usually lithotomy
- normally 20min
- minimal blood loss
- painful (use short acting opioid or get deep)

- can be performed under:

1. GA (LMA + SV) -> use ETT if patient obese or has GORD
2. spinal – saddle block
3. caudal

- usually LA infiltration by surgeon adequate analgesia
- anal stretching – ensure deep anaesthesia to avoid: bradycardia, asystole, laryngospasm or coughing

Post operative Management

- simple analgesics
- avoid PR drugs

Breast Surgery

Preoperative Management

- patients often anxious - midaz premed
- warn patients of post operative pain and PONV sometimes difficult to manage
- gain rapport
- explain anaesthesia
- chart premedication if required

- check most recent chemo (may be immunocompromised)
- check FBC
- often have difficult IV access
- reconstructive procedures -> increased blood loss (G+H)

Intraoperative Management

- long procedures require active warming
- avoid venous access of side of surgery
- invasive monitoring maybe require for reconstructive procedures
- look out for potential nerve compression
- balanced, multimodal analgesia
- PONV high risk (30-40%)
- regional analgesia sometimes appropriate;
    - may be overkill considering risks
    - better in more radical surgery
    - paravertebral block, thoracic epidural, intercostals blocks, and intrapleural block

Table 3 Advantages and disadvantages of regional anaesthetic techniques

Advantages	Disadvantages
Attenuate surgical stress response	Significant failure rate with continuous techniques (20% epidural, 10% PVB)
Superior analgesia	Local anaesthetic toxicity (very rare)
Less or no opioid consumption	Pneumothorax (1% PVB, 2% intrapleural, 2% intercostal)
Less PONV	Bleeding risk (especially epidural haematoma)
Early mobilisation	Dural puncture
Avoids immune function inhibition	Contra-indicated in local infection
	Hypotension
	Urinary retention

Post-operative management

- HDU may be required after extensive procedures
- chronic pain syndrome:
    - 25-30% at 1yr
    - located anterior chest wall, ipsilateral axilla or upper arm (phantom breast pain)
- don't cannulate affected side long term:
    - increased risk of infection and lymphoedema
    - but limited evidence of problems
    - ok to cannulate affected side & remove at end of procedure

Day Case Colonoscopy

Preoperatively

- standard

Intraoperatively

- standard monitoring + O2 FM & ETCO2 monitoring
- IVF (balanced crystalloid) - corrects hypovolaemia from bowel prep and augment preloads
- position patient in lateral position (as guided by surgeon)
- titrate propofol either by IV infusion (TCI) 0.5-3 mcg/mL
- allow colonoscopy to be carried out

- once finish turn propofol off
- propofol sedation advs:
    - rapid, predictable sedation
    - rapid, cleared headed recovery

- profound anti-emetic properties (good for day case procedures)

Post-operatively

- transfer to recovery area
- treat any side effects (PONV, discomfort)
- allow discharge once criteria met :
  - patient mobile, pain free, no PONV, has eaten, obs normal, fully awake & orientated
  - suitable carer to escort home and monitor,
  - doesn't live far from hospital
  - has access to a telephone,
  - clear plan to gain help if develops troublesome symptoms