Contents

Day Stay Surgery

- requires co-ordination and a MDT approach
- anaesthesia and surgery must be performed @ a high standard for day surgery to run smoothly
- 70% surgeries = day stay

Advs:

- To patient:
  - Recover in own home
  - Less change of cancellations
  - Less hosp infections
  - Less VTE

- To hosp:
  - Efficient use of beds
  - Less cost
  - Less hosp wait times

ISSUES
- patient
- social
- anaesthetic
- surgical

Patient selection

- should be preassessed by a specially trained nurse with adequate access to anaesthetic/medical staff for advice
- older patients will need preassessment earlier to allow time for investigations to be organized
- patients must agree to not drive, cycle, operate machinery, drink ET-OH for a minimum of 24 hrs after their anaesthetics
- moderate obesity increases anaesthetic risk and can make surgery difficult -> and can unpredictably lead to complications, thus need to be adequately assessed

- **Health status**:
  - ASA 1 or 2
  - no potential resp complications
  - BMI now only relative contraindication ie <35. (most complications occur 3-4hrs post op)
  - OSA -
    - only if mild & treated esp if no opioids ie regional
    - should have 1 hr extended PACU observation
    - D/C criteria home:
      - 2 hr obs
      - no PACU apnoea
      - min opioid needed
      - no other concern
  - (specifically not haematology, DM, neuromuscular disorder)
- **Age**: older than 6 months -> elderly should be assessed with regard to physiological reserve
- **Complexity of surgery**:
  - operations should be less than 60min and risk of major complication unlikely
  - no massive fluid shifts/risk of major haemorrhage
- **Transport:** escort home
- **Home conditions:**
  - adequate facilities (toilet and bed and phone)
  - telephone available in case of emergency
  - supervision for 24 hours post op must be available
- **Geography**: should live within 1 hour of medical attention

Fasting

- 6 hours food
- 2 hours clear fluid

Preoperatively

- commonly telephone preoperative assessment
  - structured questionnaire
  - written instructions about plan for DOS
- avoid premedication if possible -> if required oral midazolam 0.5mg/kg, raniditine 300mg or omeprazole 40mg
- paracetamol 20m/kg, diclofenac 50-100mg PO

Intraoperatively

- must address common complications:
  - bleeding
  - pain
  - nausea
- IV propofol -> TIVA or sevo
- incremental fentanyl 2-4mcg/kg in divided doses
- LA
- LMA preferable
- PONV prophylaxis as indicated

Post operatively

- opioids, LA, NSAIDS
- treat pain early
- hot water bottles following gynaeological surgery

Regional anaesthesia

Spinals

- perform spinals early in list -> allow complete resolution of block & ambulation before discharge (use 0.25% heavy bupivacaine -> decreases block duration + 10-25mcg of fentanyl, should pass urine and ambulate before discharge)
- risk of

Regionals

- arms blocks -> patients need education about protection of limb (some block regression before discharge allowed)
- leg blocks -> some block regression should be observed, adequate mobility with crutches must be demonstrated
- single shot blocks:
  - advs: ↓opioids use, ↓PONV, good initial analgesia
  - disadv: wear off at home ⟹ ↑pain, time consuming, ↑motor block (falls risk), sensory block - neurochemical damage, risk of dislocation
- pre-d/c need good written info and plan B for return/help

Discharge

CRITERIA

- stable vital signs for 1hr
- fully awake and orientated
- able to drink and eat
- if sig risk of urine retention (eg after spinal/caudal) then must PU
- ambulant
- pain and nausea controlled

ORGANISATION

- IV out

- discharge papers
- discharge prescription for analgesia +/- antiemetics
- plan for readmission if concerned or develops troublesome symptoms
- surgical follow up plan
- GP letter
- contact telephone number
- collected and monitored by responsible adult

Admission required

- don't fufill discharge criteria
- complications
- unexpected extensive surgery
- inadequate social circumstances

Planning a New Unit

- consider yourself as a patient and work through process systematically

TIVA Advantages

- rapid recovery
- low rate of behavioural disorders
- ↓PONV
- avoid risk of failure of regionals
- avoid risk of residual NMB relaxation (if using remi)
- avoids MH
- cheap
- avoids need for scavenging equipment
- ↓environmental

PONV

PONV; guidelines

Society of Ambulatory Anaesthesia guidelines for the Management of PONV (SAMBA, 2014)

Guideline 1: Identify Patients' Risk for PONV

Guideline 2: Reduce Baseline Risk Factors for PONV

Guideline 3: Administer PONV Prophylaxis Using One to Two Interventions in Adults at Moderate Risk for PONV

Guideline 4: Administer Prophylactic Therapy with Combination (>2) Interventions/Multimodal Therapy in Patients at High Risk for PONV

Guideline 5: Administer Prophylactic Antiemetic Therapy to Children at Increased Risk for POV; as in Adults, Use of Combination Therapy Is Most Effective

Guideline 6. Provide Antiemetic Treatment to Patients with PONV Who Did Not Receive Prophylaxis or in Whom Prophylaxis Failed

PONV risk factors

Overall PONV incidence ~50%
↳ can be up to 80 % in high risk

Major risk factor in red.

Patient

- female
- <50yrs old
- non-smoker
- history of motion sickness

- previous history of PONV
- concomitant disease associated with nausea and vomiting (bowel obstruction, posterior fossa tumour, gastroenteritis, vertigo, nystagmus, gastric dysmotility, pregnancy)
- DM
- emetogenic medications; NSAIDS, chemotherapy

Anaesthetic

- N2O use
- opioid use (any rather than specific agent) (post op rather than intra-op opioid)
- volatile anaesthesia

- inadequate analgesia
- no prophylactic use of anti-emetics
- tramadol bolus when awake
- some antibiotics (cephazolin bolus)
- etomidate
- (ketamine - only in high doses ie no prob with analgesic dosing)
- reversal agents; neostigmine and atropine

Surgical (general rather than pertaining to this patient)

- duration of surgery (OR 1.47/hr)
- laparoscopy, laparotomy, breast, strabismus, plastic, maxillo-facial, gynaecological, abdominal, neurologic, urologic, ophthalmologic

APFEL Score

Baseline risk of PONV general incidence = 10% (Apfel criteria)

+ 1 factor = 20%
+2 factors = 40%
+3 factors = 60%
+ 4 factors = 80%

- female
- non smoker
- Hx PONV
- Postop opioids anticipated

Disproven Risk Factors

Not assoc:

- BMI
- Anxiety
- NG tube
- O2
- Periop fasting

Conflicting evidence:

- ASA
- Menstrual cycyle
- Level anaesthetist experience
- Mm relaxant antagonists

Paeds PONV

- RFs:
  - surgery >30min
  - age >3
  - strabismums
  - Hx of PONV or Hx in FH

Post Discharge Nausea & Vomiting (PDNV)

- RFs:
  - female
  - age < 50
  - Hx PONV
  - Opioid in PACU
  - nausea in PACU

Management Strategies

PreOp

- avoid GA ie regional
- propofol & TIVA (NNT 5)
- avoid N2O
- avoid volatiles
- minimise intraop opioids & post op ie multimodal analgesia
- adequate hydration
- neostigmine - only >2.5mg
- low dose propofol:
  - end of case
  - PACU rescue
- prophylaxis:
  - low risk - nothing
  - medium risk - 1 or 2 drug interventions from diff classes
  - high - >2 drug interventions from diff classes

Post Op

- drugs - use different classes. The more classes the better:
  ↳ each class (& then additional classes) give 25% reduction of left over risk
  - droperidol -
    - only in children if to be admitted
    - equally effective as ondansetron (NNT = 5)
    - if used with ondansetron no super added effect on QtC prolongation
    - can place in PCA ⟹ NNT =3

- ondansetron -
  - 4mg NNT =
    - 5 for nausea
    - 7 for vomit
  - NNH = headache 36, ↑LFTs 31
  - QTc prolongation
- dexamethasone 4mg (=25mg pred)
- scopoderm patch:
  - NNT = 6
  - side effects - cholineric ie dry mouth, dizziness
  - 2hrs onset of affect
- metoclopramide:
  - 10mg not effective; >20mg ok
  - shorter action
  - NNT:
    - 10mg = 30
    - 20mg = 16
    - 30 = 11
  - ↑extrapyramidal symptoms with ↑dose 0.5%
- propofol:
  - good for early PONV ie within 6hrs
  - 20mg rescue in PACU
  - ↓risk of PDNV
- Gabapentin:
  - 600mg 2hrs prior to surgery
  - as effective as dex 8mg
- Midazolam
  - 2mg 30min prior to end of surgery as effective as ondansetron

- other:
  - IV hydration
  - naloxone infusion
  - non pharmacological strategies:
    - acupuncture
    - happiness

Impact Trial

Table 1. Risk of Postoperative Nausea and Vomiting According to Patients' Randomly Assigned Interventions.

Intervention	Received Intervention		Percent Relative Risk (95% CI)*	P Value†
	Yes	No		
	no. with PONV/total no. (%)‡			
Ondansetron (vs. no ondansetron)	735/2576 (28.5)	996/2585 (38.5)	−26.0 (−31.5 to −19.9)	<0.001
Dexamethasone (vs. no dexamethasone)	739/2596 (28.5)	992/2565 (38.7)	−26.4 (−31.9 to −20.4)	<0.001
Droperidol (vs. no droperidol)	742/2573 (28.8)	989/2588 (38.2)	−24.5 (−30.2 to −18.4)	<0.001
Propofol (vs. inhalational anesthetic)	1066/3427 (31.1)	665/1734 (38.4)	−18.9 (−25.0 to −12.3)	<0.001
Nitrogen as carrier gas (vs. nitrous oxide)	668/2146 (31.1)	755/2131 (35.4)	−12.1 (−19.3 to −4.3)	0.003
Remifentanil (vs. fentanyl)	827/2386 (34.7)	792/2403 (33.0)	5.2 (−2.9 to 13.8)	0.21

	Intervention	Interventions	Interventions	Interventions
	percent			
10%	7	5	4	3
20%	15	11	8	6
40%	29	22	16	12
60%	44	33	24	18
80%	59	44	32	24

* The baseline risk levels of 10 percent, 20 percent, 40 percent, 60 percent, and 80 percent reflect the presence of 0, 1, 2, 3, and 4 risk factors, respectively, according to a simplified risk score.[17]

Implementing a Strategy

- Risk assessment
- algorithm
- implement
- compliance & audit
- assessment

PACU

- Anaesthetic Crises in PACU:
  - Oxford Handbook Emergencies
  - My crisis manual

- College Recommendations

Failure to Wake

1. Pharmacological
2. Metabolic
3. Hypothermia
4. Resp failure
5. Neurological
6. Uncommon

Pharmacologicial = Common causes:

- residual effects of
  - sedative agents (look @ dose and timing, give small dose of flumazenil if benzodiazepine used or naloxone if opioid use)
  - anaesthetic agents (look @ dose and timing, often these will wear off with time)
  - analgesic agents (if opioids used can look for small pupils and decreased RR, can wait for them to wear off or trial naloxone)
  - neuromuscular blockers (neuromuscular monitoring):

Interactions with non-depolarising muscle relaxants	
Drug Interactions	Volatile anaesthetic agents
	Aminoglycosides
	Lithium
	Diuretics
	Calcium channel antagonists
Metabolic Causes	Hypothermia
	Acidosis
	Hypokalaemia
	Hypermagnesaemia
Genetic	Myasthenia gravis
	Eaton Lambert/Myasthenic syndrome
Interactions with depolarising muscle relaxants	
Genetic	Succinylcholine apnoea
	Myotonic Dystrophy
Acquired acetylcholinesterase deficiency	Pregnancy
	Liver Disease
	Renal failure
	Cardiac failure
	Thyrotoxicosis
	Drugs (ecothiopate, ketamine, oral contraceptive pill (OCP), lidocaine, neostigmine, ester local anaesthetics)

Metabolic
- causes incl:
  - ↓BSL - check
  - ↑BSL (would have to be severe and prolonged)
  - ↓Na - <110 to cause seizure/coma (SIADH, TURP syndrome, cerebral salt wasting)
  - ↑Na
  - uraemia

Hypothermia
- <30 ≈ unconciousness

Resp failure
- hypoxaemia
- hypercapnia

↳ causes =
- neurological ie ↓central drive eg intracranial pathology, COPD, central apnoea,
- pulmon disease eg PE, atelectasis, ARDS
- musculature eg obesity, primary mm problem

Neuro Causes
- ischaemic brain cell death - low MAP & failed cerebral autoregulation intra op
- non-conulsove status epilepticus (EEG) or post ictal
- haemorrhage
- thrombosis/infarct
- LAST

Uncommon
- central anticholinergic syndrome - reverse with a -stigmine which crosses bbb
- dissociative coma
- thyroid failure
- valproate tox

Agitation in PACU

Differential Diagnosis
- disorientation/emergence agitation in paeds
- pain
- stridor from obstructed airway:
  - patient factors
  - surgical factors
- hypoxaemia (check SpO2 and ABG)
- hypercarbia (check ETCO2 and ABG and look at WOB)
- hypotension:
    - hypovolaemia (blood loss, dehydration)
    - cardiogenic
    - distributive (anaphylaxis to agent administered late in OT or in recovery)
    - obstructive (may have undiagnosed tamponade or PE or fat embolism)
- electrolyte abnormality – severe hyponatraemia (iatrogenic administration of dextrose)
- hypoglycaemia (may have a liver injury be diabetic and given hypoglycaemic agents)
- ET-OH withdrawal (may have high ET-OH intake)
- nicotine withdrawal (see above)
- psychosis (psych medications may have been withheld)
- hypothermia (long operation with lots of body exposed)
- metabolic acidosis (check with ABG)
- MH (examine for rigidity, examine patient and interpret ABG)
- neuroleptic malignant syndrome (interactions with anaesthetic agents)
- serotonin syndrome (administration of tramadol with SSRI)

LMA in PACU

Arguments for:

- increased case turnover
- low frequency of airway complications when removing LMA
- LMA maintains a patent airway (removing while patient is deep may provoke laryngospasm or airway obstruction on lightening)
- able to apply high FiO2 concentration via an attached reservoir bag
- reservoir bag able to provide visual and auditory information of patients ventilation
- LMA provides some protection from aspiration as patient waking
- patient able to tolerate for until a very light degree of sedation therefore, once patient indicating removal patient protecting own airway

Arguments against:

- risk of laryngospasm when on lightening and removal of LMA (an unsupervised nurse may not have skills to manage the situation)
- if taken out too early may lead to loss of airway patency, laryngospasm, aspiration and consequential hypoxaemia.

PACU Discharge

- Scoring systems to facilitate readiness for d/c:
  - SpO2 >93%
  - breathing
  - BP
  - LOC
  - Movment
  - Pain
  - PONV
- If score >12 - can d/c without anaesthetist involved
- Normothermic
- Fluids & meds charted
- RR >10 <28
- lines flushed

Post Op Visit

- general purpose is to ensure morbidity & mortality of pt minimised
- feedback to self on quality of anaesthetic

Specific issues that should be addressed:

General information

- reassurance
- answering of questions
- assessment and adjustment of analgesia
- assessment of sensory or motor recovery from regional anaesthesia
- inform patient of complications and follow up
- feedback to anaesthetist regarding technique
- discharge check
- follow up if required

Assess for Complications

RESP
- functional status
- oxygenation
- sore throat
- dental damage

CVS
- haemodynamic stability
- adjustment of fluid therapy according patients needs
- advice on management of patients medications (beta-blockers, statins)

GI
- PONV
- bowel function

RENAL
- urine output
- U+E

SKIN
- pruritus
- pressure areas
- integrity of epidural site

HAEM
- Hb (blood loss)
- coagulation (advice on when to remove epidural catheter)