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General Considerations

Anaesthetic Implications

- major incl:
  - capacity of pt to give consent - most can give consent
  - assoc physical illness eg anorexia nervous
  - psych med interactions
Practical Problems

Sedation of Agitated Ward Patients

Acute confusional state/delirium:
- Precipitants:
  ‣ pain
  ‣ new environment
  ‣ strangers
- Presentation:
  ‣ confused
  ‣ disorientated
  ‣ agitated
  ‣ disinhibited
  ‣ violent
  ‣ hallucinations - visual & auditory
- If acute most likely organic cause
  ‣ ⟹ find & treat it
  ‣ exclude: hypoglycaemia, hypoxia, pain, alcohol withdrawal, full bladder
- Differential diagnosis:
  ‣ infection
  ‣ drugs
  ‣ metabolic - electrolytes, BSL
  ‣ head injury
  ‣ stroke
  ‣ acute psych disorder
  ‣ acute porphyria
- Drugs:
  ‣ haloperidol 5mg IV (1mg in elderly) - rpt after 5 min to max 18mg
  ‣ midaz 1-2mg IV - may cause paradoxical disinhibition & ↑ risk of falls
  ‣ alcohol withdrawal ⟹ benzo's orally 5-20mg diazepam
  ‣ ketamine 0.5-1mg/kg IV or 5-10mg/kg/IM in emergencies

Drug Misuse Patients

<table>
<thead>
<tr>
<th>Table 12.2 Street drugs in common use</th>
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<tbody>
<tr>
<td><strong>Drug</strong></td>
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<tr>
<td>Cannabis</td>
</tr>
<tr>
<td>Stimulants: cocaine, amphetamines, ecstasy</td>
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<tr>
<td>Hallucinogens: LSD, phencyclidine, ketamine</td>
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<tr>
<td>Opioids: morphine, heroin, oxycodone</td>
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Opioids
- deserve high quality anaesthetic
- RA & NSAIDs ideal
- opioids may need to be given in high doses
- consent from ex-addicts for opioid use post op

**Goals:**
1. Adequate analgesia
2. Avoidance of withdrawal
3. Management of drug seeking behaviour

3 groups of patients – IVDU, chronic non-cancer pain, cancer patients

**Preoperative assessment management**
- focussed history and examination specifically looking at the following:
  - usually will be a patient who has a substance dependence behaviour
  - dose of naltrexone
  - normal dose/intake of opioid (important this is maintained to withdrawal isn’t precipitated)
  - information major abdominal surgery will induce severe pain
  - discuss and advice epidural or rectus sheath siting if no contra-indications (spare opioids required)
  - major co-morbid conditions associated with IVDU:
    - murmurs,
    - history of endocarditis,
    - stigmata of endocarditis,
    - IV access issues
  - use of other analgesics (methadone) or recreational drugs (medications)
  - smoking history
  - social support

**Intraoperative management**
- site epidural
- ensure has taken all treatments
- ensure naltrexone stopped 24 hours prior to operation
- careful titration of opioids to perceived pain
- BIS monitoring
- good anxiolysis

**Post-operative management**
- close monitoring in 36-72 hours for withdrawal – yawing, sweating, lacrimation, anxiety, rhinorrhoea, tachycardia, diarrhoea, nausea, vomiting, abdominal pain and cramps.
  - regular non-opioid analgesia: paracetamol, tramadol and NSAIDS
  - if using PCA must set a background rate equivalent to their normal daily intake
  - increase dose until analgesia achieved or side-effects limit increase
  - once analgesia controlled -> reduce opioid intake 20%/day until pre-admission levels achieved
  - clonidine = good agent to treat withdrawal
  - use an objective measurement when assessing pain (ability to cough), pain scores are less reliable
  - liaise with patients A&D consultant

**Cocaine**
- toxicity = central & periph adrenergic stimulation:
  - CVS: ↑HR, HTN, arrhythmias, coronary spasm, infarction, death
  - neuro: intracerebral vasospasm ⇒ stroke, rigidity, hypertonia, hyperreflexia, hyperthermia
  - resp (inhalation of powder): alveolar haemorrhage, APO
  - psych: elation ⇒ enhanced physical strength ⇒ paranoid psychosis
- if need surgery following ingestion ⇒ ICU to stabilise pre-op
- life threatening problems related to vasospasm - reverse with:
  - vasodilators
  - antiarrhythmic agents
  - β blockers
- titrate small doses of vasopressors intraop
- intra-arterial cocaine injection ⇒ critical limb ischaemia:
- regional plexus block
- IV heparin
- stellate ganglion block
- intra-arterial vasodilators
- urokinase
- early fasciotomy

### Ecstasy

- =MDMA
- stimulant related to amphetamine
- problems =
  - ↑temp >39
  - DIC
  - dehydration ⇒ excessive ADH release (or water ingestion) ⇒ ↓Na ⇒ coma
Anxiety
- extremely common peri-op:
  › explanation
  › reassurance
  › oral premed
  › IV sedation
- Acute or chronic symptoms

Dementia
Preoperative
= irreversible global deterioration in higher mental functioning
- causes:
  › Alzheimer’s - 50%
  › MID
- increases with age
- mean life expectancy = 7yr from diagnosis

HISTORY
- confusion
- wandering
- memory loss
- unable to perform ADL’s
- disorientation
- withdrawn

EXAMINATION
- low AMT

INVESTIGATIONS
- dementia screen
- CT head

MANAGEMENT
- supportive
- anticholinesterase drugs
- consent will be problematic

Intraoperative
- if on anticholinesterase drugs -> prolong the action of sux and antagonise the action of NDNMBD
- ketamine can be good agent for positioning/regional anaesthesia
  ↳ may seen paradoxical agitation with midaz
- ↑ risk of POCD

Anorexia Nervosa
Preoperative
= chronic, severe, multi-system disorder which is rooted in a fear of becoming fat with deliberate weight loss
- highest mortality of any psych disorder
- 0.3% of females (bulimia nervosa 1%)
- ages 13-20

**CLINICALLY**
- thin
- psych comorbidities: major depression, anxiety, OCD
- drug misuse - laxatives, emetics, diuretics
- evasive historian
- malnutrition & starvation ⇒ cachexia, hair loss, OP
- immunosuppression at <50% of normal body weight
- panhypopituitarism features: hypothyroid, loss glycaemic control, amenorrhoea
- CVS: bradycardia, hypotension
- risk of cardiac failure if over-filled intraop
- delayed gastric emptying

**INVESTIGATIONS**
- ↓Cl, ↓Ca, ↓K metabolic alkalosis - from excessive stomach fluid loss
- ECG changes in up to 80%: AV block, ST depression, TWI, prolonged QT, arrhythmias

**MANAGEMENT**
- rehydrate
- fix electrolytes
- avoid re-feeding - dangerous so avoid

**Intraoperative**
- cautious fluid therapy as can precipitate cardiac failure
- loss of lung elasticity ⇒ high AWP
- RSI
- NMB - potentiated if ↓K & ↓Ca
- pressure cares
- avoid hyperventilation
- hypothermia cares
- avoid neostigmine if possible - risk of arrhythmia

**Alcohol Abuse**

**Preoperative**
- stages:
  ‣ 1. fatty infiltration ⇒
  ‣ 2. alcoholic hepatitis ⇒
    - abdo pain
    - weight loss
    - jaundice
    - fever
  ‣ 3. cirrhosis
    - jaundice
    - ascites
    - portal HTN
    - hepatic failure

**HISTORY**
- increased ET-OH intake
- abdo pain
- weight loss
- jaundice
- hypoglycaemia
EXAMINATION
- fever
- jaundice
- ascites
- portal hypertension
- hepatic failure
- alcoholic cardiomyopathy

INVESTIGATIONS
- ECHO: dilated, hypokinetic LV, decreased EF
- BSL
- LFTS
- Coags

MANAGEMENT
- stop drinking
- avoid non-emergency surgery
- hydrate
- support glucose and electrolytes
- IV vitamins
- correct clotting

Intraoperative
- acutely intoxicated:
  - decreased anaesthetic requirements
  - RSI
  - check for ↓BSL
- chronic user:
  - increased anaesthetic requirements
  - 2-5 fold ↑ in post op complications

Postoperative
- monitor for withdrawal -> diazepam
  → most can tolerate 24 hr withdrawal
- withdrawal seizures:
  - 6-48hr post cessation alcohol
  - cluster over few days common
  - ↓K & ↓Mg predispose
  - use benzo’s

BiPolar Affective Disorder

Preoperative
= recurrent episodes of altered mood and activity with both mania and depression

HISTORY
- increased risk in females
- peaks in early 20’s
- may lack insight when manic

MANAGEMENT
- mood stabilizers (lithium, carbamazepine or valproate)
- continue throughout perioperative period
Depression & Anti-Depressants

Preoperative
= persistent low mood + cognitive and functional impairment
- monoamine theory of depression = deficiency of serotonin & noradrenaline in CNS

HISTORY
- incidence 10-20%
- F:M 2:1
- peak incidence in late 20's

MANAGEMENT

1. TCA's
- mostly now replaced by SSRI's
- block the re-uptake of amines from the synaptic cleft by competition
- need to be given for 2-4 weeks before they are effective
- side effects (anticholinergic) : dry mouth, sedation, blurred vision, urinary retention, constipation, postural hypotension
- toxicity: agitation, delirium, respiratory depression, coma, QT prolongation -> alkaline plasma ⇒ ↓free drug
- anaesthesia:
  ♦ keep TCAs going,
  - use direct acting sympathomimetics in small doses (↑sensitivity) eg pheny, adren, norad (avoid ephedrine/metaraminol)
  - be careful of delayed gastric emptying,
  - avoid atropine (↑risk confusion)
  - avoid tramadol (CNS toxicity)

2. SSRI's
- inhibit presynaptic reuptake of serotonin from synaptic cleft and are much less toxic than TCA's
- side effects: nausea, vomiting, diarrhoea, insomnia, agitation, tremor, headache, sexual dysfunction, SIADH, platelet inhibition ⇒ prolongation of bleeding time, risk of coronary vasoconstriction
- beware of Serotonin Syndrome – precipitants: TCA's, MAOI's, pethidine, tramadol
- they inhibit cytochrome P450 and prolong the actions of: warfarin, phenytoin, carbamazepine, benzodiazepines, flecanide and some NSAIDs
- anaesthesia: keep going perioperatively, check U+E (r/o ↓Na), check coags, cautious use of benzodiazepines, avoid agents that may precipitate serotonin syndrome

  - serotonin syndrome:
    ♦ = toxic crisis from ↑synaptic serotonin in brainstem & spinal cord
    ♦ causes: overdose of SSRI or combo with other serotonin drugs - TCAs, MAOIs, pethidine, tramadol
    ♦ symptoms:
      - early: agitation, confusion, rigidity, myoclonus, hyperreflexia, autonomic instability (fever, ↑HR, diarrhoea, ↓↓bp)
      - late: seizures, occulogyric crises, DIC, rhabdo, myoglobinuria, AKI, arhythmia, coma, death
    ♦ can mimic neuroleptic malignant syndrome
    ♦ supportive treatment ⇒ cooling, benzo’s, cryropheptadine
    ♦ episode generally lasts <24hrs

3. MAOI's
- now 3rd line antidepressants
- MAO is found in mitochondrial membranes and metabolises serotonin, noradrenaline, adrenaline and other amines
- 2 types of MAO:
  ‣ A =
  - metab serotonin, norad, adren.
  - Mostly found in CNS
  ‣ B =
  - makes up 75% of all MAO activity
  - metab non polar aromatic amines eg phenylethylamine, methylhistamine
  - found in liver, lungs, non neural cells
- Tyramine & dopamine = substrates for both A & B
- irreversible binding = tranylcypromine, phenelzine, isocarboxazid (regeneration takes 3 weeks)
- reversible binding = moclobemide (A), linezolid (antibacterial for MRSA) (non selective) , selegiline (B)
  (parkinsons disease)
- anaesthesia:
  ‣ stop moclobemide for 24 hours,
  ‣ stop irreversible agents for 2 weeks (discuss with psychiatrist!),
  ‣ drugs:
    - avoid pethidine
    - avoid indirect sympathomimetics metab’ed by MAO ⇒ greatly exaggerated effects ⇒ displace NA from vesicles in huge amounts ⇒ HTN crisis
    - use
      • IVF
      • only direct acting sympathethomimetics (pheny, adren, norad) and use cautiously as ↑ed effect
    - cautious use of opioids -
      • morphine gold standard - but no direct evidence of probs with fentanyl/alfentanil/remi
      • prolonged duration of action - naloxone if required
    - avoid serotonin syndrome inducing agents (see above)
    - phenelzine -> beware of prolonged action of sux
    - avoid pancuronium (releases stored NA), avoid cocaine
  ‣ selegiline - safe to continue if doses <10mg/d (but avoid pethidine)
  ‣ safe drugs: propofol, roc/atrac, sevo/des/N2O, NSAIDs, benzo’s, LAs without adrenaline, atropine/glyco
  ‣ RAs ideal

<table>
<thead>
<tr>
<th>Drugs to be avoided</th>
<th>Reason</th>
<th>Suitable alternative</th>
</tr>
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<tbody>
<tr>
<td>Pethidine, tramadol, dextromethorphan</td>
<td>Risk of serotonin syndrome</td>
<td>Morphine, fentanyl</td>
</tr>
<tr>
<td>Ephedrine, metaraminol, cocaine</td>
<td>Hypertensive crises</td>
<td>Phenylephrine, noradrenaline</td>
</tr>
<tr>
<td>Pancuronium</td>
<td>Releases stored noradrenaline</td>
<td>Vecuronium, atracurium</td>
</tr>
<tr>
<td>Suxamethonium</td>
<td>Phenelzine only (decreased cholinesterase activity)</td>
<td>Mivacurium, rocuronium</td>
</tr>
</tbody>
</table>

4. Antipsychotics
- antipsychotics ie haloperidol, chlorpromazine, olanzapine, quetiapine, risperidone
- actions to
  ‣ antagonise D2 receptors in CNS
  ‣ also antagonises: H1, 5HT2, α-adrenergic, muscarinic receptors
- SEs:
  ‣ main = sedation, extrapyramidal, tardive dyskinesia, prolonged QT
  ‣ other = weight gain, post hypotension, antimuscarinic effects, jaundice, agraulocytosis (esp clozapine)
- potentiate sedative & hypotensive effects of anaesthetic agents - incl opioids

5. Lithium
- inorganic ion
- low therapeutic index (0.4-1.0mmol/L)
acts like Na+ and able to move through ionic channels, accumulating intracellularly \npartial depolarisation of cell
- can cause weight gain, renal impairment, T wave flattening or inversion and hypothyroidism
- toxicity (>1.5)
  - precipitants: ↓Na, diuretics, renal disease
  - symptoms: lethargy, restlessness, nausea, vomiting, thirst, tremor, polyuria, renal failure, ataxia, convulsions, coma, death -> can be treated with dialysis
- potentiates depolasing and non-depolarising NMBD (use PNS)
- NSAIDS should be used with caution

5. St Johns Wort
- extract plant contains several alkaloids similar to TCAs
- useful & safe as monotherapy in mild depression
- may induce CP450 enzymes \n\ influxion of warf, dig, theophylline, OCP
- May interact with SSRIs
- should stop 5d pre-op

Neuroleptic malignant syndrome
- rare reaction to anti-dopaminergic which can mimic MH
- young, female
- classic triad of:
  - extrapyramidal dysfunction \n\ rigidity & dystonia
  - Fever
  - autonomic instability (↑HR, sweating, labile bp, salivation, urinary incontinence)
- ↑CK & WCC
- mortality ~20%
- supportive care in ICU:
  - withdrawal of antipsychotics
  - cooling care
  - aggressive IVF +/- dialysis if required
- drugs:
  - benzo's - agitation & seizures
  - dantrolene - mm rigidty
  - bromocriptine & apomorphine - dopaminergic effects

Scizophrenia

Preoperative
= psychotic disorder

HISTORY
- 1% of population
- M=F
- peak incidence in teens
- thought echo
- withdrawal
- hallucinations
- delusion perceptions
- poverty of thought
- flat or incongruous affect
- amovitation
- high suicide risk

EXAMINATION
- agitation
- catatonia
- withdrawn
- uncommunicative

**MANAGEMENT**
- antipsychotic drugs -> continue them preoperatively
- most are dopamine antagonists (D2 receptors) + antagonism of other receptors (histamine, serotonin, Ach, alpha-adrenergic)
- side effects: sedation, extrapyramidal side-effects, tardive dyskinesia, gynaecomastia, weight gain, postural hypotension, obstructive jaundice, agranulcytosis.
- many drugs prolong the QT interval
- rarely develop NMS

**Intraoperative**
- beware of hypotension and additive sedation