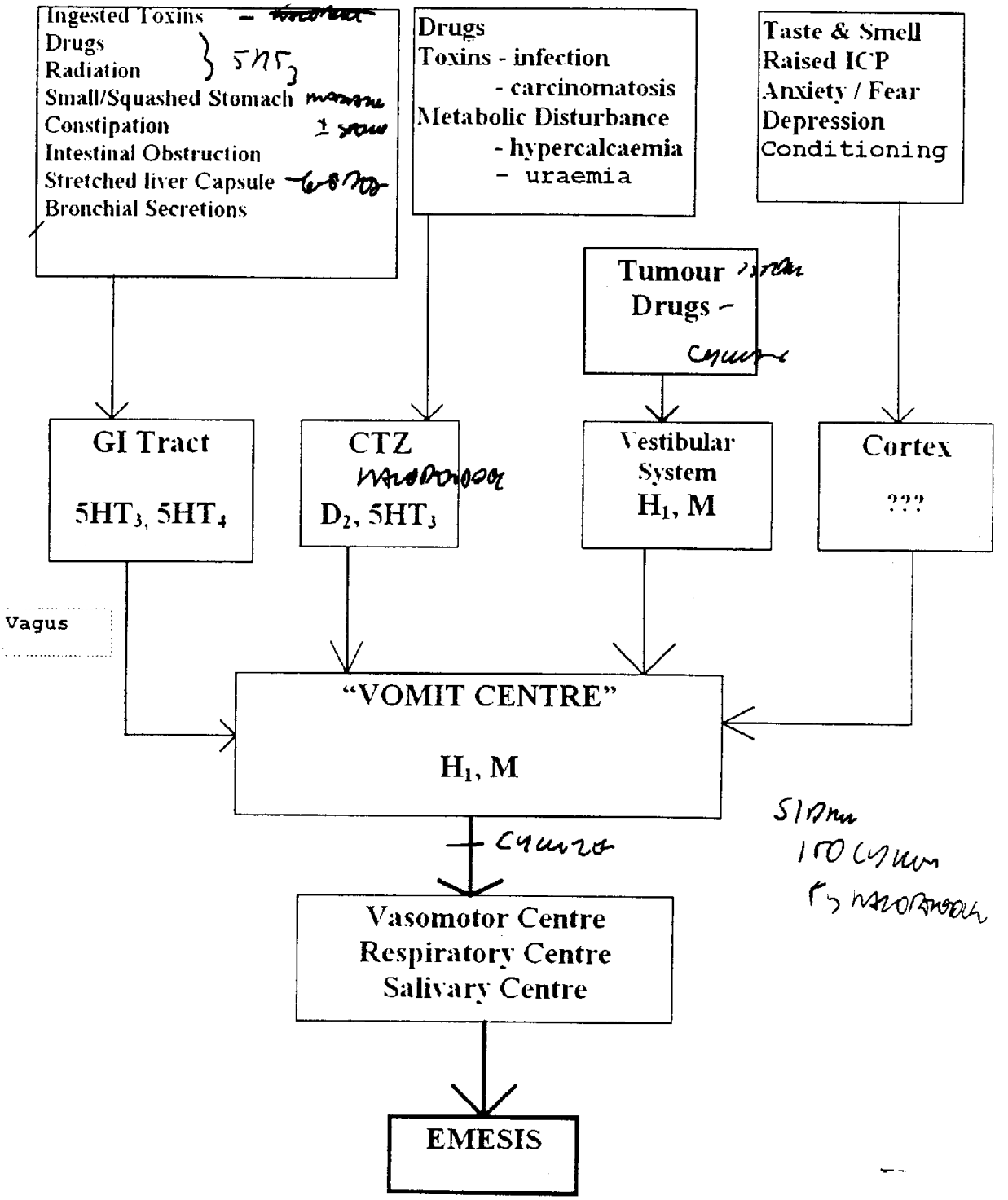
Nausea & Vomiting



AN APPROPRIATE RESPONSE TO THE INGESTION OF A TOXIN

3 Levels of defence:

Level of defence	Location of toxin	Type of sensor and location	Effects	Results
First	External to GI Tract	1. Smell & Taste 2. Peripheral	• Avoidance • Nausea	• Learned Aversion
Second	Intragastric	1.Gastric chemo-receptors 2. Near to absorptive site	• Nausea • Decreased gastric motility • Avoidance • Vomiting	• Learned Aversion • Confining toxin • Ejection
Third	Vascular	1. CTZ 2. Within CNS	• Nausea • Decreased gastric motility • Vomiting	• Ejection • Confining toxin • Learned aversion

Systems also activated by pathological states

3 Components of Emesis:

1. NAUSEA
2. RETCHING
3. VOMITING

3 Phases of Emesis:

- Pre-ejection - characterised by autonomic activity
  - salivation
  - sweating
  - tachycardia
  - antral arrhythmia
  - intestinal retroperistalsis
- Ejection phase
- Post-ejection phase
  - weakness
  - lethargy
  - shivering

THE ORGANISATION OF THE VOMIT REFLEX.

INPUTS.

1. The Gut.

Chemoreceptors
Mechanoreceptors

Sited throughout the gut but particularly in the stomach.
Present in the liver capsule.

NEUROTRANSMITTERS :

Gut wall chemoreceptors - 5HT ($5HT_3$ receptor)
Gut wall stretch receptors - ?
Vagus - ?Dopamine (D_2 receptor)

Trigger factors:

Ingested toxins
Drugs - especially chemotherapeutic agents
Radiation
Squashed stomach
Constipation
Intestinal obstruction
Stretched liver capsule
Bronchial secretions

2. The Chemoreceptor Trigger Zone (CTZ).

Chemoreceptors

Sited in the floor of the 4th ventricle.
Lies outside the blood-brain barrier

NEUROTRANSMITTERS :

Dopamine (D_2 receptor)
5HT ($5HT_3$ receptor)
? noradrenaline
? GABA

Trigger factors:

Drugs - e.g. morphine
"toxins"
- infection
- Carcinomatosis

Metabolic disturbance
- hypercalcaemia
- uraemia

Late radiotherapy emesis

3. The Vestibular Apparatus.

Ears, cerebellum, brain stem & connections.

NEUROTRANSMITTERS :

Histamine (H_1 receptor)
Acetyl choline (Muscarinic receptor)

Trigger factors :

Motion
Brain stem secondaries

4. The Cortex.

NEUROTRANSMITTERS :

Unknown ?? GABA

Trigger factors :

Taste
Smell
Raised intracranial pressure
Anxiety
Fear
Depression
Conditioning

CENTRAL.

The "Vomit Centre."

A collection of co-ordinated areas in the medulla.

NEUROTRANSMITTERS :

Histamine (H_1 receptor)
Acetyl choline (muscarinic receptor)

OUTPUTS.

Via co-ordinated action of other brain stem centres :

Vasomotor centre
Respiratory centre
Salivary centre
Vagus nerve
Phrenic nerve
Spinal motor nerves

Drug	D_2	H_1	Muscarinic	$5HT_3$	Gastrokinetic	Unknown
Haloperidol	+++					
Cyclizine		++	+			
Ondansetron				+++		
Metoclopramide	++			+	++	
Prochlorperazine	++	+	+			
Chlorpromazine	++	++	++			
Methotrimeprazine	++	+	+	?		
Domperidone	++				++	
Dexamethasone						*
Lorazepam						*
Hyoscine			+++			

Side Effects.

1. Anticholinergic:
- Dry mouth
- Blurred vision
- Palpitations
- Heartburn
- Constipation
- Urinary retention
- Confusion

2. Extrapyramidal:
- Parkinsonism
- Akathesia
- Acute dystonias
- Tardive dyskinesia

1. Do symptoms suggest vestibular involvement?

2. Are there symptoms or signs of raised ICP?

   - headache
   - vomiting
   - papilloedema
   - neurological signs

3. Has there been recent chemotherapy or radiotherapy?

4. Could it be drug induced?

5. Is there evidence of metabolic disturbance?

   - confusion
   - dehydration
   - abnormal biochemistry

6. Is there evidence of infection?

7. Is there a massive tumour burden?

   - known multiple metastasis
   - weight loss
   - deteriorating general condition

8. Is there a local cause?

   - excess secretions
   - gastric irritation
   - gastric stasis
   - squashed stomach syndrome
   - stretched liver capsule
   - constipation
   - intestinal obstruction

9. Do psychological factors contribute?

   - anxiety/fear
   - depression
   - conditioned response
   - response to taste or smell

10. HOW SHOULD DRUGS BE GIVEN?

CONSTIPATION

Defined as the passage of small hard faeces infrequently and with difficulty (<3 x /week). Very common in patients requiring palliative care.

We need to keep in mind the "whole person" and in particular their personal dignity. Their quality of life can be greatly improved if their constipation is well managed.

Causes

Many – and each patients is liable to have several.

Due to general debility – secondary to illness
- effect of the cancer
- effects of treatment
- concurrent disorders

Symptoms

Many – include
- fullness, flatulence, bad taste (halitosis)
- lethargy
- anorexia, nausea and vomiting
- headache, confusion and restlessness
- abdominal pain and distension
- overflow diarrhoea
- urinary retention and incontinence

Management

High index of suspicion
Thorough assessment - history
examination including rectal

Treatment

Attention to general factors
e.g. fluid intake
- diet
- mobility (may be improved by good general symptom control)
- social factors e.g. toilet arrangements
- review of medication

Prescribe laxatives when starting opioids, do not wait for constipation to become established. Tolerance to the constipating effect of opioids does not develop.

Aim of laxative treatment is to achieve comfortable defaecation but not at any particular frequency.
Laxatives should be regular.
Oral route should be used whenever possible.

Suggested preparations:

Oral

Movicol (polyethylene glycol with electrolytes)-hydrates stool in colon
1 sachet in ½ glass of water (or any fluid)
Titrate dose from 1 to 3 sachets/day. Can generally be reduced when initial constipation eased.
(Up to 8 sachet/day for up to 3 days can be used to relieve faecal impaction)

Co-danthramer) both contain softener and stimulant. Both available as
Co-danthrusate) capsules and liquid.

Lactulose – softener) often used together
Senna – stimulant)

Rectal

Glycerine suppos. - largely softening effect for hard stool
Bisacodyl suppos. - stimulant effect
Phosphate enema - evacuates stool from lower bowel
Arachis oil enama - softens hard impacted stools

With Spinal Cord Lesions – aim for controlled continence, with use of daily oral laxatives and suppositories or enemas every 2-3 days.

ANOREXIA, CACHEXIA AND NUTRITION

- 80% of cancer or AIDS patients have anorexia/cachexia
- higher frequency with solid tumours (except breast) eg 80% upper GI, 60% lung cancer patients have severe weight loss at diagnosis
- more common in children and elderly and at end stage
- reduced intake is normal at the end of life
- strong psychological component - food = love, not eating = giving up, eating = will recover
- aggressive nutritional treatments of **no** benefit usually
- mouth care vital
- aim to improve patient comfort and reduce family anxiety
- therapeutic options

  - dietary advice
  - nutritional supplementation
  - tumour treatment
  - drugs

    1. prokinetic — eg metoclopramide
    2. steroids — eg prednisolone
    3. progestational — eg megestrol

4 QUESTIONS

1. Does the patient have anorexia/cachexia syndrome?

2. Why - primary/secondary causes?

3. Which treatment?

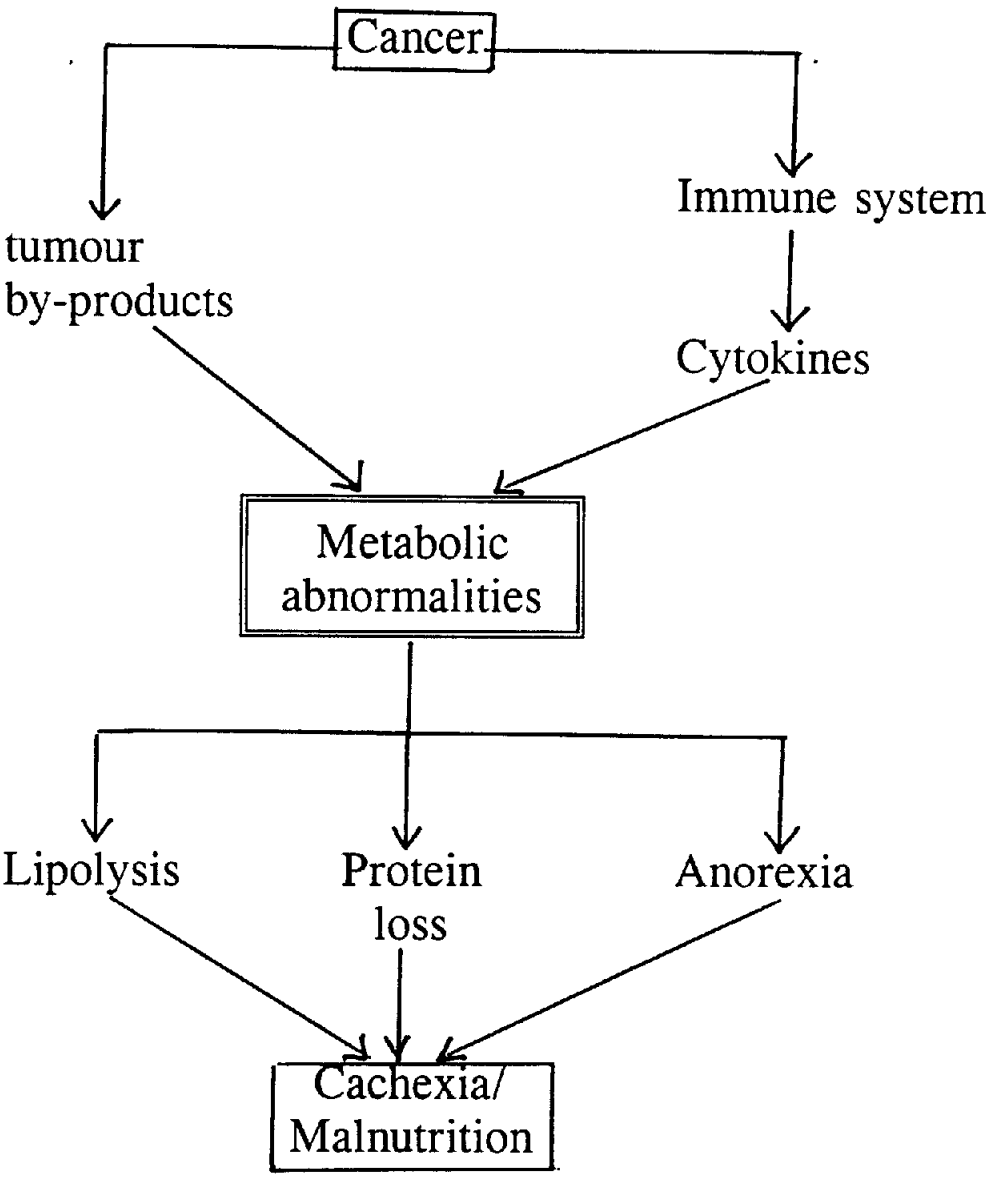
4. How to individualise treatment.

(1) Anorexia/cachexia syndrome

- diagnosis usually obvious and patient volunteers it
- plasma albumin ↓
- body weight may vary (ascites/oedema)
- effects of cachexia
  - decreased survival
  - ↑ complication of surgery, RT and chemoterhapy
  - weakness, anorexia, nausea
  - psychological distress in patient and family

(2) Causes

1. Primary



2 Secondary

- mechanical problem eg dysphagia in oesophageal cancer
- head and neck pain
- mouth problem eg oral thrush
- psychological depression/fatigue
- taste abnormality
- chronic nausea
- fear of vomiting
- constipation
- biochemical eg hypercalcaemia, uraemia
- secondary to treatment - opiates, RT, digoxin
- malabsorption eg pancreatic insufficiency/RT to abdomen

(3) Management

- treat <u>secondary causes</u> where possible
  eg fluconazole 150mg stat

- <u>intensive nutrition</u> appropriate in a few where there is an identifiable and reversible cause of weight loss eg awaiting chemotherapy, post surgery but usually does not alter outcome

- <u>dietary advice</u>

  - small meals, little and often, small plates appetising, break up courses, 'breakfast' foods, alcohol aperitif

  - nutritional supplements

  - defuse psychological impact

- drugs

1 **Steroids** eg demaxmethasone 2-6 mg
prednisolone 10-40 mg

- often improve anorexia and weakness but no benefit in nutritional status and short lasting (3-4 weeks)
- may improve mood and other symptoms
- watch for side effects

2 **Prokinetic**

- patients with early satiety or chronic nausea
- usually due to gastroparesis secondary to autonomic dysfunction caused by malnutrition, opioids, TCA, age, diabetes, paraneoplastic syndrome
- metoclopramide 10-20mg ½ hour before meals or 30-80mg SC infusion or cisapide/domperidone

3 **Progestational drugs**

- eg megestrol acetate 480mg o.d medroxyprogesterone
- improve appetite, fatigue, well-being

Others eg megestrol and ibuprofen, cyproheptadine, hydrazine sulphate, cannabinoids, androgens, low dose alcohol

(4) Individualise treatment

- intensive nutritional replacement limited value
- cachectic patient not starving
- gastrostomy tube eg dysphagia
- stop treatment in some
- intestinal obstruction - **not** prokinetic drugs
- may worsen vomiting
- octreotide, antietetics, hyoscine, NG tube