Day 2 Respiratory, cardiovascular, constipation

What are the vital signs?



Respiratory System

Respiratory System

Diaphragm

Nasal cavity -Pharynx **Oral cavity** Trachea Larynx **Right main** (primary) bronchus Left main **Right lung** (primary) bronchus Base of left lung

Nostril



Lungs

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Respiration dependent on brain function and chemoreceptors (chemical sensors) located in the aorta, carotid arteries and brain – Contents of the blood, pH, oxygen & carbon dioxide levels, hormones constantly monitored and reacted to



Lungs are the organ of breathing

anything affecting the lungs will affect breathing, respiration, O2 and CO2 levels and cellular health of whole body

Lung disease one of the most common medical conditions in the world.

2 main causes : Smoking infections

3 main areas of lung affected:

Airways

alveoli



blood vessels



What is normal?

- Respiratory rates: 12 20 breaths per minute
- Regular breathing pattern, normal depth & frequency without accessory muscles
- Peripheral Oxygen saturation (SpO₂) : 96% or above (non COPD).
 88-92% (in COPD patients) as per NEWS2.
- Patients are:
 - Well perfused (good colour)
 - Able to speak in full sentences
 - Look comfortable
 - Can cough and clear secretions

• LOOK, LISTEN, COUNT



CYANOSIS

What's the big deal?

The average person will lose consciousness after roughly one minute of not breathing. Irreparable brain damage will happen one to two minutes after that, and death about a minute later.

But the good news is,

The brain will shunt blood and oxygen to the essential organs, and organ function will be preserved for as long as resources are available.

BUT

Resources WILL RUN OUT QUICKLY. Patients with cyanosis are on a clock, they MUST be identified, assessed and treated IMMEDIATELY.







Left: Patient initially with 64% methemoglobin, peripheral oxygen saturation 84%, and PaO2 of 188 mm. Note the PaO2-saturation gap (normally a PaO2 of 188mm should produce an oxygen saturation of 100%).

Right: Improvement following treatment with 60 mg methylene blue and 500 mg ascorbic acid.

Singhai A et al. J NTR Univ Health Sci 2013; 2: 154.

What does cyanosis look like in people of darker complexion?

Impairment in cognitive function is a typical symptom of mental health illness, agree or disagree?

Cognitive function :the performance of the mental processes of perception, learning, memory, understanding, awareness, reasoning, judgment, intuition, and language.

Below is a list of symptoms associated with decreased cognitive function, agree or disagree?

- Being unable to think clearly.
- Decreased judgment or awareness.
- Inability to follow directions or complete complex tasks.
- Difficulty paying attention



Meet Barbara

Barbara is a 70 year old woman under your care. She has a diagnosis of schizophrenia and COPD but she is well managed on the ward. Last week she came down with the flu, but has since recovered.

Currently her only complaint is that she cant sleep at night because she feels discomfort in her chest. Staff provided her extra pillows and blankets, and she manages to sleep through the night.

Barbara usually wakes up every morning and asks you for the daily newspaper. Today she hasn't asked. You've decided to take initiative and ask Barbara if she would like the morning paper. She delighted that you asked and she accepts the paper.

15 minutes later, she returns and asks you if she can have the morning paper. You inform her that you have already provided her one, she suddenly remembers and goes back to her room.

Barbara has cereal and coffee for breakfast every morning, so you ask Barbara if she would like to have breakfast. She declines and tells you she already had breakfast. The time is 7:55am and breakfast hasn't been served by the domestic staff yet.

Warning Signs of Patient Respiratory Deterioration

EARLY SIGNS	INTERMEDIATE SIGNS	LATE SIGNS
Respiratory Rate > 18-22bpm	Respiratory Rate >24bpm	Reduced Respiratory Rate
Shallow rapid breaths	Unable to talk in sentences	Abnormal breathing pattern
SaO ₂ <94% on air	$SaO_2 < 91\%$ on air or <94% on oxygen	< 90% SaO ₂
Using accessory muscles	Using accessory muscles i.e. breathing looks like hard work, abdominal breathing	Patient tiring or fatigued
Distressed or anxious	Restlessness or panic	Altered level of consciousness (Confusion, drowsiness or unresponsive)
Pale A struggle to clear their own phlegm/sputum Sitting forward bracing themselves (tripoding)	Pursing their lips or flaring their nostrils when breathing New sounds such as wheezing, grunting or stridor	Cyanosis Pale/grey/blue lips, mucous membranes or nail beds. Cyanosis is a late sign. (For people with a darker skin tone look at their tongue to assess for cyanosis)

PLEASE NOTE: The higher the oxygen requirement needed to keep SaO₂ >94% the sicker the patient.





- Asthma
- COPD
- Infection 'simple', TB, Covid-19
- Pulmonary embolus
- Pulmonary oedema
- Respiratory depression
- Obesity hypoventilation

Key asthma statistics

• The prevalence of asthma in England is among the highest in the world, approx 6% of the English population/ 3.5-4 million and rising (especially in children)

• Premature mortality from asthma was 1.5 times as high in the UK than in the rest of Europe; 3 deaths per day in UK (NHS 2019)

• 1 in 6 treated in hospital for asthma attack will need hospital care again within 2 weeks

• <u>90% of deaths are associated with preventable factors.</u>

• Asthma is responsible for large numbers of attendances to Emergency Departments and admissions, the majority of which are emergency admissions, **70% of which may have been preventable with appropriate early interventions**

- despite the UK leading the world in guidelines for asthma they have been poorly implemented and people with asthma do not receive evidence-based interventions or individual action plans, which are known to impact positively on outcomes
- People with asthma should have a YEARLY REVIEW

Normal bronchiole

Asthmatic bronchiole



<u>Asthma</u>:

airways inflamed restricting airflow and causing spasm, cough, expiratory wheeze, chest tightness, shortness of breath. Allergies, infections or pollution can trigger asthma's symptoms. Can be life-threatening. **Reversible**



Treatment (refer to NICE guidance)

Aim is for patient to be free of symptoms and lead normal, active life

Poor control:

3 or more days a week with symptoms or

3 or more days a week with required use of a SABA (Short-acting β -agonist) for

symptomatic relief **or** 1 or more nights a week with awakening due to asthma.

Most asthma attacks severe enough to require hospitalisation develop over a period of six hours or more









Managemen	toracute astinin	a in addits in gen	ierai practice		
 Many deaths from asthma are preventable. Delay can be fatal. Factors leading to poor outcome include: Clinical staff failing to assess severity by objective measurement Patients or relatives failing to appreciate severity Under use of corticosteroids Regard each emergency asthma consultation as for acute severe asthma until shown otherwise. 		 Assess and record: Peak expiratory flow (PEF) Symptoms and response to self treatment Heart and respiratory rates Oxygen saturation (by pulse oximetry) Caution: Patients with severe or life-threatening attacks may not be distressed and may not have all the abnormalities listed below. The presence of any should alert the doctor. 			
Moderate asthma	Acute severe asthma		Life-threatening asthma		
INITIAL ASSESSMENT					
PEF>50-75% best or predicted	PEF 33–50% best or predicted		PEF<33% best or predicted		
FURTHER ASSESSMENT					
 SpO₂ ≥92% Speech normal Respiration <25 breaths/min Pulse <110 beats/min 	 SpO₂ ≥92% Can't complete sentences Respiration ≥25 breaths/min Pulse ≥110 beats/min 		 SpO₂ <92% Silent chest, cyanosis or poor respiratory effort Arrhythmia or hypotension Exhaustion, altered consciousness 		
MANAGEMENT					
Treat at home or in surgery and ASSESS RESPONSE TO TREATMENT	Consider	admission	Arrange immediate ADMISSION		
TREATMENT					
 β₂ bronchodilator: via spacer* If no improvement: via nebuliser (preferably oxygendriven), salbutamol 5 mg Give prednisolone 40–50 mg 	 Oxygen to mainta available β₂ bronchodilato via nebuliser driven), salbu or if nebuliser spacer* 	ain SpO ₂ 94–98% if r: (preferably oxygen- itamol 5 mg r not available, via	 Oxygen to maintain SpO₂ 94–98% β₂ bronchodilator with ipratropium: via nebuliser (preferably oxygen- driven), salbutamol 5 mg and ipratropium 0.5mg or if nebuliser and ipratropium not available β bronchodilator 		
 Continue or increase usual treatment 	shares.		via coacor#		

Treat at home or in surgery and ASSESS RESPONSE TO TREATMENT

MANAGEMENT

Consider admission

Arrange immediate ADMISSION

TREATMENT

- β₂ bronchodilator:
 - via spacer*

If no improvement:

- via nebuliser (preferably oxygendriven), salbutamol 5 mg
- Give prednisolone 40–50 mg
- Continue or increase usual treatment

If good response to first treatment (symptoms improved, respiration and pulse settling and PEF >50%) continue or increase usual treatment and continue prednisolone

- Oxygen to maintain SpO₂ 94–98% if available
- β, bronchodilator:
 - via nebuliser (preferably oxygendriven), salbutamol 5 mg
 - or if nebuliser not available, via spacer*
- Prednisolone 40–50 mg or IV hydrocortisone 100 mg
- If no response in acute severe asthma: ADMIT

- Oxygen to maintain SpO₂ 94–98%
- β, bronchodilator with ipratropium:
 - via nebuliser (preferably oxygendriven), salbutamol 5 mg and ipratropium 0.5mg
 - or if nebuliser and ipratropium not available, β₂ bronchodilator via spacer*
- Prednisolone 40–50 mg or IV hydrocortisone 100 mg immediately

Admit to hospital if any:

- Life-threatening features
- Features of acute severe asthma present after initial treatment
- Previous near-fatal asthma

Lower threshold for admission if afternoon or evening attack, recent nocturnal symptoms or hospital admission, previous severe attacks, patient unable to assess own condition, or concern over social circumstances

If admitting the patient to hospital:

- Stay with patient until ambulance arrives
- Send written asssessment and referral details to hospital
- β₂ bronchodilator via oxygen-driven nebuliser in ambulance

Follow up after treatment or discharge from hospital:

- Continue prednisolone until recovery (minimum 5 days)
- GP review within 2 working days
- Monitor symptoms and PEF
- Check inhaler technique
- Written asthma action plan
- Modify treatment according to guidelines for chronic persistent asthma
- Address potentially preventable contributors to admission

* β₂ bronchodilator via spacer given one puff at a time, inhaled separately using tidal breathing; according to response, give another puff every 60 seconds up to a maximum of 10 puffs

Life-threatening acute asthma

Any **<u>one</u>** of the following, in a patient with severe asthma:

Peak flow < 33% best or predicted oxygen saturation (SpO2) < 92% Silent chest Cyanosis Poor respiratory effort Arrhythmia Exhaustion Altered conscious level Hypotension



Chronic obstructive pulmonary disease is a long-term condition of the lungs where the flow of air to the lungs is restricted. Symptoms include frequent coughing or wheezing, excess phlegm or sputum, Shortness of breath, Trouble taking a deep breath.

- COPD is extremely common cause of emergency admission to hospital and is one of the most costly diseases in terms of acute hospital care in England. 15% of those admitted to hospital die within 3 months.
- **40% of people with COPD also have heart disease**, and significant numbers have depression and/or anxiety disorder.
- It is among the top killer diseases in the UK. (heart disease, stroke, cancer, lung and liver disease, sepsis)



Oxygen: High dose oxygen is contraindicated - can trigger respiratory failure.

Aim for sats 88-92%

Vital signs, NEWS2 - Scale 2 for Sats

Reassurance



Chronic obstructive pulmonary disease is a long-term condition of the lungs where the flow of air to the lungs is restricted. Symptoms include frequent coughing or wheezing, excess phlegm or sputum, Shortness of breath, Trouble taking a deep breath.

Break

Chest infection/Pneumonia/Covid: An infection of the alveoli, usually by bacteria.

Cough, yellow or green sputum, shortness of breath, rapid shallow breathing, wheeze, rattle/bubbly, fever, tachycardia, chest pain/tightness, altered mental state, disorientation/confusion

Sputum specimen, antibiotics, Vital signs, NEWS2, ensure adequate fluid & diet intake, monitor sputum colour and amount to ensure antibiotics working

WATCH FOR SEPSIS!!



Tuberculosis:

A slowly progressive pneumonia caused by the bacteria Mycobacterium tuberculosis. Notifiable disease

Persistent cough lasting more than 3 weeks, chest pain, sputum with blood ('rusty sputum'), weakness and fatigue, weight loss, night sweats, anorexia, chills and fever

TB therapy, infection control (isolation), Vital signs, NEWS2, skin colour, ensure adequate fluid intake and food intake, monitor sputum

WATCH FOR SEPSIS!!

Covid - 19

- Mild form of the disease include symptoms such as: fever, cough, sore throat, fatigue and aching muscles, sudden loss of smell/taste
- Some develop more serious symptoms: Respiratory failure, pneumonia or sepsis
- A small number of patients will develop Acute Respiratory Distress Syndrome (ARDS) and multiple organ failure
- Have a very low threshold for escalation to expert help in any suspected Covid 19 patient with reduced saturations and increased work of breathing or breathlessness- irrespective of NEWS2 score
- Always check DNAR status and advanced directives and signpost to specialist palliative care services as appropriate
- Highly contagious PPE
Pulmonary Embolus

4 types:

Blood (often following DVT from inactivity/bed rest/rapid tranquilisation, largely preventable - 25,000 UK deaths per year)

fat (following fracture or ortho surgery) air amniotic fluid

clot breaks off, travels to the heart and is pumped to lungs where it lodges in artery, restricts blood flow /causes infarct.

Severity of symptoms depends on size of clot: Difficulty breathing, rapid breaths, hypoxia Pleuritic and/or retrosternal chest pain Haemoptysis, cough Dizziness, anxiety, agitation Tachycardia, hypotension High temperature Loss of consciousness, collapse



Medical Emergency – call 999 NICE guidance VTE risk assessment for all in-patients

VTE Assessment

Needs to be completed for all patients on admission, and again if mobility changes.

Risk factors:

- Recent immobility (greater than 24 hours)
- Obesity (BMI greater than 30kg/m2)
- Dehydration
- Seclusion(greater than 24 hours)
- Long term conditions
- Previous DVT
- intravenous drug user
- Long haul air flight
- Underlying malignant disease
- Family history thrombosis
- Known thrombophilic defect
- Use of HRT
- One or more significant medical comorbidities
- Older than 60 years old
- Recent surgery
- Recent injury or trauma

Symptoms

- Pain or tenderness of the leg
- Swelling of calf or leg
- Pitting oedema
- Palpable venous thrombosis
- Increased temperature in the leg
- Fever
- Discoloration or erythema of the leg
- Venous distension



Physical Health
 Physical Health Assessment Forms (MH)
 Physical Health Assessments (CommHealth)
 Height, Weight and BMI Record
 Physical Health CQUIN Overview
 Physical Health CQUIN missing data

VTE on RiO

Medical Physical Health Assessment
Nursing Physical Health Assessment Form
Sychotropic Medication Monitoring
Urine Tests Form
Observations and Measurements
Lifestyle Assessment Form
Investigations Form
Diabetes Blood Glucose Monitoring Form
COVID-19 Swab Record
Infection Screening Form (for inpatients)
Contraception – Brief Assessment
Women"s Physical Health Form
Sector Pressure Ulcer Form Hyper Link
Risk Assessment for Venous

VTE on RiO

Slient ID*					
Date of assessment*					
Point of Completion?	v	Please Select	~		
Step 1 - Mobility - all patie	ents				
Vedical patient expected\NOT expected to have ongoing\significantly reduced mobility relative to normal state?	v	Please Select v			
If 'NOT Expected' sele above please assess	ected fo for thro	or the question above the F ombosis and bleeding risk I	Risk Assessment is now complete. In Delow.	'Expec	ted' selected for the question
If 'NOT Expected' sele above please assess Step 2 - Thrombosis risk Significantly reduced mobility for 3 days or	ected fo for thro V	or the question above the Fombosis and bleeding risk b Please Select v	Risk Assessment is now complete. In below. Active cancer or cancer treatment	'Expec	ted' selected for the question Please Select ∽









Pulmonary Embolus

VTE risk assessment & prophylaxis

Observe for limping, pain in calf, swollen, red, hot (particularly following seclusion/ rapid tranq – risk factors: immobility, reduced fluid intake

Medical Emergency – call 999

100% oxygen

Monitor vital signs & NEWS2 closely – high risk of cardio-respiratory

arrest

Analgesia (usually morphine)

IV access

Enoxaparin, warfarin

Pulmonary Oedema: Fluid congestion in and around lungs and alveoli due to heart failure

Early signs: slight increase in pulse, slight saturation decrease, slight breathlessness on rest or exertion, harder to breathe when laying flat (increase in pillows)

Difficulty breathing, feels like suffocating/drowning, worse if laid flat, nocturnal dyspnoea, cough, wheezing, bubbling, crackles, +/generalised oedema, reduced mental alertness, blue grey skin, hypotension, tachycardia/palpitations, sweaty, pink frothy sputum, reduced oxygen saturation (<90%)







100% oxygen, Call ambulance – needs cardiologist!

Vital signs & NEWS2, constant observation

If BP >90mmHg systolic, give 2 puffs GTN

Furosemide, heart failure treatment

Obesity hypoventilation syndrome

Extra weight on chest, neck and abdomen makes chest expansion difficult and predisposes to airway obstruction, poor gas exchange, infection

Weight loss, exercise programme, positioning to prevent obstruction, BiPAP



18 seconds – normal breathing
42 seconds / 1:07 – chest infection: crackles coarse and fine
1:50 - asthma

Other causes of respiratory problems:

Head injury Drugs Alcohol Sedation and tranquilisation (respiratory depression, VTE, dehydration)

Opiates Benzodiazepines Anti-psychotics Anti-depressants Beta-Blockers, Aspirin and NSAID can trigger asthma Oxygen in COPD patients who retain CO2 - will induce oxygen narcosis and respiratory arrest Respiratory rate should be measured and documented whenever any other vital sign measurements are performed (National Confidential Enquiry into Patient Outcome and Death, 2005)

"Monitoring the respiratory rate is essential, as it may predict cardiorespiratory arrest" (Resuscitation Council (UK))

impaired lung function is an independent predictor of mortality from all causes (NICE 2019)

Beware Respiratory rate

above 20 – pay attention, what could this be?, above 24 considered critical

below 12 – pay attention, what could this be?, Below 10 considered critical, At 8 requires intubation!

LOOK, LISTEN, COUNT

rate, effort, sound, skin colour, conscious level, saturation

Lunch

Any questions?

Cardiovascular System

Cardiovascular system comprises of



Interior View of the Heart



Conducting System

I.



Function of the cardiovascular system

- Transports and distributes blood throughout the body to:
 - Deliver materials oxygen, nutrients and hormones to the organs
 - Carries away waste products for excretion
- A constant cycle, with each heartbeat, blood is pumped through the blood vessels (a closed system of tubes) to the tissues/organs, gives up its oxygen and nutrients and then returns blood to the heart to replenish

Pulse and blood pressure critically linked!

Circulation is totally dependent upon heart rate and the amount circulated in <u>1 min</u> The heart fills with blood at rest (around 70mls per beat) i.e. when not beating It is programmed to provide sufficient blood supply to the body when beating between 60 and 100 beats per minute. If beating faster there is not enough time to fill up, if beating slower then not enough going round in 1 minute to maintain circulation

Blood pressure is dependent upon the amount of blood being pumped around

CARDIAC OUTPUT:

Normal 70 beats/min x 70 mls = 4900mls/minute

50 beats/min x 70 mls = 3500ml/min (1450 mls loss) 45 beats/min x 70mls = 3150mls/min (1750 mls loss!) 120 beats/min x 30mls = 3600mls/min (1300 mls loss) 140 beats/min x 20 mls = 2800mls/min (2100mls loss!)



Accurate Blood Pressure Measurement for Patients



The Ohio Cardiovascular and Diabetes Health Collaborative is funded by the Ohio Department of Medicaid and administered by the Ohio Colleges of Medicine Government Resource Center. The views expressed in this document are solely those of the authors and do not represent the views of the state of Ohio or federal Medicaid programs.







Tachycardia – fast pulse



How long do organs last before irreversible damage is caused?

- Irreversible brain damage already detectable at less than 20 min of ischemia.
- In the heart, irreversible heart muscle cell damage occurs after about 20 min of ischemia.
- The next most susceptible organ is the kidney. It has been established that no permanent organ damage occurs 30 minutes of ischemia.

Arteriosclerosis/Atherosclerosis





- Thickening or hardening of the arteries
- Progressive disease that evolves from deposits in the lining of large arteries:
 - Lipids
 - Cellular debris
 - Calcium
 - Fibrin
- Compounded by an inflammatory response
- Lead to "plaques forming in the artery" which narrow the lumen and decrease blood flow and make blood vessels non-elastic and brittle

Risk Factors for Atherosclerotic Disease (hardening of the arteries)

- Family History
- Diabetes Mellitus/ Obesity
 - Increased risk with psychotropic drugs
- Smoking
- Hypertension (high blood pressure)
- High cholesterol
 - Increased risk in psychotropic drugs
- Sedentary lifestyle

Arteriosclerosis One disease process many Chronic Conditions

Cerebrovascular accident (stroke) Heart Attack (MI), heart enlargement and Heart Failure High blood pressure and kidney failure Poor circulation (pain, poor mobility, leg ulcers, gangrene)

F face A arm/leg S speech T Time

Stroke:





What is hypertension?



Hypertension is blood pressure that is higher than normal

Blood pressure is the force of circulating blood against the walls of the body's arteries, the major blood vessels in the body.

World Health Organization Philippines

Why is high blood pressure an issue?

Surely higher pressure of blood would provide more nutrients to the body, right?

WRONG!

https://www.youtube.com/watch?v=kdu5QaRINIY

You have a patient that is on hypertensive medication, more than one type of tablet, but regularly refuses medication. What are you worried about?


Common Heart Conditions

- Coronary Heart Disease- Angina and heart attack
- Myocarditis (inflammation of the heart)
- Cardiomyopathy (heart enlargement and heart failure)
- Endocarditis (infection)
- Conduction problems and arrhythmia (Abnormal and dangerous heart beat)

Blood supply needed to give the heart itself oxygen and nutrients

Muscle needed for pumping

Electrics needed to make the heart pump

Muscle damage = poor pumping & lack of oxygen/nutrients to the rest of the body

Electrical damage = can not pump properly (think damaged electrical cable to your phone/lap top)

Conducting System

- Network of specialized tissue that stimulates contraction
- Modified cardiac myocytes
- The heart can contract without any innervation







Angina and heart attack

Coronary arteries are seriously narrowed or completely blocked. The heart gets little or no oxygen and starts to die





Chest pain - may radiate to the arm, jaw, shoulder blades, described as the

worst pain ever experienced, feels like a severe pressure on their chest-

like a belt tightening around the chest, difficult to point tocovers a large area, not affected by breathing or movement

Shortness of breath Blue/grey skin Cold, clammy skin Abnormal heart rate & ECG – fast/slow/irregular Low urine output

999 medical emergency - oxygen, aspirin, morphine, vital signs, ECG

Myocarditis

Inflammation of the heart muscle that causes injury to the heart muscle and even death of it

Caused by:

- Medication- Clozapine, Cocaine
- Viral- Mumps, Rubella, HIV
- Bacterial Infection- TB, Tetanus,
- Fungal/Parasitic
- Pregnancy-during last month or
 5 months post partum
- Autoimmune



Clozapine and Myocarditis/ Cardiomyopathy

- Clozapine has caused fatal Myocarditis
 - 90% of cases occur within 2 months of commencement
- usually occurs after 2 months of starting clozapine but can happen at anytime
- Full physical assessment and medical history required before starting clozapine
- Specialist examination required if any history or cardiac abnormalities



Symptoms of Myocarditis

- Fatigue
- Fever-
 - Flu like symptoms
 - Occasionally diarrhoea/vomiting or difficulty and pain when passing urine
- Chest pain
- Fast heart rate/ Palpitations
- Difficulty breathing/shortness of breath
- Abnormal blood results
 - Increased C-reactive protein
 - Positive troponin I and/or T
 - ? Stop Clozapine

Symptoms of Cardiomyopathy (heart enlargement)

- Fatigue
- Cough
- Breathless/difficulty breathing
- Palpitations
- Heart failure- Leg swelling
- Low blood pressure
- 50% of patients die within 5 years of diagnosis



Normal



Dilated



Hypertrophic



Restrictive

Symptoms of endocarditis (infection of the heart)

Initially:

- a high temperature (fever) of or above 38C
- chills
- headache
- joint and muscle pain
- If untreated infection damages heart valves, disrupts blood flow and triggers life-threatening complications:
- Heart Failure where the heart is unable to pump enough blood around the body
- Stroke



Any questions

?

Break?

Constipation

Gastro-intestinal Tract



approx 9m (30ft) long

Muscular tube controlled by autonomic nervous system

Small intestine:

6.5m (21ft) long, 2.5cm (1 inch) diameter

3 segments: duodenum, jejunum, ileum

Main function is digestion and absorption

Absorbs most of the water, electrolytes, glucose, amino acids, fatty acids from chyme

Provides nutrients to the body and <u>plays critical</u> role in water and acid-base balance and immunity



Large Intestine

Caecum, ascending, transverse, descending & sigmoid colon, rectum and anal canal

1.5m (5ft) long

Function is to absorb water from the contents passed from small intestine, producing semisolid faeces, epithelium produces mucus making it easier to pass stool

Also houses bacteria assisting immunity, ferments Carbohydrates which releases hydrogen, carbon dioxide, methane gas, synthesise vitamins (Vit K and some B vitamins), breaks down bilirubin (gives faeces its brown colour)

Under autonomic control but external anal sphincter is under voluntary control, supplied by motor nerves from spinal cord

Rectum is holding area for the stool – when full it signals the brain to initiate peristaltic wave to push the stool through the anus





Constipation – a definition.....

Difficult to define because it varies from person to person – ranges from 3 bowel movements a day to 3 per week

Therefore, important to assess person's norm

As a general rule, intervention should occur if bowels not open for 3 consecutive days or stools are hard and/or person has difficulty or pain during defecation

Stools become hard because the longer stool is in colon, the more water is absorbed – the longer you leave it the worse it is going to get! International consensus ...

the frequency of multiple symptoms (straining, hard stools) and/or bowel movement less than 3 times per week. May be accompanied by abdominal pain and/or bloating

Constipation can lead to.....

- Haemorrhoids
- Faecal and urinary incontinence
- Urinary tract infection
- Urinary retention
- Rectal bleeding
- Generalised weakness
- Nausea and vomiting
- Impaction
- Obstruction
- Perforation/necrosis
- Reverse peristalsis and faecal vomiting
- Straining can result in hernia, GI reflux, syncope, angina and TIA (raised intrathoracic pressure leads to reduction in cerebral and coronary circulation)



Intestinal obstruction

A medical emergency

A blockage prevents the normal flow of contents through the intestinal tract; can obstruct the vascular supply to the bowel wall causing necrosis

Explosive or seeping diarrhoea (overflow)

Dehydration, electrolyte imbalance, confusion, coma, death

May lead to paralytic ileus, gross distension of the bowel and Perforation

On average 2 weeks to clear

Signs and Symptoms of faecal impaction and intestinal obstruction

Nausea and vomiting – may be faecal matter

Anorexia – leading to dehydration and further hardening of stool

Electrolyte imbalance

Impediment of diaphragm or vagus nerve – hypoventilation, hypoxia,

dizziness, hypotension

Overflow, explosive diarrhoea

Urinary retention

Abdominal fullness/distension/rigidity (build up of gas)

Hyper/hypo active bowel sounds

Confusion.....coma.....death

Bowel perforation or necrosis – peritonitis, sepsis, death

Raised white cell count suggestive of bowel necrosis Dehydration, oliguria and shock suggest perforation



Plain abdominal X-ray showing a huge fecal impaction extending from the pelvis upwards to the left subphrenic space and from the left towards the right flank, measuring over 40 cm (16 inches) in length and 33 cm (13 inches) in width.

Richard's story (PHE 2016)

assessment reports by professionals said very clearly that his constipation would always need close monitoring and support and that constipation should always be considered as a potential cause, when his mental health deteriorated.

Somehow, this knowledge was lost Richard sadly died very suddenly in 2012 as a result of unmanaged constipation. He was only 33 years old.

Over 10kg of faeces was removed from Richard's bowels before he died and his bowel was 18cm (7 inches vs 1-2½ inches norm) diameter at post-mortem.

His psychiatrist and GP had both seen him that week but did not recognise the extent of faecal impaction. Richard's withdrawal and distress were attributed to his mental health and a mental health admission was arranged, when he actually needed urgent medical attention.

Causes of constipation

Poor diet – rich in animal fats (dairy and meat) refined sugar but low in fibre Medi

Medication –

Anorexia, Inadequate fluid intake, dehydration

Inactivity, immobility, spinal/nerve damage

Stress, Anxiety, Depression

Emphysema (inability to increase intra abdominal pressure)

Diabetes (autonomic neuropathy)

Alcohol (dehydration)

Changes in lifestyle

Poor bowel habits (withholding defecation), intestinal obstruction

History of laxative or enema abuse

Painful anal conditions - Haemarrhoids, fissure

Hypothyroid, Hypercalcaemia, hypokalaemia, hyponatremia

Analgesics	
Amiodarone	Clonidine
Antacids	Disopyramide
Anti-diarrhoeals	Diuretics
Antispasmodics	Iron
Calcium channel blockers	NSAID
Calcium supplements	

Antimuscarinics (procyclidine, oxybutinin) Anticholinergics (parkinson, antihistamine) Anticonvulsants (carbamazepine, gabapentin, pregabalin) Antidepressants (tricyclics) Antipsychotics Lithium Methadone Tranguilizers & sedatives

Assessment

What is normal for the patient (frequency, amount and timing)

When was the last bowel movement? What amount, consistency, colour? Was blood/mucous passed with it? (Bristol chart)

Are they passing flatus (wind)? How many times a day?

Is there any diarrhoea or leaking of faecal matter?

Has the patient been having abdominal discomfort, cramping, nausea/vomiting, pain, excessive gas or rectal fullness, difficulty urinating?

Is this symptom a recent change?

Is patient eating? What are they eating? How much and what type of fluids are they taking?

What medication is the patient taking?

Are bowel sounds present? Are they within normal parameters? Is there any abdominal distension? Digital Rectal Examination – is the rectum full? Is the stool hard or soft? Any blood?

Bristol Stool Chart



Patient to see Doctor if...

- Blood
- Severe abdominal pain
- Unintentional weight loss
- Co-existing diarrhoea
- **Tenesmus** (continuous feeling of the need to defecate without production of significant amount of faeces)
- Failure of previous laxative medicines

Treatment for constipation

Aim of treatment: (PRODIGY (NICE computer prescribing system))

- Establish patient's norm
- Establish regular, comfortable defecation using the least number of drugs for the shortest possible time (to prevent laxative induced constipation)
- Prevent laxative dependence
- Relieve discomfort
- Identify and treat early (if bowels not open for 3 days)
- Record bowel movements daily (use Bristol Stool Chart)
- Ensure adequate fluid intake (1.5-2L per day unless contraindicated)
- Ensure adequate dietary intake and fibre (must ensure adequate fluid with fibre to prevent intestinal obstruction!)
- Encourage mobility
- Reduce laxatives as symptoms resolve with aim to stop

Laxatives

Laxatives contribute most to the development of constipation and impaction as they render the colon less sensitive to its intrinsic reflexes stimulated by distension

No evidence to suggest regular laxative use prevents constipation

Key to prevention of constipation (and therefore negating need for laxatives!) is a balanced diet, adequate fluids and fibre

Limited research comparing efficacy of laxatives

No drug interactions reported in BNF

Nothing licensed for obstruction!! What to do?

Prevent impaction and obstruction!!!!

Medical emergency

Transport to A&E – NBM, NG tube to decompress bowel, IV fluids to correct dehydration and electrolyte imbalance, watch for necrosis or perforation, may require surgery

Safety alert February 2015, 2016, 2017!!

- There have been incidents of severe harm experienced by patients of this Trustrelated to bowel heath and constipation.
- constipation may be associated with serious effects such as intestinal obstruction, bowel perforation and toxic megacolon, and can be fatal.
- regular physical monitoring, appropriate and timely use of laxatives, and early referral of constipated patients--before life-threatening pathologic processes develop.
- The possible side effects of medicines need to be explained to patients at the start of treatment and repeated at regular intervals during treatment.
- Patients should be encouraged to report any change in bowel habit to their care coordinator, doctor or GP
- Clinical staff should enquire routinely about side effects of medicines including bowel habits and refer patient for review on an urgent basis if there are signs of constipation or obstruction

Questions? Break 10 mins

Fluid balance

The body needs fluids to carry out basic processes that enable it to function correctly.

- Digesting food and enabling nutrients to be absorbed
- Maintaining brain function
- Correct concentration of salts in the body (especially sodium)
- Enabling blood to circulate around the body
- Keeping cells and tissues moist
- Removing waste products via urine and faeces (including medicines)
- Helping to avoid infection
- Controlling body temperature
You need the right amount of water for the right concentration of electrolytes and blood cells and blood flow





Right amount of water to electrolytes/blo od cells



Not enough water for electrolytes/blo od cells – thick and sticky



Too much water for electrolytes/blo od cells – overdiluted

Prevent dehydration, prevent overload

Dehydration: causes rise in concentratio n of blood Na+, fluid pulled from cells to restore equilibrium

(will also affect all other components of blood & cells – HB, K+, platelets etc) 40% fluid is lost through insensible means (internal and external respiration, skin, faeces, ??hypersalivation)

Aim: 2-3L/day, - no less than 1L, no more than 4L per day, no more than 500mls negative/positive balance

<2L - will concentrate blood components</p>
>4L - will dilute blood components: HB, platelets,
RBC, sodium, potassium etc

If dehydrated may be aiming for a positive balance 500-800mls, if overloaded may be aiming for negative balance 500-800mls

Overload: causes fall in concentratio n of blood Na+, fluid pulled into cells to restore equilibrium

(will also affect all other components – HB, K+, platelelets etc) Why might your patients dehydrate/overload?

Refusing/unable to drink Rapid Tranq Hyperglycaemia Fever, vomiting, diarrhoea Sodium derangement Faecal impaction/obstruction polydipsia



What's wrong with this fluid chart?

Time	In	Total in	Out	Total out	19				
					20				
8	Tea 150				21	Tea 150			
9	Milk				22				
	100				23	H2O			
10	Tea 150				24				
11					1				
12	Cola				2				
42	300				3				
13					4				
15					-				
					5				
16	H20 200				6				
17					7				
18	Tea, cola 450				Tota	al	Tota out	I	Balance

What is this fluid chart telling you and what will you do? How might it affect the vital signs?



What is this fluid chart telling you and what will you do? How might it show in the vital signs?



What's this fluid chart telling you? What are the risks? How might it reflect in vital signs? What would you do?

	l otal in	Out	Total out	19	C (50	ola 10	111	3500				
					_							
Tea 150		900	900	21	Те	ea 150	3	650	500)	270	0
Milk	400			22								
100				23	H2	20	4	050				
Tea 150	550			24	Co	ola	4	350				
Water	1450	600	1500	1		``						
cola				2								
500				3								
Cola	1750			-					_			
Cola	2250	700	2200	4	Water 200		4	1550	700		3400	
500				5								
H20 250	2500			6								
				7	Tea 300		4850		1000		4400	
Tea, cola 500	3000			Tota	al 4850 Total		4400		400	Ba		
	Tea 150 Milk 100 Tea 150 Water 400, cola 500 Cola 500 H20 250 Tea, cola 500	in Tea 150 Milk 100 400 Tea 150 550 Water 400, cola 500 1450 Cola 1750 Cola 2250 500 2500 H20 250 2500 Tea, cola 3000	in in Tea 150 900 Milk 100 400 - Tea 150 550 - Tea 150 550 - Water 400, cola 500 1450 600 Cola 1750 - Cola 2250 700 H20 250 2500 - Tea, cola 3000 -	in out Tea 150 900 900 Milk 100 400	inoutTea 150900 900 21Milk 100400	in Tea 150900 9009001Milk 100400 $$	in Tea 150900 900900 90021 500 Milk 100400	in Tea 150900 900900 90021 500 3Milk 10040023 $H2O$ 4Tea 15055023 $H2O$ 4Tea 150550424 Oal 4Water 400, cola 50015001500112-4Water 400, cola 500145060015002214Cola 500175042004Cola 500175042004H20 250250070061202500164M20 2502500164Tea, cola 5003000IonIonIon-7-4Tea, cola 5003000IonIonIonIonIon-4Ion <t< td=""><td>in real 150out real 150solsolTea 15090090021Tea 1503650Milk 100400II23H2O4050Tea 150550II24Cola4350Vater 400, cola 5001450600155001IIVater 400, cola 5001750IIIIICola 5001750IIIIIICola 5001750IIIIIICola 5001750IIIIIII1750IIIIIIICola 5001750IIIIIII1750III<td< td=""><td>in Tea 150900 900900$500$21$500$$500$Milk 100400$$</br></td><td>in Tea 150900 90090021$500$$500$Milk 100400$$</td><td>in real 150900 9009001$500$$500$$500$$210$Milk 100$400$$$</td></td<></br></br></br></br></br></br></td></t<>	in real 150out real 150solsolTea 15090090021Tea 1503650Milk 100400II23H2O4050Tea 150550II24Cola4350Vater 400, cola 5001450600155001IIVater 400, 	in 	in Tea 150900 90090021 500 500 Milk 100400 $$	in real 150900 9009001 500 500 500 210 Milk 100 400 $$

Key messages...

- Your patients are at risk of physical deterioration because of medication and lifestyle they can deteriorate at any time
- Notice and take action EARLY
- check the pulse manually for regular/irregular beat
- Behaviour is usually the first indication that someone is not well beware the quiet patient
- Sudden confusion is dangerous
- A NEWS2 score of 1 is your first indication something is brewing increase the frequency of monitoring
- Always do a BM if someone becomes unwell/has a NEWS2 score
- Make sure people drink enough

Any Questions?

The Vital signs are?

Mental alertness TPR BP BM Sats

Recap

- Respiratory Conditions
- Cardiac Conditions
- Constipation
- Fluid Monitoring

• 5 minute highlights

2-Day PH Day 2 Quiz



2-Day Physical Health Training Feedback Form

