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* General and special care for seriously ill patients

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*Critically ill patients

Critically ill patients are defined as those patients who are at high risk for actual or potential life-threatening health problems.

The term “critically ill” is used to describe people who have acute, life-threatening conditions but who might recover if they are given prompt appropriate, effective nursing and medical care.

www.healinghealth.com

Due to American association of critical-care nurses and Alexander’s Nursing Practice (Chris Brooker, et all.)

Categories of critically ill patients

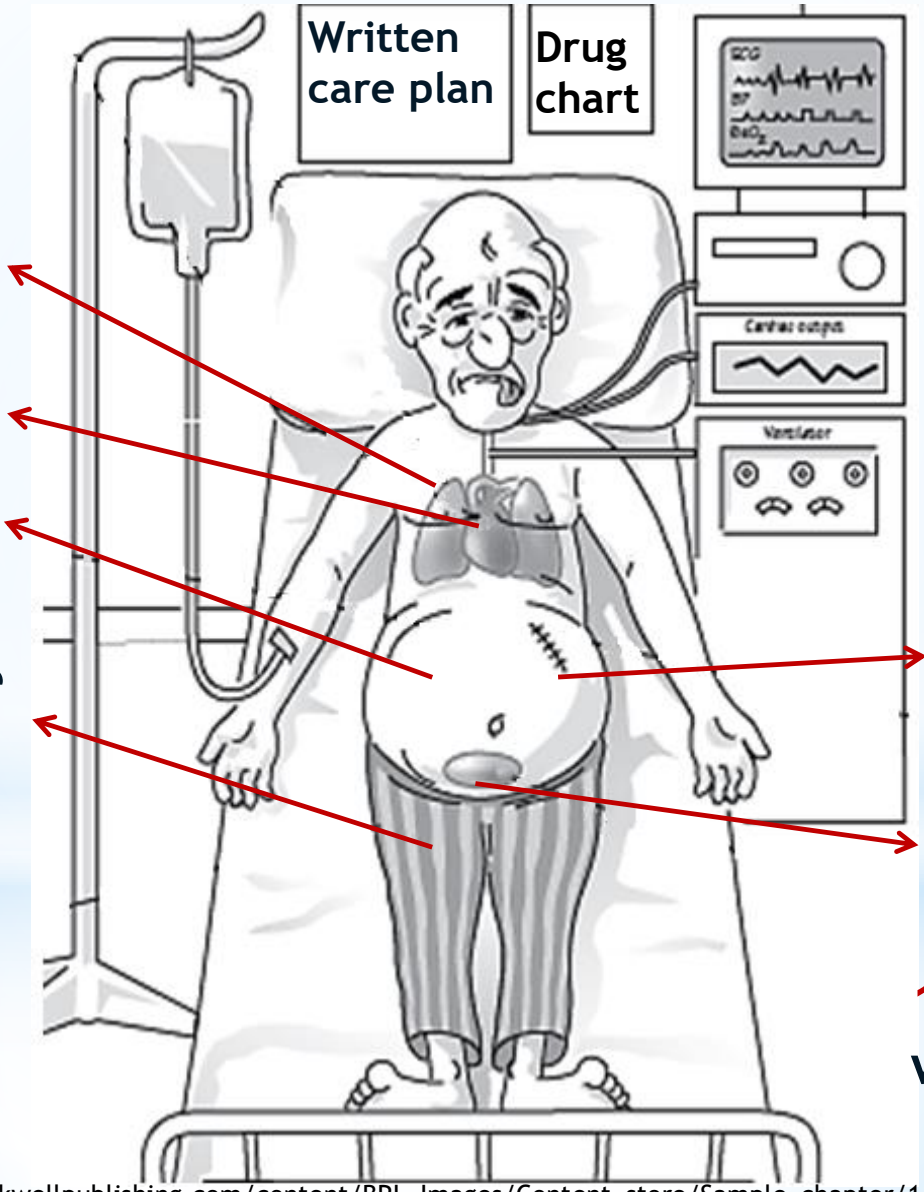
There is 3 categories of critically ill patients:

- **Those who have never before had a significant illness and who have suffered a sudden, acute life-threatening event (trauma, burns, etc.);**
- **Those who suffer from chronic illness, perhaps involving frequent previous hospital admissions (peptic ulcer, chronic hepatitis, etc.) and in whom there is combination of chronic illness and life-threatening event;**
- **Those who had become critically ill as a result of surgery (postoperative patients).**

Alexander's Nursing Practice (Chris Brooker, et all.)

*Management of critically ill patients

1. Regular review of monitored trends and response to therapy
2. Respiratory care
3. Cardiovascular care
4. Gastrointestinal (GI)/nutritional care
5. Neuromuscular care
6. Comfort and reassurance
7. Communication with the patient
8. Venous thrombosis prophylaxis



9. Infection control
10. Skin care, general hygiene and mouthcare
11. Fluid, electrolyte and glucose balance
12. Dressing and wound care
13. Bladder care and renal support
14. Communication with relatives

http://www.blackwellpublishing.com/content/BPL_Images/Content_store/Sample_chapter/1405106662/LeachChap1.pdf

*Critical care nursing

Critical care nursing deals specifically with human responses to life-threatening problems.

A critical care nurse is a licensed professional nurse who is responsible for ensuring that acutely and critically ill patients and their families receive optimal care.

Due to American association of critical-care nurses http://www.aacn.org/wd/publishing/content/pressroom/aboutcriticalcarenursing.pcms?menu=

*Critical care nurse duties

1. Identify patients' needs and alter care plans as necessary to meet those needs.
2. Collect specimens for laboratory tests.
3. Compile and analyze data obtained from monitoring or diagnostic tests.
4. Perform approved therapeutic or diagnostic procedures based upon patients' clinical status.
5. Evaluate patients' vital signs and laboratory data to determine emergency intervention needs.
6. Administer medications intravenously, by injection, orally, through gastric tubes, or by other methods.
7. Assess patients' pain levels and sedation requirements.
8. Identify patients who are at risk of development of complications.

*Critical care nurse duties-cont.

9. Monitor patients' fluid intake and output to detect emerging problems such as fluid and electrolyte imbalances.
10. Monitor patients for changes in status and indications of conditions such as sepsis or shock and institute appropriate interventions
11. Assist physicians with procedures such as bronchoscopy, endoscopy, endotracheal intubation, etc.
12. Collaborate with other health care professionals to develop and revise treatment plans based on identified needs and assessment data.
13. Advocate for patients' and families' needs, or provide emotional support for patients and their families.
14. Document patients' medical histories and assessment findings, patients' treatment plans, interventions, etc.
15. Provide post-mortem care

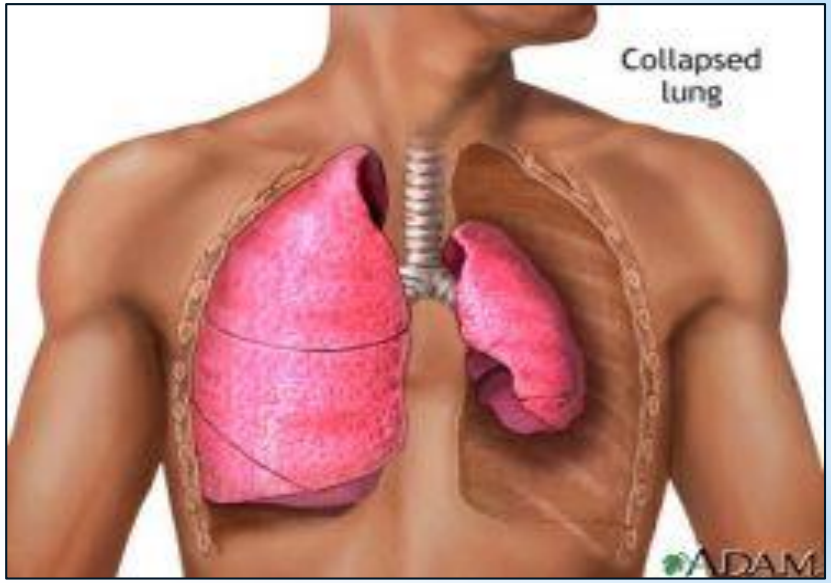
http://job-descriptions.careerplanner.com/Critical-Care-Nurse.cfm

Respiratory care

In critically ill patients can occur:

- altered ventilation,
- poor secretion clearance,
- impaired muscle function,
- lung collapse (atelectasis).

Respiratory care includes assisted coughing, deep breathing and alveolar recruitment techniques (e.g. CPAP), chest percussion, postural drainage, positioning (e.g. sitting up), bronchodilators, tracheal toilette, suctioning and tracheostomy care.



http://www.passy-muir.com/sites/kiritsy-s.JPG

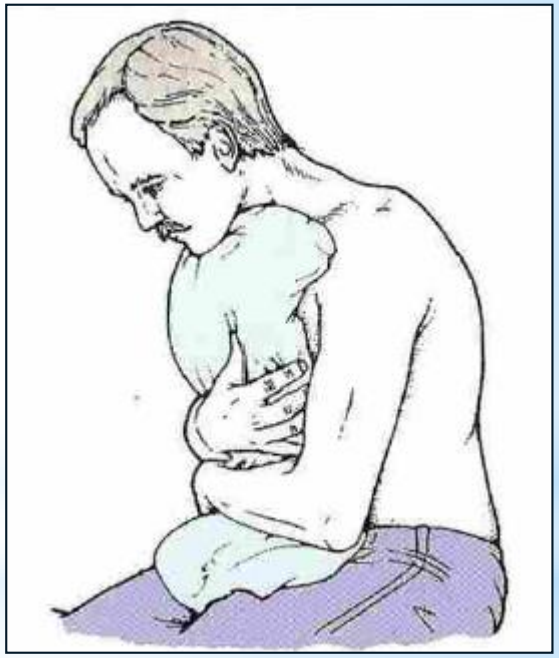
Respiratory monitoring: key points

- Respiratory rate (depth, sounds, pattern/rhythm);
- Presence of cough (productive/unproductive);
- Sputum (color, consistency, amount, smell);
- Degree of effort, use of accessory muscles;
- Color of skin/mucous membranes – mottling, pallor, cyanosis;
- Shape of thorax, symmetry of movement;
- Pain related to inspiration/expiration/movement;
- Presence/absence of airway obstruction;
- Arterial blood gas (ABG) and pulse oxymetry;
- Bedside spirometry (measurement of forced vital capacity (FVC) and forced expiratory volume (FEV);

http://4f0j00FCPaAHwDLfgJ/Handheld-Pulse-Oximeter-PM60A-.jpg

Respiratory care procedures

- **Deep breathing** stimulates surfactant and inflate hypoventilated alveoli;
- **Coughing** helps to remove retained secretions;
- **Airway suctioning** assists ineffective airway clearance and early ambulation.
- **Postural drainage, chest percussion and vibration** help to mobilize secretions. Are used for the patients who produce exeсessive amounts (>25ml/day) of thick secretions that are difficult to mobilize.



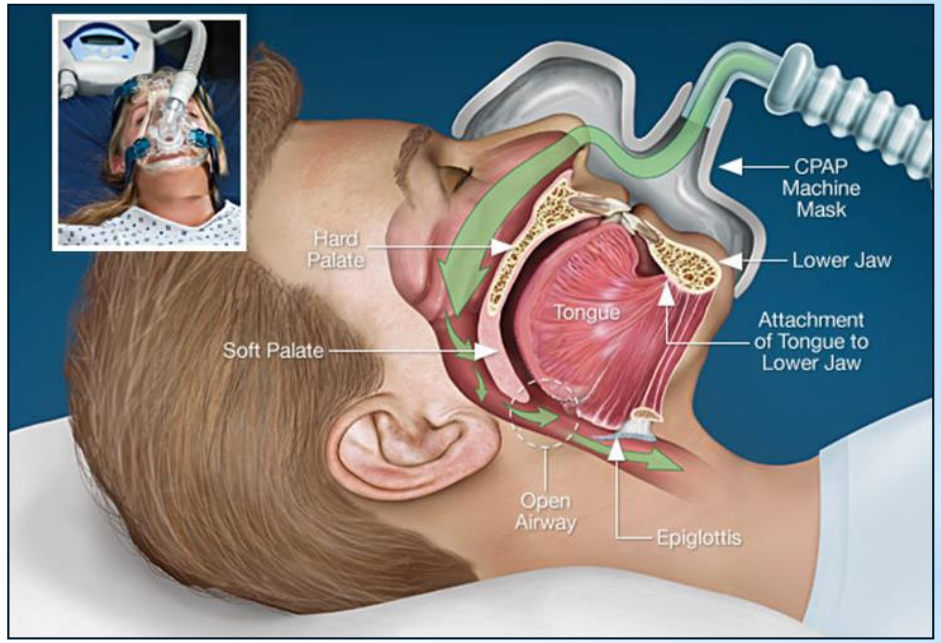
NB! Holding pillow against incision when coughing prevents incisional strain.

Clinical Nursing Skills Basic To Advanced Skills 7th edd. by Smith, Duel and Martin, ch. 26, p.948

*Respiratory care procedures

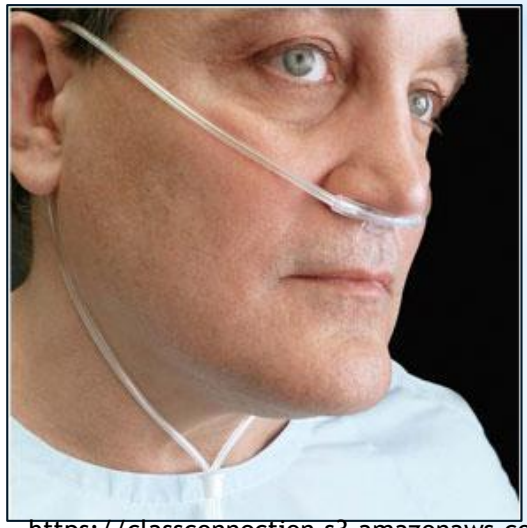
CPAP/BIPAP is the noninvasive application of positive pressure to upper airways to prevent their obstruction by the soft tissues that surround them.

NB!!! CPAP/BIPAP should never be used on a sedated client. There is great danger of aspiration if the patient will vomit.



Oxygen (O2) is administered as a corrective treatment for conditions resulting in hypoxia (low level of oxygen in the blood) via nasal cannula, simple face mask, Venturi mask, etc.

NB!!! Mask should be removed and cleaned several times a day.



https://classconnection.s3.amazonaws.com/432/flashcards/2223432/jpg/nasal-cannula-fullview1359520711681.jpg

Cardiovascular care

Prolonged immobility impairs autonomic vasomotor responses to sitting and standing causing profound postural hypotension.

Tilt tables may be beneficial prior to mobilization.

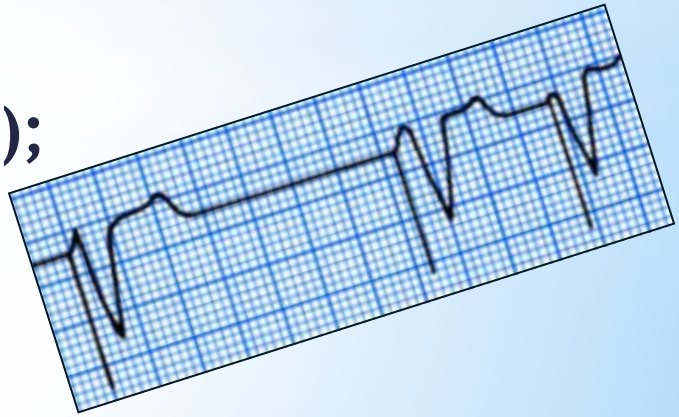
http://www.liko.com/Global/images/programs/Progressive_Mobility_2-Preliminary-Tilt-Table.jpg

Features of tilt table:

- Achieves up to 20°of reverse Trendelenburg position;
- Gradually and safely acclimatizes the patient to an upright position;
- Provides orthostatic training.

Cardiovascular monitoring: key points

- Pulse (rate, rhythm, tension);
- Blood pressure (systolic, diastolic, pulse pressure);
- Skin changes (color, edemas);
- Presence of cough, hemoptisis;
- ECG (detection of MI, ischemia, rhythm, conduction disturbances, electrolyte imbalance, effect of drugs on the heart);
- State of pacemaker if it is present;
- Monitor central venous pressure (CVP);



Oral health in critically ill patients

- In the critical care unit, deterioration of a patient's respiratory function may necessitate endotracheal intubation and mechanical ventilation. This intervention, requiring the insertion of an artificial airway, can place the patient at risk for direct introduction or micro-aspiration of pathogens from the oral cavity into the lower part of the respiratory tract.
- The risk of nosocomial pneumonia among mechanically ventilated patients is as much as 21 times greater than among non-ventilated patients, and the mortality rate in these patients may exceed 50%.
- Xerostomia, or dry mouth, may be caused by the presence of devices in the patient's mouth that keep the mouth open and is aggravated by stress and anxiety. Xerostomia can result in reduced salivary flow and lead to microbial overgrowth and heavy dental plaque formation.

Barriers to the achievement of optimal oral hygiene

- **Mechanical barriers** crowd the mouth of the ventilated critically ill patient. These may include an endotracheal tube, oral airway, oral gastric tube, and temperature probe. Delivering effective oral hygiene in this confined, occupied space will challenge even an experienced critical care nurse.
- **Communication barriers** are related to both to language and treatment. The care activities related to oral hygiene can be made easier if the patient is informed about them and understands their intention. Lack of patient compliance may be due to a language barrier, but also to the effects of sedation, other treatment interventions (i.e. endotracheal tube) or if the patient is in pain.
- **Nurses' attitude** to oral hygiene procedures (defining it as unpleasant, low priority or lack of experience in oral hygiene procedures)

Oral hygiene: key points

- Initial state of oral cavity - condition of lips, mucous membranes, gums, hard and soft palates (smooth/pink/moist/ dry/cracked/ulcerated/bleeding)
- level of consciousness
- immune status
- physical disabilities, for example unable to move tongue from side to side,
- unable to empty oral cavity when eating
- dentures/braces, full/partial, well fitting/ill fitting

Oral health is influenced by dental plaque, the presence and type of oral microbial flora and oral immunity.

One of the most significant factors impacting on the oral hygiene of a critically ill patient is simply their inability to perform this essential care aspect for themselves.

https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSTOQMtgxBlF8gsVsNlYCsg-abaLUI78UGQoTIVVbJuKNZIH9p1wA

Oral hygiene includes:

- Brushing and flossing;
- Denture care;
- Special care for patients with impaired physical mobility or who are unconscious;

The recommended frequency for oral cleansing varies between 2-4 hours intervals.

Oral hygiene – cont.

Independent patients- patients who are able to sit in a Fowler's or semi-Fowler's position, can usually perform their own oral hygiene.

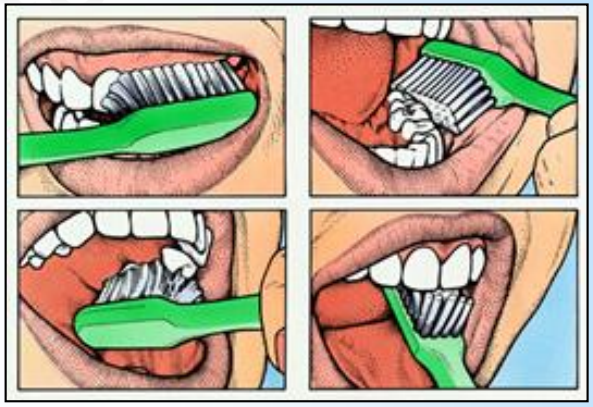
- While a patient is performing oral hygiene, it is important for to observe the process and provide any necessary teaching about brushing and flossing.

Dependent patients - patients that are incapable of performing oral hygiene by themselves.

- Be sure to assess their level of dependence and invite them to participate in any way they can.

http://unfrazzledcare.com/wp-content/uploads/2013/08/correct_tooth_brushing_technique.jpg
http://hospitalnews.com/wp-content/uploads/2012/09/Oral-Health.jpg

*Oral hygiene: procedure



- Wash your hands and put on gloves
- Remove all appliances (e.g. dentures), place in a labeled pot
- Place towel over patient's chest
- Using a soft toothbrush and fluoride toothpaste gently brush all teeth at an angle of 45o to the teeth and all other surfaces, i.e.gums, tongue, and oral tissues.

NB! When cleaning the tongue, avoid the posterior aspect as this can stimulate the gag reflex.

- Offer the patient water or mouthwash and advise them not to swallow this. Provide a receiver for disposal. Protect the airway at all times. Suction equipment may be used to remove any excess;
- Provide wipes or tissues and assist client to wash/wipe and dry mouth.

*Preparations for oral hygiene

Preparation	Uses	Disadvantages
Chlorhexidine 0.1 - 0.2%	Inhibits bacterial growth (G+ and G- microorganisms), effect for 12 hours	Tastes unpleasant and stains teeth with prolonged use
Sodium bicarbonate mouthwash 1%	reduce the viscosity of oral mucus, remove oral debris	Tastes unpleasant, can burn if not adequately diluted. Can also alter oral pH allowing bacteria to multiply
Water	Refreshing, ideal pH and readily available	Hospital tap water has been identified as a serious source of *Pseudomonas*
Toothpaste	Effective for removing debris	Can dry the oral cavity if not adequately rinsed
Synthetic saliva	Provides moisture	Does not check bacterial growth

Oral care of unconscious patients

- Positioning—lateral position with head turned to the side or side-lying. Position back of head on a pillow so that the face tips forward and fluid/ secretions will flow out of the mouth, not back into the throat.
- Place a bulb syringe or suction machine with suction equipment nearby.
- Use a padded tongue blade to open the patients mouth and separate the upper and lower teeth
- Never place your hand in the patient's mouth or open with your fingers. Oral stimulation often causes the biting -down reflex and serious injuries can occur.

http://hospitalnews.com/wp-content/uploads/2012/09/Oral-Health.jpg

*Denture care

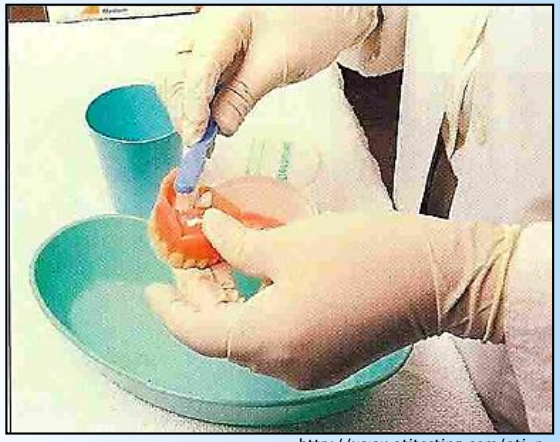
Having washed hands and donned gloves, ask the client to remove prostheses and assist if necessary - <u>remove upper denture first</u>:

- Place index finger against the roof of the mouth
- Thumb against front teeth
- Gently press and lift out at same time
- You will feel seal release
- Then remove lower dentures

Brush all surfaces of dentures, upper and lower.

Rinse denture thoroughly in cold water.

NB! Hot water can damage dentures.



If dentures are to remain out of the mouth for a period of time (at night) store them in a clearly labeled unbreakeable container of cold water.

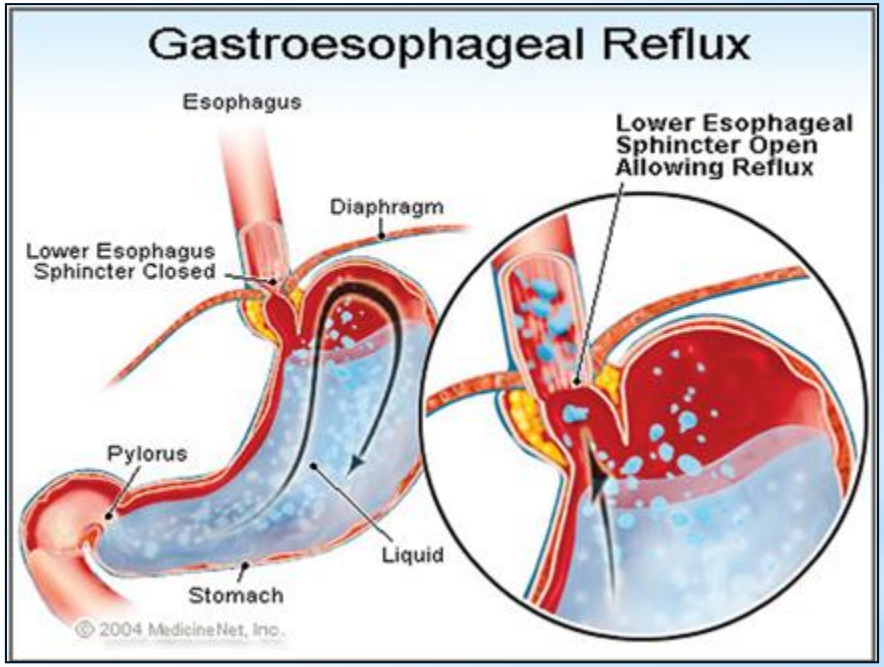
If dentures are to be worn - help patient to rinse oral cavity with warm water or mouthwash.

When replacing dentures in mouth, put lower dentures first then uppers.

http://www.atitesting.com/ati_next_gen/skillsmodules/content/personal-hygiene/images/PH-denture1.jpg

Gastro-intestinal care

- The supine position predisposes to gastro-oesophageal reflux and aspiration pneumonia. Positioning of patients 30° head-up prevents this.
- Early enteral feeding reduces infection, stress ulceration and GI bleeding.
- Immobility is associated with gastric stasis and constipation; gastric stimulants and laxatives are essential.



http://www.continuedcare.com/wp-content/uploads/2014/07/shapeimage_2.png

Gastro-intestinal monitoring: key points

- Assessment of nutritional status (BMI calculation);
- Assessment of hydration status (monitor intake and output of fluids, signs of dehydration);
- Monitor appetite, ability to chew and swallow;
- Presence of nausea, vomiting, hematemesis;
- Presence of abdominal pain, flatulence;
- Presence of diarrhoea /constipation;
- Characteristics of stool (colour, quantity, hematochezia);
- Monitor state of nasogastric tube;

$$\text{BMI calculation} = \frac{\text{weight (kg)}}{\text{height}^2\text{ (m)}}$$

*Indications for enteral tube feeding

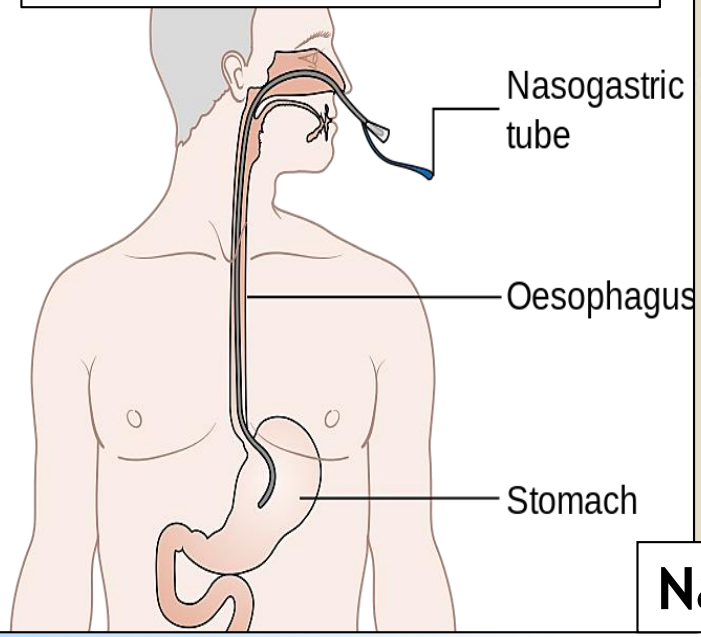
Unconscious patient	Head injury, ventilated patient
Swallowing disorder	Post-CVA (eg. stroke), multiple sclerosis, motor neurone disease
Physiological anorexia	Liver disease (particularly with ascites)
Upper GI obstruction	Oesophageal stricture
Partial intestinal failure	Postoperative ileus, inflammatory bowel disease, short bowel syndrome
Increased nutritional requirements	Cystic fibrosis, renal disease
Psychological problems	Severe depression or anorexia nervosa

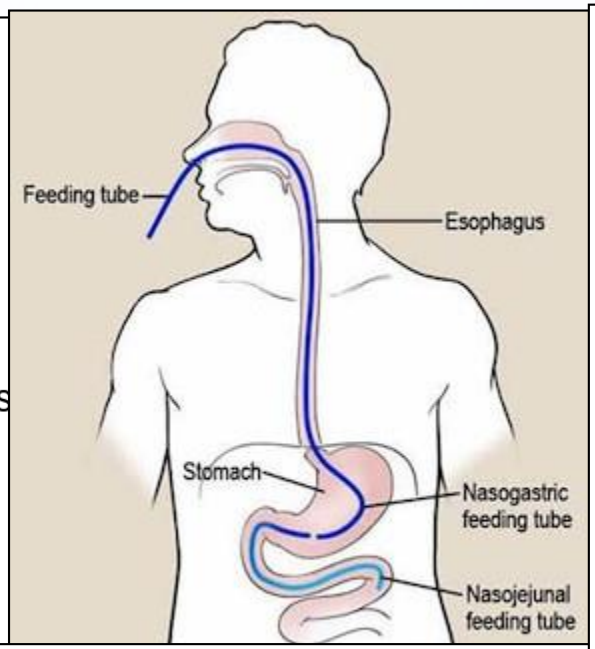
Nightingale, J. et. all. 2003

*Types of enteral feeding

Gastrointestinal access for up to 4-6 weeks is usually achieved using NG or NJ tubes, although placement of percutaneous gastrostomy or jejunostomy access should be considered sooner if feeding is very likely to be prolonged.

Nasogastric (NG) tube





Nasojejunal (NJ) tube

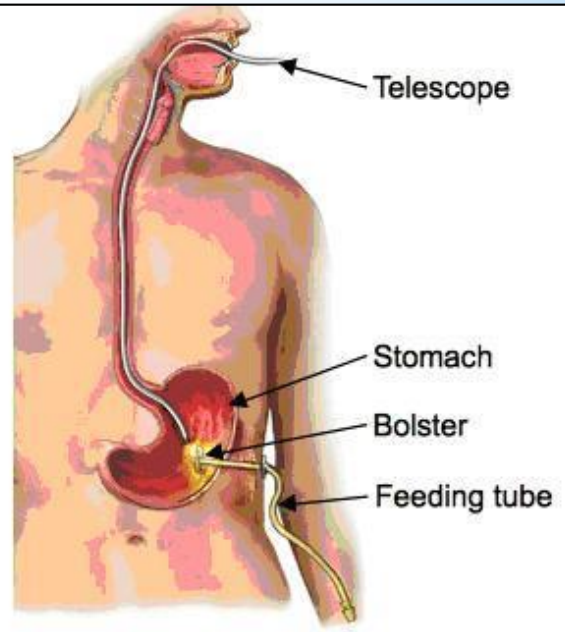


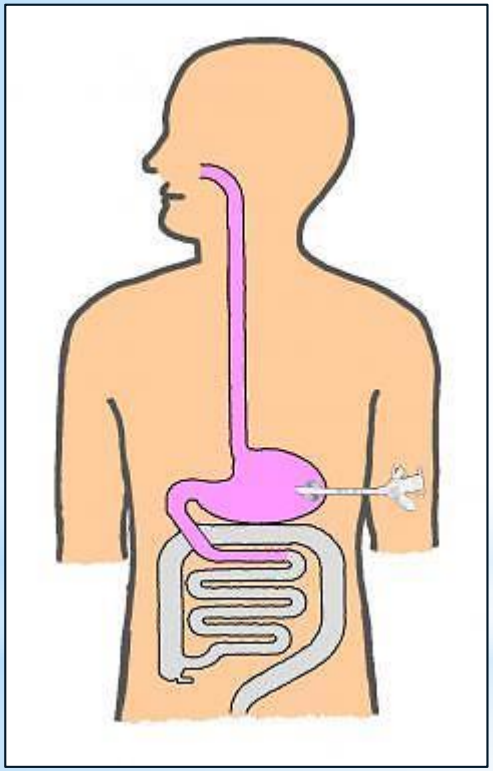
Figure 1

A feeding tube placed in the stomach

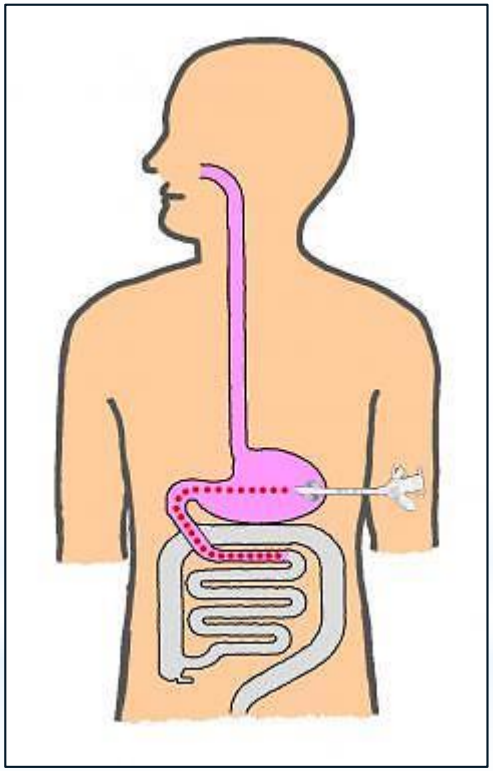
http://www.oxfordmedicaleducation.com/wp-content/uploads/2015/04/Diagram_showing_the_position_of_a_nasogastric_tube_CRUK_340.png

http://www.ramsayhealth.co.uk/image.ashx?assetid=ba483405-f25c-46b9-bd99-8d3baea8edd1

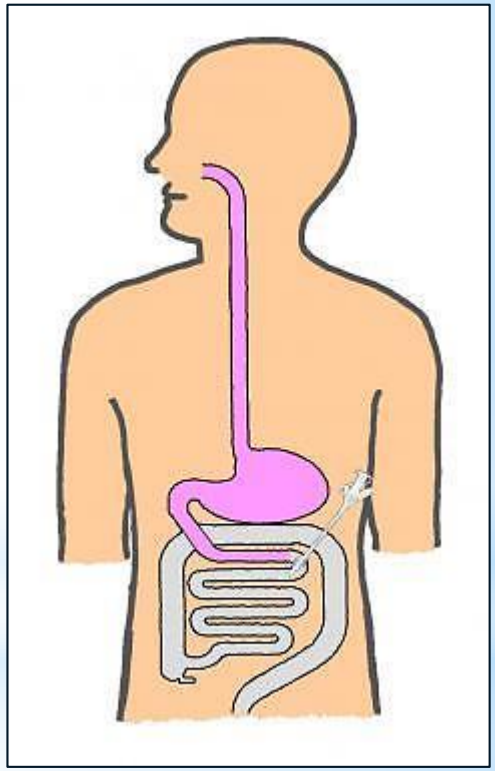
*Types of enteral feeding



Direct percutaneous gastrostomy



Transgastric jejunostomy

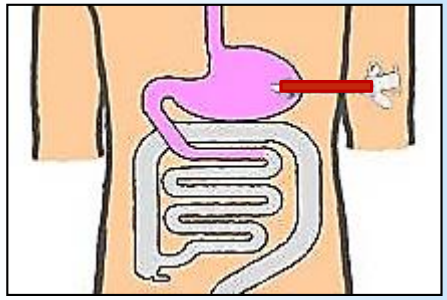


Percutaneous jejunostomy

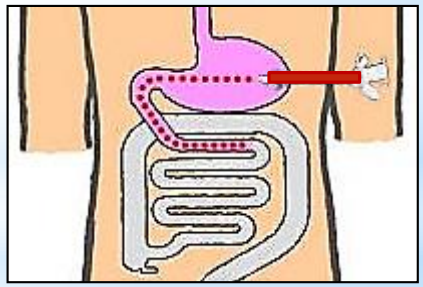
http://emedicine.medscape.com/article/1821257-technique#showall

*Types of enteral feeding

Direct percutaneous gastrostomy - tube placement entails placement of feeding catheter directly into stomach by using imaging guidance.



Transgastric jejunostomy, gastrojejunostomy tube placement entails placement of feeding tube through stomach and duodenum, with tip terminating in jejunum. Method combines simplicity of gastric access with benefits of direct small-bowel tube feedings.



Percutaneous jejunostomy entails placement of feeding tube directly into small bowel. Method is technically more difficult than percutaneous gastrostomy and is associated with higher risk.

http://emedicine.medscape.com/article/1821257-technique#showall

Enteral feeding

- Enteral tube feeds can be administered by bolus, or by intermittent or continuous infusion. Bolus feeding entails administration of 200–400 ml of feed down a feeding tube over 15–60 minutes at regular intervals. The technique may cause bloating and diarrhoea.
- Continuous infusion may help with diarrhoea in some patients but it also results in higher intragastric pH levels than bolus feeding which can promote bacterial growth. It is commonly used for very ill patients but it should be changed for intermittent infusion as soon as possible. Continuous feed should not be given overnight in patients who are at risk of aspiration.
- Monitoring of: the volume and type of feed administered, blood glucose at 4-6 hour intervals and plasma sodium, potassium, magnesium, and phosphate are to be checked daily. Liver function tests and full blood counts must be repeated weekly until the patient is stable, state of tube.

Disadvantages of enteral feeding

- Nasopharyngeal discomfort occurs frequently in patients with nasoenteral tubes and many suffer sore mouths, thirst, swallowing difficulties, and hoarseness.
- Local pressure effects from tubes may cause nasal erosions, abscess formation, sinusitis, and otitis media.
- Short term oesophageal damage can include oesophagitis and ulceration from local abrasion and gastro-oesophageal reflux. Gastro-esophageal feflux may lead to aspiration and pneumonia especially when patients are fed supine.
- Post insertion tube related complications from gastrostomies and jejunostomies include infection at the insertion site, peristomal leaks, accidental tube removal, tube fracture, peritonitis, septicaemia, and necrotising fasciitis.

Features of enteral feeding

- Feeding tubes block easily, especially if they are not flushed with fresh tap, cooled boiled, or sterile water before and after every feed or medication.
- Any drugs administered through a tube should ideally be elixirs or suspensions rather than syrups and should only be given after establishing compatibility. Hyperosmolar drugs, crushed tablets, potassium, iron supplements, and sucralfate are particularly likely to cause problems.
- A tube can often be unblocked by flushing with warm water or, if this fails, by using an alkaline solution of pancreatic enzymes.

*Parenteral nutrition

Partial parenteral nutrition (PPN) supplies only part of daily nutritional requirements, supplementing oral intake. Many hospitalized patients are given dextrose or amino acid solutions by this method.

Total parenteral nutrition (TPN) supplies all daily nutritional requirements. Because TPN solutions are concentrated and can cause thrombosis of peripheral veins, a central venous catheter is usually required.

TPN requires water (30 to 40 mL/kg/day), energy (30 to 45 kcal/kg/day, depending on energy expenditure), amino acids (1.0 to 2.0 g/kg/day, depending on the degree of catabolism), essential fatty acids, vitamins, and minerals

Possible complications: catheter-related sepsis (50% of patients), glucose abnormalities (hyperglycemia or hypoglycemia) or liver dysfunction, electrolyte abnormalities, volume overload.

http://www.merckmanuals.com/professional/nutritional-disorders/nutritional-support/total-parenteral-nutrition-tpn

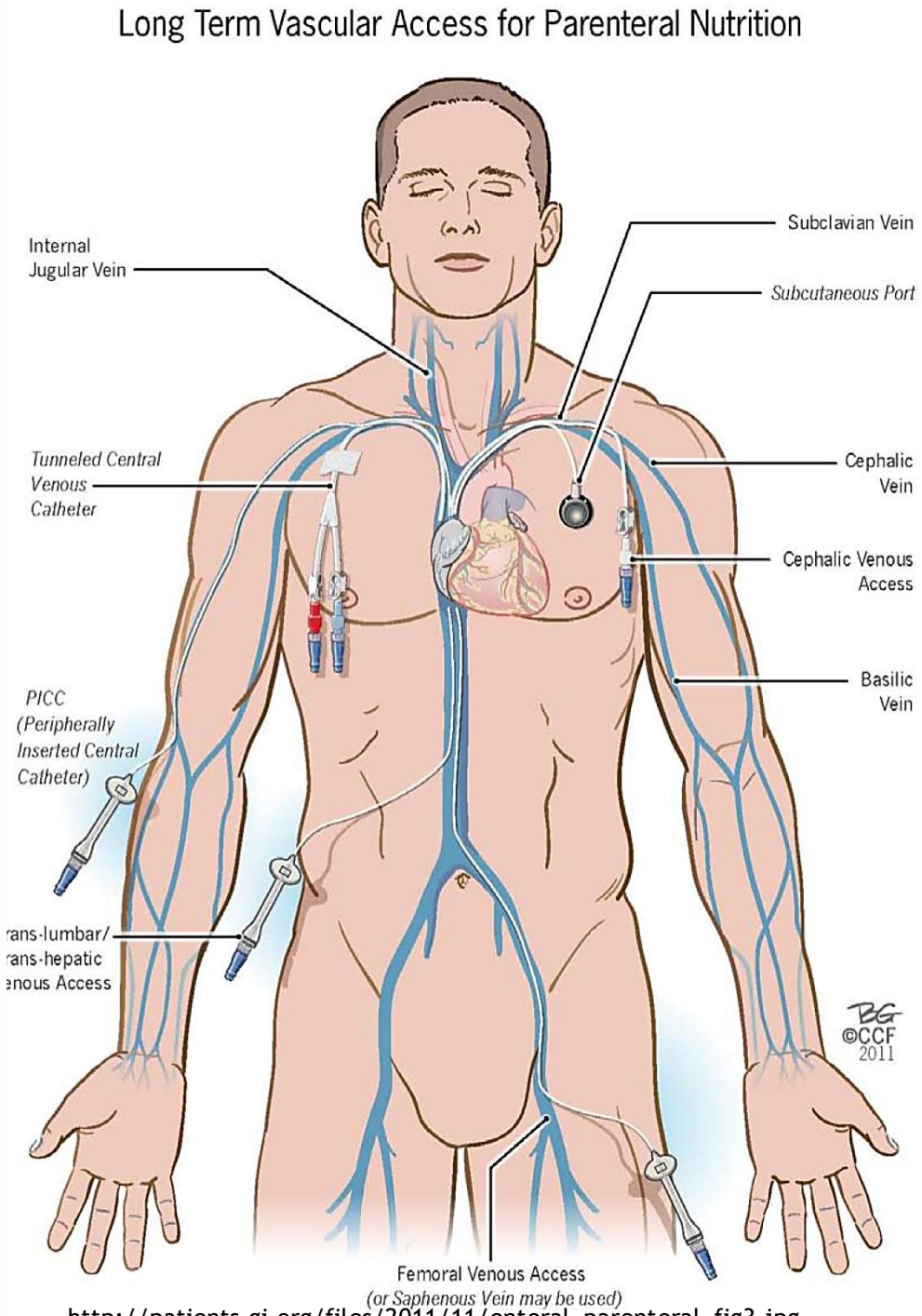
Parenteral nutrition: key points

- Consider parenteral nutrition for patients who do not have a functioning GI tract or who have disorders requiring complete bowel rest.
- Choose a solution based on patient age and organ function status; different solutions are required for patients who have compromised heart, kidney, or lung function.
- Use a central venous catheter, with strict sterile technique for insertion and maintenance.
- Monitor patients closely for complications (eg, related to central venous access, glucose levels, electrolyte and mineral levels, hepatic or gallbladder effects, volume overload, etc.).

Vascular access

- Central venous catheters (CVCs) can be inserted through the jugular, subclavian, or femoral veins or via the upper arm peripheral veins (peripherally inserted central catheters - PICC line).
- To reduce the risk of venous thrombosis and catheter sepsis, catheters should be removed as soon as possible.
- The skin entry site must be cleansed and inspected daily for local infection; the catheter must be replaced if local or systemic infection occurs.

http://www.merckmanuals.com/professional/critical-care-medicine/approach-to-the-critically-ill-patient/vascular-access

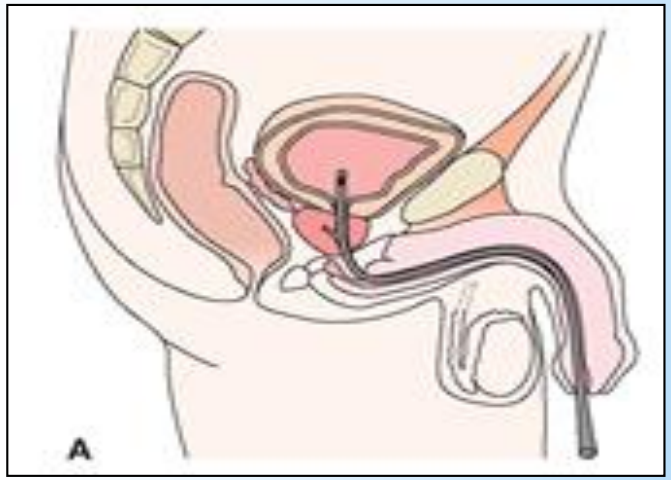


http://patients.gi.org/files/2011/11/enteral_parenteral_fig3.jpg

*Renal care

- Any catheter placed in the urinary bladder is a potential source of infection. The catheter must be inserted using sterile technique.
- Urinary catheters can cause painful urethral ulcers and must be monitored.
- Early removal reduces risk of urinary tract infections.
- Assessment and optimization of fluid and electrolyte balance is also important.

NB! The drainage bag must be below the level of the bladder.



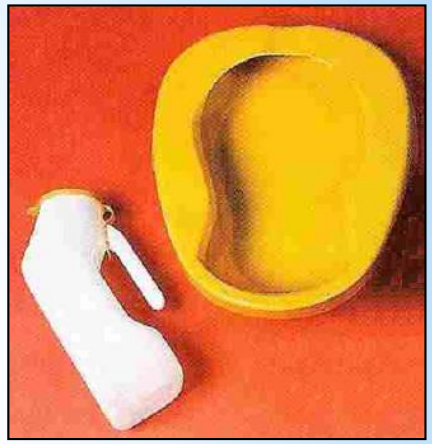
http://what-when-how.com/wp-content/uploads/2012/08/tmp61b6112_thumb222.png

Perineal care: key points

- Assess the patient's need for perineal care. Patients at risk for infection need more frequent care. These include patients with incontinence-associated dermatitis (IAD), patients with an indwelling urinary catheter, postpartum patients, and those recovering from rectal or genital/urogenital surgery.
- Note any restrictions or limitations on patient positioning.
- Determine how much of the perineal care the patient wants to complete herself.
- Before the procedure offer the patient a bedpan.
- Carefully wash the genitalia area, dry thoroughly, ensure that all skin folds are dry.

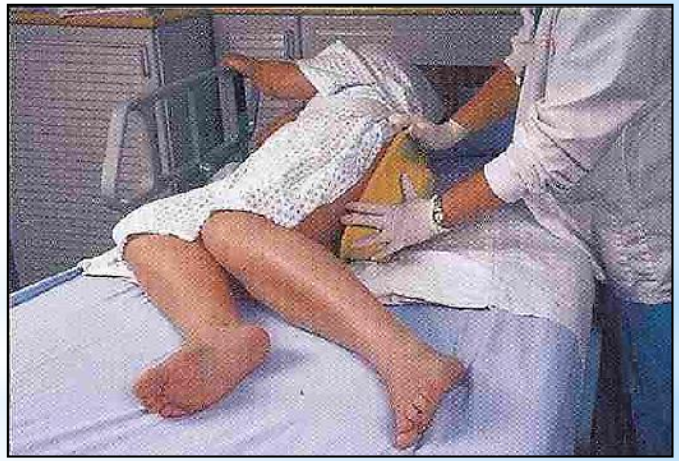
NB! For female patients important to bathe perineum from pubis to rectum.

Using a bedpan



Placing bedpan:

- Place absorbent pad under hips, if needed.
- Raise the client's hips and slip your arm under the patient or turn the patient on his or her side. Roll the patient onto the pan.
- Place a rolled towel or blanket under the client's sacrum.



Remove bedpan by placing hand under small of back.

- Assist client to lift buttocks off pan.
- Remove pan by pulling toward edge of bed.

Clinical nursing skills, basic to advanced skills 7th ed by Smith, Duel, and Martin

Enema

Enema – is a rectal introduction of various liquids with the medical and diagnostic purposes. Following types of enemas are distinguished: cleansing enema, siphon enema, therapeutic enema, nutrient enema and others.

Cleansing enema indications:

- remove a dejection and gas from the end part of a bowel;
- preparation for radiological research of a stomach, intestines, and kidneys; before operation, abortion; before applying of therapeutic enema

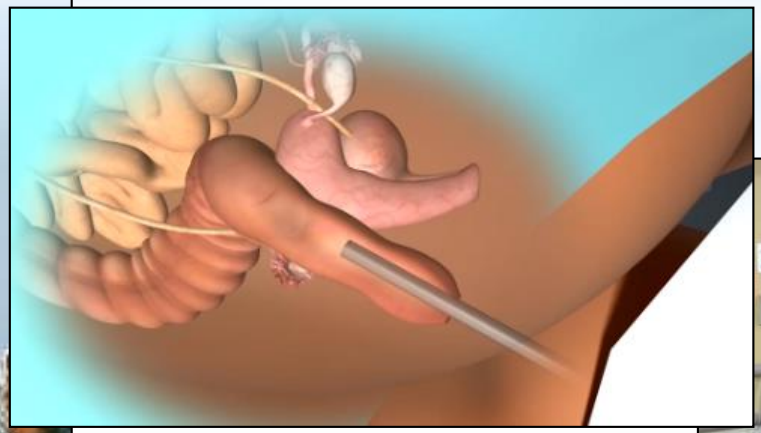
Contraindications :

- anal and perianal inflammatory diseases, bleeding hemorrhoids,
- tumors of a rectum in stages of disintegration,
- gastrointestinal bleeding.

Siphon enema (repeated washing of bowel) can be applied, if usual cleaning enema is not effective (i.e. poisoning).

Cleansing enema: procedure

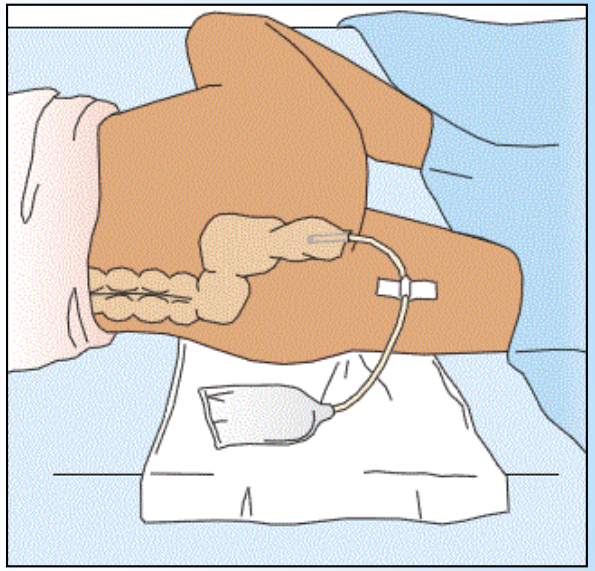
- Is done in left side-lying position with knees flexed. Process enema tip with lubricant
- Separate the buttocks and then first 3-4 cm enter an enema tip in the direction of umbilicus, and then 5-8 cm parallel to the coccygeal bone. Use water of room temperature 1-1,5 l, desirable to hold it inside for10min.



http://home.nwciowa.edu/videos/nursing/mosby/basic/skill/E004.html

http://home.nwciowa.edu/videos/nursing/mosby/basic/skill/E004.html

*Rectal tube



Flatulence is the presence of excessive amounts of flatus (gas) in the intestine, causing abdominal distension and discomfort.

A rectal tube is placed in side-lying/supine position of the patient to relieve flatulence if the gas cannot be passed naturally. The small bag connected to the end of the rectal tube is used to collect any liquid stool that may escape with the flatus.

Features of procedure:

- Lubricate the proximal end of the rectal tube with water-soluble lubricant.Gently separate buttocks, and ask client to take in a deep breath. Gently insert the tube into the client's rectum, past the external and internal anal sphincters on distance of 20-30 cm from anus. Hold a tube no more than 2 hours, then pull it out, and, if necessary, enter again.

https://bowelelimination.files.wordpress.com/2013/05/e.gif?w=450&h=375

Bed bath: key points

- Assess the patient's tolerance for bathing and activity, comfort level, cognitive ability, and musculoskeletal function. Determine whether the patient has contraindications to the bath;
- Assess for the presence and position of external medical devices or equipment.
- Before or during the bath, assess the condition of the patient's skin. Note any dryness, indicated by flaking, redness, scaling, and cracking, and any excessive moisture, inflammation, or pressure ulcers.
- Offer a bedpan or urinal before the bath;
- Wash from the cleanest area to the dirtiest area; change the water every time it get dirty;
- After the bath dry under breasts, between skin folds, between toes;
- While drying the skin do not rub it.

Bed bath: procedure

http://home.nwciowa.edu/videos/nursing/mosby/basic/skill/B001.html

*Changing an occupied bed

1. Place center of sheet in the middle of the bed

2. Tighten bottom sheet under mattress

3. Place drawsheet in the middle of the bed

4. Assist patient to roll over to other side of the bed

5. After raising side rail pull the linen toward you

Clinical nursing skills, basic to advanced skills 7th ed by Smith, Duel, and Martin

*Hair care

Hair care can usually be done after the bath and as daily hygienic activities in a daily base. Hair care includes combing (brushing of hair), washing/shampooing of hair and pediculosis treatment.

<u>Contraindications to shampooing:</u>

- head and neck injuries,
- spinal cord injuries,
- arthritis

In these conditions the patient at risk for injury during shampooing because of positioning and manipulation of the head and neck.

Before the procedure inspect the condition of the hair and scalp. Assess for abrasions, lacerations, lesions, inflammation, and infestation (such as pediculosis).

Hair care: procedure

- Remove the pillows from under the pt's head and place it under patient's shoulder (to hyperextend the neck);
- Put the towel under the patient's shoulder and neck;
- Place the shampoo basin under the patient's head with one end extending to the receptacle for used water;
- Place damp washcloths over the pt's eyes and cotton balls in the patient's ears to protect from soapy water.
- Wet the hair with water, apply shampoo, massage all over the scalp, rinse the hair with plane water, squeeze the hair with your hands to remove water, dry it with towel or drier.

https://www.youtube.com/watch?v=_rg59kHKNt8&nohtml5=False

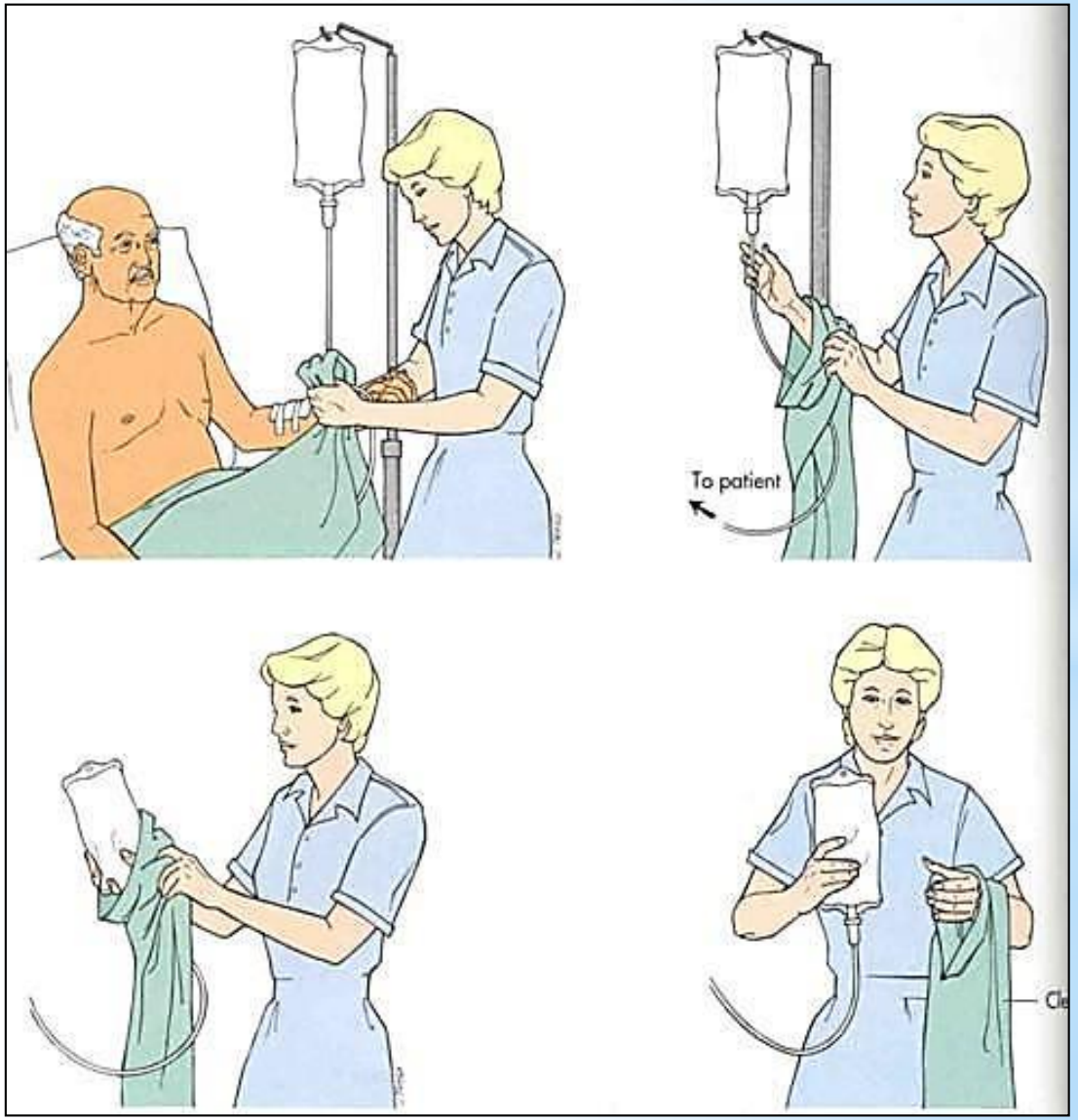
Shaving a patient

- Before shaving, determine whether the patient has a bleeding tendency. Review the patient's medical history, medications, and laboratory values, such as platelet count and anticoagulation studies.
- Assess the patient's ability to manipulate a razor.
- Done gloves and apply a warm, moist towel to soften a hair.
- Apply a sick layer of soap or shaving cream to the shaving area.
- Holding skin taut, use firm but small strokes in the direction of hair growth (safety edge razor).
- Gently remove soap or lather with a warm, damp towel.
- Inspect for areas you may have missed.
- Apply after shave lotion or powder as desired.

http://home.nwciowa.edu/videos/nursing/mosby/basic/skill/G004.html

Dressing a patient with IV

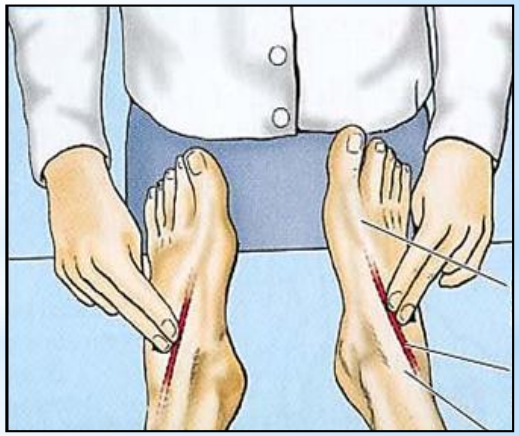
- The gown is first remove from arm without IV site.
- It is then slipped to the IV site and tubing to the bag.
- The bag is passed through the sleeve.
- The clean gown is passed over the IV.
- NB! Do not lower the bag below level of the IV site!



http://player.slideplayer.com/12/3535998/data/images/img79.jpg

Foot and nail care

- Inspect all surfaces of the patient's fingers, toes, feet, and nails. Pay particular attention to any areas of dryness, inflammation, or cracking. Also, inspect the heels, the soles of the feet, and between the toes.
- Assess the color and temperature of the patient's toes, feet, and fingers. Assess the capillary refill time of the fingernail and toenail beds. Palpate the radial and ulnar pulse of each of the patient's wrists and the dorsalis pedis pulse of the patient's feet; note the character and symmetry of the patient's pulses. Check for the nail fungus.
- Identify the patient's risk for foot or nail problems. Those at risk include older adults and those with diabetes mellitus, heart failure, renal disease, or stroke.



http://home.nwciowa.edu/videos/nursing/mosby/basic/skill/G005.html

Eye care

Risk factors for eye lesions in critically ill patients are:

- an alteration in level of consciousness, impacting on the blink reflex and lagopthalmos (the inability to close or poor closure of the eyelids);
- metabolic derangements;
- immunosuppression;
- medications such as sedatives, muscle relaxants and paralysis.
- Positive pressure ventilation causes conjunctival edema (chemosis) by raising the patient's venous pressure and reducing drainage of blood from the ocular tissue.

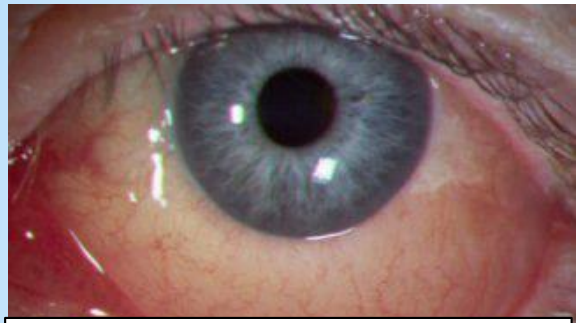
Eye Care for Critically Ill Adults 2014

Grade 1: Eyes completely closed

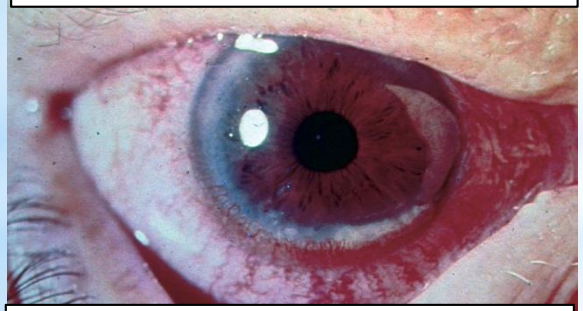
Grade 2: Eyes open: Sclera or conjunctiva visible

Grade 3: Eyes open: Cornea visible

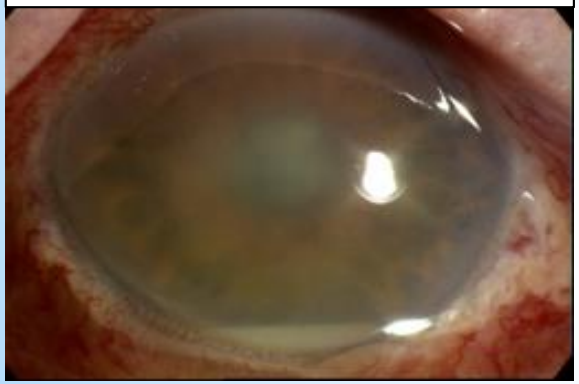
*Eye lesions in critically ill patients



Chemosis
Marginal keratitis

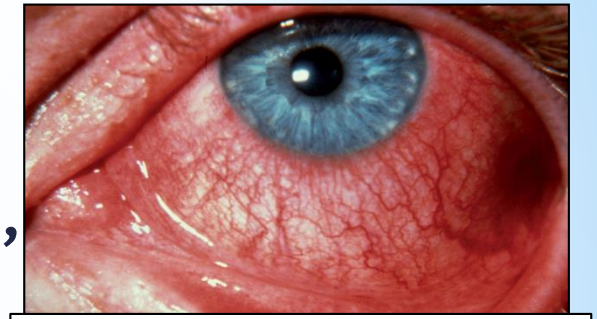


Eye in septic patient



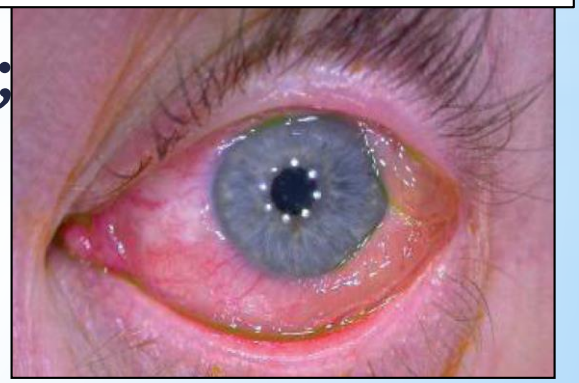
Assessment key-points:

- signs of infections (pain, redness, edema, discharges from eyes, vision problems, photophobia);
- ability for patient to maintain complete eyelid closure;
- corneal dryness or discolouration;
- eye care interventions;
- effectiveness of eye care interventions.



Viral conjunctivitis
Bacterial conjunctivitis

Allergic conjunctivitis



Eye care

- For all patients with, or at risk of lagopthalmos, second hourly eye care must be undertaken to prevent drying of ocular epithelial surfaces, and reduce the risk of infection. Interventions include:
- Cleaning of the eye (with saline soaked gauze)
- Use of ocular lubricant, or
- creation of a moisture chamber by use of polyethylene wrap
- Eye drops should be dropped in the outer fornix of the eye;
- Antibacterial eye-drops are used for bacterial lesions (chroraphenicol)

Neuromuscular care & comfort maintenance

- Immobility, prolonged neuromuscular blockade and sedation promote muscle atrophy, joint contractures and foot drop.
- Physiotherapy and splints may be required.
- Anxiety, discomfort and pain must be recognized and relieved with reassurance, physical measures, analgesics and sedatives.

Transcutaneous electrical muscle stimulation ↑

https://static-content.springer.com/image/art%3A10.1186%2Fcc11820/MediaObjects/13054_2012_1064_Fig1_HTML.jpg

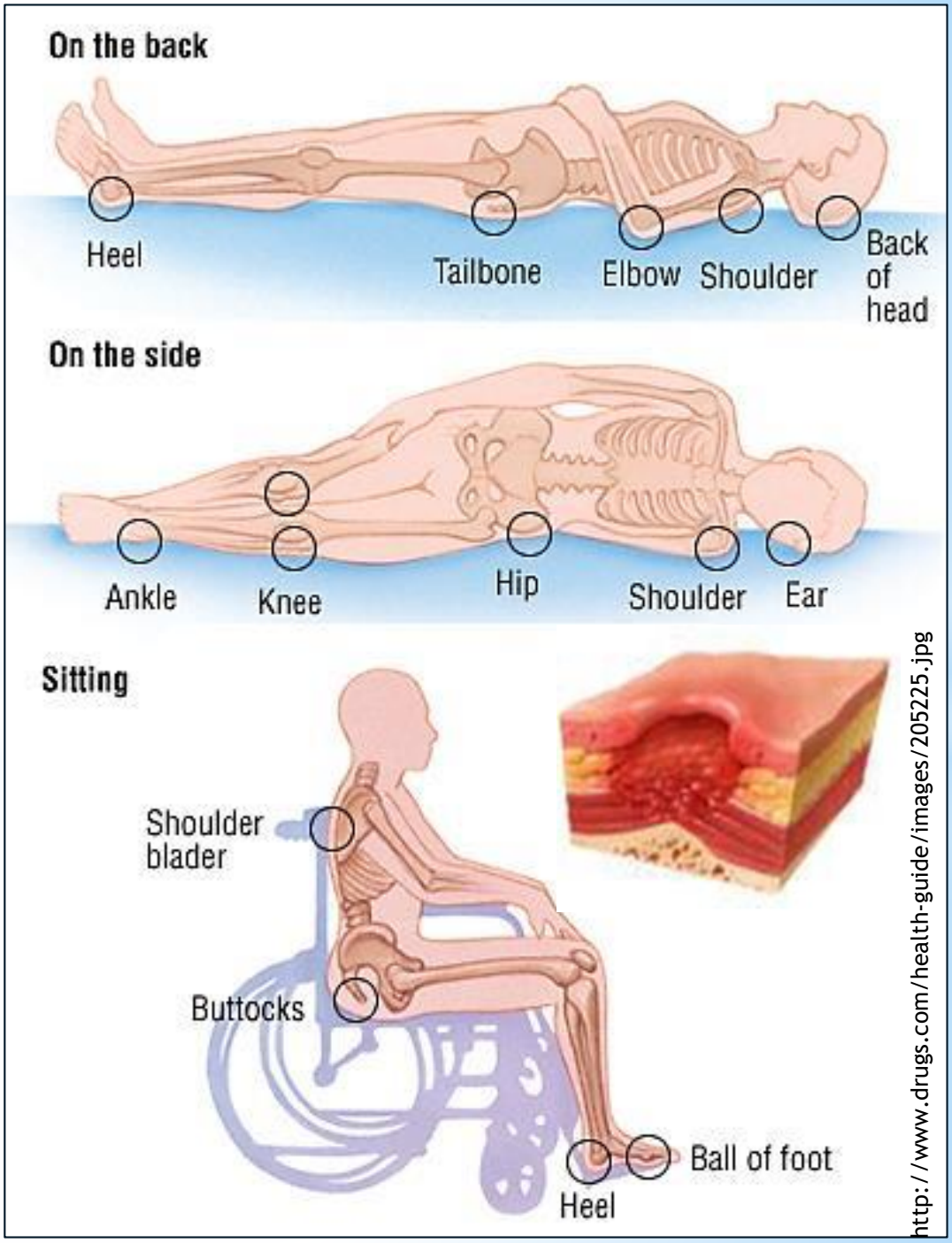
http://www.lhsc.on.ca/About_Us/LHSC/Publications/Homepage/featureimage/MOTOmed-Letto.jpg

*Pressure ulcer

A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear.

Synonims: 'bedsores‘ and 'pressure sores'.

The intensity and duration of pressure is a critical factor in the development of pressure ulcers, as is the skin's tolerance to pressure and its supporting structures.



*Risk factors for pressure ulcers

Pressure on the skin is the main cause of bedsores, other factors include:

Shearing and friction — Shearing and friction causes skin to stretch and blood vessels to kink, which can impair blood circulation in the skin. In a person confined to bed, shearing and friction occurs each time a person slides across the bed sheets.

Moisture — wetness from perspiration, urine or feces makes skin under pressure more likely to suffer injury.

Decreased movement — Bedsores are common in people who can't lift themselves off the bed sheets or roll from side to side. Without these small movements throughout the day, skin that is pressing against the bed does not get a steady supply of oxygen and nutrients. Blood flow is inadequate in these parts of the skin.

http://www.drugs.com/health-guide/bedsores-decubitus-ulcers.html

*Risk factors for pressure ulcers

Decreased sensation — neuropathy at diabetes, etc.

Circulatory problems — People with atherosclerosis, circulatory problems from long-term diabetes, etc.

Poor nutrition —diet with low protein, vitamins and minerals.

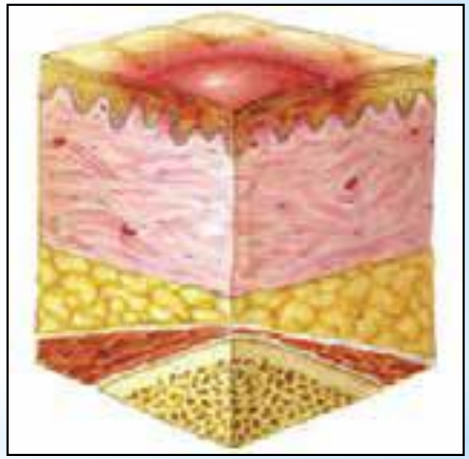
Age — Elderly people, especially those over 85, are more likely to develop pressure ulcers. Bedsores can lead to severe medical complications, including bone and blood infections.

https://www.securealnoc.org/TUTORIAL%20AND%20PUBLIC%20FILES/Pressure_Ulcer_Tutorial/oxygen_tubing.jpg

http://www.drugs.com/health-guide/bedsores-decubitus-ulcers.html

Stages of pressure ulcers
Stage I: Nonblanchable Erythema

- **Intact skin with non-blanchable redness.** Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.

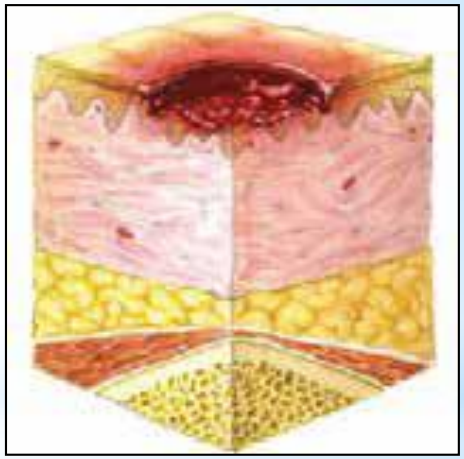


- The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue.

*Stages of pressure ulcers
Stage II: Partial Thickness Skin Loss

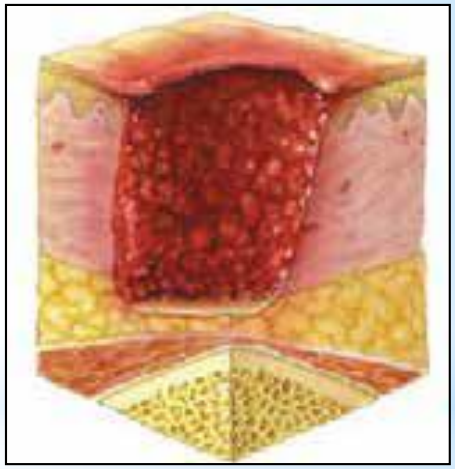
- **Partial thickness loss of dermis** presenting as a shallow open ulcer with a red pink wound bed, without slough.
- May also present as an intact or open/ ruptured serumfilled blister.
- Presents as a shiny or dry shallow ulcer without slough or bruising *.

*Bruising indicates suspected deep tissue injury.



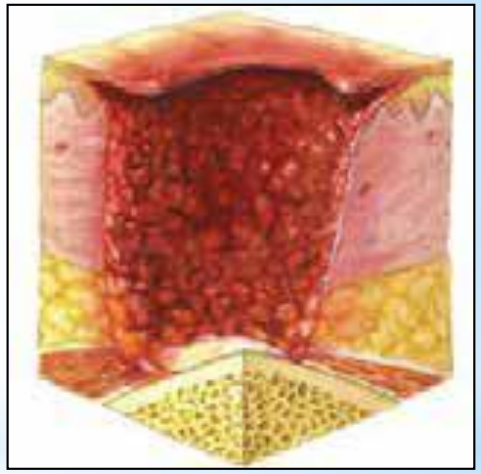
Stages of pressure ulcers
Stage III: Full Thickness Skin Loss

- Subcutaneous fat may be visible but bone, tendon or muscle are not exposed.
- Slough may be present but does not obscure the depth of tissue loss.
- May include undermining and tunneling.



Stages of pressure ulcers
Stage IV: Full Thickness Tissue Loss

- **Full thickness tissue loss with exposed bone, tendon or muscle**. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.



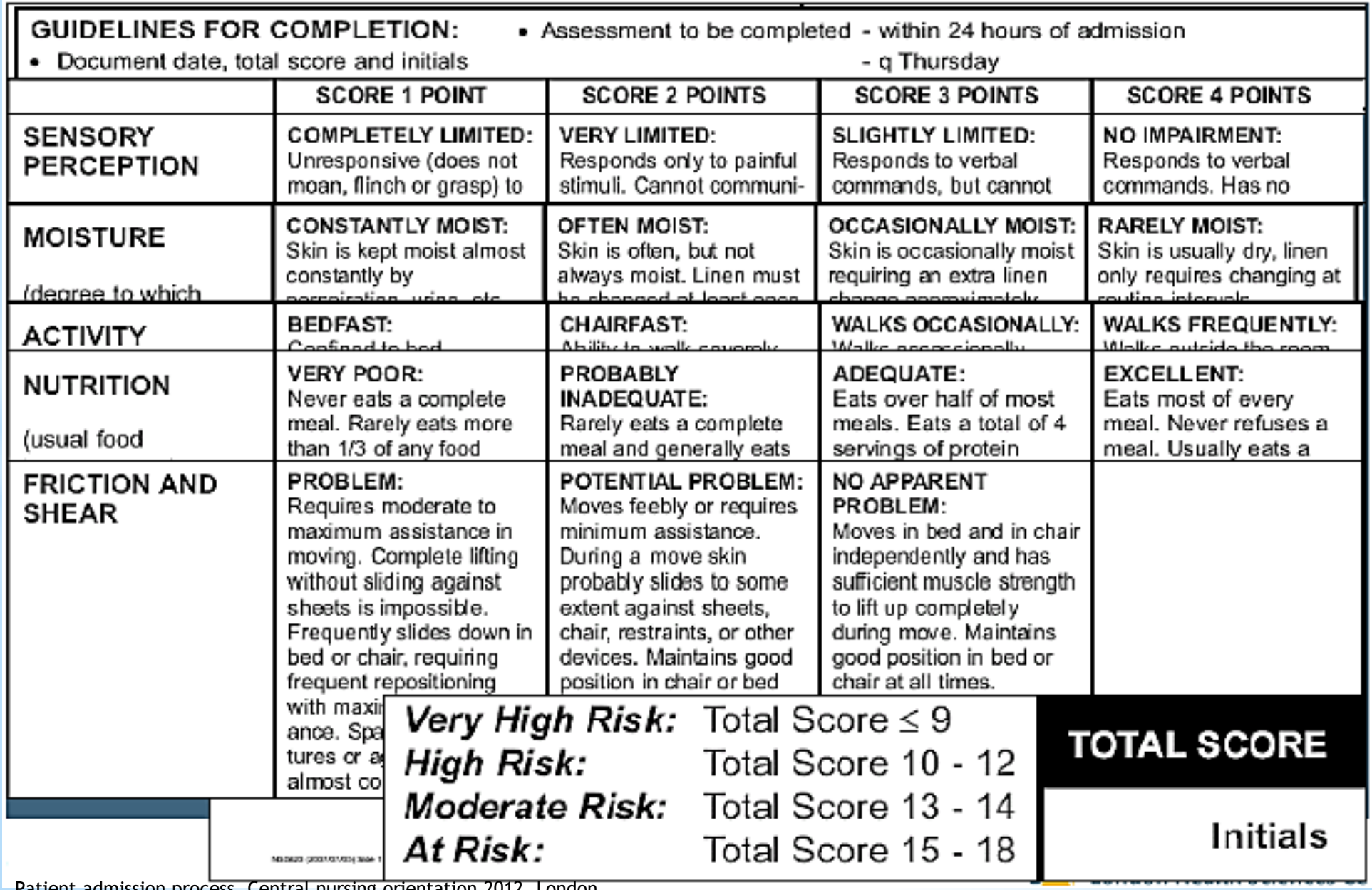
NB! The bridge of the nose, ear,etc. do not have subcutaneous tissue and ulcers can be shallow; in areas of significant adiposity they can be extremely deep.

- Stage IV ulcers can extend into muscle and/or supporting structures (e.g.,fascia, tendon) making osteomyelitis possible.

Stages of pressure ulcers Unstageable: Depth Unknown

- **Full thickness tissue loss in which the base of the ulcer is covered by slough** (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed. Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined.
- Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as 'the body's natural (biological) cover' and should not be removed.

*Braden scale for pressure ulcer risk



GUIDELINES FOR COMPLETION:
- Document date, total score and initials
- Assessment to be completed - within 24 hours of admission
  - q Thursday

	SCORE 1 POINT	SCORE 2 POINTS	SCORE 3 POINTS	SCORE 4 POINTS
SENSORY PERCEPTION	**COMPLETELY LIMITED:** Unresponsive (does not moan, flinch or grasp) to	**VERY LIMITED:** Responds only to painful stimuli. Cannot communi-	**SLIGHTLY LIMITED:** Responds to verbal commands, but cannot	**NO IMPAIRMENT:** Responds to verbal commands. Has no
MOISTURE (degree to which	**CONSTANTLY MOIST:** Skin is kept moist almost constantly by	**OFTEN MOIST:** Skin is often, but not always moist. Linen must	**OCCASIONALLY MOIST:** Skin is occasionally moist requiring an extra linen	**RARELY MOIST:** Skin is usually dry, linen only requires changing at
ACTIVITY	**BEDFAST:**	**CHAIRFAST:**	**WALKS OCCASIONALLY:**	**WALKS FREQUENTLY:**
NUTRITION (usual food	**VERY POOR:** Never eats a complete meal. Rarely eats more than 1/3 of any food	**PROBABLY INADEQUATE:** Rarely eats a complete meal and generally eats	**ADEQUATE:** Eats over half of most meals. Eats a total of 4 servings of protein	**EXCELLENT:** Eats most of every meal. Never refuses a meal. Usually eats a
FRICTION AND SHEAR	**PROBLEM:** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maxi ance. Spa tures or a almost co	**POTENTIAL PROBLEM:** Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains good position in chair or bed	**NO APPARENT PROBLEM:** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	

Very High Risk: Total Score ≤ 9
High Risk: Total Score 10 - 12
Moderate Risk: Total Score 13 - 14
At Risk: Total Score 15 - 18

TOTAL SCORE

Initials

Patient admission process, Central nursing orientation 2012, London

Pressure ulcers: key points

- Document complete initial skin evaluation on day of admission wherever you are (ED, OR, ICU, etc.)
- Complete and document initial risk stratification/score
- Develop and follow your protocol
- Implement, monitor & document turning and positioning
- Monitor, manage and document incontinence
- Use good quality moist wound care
- Document daily skin sheets on nurses notes
- Document wounds completely in terms of size, depth, drainage, slough/eschar, odor etc
- Document wound treatments and changes in treatments

*Treatment of ulcers

- Identification of problem
- Cleansing of wound with potable water or normal saline.
- Debridement of necrotic tissue
- Moist wound care without maceration
- Control of infection/bioburden
- Management of pain
- Pressure redistribution/offloading

Fig. 4: Mechanical debridement.

http://www.npuap.org/wp-content/uploads/2012/03/Final_Quick_Treatment_for_web_2010.pdf

*Consider using cleansing solutions with surfactants and/or antimicrobials to clean pressure ulcers with debris, confirmed infection, suspected infection, or suspected high levels of bacterial colonization.

*Maintaining a clean, moist wound bed is essential for promoting healing. Certain dressings help keep ulcers moist.

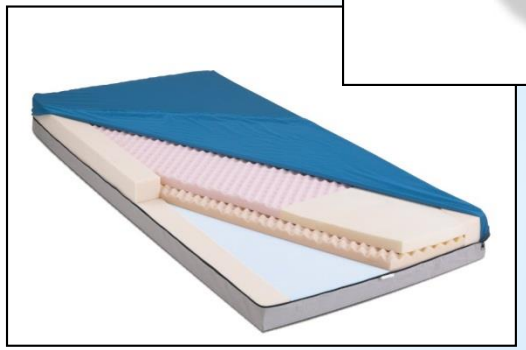
http://www.mci-forum.com/wp-content/uploads/2014/09/content-1387287754_hires-300x251.jpg

Prevention and management of pressure ulcers

Relieve pressure on vulnerable areas - Change the patient's position frequently, when possible every two hours when in bed and every hour when sitting in a chair. Pressure overlay, foam, air, water and gel pressure mattresses; air-fluidized beds and low-air-loss beds — have been shown to reduce the risk for pressure ulcer.

Pressure mattresses used if patient:

- Completely immobile (cannot move without assistance) or limited mobility
- Any stage pressure ulcer on trunk or pelvis
- Impaired nutritional status
- Fecal or urinary incontinence
- Altered sensory perception
- Compromised circulatory status



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http://www.rehabmart.com/include-mt/img-resize.asp?path=/imagesfromrd/STR-SC402_SofCare_Mattress_Overlays.jpg&width=200&height=180

Prevention of pressure ulcers

- Reduce shear and friction — Avoid dragging the patient across the bed sheets. Keep the bed free from crumbs and other particles that can rub and irritate the skin. Use sheepskin boots and elbow pads to reduce friction on heels and elbows. Wash the patient gently. Avoid rubbing or scrubbing the skin.
- Minimize irritation from chemicals — Avoid irritating antiseptics, hydrogen peroxide, povidone iodine solution or other harsh chemicals to clean or disinfect the skin.
- Nutrition — The diet should include enough calories, protein, vitamins and minerals.
- Daily exercise — Exercise increases blood flow and speeds healing.
- Keep the skin clean and dry — Clean with plain water and if needed a very gentle soap. Use absorbent pads to draw moisture away from vulnerable areas.

Signs of impending death

- Loss of interest in daily activities;
- Decreased appetite and fluid intake, weight loss;
- Gradual cooling of skin, it becomes pale, grey or bluish in colour;
- Difficulty swallowing (coughing, loss of gag reflex, dysphagia);
- CVC impairment (fast weak pulse, tachycardia);
- Breathing difficulties (Cheyne-Stokes breathing pattern);
- Neurological dysfunction, confusion, increased sleepiness , lethargy or increased anxiety, restlessness;
- Incontinence (loss of sphincter control);
- Renal dysfunction (oliguria leading to anuria)
- Cyanosis of extremities (impaired circulation);
- Pain (moaning, agitation);
- Loss the ability to close the eyes.

http://i.dailymail.co.uk/i/pix/2013/06/12/article-0-177B31F2000005DC-14_638x400.jpg

*Clinical death

Clinical death - is a condition experienced by an organism within several minutes after the termination of blood circulation and breathes, when all external signs of ability to live completely disappear, but there have not yet irreversible changes in tissues and cells.

This period - is a convertible stage of dying with duration from 4 up to 6 minutes. The previous grave condition of the patient usually reduces this period up to 1-2 minutes.

It is necessary to remember that duration of the period after which restoration of functions of a brain is possible, is usually 3-4 minutes (5-6 minutes are maximum).

Reanimation should be started as soon as possible!!

Signs of clinical death:

- full absence of consciousness and reflexes (including corneal),
- change of color of skin and mucous to waxen pallor,
- significant expansion of pupils,
- absence of breath, cramps, involuntary urination, defecation;
- decreasing of a body temperature;
- jaw falls open.
- no response of the eyes to caloric (warm or cold) stimulation
- no gag reflex (touching the back of the throat induces vomiting)
- no response to pain
- no drugs present in the body that could cause apparent death

*Biological death.

This is irreversible termination of vital activity of the organism, coming after clinical death. The fact of death of the patient is ascertained only by the doctor. He writes down day, hour and minutes of death in a case history of the patient.

Signs of biological death:

1) Absence of heart beating, pulse, respiration, reaction of pupils to light, they are fixed and dilated;

2) Opacification and a desiccation of a cornea of an eye;

3) The pupil distortion after pressure on the eye (a sign known as a «cat's eye»);

4) Decreasing of a body temperature, and appearance of death spots (livores mortis). Livor mortis on the posterior aspects of the body is caused by settling of the blood because of gravity when the body is in a supine position.

Signs of biological death - cont.

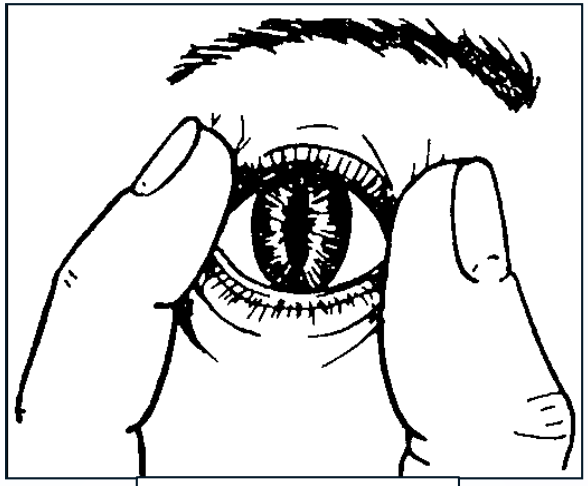
5) A postmortem rigidity (rigor mortis). This indisputable attribute of death appears in 1-2 hours after dying.

6) Tardieu spots - petechiae and purpuric hemorrhages that develop in areas of dependency secondary to the rupture of degenerating vessels under the influence of increased pressure from gravity

7) Tache noire develops when the eyelids are not completely shut and postmortem drying occurs.

Signs of biological death

Rigor mortis

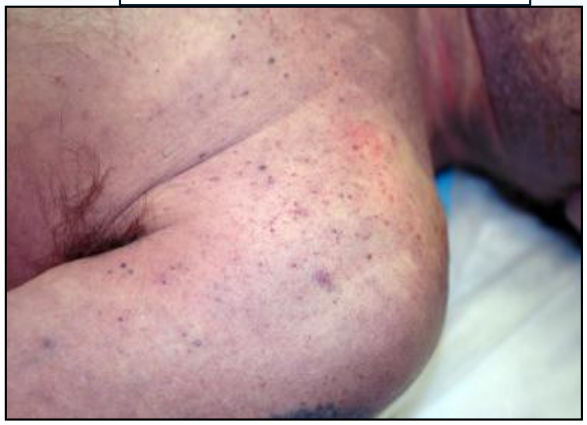


«cat's eye»

Dilated pupils

Livor mortis

Tardieu spots



Tache noire

Care after death

- A medical officer or RN will confirm the death;
- Respect the patient in death as in life;
- The patient's after death wishes are followed;
- Personal hygiene is completed with the same accuracy as if the patient was still alive, using standard precautions;
- If a Coroner's case is suspected then the body is not to be washed, dressings, cannulae and catheters are not to be removed;
- Give support to the family and friends of a patient;

*Resuscitation

http://thechronicleherald.ca/sites/default/files/imagecache/ch_article_main_image/articles/revive.jpg

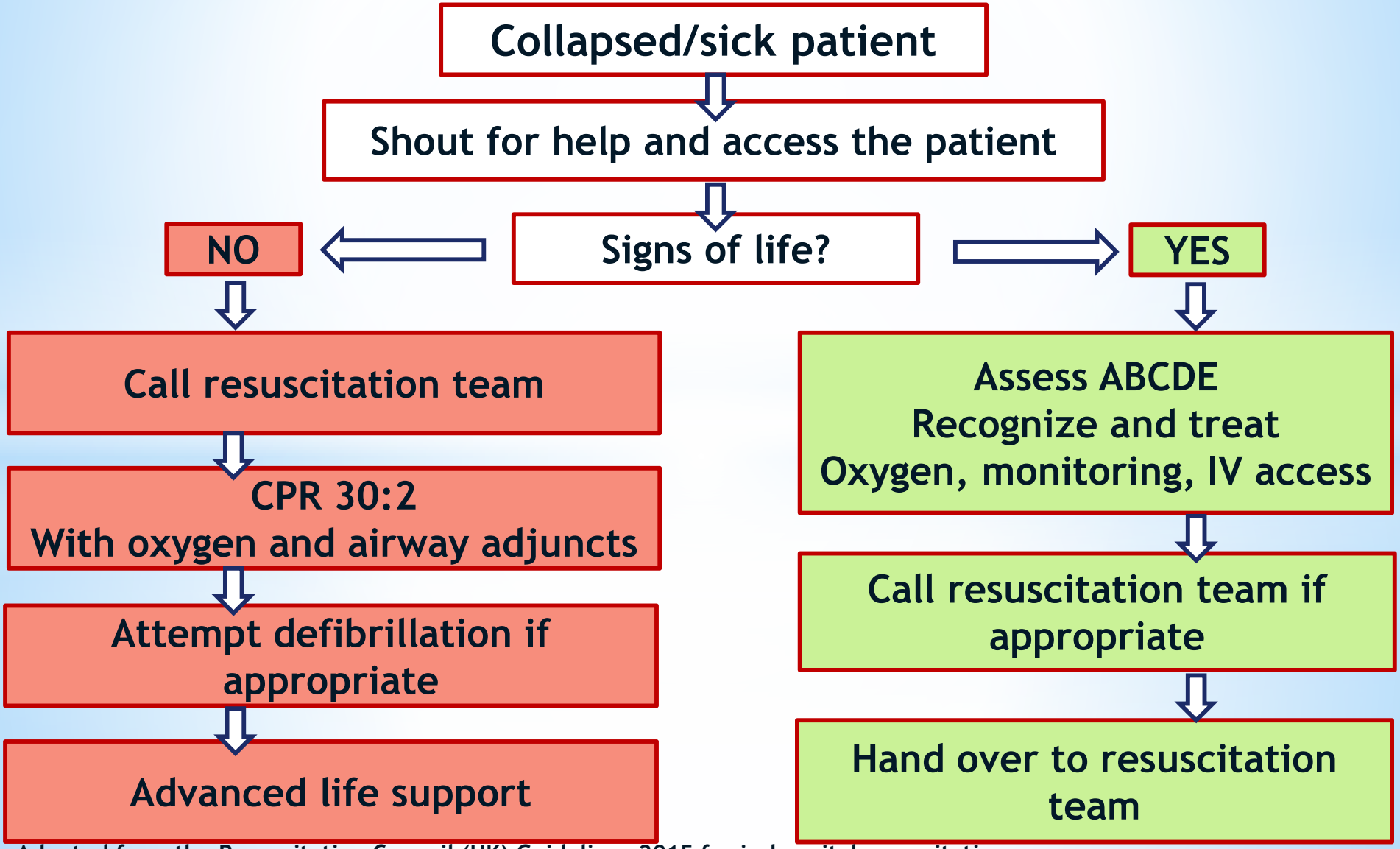
Resuscitation - administering emergency measures to sustain life.

In emergency cardiac care the opening of the airway, provision of artificial breathing and assisting the circulation until definitive treatment can restore spontaneous cardiac, pulmonary and cerebral function.

- 1st step in resuscitation - check the patient for a response to ensure that a patient needs cardiopulmonary support and is not merely asleep or unconscious. Gently shake his shoulders and ask loudly: "Are you all right?"
- A normal verbal response implies that the patient has a patent airway, is breathing and has brain perfusion.

http://medical-dictionary.thefreedictionary.com/resuscitation

* An emergency situation algorithm for in-hospital resuscitation



Adopted from the Resuscitation Council (UK) Guidelines 2015 for in-hospital resuscitation

*The ABCDE steps

A: airway

B: breathing

C: circulation

D: disability (neurological examination)

E: exposure/examination

Use vital signs monitoring early. Apply a pulse oximeter, ECG monitor and continuous non-invasive blood pressure monitor to all critically ill patients, as soon as is safely possible.

CPR (cardiopulmonary resuscitation)

- The patient should be placed supine on a firm, flat surface with care taken to protect his cervical spine if traumatic injury is suspected.
- (CPR) comprises 3 steps: chest compressions, airway, and breathing (CAB), to be performed in that order in accordance with the 2010 American Heart Association (AHA) guidelines.
- For an unconscious adult, CPR is initiated using 30 chest compressions. Perform the head-tilt chin-lift maneuver to open the airway and determine if the patient is breathing. Before beginning ventilations, rule out airway obstruction by looking in the patient's mouth for a foreign body blocking the patient's airway. CPR in the presence of an airway obstruction results in ineffective ventilation/oxygenation and may lead to worsening hypoxemia.

*CPR 30:2

CPR revised guidelines: Think C-A-B

COMPRESSIONS	AIRWAY	BREATHING
Push at least 2 inches on adult breastbone, 100 times per minute, to move oxygenated blood to vital organs	Open the airway and check for breathing or blockage; watch for rise of chest and listen for air movement	Tilt chin back for the unobstructed passing of air; give two breaths and resume chest compressions

NOTE: Those untrained in CPR can simply do chest compressions until help arrives.

http://tucsoncpracls.com/wp-content/uploads/2012/06/newcprguidelines2010cab.jpg

Airway (A)

- Treat airway obstruction as a medical emergency and obtain expert help immediately. Untreated, airway obstruction leads to a lowered PaO2 and risks hypoxic damage to the brain, kidneys and heart, cardiac arrest, and even death.

Open the airway using head tilt and chin lift.

- In the majority of cases, simple methods of airway clearance are all that are required (e.g., airway opening manoeuvres, airways suction, insertion of an oropharyngeal or nasopharyngeal airway). Tracheal intubation may be required, where simple airway opening measures fail.

  - Give oxygen at high concentration

Breathing (B)

- During the immediate assessment of breathing, it is vital to diagnose and treat immediately life-threatening conditions, e.g., acute severe asthma, pulmonary oedema, tension pneumothorax, massive haemothorax.
  Look for the general signs of respiratory distress: sweating, central cyanosis, use of the accessory muscles of respiration, abdominal breathing.
- Count the RR, assess the depth of each breath, the pattern (rhythm) of respiration and whether chest expansion is equal on both sides, note any chest deformity.
- If the depth or rate of breathing of any patient is judged to be inadequate, or absent, use bag-valve-mask ventilation to improve oxygenation and ventilation, whilst calling urgently for intensive care assistance.

Circulation (C)

In almost all medical and surgical emergencies, consider hypovolaemia to be the primary cause of shock, until proven otherwise. Unless there are obvious signs of a cardiac cause, give intravenous fluid to any patient with cool peripheries and a fast heart rate. In surgical patients, rapidly exclude haemorrhage (overt or hidden).

- Look at the colour of the hands and digits (blue, pink, pale or mottled)
- Assess the limb temperature
- Measure the capillary refill time (CRT). It is assessed by applying cutaneous pressure for five seconds on a fingertip held at heart level (or just above) and counting the time it takes for capillary refill after the pressure has been released. (N= less than two seconds).
- Assess the state of the veins: they may be under-filled or collapsed, count the patient's pulse rate, palpate all the peripheral and central pulses

Thank you for attention!