FUNDAMENTALS OF NURSING PRACTICE
ASEPSIS

HANDWASHING

The single most critical measure for reducing the risk of transmitting microorganisms
LEAVELL & CLARK: ECOLOGIC MODEL

Describes the causation of illness that depends on the dynamic relationship of 3 variables
Handwashing

0. Wet hands with water;

1. Apply enough soap to cover all hand surfaces;

2. Rub hands palm to palm;

3. Right palm over left dorsum with interlaced fingers and vice versa;

4. Palm to palm with fingers interlaced;

5. Backs of fingers to opposing palms with fingers interlocked;

6. Rotational rubbing of left thumb clasped in right palm and vice versa;

7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8. Rinse hands with water;

9. Dry hands thoroughly with a single use towel;

10. Use towel to turn off faucet;

11. Your hands are now safe.

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<table>
<thead>
<tr>
<th>The process by which pathogens from inanimate objects, but not their spores, are destroyed</th>
<th>DISINFECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A substance, usually used on inanimate objects, that destroys pathogens but generally not their spores</td>
<td>DISINFECTANT</td>
</tr>
<tr>
<td>A substance, usually used on persons, that inhibits the growth of pathogens but not necessarily destroy them</td>
<td>ANTISEPTIC</td>
</tr>
<tr>
<td>The process by which all microorganisms including their spores are destroyed</td>
<td>STERILIZATION</td>
</tr>
<tr>
<td><strong>Medical Asepsis</strong></td>
<td><strong>Surgical Asepsis</strong></td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>➢ Clean technique</td>
<td>➢ Sterile technique</td>
</tr>
<tr>
<td>➢ <em>Practices designed to reduce the number and transfer of pathogens</em></td>
<td>➢ <em>Practices that render and keep objects and areas free from microorganisms</em></td>
</tr>
<tr>
<td>➢ Handwashing</td>
<td>➢ Scrubbing</td>
</tr>
</tbody>
</table>

**Objective:** *protect health personnel*

**Objective:** *protect the patient*
Guidelines on Surgical Asepsis
General

- Sterile to sterile contact only.
- A **doubtful** article = unsterile
- Whatever is sterile for patient is sterile for that patient only.
Personnel

• Scrubbed personnel must remain in the area of the surgical procedure

• Scrubbed person leaves = unsterile
• Sterile parts
  a. **Waist** to the shoulder area.
  b. **Forearms** and gloves

**Important:** Gloved hand must be kept in front between the shoulders and waistline.
Delivery of supplies

- Packages are wrapped or sealed
- Must not be opened easily
- Sterile supplies are delivered to a sterile field or handed to a “scrubbed person”.

• Edges of wrappers or outer lips of bottles or flasks = unsterile

• Unsterile arm of the **circulating** nurse must not extend over a sterile area.
Solutions

• Solutions are poured from a point high enough to prevent accidental touching

• Avoid splashing

• Wet area = contaminated
ABG ANALYSIS
Acid - Base Ratio
Arterial Blood Gas Studies

• Purpose is to assess ventilation and acid-base balance

• Radial artery – common site of blood extraction

• 10 ml pre-heparinized syringe

• Container with ice
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.49</td>
<td>7.52</td>
<td>7.39</td>
<td>7.16</td>
<td>7.48</td>
</tr>
<tr>
<td>PaCO₂</td>
<td>47</td>
<td>50</td>
<td>54</td>
<td>49</td>
<td>31</td>
</tr>
<tr>
<td>HCO₃</td>
<td>32</td>
<td>15</td>
<td>33</td>
<td>24</td>
<td>31</td>
</tr>
</tbody>
</table>
Chest X-ray

• **Radiographic visualization** of the chest

• **Instructions:**
  • Hold his breath
  • Remove metals from the chest
Lung Scan

• Measures blood perfusion through the lungs.

• For pulmonary embolism or blood-flow abnormalities.

• Injection of dye

• Remain still during the procedure.
Bronchography

- **Injection of dye**
- **Pre-procedure**
  - Informed consent
  - Check for **allergy**
  - NPO (6-8 hrs)
  - Pre-op meds:
    - Atropine SO4
    - Valium
    - Anesthesia
  - O2, antispasmodic agents at bedside
• After the procedure are:
  ○ Side-lying position
  ○ NPO until cough, gag reflex return
  ○ DBCT
  ○ Low-grade fever is common
Bronchoscopy

- Direct inspection

- Purposes:
  - Diagnostic
  - Therapeutic uses
• Before the procedure:
  ○ Same with bronchography
CHEST TUBE
THORACOSTOMY
• For pneumothorax / pleural effusion

• Insertion site:
  • Air - 2nd or 3rd ICS MCL
  • Fluid - 4th or 5th ICS MCL

• At bedside
  • Petrolatum gauze
  • Extra bottle with water / rubberized forceps
THORACENTESIS
Thoracentesis

• **Aspiration** of fluid or air from the pleural cavity
• May be used for **diagnosis** or **therapy**
• Before the procedure:
  o Consent
  o Take VS
  o **Position:** Orthopneic
  o Remain still
Syringe on catheter removing fluid from around the lung

Vacuum bottle collecting pleural fluid
• After the procedure:
  o **Position:** unaffected side
  o **CBR**
  o **Check for expectoration of blood**
  o **Monitor VS**
OXYGEN ADMINISTRATION
2 Categories:

- Low Flow Oxygen System
  - Mixes oxygen with room air
  - Examples:
    - Nasal cannula
    - Simple face mask
    - Partial rebreather mask
• High Flow Oxygen System
  • Only source of gas
  • No vent
  • Examples:
    • Non-rebreather mask
      • With one-way valve
      • 95 - 100% delivery
      • Choice for carbon monoxide poisoning
    • Venturi mask - most accurate
NASOGASTRIC TUBE
• Done of short-time basis
• Salem tube or Levin tube
• Measure by N-E-X
• Purposes
  • Gavage
  • Lavage
• During insertion:
  • Position: High-Fowler’s
  • Neck - hyperextended
  • Head - flexed
• Swallow
• When gagging occurs
  • Stop!
  • Rest
  • Offer sips of water
• When obstruction occurs
  • Remove
  • Relubricate
  • Reinsert (on the opposite nostril)
• Placement checking:
  • X-ray
  • Gastric pH
  • Auscultation
  • Basin
TOTAL PARENTERAL NUTRITION
• Insertion: CENTRAL LINE
ENEMA
• Always position on the left side
• Cramping is normal
• 12 inches maximum height

COMMON TYPES:
• Carminative – a fluid (80ml) is introduced to release gas
• Retention
  • oil preparation to soften and lubricate
  • must remain for 1-3 hours
• Return flow
  • expels flatus
  • 200 ml fluid that stimulates peristalsis
COLOSTOMY
Large Intestines

Divisions:
Cecum - first part
Colon

- Ascending
- Transverse
- Descending
- Sigmoid
• Surgical creation of an opening of the colon onto the surface of the abdomen

• Stoma
  • Normally shrinks in 6-8 weeks
  • Measure at least once a week
  • Normal: pink to red, moist and secretes mucous
  • Abnormal: Purple or black
• Diet:
  • DAT
  • Avoid gas-forming foods

• Irrigation:
  • Same time each day, after meals
  • Fluid: Lukewarm, tap water (500-1000 ml); 37.8 °C

• Height
  • Standing: shoulder level
  • Supine: 12-18 inches above the stoma

• If cramping occurs:
  • Slow down, if it persists stop temporarily
AVPU SCALE /
GLASGOW COMA SCALE
AVPU Scale
The AVPU scale is a system by which a health care professional can measure and record a patient’s LOC. It is mostly used in emergency medicine protocols, and within first aid.
Glasgow Coma Scale
The GCS provides a practical method for assessment of impairment of LOC in response to a defined stimuli.
The GCS Total Scores....

15  Best response
8 or less  Comatose
3    Unresponsive
GCS-P Scale
The GCS-P is used:

- As an index of “overall” brain damage
- In distinguishing head injuries of differing severities
- Monitoring their progress and prognosis
The GCS Total Scores:

15 Minor injury
9-12 Moderate injury
3-8 Severe injury
<table>
<thead>
<tr>
<th>Score</th>
<th>Motor Response</th>
<th>Verbal Response</th>
<th>Eye Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Extension</td>
<td>Sounds</td>
<td>To pressure</td>
</tr>
<tr>
<td>3</td>
<td>Abnormal Flexion</td>
<td>Words</td>
<td>To speech</td>
</tr>
<tr>
<td>4</td>
<td>Withdrawal</td>
<td>Confused</td>
<td>Spontaneous</td>
</tr>
<tr>
<td>5</td>
<td>Localizing</td>
<td>Oriented</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Obeying Commands</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Pupil Reactivity Score
(Pupils UNREACTIVE to light)

<table>
<thead>
<tr>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Pupil</td>
</tr>
<tr>
<td>Neither Pupil</td>
</tr>
</tbody>
</table>
For total GCS, subtract pupil reactivity score from calculated GCS.
Example: A 37-year-old patient with a traumatic head injury is admitted to the ER. The admission assessment are as follows: She does not open her eyes, she moans, and displays abnormal flexion in her limbs to pain. On examination of her pupils, they are both fixed and dilated.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Assessment</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Response</td>
<td>Abnormal flexion</td>
<td></td>
</tr>
<tr>
<td>Verbal Response</td>
<td>She moans (sound)</td>
<td></td>
</tr>
<tr>
<td>Eye Opening</td>
<td>Does not open her eyes</td>
<td></td>
</tr>
<tr>
<td>Total calculated GCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pupil reactivity</td>
<td>Both are fixed and dilated</td>
<td></td>
</tr>
<tr>
<td>GCS-P SCORE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CATHETERIZATION
<table>
<thead>
<tr>
<th></th>
<th>MALE</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Position</strong></td>
<td>Supine</td>
<td>Dorsal Recumbent</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>Until urine outflow + 2 inches</td>
<td>Until urine outflow + 2-3 inches</td>
</tr>
<tr>
<td><strong>RN’s Hand</strong></td>
<td>Grab penis 90°</td>
<td>Retract the labia</td>
</tr>
<tr>
<td><strong>Cleaning</strong></td>
<td>Circular with betadine; inner to outer motion</td>
<td>Front to back</td>
</tr>
<tr>
<td><strong>During insertion</strong></td>
<td>Inhale thru mouth, exhale as nurse inserts the catheter</td>
<td>Same</td>
</tr>
<tr>
<td><strong>Anchor</strong></td>
<td>Abdomen</td>
<td>Inner thigh</td>
</tr>
</tbody>
</table>
Type of Catheters

- **CONDOM CATHETER**
  - Non-invasive
  - For incontinence
  - Leave 1 inch space in the tip
  - Secure around base of the penis
  - Check for penis circulation after 30 mins.
  - Change every 24 hours

- **STRAIGHT CATHETER**
  - Single drain
  - For urinary retention
  - After removal - must void within 4 hours
• **INDWELLING (FOLEY) CATHETER**
  
  • Left inside the bladder
  
  • For continuous draining
  
  • Inflate the balloon (use sterile water only)

• **3-WAY FOLEY CATHETER**
  
  • AKA retention catheter
  
  • Lumens
    
    • 1 - collect urine
    
    • 2 - balloon inflation
    
    • 3 - medications / CBI
## Routine Urinalysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>Amber / Straw</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>4.5-8 (Average – 6)</td>
</tr>
<tr>
<td><strong>Specific Gravity</strong></td>
<td>1.010-1.025</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>RBC</strong></td>
<td>0-5 / hpf</td>
</tr>
<tr>
<td><strong>WBC</strong></td>
<td>0-5 / hpf</td>
</tr>
<tr>
<td><strong>Pus</strong></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Glucose</strong></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Ketones</strong></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Casts</strong></td>
<td>0-4</td>
</tr>
</tbody>
</table>
Creatinine Clearance

• Normal Values
  • a. Male – 20-26 mg/kg
  • b. Female – 14-22 mg/kg
### Blood Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUN</td>
<td>10-20 mg/dL</td>
</tr>
<tr>
<td>Serum Creatinine</td>
<td>.4-1.2 mg/dL</td>
</tr>
<tr>
<td>Serum Uric Acid</td>
<td>2.5-8 mg/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.2-5.5 mg/dL</td>
</tr>
<tr>
<td>RBC</td>
<td>4.5-5.5 mg/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>38-54 vol%</td>
</tr>
<tr>
<td>Electrolyte</td>
<td>Range</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.5-5 mEq/L</td>
</tr>
<tr>
<td>Sodium</td>
<td>135-145 mEq/L</td>
</tr>
<tr>
<td>Calcium</td>
<td>4.5-5.5 mEq/L</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1.5-2.5 mEq/L</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>3.5-5.5 mEq/L</td>
</tr>
<tr>
<td>Chloride</td>
<td>98-108 mEq/L</td>
</tr>
</tbody>
</table>
Cystoscopy

• Direct visualization of the urethra, urethral orifices and the bladder.
• Uses a Cystoscope
• Purposes:
Preparation:

• Written consent
• Force fluids
• Done under local / general anesthesia
• Inform that desire to void will be felt
• Position:
After Cystoscopy

• BR until VS are stable
• Expect for:
• Due to irritation:
  • Dysuria
  • Frequency
  • Hematuria
• Assess for:
  • Urinary retention
  • Signs of infection
  • Prolonged / excessive hematuria
• Monitor VS and I&O
• Force fluids
• Hot Sitz bath
KUB
(Abdominal x-ray film)

- To note stones in the entire urinary tract
- A flat plate x-ray film is placed over the abdomen
- Non-invasive
- Assure patient it is painless
- Bowel preparation as feces / gas may interfere with the visualization
Excretory Urogram / Intravenous Pyelography

- An x-ray photograph of the renal pelvis and ureter.
- A radiopaque material is given IV and excreted through the kidneys
Retrograde Pyelogram (RPG)

- Outlines renal pelvis and ureters by injecting a dye into each ureter with use of catheter through cystoscope.
Voiding Cystourethrogram Film

Contrast medium is instilled into the bladder by the use of cystoscope.
Provides visualization in 3 phases:

- Before voiding: Outlines bladder wall
- During voiding: Outlines urethra and reflux of urine into ureters
- After voiding: demonstrates if bladder is emptied completely
Before IVP, RPG & VCF . . .

• Secure written consent
• NPO:
• Bowel preparation
• Check for hypersensitivity to iodine (sea foods)
• Emergency drug: ________________
• Inform: warm flushing sensation on IV injection site is normal
After the procedure...

- Monitor VS
- Increase fluid intake

- Inform: Burning sensation during urination may be experienced
- Assess: Late allergic reactions
RENAL ARTERIOGRAM

• Provides x-ray pictures of the blood vessels supplying the kidney.

• Introduction of a radiopaque dye directly into the renal artery.

• Most common site is the femoral artery.
• Used in evaluating persons suspected of having renal artery stenosis, abnormalities on the renal blood vessels or vascular damages.
Before RA

- Cleanse bowel (Laxative)
- Shave catheter insertion site
After RA

- VS until stable
- Cold compress on the puncture site
- Check for swelling / edema
- Assess peripheral pulses
- Check for color and temperature of the skin
- Bed rest for 24 hours, no sitting
- Measure I and O
ULTRASOUND

• Detects tumors, cysts, obstructions and abscesses

• Nursing Interventions:
  • Cleanse the bowel
  • Force fluids
  • Withhold voiding
RENAL BIOPSY

• To determine malignancies

• Nursing Interventions
  • NPO 6-8 hours
  • Check PTT, PT (Bleeding is usual)
  • Mild Sedation
  • Local anesthesia
  • Hold breath during insertion of needle
  • UTZ to locate kidneys
Care after biopsy...

- Bedrest – 24 hours
- Monitor V/S
- Assess for pain, N/V
- Hct and Hgb
- No heavy activity – 2 weeks
- Assess for:
  - Infection
  - Bleeding
DIALYSIS
Hemodialysis

• Only replaces the **excretory** function
• Practice **ARM PRECAUTION**
• Assess for **PATENCY**
Vascular Access

AV Shunt
(ideal for ARF)

AV Fistula
(ideal for CRF)
Arteriovenous Fistula
Management

- Implement standard precautions
- Prevent
  - hypovolemia and shock
  - disequilibrium syndrome
  - blood loss

Emergency Equipment: Tourniquet
Peritoneal Dialysis

- Can be done ambulatory
- Not much change in chemistries
- Can be done even if with hemodynamic problems
- Proteins are wasted
• Drain > Fill

• Most common complication: *peritonitis*

• Warm the dialysate
Cancer Concepts
Surgery

- Urinary Diversion Surgeries
  - Ileal Conduit
  - Ureterostomy
  - Ureterosigmoidostomy
  - Nephrostomy
Ileal Conduit

- For CA Bladder
- Adult Neurogenic Bladder
- Interstitial Cystitis
- Irreparable Trauma
Important!
- External collection device needed
- Proper fitting to prevent urine leak to the skin
- Skin care with warm water and mild soap

Complications
- Obstruction to the urine flow via small intestines secondary to edema
- Infection
- Stoma prolapse
- Calculi
- Electrolyte imbalances
Ureterostomy

- Either or both ureters are out to the abdominal wall
- Ureteral stoma is created
- External collection device is needed
- Infection is a potential hazard
- Increase fluid intake
Nephrostomy

- To drain the urine while ureteral inflammation from trauma or calculus is present
Complications

- Infection (Pyelonephritis)
- Blockage of the catheter

Important!

- DO NOT IRRIGATE!!!
Ureterosigmoidostomy

- No external collection device
- Passage of flatus includes leak of urine
- Infection is possible
Inflammation and Wound Care
Purpose of inflammation:
• to localize tissue injury
• to protect tissue from injury
• to prepare tissue for repair

Stages:
• **Vascular stage** - rubor, calor, tumor, dolor
• **Cellular stage** - neutrophils, monocytes, lymphocytes
• **Reparative stage** - regeneration and scar tissue formation
Nursing Management for inflammation:

- Rest
- Reduce swelling - elevate
- Relieve pain - hot and cold application
- Hydrate - increase excretion of microorganism
- Diet:
  - High-caloric
  - High-protein
  - Collagen support
- Pharmacotherapy
- Surgery
Heat Versus Cold Application

**HEAT**
- vasodilation
- increase cellular metabolism
- promote muscle relaxation
- relieves pain
- provide sedative effect
- relieves edema

**COLD**
- Vasoconstriction
- decrease cellular metabolism
- numb nerve endings, local anesthetic
- relieves pain
Principles of Heat and Cold Application

- Done at a maximum of 30 minutes (to prevent rebound effect)
- Check the area every 15-20 mins.
- Cold application
  - generally safe
  - first 72 hours
- Heat application
  - requires doctors order
  - after 72 hours
DECUBITUS ULCER

- Impairment of skin integrity
- Common to bedridden and immobile

Risk Factors:
1. Malnutrition
2. Incontinence
3. Immobility
4. Decrease sensory perception
COMMON PRESSURE AREAS
DOCUMENTING & REPORTING
Purpose of Client’s Record:
– provides efficient and effective method of sharing information
– it is admissible in the court of law
– valuable data for research
– educational tool
– provides data which the entire health team uses to plan care for the client
Charting

Purposes:
• communication
• continuation of care
• audit
• legal – evidence in court
• research – study or investigate treatment or nursing care
• education
• statistics – frequency on distribution
Types of Records

• **Source-Oriented Medical Record**: traditional client record
• **Problem-Oriented Medical Record**: focused on the client's problem
• **Kardex and Nursing Care Plan**
  • Provide concise method of organization and recording data about a client
  • makes information readily accessible to all members of the health team.
Characteristics of a good recoding
1. Brevity
2. Accuracy
3. Appropriateness
4. Completeness
5. Use of standard terminology
6. Signed
7. Errors (logged and corrected)
8. Timing
9. Confidentiality
10. Legal awareness
11. Legible
12. Use of common abbreviations
Teaching and Learning
Learning
• a change in human disposition over a period of time
• reflected by a change behavior

Teaching
• system of activities aimed to produce learning
Factors facilitating learning:
- Motivation
- Readiness
- Active involvement
- Feedback
- Simple to complex
- Repetition
- Timing
- Environment

Factors inhibiting learning:
- Emotions
- Physiologic factors
- Cultural barriers