Histopathology

- Examination of Fresh Tissue
- Tissue Processing
- Fixation
- Fixatives

## Examination of Fresh Tissue

Surgical Procedures:

- Fine needle aspiration
  **- least invasive test, simplest**
  - remove cells from the area of abnormality
- **Core Needle biopsy**
  **-** Removes not only cells, but a small amount of the surrounding tissue.
- **Incisional Biopsy**
  **-** Takes out even more surrounding tissue**.**
- **Excisional Biopsy**
  **-** Removes the entire area in question.
- **Punch Biopsy**
  **-** Uses circular bladed yielding 3-4 mm cylindrical core of tissue sample.
- **Shave biopsy**
  **-** Small fragments of tissue are "shaved" from surface, usually skin.
- **Curettings**
  - Tissue is scooped or spooned to remove tissue or growths from body cavity such as endometrium or cervical canal.

**Methods of Fresh Tissue Examination**

**1. Teasing or Dissociation**
> Process whereby a selected tissue specimen is immersed in isotonic salt solution such as normal saline or Ringer's solution.
> View cells using phase contrast/ Brightfield Microscope

**2. Squash/Crushing Preparation**
> Small piece of tissue (not >1mm in diameter) is place on a slide and forcibly compressed with another slide or a cover glass.
> A vital stain is applied (selectively stains living cells)

**3. Smear preparation**
> Sections or sediments are spread lightly over a slide using a wire loop or applicator stick.

**Types of smear preparation**

- **Streaking**
  > Using an applicator stick or a platinum loop, the material is rapidly and gently applied in a direct or zigzag line.
- **Spreading**
  **>** A selected portion of the material is transferred to a clean slide and gently spread into moderately thick film by teasing the mucous
  **>** Recommended for: **fresh sputum, bronchial aspirates, and thick mucoid secretions**
- **Pull apart**
  **>** Done by placing a drop of secretion or sediment upon one slide and facing it with another slide. Material disperses evenly over the surface of the two slides. The two slides are then pulled apart with a single uninterrupted motion.
  > Used for thick secretions such as serous fluids, concentrated sputum, enzymatic lavage (GI tract) and blood smears.

**4. Touch Preparation (Impression smear)**

> Special method of smear preparation whereby the surface of a freshly cut piece of tissue is brought into contact and pressed on to the surface of a clean glass slide, allowing cells to be transferred directly to the slide for examination by Phase Contrast Microscopy.

**5. Frozen Sections**
**> Most ideal and preferred method**
> Rapid diagnosis of a pathologic tissue during surgery.
> Recommended for: lipids and nervous tissue elements.
> Cryostat: Optimum working temperature -18-20 C

**Methods of Freezing**

- **Liquid Nitrogen** (Most rapid freezing agent)
- Isopentane cooled by liquid nitrogen
- $CO_2$ gas
- Aerosol sprays