Aim of treatment and disposal:

Limit public health and environment impacts by

- transforming the waste into non-hazardous residues by treatment
- containing the waste/residues to avoid human exposure
- containing the waste/residues to avoid dispersion into the environment.
Criteria for choice of options

- Prevailing regulations
- Available options in the region
- Quantities of generated waste categories
- Availability of qualified personnel
- Technologies available on the market
- Available options for final disposal
- Environmental aspects
- Available space on hospital premises
- Related cost

etc.
Treatment and disposal options for waste

Treatment
• Incineration
• Chemical disinfection
• Autoclaving
• Encapsulation
• Microwave irradiation etc.

Final disposal
• Municipal landfill
• Burying inside premises
• Discharge into sewer etc.
Incineration

- Reduces organic and combustible waste to inorganic incombustible waste (ashes)
- Reduces significantly waste volume and weight
- Residues are transferred to final disposal site
- Treatment efficiency depends on incineration temperature and type of incinerator
- Not all wastes can be incinerated
- Investment and operation costs vary greatly according to type of incinerator
- Produces combustion gases
Wastes *not to be incinerated*

- Pressurized gas containers
- Large amounts of reactive chemical waste
- Radioactive waste
- Silver salts or radiographic waste
- Halogenated plastics (e.g. PVC)
- Mercury or cadmium
- Ampoules of heavy metals
Types of incinerators

• **Rotary Kilns**
  1200°C to 1600°C

• **Double chamber pyrolitic incinerators**
  Burning Temperature 800°C-900°C

• **Single chamber furnaces with static grate**
  300°C- 400°C

• **Simple field incinerators**
  <300°C
Incinerator applications

- Municipal incinerators
- Incinerators for industrial waste
- On-site incinerators
  (on hospital premises)
- Regional incinerators
- Furnaces for industrial application
  (e.g. cement industry)
HCW incineration in municipal incinerators

- Check packaging on delivery to plant
- Special incinerator loading required
- Should NOT be placed in bunker
- Automatic loading devices recommended
- Not longer than 24 hour storage
- Only introduce HCW when regular combustion conditions established (not during start-up phase)
Simple field incinerators

Simple one chamber incinerator with manual operation; can be constructed of:

- Steel drums
- Sheet metal
- Clay
- Brick or concrete

Should be used as a last resort
Requires adequate fuel and good air supply
Incineration of HCW - Some advantages and disadvantages

Advantages:
• Good disinfection efficiency
• Drastic reduction of weight and volume

Disadvantages
• Efficiency of chemical + pharmaceutical waste treatment good for rotary kiln, ~95% for pyrolytic incinerator, very limited for lower temperatures
• Toxic emission to air if no control devices
• Maintaining temperature levels (and efficiency) in field incinerators is difficult
• Usually high costs for high temperature incineration