Module 3
Packaging of Infectious Substances
Overview

- Triple packaging
- Packaging Category A infectious substances (P620)
- Packaging Category B biological substances (P650)
- Packaging Exempt human/animal specimens
- Packaging limitations
- Packaging exercise
How are Category A, Category B, and Exempt human/animal specimens packaged?
Triple packaging

Triple packaging provides three layers of containment to protect the substances being shipped. These layers are primary, secondary, and outer containers. The following diagram shows the basic concept of triple packages.
What are the requirements for packaging Category A substances?
Category A packaging requirements

- Primary container is leakproof
- Secondary container is leakproof
- Outer container is rigid
- UN specification marking:
  - Pressure tested at 95 kPa
  - Drop tested from 9 m
  - Puncture tested at 7 kg
  - Stacking tested
- Shipper must be trained
Category A packaging requirements

- Primary receptacle (test tube)
- Secondary packaging (watertight)
- Cap
- Absorbent material
- Specimen record (includes itemized list of contents)
- Outer packaging
- Package orientation label (not mandatory when primary receptacle does not exceed 50 ml)
- UN specification marking

Infectious Substance, Affecting Humans
UN 2814
What are the requirements for packaging Category B substances?
Category B packaging requirements

- Primary container is leakproof
- Secondary container is leakproof
- Either the primary or the secondary container must be pressure tested at 95 kPa
- Either secondary or outer container is rigid
  - If the shipment is transported by air, the outer container must be rigid.
- Drop tested from 1.2 m
Category B packaging requirements

- Primary receptacle (leakproof or siftproof)
- Rack-type holder (styrofoam, sponge)
- Itemized list of contents (specimen record)
- Secondary packaging (leakproof or siftproof)
- Rigid outer packaging
- Proper shipping name
- UN Number
- To/From labels
- Waterproof cap
- Absorbent packaging material
Category B packaging requirements

Minimum dimension: the width of the line forming the square shall be at least 2 mm, and the letters and numbers shall be at least 6 mm high. For air transport, each side of the square shall have a length of at least 50 mm.

Colour: none specified, provided the mark is displayed on the external surface of the outer packaging on a background of contrasting colour and that it is clearly visible and legible.
What are the requirements for packaging Exempt human/animal specimens?
Packaging requirements for Exempt human/animal specimens

- Primary container is leakproof
- Secondary container is leakproof
- Outer container must be of adequate strength
Exempt packaging requirements

Specimen

Primary container leakproof or siftproof

Absorbent and cushioning material

Secondary container leakproof or siftproof (e.g. sealed plastic bag)

Outer packaging

Exempt Human Specimen
What are the limitations for shipping infectious substances by air?
Limitations for shipping

⚠️ Weight and volume (excluding overpacks)

**Category A Substances**
- Maximum 50 ml or 50 g per package for passenger aircraft
- Maximum 4 litres or 4 kg per package for cargo aircraft
- There are no limitations for shipments by road, rail or sea

**Category B Substances**
- Maximum 4 litres or 4 kg per package for passenger or cargo aircraft
- Maximum 1 litre per primary container for passenger or cargo aircraft
- There are no limitations for shipments by road, rail or sea

⚠️ Multiple samples
- Multiple primary containers can be placed in the same package and must be individually wrapped or separated to prevent contact

⚠️ Package dimensions

**P620 packages:**
- The smallest external dimension shall not be less than 10 cm

**P650 packages:**
- At least one surface of the outer packaging must have a minimal dimension of 10 cm × 10 cm
Can packages shipped to the same destination be consolidated?
Overpacks

These figures show examples of overpacks
Overpacks

Overpacks are enclosures used by a single shipper to contain one or more packages shipped to a single destination and to form one unit for convenience of handling, stowage or refrigeration during transport.

Examples of overpacks are a number of packages either:

- Placed or stacked on to a load board such as a pallet and secured by strapping, shrink wrapping, stretch wrapping, or other suitable means; or

- Placed in a protective outer packaging such as a box or crate; or

- Placed into an insulated chest and surrounded with refrigerants such as ice, dry ice or gel pads
Overpacks

Overpacks are useful to ship samples that exceed the individual package quantity limits.

For example:

- A shipper needs to send 100 ml of a Category A substance on a passenger aircraft. However, the quantity limit is 50 ml per package.

- The sample could be split, divided into two packages of 50 ml, and then consolidated into a single overpack.

- There are no specifications or testing requirements for overpacks.

- However, any package placed in an overpack must comply with the regulations.
Exercise

Packaging infectious substances
Provided supplies

- Gloves
- 2 Category A samples in primary containers
- Secondary container
- Rubber bands
- Absorbent material
- Inner lining
- Cushioning material
- Outer container
- Disinfectant
- Laboratory test instructions and itemized list of contents
# SOP for Category A packages

<table>
<thead>
<tr>
<th>Step</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>
Questions and comments