

## Security & Biosecurity

- 1) Security
  - a) Double fence
  - b) Controlled access to the premises
    - i) Guards at gate check pass and licence plate
    - ii) Guards check badge, which shows
      - (1) Photo
      - (2) Name
      - (3) Expiry date
  - c) Central monitoring station
    - i) Touchscreens that monitor alarms and intercoms
    - ii) Fire alarms
    - iii) Database computers
    - iv) CCTV screens
    - v) Adjacent equipment room with support devices
      - (1) Cables should be labelled with nonremovable, easy-to-read tags, to minimise system downtime in case of failure
  - d) Fingerprint check at lab entrance. Trained & vaccinated people only. This includes maintenance people.
  - e) Bulletproof windows in BSL4.
  - f) Primary intrusion detection.
    - i) Control panel circuit board & housing—
      - (1) Protected by tamper switches & shock sensor
      - (2) Connected to a 24-hour zone so that any attempt to open it will trigger an alarm
    - ii) End-of-line resistor (EOLR) circuitry detects any short rendering the system inoperable
    - iii) High-security balanced switches or biased switches signal equipment substitution
  - g) All alarm systems use phone lines, therefore:
    - i) Phone and meter rooms are “mission critical” areas
    - ii) The system must poll the line continuously to verify that it is operational
    - iii) Anyone working on the phone system must be supervised
  - h) A crisis plan
- 2) Biosecurity
  - a) The lab on three floors:
    - i) Basement for waste water treatment
    - ii) Research space on the ground floor
      - (1) Labs
      - (2) Storage
      - (3) Patient isolation area
    - iii) Air handling equipment above
  - b) Four different levels of air pressure before you reach BSL4
  - c) Everyone goes to the loo before entering
  - d) Two-person rule. No one ever works alone in a laboratory.
  - e) Entering BSL4 takes 20 minutes
    - i) Universal biohazard symbol on the door (plus other information)
    - ii) Changing room where you remove clothing and jewellery

- iii) Hallway & door
  - iv) Locker room. Put on underwear, socks, a cotton overall, and nitrile examination gloves; helmet with radio communication (or earplugs); an egg-blue polyurethane vinyl space suit; overshoes; and—if you are going to handle biting animals—thick leather (or similar) gloves
  - v) Antechamber
  - vi) Double-airlock with stainless steel doors made by a submarine manufacture
  - f) Supplies—
    - i) Supplies and materials that are not brought into the cabinet room through the changing area are introduced through a double-door autoclave or fumigation chamber
    - ii) Infectious materials are delivered in airtight, watertight, stainless steel boxes and opened under a hood.
  - g) Inside—
    - i) Room is sealable for decontamination
    - ii) Mechanical, independent ventilation with HEPA filters
    - iii) Connect your suit to a yellow air hose that hangs from the ceiling. This pressurises the suit so that it is held away from the skin. If it is punctured, air rushes out, not in. The inward rush of air is loud (hence the ear plugs or radio headset). Scientists may talk by lipreading or dry-erase boards.
    - iv) No—
      - (1) Smoking
      - (2) Eating
      - (3) Drinking
      - (4) Storage of food
      - (5) Putting on make-up
      - (6) Handling contact lenses
    - v) Class III BioSafety Cabinets are airtight stainless-steel-and-glass cabinets with built-in plastic gloves. But, in a suit lab, Class II BSCs are used
    - vi) Samples are stored in sealed vials in cardboard boxes in freezers
    - vii) Centrifuges, incubators, roller culture apparatus
    - viii) A double-ended autoclave (through the wall). Saturated steam under pressure (autoclaving) is the best means of sterilizing lab materials
  - h) Exiting also takes 20 minutes
    - i) Shower in your suit
    - ii) Take off all your clothes and throw them in a bin
    - iii) Blow your nose, clear your throat and spit
    - iv) Scrub your nails
    - v) Wash your glasses in acetic acid
    - vi) Shower your body and hair—
      - (1) 1 minute water
      - (2) 2.5 minutes misting with 5% Micro Chem Plus Detergent Disinfectant
      - (3) 1 minute water
    - vii) Your notes will be faxed outside
- 3) Mobile medical isolation facility
- a) Workers wear space suits
  - b) Stretcher isolator for patient

4) Packaging

a) Triple packaging system

i) Labelled primary watertight, leak-proof receptacle containing the specimen.

(1) The receptacle is wrapped in enough absorbent material to soak up all fluid in case of breakage

ii) Durable, watertight, leak-proof secondary receptacle.

(1) Several primary receptacles may be wrapped in one secondary.

(2) Sufficient absorbent material must be used to cushion multiple primary receptacles

iii) Outer shipping package to protect from physical damage and water