



Department of Anesthesia Techniques
Title of the lecture:- Biosafety and y Biosecurity



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Biosafety and Biosecurity





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BIOSAFETY

Definition (WHO)

“Laboratory biosafety – the containment principles, technologies and practices that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release .”

BIOSECURITY

Definition (WHO)

“Laboratory biosecurity – the containment principles, technologies and practices that are implemented to prevent the intentional exposure to pathogens and toxins, or their intentional release .”

- ❖ Laboratory biosafety may be addressed through the coordination of the following procedures and practices:
 - ✚ Engineering
 - ✚ Administrative
 - ✚ Standard Operating Procedures (SOPs)
 - ✚ Personal Protective Equipment (PPE)

❖ **Four Primary Controls of Biosafety**



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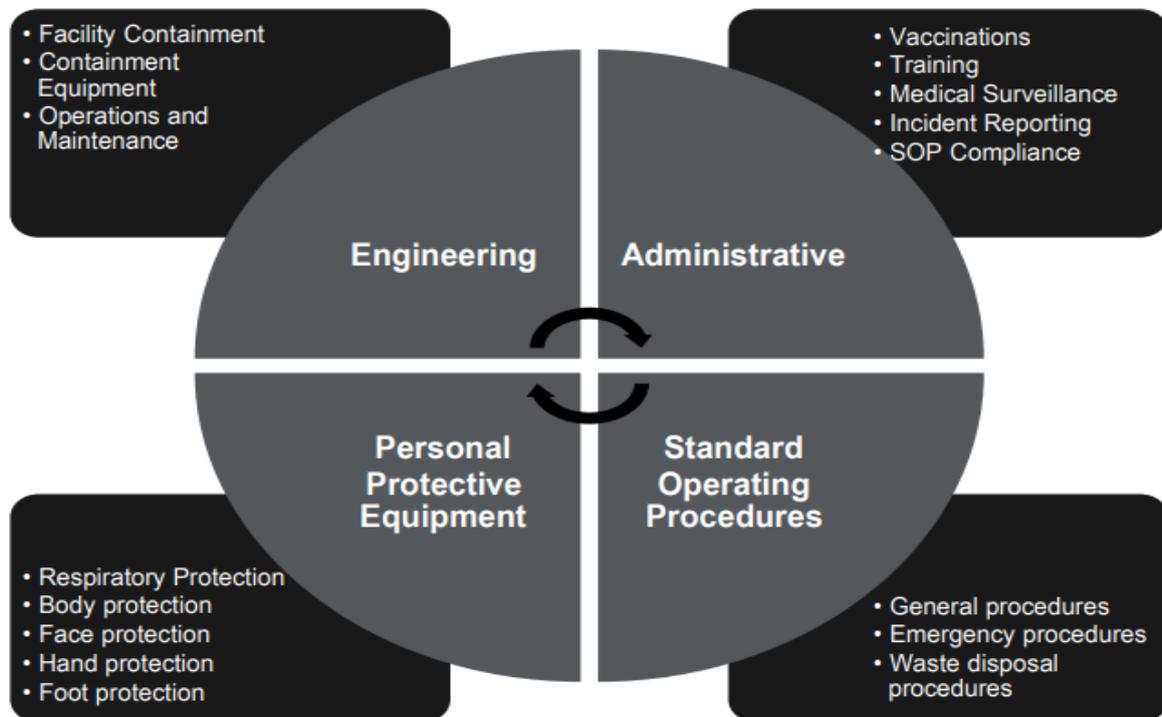


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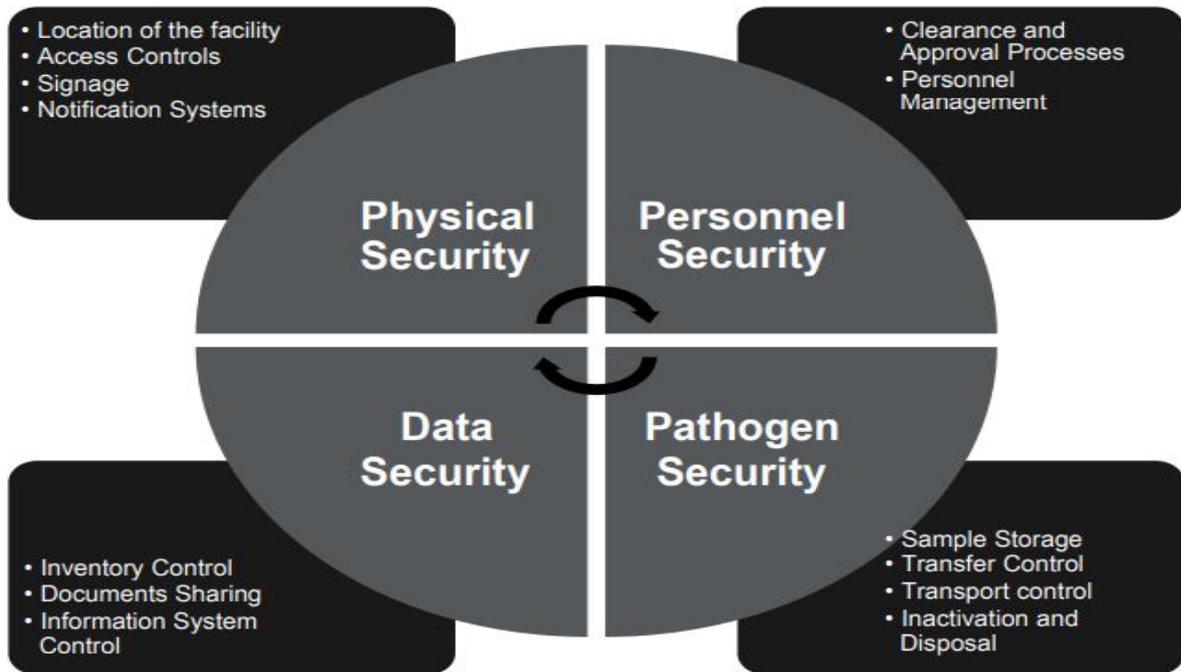


❖ Laboratory biosecurity may be addressed through the coordination of the following procedures and practices:

- ✚ Regulatory
- ✚ Physical Security
- ✚ Administrative
- ✚ Standard Operating Procedures (SOPs)

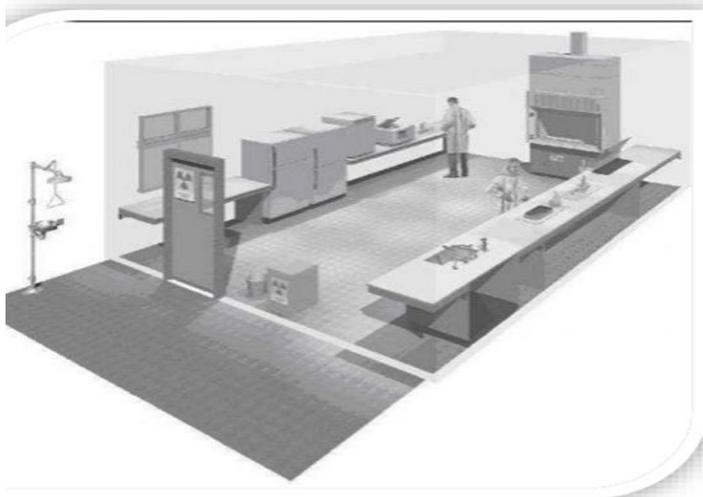


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BIOSAFETY LEVELS

BIOSAFETY LEVEL 1



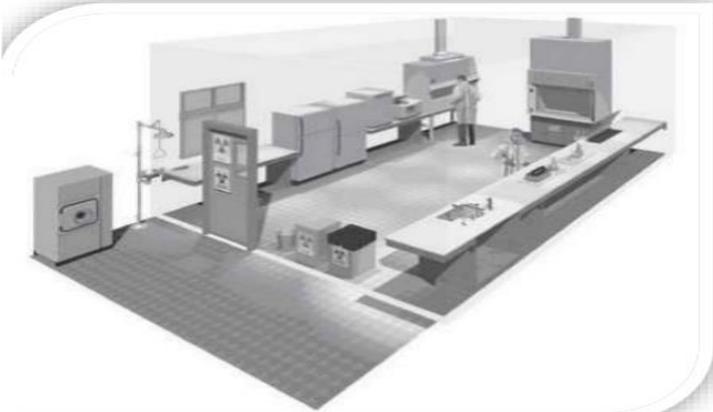
- » labs have doors
- » labs have sinks
- » surfaces are easy to clean
- » tables are water-resistant
- » windows are screened



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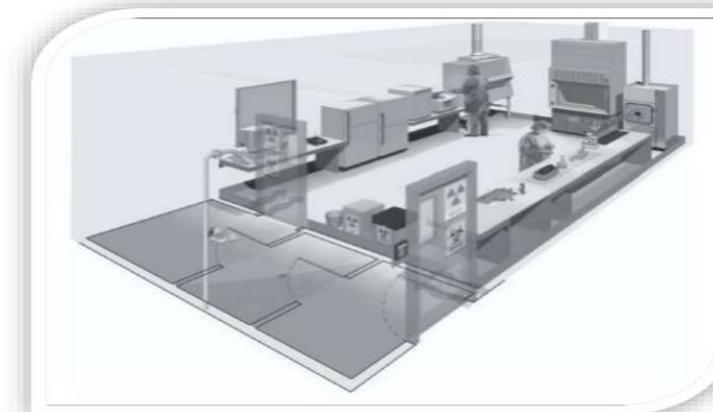
BIOSAFETY LEVEL 2



All items listed in BSL1 – and:

- » eyewash station
- » restricted access when work is in progress
- » doors that lock
- » BSC as needed
- » air flows into the lab without recirculation to non-lab areas (recommended for new construction)

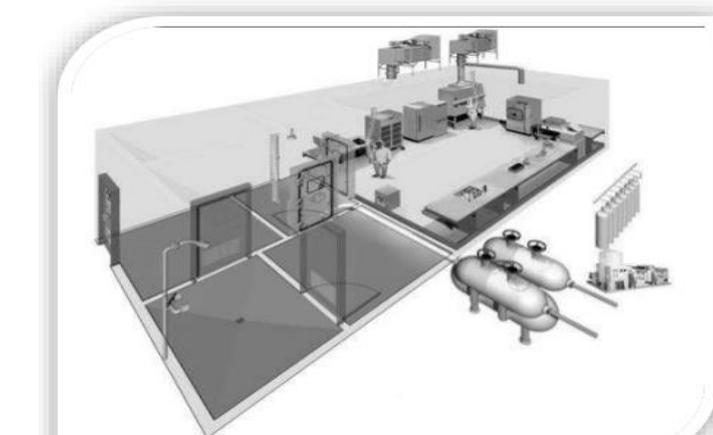
BIOSAFETY LEVEL 3



All items listed in BSL2 – and

- » access to an autoclave
- » separated building or isolated zone
- » double door entry
- » directional inward flow
- » single pass air
- » enclosures for aerosol generating equipment
- » walls, floors, and ceilings are H₂O resistant

BIOSAFETY LEVEL 4



All items listed in BSL3 – and

- » double door autoclaves
- » rooms are sealed
- » inner and outer doors are interlocked to prevent doors being opened at the same time
- » liquids are decontaminated
- » multi-level system redundancy



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BIORISK

Definition (WHO)

“The probability or chance that a particular adverse event (in the context of this document: accidental infection or unauthorized access, loss, theft, misuse, diversion or intentional release), possibly leading to harm, will occur.”

BIORISK ASSESSMENT

(WHO)

“The process to identify acceptable and unacceptable risks (embracing biosafety risks (risks of accidental infection) and laboratory biosecurity risks (risks of unauthorized access, loss, theft, misuse, diversion or intentional release)) and their potential consequences.”

BIORISK MANAGEMENT (WHO)

“ The analysis of ways and development of strategies to minimize the likelihood of the occurrence of biorisks. The management of biorisk places responsibility on the facility and its manager (director) to demonstrate that appropriate and valid biorisk reduction (minimization) procedures have been established and are implemented. A biorisk management committee should be established to assist the facility director in identifying, developing and reaching biorisk management goals. ”

COMPONENTS OF BIORISK MANAGEMENT (WHO)

- ✓ reducing the risk of unintentional exposure to pathogens and toxins or their accidental release (biosafety)
- ✓ reducing the risk of unauthorized access, loss, theft, misuse, diversion or Intentional release to tolerable, acceptable levels (laboratory biosecurity)
- ✓ providing assurance, internally and externally (facility, local area, government, global community, etc.), that suitable measures have been adopted and effectively implemented
- ✓ providing a framework for continuous awareness-raising for biosafety, Laboratory biosecurity and ethical code of conduct, and training within the Facility



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PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE “specialized clothing/equipment worn by an employee for protection against infectious materials”

- ❖ Provides protection from biohazard agent
- ❖ It is removable and/or disposable (prevents contamination of community and environment)
- ❖ Must be worn when handling infectious materials
- ❖ Must be removed before leaving the work place

TYPES OF PPE

1. body protection

- Head Protection(Protect hair and scalp from contamination, Hair covers)
- Foot Protection(Disposable shoe covers (additional layer of protection) , Rubber boots ,Dedicated lab shoes , Non-slip footwear).
- Additional Body Protection (based on risk assessment): (Disposable sleeve covers , Scrubs)





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2. face protection(Face shield → Surgical mask → Indirectly vented safety goggles → Safety glasses)



3. hand protection(Gloves are made of different materials o Latex, nitrile, vinyl, etc).



4. respiratory protection(P100 respirator , N95 respirator).



P100 respirator



N95 respirator