



Management of the Environment

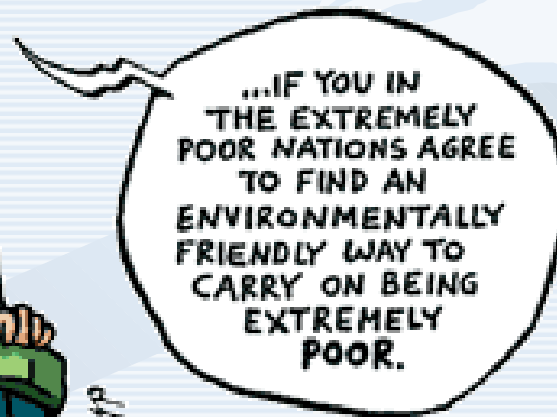
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Consultant Microbiologist

Management of the Environment



TOGETHER WE CAN
SAVE OUR PLANET



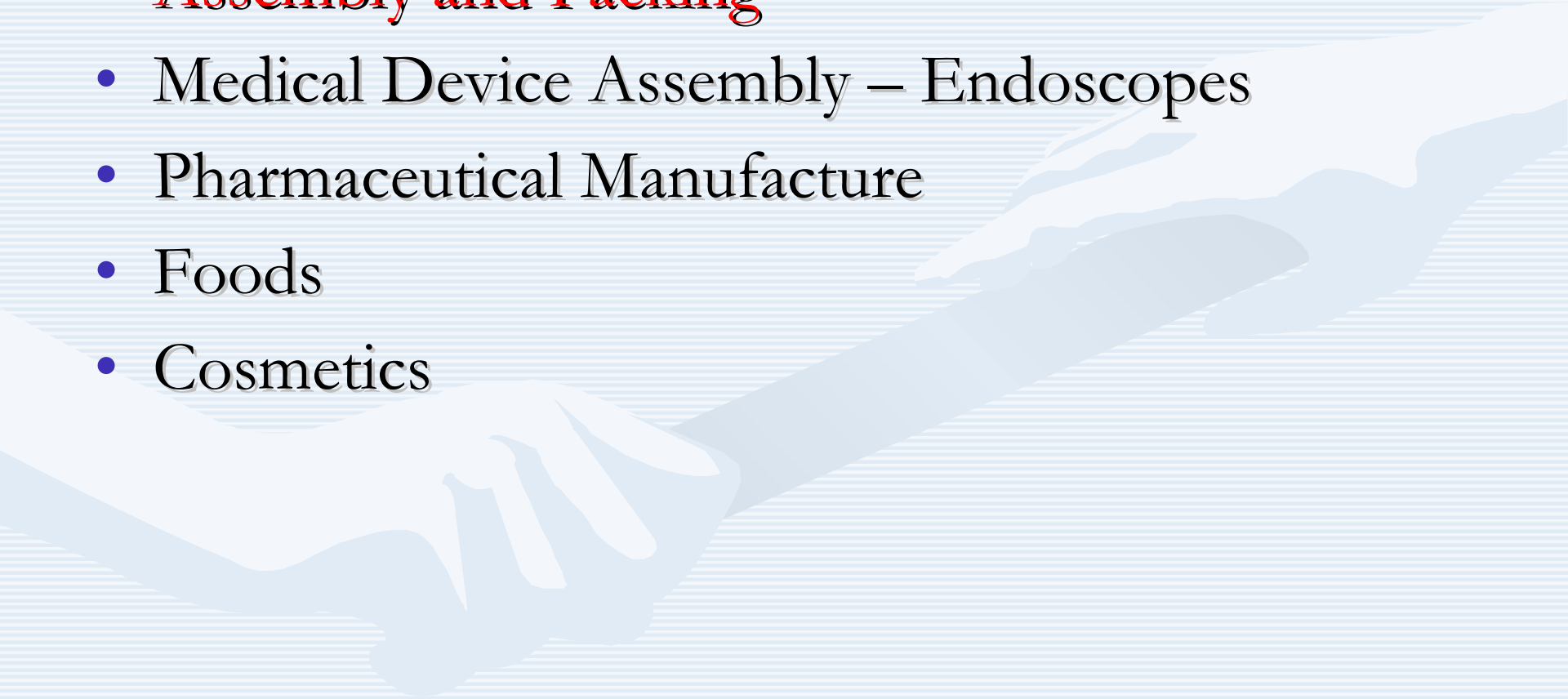
Polyp

Management of the Environment

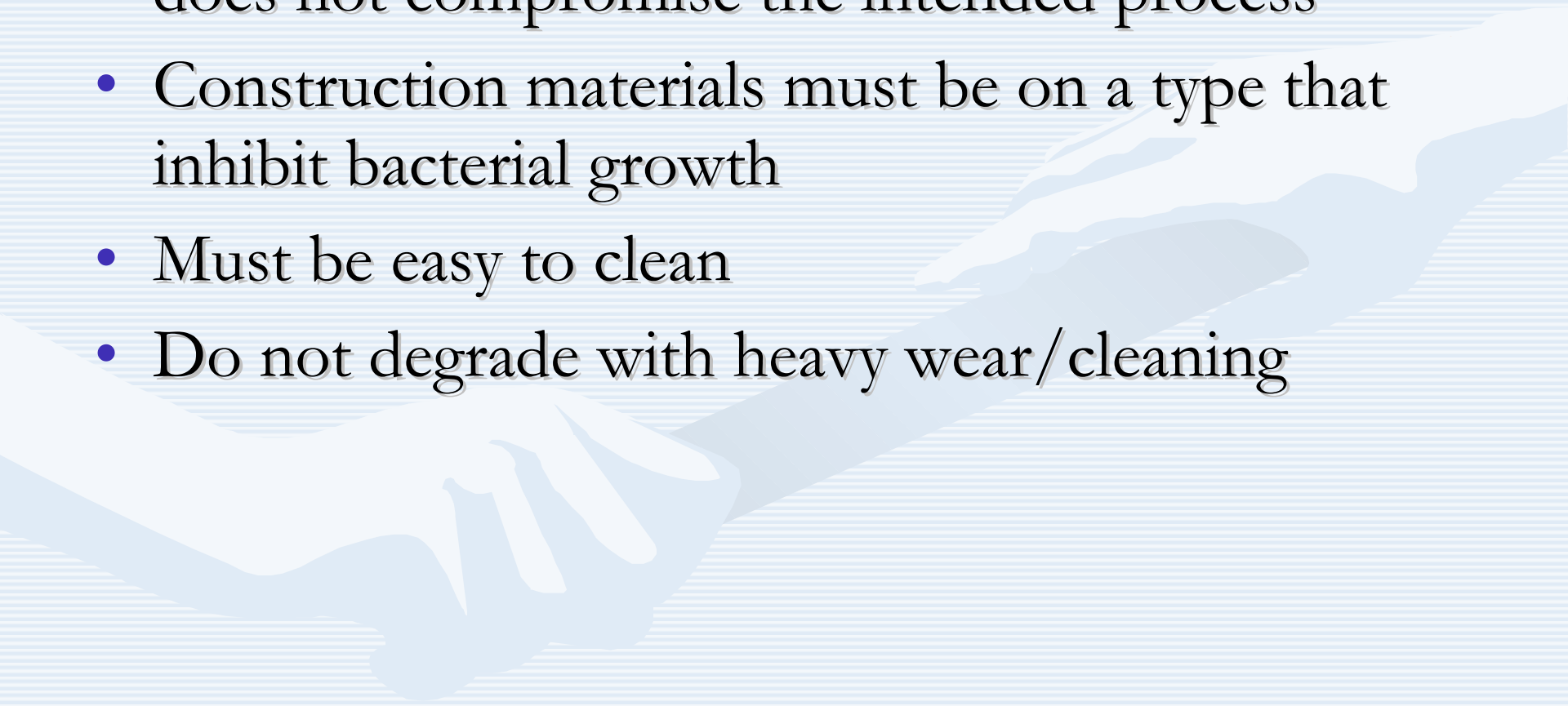


Areas Under Consideration

- Clean Room – Surgical Instrument Inspection, Assembly and Packing
- Medical Device Assembly – Endoscopes
- Pharmaceutical Manufacture
- Foods
- Cosmetics



Clean Rooms – Sterile Services

- The room must be constructed in a manner that does not compromise the intended process
 - Construction materials must be on a type that inhibit bacterial growth
 - Must be easy to clean
 - Do not degrade with heavy wear/cleaning
- 
- A faint, light blue illustration of two hands shaking is visible in the background, spanning the lower half of the slide. The hands are rendered in a simple, stylized manner, with the fingers and palms clearly defined. The overall tone is professional and clean, matching the theme of the presentation.

Clean Rooms – Packing Area

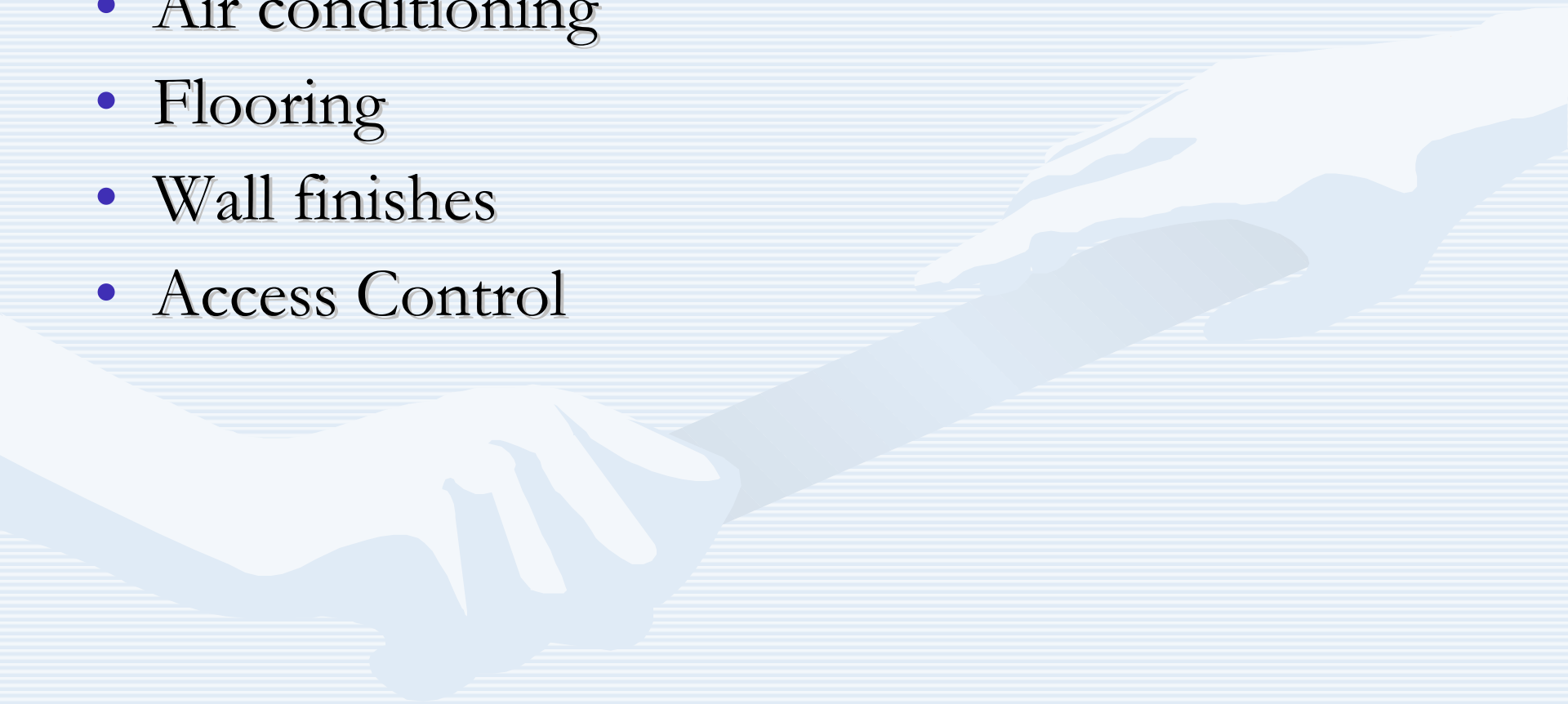


Packing Area – How Not To Do It



Environmental Construction

- Electrical System
- Air conditioning
- Flooring
- Wall finishes
- Access Control



Lighting Fittings



Air Conditioning Unit



Sheet Vinyl Flooring



Flooring/Wall Defects



Flooring Defects



Wall Finishes



Another Packing Area That Does Not Conform

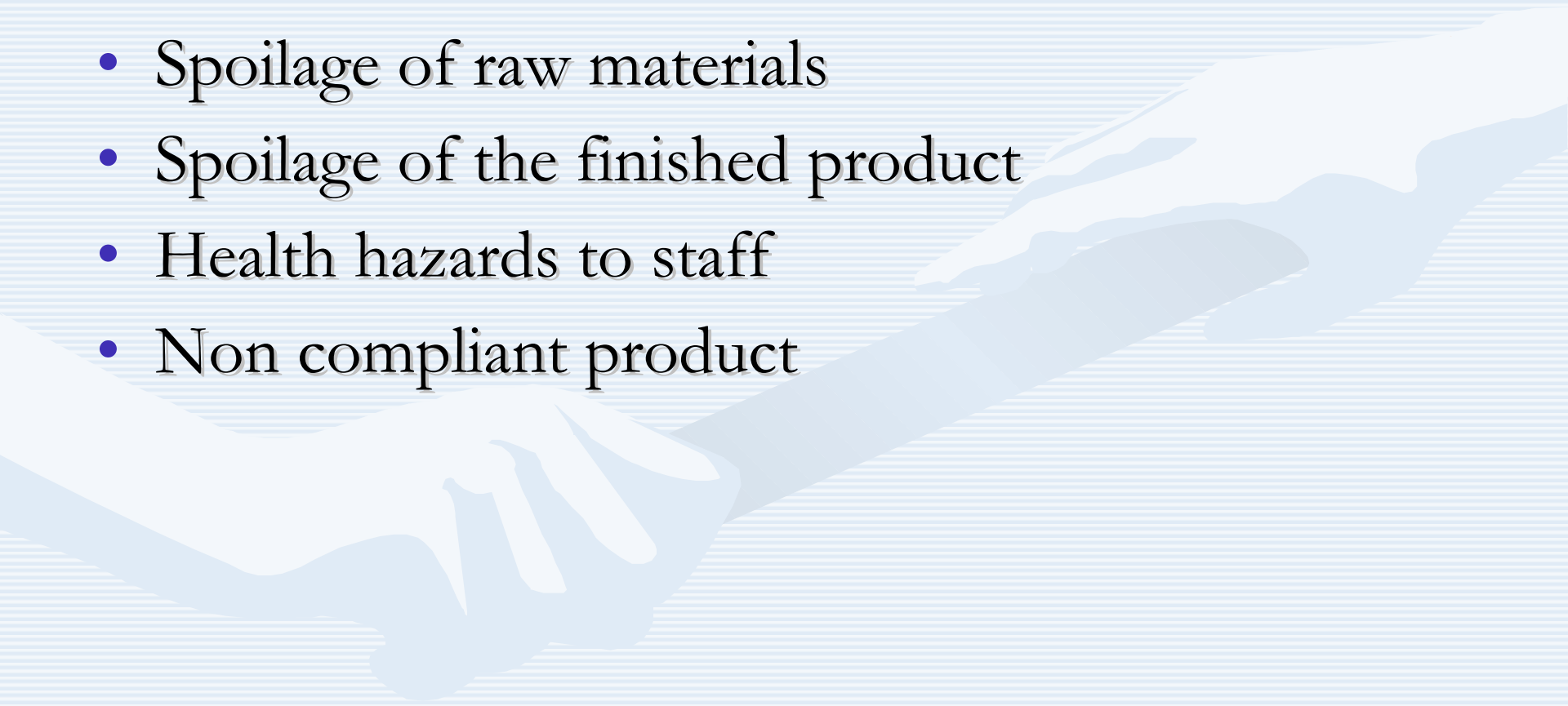


Access Door Into Clean Area



Effects of Microbial Contamination on the Environment

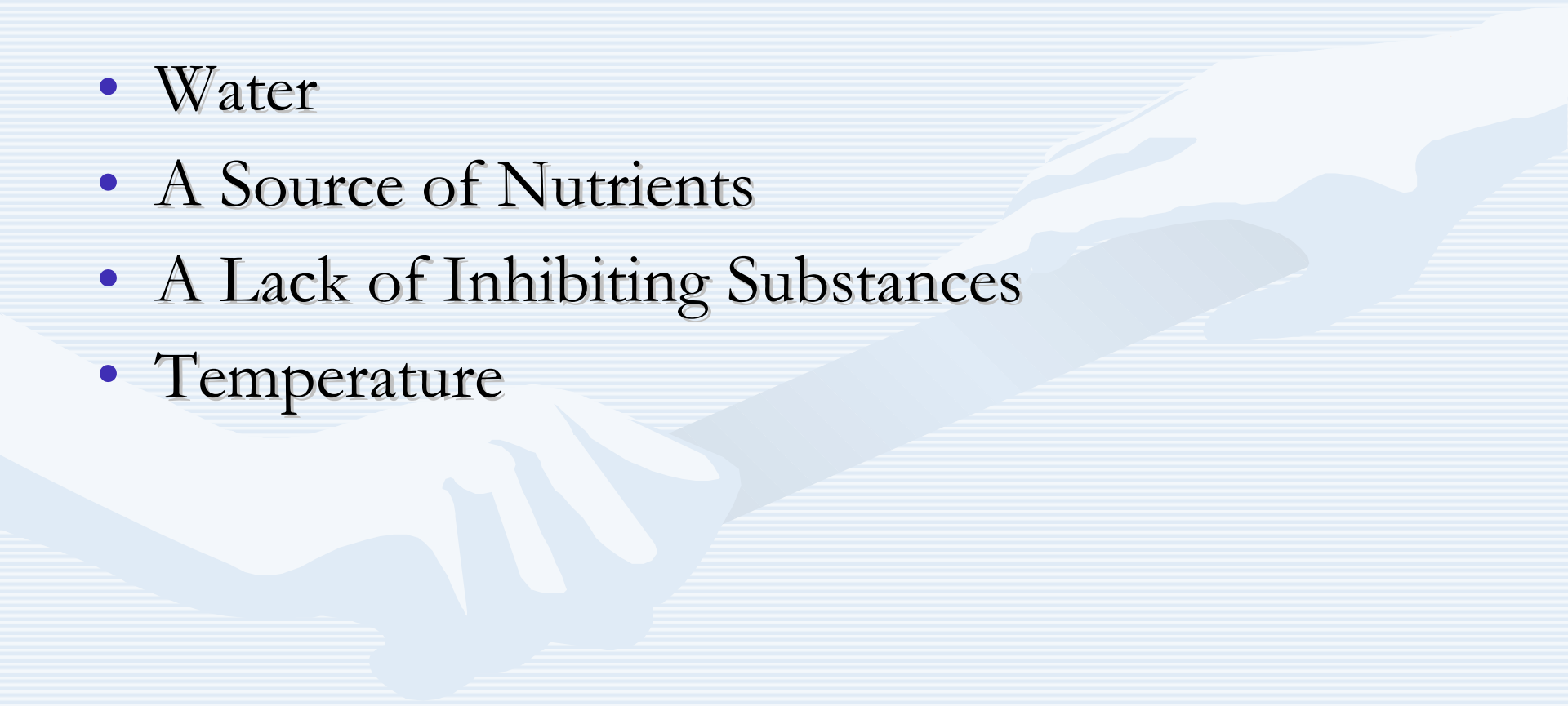
- Spoilage of raw materials
- Spoilage of the finished product
- Health hazards to staff
- Non compliant product



Microbial Contamination

For Microbial Growth the Following is Required

- Water
- A Source of Nutrients
- A Lack of Inhibiting Substances
- Temperature



Sources of Microbial Contamination

- Raw materials such as brown cardboard
- Water
- Airborne bacteria
- Contaminated equipment
- Disinfectants/detergents/cleaning materials
- But Above All - **People**

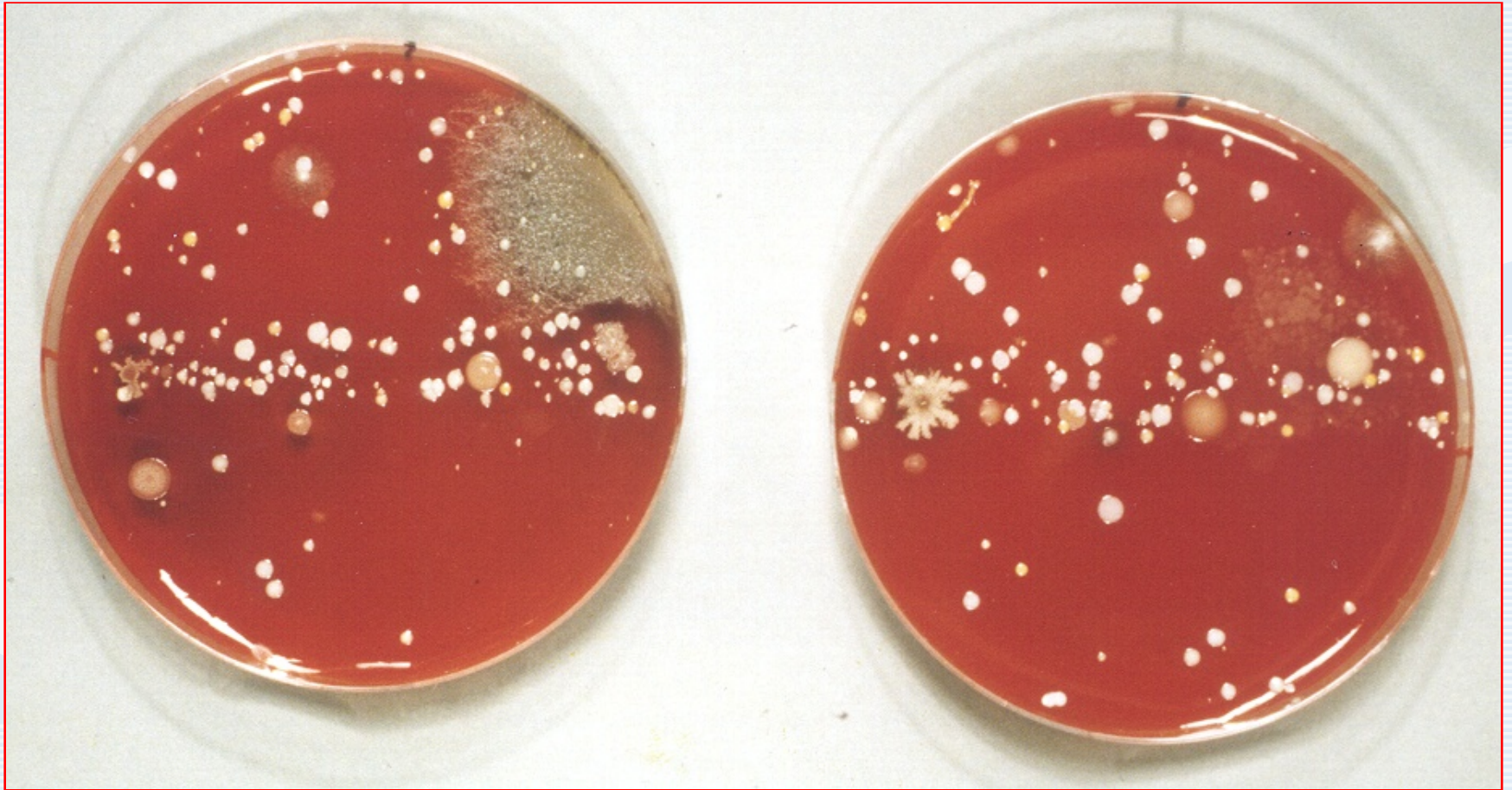
Brown Cardboard



Water/Aerosols/Steam



Airborne Bacteria



Contaminated Equipment



Contaminated Detergents/Disinfectants



People - Resident Flora

These organisms live and multiply on the skin (mainly on superficial layers, but 10-20% inhabit deep layers) and can be repeatedly cultured, even after routine handwashing. Although these organisms are generally harmless, they are of special concern if staff are performing invasive procedures. In these circumstances they need to be reduced and inhibited using an antimicrobial preparation, to prevent cross-infection.

People - Transient Flora

These organisms are present in the hospital micro-environment and contaminate the hands of hospital staff during normal work activities. They can be readily passed on to another person during contact and will survive on the hands for up to 24 hours, if not removed by handwashing. (Occasionally, despite routine handwashing, a transient organism may take up "temporary residence" for a period of several weeks.)

Contamination with transient flora may occur in the absence of visible soiling. **Routine handwashing** is performed to remove transient microbial flora derived from touching one's skin, another person's skin, or some object in the environment. Antimicrobial skin cleansers are not required.

Fomites

A **fomite** is any inanimate object or substance capable of carrying infectious organisms (such as bacteria or parasites) and hence transferring them from one individual to another. A fomite can be anything such as a cloth or mop heads so when cleaning this is important to remember that this could aid when spreading pathogenic organisms.

Utilities into the Clean Room Areas

- Water
 - Water – Moisture from an incorrect type of air conditioning unit
 - Steam over-run from sterilisers and W/D's
- Compressed Air
 - An important source of contamination ranging from moisture to particulates and oil

Medical Gas Installation

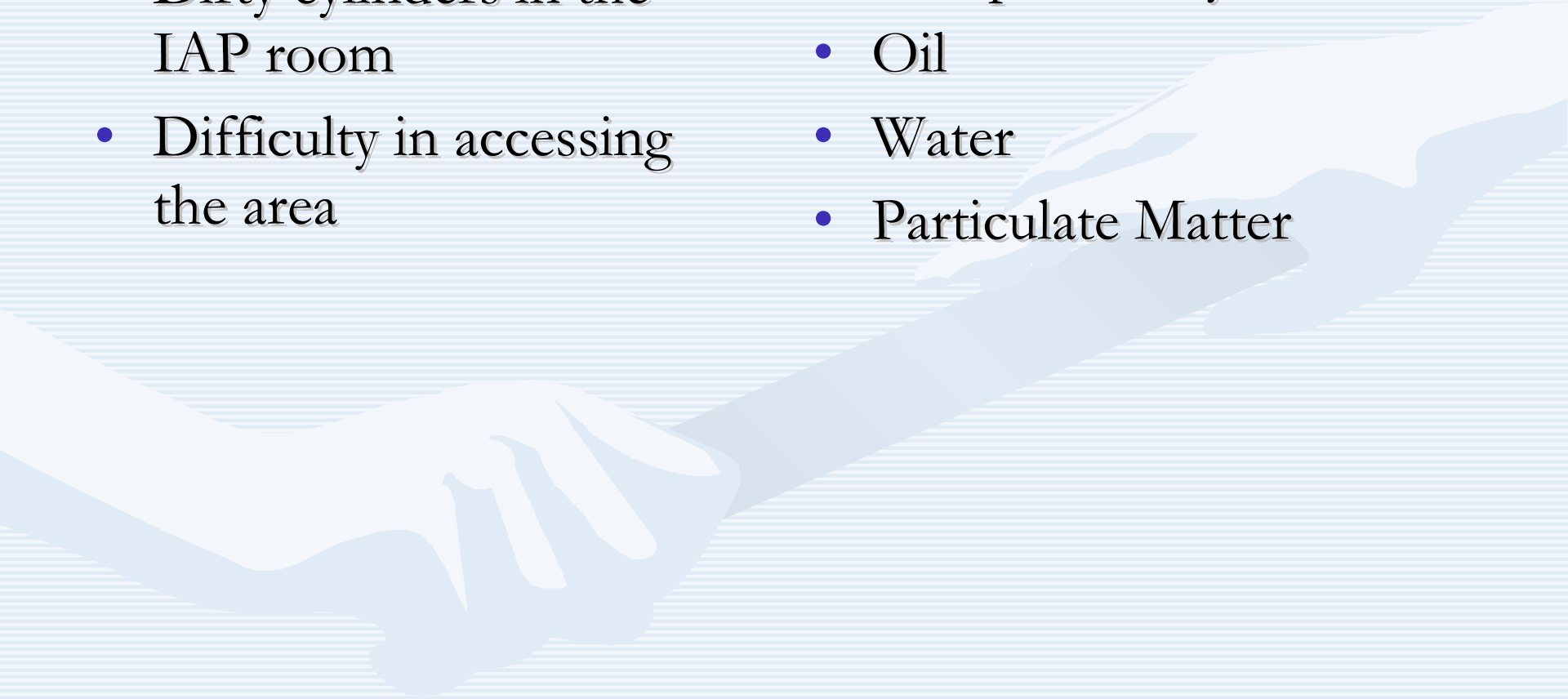


Medical Air Compressor



Problems with Medical Air

- Supplied from a Cylinder
- Dirty cylinders in the IAP room
- Difficulty in accessing the area
- Supplied from a Compressor System
- Oil
- Water
- Particulate Matter



Access Into the Clean Room



Fittings in the Gowning Room



Determination of the Air Quality in the Clean Room

- Examination of Wall, Ceiling, Floor Finishes
- Protein Tests
- Particle Counts
- Microbiological Investigation
 - Settle Plates
 - Active Microbiological Sampling



Examination and Testing of the Clean Room Environment

- Physical examination of the floor



Examination and Testing of the Clean Room Environment

Wall Damage



Examination and Testing of the Clean Room Environment

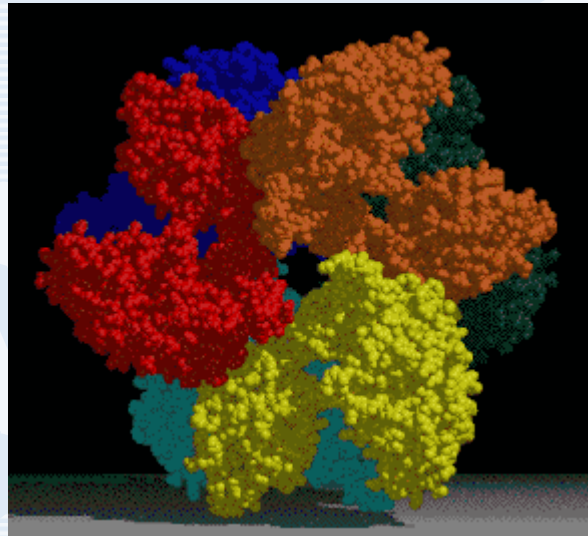


What is Protein

Proteins are composed of small units. These units are the amino acids which are called the building blocks of protein. There are about 20 different amino acids which are commonly known. Each different protein is composed of various amino acids put together in varying order with almost limitless combinations. Most proteins are large molecules that may contain several hundred amino acids arranged in branches and chains.

Protein

Protein is an essential nutrient. There is no life without protein. Protein is contained in every part of your body, the skin, muscles, hair, blood, body organs, eyes, even fingernails and bone. Next to water, protein is the most plentiful substance in your body.



Protein Detection



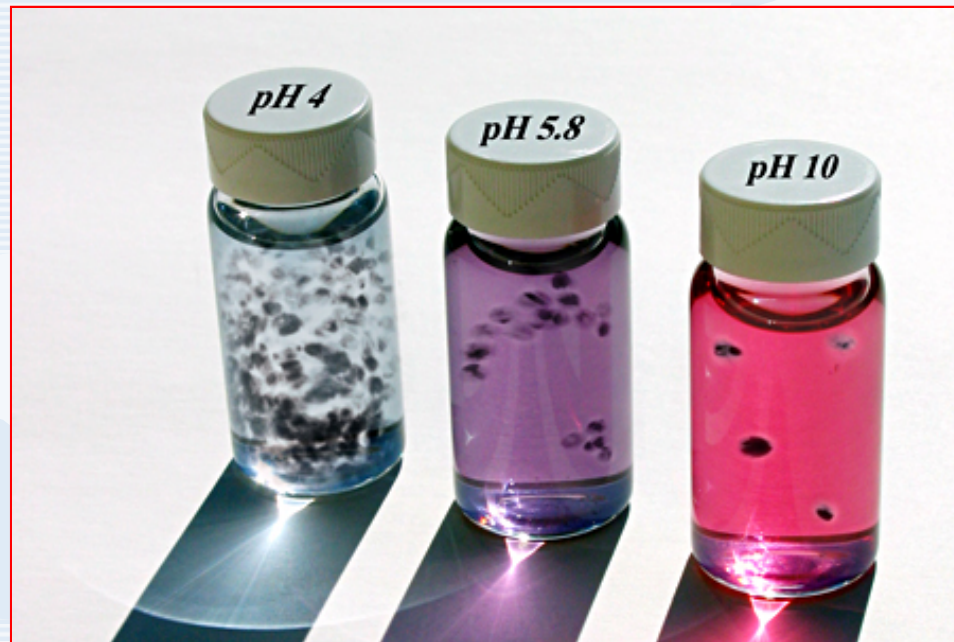
Pro-Tect Swabs



ATP Detection

Protein Detection

Every protein is folded into a unique, three-dimensional shape that allows it to function properly. This simple test, that instantly changes color when a protein molecule attached to a gold nanoparticle folds or unfolds. The new technique, which works on the same principle as ordinary pH tests that measure the acidity of water



Particle Counting

- Classified according to the cleanliness of their air
- Room to be to ISO Class 8
- Need to determine the maximum airborne concentration of particles
- 0.5um Particles = 3,520,000
- 1um Particles = 832,000
- 5um Particles = 29,300

Particle Counting



Microbiological Sampling

Active Microbiological Sampling



Contact Plates



Settle Plates



Can Be Used in the Assessment of Transfer Hatches

Management of the Environment

- Ensure that all specific areas of the clean room are identified and routine tests are carried out
- Don't treat each test in isolation
- Document all testing carried out and assess the results
- Ensure that all policies and procedures are in place and are effective and policed

Thanks to the Review Panel

