BARRIER® Clean Air Suit can maintain ultra clean air in the operating room (OR). It’s a single-use clothing system proven to have a better protective effect than reusable systems made of Mertex, olefin, cotton or polyester1-4,5.

We’ve heard how decreasing counts of airborne bacteria in the OR plays an important part in infection control. And we understand that people in the OR are a main source of airborne microorganisms6 that can cause surgical site infections. Our BARRIER Clean Air Suit is proven to contribute to hospital infection control – the below evidence summaries explain how.

**Kasina P et al, 20161**

**Prospective study/clinical setting**

**Key findings:**
- The BARRIER Clean Air Suit achieved a significantly larger reduction in colony forming units (CFU/m³) compared to the olefin suit, and also compared to the laminar air flow-assisted Mertex suit (p=0.009)

**Objective:**
To investigate if BARRIER Clean Air Suit alone can achieve similar air quality in the OR to reusable clothing systems assisted by mobile laminar air flow.

**Methods:**
- Setting: OR (hip and knee arthroplasties)
- No. of procedures: 37
- Outcome measure: CFU/m³ of air (mean, median, range)

**Products tested:**
- BARRIER Clean Air Suit (n=11)
- Olefin suit (n=13): reusable suit made out of olefin fabric (woven polypropylene). Test was done without laminar air flow devices
- Mertex P-3477 suit (n=13): reusable suit made out of mixed material (cotton/polyester). Test was done with using 2 TOUL mobile laminar air flow devices

**Tammelin A et al, 20135**

**Prospective studies/clinical and laboratory settings**

**Key findings:**
- BARRIER Clean Air Suit maintained significantly lower counts of CFU/m³ compared to a reusable clothing system (Mertex) both in the OR and in an air chamber (p<0.05)
- BARRIER Clean Air Suit improved air quality (<10 CFU/m³) even when ordinary ventilation was used in the OR
- The results show that clean air suits of different materials meeting the requirements of the EN 13795 standard may still exhibit significant differences in their protection capacity (bacterial penetration)
- BARRIER Clean Air Suit has a better protective effect than a reusable system made of cotton/polyester

**Objective:**
To investigate if there is a difference in protective efficacy between BARRIER Clean Air Suit and a reusable clothing system.

**Methods:**
- Settings: OR/dispersal chamber
- No. of procedures: OR, n=10; dispersal chamber, n=5
- Outcome measure: CFU/m³ of air (mean, range)

**Products tested:**
- BARRIER Clean Air Suit
- Mertex P-3477 suit – reusable, mixed material (cotton/polyester/carbon fibre)
Ljungqvist B and Reinmuller B, 2012
Laboratory study

Key findings:
• The BARRIER Clean Air Suits all resulted in a >75% reduction in CFU concentration and a >90% reduction in particles emitted from the test subjects, compared to the mixed cotton/polyester reusable material (Mertex P-3477).
• When low concentrations of airborne bacteria-carrying particles are necessary to avoid hospital infections to patients, surgical clothing systems of evaluated disposable non-woven material is preferable.

Objective:
To evaluate and compare the protective efficiency of a single-use and a reusable clothing system in a laboratory setting.

Methods:
• Setting: dispersal chamber
• No. of procedures: 5 per product (4 measurements per individual)
• Outcome measures: source strength – total particulates (numbers); bacteria-carrying particles (CFU)

Products tested:
• Older version of BARRIER Clean Air Suit (shirt tucked in)
• New BARRIER Clean Air Suit, antistatic-treated (shirt outside pants)
• New BARRIER Clean Air Suit, not antistatic-treated (shirt outside pants)
• Reusable clothing system (cotton/polyester): Mertex P-3477 clean air suit. Reusable, laundered up to 50 times (shirt tucked in)

Dispersal chamber:
Test chamber with HEPA-filtered air supply and with exhaust air in which the concentration of the total number of particles and bacteria-carrying particles from the test subjects are measured in order to calculate the source strength.

Source strength:
The average number of CFUs released per second from one person wearing a specified clothing system.

Definitions
Colony forming units (CFUs): Number of particles that carry bacteria and can give rise to a colony on a culture plate.

Laminar air flow device: Instrument that creates a streamlined air flow in the operating room. This makes all particles move in the same direction.

What is needed to limit the levels of airborne bacteria?
• Staff clothing that reduces the emission of skin scales
• Adequate hygienic standards
• Good ventilation

BARRIER® Clean Air Suit
Proven to maintain ultra clean air in the OR

Ljungqvist B and Reinmuller B, 2013
Laborative study/clinical setting

Key findings:
• BARRIER Clean Air Suits achieved a CFU concentration (CFU/m^3, mean (SD)) of 1.15 ± 0.6 and a source strength of 1.15 ± 0.6 under the stated conditions.
• The BARRIER Clean Air Suit showed higher protection efficiency when compared to that of a suit from reusable material, Mertex P-3477 (data from a previous study in the same environment).

Objective:
To evaluate the protective efficiency of a single-use clothing system in a clinical setting.

Methods:
• Setting: OR (hip and knee arthroplasties)
• No. of procedures: 10
• Outcome measures: source strength – total particulates (numbers); bacteria-carrying particles (CFU)

Products tested:
• BARRIER Clean Air Suit

References:

These synopses of published articles have been compiled by Mölnlycke as a service to healthcare professionals. It does not contain the complete text and Mölnlycke makes no representation as to its completeness in addressing all issues in the articles.