NanoCleanAir

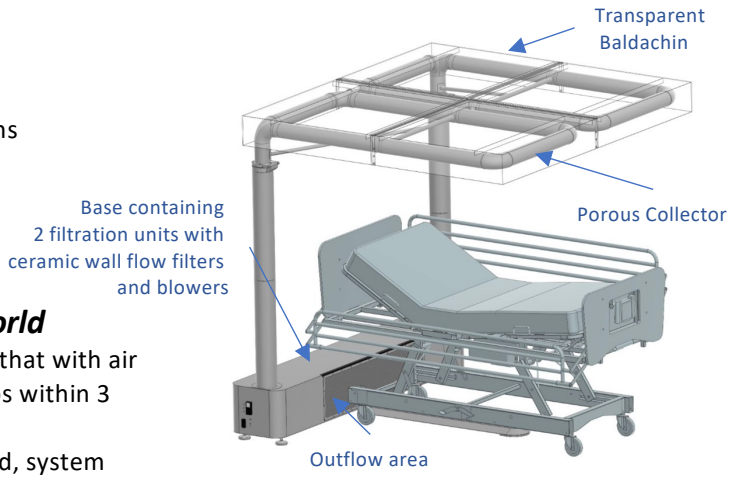
NanoCleanAir® Baldachin
Hospital Bed Protection in Intermediate Care (IMC)

Introduction

Intermediate care units (IMCs) provide highly specialized care and allow close monitoring of patients. They play an essential intermediate role between the standard and intensive care units. IMCs are open, multi-bed wards with 4 – 10 patients. In an IMC, a patient with an infectious, air-transmittable disease (e.g., influenza, covid, hrV, measles) puts other freshly operated patients in the same room at risk. The necessity to isolate these patients is severely limiting hospitals' capacity impacting patients' safety, and hospital finances

Clinical Requirements

- Mobile and safe to handle
- 100% Cleanable
- No interference with surveillance and support systems
- Independent of the bed
- Free mobility of patients and caretakers
- Reliable protection, e.g., patient sitting, coughing
- Silent

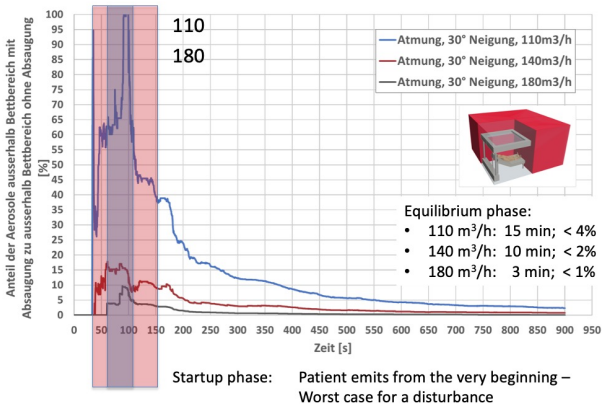


Baldachin Performance *in silico* and in *real-world*

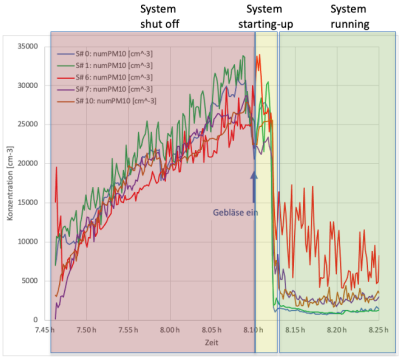
Modeling of a 4-bed ward: The calculation below shows that with air exchange rates, the virus load outside the bed area drops within 3 mins to less than 1% of the emitted viruses

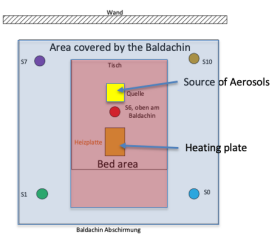
In the real-word experiment, a fully loaded the room (red, system shut off) the area is cleared down to about 1-2% within (yellow) a minute. This indicates efficient clearing after disturbances like coughing, patient / nurse movements, or short air blows

Escape into the outside the bed area (red): With / Without Filtration



In silico: *Modeling of the aerosol clearance efficiency (escape rate) outside the bed area after a worst-case incident: "The patient has a coughing fit after entering the bed"*





Setting:
- Aerosol source at the patient's head
- Heating plate to simulate heat emission by the patient
- S1, S7, S10, S0 measure concentration outside the bed
- S6 measures source emission
- Flow 180 m³/h

Real-World: *particle concentration measurements without(red) cleaning, in the start-up phase (yellow) and with the running system (green)*

Integration of the NanoCleanAir® Baldachin into the ward, illustrating free accessibility of patient as well as monitoring and support instrumentation

Partners:

Fachhochschule Nordwestschweiz
Hochschule für Technik

adolphe merkle institute
excellence in pure and applied nanoscience

combustion and flow solutions GmbH

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