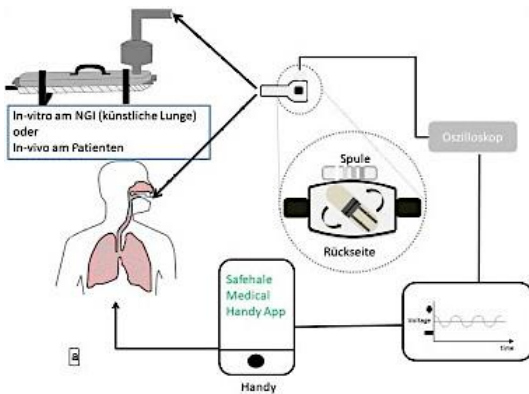


## Feedback mechanism for powder inhalers

### Inhalation flow rate and duration measurement

#### Invention

Capsule-based powder inhalers enjoy widespread use in the treatment of respiratory illnesses. Successful therapy depends not only on inhaler and active ingredient, but also on how patients use them. Inhalation at a low flow rate or for too short a time subjects the therapeutic effect to great fluctuation.



Schematic drawing of the functional principle

To give the patient feedback about inhalation effectiveness, scientists at the University of Bonn have developed a system from which conclusions can be drawn about inhalation quality and respirable particle quantity. The capsule rotation frequency during inhalation is used to determine airflow and inhalation duration. Rotation is read out by means of a neodymium magnet and a coil and can be used to determine such parameters as flow rate and emitted medication dose. In the future, a special app (currently in conceptual design) will enable the patient to receive the measured data easily and directly on his smartphone. He can use it to adjust his inhalation behavior, improving inhaled medication effectiveness.

#### Commercial Opportunities

The described setup is suitable for various commonly used and already established capsule-based powder inhalers. Various medication formulations can also be used and the system calibrated to them with little effort. The system does not depend on further parameters, specifically acoustic influences, so it can be used anywhere.

#### Current Status

The system has been verified for various formulations and inhalers. A laboratory sample has been prepared and miniaturization planned. On behalf of the University of Bonn, we are offering the technology for cooperation projects and commercial licenses.

An invention from the University of Bonn.

#### Advantages

- Quick feedback
- Small setup implementable in the inhaler
- Easy patient use
- Increased therapy effectiveness
- No interfering parameters

#### Technology Readiness Level

1 2 3 4 5 6 7 8 9  
Technology validated in lab

#### Sector(s)

- Medical technology
- Pharmaceutical industry

#### Ref.-No.

6436



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