

SMART INHALERS.

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Introduction

The rise in air pollution levels has been a matter of rising concern in developed as well as developing economies. As per the World Health Organization (WHO, 2018), 9 out of 10 individuals are believed to breathe air containing high levels of pollutants. Studies reveal that, 90% and above of the air pollution-related deaths worldwide occur in low- and middle-income countries, especially in Asian and African countries.

Smart Inhalers

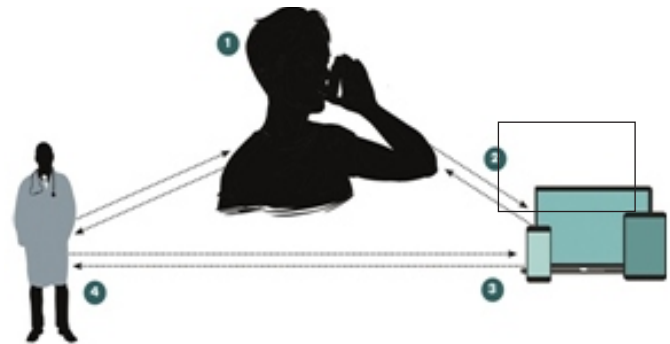
Smart inhalers are respiratory inhalers which can be connected to electronic devices to take the patients' health updates on daily basis especially for the people who have respiratory diseases like asthma or obstructive diseases. These inhalers have sensors which reminds us about the daily dosage of medication.

Smart inhalers contain sensors that attach to existing inhalers and record when the medication is taken by a patient. They are bluetooth - enabled, so it can be paired wirelessly with a smart device like a phone or tablet or with a computer to allow data to be transferred from the smart inhaler automatically.

Smart inhalers are inhalers that have extra digital features, they link to an application on the phone or tablet to help patients and treat physician to manage asthma better.

Smart inhalers use sensors and bluetooth technology to detect inhaler use, remind patients when to take their medication and gather data to help guide care.

1. Patients receive audio and visual reminders about inhaler use via the mobiles



2. The sensors in the smart inhalers record every time a patient uses their inhaler.
3. Informations are communicated to a mobile application or desktop computer, and are stored there.
4. Healthcare professionals can track inhaler use and provide patients with individualised feedback and instructions.

Smart inhalers are one of the examples of smart technology. Now patients, who are suffering from bronchospasm, can schedule their dosage and timings of medication. With the available technology, patients very much know about diseases which allow them to search anything from the website and get details easily. It is a multifunctional device which allows these devices to connect it. It has 3 main functions which are: (1) Inform the limit of daily dosage, (2) Amount of dosage left, and (3) The condition of patients health. As technology is getting smarter, it's getting useful in healthcare products too. However, people who are using different medications to control asthma, need to also provide permission for multi medications use.

Advantages of the devices are:

- Improved quality of life with better control of bronchospasm.



- Improves compliance with therapy.
- Increased patient involvement and motivation in controlling symptoms.
- Aids in informed decision-making for clinicians.
- Helps patients to have discussions with treating physicians.

All are of great importance in the use of a smart inhaler for the patient. Patient get motivated and empowered over their own care, while providing real-time based data for the health care professionals to improve outcomes in disease control.

Disadvantages of the devices are:

- Effectiveness of electronic devices needs to be questioned.
- Patients may not like being watched via the internet-based monitoring component.
- May interfere with usual inhalation technique or be incompatible with some spacers.
- An electronic monitoring device may be required for more than one inhaler per patient.
- Accuracy and reliability of the device, as well as potential technical issues, are not known.

A recent survey conducted by the COPD Foundation observed adoption of mobile application technology and overall digital behaviors of 291 patients. Individual patients shared information about

mobile use as well as their interest in smart inhaler technology. Survey found that:

- 58% of respondents used mobile applications on a regular basis, however nearly 70% were unfamiliar with smart inhaler technology.
- 66% would like a tool to help track medications.
- 71% would like information on the finger tips for living well with COPD included in a mobile application.

The demand for smart inhalers is anticipated to be significantly high in India due to the rising rate of respiratory illnesses, increasing pollutants and rise in the aging population. Limited awareness regarding the usage of smart inhalers is a common factor inhibiting extensive adoption of the device. With each inhalation with the inhaler, the device delivers a decided amount of medication to the lungs as per the pre set amount. Adapting incorrect inhaler technique, results in insufficient medication intake. This is possible to both metered-dose inhalers (MDIs) and dry powder inhalers (DPIs), which leads to poor disease control along with increased healthcare costs.

References

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