‘TRYING BUT FAILING’: MEDICATION DELIVERY VIA INHALERS
LET'S LEAVE NO ONE BEHIND

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Clinical Commentary Review

"Trying, But Failing" — The Role of Inhaler Technique and Mode of Delivery in Respiratory Medication Adherence

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WHAT AND WHY SDS?

- The Sustainable Development Goals
  - the blueprint to achieve a better and more sustainable future for all
  - address the global challenges
  - interconnect and in order to leave no one behind
- Each goal and target to be achieved by 2030
1 NO POVERTY

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

10 REDUCED INEQUALITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment...

3.8 Achieve universal health coverage, ... and access to safe, effective, quality and affordable essential medicines and vaccines for all

3.9B Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries.
MAJOR NON-COMMUNICABLE DISEASES IN WHO EUROPEAN REGION

- Cancer
- Cardiovascular Disease
- Respiratory Disease
- Diabetes
- Mental Health
- Obesity

Together they account for 86% of deaths and 77% of the disease burden within the region.
Global burden

In 2015

- Asthma most prevalent chronic respiratory disease worldwide - 358 million - COPD 174 million
- COPD deaths - 8 times more common than deaths from asthma
- 3.2 million died from COPD
- 0.4 million died from asthma

GBD study – The Lancet Respiratory 5 Sept 2017
3.15. Respiratory diseases mortality, 2015

Age-standardised rates per 100 000 population

Source: Eurostat Database.
ASTHMA REPORTED IN EUROPE 2014

Share of the population reporting they suffered from asthma, 2014 (%)

The figure is ranked on the share of the total population (both sexes combined) reporting that they suffer from asthma.
Source: Eurostat (online data code: hlth_ehis_cd1e)
**DISABILITY ADJUSTED LIFE YEAR (DALY)**

YLL contributed to more than 80% of DALY for COPD
Asthma fewer deaths – YLDs formed larger component of DALY – 60%

GBD study – The Lancet Respiratory 5:Sept 2017
ADDITIONAL BURDENS OF ASTHMA

- Increasing asthma prevalence in children
- Hospitalizations and deaths due to asthma
  - Unacceptable burden on HC system
- Impact on society – loss of productivity in the workplace
- Impact on children – days lost from school and impact on social life and development
- Disruption to family

GINA 2019
ADDITIONAL BURDENS OF COPD

- 3rd leading cause of death by 2020
- Increase visits to doctor, emergency department, hospitalizations
- Increased burden on healthcare system
- Significant morbidity
- Impact on other comorbidities
- Decline in autonomy, increase burden on family
- Decline in health status - Health Related Quality of Life
- Increase in costs of patient
ADDRESSING THE ISSUE

- Awareness
- Prevention
- Diagnosis
- Management
  – including inhaled therapy
KEY STAKEHOLDERS

- Scientists
- Pharmaceutical industry
- Healthcare systems
- Healthcare professionals: Doctors, nurses, pharmacists, respiratory therapists, physiotherapists, occupational therapists
- Patients
- Carers
DO WE NEED TO INNOVATE?

17 Partnership for the Goals

SDGs for a healthy social Europe: Time for partnership and innovation

Partnership for innovation
BASIC REQUIREMENT FOR INHALED THERAPY TO WORK

- Initiating prescribed therapy (assuming correct diagnosis and prescription)
- Implementing as prescribed- administering dose at prescribed dose, frequency
- Persisting with treatment

(Vrijens 2012)

Successful administration which requires patients to have the knowledge and ability to implement the appropriate inhaler technique
GENERAL CHALLENGES

- Plethora of different inhaler types/classes:
  - pMDIs, with or without spacers or valved holding chambers
  - BAIs, DPIs, soft mist inhalers
- Over 200 drug inhaler device combinations
- Each class requires a different approach to inhalation
  - Within each class, each device may have different requirements for inhalation
  - Depending on device special attention needs to be paid to: Coordination, breath control, inspiratory flow,
  - Challenges especially for the elderly and children
- Any one patient may be prescribed different types of devices

(Braido et al 2016)
INITIATION OF TREATMENT CHALLENGES

- 28% of new prescription for chronic disease in adults are never dispensed
- 25% of patients with new asthma diagnosis do not collect their first prescription

Why? Possibly:
- Denial of diagnosis
- Lack of awareness
- Lack of trust in healthcare professional
- Medication fears
- Affordability
- Access to therapy
- Psychosocial barriers including inhaler stigma

(Braido et al 2016)
IMPLEMENTATION AND PERSISTENCE CHALLENGES

- Inability to distinguish controller from reliever (REALISE Price et al 2015)
- Incorrect/inadequate inhaler technique:
  - Poor inhaler technique 14%-90% (review of 21 studies)
  - Multiple devices used by individual patient – higher prevalence of errors
- iHARP study – 5000 inhaler technique assessments in 8 countries – 90% errors across all devices

<table>
<thead>
<tr>
<th>Device</th>
<th>% Error</th>
</tr>
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<tbody>
<tr>
<td>Diskus</td>
<td>84%</td>
</tr>
<tr>
<td>Turbohaler</td>
<td>91%</td>
</tr>
<tr>
<td>pMDI</td>
<td>92%</td>
</tr>
<tr>
<td>pMDI + Spacer</td>
<td>91%</td>
</tr>
</tbody>
</table>
ADDITIONAL ISSUES

- **Inhaler device switching** (Rossi et al 2014, Hanada et al 2015)
  - Changing brands, generics
  - New/ multiple inhalers
- **Inhaler device mixing** (Price et al 2012)
  - Patients prescribed ≥2 maintenance inhaler devices
    - 34% less likely to be adherent
    - 40% rate of treatment discontinuation as compared to those on single inhaler
- **Dosing frequency**
  - The simpler the better (Price et al 2010, 2013)
IMPLICATIONS

- The worse the technique the worse the patient outcomes
- Higher satisfaction with inhaler better patient outcomes 
  (Price et al 2015, Chrystyn et al 2014)
- Better adherence & inhaler satisfaction – fewer exacerbations and hospitalizations 
  (Price et al 2015, Chrystyn et al 2014)
MITIGATING NEGATIVE EFFECTS

- Training
- Re training
- Ongoing education

- Following an initial educational intervention, review and reinforcement every 4-6 weeks (GINA 2019)
DO HEALTHCARE PROFESSIONALS KNOW HOW TO USE INHALERS?

- Between 39-85% of doctors, nurses and respiratory therapists were found to be unable to demonstrate the proper use of an inhaler (Plaza et al 2012, Hanania 1994, Fink 2005)

- Pharmacists ability is variable. After receiving specific training pharmacist interventions have been shown to have a positive impact (Cordina et al 2001, GINA 2019)
BARRIERS TO INSTRUCTING INHALER TECHNIQUE

- Prescriber/clinician:
  - If not competent – cannot teach properly
  - If competent – time constraints – initial education and review is highly time consuming
- Community pharmacists
  - Can engage with patient voluntarily (time constraints)
  - For intervention to be delivered as a standard service needs to be recognised by health service
ADDITIONAL BARRIERS TO INSTRUCTING INHALER TECHNIQUE

- Health professionals competency in communication skills and instruction skills is highly variable
- Health professionals ability to understand levels of health literacy and devise individualised intervention still needs further study
CONCLUSION

- New generation of devices:
  - Limit number of inhaler manoeuvres
  - Support successful administration through visual and auditory feedback systems (Braido et al 2016)

- Researchers:
  - Cognisant of the needs and issues that are faced by patients from the inception of the research process
  - Study and design products, are the least intrusive, have high patient acceptability, and pose the least possible burden on the individual
ARE WE LEAVING OUR PATIENTS NEEDING INHALERS BEHIND?
KEEP IT SIMPLE

THANK YOU