Identifying asthma that is truly refractory to treatment is not straightforward, according to Professor Peter Barnes. He outlined the continuing challenge of poor asthma control, bad inhaler technique and inadequate adherence. In severe asthma only 2% of patients used inhalers correctly, so truly refractory patients are probably a minor proportion of those who are apparently unresponsive to therapy. Poor inhaler technique is in part due to clinicians not checking technique when prescribing a new inhaler. Patients with critical errors in their technique are more likely to have lower disease control; as disease becomes more unstable, the patient’s technique often worsens further. The frequency of errors tends to be higher with dry powder inhalers compared with metered dose inhalers. If a patient uses more than one type of inhaler, their technique deteriorates with each one they use. Other factors associated with higher error frequency are older age, female gender, lower socioeconomic status and less education.

Technique can be improved by ensuring instruction and demonstration, incorporating feedback indicators in devices, using only one device, and having a standardised checklist for assessment of technique.

BRINGING NEW INHALER TECHNOLOGY TO THE CLINIC: RECENT ADVANCES AND FUTURE DEVELOPMENTS Professor Richard Costello | Royal College of Surgeons, Ireland

In his presentation, Professor Richard Costello described INCA technology, a device that compares the sounds made when a patient uses an inhaler with audio files of ideal technique, and alerts patients when suboptimal technique is detected. The device simultaneously collects data on how well the device is used, which can then be analysed in the clinic. A few case studies were presented of patients who have used this technology, suggesting that:

- Inhaler training needs to be repeated
- Many patients use their preventer inhaler irregularly and erratically
- Critical errors in inhaler handling occur frequently

Features that make an ‘ideal’ inhaler include ease of use, resistance to poor in technique and built-in feedback mechanisms. The Spiromax® inhaler was noted as a good example of an easy-to-use device. Overall, the inhaler should help the patient manage their condition and inhaler technology provides objective measures to help improve outcomes.

“Novel technologies will improve the value of our consultations, not replace them.”

Professor Richard Costello

There is no doubt that technological advances can help improve poor asthma control.”

Professor Peter Barnes

Full house at the 2017 ERS congress
Adherence in respiratory medicine is not merely a failure to take medicine but also its misuse, particularly the overuse of relievers and underuse of preventers. **Professor Robert Horne** explained that while it is possible to improve asthma patients’ adherence to medication, the number of effective interventions is limited, none of which is used in primary care.

For effective adherence support to work, intelligent information design is needed, driven by an understanding of the practical and perception-based barriers to adherence.

However, questioning patients about adherence can introduce ‘self-presentation bias’ where patients present a picture of themselves as adherent to please their doctors. In addition, clinicians often think their own patients are more adherent than they actually are, opening a route for more objective measures of adherence, such as smart inhalers. However, whilst the potential benefits are clear, caution was advised, as there can be a perception of a ‘Big Brother’ effect.

Overall, clinicians should avoid ‘blaming’ patients and remind them that non-adherence is the norm, not the exception. Professor Horne identified high-risk patients with low levels of adherence and poor control as the primary target for intervention, and proposed that a tailored 3-step Perceptions and Practicalities Approach (PAPA) can offer better value and more effective management of vulnerable patients.

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**COGNITIVE COMPUTING AND BIG DATA IN RESPIRATORY MEDICINE**

Dr Kyu Rhee | IBM Watson Health, New York

Technology has become a major contributor to health outcomes, according to **Dr Kyu Rhee**, who described the concept of augmented intelligence and its role in healthcare. A cognitive system can synthesise millions of data items, such as case records and clinical trial research, and unlike traditional programmed systems, cognitive systems become more ‘clever’ as they process more information. This could benefit not only doctors and patients, but also other parts of the healthcare system – such as payers, providers and policymakers. Combined with the experience and knowledge of the treating physician, cognitive systems can support an augmented intelligence approach to optimise health outcomes.

IBM Watson has paired up with Teva to advance asthma treatment. Data collected from smart inhalers will feed into Watson’s platform for health. These data will be added to existing data in the platform to allow for better patient stratification and determination of risk factors for exacerbations. The goal is to use this cognitive system to determine the likelihood of an exacerbation and alert the patient and caregiver. Such data collection systems, Dr Rhee said, are pivotal to overcoming the challenges in respiratory care discussed today.

> “Cognitive computing will transform healthcare on a global scale.”
> 
> Dr Kyu Rhee

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**LEARNINGS AT A GLANCE**

- **Poor disease control is directly related to poor outcomes – an ongoing issue in asthma**
- **Understanding practical and perceptual barriers to usage behaviour can help identify and manage vulnerable patients**
- **Inhaler technology can reveal actual adherence and enhance the consultation by improving HCP-patient interactions**
- **Cognitive systems may further improve outcomes via ‘augmented intelligence’, using a combination of machine learning and human experience and judgement**

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**PANEL DISCUSSION AND CONCLUSION**

Professor Richard Dekhuijzen (Radboud University Nijmegen, The Netherlands) led the panel discussion and fielded questions from the audience, from which several key conclusions emerged:

- Technology can support clinicians in overcoming the challenges of disease control in respiratory care
- Technological advances will inevitably transform disease management
- Notwithstanding the above, technology will never replace the physician, who remains integral in directing the best care for each patient