

# Understanding spirometry results: Global Lung Function Initiative

## A carer and healthcare professional perspective

### The healthcare professional's perspective: Diana

Diana Bilton is head of the Adult CF Unit at the Royal Brompton Hospital, London

I work with CF patients and it has always been very important for me to ensure I am effectively explaining the significance and importance of spirometry results to patients. This is particularly important for explaining the success or failure of treatment, so that patients and carers can understand how we make decisions about their treatment and for what reasons.

I find that my patients are particularly concerned with how their results compare to normal. To help them understand this, I like to explain that their forced expiratory volume in 1 second (FEV<sub>1</sub>) refers to how much they are able to blow out during the first second of the test. I then explain that if we took 100 people of the same age, height and sex and take the average score, we can look at a comparison with a statistically average person, or a "normal measurement".

I work with a lot of teenagers who are coming through the transition phase from paediatric care to adult care. This change is very unsettling and it takes a lot of time to help our patients feel comfortable and relaxed with a different form of care.

With the spirometry equations used before the introduction of the GLI, the hardest part of this transition was patients seeing a drop

in the percentage predicted results of the spirometry test. This could happen in the space of a month, without the patient seeing any change in the absolute value in millilitres of FEV<sub>1</sub>.

This would be the last thing a patient needed at a time of turmoil and often created a situation where we had to try to build their confidence and explain that the results did not reflect a change for the worse in their health. This could then lead to questions regarding the effectiveness of the equipment or the reliability of the score. This uncertainty created extra problems for both professionals and patients.

The previous equations could also lead to other errors. For example, patients with CF may have a growth spurt later in adolescence or early adulthood than healthy individuals and this was not accounted for in the equations. Some of the old equations also did not recognise ethnicity, leading to inaccurate results for someone of a different ethnic background to the equations used.

The introduction of the GLI has been welcomed by me and my colleagues. It has ensured that spirometry test measurements are consistent from childhood into adulthood, without a step change.

It has also made interpreting a test a lot easier. Previously, each spirometry device could contain at least nine different sets of equations, requiring the user to select the correct set, often in a time-pressured situation. In future, if all devices are pre-set with the new GLI equations, which cover the entire age range, there will be



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much less room for error as no selection will be required. This has streamlined the process and given us confidence that we are providing an accurate and specific result to each patient.

Patients have also seen benefits in the changes. The equations make it easier to provide the context, resulting in an increase in understanding from the patient's perspective. In comparison, most people understand their blood pressure score and what this means for their health, but we are not there yet with spirometry. I believe the introduction of the new equations will change this and lead to an increase in people understanding how much change is significant and what this means for them.

There is a huge job to be done with educating healthcare professionals about the new equations but the benefits it can bring are invaluable.

## A carer's perspective: Marian

Marian is a parent of two children with cystic fibrosis

I have two children with cystic fibrosis (CF) and spirometry tests are therefore a regular feature in our lives.

How spirometry figures are calculated was never explained to us in detail and I never really saw the need to understand the method. Over time you learn the importance of the score and you begin to see the significance in the results the children achieve.

I learnt that the spirometry result along with other symptoms was used as an indicator of greater exacerbation risk or an improvement following new treatment.

When my eldest child switched from paediatric to adult care, we were told about the change in spirometry scores from percentage results to litres. There was such a huge amount of cultural change at this time in the visits to a new clinic and the differences in the way treatment was now being presented, that the details of the spirometry results did not feature highly in our thought process at this time.

It was only fairly recently that I began to understand more about the results when I heard a presentation about the Global Lung Function Initiative (GLI) and how this was changing the interpretation of spirometry measurements.

After this presentation, I had a new understanding of the variability of the human body and lung capacity. What was normal for

one person was not for another. The usual measurements of height and weight were misleading as they do not also consider factors such as length of the legs or size of the torso and ethnicity.

When you are new to a medical field, as I was when my children started receiving treatment for CF, you are naïve and often believe that every person with CF is similar. It was a shock to me to realise the great range of variables that exist between each person and how these can affect a spirometry score.

Now, when we looked at spirometry results, they suddenly became more relevant and personalised to my children. It is immensely important that these measures apply to all ages. It has provided a level playing field so that people everywhere can have comparable and relevant results.

When you are caring for a child with a long-term illness, it is so important that things remain constant. Previously, an adolescent could see their level of lung function apparently decrease dramatically when their care is transferred to an adult clinic, due to differences in the way the results were calculated. The new equations mean that there is consistency between this now, which can provide much-needed peace of mind when a child is already going through a huge change in the way their treatment is presented to them.

I was genuinely very excited when I learnt more about the new equations. We now have a consistent method, used across all ages, countries, clinics and centres so that there are no setbacks and no bad decision-making as a result of comparing apples with pears. If the GLI can become standard across all services and centres, it would have a hugely positive impact for all patients who have to undertake regular spirometry tests.

There are still improvements to be made. At the moment, people being considered for a lung transplant have their spirometry score considered to see if they are eligible. This score is different in the old equations compared to the new equations, an inconsistency that can make the difference between going on the transplant list or not.

These GLI changes have had a huge impact on my children. It is bad enough that they are feeling ill all the time and have to cope with a daily intensive treatment regime, without the management of their condition being confusing. Anything to make interpretation of the progression of their condition easier is a huge benefit.