

# Why is In-Check DIAL changing?



## The first inspiratory flow meter for inhaler training

In-Check DIAL was the first inspiratory flow meter to be used to assess inspiratory flow as part of inhaler technique. Since it was introduced, over ten years ago, there have been numerous studies published into its use and it has contributed to an increased interest in the subject of inspiratory flow in inhaler use.

With the new knowledge generated through this increased interest it is no longer necessary or appropriate to rely on in-vitro studies. In fact in-vitro studies are now regarded as only appropriate for regulatory purposes in demonstrating uniformity of a product. They do not reflect clinical use of inhalers very well. Therefore In-Check has been revised to reflect the information that is available from published clinical studies.

## The new scale

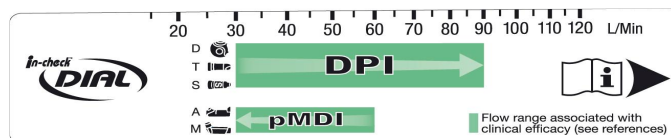
The previous scale on In-Check DIAL was labeled as optimal inspiratory flow range and now it is labeled as clinically effective flow range.

**In-Check DIAL now refers to the flow ranges that have been shown to be clinically effective**

As there are some inhalers that are used with different formulations and even combinations of medicines, it is no longer possible to be categorical that a particular inhaler has optimal efficiency across a certain range. Indeed in-vitro studies have shown that even in the same inhaler different formulations have peak delivery at different flow rates <sup>(1)</sup> and that individual components of certain combinations may behave differently at different flow rates <sup>(2)</sup>. While these differences are noticeable in in-vitro analysis, when it comes to clinical efficacy they are not apparent. Therefore In-Check DIAL now refers to the flow ranges that have been shown to be clinically effective through published clinical studies. User feedback has revealed that this information is what the majority of users expect from In-Check

Good inhaler use depends on inspiratory flow in an important way. For good drug delivery, dry powder inhalers (DPI) depend particularly on the adequacy of the flows generated at the start of inhalation, whereas pressurized metered dose inhalers (pMDI) depend on not exceeding a certain flow rate.

## New Scale - more clinically relevant



All of the inhalers depend, to an extent, on duration of inhalation for good delivery. In-Check DIAL measures the peak inspiratory flow (PIF) rate, but it does not measure the flows at the start of inhalation or the duration of inhalation. Despite the fact that the In-Check DIAL does not measure the early flow rate, if the healthcare professional (HCP) pays good attention to the start of inhalation and can recognise a good effort, then In-Check is still useful for coaching DPI inhalation technique.

With good technique, when a PIF within a certain range is achieved it implies that there would have been adequacy of flow at the start of breath for efficient DPI delivery. If the start of inhalation is slow this means that the dry powders are exposed to low energy flow and will not de-aggregate efficiently. An inhalation with a slow start and a strong finish could still produce a high PIF, so the observation of the HCP during patient inhalation, and the appropriate technique for the particular device, are very important. For this reason the In-Check DIAL now include a reminder of appropriate technique alongside each inhaler icon on the accompanying laminated information card.

## References:

1. Measuring charge and mass distributions in dry powder inhalers using the electrical Next Generation Impactor (eNGI). Hoe S, Traini D, Chan HK, Young PM. Eur J Pharm Sci. 2009 Sep 10;38(2):88-94.
2. The influence of flow rate on the aerosol deposition profile and electrostatic charge of single and combination metered dose inhalers. Susan Hoe; Daniela Traini; Hak-Kim Chan; Paul M Young. Pharmaceutical Research – December 2009 (Vol. 26, Issue 12, Pages 2639-2646)

In-Check DIAL		Clinically Effective Flow Range											
Inhaler	L/Min	20	30	40	50	60	70	80	90	100	110	120	
Accuhaler/ Diskus	D Steady & Deep												Ref: 1, 2
Turbobhaler	T Forceful & Deep												Ref: 3, 4, 5, 6, 7, 8
Turbobhaler (combination)	S Forceful & Deep												Ref: 2, 8
Autohaler	A Slow & Deep												Ref: 9
Conventional pMDI	M Slow & Deep												Ref: 10

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