

MAKING TECHNOLOGY WORK

The mantra 'making technology work' is central to our business philosophy, and over the last four years we have been doing exactly that for our client Chiesi Farmaceutici. Chiesi approached Cambridge Consultants needing a next generation multi-dose dry powder inhaler (DPI) to deliver their own innovative drug formulation to the lung.

Usually, when a new product is considered, the first thing that is thought of is the functional performance, but with Chiesi's inhaler we took a different approach. We assumed that the functional performance would be met, and made the interaction between the device and the user the priority. The logic behind this was simple. If an inhaler is easy to use, it is likely to be more effective for the patient, as it will be used correctly. If it is more effective for the patient, then it is more likely to be prescribed by doctors and nurses, which in turn will make more money for our client.

To achieve ease of use and ensure that the inhaler is used by the patient correctly, as well as delivering the drug to relieve the patient's symptoms, four design activities were undertaken:

- 1 understanding the users and their requirements by both carrying out background research and speaking to healthcare professionals
- 2 analysing the users' needs to understand any key issues and then identifying technologies to address each of them
- 3 creating concepts that addressed the key issues
- 4 and finally showing the design concepts to both patient and physician focus groups across Europe, and using that feedback to select and refine the best concept.

From the results of this work, it was concluded that in order to maximise usability, the operating sequence should be as simple as possible, and that the release of the drug and the counting of each dose should be breath-actuated (released automatically when the patient breathes in) to give accurate feedback on the number of doses taken. This would give the user greater confidence in the device and reassurance about how many doses were remaining. These attributes were integrated into a design layout with enabling technologies to ensure product performance, including dose counting to guarantee that doses are consistently and reliably given to the patient, environmental protection to protect the powder against moisture which would affect its performance, and drug de-aggregation which breaks the powder up so that it can be effectively inhaled and go deep into the lungs.



After four years of design, analysis, engineering, prototyping and testing, the product consistently achieves class-leading drug delivery performance and has successfully completed pharmacokinetic clinical studies. The NEXT™ device, currently being ramped up for manufacture, has also finished extensive user-group research, where both doctors and patients reacted positively to the DPI's features and its discreet and robust, yet modern, style. Due for launch by the end of 2007, the device looks set to capture significant market share as it harnesses cutting-edge technology to deliver the critical benefits required by the two most critical and important segments – healthcare professionals and patients alike.

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