

# Web-based inhalation training

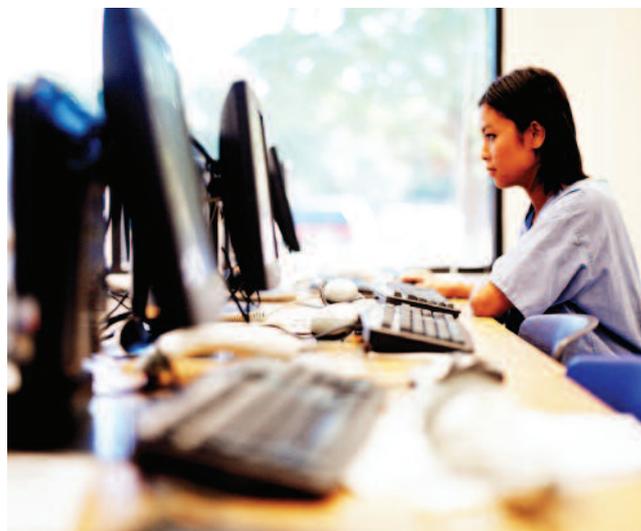
*Convenient, high-quality, no-cost training in respiratory drug delivery that helps companies meet GMP training documentation requirements is available online*

Recognizing a need for timely, low-cost basic training in inhaled drug delivery, RDD Online decided recently to develop a series of unbiased, modular, web-based training presentations. While many universities and healthcare providers are using the modules, the online training may prove particularly helpful for pharmaceutical companies that need to meet regulatory requirements to assess and document employee training. According to Joanne Peart of RDD Online, over 1,000 individuals worldwide have completed some or all of the 4 modules currently available, and at least 4 more modules are planned.

## **The need for web-based training**

All of the different types of organizations involved in the areas of pulmonary and nasal drug delivery—pharmaceutical companies, contract research organizations (CROs), regulatory agencies who oversee drug product approvals, and vendors of equipment and materials—have something in common: they have a need for well informed and highly trained scientists, clinicians, and managers.

Since only a small percentage of universities offer graduate training programs in aerosol drug delivery, laboratory scientists and managers new to the field, as well as recent graduates or new hires, need accessible, specialized training so they can become knowledgeable and productive as quickly as possible. Pharmaceutical companies and other organizations may offer their own scientific and good manufacturing practice (GMP) training to their employees.



However, small companies may not have the resources to conduct formalized training in-house, and companies entering into the inhalation or nasal drug delivery market for the first time may not have employees qualified to act as trainers.

Scientists working in the area of pulmonary drug delivery have long relied on RDD Online for continuing education. RDD was founded in 1988 to advance knowledge in the field of respiratory drug delivery through a series of biennial meetings that quickly became a major venue for obtaining state-of-the-art science in the areas of pulmonary and nasal drug delivery. Since 2005, the meetings have been held annually, alternating between the US and Europe.

The RDD conferences provide an opportunity for scientists to learn about novel techniques as well as trends in regulation and treatment. Conferences such as those presented by RDD, however, generally presuppose a certain level of knowledge of the field on the part of participants, with talks and posters addressing advanced concepts. Furthermore, the meetings occur only once a year, have room for only a limited number of attendees, and may require potentially costly travel.

Scientists wanting to learn the basics of the field in a hurry can always turn to books, of course, and RDD

## Currently available RDD online training modules and their learning objectives:

### **Background issues in pulmonary delivery**

- Drugs administered by the inhaled route for both local and systemic delivery
- History of pulmonary drug delivery
- Basic anatomy and physiology of the respiratory tract
- Simple lung function testing
- Advantages and limitations of the pulmonary route
- Introduction to inhaler devices

### **Pressurized metered dose inhalers**

- How pressurized metered dose inhalers (pMDIs) function and the role of each formulation and hardware component
- What issues are important in chlorofluorocarbon propellant replacement and the benefits of newer hydrofluoroalkane formulations
- Correct and incorrect pressurized inhaler use and optimal inhalation technique

- Advantages and disadvantages of pMDIs

### **Additional technologies for pressurized metered dose inhalers**

- The potential benefits, limitations, and mode of operation of breath-actuated and breath-coordinated pressurized devices used in association with pressurized metered dose inhalers (pMDIs)
- The potential benefits, limitations, and mode of operation of velocity modifying devices used in association with pressurized metered dose inhalers (pMDIs)
- The potential benefits, limitations, and mode of operation of add-on devices including tube spacers, holding chambers, reverse flow devices used in association with pressurized metered dose inhalers (pMDIs)
- The range of inhalation techniques that are required to

successfully utilize each class of add-on device

- The influence of electrostatic charge effects and washing processes on spacer performance
- Advantages and disadvantages of additional technologies used with pMDIs

### **Dry powder inhalers**

- The different categories of dry powder inhalers, e.g. unit dose, multiple unit dose, multidose, passive, and active devices
- Device and formulation factors that influence the performance of DPIs
- Pulmonary deposition from DPIs and the importance of device resistance and inhaled flow rate on their efficiency
- Correct use of DPIs and common handling errors
- Advantages and disadvantages of DPIs

recently published a new book by Stephen Newman titled *Respiratory Drug Delivery: Essential Theory and Practice*. While this book can serve as a stand-alone introduction to the issues surrounding inhalation products, readers may find RDD Online's companion series of web-based presentations a useful complement to the book.

### **RDD's online training opportunities**

As early as 2003, RDD Online ([www.rddonline.com](http://www.rddonline.com)) began offering online presentations based on sessions held at its meetings. In 2008, the organization also began to add training modules developed by Steve Newman that complement his book.

With Steve Newman presenting the training materials, companies can feel assured that their employees are receiving training from a recognized authority on inhaled medications. Dr. Newman, who has pub-

lished more than 220 research papers, book chapters, and invited articles, serves on the editorial boards of the *Journal of Aerosol Medicine* and *Expert Opinion in Drug Delivery*. He is also a recipient of the Thomas T. Mercer award, presented by the American Association of Aerosol Research in conjunction with the International Society for Aerosols in Medicine for "excellence in pharmaceutical aerosols and inhalable materials."

Thanks to corporate sponsors such as Philips Respironics, Valois Pharma, and Vectura, the learning modules, in the form of multimedia presentations comprised of slides and voiceovers, are available free of charge, 24 hours a day, 7 days a week, to anyone with an internet-enabled multimedia PC. Currently available modules include:

- Background issues in pulmonary delivery
- Pressurized metered dose inhalers

- Additional technologies for metered dose inhalers
- Dry powder inhalers.

Anyone who wishes to review the modules can view each 30-60 minute presentation at his or her own pace in one sitting or in segments over several days. Viewers have the opportunity to repeat or review slides as desired.

Once individuals feel that they have mastered the learning objectives specified at the beginning of each presentation, they have the opportunity to test their understanding of the material by attempting to answer a series of questions chosen randomly from a question bank. Companies using the presentations as part of formal training programs may require that the employee complete the electronic quiz at the end of each module under supervision in order to provide verification of the trainee's identity.

If individuals score more than 80%, they can print certificates documenting successful completion of the modules that can be maintained in their training files.

### **Other RDD resources online**

RDD Online also offers a series of online presentations, some of which are instructional and some of which consist of recordings from selected sessions from recent RDD meetings that focus on controversial topics of intense interest to companies developing inhalation products worldwide. Current instructional offerings include a free 15-minute "Introduction to inhaled aerosols" and a 2-hour pay per view presentation on "Selection and validation of cascade impactor methods."

Presentations recorded at past RDD meetings generally feature talks by expert speakers followed by moderated Q&A sessions in which the panel addresses questions posed by the audience. The available presentations include "Quality by Design (QbD): What type of *in vitro*-*in vivo* correlations are feasible?" and "Can we move toward harmonized requirements for bioequivalence of inhalers?" These audio recordings augmented with slides represent excellent starting points for companies wrestling with difficult commercial decisions who need to learn about these issues.

RDD plans to continue adding presentations covering a wide range of technical subjects covering all aspects of pulmonary/nasal drug delivery and is accepting proposals for topics and for sponsorship.

*Inhalation*