U.S. FOOD & DRUG ADMINISTRATION

Public Workshop: New Insights for Product Development and Bioequivalence Assessments of Generic Orally Inhaled and Nasal Drug Products (OINDPs)

January 09, 2018

Session 3: Realistic Models for Prediction of Regional Drug Deposition from Orally Inhaled and Nasal Drug Products (OINDPs)

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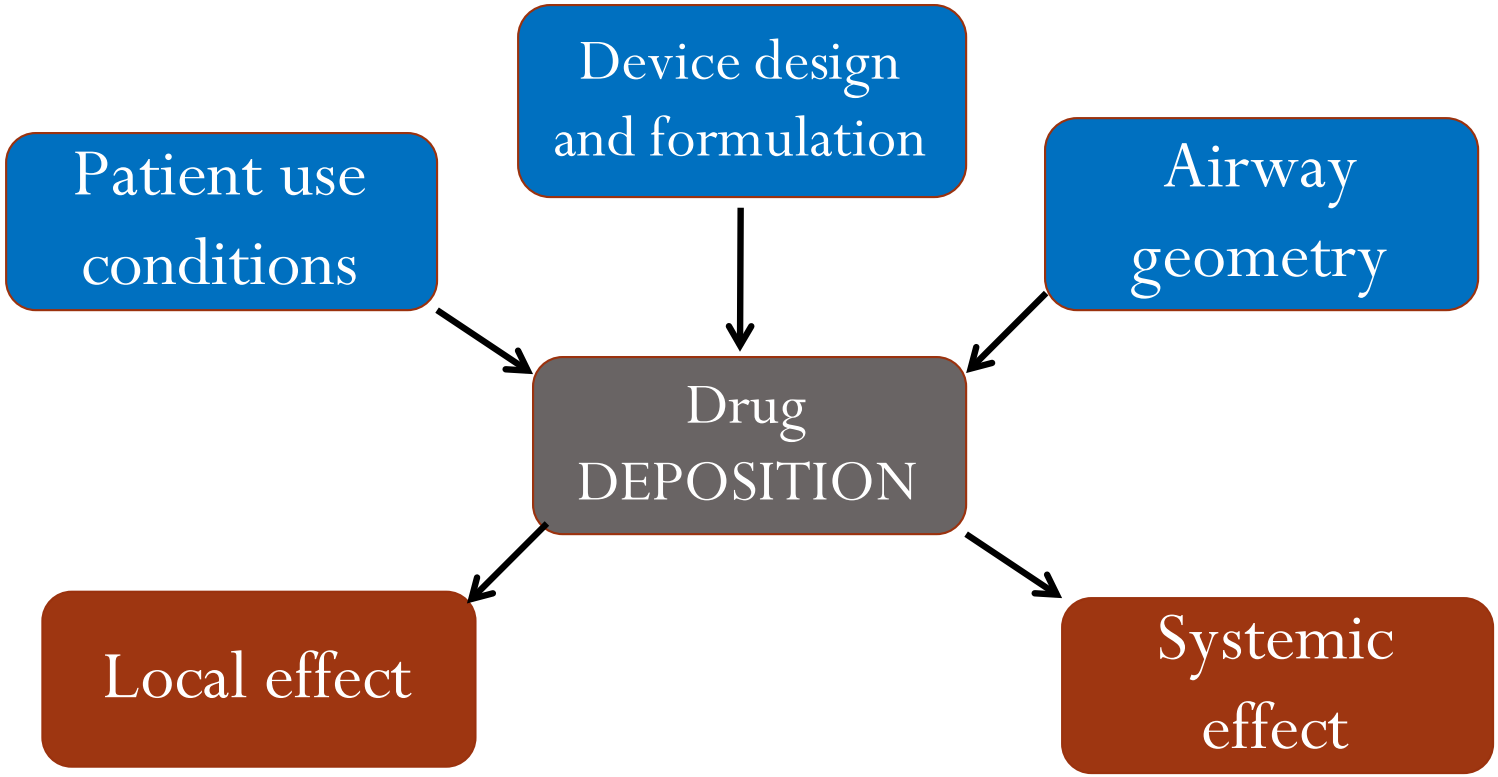
Focus of the Session

- Realistic models for predicting drug deposition from OINDPs
  - Ways to capture critical physiological variables using in vitro models
  - Validation/in vivo predictability of the realistic models
  - Application/case examples
  - Current limitations and future direction

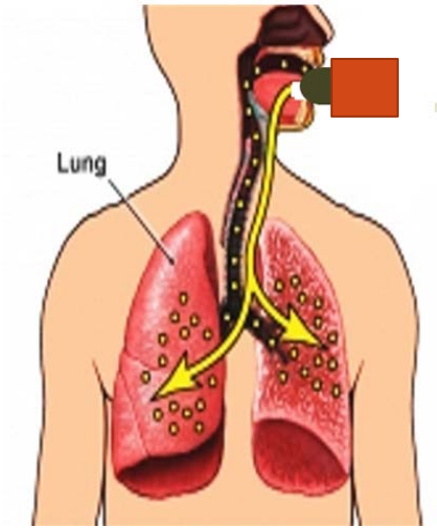
Presentation 1: Clinically Relevant In Vitro Testing of Oral Inhalation Products Using Realistic Mouth-Throat Models – Peter Byron, PhD (Virginia Commonwealth University)

Presentation 2- Comparing Nasal Suspension Products Using Realistic In Vitro Test Methods – Michael Hindle, PhD (Virginia Commonwealth University)

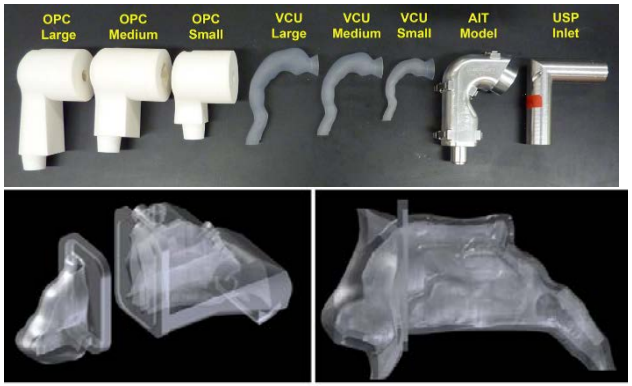
Factors influencing performance of OINDPs



Realistic in vitro method: Concept



http://images.lifescript.com/images/ebsco/images/inhaled_poison.jpg



Representative Physical models

Patient use conditions
- Inhalation profiles
- Orientation of use
- Actuation force
- Other parameters

In vivo deposition predicted by *in vitro* method

Why do we need realistic in vitro tests for OIDNPs?

- Gamma scintigraphy is not currently cost-effective and requires formulation modification for radio-labeling.
- Current in vitro methods are designed for quality control purpose and may have limited predictability of drug deposition in vivo because they do not adequately mimic
  - airway geometry
  - actual use conditions (breathing/inhalation profile, orientation etc)
- Realistic in vitro methods that could predict in vivo drug deposition variation from OINDPs would potentially be excellent product development tools and may be helpful in BE determination.

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