CENTER FOR DRUG EVALUATION AND RESEARCH

What's New in Regulatory Science

Issue III- 2023

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Brought to you by the Office of Translational Sciences (OTS) in collaboration with the Office of Communications within the Center for Drug Evaluation and Research (CDER)

What's New in Regulatory Science is a quarterly newsletter from the Food and Drug Administration's (FDA's) Center for Drug Evaluation and Research (CDER). It features new developments, opportunities, and initiatives in drug development and regulatory science, with the goal of advancing medical product development.

Please share this message and the sign-up link with colleagues (select regulatory science as the topic area). If you have comments or questions, please contact us at OTSCommunications@fda.hhs.gov.

September 12, 2023: FDA posts a report on the impact of GDUFA-funded science and research projects for fiscal year 2022 (FY22)

FDA posted its report on the extent to which GDUFA-funded science and research projects conducted in fiscal year 2022 (FY22) supported:

- development of generic drug products,
- generation of evidence needed to support efficient review and timely approval of abbreviated new drug applications,
- and evaluation of generic drug equivalence.

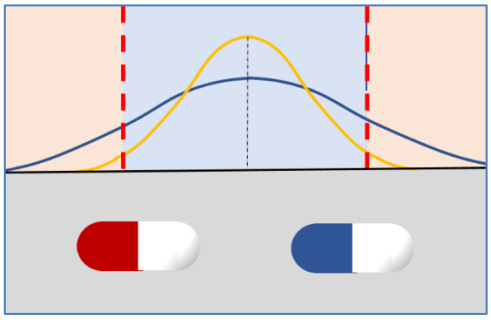
FY22 metrics for each of the three categories are provided within summary tables in the Research Outcomes Report. Separate reports for previous years, also listed on the webpage, include more details about the research outcomes in each category, including lists of publications, presentations, and posters; links to product-specific guidances; and information about workshops at which scientific advancements and regulatory advice were communicated to the generic drug industry. Learn more.

November 1, 2023: FDA released a CDER From Our Perspective article titled, "FDA's 50 Years of Experience with Cannabis Research Helping to Support Tomorrow's Cannabis Drug Development"

In the article, FDA presents a breakdown of cannabis and cannabis-derived product (CCDP) applications the agency has received over the past 50 years, summarizes our experiences and challenges in reviewing CCDP research applications, and provides recommendations and resources for those interested in studying CCDPs in human clinical trials. Learn more.

REGULATORY SCIENCE IMPACT STORIES

An adaptive trial design for bioequivalence trials of highly variable drugs



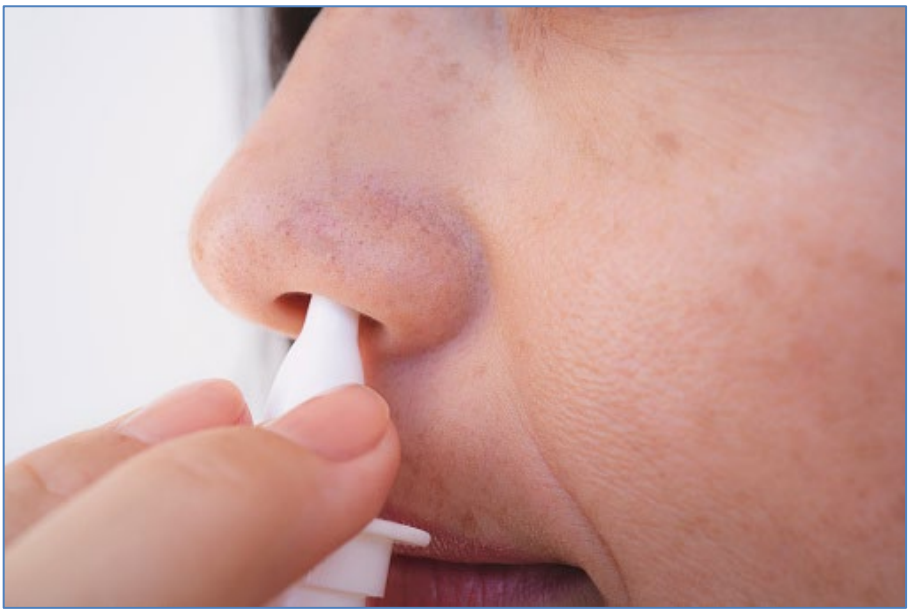
FDA statisticians and collaborators have developed an adaptive trial design for determining the bioequivalence of generics for highly variable drugs (i.e., drugs which show high within-subject variability in pharmacokinetic parameters) by using computational methods to study the trial's performance. Simulations reveal the potential of this design to help ensure that trials are adequately powered without involving excessive numbers of patients. The software to assess this design has been made freely available. Learn more.

In vitro dissolution studies and PBPK modeling to support BE in children

Pediatricians often face the dilemma of whether to prescribe a drug for their patients with only limited evidence on its effects and proper dosage in the patients they treat. CDER and their collaborators used biorelevant in vitro methods to investigate differences in the dissolution of generic tablets of the anticonvulsant carbamazepine in adults and children. The investigation showed that integration of their dissolution study data into a pharmacokinetic model could predict the PK profile of a poorly soluble drug in children. This work underscores the potential of such model-informed approaches for assessing relative bioavailability and bioequivalence of drugs in support of pediatric drug development. Learn more.

SPOTLIGHT ON CDER SCIENCE

Computational Simulations Shed Light on Factors Affecting Nasal Spray Distribution



In a series of recently published simulations, researchers in CDER and external collaborators studied how different factors may affect corticosteroid nasal deposition (where the drug particles land in the nose) and, relatedly, nasal distribution (where the drug particles ultimately 'reside'). This information can be used to predict local and systemic concentrations. For these simulations, the researchers examined three groups of factors — spray characteristics, human factors, and nasal anatomy — to better understand how these three groups of factors affect drug delivery for generic nasal drugs. To conduct the simulations, the researchers created three-dimensional reconstructions of the nasal cavity (inside of the nose) from computed tomography scans of one healthy person and one patient with allergic rhinitis. Learn more.

IN PRESS

This section provides highlights of select CDER research recently published in scientific journals.

Opioid Overdose: Limitations in Naloxone Reversal of Respiratory Depression and Prevention of Cardiac Arrest

CDER scientists review the pharmacology of naloxone and its safety and limitations in reversing opioid-induced respiratory depression, including its ability to prevent cardiac arrest. The effectiveness of naloxone, particularly after opioid overdose, varies depending on the pharmacokinetics of the overdosed drug and its interaction with the opioid receptor. Learn more.

The Mannose in the Mirror: A Reflection on the Pharmacokinetic Impact of High Mannose Glycans of Monoclonal Antibodies in Biosimilar Development

CDER researchers report on their study of the reliability of analytical methods as used by applicants to detect high mannose glycans in monoclonal antibodies and how these methods can help ensure the quality of biosimilars. Learn more.

Computational Model of In Vivo Corneal Pharmacokinetics and Pharmacodynamics of Topically Administered Ophthalmic Drug Products

CDER researchers describe a high-fidelity computational model of the anterior eye for predicting the pharmacokinetics and pharmaco-dynamics of topically administered ophthalmic drug products. Learn more.

Reproducibility of drug-induced effects on the contractility of an engineered heart tissue derived from human pluripotent stem cells

CDER scientists report on the reproducibility of drug-induced effects in engineered heart tissues (EHTs), which are three-dimensional culture platforms containing cardiomyocytes differentiated from human pluripotent stem cells (hPSCs). The EHTs studied were made with different tissue casting batches and different lines of differentiated cardiomyocytes and analyzed at various times after fabrication. Learn more.

The expanding universe of NUTM1 fusions in pediatric cancer

To inform discussions about how to design treatment modalities, CDER authors reviewed recent discoveries of nuclear protein in testis midline carcinoma family member 1 (NUTM1) fusions in pediatric cancers, including their prognostic value and their emergence as novel drivers of oncogenesis. Although NUTM1 fusions are considered relevant targets in pediatric cancer, multiple challenges and questions remain to be addressed, including how to better identify them and their specific role in oncogenesis. Learn more.

CDER- RESEARCH AREAS, TOOLS AND TRAININGS

FDA's Regulatory Science

Regulatory Science is the science of developing new tools, standards, and approaches to assess the safety, efficacy, quality, and performance of all FDA-regulated products. Learn more at https://www.fda.gov/science-research/science-and-research-special-topics/advancing-regulatory-science and Researching FDA – YouTube.

FDA: Overview of our Role Regulating and Approving Drugs | Video Series

FDA oversees prescription, generic, biosimilars, and over-the-counter drugs. Learn more at Overview of our role regulating and approving drugs | Video series | FDA

CDER's Regulatory Science Program Areas

CDER's diverse research programs address a wide variety of critical areas that affect drug safety and manufacturing quality. Learn more at https://www.fda.gov/drugs/science-and-research-drugs/cders-regulatory-science-program-areas.

Research Tools and Resources

Developing and sharing knowledge and scientific resources with researchers in the public and private sectors is at the heart of what CDER scientists do. Learn more about scientific tools and resources at CDER/FDA at https://www.fda.gov/drugs/science-and-research-drugs/research-tools-and-resources.

Office of New Drugs- Regulatory Science Research

The Office of New Drugs (OND)-led regulatory science research projects are designed to address knowledge gaps identified during regulatory review of investigational or new drug applications. Learn more about these research programs at https://www.fda.gov/about-fda/center-drug-evaluation-and-research-cder/office-new-drugs-regulatory-science-research.

Office of Generic Drugs- Science and Research

The Office of Research and Standards within the FDA's Office of Generic Drugs (OGD) supports the Science and Research program established under the Generic Drug User Fee Amendments (GDUFA). In collaboration with industry and the public, FDA creates an annual list of its regulatory science initiatives on generic drugs. Learn more at https://www.fda.gov/drugs/generic-drugs/science-research.

CDER- Training and Education

Information on learning opportunities for healthcare professionals, researchers in industry and academia, students, and consumers can be accessed at https://www.fda.gov/Training/ForHealthProfessionals/default.htm.

UPCOMING EVENTS

Information on upcoming meetings, conferences, and workshops sponsored or co-sponsored by CDER, click here. Some of the events are listed below:

- **January 23-24, 2024: Advancing Drug Development for the Prevention of Preterm Birth**
  This meeting is jointly sponsored by FDA and Duke Margolis Center for Health Policy. The meeting will bring together stakeholders to help generate ideas and discussion related to overcoming the challenges of developing and studying products to prevent preterm birth. Learn more

- **March 5, 2024: Advancing the Use of Complex Innovative Designs in Clinical Trials: From Pilot to Practice**
  The purpose of this public workshop is to facilitate discussion on the use of external data sources, Bayesian statistical methods, and simulations in complex innovative trial designs as well as trial implementation. Learn more

- **March 19-20, 2024: Enhancing Adoption of Innovative Clinical Trial Approaches**
  The U.S. Food and Drug Administration and the Duke-Margolis Center for Health Policy will convene a hybrid public workshop on March 19 and 20, 2024, to discuss efforts to advance innovation of clinical trial design and conduct. Learn more

CAREER OPPORTUNITIES

You want to make a difference.

FDA wants to hire You.

Scientific Internships and Fellowships

Whether you're an undergraduate looking to pursue a career in science, a graduate student seeking experience in regulatory science, a postgraduate looking for fellowship opportunities, or a senior scientist pursuing research experience in your field of expertise, FDA offers you many paths to learning about the exciting field of regulatory science. Click here for more information.

FDA-NCATS Translational Science Interagency Fellowship (TSIF)- Submission deadline January 15, 2024

The Translational Science Interagency Fellowship (TSIF) program is jointly sponsored by NCATS and the U.S. Food and Drug Administration (FDA) and aims to provide training in both translational science and regulatory science. The application cycle starts on November 13, 2023. Submit your applications by **January 15, 2024**. Click here for more information.

Employment Opportunities

FDA continues to recruit and retain a world-class workforce dedicated to protecting and promoting public health. Information on job vacancies, employment events, and hiring programs can be found by following @FDAJobs on Twitter and by visiting FDA's LinkedIn page, Jobs at CDER, or the Career Opportunities at CDER webpage. In addition, you can contact OTS directly at CDEROTSHires@fda.hhs.gov. Help us spread the news through your social media networks!