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Advancing Generic Drug Development (AGDD) – Webinar

Developing Pediatric Formulation (Regulatory Considerations)

Developing Pediatric Formulation

Overview

- Definition of Pediatric Population
- Quality Target Product Profile (QTPP)
- Product Quality Attributes/Target Product Profile
- Meeting End User Expectations
- Conclusion

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Definition of Pediatric Population

- **Federal Food, Drug, and Cosmetic Act (FD&C Act) defines pediatric patients as persons aged 21 or younger at the time of their diagnosis or treatment. Pediatric subpopulations are further categorized as follows:**
- **Neonates - from birth through the first 28 days of life.**
- **Infants - 29 days to less than 2 years.**

Dose and Administration

- **Intended Population**
- **Route of Administration – Product formulation impact on pediatric population compliance based on how the product is administered**

Quality Target Product Profile (QTPP)

Product Attributes set by RLD

- Active Ingredient
- Route of Administration
- Dosage Form
- Strength
- Condition of Use

Target Product Profile

- Product Design
- Manufacturing Process
- Quality Attributes for Patient compliance

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Target Product Profile

- **ICH Q8(R1) definition:**
  - "***A target product profile is a prospective and dynamic summary of the quality characteristics of a drug product that ideally will be achieved to ensure that the desired quality, and hence the safety and efficacy, of a drug product is realized. The target product profile forms the basis of design for the development of the product.***"

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Target Product Profile

- **Product profile for pediatric population may differ from the other population within the same RLD/NDA.**
  - **Drug Product physical aspect may differ for pediatric population**
  - **Product administration**
    - **Critical for pediatric population compliance based on how the product is administered**

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Target Product Profile

Product Design

- Drug substance properties (physical and chemical)
- Excipient selection to meet palatability expectation
  - Provide intended function of excipient
- Impact of excipient on manufacturability and meeting the dose administration goal
- Formulation and Process selection to meet product stability and enhance palatability

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Product Quality Attributes

Product Design

- **Capture key Product Design and prior knowledge in product development report**
  - **Describe product design and explain its strategic impact in meeting clinical outcome**
  - **Identify risk to quality and/or performance by variation in supply chain and/or process**
- **Discuss elements essential for patient compliance**
  - **Design strategy to address palatability and taste in selection of final formulation in product development.**
- **Product design aspect to cover in-depth**
  - **Applicability of guidances in addressing pediatric population.**
  - **Impact of formulation on product use recommendation**
  - **Palatability/Taste**
  - **Swallowability – SODF**
  - **Risk Assessment and Mitigation**

Product Quality Attribute

Palatability:

- **Palatability is the hedonic, subjective measure of how pleasant or acceptable a food, beverage, or drug is to consume, encompassing taste, aroma, texture, and appearance.**

Taste:

- **Patient non-compliance due to poor taste is a major barrier to treatment, affecting up to 91% of patients with acute illness and 84% with chronic conditions.**
  - **By some account 75% of API are reported to be bitter.**

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Container/Closure

Container Closure System

- **May have suitable device for dispensing the drug product.**
- **Discuss suitability of device on the product stability and performance over shelf life**
- **Provide studies to demonstrate that the C/C system will protect the product during storage, shipping and use**

Risk Assessment and Mitigation

- **Provide risk analysis of C/C selection and basis of C/C selection**
- **Identify risk to quality and/or product elegance**
- **Provide appropriate mitigation plan**

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Conclusion

- Tailer the patient need and compliance based on dosage form .
- Pharmaceutical Science and Development should be well presented
- Desired Product Performance Attributes should be well articulated
- Performance Attributes should be built in the development process rather than determine by end-product testing

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