LIFE TESTING FOR DEVICE COMBINATION PRODUCTS

APPROACHES AND CHALLENGES FOR INTEGRATING DEVICES INTO A COMPREHENSIVE STABILITY PROGRAM

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INTRODUCTION

- What is shelf life for a device?
- Mapping shelf life and leveraging design controls
- How is shelf life established and tested?
- Shelf life for combination products
- Example challenges and approaches

WHAT IS SHELF LIFE FOR A DEVICE?

- ***Shelf life is the term or period during which a commodity remains suitable for the intended use.***

  – FDA Guidance "Shelf Life of Medical Devices" (April 1991)

- **The duration and conditions over which required performance is achieved.**

REQUIRED PERFORMANCE

- **What is required to be suitable for the intended use(s)?**
  - **What is potentially affected by shelf life?**
  - **What is the relationship with the drug product?**
- **Capture explicitly as design input**
- **Examples: sterility, delivered volume, reliability, cycle life**
  - ***"The device shall be X% reliable over a Y shelf life."***

Focus on safety and effectiveness, risk, and critical quality attributes.

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DURATION

- **Period(s) with a defined start, duration, and end.**
  - **Examples: date of manufacture, assembly, sterilization, first use**
  - **End Examples: use by, package by, expiration date**
- **Capture in design inputs and design outputs where appropriate.**

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CONDITIONS

- **Factors that potentially affect performance over time.**
  - **Examples: storage conditions, interactions, processing, cycling, maintenance, sterilization, shipping / transit**
- **Capture in design inputs and design outputs where appropriate.**

MAPPING DEVICE SHELF LIFE

- **Device shelf life is comprised of multiple stages, each with unique durations and conditions.**
  - **i.e. room temp. vs cold storage, partial vs. full assembly, bulk vs individual packaging, pre vs. post sterilization, etc.**
  - **Consider what design requirements and controls are appropriate for each stage**

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LEVERAGING DESIGN & PURCHASING CONTROLS

- 820.30(b) Design & Development Planning
- 820.30(c) Design Input
- 820.30(d) Design Output
- 820.30(e) Design Review
- 820.30(f) Design Verification
- 820.30(g) Design Validation (Risk Analysis)
- 820.30(h) Design Transfer
- 820.30(i) Design Changes
- 820.50 Purchasing Controls

Consider shelf life throughout the process!

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HOW ESTABLISH AND TEST SHELF LIFE

- Identify target shelf life
  - Consider user needs, drug product expiration, supply chain
- Establish design inputs for key stages
- Develop design outputs and identify critical components
- Create verification plan
- Apply preconditions and aging (i.e. sterilization, transit, current drain)
- Verify requirements after accelerated and real time aging
- Control the process

SHELF LIFE FOR COMBINATION PRODUCTS

- **Applicable 800 series requirements**
- **211.137 Expiration dating**
- **211.166 Stability testing**
- ***CGMP Requirements for Combination Products January 2017***
  - **Clarifies expiration assignment for combination product**
  - **Device and drug product constituents may have different expiration**
- **Expiration for kits or integral products set to earliest of constituent parts.**

CHALLENGES AND APPROACHES

- Changing storage and assembly conditions
- Drug product and material sensitivities
- Use of surrogates and bracketing
- Date formats
- Nominal vs. limit testing
- Lab vs. actual storage

Approach these challenges based on product risk and intended use!

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END