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Calculations Roundtable #1: Invitation To Participate

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By ,

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INVITATION TO PARTICIPATE

*Calculations Roundtable*is a new IVT feature that will provide readers an opportunity to discuss typical calculations related to pharmaceutical compounding and product use. Correct product calculations are vital in product design, development, and analysis. After commercialization, calculations are equally vital in healthcare practice including calculation of patient dosages. Erroneous calculations are a well-recognized cause of medication errors in patients. Any effort to increase the understanding of calculations, simplify execution, or provide a reference for use by personnel involved will be a useful endeavor.

WE NEED THIS FEATURE

The idea for an ongoing calculation discussion in the IVT journals came from multiple sources. Calculations are never addressed at technical professional meetings – calculations are too simple and too basic; everyone learns math and should know how to calculate. Reality, however, is much different. For example: An R&D scientist calculated the API amount in a formulation; actual preparation used an API salt. The API amount calculated was made without the salt conversion; the error resulted in low API drug content in clinical product administered to patients. Another example: A pediatric dose of IV digoxin was calculated to be 0.7 mg; the correct calculation should have been 0.07 mg – a decimal calculation error and a 10x overdose -- fatal to a pediatric patient. Some compounded dosage forms may include several different units of measure in the same compounded product; for example, a Total Parenteral Nutrition (TPN) formulation may contain ingredients quantitated by %w/v, mEq/L, millimoles/L, and units/mL. Often calculations are done in an environment under emergency conditions with noise, interruptions, and other distractions – all of which contribute to calculation errors. Calculations errors are complex – broad in scope with numerous contributing causes.

*CALCULATIONS ROUNDTABLE*OBJECTIVES

The potential content in*Calculation Roundtable* may be extensive; types of calculations in compounded products and in healthcare practice are numerous. Units to quantify drug content are many and varied – mg/mL, mg/g, mg/mL, units/mL, %, mEq/mL, millimoles, milliosmoles, ratio strength, and so on. Applications are numerous; product formulation scientists use fundamental calculations in the design and preparation of products. Calculations are used to evaluate experiments, characterize process data, monitor ongoing manufacturing performance, prepare dilutions in laboratory procedures, and have many other applications. Healthcare professionals calculate appropriate dosages for patients. Personnel with appropriate knowledge and understanding of calculation approaches and methods to successfully accomplish their function responsibilities are vital in an organization.

Our goal in*Calculations Roundtable* is to provide basic understanding of principles and approaches to solve typical calculation problems. We will identify calculation concepts applicable to compounding and product administration and demonstrate their use in example problems. Readers have opined their preference for case studies or example problems desc*r*ibing practical applications of theory; we intend to emphasize fundamental approaches and problem-solving including reasons for errors. If we are able to provide a basic understanding of concepts to facilitate correct execution of calculations in the daily work environment,*Calculations Roundtable* will be a success.

Discussion Topics. Topics to be discussed will provide a baseline understanding of relevant calculation topics including the following:

- Approach to calculations
- Drug forms calculations – salts, modified drugs, carriers, others
- Formulation calculations – amount/dosage unit
- Specific gravity and density
- Patient dosage – patient mg/kg to mg/dose from product mg/mL
- Decimals, leading zeros, and trailing zeros
- Milliequivalents and millimoles.

WE NEED YOUR HELP

The title*Calculations Roundtable* was selected to emphasize our desire for reader involvement in this feature. We invite participation and contributions from industry professionals with calculations experience. We envision brief discussions of individual topics followed by example calculations – brief, clear, and straightforward. Joint submissions from compounding professionals and healthcare practitioners with patient involvement are most welcome.

Communication Methods. The multiple communication methods available through IVT will be utilized in *Calculations Roundtable.* Journal submissions for publication are invited. Blog discussions posted on the IVT Network are more informal and are also welcome. IVT*Voices in Validation* podcasts provide visual and verbal discussion by individuals and groups; information sharing through IVT podcasts has been very well received and very successful. Coupling written and podcast discussions have been effective methods of transmitting content and provide multiple preferred adult learning methods. The IVT Network is currently experiencing tremendous growth in each of our communication vehicles; applying their outreach will contribute to general website value as well as providing contributing individuals with global visibility and recognition. Please join us; this feature will be most successful when pharma personnel and healthcare practitioners participate in this endeavor. Please respond in the comments section below with ideas, suggestions, problems for calculation, and topics for discussion.

COORDINATOR AND CONTRIBUTORS

Brad Bartels, PharmD, is Clinical Assistant Professor and Laboratory Director at the University of Illinois College of Pharmacy in Chicago, IL. Dr. Bartels and other future contributors to this feature are well experienced in pharmaceutical calculations, dosage form compounding, and associated topics as practiced in hospital, academic, industry, and community settings.
