☐ **USP <797> 1. INTRODUCTION AND SCOPE:** Standards to be followed when preparing compounded sterile human & animal drugs [compounded sterile preparations (CSPs)]. Required to minimize harm & death, to human & animal patients that could result from:

- ☐ Microbial contamination (nonsterility)
- ☐ Excessive bacterial endotoxins
- ☐ Variability from intended strength of correct ingredients
- ☐ Physical and chemical incompatibilities
- ☐ Chemical and physical contaminants
- ☐ Use of ingredients of inappropriate quality

Aseptic technique must be followed, procedures in place to minimize:

- ☐ Potential for contact with nonsterile surfaces
- ☐ Introduction of particulate matter or biological fluids
- ☐ Mix-ups with other products or CSPs
- ☐ **USP <797> 1.1 Scope: CSPs affected**, the following (but not limited to) must be sterile:
  - ☐ Injections, including infusions
  - ☐ Irrigations for internal body cavities
  - ☐ Ophthalmic dosage forms
  - ☐ Preparations for pulmonary inhalation
  - ☐ Baths and soaks for live organs and tissues
  - ☐ Implants
- ☐ **USP <797> 1.1 Scope: Specific Practices:**
  - ☐ Repackaging: Repackaging of a sterile product or preparation from its original container into another container must be performed in accordance with the requirements of USP and/or pharmacy regulations
  - ☐ Allergenic extracts: These are mixed and diluted to prepare prescription sets for administration to patients and are applicable to other sterile CSPs. See applicable standards USP <21> Compounding Allergenic Extracts:
    - ☐ The compounding process involves transfer via sterile needles and syringes of conventionally manufactured sterile allergen products and appropriate conventionally manufactured sterile added substances
    - ☐ Manipulations are limited to penetrating stoppers on vials with sterile needles and syringes, and transferring sterile liquids in sterile syringes to sterile vials
  - ☐ Hazardous drugs: Compounding of sterile hazardous drugs (HDs) must additionally comply with USP Chapter <800>
  - ☐ Blood-derived & other biological materials: When compounding activities require the manipulation of patient's blood-derived or other biological material (e.g., autologous serum), manipulations must be clearly separated from other compounding activities & equipment used in CSP prep activities, & must be controlled by specific SOPs to avoid any cross-contamination Handling of blood components must additionally comply with jurisdictional standards and guidelines
  - ☐ Sterile radiopharmaceuticals: see Radiopharmaceuticals—Preparation, Compounding, Dispensing, & Repackaging USP <825>
- ☐ **USP <797> 1.1 Scope: Personnel and Settings Affected:** minimum requirements that apply to all persons who prepare CSPs and all places where CSPs are prepared. This includes, but is not limited to:

☐ Persons:

- ☐ Pharmacists
- ☐ Pharmacy Technicians
- ☐ Veterinarians
- ☐ Nurses
- ☐ Physicians
- ☐ Naturopaths
- ☐ Dentists
- ☐ Chiropractors

☐ Designate one or more individuals [i.e., designated person(s)] to be responsible & accountable for the performance and operation of the facility and personnel in the preparation of CSPs

☐ Places:

- ☐ Hospital
- ☐ Healthcare institution
- ☐ Physician practice site
- ☐ Infusion facility
- ☐ Medical & surgical patient treatment site
- ☐ Veterinarian practice site
- ☐ Pharmacy

- ☐ **USP <797> 1.3 Immediate Use CSPs:** Compounding of CSPs for direct and immediate administration to a patient is not subject to the requirements for Category 1 or Category 2 CSPs when:
  - ☐ Aseptic processes are followed & written procedures are in place to minimize the potential for contact with nonsterile surfaces, introduction of particulate matter or biological fluids, & mix-ups with other manufactured products or CSPs
  - ☐ The preparation is performed in accordance with evidence-based information for physical and chemical compatibility of the drugs (e.g., FDA-approved labeling, stability studies)
  - ☐ The preparation involves not more than 3 different sterile products
  - ☐ Any Unused starting component from single-dose container must be discarded after preparation for the individual patient is complete. Single-dose containers must not be used for more than 1 patient
  - ☐ Administration begins within 4 hours following start of preparation. If administration has not begun within 4 hours following the start of preparation, it must be promptly, appropriately, and safely discarded
  - ☐ Unless administered by person who prepared it or administration is witnessed by the preparer, CSP must be labeled:
    - ☐ Names and amounts of all active ingredients ☐ Name or initials of the person who prepared CSP
    - ☐ Exact 4-hour time period within which administration must begin
- ☐ **USP <797> 1.4 Preparation Per Approved Labeling:** Compounding does not include mixing, reconstituting, or other such acts that are performed in accordance with directions contained in approved labeling provided by the product's manufacturer and other manufacturer directions consistent with that labeling [21 USC 353a (e)]
  - ☐ Preparing a conventionally manufactured sterile product in accordance with the directions in the manufacturer's approved labeling is out of scope only if:
    - ☐ Product is prepared as a single dose for an individual patient
    - ☐ Approved labeling includes info for diluent, resultant strength, container closure system, & storage time
  - ☐ Proprietary Bag and Vial Systems
    - ☐ Docking and activation of proprietary bag and vial systems (e.g., addEASE, ADD-Vantage, Mini Bag Plus) in accordance with the manufacturer's labeling for immediate administration to an individual patient is not considered compounding and may be performed outside of an ISO 5 environment
    - ☐ Docking of proprietary bag & vial systems for future activation and administration is considered compounding
    - ☐ Beyond-use dates for proprietary bag & vial systems must not be longer than in manufacturer's labeling
- ☐ **USP <797> 1.5 CSP Categories:** Two categories of CSPs, Category 1 and Category 2, primarily based on the conditions under which they are made, the probability for microbial growth, and the time period within which they must be used
  - ☐ Category 1 are assigned a BUD of 12 hours or less at controlled room temp or 24 hours or less when refrigerated
  - ☐ Category 2 are assigned a BUD of greater than 12 hours at controlled room temp or greater than 24 hours if refrigerated

  CSPs can be compounded by using only sterile starting ingredients or by using some or all nonsterile starting ingredients
  - ☐ If all of the components used to compound a drug are sterile to begin with, the sterility of the components must be maintained during compounding to produce a CSP
  - ☐ If one or more of the starting components being used to compound is not sterile, the sterility of the compounded preparation must be achieved through a sterilization process:
    - ☐ Terminal sterilization in the final sealed container
    - ☐ Sterilizing filtration

☐ **USP <797> 2. PERSONNEL TRAINING AND EVALUATION:** All personnel involved in the compounding of CSPs must be initially trained and qualified by demonstrating proficiency in compounding CSPs

- ☐ Designated person must oversee the training of personnel
- ☐ Training and observation may be performed by the designated person(s) or an assigned trainer
- ☐ Personnel must complete training every 12 months in appropriate sterile compounding principles and practices
- ☐ Training and evaluation of personnel must be documented
- ☐ Compounding facility must develop a written training program that describes:
  - ☐ Required training
  - ☐ Frequency of training
  - ☐ Process for evaluating the performance of individuals involved in preparing CSPs
  - ☐ Equip personnel with appropriate knowledge & trains them with required skills necessary to perform assigned tasks
- ☐ **USP <797> 2.1 Demonstrating Proficiency in Core Competencies:** Before beginning to prepare CSPs independently, all compounding personnel must complete training and be able to demonstrate knowledge of principles and proficiency of skills for performing sterile manipulations and achieving and maintaining appropriate environmental conditions.
  - ☐ Competency must be demonstrated every 12 months in at least the following:
    - ☐ Hand hygiene
    - ☐ Garbing
    - ☐ Cleaning and disinfection
    - ☐ Aseptic technique
    - ☐ Principles of high-efficiency particulate air (HEPA)-filtered unidirectional airflow within the ISO Class 5 area
    - ☐ Documentation of the compounding process (e.g., master formulation and compounding records)
    - ☐ Principles of movement of materials and personnel within the compounding area
    - ☐ Achieving and/or maintaining sterility & apyrogenicity
    - ☐ Use of equipment
    - ☐ Proper use of primary engineering controls (PECs)
    - ☐ Calculations, measuring, and mixing
  - ☐ All compounding personnel must complete written or electronic testing every 12 months
  - ☐ All personnel accessing compounding area must complete training and demonstrate competency in maintaining the quality of the compounding environment
  - ☐ Designated person(s) must ensure any person entering sterile compounding area maintains quality of environment
- ☐ **USP <797> 2.2 Demonstrating Competency in Garbing and Hand Hygiene**
  - ☐ All compounding personnel must be visually observed initially and every 6 months while performing hand hygiene and garbing procedures
  - ☐ Visual audit must be documented and the documentation maintained to provide a record of personnel competency
  - ☐ Before being allowed to independently compound, all compounders must successfully complete initial competency evaluation, w/ visual observation & gloved fingertip & thumb sampling on both hands, no fewer than 3 separate times
    - ☐ Initial gloved fingertip and thumb sampling must be performed on donned sterile gloves in a classified area or segregated compounding area (SCA)
  - ☐ After the initial competency evaluation, compounding personnel must successfully complete gloved fingertip & thumb sampling at least every 6 months **after completing the media-fill test** (See USP <797> 2.3 Competency Testing in Aseptic Manipulation below)
    - ☐ Subsequent gloved fingertip and thumb sampling must be performed on donned sterile gloves inside of an ISO Class 5 PEC
  - ☐ If conducting gloved fingertip and thumb sampling in a compounding aseptic isolator (CAI), compounding aseptic containment isolator (CACI), or a pharmaceutical isolator, samples must be taken from the sterile gloves placed over the gloves attached to the restricted-access barrier system (RABS) sleeves

☐ **USP <797> 2.2 Demonstrating Competency in Garbing and Hand Hygiene** continued

- ☐ Successful completion of **initial** gloved fingertip and thumb sampling is defined as zero colony-forming units (cfu).
- ☐ Successful completion of **subsequent** gloved fingertip and thumb sampling after media-fill testing is defined as ≤3 cfu (total from both hands)
- ☐ Gloved Fingertip and Thumb Sampling Procedures
  - ☐ Use one sampling device per hand (e.g., plates, paddles, or slides) containing general microbial growth agar [e.g., trypticase soy agar (TSA)] supplemented with neutralizing additives (e.g., lecithin and polysorbate 80)
  - ☐ Label each sampling device with personnel identifier, right or left hand, and date and time of sampling
  - ☐ **Do not** apply sterile 70% isopropyl alcohol (IPA) to gloves immediately before touching the sampling device
  - ☐ Using a separate sampling device for each hand, collect samples from all gloved fingers and thumbs from both hands by rolling finger pads and thumb pad over the agar surface
  - ☐ Incubate the sampling device at a temperature of 30°–35° for no less than 48 hours and then at 20°–25° for no less than 5 additional days. Store media devices inverted during incubation to prevent condensation drip
  - ☐ Record the number of cfu per hand (left hand, right hand)
  - ☐ Determine whether the cfu action level is exceeded by counting the total number of cfu from **both** hands
- ☐ Action Levels for Gloved Fingertip and Thumb Sampling (successful completion is below cfu action levels)

Gloved Fingertip and Thumb Sampling	Action Levels (total number of cfu from both hands
Initial sampling after garbing	>0
Subsequent sampling after media-fill testing (every 6 months)	>3

- ☐ Failure is indicated by visual observation of improper hand hygiene and garbing procedures and/or gloved fingertip and thumb sampling results that exceed the cfu action levels
  - ☐ Results of the evaluation and corrective actions, in the event of failure, must be documented and the documentation maintained to provide a record and long-term assessment of personnel competency
- ☐ Documentation must at a minimum include:
  - ☐ Name of the person evaluated
  - ☐ Evaluation date/time
  - ☐ Media and components used including manufacturer, expiration date and lot number
  - ☐ Starting temperature for each interval of incubation,
  - ☐ Dates of incubation
  - ☐ Incubation results
  - ☐ Identification of the observer
  - ☐ Identification of and the person who reads and documents the results

☐ **USP <797> 2.3 Competency Testing in Aseptic Manipulation**

- ☐ All compounding personnel must perform media-fill testing to assess their sterile technique and related practices initially and every 6 months thereafter
- ☐ Perform media-fill test by simulating the most difficult and challenging compounding procedures and processing conditions encountered by the person replacing all the components used in CSPs with soybean–casein digest media
- ☐ If using commercial sterile microbial growth media, a certificate of analysis (COA) must be obtained from the supplier stating that the lot of the growth media will support the growth of microorganisms
  - ☐ Store microbial growth media in accordance with manufacturer instructions
  - ☐ Initiate the media-fill test before the expiration date of the media

- ☐ **USP <797> 2.3 Competency Testing in Aseptic Manipulation** continued
  - ☐ Media-Fill Testing Procedures
    - ☐ If all starting components are **sterile**, manipulate in a manner that simulates sterile-to-sterile compounding activities, & transfer the sterile soybean–casein digest media into the same types of container–closure systems commonly used at the facility.
    - ☐ Do not further dilute the media unless specified by the manufacturer
    - ☐ If some of starting components are **nonsterile**, use nonsterile soybean–casein digest powder to make solution. Dissolve nonsterile commercially available soybean–casein digest medium in nonbacteriostatic water to make a 3% nonsterile solution. Manipulate it in a manner that simulates nonsterile-to-sterile compounding activities. Prepare at least 1 container as the positive control to demonstrate growth promotion
    - ☐ Incubate test media in an incubator for 7 days at 20°– 25° followed by 7 days at 30°–35°
    - ☐ Failure is indicated by visible turbidity or other visual manifestations of growth in the media in one or more container–closure unit(s) on or before 14 days
    - ☐ Failure results and corrective actions must be documented and the documentation maintained to provide a record and long-term assessment of personnel competency
    - ☐ Documentation must at a minimum include:
      - ☐ Name of the person evaluated
      - ☐ Evaluation date/time
      - ☐ Media and components used including manufacturer, expiration date and lot number
      - ☐ Starting temperature for each interval of incubation
      - ☐ Dates of incubation
      - ☐ Incubation results
      - ☐ Identification of the observer
      - ☐ Identification of the person who reads and documents the results

- ☐ **USP <797> 3. PERSONAL HYGIENE AND GARBING:** Individuals entering a compounding area must be properly garbed and must maintain proper personal hygiene to minimize the risk of contamination to the environment and/or CSPs
  - ☐ Individuals that may have a higher risk of contaminating the CSP and the environment (personnel with rashes, recent tattoos, oozing sores, conjunctivitis, or active respiratory infection) must report these conditions to designated person(s)
  - ☐ Designated person(s) is responsible for evaluating whether these individuals should be excluded from working in compounding areas before their conditions have resolved
  - ☐ **USP <797> 3.1 Personnel Preparation:** Individuals entering a compounding area must take appropriate steps to minimize microbial contamination of the environment and the CSPs, including hand hygiene, garbing, and consideration of needed materials to be brought into the compounding area. At a minimum, individuals must:
    - ☐ Remove personal outer garments (e.g., bandanas, coats, hats, jackets, sweaters, vests)
    - ☐ Remove all cosmetics because they shed flakes and particles
    - ☐ Remove all hand, wrist, & exposed jewelry including piercings that could interfere with the effectiveness of garbing
    - ☐ Cover any jewelry that cannot be removed
    - ☐ Not wear earbuds or headphones
    - ☐ Not bring electronic devices that are not necessary for compounding or required tasks into the compounding area
    - ☐ Keep nails clean and neatly trimmed, nail products (e.g., polish, artificial nails, and extenders) must not be worn
    - ☐ Wipe eyeglasses, if worn
    - ☐ Designated person(s) may permit accommodations as long as quality of the CSP & environment will not be affected

- ☐ **USP <797> 3.2 Hand Hygiene**
  - ☐ Personnel must wash hands & forearms up to elbows with soap & water before initiating compounding activities
  - ☐ Brushes must not be used for hand hygiene
  - ☐ Hand dryers must not be used
  - ☐ A closed system of soap (i.e., nonrefillable container) must be readily available or in close proximity to the sink
  - ☐ The order of hand washing and garbing depends on the placement of the sink
  - ☐ The order of garbing must be determined by the facility and documented in the facility's SOP
  - ☐ Hands must be sanitized with alcohol-based hand rub before donning sterile gloves
  - ☐ Sterile gloves must be donned in a classified room or Sterile Compounding Area (SCA)
  - ☐ Hand Washing Procedures
    - ☐ Remove visible debris from underneath fingernails under warm running water using a disposable nail cleaner
    - ☐ Wash hands and forearms up to the elbows with soap and water for at least 30 seconds
    - ☐ Dry hands and forearms to the elbows completely with low-lint disposable towels or wipers
  - ☐ Hand Sanitizing Procedures
    - ☐ Apply alcohol-based hand rub to dry skin following manufacturer's instructions for volume of product to use
    - ☐ Apply product to one hand & rub hands together, covering all surfaces of hands & fingers, until hands are dry
    - ☐ Allow hands to dry thoroughly before donning sterile gloves
- ☐ **USP <797> 3.3 Garbing Requirements:** Any person entering a compounding area must be properly garbed in accordance with the facility's SOPs
  - ☐ Garb must be donned and doffed in an order that reduces the risk of contamination
  - ☐ The order of garbing must be determined by the facility and documented in the facility's SOP
  - ☐ Donning and doffing garb should not occur in the ante-room or the SCA at the same time
  - ☐ Skin must not be exposed inside the ISO Class 5 PEC
  - ☐ The minimum garbing requirements include:
    - ☐ Low-lint garment w/ sleeves that fit snugly around wrists & is enclosed at the neck (e.g., gowns or coveralls)
    - ☐ Low-lint, disposable covers for shoes
    - ☐ Low-lint, disposable covers for head that cover hair & ears, and if applicable, disposable cover for facial hair
    - ☐ Face mask
    - ☐ Sterile powder-free gloves
    - ☐ If using a restricted-access barrier system (RABS) sleeves with a CAI or CACI, disposable gloves (e.g., cotton, nonsterile, sterile) should be worn inside gloves attached to the RABS sleeves.
      Sterile gloves must be worn over gloves attached to the RABS sleeve
    - ☐ Garb must be replaced immediately if it becomes visibly soiled or if its integrity is compromised
    - ☐ Gowns and other garb must be stored in a manner that minimizes contamination (e.g., away from sinks)
    - ☐ When personnel exit the compounding area, garb except for gowns cannot be reused and must be discarded.
    - ☐ Gowns may be re-used within the same shift if the gown is maintained in a classified area or inside the perimeter of an SCA
    - ☐ If compounding a HD, appropriate personal protective equipment (PPE) must be worn and disposed of in accordance with USP <800>
  - ☐ Gloves:
    - ☐ Application of sterile 70% IPA to gloves must occur regularly throughout the compounding process
    - ☐ All gloves must be inspected for holes, punctures, or tears & must be replaced immediately if defects detected
    - ☐ RABS sleeves & gloves should be changed per manufacturer's recommendations and defined in facility's SOP

☐ **USP <797> 4. FACILITIES AND ENGINEERING CONTROLS:** The ante-room, buffer room, and SCA must be separated from areas not directly related to compounding

- ☐ **USP <797> 4.1 Protection from Airborne Contaminants**
  - ☐ AIR QUALITY STANDARDS: ISO Classification of Particulate Matter in Room Air

ISO Class	Particle Countb/m3	ISO Class	Particle Countb/m3
3	35.2	6	35,200
4	352	7	352,000
5	3520	8	3,520,000

  - ☐ DESIGN REQUIREMENTS TO MAINTAIN AIR QUALITY: Classified areas in which the air quality is controlled include ante-rooms, buffer rooms, and PECs
    - ☐ Ante-rooms providing access to **positive** pressure buffer rooms must meet at least ISO Class 8 classification
    - ☐ Ante-rooms providing access to **negative** pressure buffer rooms must meet at least ISO Class 7 classification
    - ☐ A buffer room must meet at least ISO Class 7 air quality
    - ☐ Category 1 and Category 2 CSPs must be prepared in an ISO Class 5 or better PEC
    - ☐ If compounding only Category 1 CSPs, the PEC may be placed in an unclassified SCA
- ☐ **USP <797> 4.2 Facility Design and Environmental Controls**
  - ☐ The cleanroom suite should be maintained at a temperature of 20° C or cooler
  - ☐ The relative humidity should be below 60%
  - ☐ Temperature & humidity must be monitored and documented in each room of the cleanroom suite each day that compounding is performed
  - ☐ Temp & humidity in cleanroom suite must be controlled by heating, ventilation, & air conditioning (HVAC) system
  - ☐ Free-standing humidifiers/dehumidifiers and air conditioners must not be used within the classified area or within the perimeter of the SCA
  - ☐ Temperature & humidity monitoring devices must be verified for accuracy every 12 months or as required by manuf.
  - ☐ The designated person(s) is responsible for ensuring:
    - ☐ Each area related to CSP preparation meets classified air quality standard appropriate for that area
    - ☐ That ISO Class 5 areas are located, operated, maintained, monitored, & certified with appropriate air quality
  - ☐ TYPES OF SECS AND DESIGN: The PEC must be located in the buffer room of the cleanroom suite or SCA in a manner that minimizes conditions that could increase the risk of microbial contamination
    - ☐ Access to the SEC must be restricted to authorized personnel and required materials
    - ☐ **Cleanroom suite:**
      - ☐ ISO-classified ante-room and buffer room must be separated from the surrounding unclassified areas of the facility by fixed walls and doors
      - ☐ Air supplied to the cleanroom suite must be introduced through HEPA filters that are located in the ceiling of the buffer and ante-rooms
      - ☐ Air returns in cleanroom suite must be low on the wall unless a visual smoke study demonstrates an absence of stagnant airflow where particulate will accumulate
      - ☐ Smoke study along with environmental monitoring must be repeated whenever a change to the placement of equipment within the room is made or any other alteration is performed
      - ☐ Classified rooms must be equipped with a pressure-differential monitoring system
      - ☐ Ante-room must have a line of demarcation to separate the clean side from the dirty side or facility may be designed with two separate anterooms, a clean ante-room and a dirty ante-room
      - ☐ Ante-room is entered through dirty side/room, & clean side/ room is area closest to buffer room

- ☐ **USP <797> 4.2 Facility Design and Environmental Controls:** continued
  - ☐ **Cleanroom suite:** continued
    - ☐ If pass-through is used, both doors must never be opened at same time; doors should be interlocking
    - ☐ Seals and sweeps should not be installed at doors between buffer and ante-rooms
    - ☐ Access doors should be hands-free
    - ☐ Tacky mats must not be placed within ISO-classified areas
  - ☐ **Segregated compounding area (SCA):**
    - ☐ PEC may be located within an unclassified area, without an ante-room or buffer room
    - ☐ Only Category 1 CSPs can be compounded in an SCA
    - ☐ SCA located away from unsealed windows, doors that connect to the outdoors, and traffic flow
    - ☐ A visible perimeter must establish the boundaries of the SCA
  - ☐ THE CSP COMPOUNDING ENVIRONMENT
    - ☐ PEC must be certified to meet ISO Class 5 or better conditions during dynamic operating conditions
    - ☐ Unidirectional airflow must be maintained in the PEC
    - ☐ HEPA-filtered air must be supplied by the PEC at a velocity sufficient to sweep particles away from critical sites and maintain unidirectional airflow during operations
  - ☐ TYPES OF PECS AND PLACEMENT
    - ☐ Placement of the PEC must allow for cleaning around the PEC
    - ☐ Laminar airflow system (LAFS): include LAFWs, integrated vertical laminar flow zones (IVLFZs), and biological safety cabinets (BSCs)
      - ☐ LAMINAR AIRFLOW WORKBENCH (LAFW): provides an ISO Class 5 or better environment for sterile compounding; provides either horizontal or vertical unidirectional HEPA-filtered airflow
      - ☐ INTEGRATED VERTICAL LAMINAR FLOW ZONE (IVLFZ): designated ISO Class 5 area serving as the PEC within an ISO Class 7 or cleaner buffer room; unidirectional HEPA-filtered zone must be separated from ISO Class 7 area with physical barrier to direct airflow downward over work area
      - ☐ CLASS II BIOLOGICAL SAFETY CABINET (BSC): ventilated cabinet with an open front and inward & downward unidirectional HEPA-filtered airflow and HEPA-filtered exhaust; provides ISO Class 5 or better environment; must be externally vented for preparation of antineoplastic and/or API HDs
      - ☐ Placement of LAFS: located out of traffic patterns and away from room air currents that could disrupt the intended airflow patterns inside the PEC
      - ☐ LAFS must be located within a cleanroom suite with an ISO Class 7 or better buffer room with an ISO Class 8 or better ante-room if used to prepare Category 2 CSPs
      - ☐ Dynamic airflow smoke pattern test must be performed in PEC initially & at least every 6 months
    - ☐ Restricted-access barrier system (RABS): include CAIs and CACIs
      - ☐ COMPOUNDING ASEPTIC ISOLATOR (CAI): maintains an ISO Class 5 environment; No HD in CAI
      - ☐ COMPOUNDING ASEPTIC CONTAINMENT ISOLATOR (CACI): maintains an ISO Class 5 environment for compounding sterile Hazardous Drug (HD) preparations
      - ☐ RABS recovery time after opening the transfer chamber to achieve ISO Class 5 air quality must be documented (e.g., by the manufacturer)
      - ☐ SOPs must be developed to ensure that adequate recovery time is allowed after opening and closing the RABS, both before and during compounding operations
      - ☐ Dynamic airflow smoke pattern test must be performed in the PEC under dynamic operating conditions initially and at least every 6 months

☐ **USP <797> 4.2 Facility Design and Environmental Controls:** continued

- ☐ Pharmaceutical isolator: provides isolation from the surrounding area and maintains ISO Class 5 air quality during dynamic operating conditions. [NOTE—A CAI or CACI is not a pharmaceutical isolator]
- ☐ A pharmaceutical isolator comprises four elements:
  [1] Controlled workspace, [2] Transfer device(s), [3] Access device(s), [4] Integral decontamination system
  - ☐ An ante-room is not required when using a pharmaceutical isolator
  - ☐ Dynamic airflow smoke pattern test must be performed in PEC initially & at least every 6 months

☐ If robotic enclosure is used as PEC, a dynamic airflow smoke pattern test must be performed initially & every 6 months

☐ Summary of Minimum Requirements for Placement of PEC for Compounding Non-HD CSPs

PEC Type	Device Type	Placement for Category 1 CSPs	Placement for Category 2 CSPs
LAFS	LAFW	Unclassified SCA	ISO Class 7 positive pressure
	IVLFZ	N/A, must not be use in unclassified SCA	Buffer room with an ISO Class 8
	BSC	Unclassified SCA	Positive pressure ante-room
RABS	CAI or CACI	Unclassified SCA	
Pharmaceutical isolator	Pharmaceutical isolator	Unclassified SCA	ISO Class 8 positive pressure room

☐ AIR EXCHANGE REQUIREMENTS: Airflow is measured in terms of the number of air changes per hour (ACPH)

- ☐ At least 15 ACPH of the total air change rate in a room must come from the HVAC through HEPA filters located in the ceiling for ISO 7 and ISO 8 Rooms
- ☐ If PEC is used to meet minimum total ACPH requirements, PEC must not be turned off except for maintenance
- ☐ HEPA-filtered air from the PEC, when added to the HVAC-supplied HEPA-filtered air, increases the total HEPA-filtered ACPH to at least 30 ACPH
- ☐ The ACPH from HVAC, ACPH contributed from PEC, & total ACPH must be documented on certification report
- ☐ Summary of ACPH Requirements for Non-HD Sterile Compounding Areas

Compounding Area	ACPH Requirement
Unclassified SCA	No requirement
ISO Class 7 room(s)	≥ 30 ACPH
ISO Class 8 room(s)	≥ 20 ACPH

☐ ESTABLISHING AND MAINTAINING PRESSURE DIFFERENTIALS: Continuous differential positive pressure is required

- ☐ In cleanroom suite, a minimum differential positive pressure of 0.020-inch water column is required between each ISO classified area (e.g., between the buffer room and ante-room)
- ☐ Pressure differential between ante-room and unclassified area must not be less than 0.020-inch water column
- ☐ No pressure differential is required between the SCA and the surrounding area
- ☐ Where pressure differentials are required, a pressure differential monitoring device must be used to continuously monitor the pressure differentials
- ☐ Quantitative results from the pressure monitoring device must be reviewed and documented at least daily on the days when compounding is occurring

☐ FACILITIES PREPARING CSPS FROM NONSTERILE STARTING INGREDIENT(S) OR COMPONENT(S)

- ☐ If preparing a Category 2 CSP from nonsterile component(s), presterilization procedures, such as weighing and mixing, must be completed in no worse than an ISO Class 8 environment (e.g., ante-room, buffer room)
- ☐ Presterilization procedures must be performed in single-use containment glove bags, containment ventilated enclosure (CVE) , BSC, or CACI
- ☐ CVE, BSC, or CACI used for presterilization procedures must be certified at least every 6 months

- ☐ **USP <797> 4.3 Creating Areas to Achieve Easily Cleanable Conditions**
  - ☐ CLEANROOM SUITE
    - ☐ Surfaces of ceilings, walls, floors, doors, door frames, fixtures, shelving, work surfaces, counters, and cabinets in the classified area must be smooth, impervious, free from cracks and crevices, and non-shedding
    - ☐ Surfaces should be resistant to damage by cleaning agents, disinfectants, sporicidal agents, & cleaning tools
    - ☐ Junctures between the ceiling and the walls and between the walls and the floor must be sealed
    - ☐ If ceilings consist of inlaid panels, panels must be caulked around each panel to seal them to support frame
    - ☐ Walls must be constructed of, or may be covered with, durable material (e.g., epoxy painted walls or heavy-gauge polymer) and the integrity of the surface must be maintained
    - ☐ Wall panels must be joined together and sealed to each other and the support structure
    - ☐ Floors must include coving to the sidewall, or the juncture between the floor and the wall must be caulked
    - ☐ Classified areas should minimize dust-collecting overhangs such as utility pipes and ledges such as windowsills
      - ☐ If overhangs or ledges are present, they must be easily cleanable
    - ☐ The exterior lens surface of ceiling light fixtures must be smooth, mounted flush, and sealed
    - ☐ Any other penetrations through the ceiling or walls must be sealed
  - ☐ SCA
    - ☐ The SCA and all surfaces (e.g., walls, floors, counters, and equipment) in the SCA must be clean, uncluttered, and dedicated to compounding
    - ☐ Surfaces in the SCA should be smooth, impervious, free from cracks and crevices, and nonshedding
    - ☐ Surfaces should be resistant to damage by cleaning agents, disinfectants, sporicidal agents, and cleaning tools
    - ☐ Dust-collecting overhangs such as utility pipes and ledges such as windowsills should be minimized
      - ☐ If overhangs or ledges are present, they must be easily cleanable
- ☐ **USP <797> 4.4 Water Sources**
  - ☐ Sinks should enable hands-free use
  - ☐ Surfaces of sink(s) must be cleaned & disinfected at least daily & a sporicidal agent must be applied at least monthly
  - ☐ If compounding is not performed daily, cleaning & disinfecting sink must be completed before initiating compounding
  - ☐ In facilities with cleanroom suite, the sink used for hand hygiene may be placed either inside or outside of anteroom
    - ☐ Sink located outside of ante-room must be located in clean space to minimize risk of ante-room contaminants
    - ☐ Sink located inside the ante-room, it may be placed on either the clean side or the dirty side of the ante-room
  - ☐ The ante-room must not contain floor drain(s)
  - ☐ The buffer room must not contain plumbed water sources [e.g., sink(s), eyewash(es), shower(s), or floor drain(s)]
  - ☐ If installed, sprinkler systems should be recessed and covered, and the covers should be easily cleanable
  - ☐ SCA
    - ☐ The sink must be accessible but located at least 1 meter away from the PEC
    - ☐ The sink must not be located inside the perimeter of the SCA
- ☐ **USP <797> 4.5 Placement and Movement of Materials**
  - ☐ Only furniture, equipment, and other materials necessary for performing compounding activities are permitted in a classified area or SCA, and they should be low-shedding and easily cleaned and disinfected
  - ☐ No shipping carton(s) or other corrugated or uncoated cardboard are allowed in a classified area or SCA
  - ☐ Carts used to transport components or equipment into classified areas must be constructed from nonporous materials with cleanable casters and wheels to promote mobility and ensure ease of cleaning and disinfection
    - ☐ In a cleanroom suite, carts must not be moved from the dirty side to the clean side of the ante-room unless the entire cart, including casters, is cleaned and disinfected
  - ☐ Proper placement & subsequent move of equipment in PEC must be verified by a dynamic airflow smoke pattern test
  - ☐ Equipment should not be removed except for calibration, servicing, cleaning, or maintenance
    - ☐ Equipment must be cleaned & wiped with sterile 70% IPA or a suitable disinfectant before they are returned

☐ **USP <797> 5. CERTIFICATION AND RECERTIFICATION**

- ☐ Compounding area must be certified using procedures in current Controlled Environment Testing Association (CETA) certification guide for Sterile Compounding Facilities or an equivalent guideline
- ☐ Certification of classified areas including the PEC must be performed initially, and recertification must be performed at least every 6 months and must include:
  - ☐ Airflow testing maintained under dynamic operating conditions; The ACPH from HVAC, ACPH contributed from the PEC, and the total ACPH must be documented on the certification report
  - ☐ HEPA filter integrity testing: HEPA filters must be leak tested at factory, after installation, & as recertification
  - ☐ Total particle count testing performed under dynamic operating conditions using calibrated electronic equipment
  - ☐ Dynamic airflow smoke pattern test performed for each PEC during dynamic operating conditions to demonstrate unidirectional airflow and sweeping action over and away from the preparation(s)
  - ☐ Classified areas additionally must be recertified if there are changes to the area such as redesign, construction, replacement or relocation of any PEC, or alteration in the configuration of the room
  - ☐ All certification and recertification records must be reviewed by the designated person(s) to ensure that the classified environments meet the minimum requirements
  - ☐ The number of personnel present in each PEC and SEC during total particle count tests and dynamic airflow smoke pattern tests must be documented
  - ☐ A corrective action plan must be implemented and documented in response to any out-of-range results
    - ☐ Corrective actions data collected must be reviewed to confirm actions taken have been effective
- ☐ **USP <797> 5.1 Total Airborne Particle Sampling:** A monitoring program for total airborne particles must be developed and implemented to measure the performance of engineering controls that are used to provide specified levels of air cleanliness
  - ☐ Total airborne particle count testing must be conducted in all classified areas during dynamic operating conditions at least every 6 months
  - ☐ Measurements of total airborne particles in other classified areas, including the buffer room(s) and ante-room(s), should be taken at representative locations that reflect the quality of air in the room(s)
  - ☐ All sampling sites and procedures must be described in the facility's SOP
  - ☐ DATA EVALUATION AND ACTION LEVELS
    - ☐ If levels measured during total air sampling program exceed criteria for ISO classification of the area sampled, the cause must be investigated and corrective action taken and documented
    - ☐ Corrective actions data collected must be reviewed to confirm that the actions taken have been effective
    - ☐ Extent of investigation should be consistent with the deviation and should include an evaluation of trends

☐ **USP <797> 6. MICROBIOLOGICAL AIR AND SURFACE MONITORING:** Sterile compounding facilities must develop and implement written procedures for microbiological air and surface monitoring

- ☐ All microbiological air and surface monitoring procedures, the test results, and the corrective actions must be documented
- ☐ Data collected in response to corrective actions must be reviewed to confirm that the actions taken have been effective
- ☐ **USP <797> 6.1 General Monitoring Requirements**
  - ☐ Microbiological air and surface monitoring program must include 1) viable impact volumetric airborne particulate sampling and 2) surface sampling
  - ☐ Regular review of sampling data must be performed to detect trends & the results of the review must be documented
  - ☐ Results from microbiological air and surface sampling must be reviewed in conjunction with personnel data (i.e., training records, visual observations, competency assessments) to assess state of control and risks of contamination
  - ☐ The microbiological air & surface monitoring program must be clearly described in facility's SOPs, which must include:
    - ☐ diagram of the sampling locations
    - ☐ procedures for collecting samples
    - ☐ frequency of sampling
    - ☐ size of samples (e.g., surface area, volume of air)
    - ☐ time of day of sampling in relation to activities in the compounding area
    - ☐ action levels that will trigger corrective action

☐ **USP <797> 6.2 Monitoring Air Quality for Viable Airborne Particles:**

- ☐ Volumetric active air sampling of all classified areas using an impaction device must be conducted in each classified area [e.g., ISO Class 5 PEC and ISO Class 7 and 8 room(s)] during dynamic operating conditions at least every 6 months
- ☐ Active Air Sampling Procedures for Viable Airborne Monitoring
  - ☐ Follow manufacturer's instructions for operation of active air sampling device, including placement of media
  - ☐ Using the sampling device, test at least 1 cubic meter or 1000 liters of air from each location sampled
  - ☐ At the end of the sampling, retrieve the media devices and cover them
  - ☐ Invert the media and incubate at 30°–35° for no less than 48 hours. Record total number of discrete colonies microorganisms on each media device as cfu per cubic meter of air on an environmental sampling form based on sample type (i.e., viable air), sample location, and sample date
  - ☐ Incubate the inverted media at 20°–25° for no less than 5 additional days. Record the total number of discrete colonies of microorganisms on each media device as cfu per cubic meter of air on an environmental sampling form based on sample type (i.e., viable air), sample location, and sample date
  - ☐ Alternatively, to shorten the overall incubation period, two samples may be collected for each sample location and incubated concurrently
    - ☐ Both samples could be TSA or one sample could be TSA and the other fungal media (e.g., malt extract agar (MEA) or sabouraud dextrose agar (SDA))
    - ☐ Incubate each sample in a separate incubator. Incubate one sample at 30°–35° for no less than 48 hours, and incubate the other sample at 20°–25° for no less than 5 days
      - ☐ If fungal media are used as one of the samples, incubate the fungal media sample at 20°–25° for no less than 5 days
    - ☐ Count the total number of discrete colonies of microorganisms on each sample, and record these results as cfu per cubic meter of air
    - ☐ Record the results of the sampling on an environmental sampling form based on sample type (i.e., viable air), and include the sample location, and sample date
- ☐ DATA EVALUATION AND ACTION LEVELS: If levels measured during viable air monitoring program exceed the levels for the ISO classification levels of the area sampled, the cause must be investigated & corrective action must be taken
  - ☐ Corrective action plan must be dependent on the cfu count and the microorganism recovered
  - ☐ If levels measured exceed action levels, an attempt must be made to identify any microorganisms recovered to the genus level with the assistance of a microbiologist
  - ☐ The corrective action plan must be documented
  - ☐ Action Levels for Viable Airborne Particle Air Sampling

ISO Class	Air Sampling Action Levels [cfu per cubic meter (1000 liters) of air per plate]
5	>1
7	>10
8	>100

☐ **USP <797> 6.3 Monitoring Surfaces for Viable Particles**

- ☐ Surface sampling of all classified areas and pass-through chambers connecting to classified areas for microbial contamination must be performed at the end of compounding activity or shift, but before the area has been cleaned and disinfected and must be conducted at least monthly
- ☐ Surface Sampling Procedures
  - ☐ Remove cover from surface sampling device. Using a rolling motion, firmly press media surface onto surface to be sampled. Surface sampling device will leave a residue of growth media on the sample site.
  - ☐ After sampling, remove the residue from the surface using sterile 70% IPA
  - ☐ Cover each surface sampling device. Store media devices during incubation to prevent condensate from dropping onto the agar and affecting the accuracy of the cfu reading (e.g., invert plates).

- ☐ **USP <797> 6.3 Monitoring Surfaces for Viable Particles:** continued
  - ☐ Surface Sampling Procedures: continued
  - ☐ Incubate surface sampling devices at 30°–35° for no less than 48 hours. Record the total number of discrete colonies of microorganisms on each device as cfu per sample on an environmental sampling form based on sample type (i.e., surface), sample location, and sample date
  - ☐ Incubate the surface sampling device at 20°–25° for no less than 5 additional days. Record total number of discrete colonies of microorganisms on each media device (cfu per sample) on the environmental sampling record based on sample type (i.e., surface), sample location, and sample date
    Alternatively, to shorten overall incubation period, two samples may be collected for each sample location and incubated concurrently
    - ☐ Both samples could be TSA or one sample could be TSA & the other fungal media (MEA or SDA)
    - ☐ Incubate each sample in a separate incubator. Incubate one sample at 30°–35° for no less than 48 hours, and incubate the other sample at 20°–25° for no less than 5 days
      - ☐ If fungal media are used as one of the samples, incubate the fungal media sample at 20°–25° for no less than 5 days
    - ☐ Count the total number of discrete colonies of microorganisms on each sample, and record these results as cfu per sample
    - ☐ Record the results of the sampling on an environmental sampling form based on sample type (i.e., surface), and include the sample location, and sample date
  - ☐ DATA EVALUATION AND ACTION LEVELS
    - ☐ Evaluate cfu counts against the action levels and examine counts in relation to previous data to identify adverse results or trends
    - ☐ If two devices were collected at a single location, all recovered growth on each must be documented and action levels are applied to each device of media
    - ☐ If levels measured during surface sampling exceed the action levels, the cause must be investigated and corrective action must be taken
    - ☐ Corrective actions data must be reviewed to confirm that the actions taken have been effective
    - ☐ Investigation should be consistent with the deviation and should include an evaluation of trends
    - ☐ Corrective action plan must be documented
    - ☐ If levels measured exceed action levels, an attempt must be made to identify any microorganisms recovered to the genus level with the assistance of a microbiologist
    - ☐ Action Levels for Surface Sampling

ISO Class	Surface Sampling Action Levels (cfu/device or swab)
5	> 3
7	> 5
8	> 50

- ☐ **USP <797> 7. CLEANING, DISINFECTING, AND APPLYING SPORICIDAL AGENTS IN COMPOUNDING AREAS**
  - ☐ All cleaning and disinfecting activities must be performed by trained and appropriately garbed personnel
  - ☐ Personnel must be trained if there are any changes in the cleaning and disinfecting procedures
  - ☐ Surfaces must be cleaned prior to being disinfected unless an Environmental Protection Agency (EPA)-registered (or equivalent) one-step disinfectant cleaner is used to accomplish both the cleaning and disinfection in one step
  - ☐ A sporicidal agent must be applied to destroy bacterial and fungal spores
  - ☐ After cleaning and disinfecting or the application of a sporicidal agent in a PEC, apply sterile 70% IPA to remove any residue
  - ☐ Cleaning must be performed in the direction of clean to dirty areas
  - ☐ Frequency, method(s), & location(s) of cleaning, disinfecting, and sporicidal agent use must be established in written SOPs
  - ☐ The manufacturer's directions or published data for the minimum contact time must be followed for the cleaning, disinfecting, and sporicidal agents used

☐ **USP <797> 7. CLEANING, DISINFECTING, AND APPLYING SPORICIDAL AGENTS IN COMPOUNDING AREAS:** continued

- ☐ When sterile 70% IPA is used, it must be allowed to dry
- ☐ All cleaning, disinfecting, and application of sporicidal agents must be documented according to facility SOPs
- ☐ Minimum Frequency for Cleaning & Disinfecting Surfaces & Applying Sporicidal Agents in Classified Areas & within the Perimeter of the SCA

Site	Cleaning	Disinfecting	Applying Sporicidal
PEC(s) and equipment inside the PEC(s)	Equipment and all interior surfaces of the PEC daily and when surface contamination is known or suspected	• Equipment and all interior surfaces of the PEC daily and when surface contamination is known or suspected. • Apply sterile 70% IPA to the horizontal work surface at least every 30 minutes if the compounding process takes 30 minutes or less. If the compounding process takes more than 30 minutes, compounding must not be disrupted and the work surface of the PEC must be disinfected immediately after compounding.	Monthly
Removable work tray of the PEC	• Work surface of the tray daily • All surfaces and the area underneath the work tray monthly	• Work surface of the tray daily • All surfaces and the area underneath the work tray monthly	• Work surface of the tray daily • All surfaces and the area underneath the work tray monthly
Pass-through(s)	Daily	Daily	Monthly
Work surface(s) outside the PEC	Daily	Daily	Monthly
Floor(s)	Daily	Daily	Monthly
Wall(s), door(s), and door frame(s)	Monthly	Monthly	Monthly
Ceiling(s)[a]	Monthly	Monthly	Monthly
Storage shelving and bins	Monthly	Monthly	Monthly
Equipment outside the PEC(s)	Monthly	Monthly	Monthly

[a] Ceilings of the SCA are required to be cleaned, disinfected, and applied with sporicidal agent only when visibly soiled and when surface contamination is known or suspected

- ☐ **USP <797> 7.1 Cleaning, Disinfecting, and Sporicidal Agents:** Cleaning and disinfecting agents must be selected and used with careful consideration of compatibilities, effectiveness, and user safety
  - ☐ Disinfectants selection and use include their antimicrobial activity, inactivation by organic matter, residue, shelf life, preparation requirements of the agent, and suitability for surfaces being disinfected
  - ☐ Applied disinfectant or sporicidal agent must dwell for the minimum contact time specified by the manufacturer
- ☐ **USP <797> 7.2 Cleaning Supplies**
  - ☐ All cleaning supplies (wipers, sponges, & mop heads) with the exception of tool handles and holders must be low lint
  - ☐ Wipers, pads, and mop heads should be disposable
  - ☐ Disposable cleaning supplies must be discarded after each cleaning activity
  - ☐ Reusable cleaning tools must be made of cleanable materials (e.g., no wooden handles) and must be cleaned and disinfected before and after each use
  - ☐ Reusable cleaning tools must be dedicated for use in the classified areas or SCA and must not be removed from these areas except for disposal
  - ☐ Dispose of cleaning supplies in a manner that minimizes the potential for dispersing contaminants into the air

- ☐ **USP <797> 7.3 Cleaning, Disinfecting, and Applying Sporicidal Agents in the PEC**
  - ☐ Procedures for Cleaning and Disinfecting the PEC
    - ☐ Remove visible particles, debris, or residue with an appropriate solution (e.g., Sterile Water for Injection or Sterile Water for Irrigation) using sterile, low-lint wipers
    - ☐ Using a low-lint wiper, apply a cleaning agent, followed by a disinfecting agent, or apply an EPA-registered (or equivalent) one-step disinfectant cleaner to equipment and all interior surfaces of the PEC
    - ☐ Ensure the contact time specified by the manufacturer is achieved
    - ☐ Using a low-lint wiper, apply sterile 70% IPA to equipment and all interior surfaces in the PEC
    - ☐ Allow the surface to dry completely before beginning compounding
  - ☐ Procedures for Applying a Sporicidal Agent in the PEC
    - ☐ Remove visible particles, debris, or residue with an appropriate solution (e.g., Sterile Water for Injection or Sterile Water for Irrigation) using sterile, low-lint wipers
    - ☐ After cleaning and disinfecting, apply the sporicidal agent using a low-lint wiper to all surfaces and the area underneath the work tray. If the sporicidal agent is an EPA-registered (or equivalent) one-step disinfectant sporicidal cleaner, separate cleaning and disinfecting steps are not required
    - ☐ Ensure the contact time specified by the manufacturer is achieved
    - ☐ Using a low-lint wiper, apply sterile 70% IPA to all interior surfaces, including underneath the work tray
    - ☐ Allow the surface to dry completely before beginning compounding

- ☐ **USP <797> 8. INTRODUCING ITEMS INTO THE SEC AND PEC**
  - ☐ **USP <797> 8.1 Introducing Items into the Cleanroom Suite and SCAs**
    - ☐ Before any item is introduced into the clean side of ante-room(s), placed into pass-through(s), or brought inside the perimeter SCA and when packaging integrity will not be compromised, it must be wiped with a sporicidal agent, EPA-registered disinfectant, or sterile 70% IPA using low-lint wipers by personnel wearing gloves
    - ☐ EPA-registered disinfectant or sporicidal agent must dwell for minimum contact time specified by the manufacturer
    - ☐ If sterile 70% IPA is used, it must be allowed to dry
    - ☐ The wiping procedure must not render the product label unreadable
  - ☐ **USP <797> 8.2 Introducing Items into the PEC**
    - ☐ Any item introduced into PEC must be wiped with sterile 70% IPA using low-lint wipers and allowed to dry before use Sterile items in sealed containers introduced into ISO Class 5 PEC do not need to be wiped with sterile 70% IPA
    - ☐ The wiping procedure must not render the product label unreadable
  - ☐ **USP <797> 8.3 Use of Sterile 70% IPA on Critical Sites within the PEC**
    - ☐ Critical sites (e.g., vial stoppers, ampule necks, and intravenous bag septums) must be wiped (NOT SPRAYED) with sterile 70% IPA in the PEC to provide both chemical and mechanical actions to remove contaminants
    - ☐ Sterile 70% IPA must be allowed to dry before entering or puncturing stoppers/septums or breaking necks of ampules

- ☐ **USP <797> 9. EQUIPMENT, SUPPLIES, AND COMPONENTS**
  - ☐ **USP <797> 9.1 Equipment**
    - ☐ Equipment brought into classified areas must be wiped with a sporicidal agent, EPA-registered disinfectant, or sterile 70% IPA using low-lint wipers
    - ☐ Equipment must be placed in a manner that facilitates sterile compounding operations
    - ☐ Compounding personnel must follow established SOPs for the calibration, maintenance, cleaning, and use of the equipment based on the manufacturer's recommendations
    - ☐ Personnel must maintain records from equipment calibration, verification, and maintenance requirements
    - ☐ Compounding personnel must conduct an accuracy assessment of automated compounding devices (ACDs) before the first use and again each day the equipment is used to compound CSPs

- ☐ **USP <797> 9.1 Equipment:** continued
  - ☐ Precision of equipment can be monitored based on an assessment of day-to-day variations in its accuracy measures
  - ☐ Compounding personnel must maintain a daily record of the accuracy measurements on days the equipment is in use
  - ☐ Corrective actions must be implemented if accuracy measurements are outside the manufacturer's specification
- ☐ **USP <797> 9.2 Supplies**
  - ☐ Supplies (e.g., beakers, utensils, needles, syringes, filters, and tubing sets) should be of suitable composition such that the surfaces that contact components are not reactive or sorptive
  - ☐ Supplies in direct contact with the CSP must be sterile and depyrogenated
- ☐ **USP <797> 9.3 Components:** Compounding personnel must follow facility SOPs, which must address the selection, receipt, evaluation, handling, storage, and documentation of all CSP components, including all ingredients, containers, and closures
  - ☐ COMPONENT SELECTION: Conventionally manufactured sterile products should be used when available and appropriate
    - ☐ Active Pharmaceutical Ingredients (APIs):
      - ☐ Must comply with the criteria in the USP–NF monograph, if one exists
      - ☐ Must have a COA that includes the API met specifications and test results
      - ☐ Must be obtained from an FDA-registered facility
    - ☐ Non - APIs
      - ☐ Must comply with the criteria in the USP–NF monograph, if one exists
      - ☐ Must have a COA that includes the Non-API met specifications and test results
      - ☐ Should be obtained from an FDA-registered facility. If cannot be obtained from FDA-registered facility
        - ☐ Designated person(s) must select an acceptable and reliable source
        - ☐ Compounding facility must establish the identity, strength, purity, and quality of the ingredients obtained from that supplier by reasonable means
        - ☐ Reasonable means include, not limited to, visual inspections, evaluation of COA supplied by manufacturer, and/or verification by analytically testing a sample to determine conformance with the COA or other specifications
    - ☐ Each lot of commercially available sterile, depyrogenated containers and container–closure systems must be accompanied by a COA or other documentation showing conformance with established specifications
    - ☐ If sterilization and depyrogenation of supplies or container–closure systems are performed on site, the efficacy of each process must be established and documented
  - ☐ COMPONENT RECEIPT
    - ☐ Upon receipt of each lot of component, external packaging must be examined for evidence of deterioration and other aspects of unacceptable quality
    - ☐ Personnel must verify labeling & condition of component [e.g., outer packaging is damaged and whether temperature-sensing indicators show that the component has been exposed to excessive temperature(s)
    - ☐ Any component found to be of unacceptable quality must be promptly rejected, clearly labeled as rejected, and segregated to prevent use before appropriate disposal; Lots from same vendor also need inspection
    - ☐ Date of receipt by the compounding facility must be clearly marked on each API or added substance package that lacks a vendor expiration date
    - ☐ Packages of components that lack a vendor's expiration date must be assigned a conservative expiration date, not to exceed 1 year after receipt by the compounding facility
  - ☐ COMPONENT EVALUATION BEFORE USE
    - ☐ Components are correct identity, appropriate quality, within expiry date, and have been stored appropriately
    - ☐ All components and packages must be re-inspected to detect container breaks, looseness of the cap or closure, & deviation from expected appearance, aroma, & texture of contents that might have occurred during storage

- ☐ **USP <797> 9.3 Components:** continued
  - ☐ COMPONENT EVALUATION BEFORE USE: continued
    - ☐ Sterile container–closures must be visually re-inspected to ensure that they are free from defects that could compromise sterility and are otherwise suitable for their intended use
    - ☐ Any component found to be of unacceptable quality must be promptly rejected, clearly labeled as rejected, and segregated to prevent use before appropriate disposal; Lots from same vendor also need inspection
  - ☐ COMPONENT HANDLING AND STORAGE
    - ☐ Must monitor temperature in the area(s) where components are stored either manually at least once daily on days that the facility is open or by a continuous temperature recording device (CTRD)
    - ☐ Results of temperature readings must be documented on temp log or stored in CTRD, and must be retrievable
    - ☐ All monitoring equipment must be calibrated or verified for accuracy as recommended by the manufacturer or every 12 months if not specified by the manufacturer

- ☐ **USP <797> 10. STERILIZATION AND DEPYROGENATION**
  - ☐ The following must be considered when selecting an appropriate sterilization method:
    - ☐ Terminal sterilization (dry heat, steam, or irradiation) is preferred method unless the specific CSP or container– closure system cannot tolerate terminal sterilization; achieve probability of nonsterile unit (PNSU) of 10^{-6}
    - ☐ Steam sterilization is not an option if moisture, pressure, or the temperatures used would degrade the CSP or if there is insufficient moisture to sterilize the CSP within the final, sealed container–closure system
    - ☐ Filtration is not an option when compounding a suspension if suspended drug particles are removed by the filter used
  - ☐ Injectable compounded preparations that contain nonsterile components or that come into contact with nonsterile devices (e.g., containers, tubing) during any phase of compounding procedure must be sterilized within 6 hours after completing prep
  - ☐ Description of terminal sterilization & depyrogenation process, including the temp, pressure, duration, permissible load conditions for each cycle, & use of biological indicators & endotoxin challenge vials (ECVs) must be included in facility's SOPs
  - ☐ SOPs must include:
    - ☐ Training and competency of personnel on all sterilization methods and equipment used by the facility
    - ☐ Schedule & method for establishing & verifying effectiveness of terminal sterilization & depyrogenation methods
    - ☐ Methods for maintaining and cleaning the sterilizing and depyrogenation equipment
  - ☐ **USP <797> 10.1 Depyrogenation:** Dry heat depyrogenation must be used to render glassware, metal, & other thermostable containers and components pyrogen-free
    - ☐ Depyrogenation processes typically operate at a range of temperatures, from approximately 170° up to about 400°, depending on the exposure time. Items must remain at depyrogenation temp for duration of depyrogenation period
    - ☐ Effectiveness of the dry heat depyrogenation cycle must be established initially and verified annually using endotoxin challenge vials (ECVs) to demonstrate that the cycle is capable of achieving ≥3-log reduction in endotoxins
    - ☐ Effectiveness of the depyrogenation cycle must be re-established if there are changes to the depyrogenation cycle described in SOPs and must be documented
    - ☐ Items not thermostable must be depyrogenated by rinsing with sterile, non-pyrogenic water (e.g., Sterile Water for Injection, Sterile Water for Irrigation) and then thoroughly drained or dried immediately before use in compounding
  - ☐ **USP <797> 10.2 Sterilization by Filtration**
    - ☐ Sterilizing filters must be sterile, depyrogenated, pore size of 0.22 µm or smaller, and labeling for pharmaceutical use
    - ☐ Sterilizing filters with labeling "for laboratory use only" or equivalent statement must not be used for compounding CSPs
    - ☐ Sterilizing filters must be certified by manufacturer to retain at least 107 microorganisms of a strain of Brevundimonas diminuta per square cm of upstream filter surface area under conditions similar to which the CSPs will be filtered

☐ **USP <797> 10.2 Sterilization by Filtration:** continued

- ☐ Designated person(s) must ensure—from available published information, from supplier documentation, or through direct challenge (e.g., filtering the CSP)—that the filters:
  - ☐ are chemically and physically compatible with all ingredients in the CSP
  - ☐ are chemically stable at the pressure and temperature conditions that will be used
  - ☐ have enough capacity to filter the required volumes
- ☐ Filter dimensions and the CSP to be sterilized by filtration should permit the sterilization process to be completed without the need for replacement of the filter during the process
- ☐ Filter units used to sterilize CSPs must be subjected to the manufacturers' integrity testing, i.e., a post-use bubble point test
- ☐ If multiple filters are required for the compounding process, each of the filters must pass a filter-integrity test
- ☐ When CSPs are known to contain excessive particulate matter, a prefiltration step must be performed using a filter of larger nominal pore size (e.g., 1.2 µm) to remove gross particulate contaminants before CSP passed through sterilizing-grade filter

☐ **USP <797> 10.3 Sterilization by Steam Heat**

- ☐ Process of thermal sterilization using saturated steam under pressure (i.e., autoclaving) is the preferred method for terminal sterilization of aqueous CSPs in their final, sealed container–closure system
- ☐ Between 20 & 60 mins at 121° saturated steam under pressure 15 psi, depending on the vol or size of CSP sterilized
- ☐ The effectiveness of steam sterilization must be verified and documented with each sterilization run or load by using appropriate biological indicators and physicochemical indicators and integrators:
  - ☐ Spores of Geobacillus stearothermophilus ☐ ATCC 12980 ☐ ATCC 7953
- ☐ Steam supplied must be free of contaminants and generated using water per the manufacturer's recommendation
- ☐ A calibrated data recorder or chart must be used to monitor each cycle and to examine for cycle irregularities
- ☐ Date, run, & load numbers of steam sterilizer used to sterilize a CSP must be documented in the compounding record

☐ **USP <797> 10.4 Sterilization by Dry Heat**

- ☐ Dry heat sterilization is usually performed in an oven designed for sterilization at a temperature of 160° or higher If lower temperatures are used, they must be shown to achieve effective sterilization
- ☐ Calibrated oven must be equipped with temperature controls and a timer
- ☐ During sterilization, sufficient space must be left between materials to allow for circulation of the hot air
- ☐ Calibrated data recorder or chart must be used to monitor each cycle; data must be reviewed to ID cycle irregularities
- ☐ Effectiveness of the dry heat sterilization method must be verified and documented with each sterilization run or load using appropriate biological indicators such as:
  - ☐ Spores of Bacillus atrophaeus ☐ ATCC 9372 ☐ Temperature-sensing devices
- ☐ Date, run, & load numbers of dry heat oven used to sterilize a CSP must be documented in the compounding record

☐ **USP <797> 11. MASTER FORMULATION AND COMPOUNDING RECORDS (MFR)**

- ☐ **USP <797> 11.1 Creating Master Formulation Records:** detailed record of procedures that describes how CSP is prepared
  - ☐ Must be created for CSPs prepared for more than 1 patient
  - ☐ Must be created for CSPs prepared from nonsterile ingredient(s)
  - ☐ Any changes or alterations to the MFR must be approved and documented according to the facility's SOP
  - ☐ MFR must include at least the following information:
    - ☐ Name, strength or activity, and dosage form of the CSP
    - ☐ Identities and amounts of all ingredients
    - ☐ Type and size of container–closure system(s)
    - ☐ Physical description of the final CSP

- ☐ **USP <797> 11.1 Creating Master Formulation Records:** continued
  - ☐ MFR must include at least the following information: continued
    - ☐ Complete instructions for preparing the CSP, including equipment, supplies, a description of the compounding steps, and any special precautions
    - ☐ BUD and storage requirements
    - ☐ Reference source to support the stability of the CSP
    - ☐ Quality control (QC) procedures (e.g., pH testing, filter integrity testing)
    - ☐ Other information as needed to describe the compounding process and ensure repeatability
- ☐ **USP <797> 11.2 Creating Compounding Records:** Must be created to document the compounding process or repackaging process for all CSPs. A prescription or medication order or label may serve as the compounding record
  - ☐ Compounding Records must include at least the following information:
    - ☐ Name, strength or activity, and dosage form of the CSP
    - ☐ Name of each component
    - ☐ Date and time of preparation of the CSP
    - ☐ Total quantity compounded
    - ☐ Strength or activity of each component
    - ☐ Weight or volume of each component
    - ☐ Assigned BUD and storage requirements
    - ☐ Assigned internal identification number (e.g., prescription, order, or lot number)
    - ☐ A method to identify the individuals involved in the compounding process and verifying the final CSP
    - ☐ Vendor, lot number, and expiration date for each component for CSPs prepared for more than 1 patient and for CSPs prepared from nonsterile ingredient(s)
    - ☐ Results of QC procedures (e.g., visual inspection, filter integrity testing, pH testing)
    - ☐ If applicable, Master Formulation Record reference for the CSP
    - ☐ If applicable, calculations made to determine and verify quantities and/or concentrations of components

- ☐ **USP <797> 12. RELEASE INSPECTIONS AND TESTING:** must be included in the facility's documentation, any out-of-specification results must be investigated, & corrective action plan must be implemented & documented as part of the quality assurance (QA) and QC program
  - ☐ **USP <797> 12.1 Visual Inspection:** At the completion of compounding, before release and dispensing, the CSP must be visually inspected to determine whether the physical appearance of the CSP is as expected
    - ☐ Inspected for evidence of inappropriate visible particulates or other foreign matter, discoloration, or other defects
    - ☐ Inspected to confirm that the CSP and its labeling match the prescription or medication order
    - ☐ Must include visual inspection of container–closure integrity (checking for leakage, cracks in container, or improper seals)
    - ☐ Inspected immediately before it is released or dispensed to make sure does not exhibit any defects, such as precipitation, cloudiness, or leakage, which could develop during storage
    - ☐ Defects must be discarded, marked & segregated from acceptable units in manner prevents from being released or dispensed
    - ☐ Any defect may indicate sterility or stability problems, which should be investigated to determine the cause
  - ☐ **USP <797> 12.2 Sterility Testing:** Sterility testing is not required for Category 1 CSPs
    - ☐ If between 1 and 39 CSPs are compounded in a single batch, the sterility testing must be performed on a number of units equal to 10% of the number of CSPs prepared, rounded up to the next whole number
    - ☐ If > 40 CSPs are prepared in a single batch, the sample sizes specified in Sterility Tests USP <71>, Table 3 must be used
    - ☐ Sterility tests failures must prompt an investigation, must identify microorganism, evaluate sterility testing procedure, compounding facility, process, and/or personnel that may have contributed to the failure.
    - ☐ The source(s) of the contamination, if identified, must be corrected, and the facility must determine whether the conditions causing the sterility failure affect other CSPs.
    - ☐ The investigation and resulting corrective actions must be documented

- ☐ **USP <797> 12.3 Bacterial Endotoxins Testing:** Category 2 injectable CSPs made from one or more nonsterile component(s) and assigned a BUD that does not require sterility testing should be tested for bacterial endotoxins
  - ☐ CSP must not exceed endotoxins limit calculated in USP <85> for the appropriate route of administration for humans
  - ☐ CSPs for non-human species must not exceed the endotoxin reference limits calculated as described in USP <85> based on the weight of the target animal unless a different limit is scientifically supported
  - ☐ CSPs administered epidurally should have the same endotoxin limit as that of intrathecally administered CSPs

- ☐ **USP <797> 13. LABELING:** designates all labels & other written, printed, or graphic matter on the immediate container or on, or in, any package or wrapper in which it is enclosed, except any outer shipping container
  - ☐ Label on the immediate container of CSP must, at a minimum, display prominently and legibly the following information:
    - ☐ Assigned internal identification number (e.g., barcode, prescription, order, or lot number)
    - ☐ Active ingredient(s) and their amounts, activities, or concentrations
    - ☐ Storage conditions if other than controlled room temperature
    - ☐ Beyond Use Date (BUD)
    - ☐ Route of administration
    - ☐ Total amount or volume if it is not obvious from the container
    - ☐ If it is a single-dose container, a statement stating such when space permits
    - ☐ If it is a multiple-dose container, a statement stating such
  - ☐ Labeling on the CSP should indicate that the preparation is compounded
  - ☐ If CSP compounded at outside facility, the labeling must include the contact information of the compounding facility
  - ☐ Labeling of the CSP must also provide any applicable special handling instructions or warning statements
  - ☐ Labeling procedures must be followed as described in the facility's SOPs
  - ☐ Label of the CSP must be verified to ensure that it conforms with the:
    - ☐ Prescription or medication order
    - ☐ Master Formulation Record
    - ☐ Compounding Record
  - ☐ All labels must also comply with laws and regulations of the applicable federal and state regulatory jurisdiction

- ☐ **USP <797> 14. ESTABLISHING BEYOND-USE DATES (BUD):** BUDs and expiration dates are not the same
  - ☐ **USP <797> 14.1 Terminology**
    - ☐ BUD: The date, or the hour and date, beyond which the preparation must not be used and must be discarded
    - ☐ BUD: Determined from the date/time that preparation of the CSP is initiated
    - ☐ BUD: Is not intended to limit the time during which the CSP is administered (e.g., infused)
    - ☐ Expiration date: identifies the time during which a conventionally manufactured product, API, or added substance can be expected to meet the requirements of a compendial monograph, if one exists
    - ☐ Expiration date: identifies the time during which a conventionally manufactured product, API, or added substance can be expected to maintain expected quality provided it is kept under the specified storage conditions
    - ☐ Expiration date: Limits time of conventionally manufactured product, API, or added substance dispensed or used
    - ☐ Expiration dates are assigned by manufacturers based on analytical and performance testing of the sterility, chemical and physical stability, and packaging integrity of the product
    - ☐ Expiration dates are specific for a particular formulation in its container and at stated exposure conditions of illumination and temperature

☐ **USP <797> 14.2 Parameters to Consider in Establishing a BUD: Including but not limited to:**

- ☐ The chemical and physical properties of the drug and/or its formulation
- ☐ Compatibility of container–closure system with finished preparation (leachables, interactions, & storage conditions)
- ☐ Environment in which the CSP is prepared (e.g., PEC in a cleanroom suite or SCA)
- ☐ Aseptic processing and sterilization method
  - ☐ Aseptic processing, which includes either 1) compounding with only sterile starting ingredient(s), or 2) compounding with nonsterile ingredient(s) followed by sterilization by filtration
  - ☐ Terminal sterilization, which includes compounding with sterile and/or nonsterile starting ingredient(s) and subsequent sterilization with a process intended to achieve a PNSU of 10^{-6} (dry heat, steam, irradiation)
- ☐ Starting components (e.g., sterile or nonsterile starting ingredients)
- ☐ Whether or not sterility testing is performed
- ☐ Storage conditions (e.g., packaging and temperature)
  - ☐ CSP stored in frozen state, the container–closure system must be able to withstand the physical stress (i.e., without breaking or cracking) during storage in a freezer
  - ☐ CSP must be thawed in appropriate conditions to avoid compromising the physical and chemical stability of the preparation and its components (e.g., do not heat in a microwave)
  - ☐ Once the CSP is thawed, the CSP must not be re-frozen
  - ☐ Storage time of CSP must not exceed original BUD for labeled storage condition, & BUDs must not be additive

☐ **USP <797> 14.3 Establishing a BUD for a CSP:** Note: one day is equivalent to 24 hours

- ☐ BUD must not exceed shortest remaining expiration date or BUD of any starting components, regardless of the source
- ☐ A shorter BUD must be assigned when stability of CSP or its components is less than the hours or days stated below:
  - ☐ BUDs for Category 1 CSPs

	Storage Conditions	
	Controlled Room Temperature (20°–25°)	Refrigerator (2°–8°)
BUD	≤12 hours	≤24 hours

  - ☐ BUDs for Category 2 CSPs

Preparation Characteristics		Storage Conditions		
Compounding Method	Sterility Testing Performed & Passed	Controlled Room Temp (20°-25°)	Refrigerator (2°–8°)	Freezer (−25° to −10°)
Aseptically processed CSPs	No	Prepared from one or more nonsterile starting component(s): 1 day	Prepared from one or more nonsterile starting component(s): 4 days	Prepared from one or more nonsterile start component(s): 45 days
		Prepared from only sterile start components: 4 days	Prepared from only sterile start compon-ents: 10 days	Prepared from only sterile start compon-ents: 45 days
	Yes	30 days	45 days	60 days
Terminally sterilized CSPs	No	14 days	28 days	45 days
	Yes	45 days	60 days	90 days

☐ **USP <797> 14.4 Multiple-Dose (M-D) CSPs:** A multiple-dose CSP must be prepared as a Category 2 CSP

- ☐ M-D CSP must pass antimicrobial effectiveness testing in accordance with Antimicrobial Effectiveness Testing <51>
- ☐ After a multiple-dose container is initially entered or punctured, the multiple-dose container must not be used for longer than the assigned BUD or 28 days, whichever is shorter

- ☐ **USP <797> 15. USE OF CONVENTIONALLY MANUFACTURED PRODUCTS AS COMPONENTS**
  - ☐ **USP <797> 15.1 Use of Conventionally Manufactured Single-Dose Containers:** not required to meet the antimicrobial effectiveness testing requirements
    - ☐ Entered or punctured only in an ISO Class 5 or cleaner air, may be used up to 12 hours after initial entry or puncture
  - ☐ **USP <797> 15.2 Use of Conventionally Manufactured Multiple-Dose Containers**
    - ☐ Entered or punctured, must not be used for > 28 days unless otherwise specified by the manufacturer on the labeling
  - ☐ **USP <797> 15.3 Use of Conventionally Manufactured Pharmacy Bulk Packages:** container of a sterile product for parenteral use that contains many single doses and must be used according to the manufacturer's labeling
    - ☐ Pharmacy bulk package must be entered or punctured only in an ISO Class 5 PEC

- ☐ **USP <797> 16. USE OF CSPS AS COMPONENTS:** Care must be taken to minimize the risk of contamination of both the starting component CSP and the finished CSP(s)
  - ☐ BUD of CSP prepared from one or more compounded components may not exceed shortest BUD of any of the individual starting components
  - ☐ **USP <797> 16.1 Use of Compounded Multiple-Dose CSPs**
    - ☐ M-D CSPs must be stored under the conditions upon which its BUD is based (e.g., refrigerator, controlled room temp)
    - ☐ Entered or punctured, the M-D CSP must not be used for > 28 days or assigned BUD, whichever is shorter
  - ☐ **USP <797> 16.2 Use of Compounded Single-Dose CSPs and CSP Stock Solutions**
    - ☐ Must be entered or punctured in ISO Class 5 or cleaner air, and must be stored under the conditions upon which its BUD is based (e.g., refrigerator, controlled room temperature)
    - ☐ Component CSP may be used for sterile compounding for up to 12 hours or its assigned BUD, whichever is shorter, and any remainder must be discarded

- ☐ **USP <797> 17. SOPS:** CSPs must be developed for the compounding process and other support activities
  - ☐ A designated person (DP) must ensure that SOPs are appropriate and are implemented
    - ☐ DP ensures personnel demonstrate competency in performing every procedure that relates to their job function
    - ☐ DP ensures that corrective actions are taken if problems, deviations, failures, or errors are identified
  - ☐ All corrective actions must be documented
  - ☐ All personnel who perform or oversee compounding or support activities must be trained in the SOPs
  - ☐ All compounding personnel must:
    - ☐ Recognize potential problems, deviations, failures, contamination, poor quality, or errors associated w/ preparing CSP
    - ☐ Report any problems, deviations, failures or errors to the designated person(s)
  - ☐ SOPs must be reviewed at least every 12 months by the designated person(s) to ensure that they reflect current practices
  - ☐ The 12 month SOPs review must be documented
  - ☐ Any changes or alterations to an SOP must be made only by a designated person and must be documented
    - ☐ Revisions to SOPs must be communicated to all personnel involved in these processes and procedures
    - ☐ Personnel should document acknowledgment of the communication of SOP changes or alterations

- ☐ **USP <797> 18. QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC):** QA is a system of procedures, activities, and oversight that ensures that the compounding process consistently meets quality standards. QC is the sampling, testing, and documentation of results that, taken together, ensure that specifications have been met before release of the CSP
  - ☐ A facility's QA and QC programs must be formally established and documented in SOPs

☐ **USP <797> 18. QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC):** continued

- ☐ A designated person must ensure that the facility has formal, written QA and QC programs that establish a system of:
  - ☐ Adherence to procedures
  - ☐ Prevention and detection of errors and other quality problems
  - ☐ Evaluation of complaints and adverse events
  - ☐ Appropriate investigations and corrective actions
- ☐ The overall QA and QC program must be reviewed at least once every 12 months by the designated person(s)
- ☐ The results of the 12 month review must be documented and appropriate action must be taken if needed
- ☐ SOPs must describe the roles, duties, and training of the personnel responsible for each aspect of the QA program
- ☐ **USP <797> 18.1 Notification About and Recall of Out-of-Specification Dispensed CSPs:** If a CSP is dispensed or administered before the results of release testing are known, the facility must have procedures in place to:
  - ☐ Immediately notify the prescriber of a failure of specifications with the potential to cause patient harm
  - ☐ Determine whether a recall is necessary
  - ☐ SOP for recall of out-of-specification dispensed CSPs must contain procedures to/for:
    - ☐ Determine the severity of the problem and the urgency for implementation and completion of the recall
    - ☐ Determine the distribution of any affected CSP, including the date and quantity of distribution
    - ☐ Identify patients who have received the CSP
    - ☐ Disposition and reconciliation of the recalled CSP
  - ☐ Sterile compounding facility must document the implementation of the recall procedures
  - ☐ Recalls must be reported to appropriate regulatory bodies as required by federal and state laws and regulations
- ☐ **USP <797> 18.2 Complaint Handling:** must develop and implement SOPs for handling complaints. Complaints may include, but are not limited to, concerns or reports on the quality, labeling, or possible adverse reactions related to a specific CSP
  - ☐ DP must review all complaints to determine whether the complaint indicates a potential quality problem with CSP
    - ☐ If CSP problem, a thorough investigation into the cause of the problem must be initiated and completed
    - ☐ CSP problem investigation must consider whether the quality problem extends to other CSPs
    - ☐ Corrective action, if necessary, must be implemented for all potentially affected CSPs
    - ☐ Consider whether to initiate a recall of potentially affected CSPs and whether to cease sterile compounding processes until all underlying problems have been identified and corrected
    - ☐ A readily retrievable written or electronic record of each complaint must be kept by the facility, regardless of the source of the complaint (e.g., email, telephone, mail). Record must contain the:
      - ☐ Name of the complainant or unique identifier
      - ☐ Date the complaint was received
      - ☐ Nature of the complaint
      - ☐ Response to the complaint
      - ☐ CSP assigned internal identification number
      - ☐ Name and strength of the CSP
      - ☐ Findings of any investigation and any follow-up
    - ☐ Complaint(s) records must be easily retrievable for review & evaluation for possible trends & must be retained
    - ☐ CSP that is returned in connection with a complaint must be quarantined until it is destroyed after completion of the investigation and in accordance with laws and regulations of the applicable regulatory jurisdiction
- ☐ **USP <797> 18.3 Adverse Event Reporting:** Adverse events potentially associated with the quality of CSPs must be reported in accordance with facility SOPs and all laws and regulations of the applicable regulatory jurisdiction
  - ☐ Applicable jurisdictional regulatory bodies include:
    - ☐ State boards of pharmacy
    - ☐ FDA's MedWatch program for human drugs
    - ☐ State health departments
    - ☐ FDA Form 1932a for animal drugs

- ☐ **USP <797> 19. CSP HANDLING, STORAGE, PACKAGING, SHIPPING, AND TRANSPORT:** Processes & techniques for handling, storing, packaging, and transporting CSPs must be outlined in SOPs
  - ☐ Personnel handling, storing, packaging, and transporting CSPs must be trained in accordance with the relevant SOPs
  - ☐ Training of personnel handling, storing, packaging, and transporting CSPs must be documented
  - ☐ **USP <797> 19.1 Handling and Storing CSPs:** CSPs must be handled in a manner that maintains CSP quality and packaging integrity
    - ☐ Personnel must monitor conditions in the storage areas
      - ☐ Temperature must be monitored each day, either manually or by a continuous recording device
      - ☐ Results of the temperature readings must be documented in a temperature log at least once daily or stored in the continuous temperature recording device, and must be retrievable
      - ☐ Temp monitoring devices must be verified for accuracy at least every 12 months or as required by the manufacturer
      - ☐ The compounding facility must detect and minimize temperature excursions that are outside the temperature limits
      - ☐ DP must determine (e.g., by consulting literature or analytical testing) whether the temperature excursion for a CSP is expected to retain its integrity or quality
      - ☐ If CSP integrity or quality due to temperature excursion cannot be determined, it must be discarded
  - ☐ **USP <797> 19.2 Packaging of CSPs:** Packaging materials should protect CSPs from damage, leakage, contamination, degradation, and adsorption while preventing inadvertent exposure to transport personnel
    - ☐ The facility must select appropriate shipping containers and packaging materials based on:
      - ☐ Mode of transport ☐ Information from vendors ☐ Product specifications
    - ☐ If the CSP is sensitive to light, light-resistant packaging materials must be used
    - ☐ In some cases, CSP must be packaged in a special container (e.g., a cooler) to protect from temperature fluctuations
  - ☐ **USP <797> 19.3 Shipping and Transporting CSPs:** Compounding personnel must select modes of transport that are expected to deliver properly packed CSPs in an undamaged, sterile, and stable condition
    - ☐ Considerations should be given to physical shaking that might occur during pneumatic tube transport or undue exposure to heat, cold, or light
    - ☐ Personnel must include specific handling instructions on exterior of container for CSPs that require special handling

- ☐ **USP <797> 20. DOCUMENTATION**
  - ☐ All facilities where CSPs are prepared must have & maintain written or electronic documentation to demonstrate compliance and must include, but is not limited to, the following:
    - ☐ Personnel training, competency assessments, and qualification records including corrective actions for any failures
    - ☐ Certification reports, including corrective actions for any failures
    - ☐ Environmental air and surface monitoring procedures and results
    - ☐ Equipment records (e.g., calibration, verification, and maintenance reports)
    - ☐ Receipt of components
    - ☐ SOPs, Master Formulation Records (when used), and Compounding Records
    - ☐ Release inspection and testing records
    - ☐ Information related to complaints and adverse events
    - ☐ Results of investigations and corrective actions
  - ☐ Documentation must comply with all laws and regulations of the applicable jurisdiction
  - ☐ Records must be legible and stored in a manner that prevents their deterioration and/or loss
  - ☐ All required compounding records for a particular CSP (e.g., Master Formulation Record, Compounding Record, and release testing results) must be readily retrievable for at least 3 years after preparation or as required by laws and regulations of the applicable regulatory jurisdiction, whichever is longer

- ☐ **USP <797> 21. COMPOUNDING ALLERGENIC EXTRACTS:** Allergenic extracts prescription sets must follow at least these standards:
  - ☐ Personnel Qualifications
    - ☐ DP with training and expertise in allergen immunotherapy is responsible for ensuring that personnel who will be preparing allergen immunotherapy are trained, evaluated, and supervised
    - ☐ Before beginning to independently prepare allergenic extracts, all compounding personnel must complete training and be able to demonstrate knowledge of principles and skills for sterile compounding
    - ☐ Annual personnel training and competency (written or electronic testing) must be documented
    - ☐ Compounding personnel must successfully complete glove-tip and media-fill testing, hand hygiene and garbing procedures delineated in USP <797> 2. PERSONNEL TRAINING AND EVALUATION every 12 months
    - ☐ Personnel who fail competency evaluations must successfully pass reevaluations in the deficient area(s) before they can resume compounding of allergenic extract prescription sets
      - ☐ Designated person(s) must identify the cause of failure and determine appropriate retraining requirements
    - ☐ Personnel who have not compounded an allergenic extract prescription set in more than 6 months must be evaluated in all core competencies before resuming compounding duties
  - ☐ Personnel Hygiene and Garbing: Follow procedures stated in USP <797> 3. PERSONAL HYGIENE AND GARBING
  - ☐ Facilities: Follow requirements stated in USP <797> 4. FACILITIES AND ENGINEERING CONTROLS and USP <797> 5. CERTIFICATION AND RECERTIFICATION
  - ☐ Cleaning and Disinfecting: Follow procedures stated in USP <797> 7. CLEANING, DISINFECTING, AND APPLYING SPORICIDAL AGENTS IN COMPOUNDING AREAS
  - ☐ Establishing BUDs: BUD for the prescription set must be no later than the earliest expiration date of any allergenic extract or any diluent that is part of prescription set, & BUD must not exceed 1 year from date the prescription set is mixed or diluted
  - ☐ Labeling: Label of each vial of allergenic extract prescription set must display the following prominently & understandably:
    - ☐ Patient name ☐ Storage conditions ☐ Beyond Use Date
    - ☐ Type and fractional dilution of each vial, with a corresponding vial number
  - ☐ Shipping and Transport: Follow procedures stated in USP <797> 19.3 Shipping and Transporting CSPs
  - ☐ Documentation: Must have and maintain written or electronic documentation to include, but not limited to, the following:
    - ☐ SOPs describing all aspects of the compounding process
    - ☐ Personnel training records, competency assessments, & qualification records including corrective actions for failures
    - ☐ Certification reports of the PEC, if used, including corrective actions for any failures
    - ☐ Temperature logs for the refrigerator(s)
    - ☐ Information related to complaints and adverse events
    - ☐ Investigations and corrective actions
    - ☐ Compounding records for individual allergenic extract prescription sets, must include:
      - ☐ Name, concentration, volume, vendor or manufacturer, lot number, and expiration date for each component
      - ☐ Date and time of preparation of the allergenic extract
      - ☐ Assigned internal identification number
      - ☐ A method to identify the individuals involved in the compounding process and verifying the final CSP
      - ☐ Total quantity compounded
      - ☐ Assigned BUD and storage requirements
      - ☐ Results of QC procedures (e.g., visual inspection, second verification of quantities)