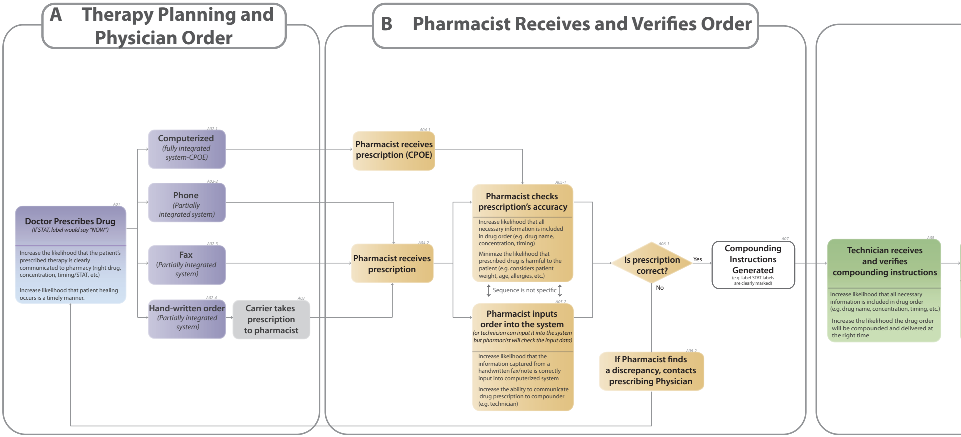


A Therapy Planning and Physician Order

B Pharmacist Receives and Verifies Order

A01
Doctor Prescribes Drug
(If STAT, label would say "NOW")

Increase the likelihood that the patient's prescribed therapy is clearly communicated to pharmacy (right drug, concentration, timing/STAT, etc)

Increase likelihood that patient healing occurs is a timely manner.

A02-1
Computerized
(fully integrated system-CPOE)

A02-2
Phone
(Partially integrated system)

A02-3
Fax
(Partially integrated system)

A02-4
Hand-written order
(Partially integrated system)

A03
Carrier takes prescription to pharmacist

A04-1
Pharmacist receives prescription (CPOE)

A04-2
Pharmacist receives prescription

A05-1
Pharmacist checks prescription's accuracy

Increase likelihood that all necessary information is included in drug order (e.g. drug name, concentration, timing)

Minimize the likelihood that prescribed drug is harmful to the patient (e.g. considers patient weight, age, allergies, etc.)

Sequence is not specific

A05-2
Pharmacist inputs order into the system
(or technician can input it into the system but pharmacist will check the input data)

Increase likelihood that the information captured from a handwritten fax/note is correctly input into computerized system

Increase the ability to communicate drug prescription to compounder (e.g. technician)

A06-1
Is prescription correct?

Yes

No

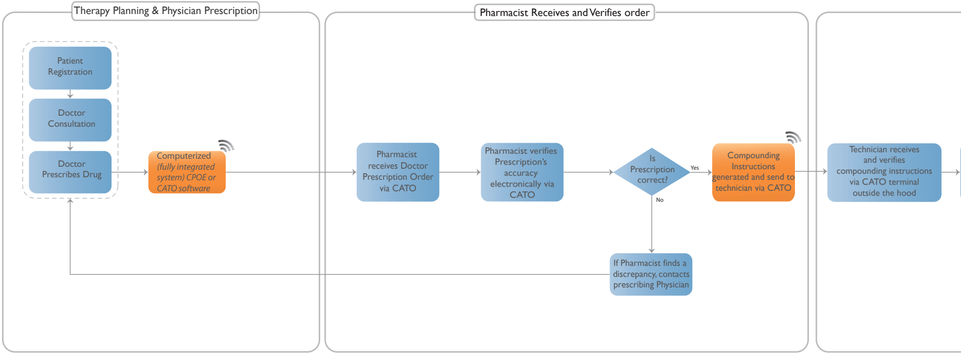
A06-2
If Pharmacist finds a discrepancy, contacts prescribing Physician

A07
Compounding Instructions Generated
(e.g. label STAT labels are clearly marked)

A08
Technician receives and verifies compounding instructions

Increase likelihood that all necessary information is included in drug order (e.g. drug name, concentration, timing, etc.)

Increase the likelihood the drug order will be compounded and delivered at the right time



Therapy Planning & Physician Prescription

Pharmacist Receives and Verifies order

Patient Registration

Doctor Consultation

Doctor Prescribes Drug

Computerized (fully integrated system) CPOE or CATO software

Pharmacist receives Doctor Prescription Order via CATO

Pharmacist verifies Prescription's accuracy electronically via CATO

Is Prescription correct?

Yes

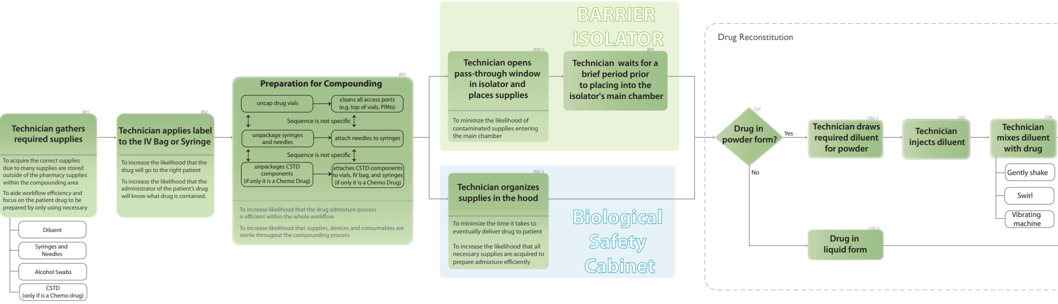
No

Compounding Instructions generated and send to technician via CATO

If Pharmacist finds a discrepancy, contacts prescribing Physician

Technician receives and verifies compounding instructions via CATO terminal outside the hood

C Pharmacy Technician (IV Admixture) Preparation



B01

Technician gathers required supplies

To acquire the correct supplies due to many supplies are stored outside of the pharmacy supplies within the compounding area

To aide workflow efficiency and focus on the patient drug to be prepared by only using necessary

- Diluent
- Syringes and Needles
- Alcohol Swabs
- CSTD (only if is a Chemo drug)

B02

Technician applies label to the IV Bag or Syringe

To increase the likelihood that the drug will go to the right patient

To increase the likelihood that the administrator of the patient's drug will know what drug is contained.

B05

Preparation for Compounding

uncap drug vials → cleans all access ports (e.g. top of vials, PRNs)

Sequence is not specific

unpackage syringes and needles → attach needles to syringes

Sequence is not specific

unpackages CSTD components (if only it is a Chemo Drug) → attaches CSTD components to vials, IV bag, and syringes (if only it is a Chemo Drug)

To increase likelihood that the drug admixture process is efficient within the whole workflow

To increase likelihood that supplies, devices and consumables are sterile througout the compounding process

BARRIER ISOLATOR

B03-1

Technician opens pass-through window in isolator and places supplies

To minimze the likelihood of contaminated supplies entering the main chamber

B04

Technician waits for a brief period prior to placing into the isolator's main chamber

B03-2

Technician organizes supplies in the hood

To minimize the time it takes to eventually deliver drug to patient

To increase the likelihood that all necessary supplies are acquired to prepare admixture efficiently

Biological Safety Cabinet

Drug Reconstitution

C01

Drug in powder form?

Yes

C02-1

Technician draws required diluent for powder

C03

Technician injects diluent

C04

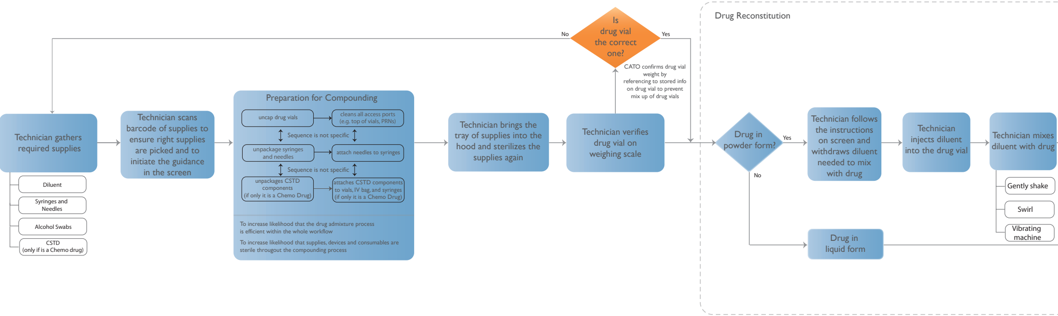
Technician mixes diluent with drug

- Gently shake
- Swirl
- Vibrating machine

No

C02-2

Drug in liquid form



Technician gathers required supplies

- Diluent
- Syringes and Needles
- Alcohol Swabs
- CSTD (only if is a Chemo drug)

Technician scans barcode of supplies to ensure right supplies are picked and to initiate the guidance in the screen

Preparation for Compounding

uncap drug vials → cleans all access ports (e.g. top of vials, PRNs)

Sequence is not specific

unpackage syringes and needles → attach needles to syringes

Sequence is not specific

unpackages CSTD components (if only it is a Chemo Drug) → attaches CSTD components to vials, IV bag, and syringes (if only it is a Chemo Drug)

To increase likelihood that the drug admixture process is efficient within the whole workflow

To increase likelihood that supplies, devices and consumables are sterile througout the compounding process

Technician brings the tray of supplies into the hood and sterilizes the supplies again

Technician verifies drug vial on weighing scale

Is drug vial the correct one?

No

Yes

CATO confirms drug vial weight by referencing to stored info on drug vial to prevent mix up of drug vials

Drug Reconstitution

Drug in powder form?

Yes

Technician follows the instructions on screen and withdraws diluent needed to mix with drug

Technician injects diluent into the drug vial

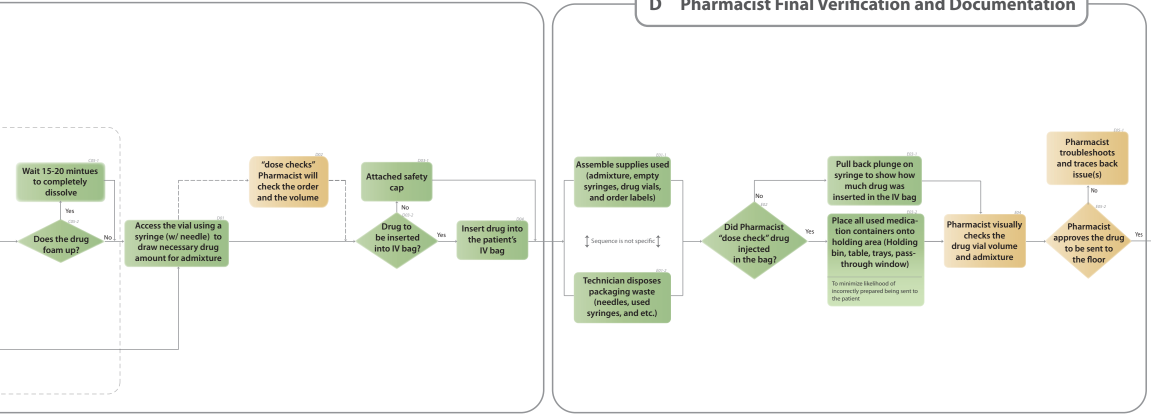
Technician mixes diluent with drug

- Gently shake
- Swirl
- Vibrating machine

No

Drug in liquid form

D Pharmacist Final Verification and Documentation



Wait 15-20 mintues to completely dissolve

Does the drug foam up?

Access the vial using a syringe (w/ needle) to draw necessary drug amount for admixture

“dose checks” Pharmacist will check the order and the volume

Attached safety cap

Drug to be inserted into IV bag?

Insert drug into the patient’s IV bag

Assemble supplies used (admixture, empty syringes, drug vials, and order labels)

Sequence is not specific

Technician disposes packaging waste (needles, used syringes, and etc.)

Did Pharmacist “dose check” drug injected in the bag?

Pull back plunge on syringe to show how much drug was inserted in the IV bag

Place all used medication containers onto holding area (Holding bin, table, trays, pass-through window)

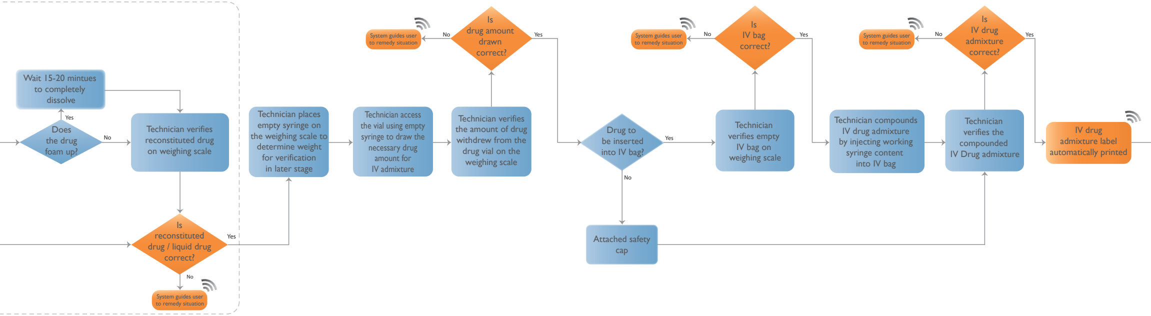
To minimize likelihood of incorrectly prepared being sent to the patient

Pharmacist visually checks the drug vial volume and admixture

Pharmacist approves the drug to be sent to the floor

Pharmacist troubleshoots and traces back issue(s)

Pharmacy Technician Preparation



Wait 15-20 mintues to completely dissolve

Does the drug foam up?

Technician verifies reconstituted drug on weighing scale

Is reconstituted drug / liquid drug correct?

System guides user to remedy situation

Technician places empty syringe on the weighing scale to determine weight for verification in later stage

Technician access the vial using empty syringe to draw the necessary drug amount for IV admixture

Technician verifies the amount of drug withdrew from the drug vial on the weighing scale

Is drug amount drawn correct?

System guides user to remedy situation

Drug to be inserted into IV bag?

Attached safety cap

Technician verifies empty IV bag on weighing scale

Is IV bag correct?

System guides user to remedy situation

Technician compounds IV drug admixture by injecting working syringe content into IV bag

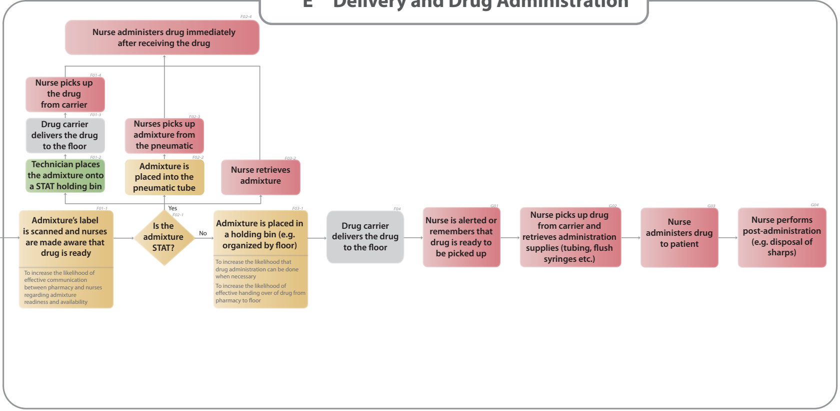
Technician verifies the compounded IV Drug admixture

Is IV drug admixture correct?

System guides user to remedy situation

IV drug admixture label automatically printed

E Delivery and Drug Administration



Nurse administers drug immediately after receiving the drug

Nurse picks up the drug from carrier

Drug carrier delivers the drug to the floor

Technician places the admixture onto a STAT holding bin

Nurses picks up admixture from the pneumatic

Admixture is placed into the pneumatic tube

Nurse retrieves admixture

Admixture's label is scanned and nurses are made aware that drug is ready

To increase the likelihood of effective communication between pharmacy and nurses regarding admixture readiness and availability

Is the admixture STAT?

Yes

No

Admixture is placed in a holding bin (e.g. organized by floor)

To increase the likelihood that drug administration can be done when necessary

To increase the likelihood of effective handing over of drug from pharmacy to floor

Drug carrier delivers the drug to the floor

Nurse is alerted or remembers that drug is ready to be picked up

Nurse picks up drug from carrier and retrieves administration supplies (tubing, flush syringes etc.)

Nurse administers drug to patient

Nurse performs post-administration (e.g. disposal of sharps)

LEGENDS

🟪 Physician

🟨 Pharmacist

🟩 Technician

🟥 Nurse

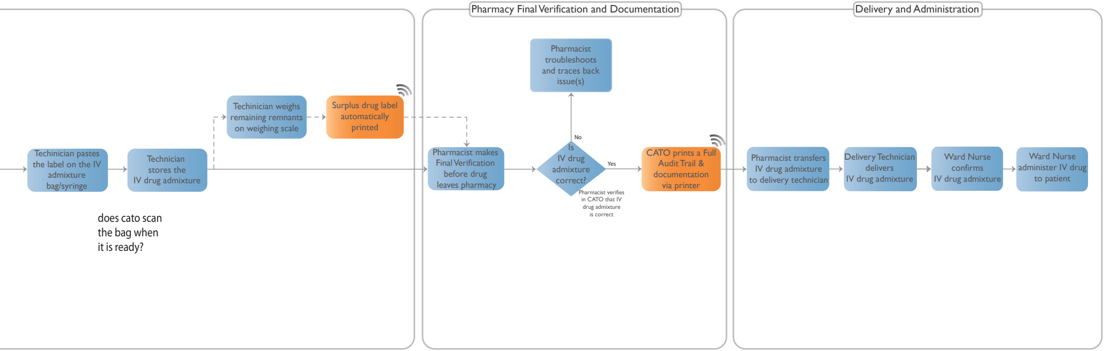
⬜ Carrier

Step of the process

Outcome

🟦 Steps executed by users

🟧 Steps performed by CATO



Technician pastes the label on the IV admixture bag/syringe

Technician stores the IV drug admixture

Technician weighs remaining remnants on weighing scale

Surplus drug label automatically printed

Pharmacy Final Verification and Documentation

Pharmacist makes Final Verification before drug leaves pharmacy

Is IV drug admixture correct?

No

Pharmacist troubleshoots and traces back issue(s)

Yes

Pharmacist verifies in CATO that IV drug admixture is correct

CATO prints a Full Audit Trail & documentation via printer

Delivery and Administration

Pharmacist transfers IV drug admixture to delivery technician

Delivery Technician delivers IV drug admixture

Ward Nurse confirms IV drug admixture

Ward Nurse administer IV drug to patient

does cato scan
the bag when
it is ready?