Chemotherapy Administration

Pertinent Policies: For additional information, review the following policies once you are ON-SITE (these require a PSJH login to access):

Inpatient Oncology Chemotherapy Immunotherapy Administration

Outpatient Oncology Chemotherapy Immunotherapy Administration

1. Only a chemotherapy immunotherapy certified nurse (CICN) may independently administer chemotherapy, targeted therapy and /or immunotherapy (Olsen, Le Febvre, & Brassil, 2019).
    a. Requirements for chemotherapy immunotherapy administration:
        i. Obtain and maintain successful completion of the Oncology Nursing Society/Oncology Nursing Certification Corporation (ONS/ONCC) *Chemotherapy Immunotherapy Certificate Course.*
        ii. For nurses that administer chemotherapy and/or immunotherapy infrequently, the *Fundamentals of Chemotherapy Immunotherapy Administration course* by ONS/ONCC must be completed initially and every two years.
        iii. New hires and /or new to specialty will complete an initial competency that includes demonstration of knowledge and skill in chemotherapy, targeted therapy and /or immunotherapy administration with a preceptor.
        iv. Complete and validate annual continuing education and ongoing competency assessment designed to meet the identified needs of staff in their healthcare setting and emphasize new information available (Neuss et al., 2016 and Olsen et al., 2019).
2. Orders for chemotherapy, targeted therapy, and immunotherapy are written and signed manually or by electronic approval only by licensed independent practitioners (LIP's) who are determined to be qualified by the practice/institution according to the practice/institution guidelines (Neuss et al, 2016).
    a. Verbal, telephone, or text messaging orders for chemotherapy, targeted therapy, and immunotherapy, or modifications to existing orders are not permitted, except to hold or discontinue drugs (Neuss et al., 2016).
    b. Standardized regimen-based electronic or preprinted orders should be used for chemotherapy, targeted therapy, and immunotherapy.
    c. Faxed orders are acceptable.
    d. Avoid the use of abbreviations, acronyms, and other ambiguous methods of communicating drug information.
3. Chemotherapy, targeted therapy and/ or immunotherapy dose and drug verification include three independent verifications for all routes of delivery, before preparation, after preparation and before administration of medication (Neuss et al.,2016 and Olsen et al., 2019):
    a. Use a Closed System Device for administration of Hazardous Drug (Polovich & Olsen, 2018).
    b. Prior to antineoplastic agent or immunotherapy preparation, at least two chemotherapy immunotherapy approved practitioners (i.e., CICN, pharmacist) will independently review patient history and cancer treatment plan (include orders and notes) and verify for accuracy.

c. For chemotherapy protocols only where a treatment plan does not exist in the BEACON (EPIC Oncology Module) library, all orders must be verified against the know protocol or regimen. Protocols from the BEACON library have already been validated by system the Providence Health System Oncology EPIC Liaison Optimization Team (OCELOT)

d. At least two chemotherapy immunotherapy approved practitioners will independently perform antineoplastic drug or immunotherapy verification and calculate dosing, (using current measured, not stated) height and weight, and compare results for accuracy.

    i. Height and weight are considered current if measured at least weekly (Olsen et al., 2019).

    ii. Independently calculated antineoplastic agent and/or immunotherapy doses must be within 10% of the actual ordered dose.

    iii. All unresolved discrepancies or questions regarding antineoplastic agent and/ or immunotherapy orders will be clarified prior to preparation or administration.

    iv. For standard dose modification orders, the rationale will be documented before administration.

    v. For regimens that vary from standard regimens, the prescribing LIP is required to provide and document supporting references for the variance (Olsen et al., 2019).

e. At least two chemotherapy immunotherapy approved practitioners will independently perform drug verification of the prepared medication.

f. At least two chemotherapy immunotherapy approved practitioners will perform verification, immediately before administration at bedside or chairside, of the patient, medication, and pump programming.

4. For vesicant administration (Olsen et al., 2019):

    a. Peripheral IV access may be used for chemotherapy vesicant drugs administered only by IV push or mini-bag infusions of less than 30 minutes. (Exception midline catheters will not be permitted due to increased risk of undetected infiltration and extravasation (Infusion Nurses Society, 2016).

    b. Do not use peripheral IV sites for the administration of vesicants given as continuous infusions.

    c. An infusion pump will not be used to administer peripheral vesicant infusions.

    d. The administering CICN will remain with the patient throughout the entire administration of vesicant IVP and mini-bag infusions.

    e. A central venous catheter is required for vesicant infusions lasting 30 minutes or longer.

    f. Confirm patency and function of the central or peripheral venous catheter by checking for a blood return before, during and after vesicant administration.

    g. If patency and function of the catheter are not confirmed, do not proceed with vesicant administration.

    h. Never administer vesicants by SQ or IM route (Olsen, et al., 2019).

    i. Administer all vinca alkaloids (vesicants) as short term mini-bag infusions to prevent inadvertent administration into CNS (NCCN,n.d. and Neuss et al., 2016).

j. Stop administration immediately if infiltration or extravasation is suspected and infiltration or extravasation protocols implemented per institutional policy.

5. Midline catheters will not be permitted for antineoplastic drug administration.

6. Only RN's who have additional education, training and competency may administer chemotherapy by intraperitoneal, intravascular, intrathecal, intrapleural, or intra-tumor routes.

Standards:

1. Pretreatment for Administration of Chemotherapy (Neuss et al, 2016 and Olsen et al, 2019):

    a. Prior to the preparation of chemotherapy, immunotherapy and targeted agents assess and complete the following:

        i. Confirm that the treatment plan (include orders and notes), protocol and goals of therapy are appropriate for the disease being treated.

        ii. At least two chemotherapy immunotherapy approved practitioners will independently verify accuracy of prescribed therapy for completeness and verify orders are signed by a LIP. Verify accuracy with a reference of the following:

            1. Two patient identifiers
            2. Drug name
            3. Drug dose
            4. Calculation for dosing, including variables used in dosing
            5. Drug volume
            6. Route, sequence, and duration of administration
            7. Rate of administration
            8. Treatment cycle and day of cycle

        iii. Confirm patient's medical history (include cancer diagnosis, treatment history and tolerance, comorbidities, and pertinent surgical history), allergies, risk factors for adverse reactions and current medications to assess if patient appropriate to treat.

        iv. Ensure the patient's height and weight are measured (not stated) and current. Height and weight are considered current if measured at least weekly (Olsen et al., 2019).

        v. At least two chemotherapy immunotherapy practitioners perform independent calculations of the drug doses and compare results for agreement.

            1. Use appropriate methodology/formulas for calculations:

                a. For BSA weight-based dosing, use Mosteller (www.globalrph.com).

                b. For Carboplatin and AUC- based dosing use Cockcroft-Gault formula (www.globalrph.com).

            2. If the independent calculations are not consistent (greater than 10% variance) with the ordered dose, then a clarification order must be obtained from the LIP.

vi. Verify chemotherapy, immunotherapy, or targeted agent doses against a reference.

1. Acceptable resources include: www.chemoregimen.com, up-to-date printed drug and regimen references, or current published dosing guidelines at www.nccn.org.
2. If a nonstandard or research reference is used, ensure that a copy of the reference is available to verify the chemotherapy, immunotherapy or targeted agent ordered regimen.
3. For any discrepancies discovered, the prescribing practitioner must rewrite clarification orders with supporting references prior to treatment.

vii. Confirm clear documentation of dose modification orders with rationale for standard doses that are modified.

viii. Determine if chemotherapy drugs have vesicant or irritant potential.

ix. Review history of previous treatment or infusion reactions.

x. Verify supportive meds ordered and available include pre-medications, hydration, growth factors and infusion reaction order set.

xi. Confirm that the patient/caregiver understands the reason for the visit including chemotherapy agents, supportive drugs to be administered and their side effects.

xii. Assess for any toxicities found during the patient assessment.

xiii. Verify lifetime dosing of the chemotherapy agents tracked in EPIC.

xiv. Confirm lab results are within ordered parameters to administer chemotherapy.

xv. Confirm any pertinent diagnostic testing unique to specific agents have been completed (i.e., cardiac function prior to Doxorubicin, Trastuzumab, etc.).

xvi. Verify consent to receive cancer treatment by at least one of following methods (Olsen, et al., 2019):

1. General hospital consent to treat.
2. Specific patient consent form.
3. Consent documented within the medical record.

2. Chemotherapy Administration:

a. Wash hands and don Personal Protective Equipment (PPE): gown, double gloves, and eyewear.

b. Ensure a chemotherapy spill kit and emergency drugs/equipment for treatment of infusion reaction available in the treatment area.

c. Prior to administration, two chemotherapy immunotherapy approved practitioners will independently compare the prepared medication and label with treatment plan (orders) and verify the following for accuracy:

i. Patient name and second identifier

ii. Drug name

iii. Drug dose

iv. Diluent type (as appropriate) and drug volume

v. Rate of administration

vi. Route of administration

vii. Expiration dates and times

viii. Appearance and physical integrity of the drugs

d. At the patient's bedside (or chair side), two chemotherapy immunotherapy approved practitioners verify the following against the drug label and orders immediately prior to administration:

i. Patient's full name

ii. Second patient identifier (i.e., Date of Birth or Medical Record number)

iii. Drug name, dose, route, and schedule

iv. Confirm infusion pump is programed at the correct rate

e. Document Co-sign Verification, by the second RN, in the EMR.

f. Ensure a closed system transfer device (CSTD) in use and place a plastic-backed pad on the intended work area to absorb potential chemotherapy droplets.

g. Ensure access to LIP during chemotherapy, immunotherapy and/or targeted agent infusions for emergent situations.

h. Observe patient for any hypersensitivity reactions during infusion.

i. After completion of chemotherapy administration, follow ONS Safe Handling practice guidelines for disposal of all equipment and PPE into trace chemotherapy bins.

3. Specific Routes of Administration for Chemotherapy:

a. Intravenous (IV):

i. Peripheral venous access (non-vesicant):

1. An IV site less than 24 hours old is preferred.

2. Assess site for patency, including blood return and complications before and during administration.

3. Choose veins that are smooth and pliable.

4. Sites to avoid for starting IVs for chemotherapy: hand, joints and areas near joints, lower extremities, areas of recent venipuncture, arms with lymph node dissection, impaired circulation, or decreased sensation.

5. Use the smallest IV catheter possible.

6. Verify blood return prior to administration of chemotherapy. If no blood return is present, discontinue the IV catheter and place a new IV catheter in the opposite arm or proximal to the previous IV site.

7. Observe for signs of infiltration (swelling, burning, tightness, cool skin, redness, skin color changes, or flow rate changes).

8. Stop administration immediately if infiltration or extravasation is suspected and infiltration or extravasation protocols implemented per institutional policy.

ii. Central Venous Catheter's (CVC's) (non-vesicant) (Olsen et al, 2019):

1. Assess for signs and symptoms of occlusion prior to administration of antineoplastic therapy.

2. If no blood is present, do not proceed with antineoplastic infusion and follow institutional policy for troubleshooting or declotting of the CVC.

a. Proceed with administration if blood return is re-established.

b. If blood return is not present after attempting to de-clot the CVC, obtain an order for radiographic (dye study, x-ray) confirmation of CVC placement prior to chemotherapy administration.

c. For CVCs with a documented radiographic report demonstrating patency, but no blood return:

i. An LIP order to proceed with chemotherapy must be in place prior to each administration.

ii. Assess catheter or needle insertion site for dislodgement, leakage of IV fluid or edema prior to use and during infusions. (Olsen et al., 2019).

b. Subcutaneous administration (Olsen et al., 2019):

i. Assess for adequate subcutaneous sites.

ii. Review coagulation values and other risks for bleeding.

iii. Use the smallest gauge needle possible.

iv. Avoid scars.

c. Intramuscular administration (Olsen et al., 2019):

i. Assess for adequate muscle sites.

ii. Review coagulation values and other risks for bleeding.

iii. Preferred injection sites include deltoid, vastus lateralis and ventrogluteal. Aspiration not required for these sites (Olsen, et al., 2019).

iv. Avoid scars.

v. Use the smallest gauge needle possible.

vi. Rotate sites.

vii. Document any localized swelling or erythema.

4. Vesicant Administration (Olsen et al., 2019):

a. Peripheral Intravenous (PIV) site precautions:

i. An IV site less than 24 hours old is preferred.

ii. Assess the IV site for patency, including blood return and complications before, every 5-10mls during IVP and after infusion complete.

iii. An infusion pump will not be used for administration to minimize pressure and avoid injury to the vein.

iv. Administer vesicants by IV push or by mini-bag gravity infusion less than 30 minutes, under continuous observation (Olsen et al., 2019).

v. Review with the patient the possibility of extravasation and instruct the patient to immediately report any pain, burning, or feeling of leaking around the IV site.

b. Central Venous Catheter (CVC) precautions:

i. Vesicant administration via CVC may be given via IVP, mini-bag infusion or continuous infusion as ordered.

ii. A CVC is required for vesicants administered over 30 minutes (Olsen et al, 2019).

iii. See CVC (non-vesicants) for remaining precautions.

c. Administration via mini-bag infusion (vesicant):

i. Verify venous access: follow CVC or PIV vesicant administration precautions above.

ii. Assess blood return and IV patency prior to drug administration.

iii. Connect mini bag of vesicant drug directly to the patient's venous access or as a secondary line to a free-flowing primary compatible solution using a CSTD (Polovich & Olsen, 2018).

iv. Administer at the rate according to LIP order.

v. During infusion with peripheral access, verify blood return every 5-10 minutes and after infusion complete (Olsen et al., 2019)

vi. Flush the catheter per policy following administration with a compatible solution.

vii. Closely monitor site for signs and symptoms of extravasation that include: pain, burning, stinging, sensation of coolness, redness, swelling and loss of blood return (Polovich, 2014).

1. Stop administration immediately if infiltration or extravasation is suspected and infiltration or extravasation protocols implemented per institutional policy.

d. Administration via continuous IV infusion (CIVI) for inpatients (vesicant/nonvesicant):

i. Assess for blood return and patency prior to administration, at least every 4 hours, and at the end of the infusion (e.g., no pain, no leaking, no swelling at IV site) (Olsen et.al, 2019). Document blood return checks in the EMR.

ii. Connect continuous infusion medication directly to the patient's venous access or to a primary compatible solution.

iii. Monitor catheter insertion site for needle or catheter dislodgement include: no pain, no leaking, no swelling at IV site (Olsen et.al, 2019).

iv. If patient is tolerating continuous infusion medication, ensure ordered volume is infused by prescribed time. (For chemotherapy only, it is recommended to begin monitoring the volume to be infused several hours prior to completion time).

1. If rate adjustments are needed to complete chemotherapy medication bag on time, consult with pharmacy to confirm new rate.
2. Second nurse cosign is needed for rate adjustments.
3. Stop administration immediately if extravasation is suspected and extravasation protocols implemented per institutional policy.

e. Administration via continuous IV infusion (CIVI) for patients discharged home:

i. Verify blood return prior to initiation of CIVI.

ii. Secure port needle in place with steri-strips and a dressing. PICC lines will have a stabilization device and dressing in place.

iii. When patients are discharged with a portable pump for home continuous infusion, ensure they are instructed on the following:

1. Total dose they are to receive, the length of time the infusion should last, and instruction to routinely check that the pump is not infusing too fast.
2. Troubleshooting alarms and pump malfunctions and who to contact for questions and problems.
3. Steps to take if tubing becomes disconnected, a spill occurs, or a port needle becomes dislodged.
4. Where to go for pump discontinuation (i.e., infusion center, Dr.'s office).
5. Signs and symptoms of extravasation and how to stop pump infusion if extravasation is suspected.
6. Chemotherapy precautions in the home.

iv. Once the patient returns to clinic for pump discontinuation, flush the catheter per policy with a compatible solution.

f. Administration via Intravenous Push (IVP):

i. Refer to CVC or PIV vesicant administration precautions.

ii. Hang primary IV line with solution compatible with IVP medication and allow to run free flow.

iii. Use side-arm administration technique by connecting the syringe with the vesicant agent at the injection port closest to the patient.

iv. Assess blood return to ensure patency by gently aspirating the line. Do not pinch tubing to determine blood return because the vein can rupture. Aspirate with a syringe at the lowest Y-site and clamp off fluid from the bag or use gravity by lowering the IV bag below the patient's IV site (Olsen et al., 2019).

v. Refer to institution guidelines and drug reference for the recommenced rate of administration.

vi. Slowly administer the vesicant to allow free flowing primary IV solution to dilute the vesicant (Olsen et al., 2019).

vii. Check for blood return every 2-5mls throughout administration. (Olsen et al., 2019).

viii. If more than one vesicant is to be administered, flush catheter between agents and at the end of each push with a compatible solution.

ix. Stop administration immediately If infiltration or extravasation is suspected and infiltration or extravasation protocols implemented per institutional policy.

g. If extravasation is suspected (Olsen et al., 2019):

i. Stop infusion and IVF immediately.

ii. Do not attempt to flush.

iii. Disconnect the IV tubing from the IV device. Do not remove the IV device or non-coring port needle.

iv. Attempt to aspirate residual vesicant from IV device or port needle using a 1-3cc syringe.

v. Remove the peripheral IV device or port needle.

vi. Assess the IV site and any symptoms the patient reports.

vii. Notify MD and pharmacy of suspected extravasation and follow institutional policy on extravasation management.

5. Documentation of Chemotherapy Administration:

a. Document the chemotherapy administration and independent verification/safety checks.

b. Document education/information given to the patient/caregiver.

c. Document IV access patency and function prior to, during and after chemotherapy administration.

d. Document patient teaching regarding signs and symptoms of adverse reactions to report.

e. Document the patient response to and tolerance of treatment.

Chemotherapy Extravasation Management

Pertinent Policies: For additional information, review the following policies once you are ON-SITE (these require a PSJH login to access):

Oregon Region Oncology Nursing Chemotherapy Extravasation Management

- Timely management of extravasation to limit adverse patient outcomes due to inadvertent or suspected extravasation of chemotherapy agents based on the best practice recommendations is critical. Specific actions to facilitate rapid response are outlined to be implemented in consultation and approval of responsible physician. Refer to chemotherapy administration policy for the administration and monitoring of chemotherapy for extravasation. Antidotes specific for offending agents are outlined. Pharmacy will maintain a supply of medication used for extravasation management.

1. Vesicant administration will be stopped immediately when extravasation is suspected.
2. Treatment will be initiated for vesicant/irritant extravasation.
3. The physician and pharmacy will be notified whenever vesicant extravasation occurs.

Guidelines:

1. If extravasation occurs or is suspected (Polovich, 2014):
    a. Stop infusion immediately.
    b. Do not attempt to flush.
    c. Disconnect the IV tubing from the catheter connecter. (Do not remove the IV device or the noncoring port needle at this time).
    d. Attempt to withdraw residual vesicant from IV device using a 1-3cc syringe.
    e. Remove the peripheral IV device or the port needle.
    f. Assess the IV site and any symptoms the patient reports.
    g. Notify MD and Pharmacy of expected extravasation.
    h. Identify the specific offending agent(s)/medication(s) and initiate appropriate management measures (See #4 Vesicant/Irritant Management Guidelines).
2. If multiple agents are involved in a combination infusion, the highest risk agent should dictate which guideline to follow.
    a. Anthracyclines have the greatest risk for extravasation. For example, in the EPOCH regimen, doxorubicin has the greater risk for extravasation so the cold protocol should be followed for doxorubicin.
3. Offending agents without a specific antidote should be treated with a warm or cold compress as outlined.
4. Vesicant/Irritant management Guidelines (see table in policy)

1. Cold Protocol (Fidalgo et al., 2012; Polovich, 2014; Schulmeister, 2014):

a. Immediately after initial procedure is completed, apply cold compress/ice pack to affected area to decrease the absorption of the drug. The cold compress should be placed on the affected area for 15-20 minutes and then removed for 30 minutes.

b. This procedure should be repeated continuously for 24 hours.

c. After the first 24 hours, ice should be applied for 15-20 minutes every 4-6 hours until inflammation is gone.

d. The limb should be elevated at all times and exercised at least every 4-6 hours to reduce immobility.

1. Warm Protocol (Fidalgo et al., 2012; Polovich 2014; Schulmeister, 2014):

    a. Apply warm compress to the affected area for 15-20 minutes at least 4 times per day for the first 24-48 hours by any of the following means:

        i. Heating pad (K pad) on moderate setting.

        ii. Instant warm pack.

    b. Continue heat application until the inflammation/discomfort is gone.

    c. The limb should be extended to promote circulation at all times and exercised at least every 4-6 hours to reduce immobility.

2. Guidelines for antidotes (Fidalgo et al., 2012; Polovich, 2014; Schulmeister, 2014):
    a. Antidote : Dexrazoxane for anthracyclines (Doxorubicin, Daunorubicin, Epirubicin, Idarubicin). Liposomal anthracyclines usually only require cold compress unless symptomatic in which case Dexrazoxane may be indicated.

        i. Consider systemic treatment when centrally placed venous catheter extravasations may result in extensive underlying soft tissue involvement, and with large volume extravasations[>2mL] (when ulceration and necrosis is likely to occur), or when a significant amount of time (> 1 hour) has elapsed between discovery of the extravasation and initiation of extravasation management.

        ii. Remove cold compress at least 15 minutes prior to infusion through 15 minutes after infusion.

        iii. Alert provider and pharmacy prior to starting therapy. A physician order is necessary.

        iv. Initiate Dexrazoxane infusion within 6 hours of extravasation via a different IV access site.

            1. Days 1 and 2: Dexrazoxane 1000 mg/m^2 (2000 mg max dose) IV
            2. Day 3: Dexrazoxane 500mg/m^2 (1000 mg max dose) IV

        v. Reduce dose by 50% for patients with a creatinine clearance less than 40 mL/ min [Using the Cockcroft/Gault formula as calculated by the EMR].

        vi. Dilute in 1000 mL 0.9% NaCl and infuse over 1-2 hours in opposite extremity/area than the one affected by the extravasation.

        vii. There is no published data to support the use of DMSO in conjunction with dexrazoxane, and therefore should not be used together.

        viii. Dexrazoxane is considered a Low risk emetogenic agent. Assure appropriate pre-medications such as Prochlorperazine 10mg PO or dexamethasone 12mg are administered prior to administration to prevent nausea and vomiting. Continuous chemotherapy infusions should be held until new central access is obtained in consultation with Physician. If resumption is indicated in the clinical judgment of oncologist consider 20 hr infusion with 4 hour off window for facilitation of follow up doses of Dexrazoxane with 3 hour rest period after Dexrazoxane infusion is complete prior to resumption of continuous infusion.

    b. Antidote: Hyaluronidase (promotes drug dispersion and absorption). Indicated for Vincristine, Vinblastine, and Vinorelbine. Also may be considered for Etoposide,Teniposide, and Ifosfamide.

        i. Stop infusion and aspirate as much solution as possible from site.

ii. Apply warm pack for 15-20 min at least 4 times per day for 24 – 48 hrs.

iii. Cleanse area with povidone-iodine.

iv. Give a test dose of 0.02 mL of 200 unit/ml Hyaluronidase intradermally locally using 25 G needle. Wait 5 minutes before proceeding to Step (v).

v. Inject Hyaluronidase 2 mL (400 units) subcutaneously locally using 25 G needle. Inject (change needle for each injection) in 10 separate injections of 0.2 ml each into extravasation site in and around the compass pattern (Hyaluronidase must not be given IV; death has resulted.)

c. Antidote: Sodium Thiosulfate (neutralizes drug). Indicated for Mechlorethamine or for Cisplatin as indicated by table above.

i. Stop infusion and aspirate as much solution as possible from site.

ii. Make 10 ml of Sodium Thiosulfate 4% solution from either a 25% or 10% stock solution.

1. Using a Sodium Thiosulfate 25% stock solution, add 1.6 ml of 25% Sodium Thiosulfate to 8.4 ml Sterile Water for Injection

2. Using a Sodium Thiosulfate 10% stock solution, add 4 mL of 10% Sodium Thiosulfate to 6 mL Sterile Water for Injection.

iii. Inject 2 ml for each milligram of suspected Mechlorethamine extravasated.

iv. Inject 2 ml for each 100 mg of suspected Cisplatin extravasated.

v. Max volume of 5 ml per site.

vi. Inject subcutaneously with 25 G needle into extravasation site (change needle for each injection).

vii. Apply Cold compress for 6-12 hours following sodium thiosulfate injection.

3. Patient Monitoring and Teaching (Polovich & Schulmeister, 2014):

a. Assess the extravasation area for pain, blister formation, and skin sloughing periodically as needed.

b. Instruct the patient to monitor the extravasation site and report fever, chills, blistering, skin sloughing, and worsening of pain to their provider.

c. Instruct the patient with peripheral extravasation to report arm or hand swelling and stiffness.

d. Instruct patient on any continued home care treatment (i.e. cold or warm therapies as advised).

e. Review with patient any further follow-up visits for extravasation assessments/management as determined by the physician or specialist.

f. In collaboration with the physician or advanced practice nurse, refer the patient to specialized care as needed (i.e. plastic or hand surgery, physical therapy, rehabilitation).

4. Documentation of vesicant extravasation and treatment (Polovich & Schulmeister, 2014):

a. Documentation of extravasation in EMR.

b. Date and time extravasation occurred or was suspected.

c. Type and size of peripheral venous access device or type of CVC and gauge/length of noncoring needle (implanted ports).

d. Location, patency and function of peripheral or central venous access device.

e. Number and location(s) of venipuncture attempts if peripheral vesicant administration.

f. Description and quality of a blood return before and during vesicant administration.

g. Vesicant administration technique (IV push, infusion).

h. Concentration and estimated amount of extravasated vesicant.

i. Symptoms reported by patient (e.g. pain, burning).

j. Description of administration site appearance including measurement of edema and/or redness, if present.

k. Photographs of administration site that include date and time in the photographic field (See PolicyStat #1418340). Cell phones may not be used.

l. Assessment of extremity (if applicable) for range of motion and discomfort with movement.

m. Immediate nursing interventions (e.g. limb elevation, topical cooling or heating; physician notification).

n. Documentation of extravasation treatments/antidotes used.

o. Patient teaching should include protecting the site of extravasation from sunlight, monitor the site, and report fever, chills, blistering, skin sloughing, stiffness, and worsening pain. Document patient understanding of teaching.

Radiation

Pertinent Policies: For additional information, review the following policies once you are ON-SITE (these require a PSJH login to access):

Oncology ASCT Total Body Irradiation (TBI) – Nursing Procedure

EXPECTED OUTCOME/PURPOSE:

To establish guidelines for safe and efficient care of patients receiving total body irradiation.

SPECIAL CONSIDERATIONS:

1. Protocols specify the irradiation exposure and type of administration. TBI may either be given as a total single dose, "fractionated" in multiple doses given once a day over several days, or "hyperfractionated" in multiple doses given two or more times a day over several days.
2. Verify with Radiation Oncology if a RN specifically trained in oncology and stem cell transplant is available in the department. If a certified RN is not available in the department, then a certified RN from the oncology unit must accompany the patient to Radiation Oncology each day and must remain in the department while the patient receives treatment.
3. Radiation can be stopped for administration of antiemetics and other patient care.
4. IV HYDRATION PRIOR TO AND DURING TBI ADMINISTRATION:
    1. Fractionated TBI: fluid therapy above maintenance is not necessary but may be given as TPN and/or hydration during days of irradiation. Hydration can be stopped during the radiation treatment.
    2. Hyperfractionated TBI: fluid therapy may be given as TPN and/or hydration during the days of irradiation. Hydration can be stopped during the radiation treatment. If patient is tolerating oral fluids, hydration may not be necessary.

EQUIPMENT/FORMS:

1. IV tray with appropriate flushes (normal saline/heparin) for venous access device and syringes
2. Alcohol wipes
3. Gloves
4. Appropriate caps for venous access device
5. Medications as prescribed, e.g., antiemetics.

INTERVENTIONS/DIRECTIONS:

1. Verify physician order in patient electronic medical record with the protocol.
2. Ensure that the patient/family has had appropriate teaching and that their questions have been answered.
3. Verify scheduled times for TBI with Radiation Oncology daily.
4. Perform patient assessment, including vital signs, and check lab results. Contact physician if the patient's physical condition suggests contraindication to TBI.

5. Remove all metal, jewelry, glasses, contact lenses and tight fitting clothes.
6. Administer IV hydration as ordered by the physician.
7. Administer pre-meds as ordered by the physician.
8. Consult with Radiation Oncologist before applying any lotion or medication to the skin.
9. Continue post-hydration as ordered by the physician.

TOXICITIES

Nausea and Vomiting: Administer pre-medications 1/2 hour before TBI, per order. Most patients require an antiemetic prior to TBI. Nausea and/or vomiting usually peak 1.5-2 hours after TBI. Premedication with antiemetics may especially help with fractionated TBI and single dose TBI. Scheduled doses of antiemetics may be required if patient experiences nausea and vomiting (see CLIN-22).

Fever: Most patients receiving single dose TBI will be febrile in the hours following the treatment. Although this is an expected side effect, the fever should be evaluated and the patient started on prophylactic antibiotics as ordered by the transplant physician or radiation oncologist.

Parotitis and Pancreatitis: Virtually all patients receiving 10 Gy at one time will get symptomatic parotitis 4-24 hours after irradiation and less than 10% get symptomatic pancreatitis. There have also been rare occurrences of these side effects with fractionated TBI. Both processes resolve in 24-72 hours. Ice packs to the parotids and the use of acetaminophen (Tylenol) may help to relieve the symptoms.

Diarrhea: This is variable and usually develops in the first week following irradiation and may be treated symptomatically with loperamide (Imodium) or diphenoxylate atropine (Lomotil). Stool culture or C. Diff toxin should be obtained per hospital guidelines.

Integumentary Concerns: All metal and tight fitting garments should be removed before treatment. Some patients develop hyperpigmentation 2-3 weeks after irradiation.

Severe Mucositis: This occurs in most patients and is aggravated by the conditioning regimen, neutropenia and the use of methotrexate. It is treated symptomatically with routine normal saline mouth washes, topical agents and, in some instances, IV narcotics. Severe mucositis with bleeding and inflammation may compromise respiration. Stridor in such a situation is a sign of impending obstruction and should be treated as a medical emergency. Consider elective intubation (see CLIN-29).

Late Effects: There is the possibility of cataract formation, growth retardation, pulmonary damage, and carcinogenesis as well as the probability of sterilization.

Note: Potential for fluid deficit is increased due to vomiting, diarrhea and fever. Patients with increased tumor load need extra hydration for blood flow to kidneys. Fluids can be combination of TPN, lipids and hydration. Hydration is continued for 24 hours post TBI.