rituximab (rit-tux-i-mab)

**Indications**
- B-lymphoproliferative disorders: low-grade and follicular (DHCL)
- CD-20 positive chronic lymphocytic leukemia (CLL)
- Moderate to severe rheumatoid arthritis

**Pharmacokinetics**
- **Absorption:** IV administration results in complete bioavailability.
- **Distribution:** Binds specifically to the CD20 binding site on lymphoma cells.
- **Half-life:** 59.8–174 hr (depending on tumor burden).

**Contraindications/Precautions**
- Hypersensitivity to murine (mouse) proteins
- OB: Can pass placental barrier potentially causing fetal B-cell depletion. Give only if clearly needed
- Use cautiously in:
  - Pre-existing bone marrow depression
  - Systemic lupus erythematosus
  - HIV infection

**Adverse Reactions/Side Effects**
- CNS: PROGRESSIVE MULTIFOCAL LEUKOENCEPHALOPATHY
- Resp: bronchoconstriction, cough, dyspnea
- CV: arrhythmias, hypotension, peripheral edema
- GI: abdominal pain, altered taste, dyspepsia
- Derm: mucocutaneous skin reactions, flushing, urticaria
- Endo: hyperglycemia
- F and E: hypocalcemia
- Hemat: anemia, neutropenia, thrombocytopenia
- Misc: infusion reactions, fever/chills/rigors

**Interactions**
- Drug-Drug: None known.

**Route/Dosage**
- **Relapsed or Refractory, Low-Grade or Follicular, CD20–Positive, B-Cell NHL**
  - IV (Adults): 375 mg/m² once weekly for 4 or 8 doses; may retreat with 375 mg/m² once weekly for 4 doses.

- **Previously Untreated Follicular, CD20–Positive, B-Cell NHL**
  - IV (Adults): 375 mg/m² on Day 1 of each cycle of CHOP for up to 6 doses; if patients experience complete or partial response, give 375 mg/m² (as monotherapy) for up to 4 additional cycles.
every 8 wk for 12 doses (initiate this maintenance therapy 8 wk after completion of rituximab - CVP regimen).

**Non-Progressing Low-Grade, CD20–Positive, B-Cell NHL**

**IV (Adults):** For patients who have not progressed following 6–8 cycles of CVP chemotherapy, 375 mg/m² given once weekly for 4 doses given every 6 mo for up to 16 doses.

**Diffuse Large B-Cell NHL**

**IV (Adults):** 375 mg/m² given on Day 1 of each cycle of chemotherapy for up to 8 infusions.

**CLL**

**IV (Adults):** For patients who have not progressed following 6–8 cycles of CVP chemotherapy, 375 mg/m² given once weekly for 4 doses given every 6 mo for up to 16 doses.

**Rheumatoid Arthritis**

**IV (Adults):** Two 1000 mg infusions separated by 2 wk.

**GPA and MPA**

**IV (Adults):** 375 mg/m² once weekly for 4 wk.

**NURSING IMPLICATIONS**

**Assessment**

- Monitor patient for fever, chills, rigors, nausea, vomiting, headache, pruritus, bronchospasm, diarrhea, ulceration, flushing, and pain at disease sites. Infusions related events occur frequently within 30 min–2 hr of beginning first infusion and may resolve with slowing or discontinuing infusion and treatment with IV saline, diphenhydramine, and acetaminophen.

- Patients with increased risk (females, patients with pulmonary infiltrates, chronic lymphocytic leukemia, or mantle cell leukemia) may have more severe reactions, which may be fatal. Signs of severe reactions include hypotension, angioedema, hypoxia, or broncho- spasm and may require interruption of infusion. May result in pulmonary infiltrates, adult respiratory distress syndrome, MI, ventricular fibrillation, and cardiogenic shock. Monitor closely.

- Incidence decreases with subsequent infusions.

- Monitor patient for tumor lysis syndrome due to rapid reduction in tumor volume (acute renal failure, hyperkalemia, hypercalcemia, hyperuricemia, or hypophosphatemia) usually occurring 12–24 hr after first infusion. Risks are higher in patients with greater tumor burden; may be fatal. Correct electrolyte abnormalities, monitor renal function and fluid balance, and administer supportive care, including dialysis, as indicated.

- Assess patient for hypersensitivity reactions (hypotension, bronchospasm, angioedema) during administration. May respond to decrease in infusion rate. Premedication with diphenhydramine and acetaminophen is recommended. Treatment includes diphenhydramine, acetaminophen, bronchodilators, or IV fluids as indicated. Epinephrine, antihistamines, and corticosteroids should be readily available in the event of a severe reaction. If severe reactions occur, discontinue infusion; may be resumed at 50% of the rate when symptoms have resolved completely.

- Monitor ECG during and immediately after infusion in patients with pre-existing cardiac conditions (arrhythmias, angina) or patients who have developed arrhythmias during previous infusions of rituximab. Life-threatening arrhythmias may occur.

- Assess for signs of progressive multifocal leukoencephalopathy (hemiparesis, aphasia, confusion, cognitive deficiencies, and ataxia) periodically during therapy.

- Assess for infection during and for 1 yr after therapy. Bacterial, fungal, and new or reactivated viral infections may occur. Screen patient for hepatitis B infection prior to therapy. Discontinue rituximab and any concomitant chemotherapy in patients who develop viral hepatitis or other serious infections, and institute appropriate treatment.

- Assess for mucocutaneous reactions periodically during therapy. May cause Stevens-Johnson syndrome and toxic epidermal necrolysis. Discontinue therapy if severe or accompanied by fever, general malaise, fatigue, muscle or joint aches, myalgia, oral lesions, conjunctivitis, hepatitis and/or eosinophilia.

- **Lab Test Considerations:** Monitor CBC and platelet count regularly during therapy and frequently in patients with blood dyscrasias. May cause anemia, thrombocytopenia, or neutropenia. Frequently causes B-cell depletion with an associated ↓ in serum immunoglobulins in a minority of patients; does not appear to cause an increased incidence of infection.
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rituximab

- Obtain HBsAg and anti-HBc to screen patient for HBV infection before initiating therapy. May cause reactivation of hepatitis B up to 24 months after therapy.

Potential Nursing Diagnoses

- Risk for infection (Side Effects)

Implementation

- Do not confuse rituximab with infliximab.
- Transient hypotension may occur during infusion; antihypertensive medications may be held for 12 hr before infusion.
- Discontinue arthritides. Administer 100 mg methylprednisolone IV or equivalent 30 min prior to each infusion to minimize infusion reactions.
- G-CSF and HPA: Administer methylprednisolone 100 mg/kg per day for 1 to 3 days followed by oral prednisone 1 mg/kg/day (not to exceed 60 mg/day) and tapered per clinical need to treat severe vasculitis symptoms. Begins regimen within 14 days prior to or with the initiation of rituximab and may continue during and after the 4-week course of rituximab treatment.
- Prophylaxis against Pneumocystis jiroveci pneumonia and herpes virus recom-

IV Administration

- For previously untreated Non-Hodgkin lymphoma and B-cell non-Hodgkin's lym-
- phoma, if no Grade 3 or 4 infusion-related reactions occurred in Cycle 1, may administer via 90–min infusion using glucocorticoids. Begin at rate of 100 mg/hr and increased by 100 mg/hr every 30 min intervals to a maximum of 400 mg/hr.

Patient/Family Teaching

- Inform patient of the purpose of the medication. Advise patient to read the Medi-
- cation Guide prior to starting therapy and before each infusion in case of changes.
- Advise patient to notify health care professional promptly if fever; chills; cough; hoarseness; sore throat; signs of infection; lower back or
side pain; painful or difficult urination; bleeding gums; petechiae; blood in stools, urine, or emesis; increased fatigue; dyspnea; or thready pulse; or painful ulcers or sores on your skin, lips, or in mouth. Blistering, peeling skin, rash, pustule occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush and electric razor and to avoid falls. Caution patient not to drink alcoholic beverages or take medication containing aspirin or NSAIDs; may precipitate gastric bleeding.

- Advise patient to consult health care professional prior to receiving any vaccinations.
- Instruct patient to use effective contraception during therapy and for 12 mo following therapy, and to avoid breast feeding.

Evaluation/Desired Outcomes
- Decrease in spread of malignancy.
- Reduced signs and symptoms of rheumatoid arthritis.
- Achievement of complete remission in GPA and MPA.

Why was this drug prescribed for your patient?