ABSTRACT

Multidisciplinary comprehensive care of patients with rheumatoid arthritis (RA) enhances clinical outcomes and improves quality of life. The introduction of biologic therapies for RA has offered promising alternatives to traditional oral therapies. As members of the multidisciplinary team, rheumatology infusion nurses are central to patient evaluation, monitoring, education, and treatment plans. As the role of rheumatology infusion nurses continues to evolve, optimal patient care is promoted through nursing mentorship and patient advocacy.


In 1925, safe intravenous (IV) therapy began with physician-administered normal saline.1 Infusion nursing began in 1940 when Ada Plumer became the first “IV nurse,” her only requirement being the ability to perform venipuncture skillfully.12 Since then, infusion nursing has evolved into subspecialties (ie, oncology and rheumatology) and has become part of a multidisciplinary patient care approach. Promotion of patient safety and management of overall patient well-being has become the primary responsibilities of infusion nurses. Policy and procedure development, patient and colleague education, mentorship, research, and reimbursement management are also important responsibilities of infusion nurses.1

Because disease-modifying antirheumatic drug (DMARD) therapy is trending toward the use of biologics, rheumatology infusion nurses have become vital to successful rheumatoid arthritis (RA) therapy. Specialized infusions of biologics require disease state understanding, clinical expertise in administration, and diligent monitoring of adverse events (AEs). Because RA nurses are directly involved with patient care, they become integral in treatment decisions, patient advocacy when therapies are not effective, and patient perceptions of their choice of treatment modality.3 Nursing objectives should focus on the prevention of long-term joint damage and the enhancement of quality of life.

As drug technology and treatment advancements continue in rheumatology, mentorship and continual education are become increasingly needed. Professional societies, such as the Rheumatology Nurses Society (RNS), were founded to meet these needs.

TREATMENT APPROACH

Patients should be referred early to a rheumatologist for RA diagnosis and treatment. An oral DMARD is typically initiated but may be changed to a biologic if oral therapy fails to control disease. The choice of biologic agent should be based on a collaborative decision between physicians and patients. This choice should be based on several factors including the
patient’s lifestyle, support system, health history, and comfort level with risk-benefit profiles. Additionally, insurance coverage and financial impact should be considered and is often the deciding factor in agent selection. Treatment plans of care should recognize the long-term commitment of patients to therapy and the physical and emotional effects of RA. Ongoing patient assessments should include AE monitoring, response to therapy, and overall health status evaluation.

Ms Daul: Although our role as infusion nurses is multifocal, our influence on patient financial decisions can be significant. Patients may not understand insurance benefits and copayment structures or may be unaware of changes in coverage. Verifying and explaining benefits is crucial to improving therapy compliance. When patients demonstrate financial need, nurses can investigate pharmaceutical company patient assistance programs (PAPs). Patients may opt to refuse therapy or delay scheduled infusions because of high costs, decisions that can be avoided if nurses provide financial information and clinical education.

Ms Dexter: As copayment costs continue to rise, patient compliance is impeded, and financial advocacy has become essential.

Ms Dillard: Periodic insurance verification is time-consuming but important. PAPs may include copayment assistance.

Ms Dexter: One considerable challenge is patients who do not qualify for PAPs, particularly elderly or disabled patients on Medicare Part B or Part D programs.

Ms Neuberger: Is it Federal law that prevents Medicare patients from PAPs?

Ms Ruffing: It is my understanding that a Medicare Part D Act provision prevents patients from qualifying for some PAPs.

Ms Daul: Patient comorbidities can contribute to copayment costs for prescription therapies, which may affect compliance with not only biologics but also other medications. For example, patients may halve pills for hypertension to save money. Because RA is associated with cardiovascular disease (CVD) manifestations, this noncompliance affects both hypertension and RA morbidity.

Ms Dolan: Noncompliance may occur when patients are billed for previously covered biologics, as seen recently with Medicare changes. In my practice, the county formulary restricts biologics that are available for indigent patients with RA. Through diligent lobbying and negotiation, new biologics are added to this formulary.

As patient liaisons and primary caregivers, nurses are strategically positioned to become involved in legislative advocacy to improve rheumatology care. The American College of Rheumatology (ACR) Web site (Table 1) offers useful resources, including form letters and contact information, for advocacy efforts. This information can be shared with patients because personal stories are very influential.

Ms Ruffing: The ACR Web site also provides a list of PAPs for rheumatology-related therapies, including comorbidity therapies (Table 1).

Ms Neuberger: Rheumatology clinics associated with hospitals may have access to charity care through endowment funds established by benefactor gifts.

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ACR = American College of Rheumatology; AARP = American Association of Retired Persons; NCA = National Council on Aging.
Ms Ruffing: State arthritis foundations may provide grants for indigent care (Table 1). However, the amount available varies from state to state, and the application process can be tedious.

Ms Dexter: Lengthy documentation requirements for insurance and charity care can detract from providing optimal patient care.

Ms Dilliard: Insurance denials can prevent patients from receiving optimal improvement in quality of life and productivity. Because RA is not defined as a primary terminal illness, comprehensive insurance coverage might be prevented. As therapy costs with biologics continue to increase, legislation affecting insurance coverage should recognize the impact of undertreating RA.

Ms Dolan: Increased mortality should be recognized with RA because it shortens life expectancy by 5 to 15 years as discussed by Dr Saleh. Patients with RA have a roughly 4-fold increase in CVD event risk. If fatal, cardiac-related death is typically reported, which diminishes RA association to mortality. If not fatal, cardiac-related disability is typically reported, which diminishes RA association to disability. RA becomes a secondary comorbidity. Disability places a tremendous societal burden, which can be prevented if appropriate RA therapy is administered.

Ms Dexter: Because depression is a leading cause of disability, disability is compounded in patients with RA given that many are depressed, especially if experiencing chronic pain.

Ms Neuberger: A recent article in *Arthritis & Rheumatism* discusses an observational study that investigated the relationship of circulating tumor necrosis factor α receptors (TNFRs) and mortality in patients with RA. After 13 years, 48.5% of patients died from CVD, and a significant association between all-cause mortality and baseline TNFR levels was identified. Because many biologics target TNF-α, this study provides evidence to support the use of biologics to decrease mortality in patients with RA.

**INFUSION NURSE RESPONSIBILITIES**

As members of the multidisciplinary healthcare team, infusion nurses should understand RA disease and treatment, particularly that involving biologics. Building nurse-patient relationships enables nurses to become familiar with patient needs, to effectively communicate, and to improve patients’ functional independence. Nurses are often well positioned to monitor for changes or worsening of disease symptoms and for potential AEs. Additionally, nurses are critical to proper reimbursement through documentation and insurance verification.

**PATIENT ASSESSMENT**

Patient assessment encompasses the entire infusion process. Initial assessments should include concomitant medications, allergy history, medical history, and age, whereas subsequent assessments should include screening for infections, AEs, and response to therapy. Treatment decisions can be influenced by patient age and other factors, including comorbidities and past infections (ie, congestive heart failure and hepatitis). The Health Assessment Questionnaire (HAQ) provides a comprehensive measurement tool for response to therapy. Assessment and monitoring considerations for various biologics are summarized in Table 2.

| Table 2. Summary of Nursing Assessment and Monitoring Considerations for Various Biologics |
|---------------------------------|---------------------------------|---------------------------------|
| **Infliximab**                  | **Abatacept**                   | **Rituximab**                   |
| Tuberculosis/hepatitis B reactivation | Serious infections                      | Tuberculosis/hepatitis B reactivation |
| Lupus-like syndrome            | Hematologic events                | Serious infections                      |
| Malignancies                   | Hypersensitivity                   | Chronic obstructive pulmonary disorder |
| Congestive heart failure       | Neurologic events                  | Pregnancy (Category C)              |
| Hepatotoxicity                 |                                     | Malignancies                        |
|                               |                                     | Live vaccines not recommended        |
|                               |                                     | Heart or lung problems               |
|                               |                                     | Pregnancy (Category C)               |
|                               |                                     | Mucocutaneous reactions              |

Data from Infliximab [prescribing information]; Abatacept [prescribing information]; Rituximab [prescribing information].
Ms Dolan: In the clinic setting, a modified HAQ improves assessment of disease progression and treatment success. It is also useful for patient education, given that patient perceptions of functional status can be measured more objectively.

Ms Ruffing: Insurance companies may currently require RA assessment tools, such as ACR20 (ACR 20% improvement criteria), C-reactive protein, and erythrocyte sedimentation rate, to justify the use of biologics. HAQ could become a future requirement.

Ms Daul: Documenting visual analogue scale pain scores and duration of AM gel (morning stiffness) at every patient visit provides a reference point for response to therapy. This may be useful for physician assessment and insurance authorization. Additionally, response patterns can be explained to patients to reinforce compliance.

Patient Education

Patient education can be used to provide psychosocial support, dispel misconceptions, and improve compliance. Treatment schedules, potential AEs, reimbursement concerns, and methods to promote quality of life should be discussed.

Drug Preparation and Administration

For individual biologics, nurses should understand manufacturer recommendations for handling, preparation, and administration. Requirements for premedication and special equipment (ie, filtered tubing, silicone-free syringes, and rate control devices) must be observed. Infusion rates, volume, duration, and frequencies can differ not only for individual biologics but also for disease indication (ie, RA, lymphoma, and Crohn's disease).

AE Monitoring and Management

Infusion-related reactions (ie, headache, pruritus, urticaria, facial flushing, shortness of breath, chest tightness, and hypotension) may be acute or delayed. Reactions may be prevented through premedications and avoidance of prolonged drug holidays between infusions. During infusions, vital sign monitoring may be necessary, and emergency protocols and medications (ie, acetaminophen, antihistamines, glucocorticoids, epinephrine, oxygen, and IV fluids) should be readily available. Nursing assessment skills and patient instruction to report unusual occurrences provide ongoing monitoring. In addition to infusion reactions, overall well-being (ie, infections and extravascular changes) should also be routinely assessed.

Reimbursement

Nurses should be familiar with insurance requirements, PAPs, outside funding sources, and professional organizational activity because these resources provide patient financial support and advocacy.

Safety Considerations

Because biologics alter immune function, concerns about immune-related adverse effects, specifically infection and malignancy, are raised. Latent tuberculosis or hepatitis B reactivation has been associated with biologics. Induction of malignancy associated with RA is thought to result from immunosuppression related to biologic therapy. Biologics are associated with a higher prevalence of non-Hodgkin's lymphoma and may be associated with skin cancer. Biologics are not associated with solid cancers or lymphoproliferative malignancies.

Ms Dolan: At my institution, some attending physicians request tuberculosis screening when patients return from foreign travel. Live vaccines are not administered to patients on biologics. Pneumococcal and influenza vaccines are safe and recommended. In pediatrics, the child may receive regular immunizations except those that are live or attenuated (ie, measles-mumps-rubella [MMR], oral polio, or varicella). There are no alternatives for the MMR or varicella vaccines; however, intramuscular polio may be given rather than oral polio. In addition, tuberculosis skin test is recommended. The infusion nurse's role in communicating this information to the patient and primary care providers is an important safety consideration.

Ms Daul: Because some biologics contain maltose or sucrose, patients with diabetes should be counseled that blood glucose could be falsely elevated on infusion days, and they should follow the advice of their physicians.

Dr Saleh: Although rare, patients initiated on biologics should be informed of the risk of skin cancer. Prophylactic measures, such as mole observation and annual dermatologic examinations, should be stressed.

Ms Dexter: Skin cancer counseling is particularly important for patients in warm climate states.
PATIENT CONSIDERATIONS AND CONCLUSIONS

As patient liaisons, nurses serve an essential role in patient education and support. Due to the physically disabling effects of RA, patients often feel helpless, develop low self-esteem, and become depressed. In addition to disease management, nursing plans of care should include psychosocial assessment. Educating patients about disease processes and treatment options enhances compliance and changes perspectives. Nursing support includes family education and community resource information (ie, Internet, support groups, and Arthritis Foundation; Table 1).

The ultimate goal of managing RA is the prevention of joint damage and functional loss while decreasing pain. Providing detailed, realistic therapy information facilitates patient decisions and respects patient autonomy in the decision-making process. Rheumatology infusion nurses should focus their care on patient safety and advocacy.

DISCUSSION

**Dr Saleh:** Because biologics are generally considered comparable in efficacy and safety profiles, selection of an appropriate agent should focus on patient considerations. These considerations may include self-injection capability, compliance, insurance coverage, and lifestyle. Younger patients in the workforce would possibly prefer subcutaneous self-administration whereas patients with compliance problems or inadequate family support would possibly prefer supervised clinic infusions. Some infusion clinics may have less choice in agent selection because of financial incentives, such as contract pricing, grants, or formulary restrictions.

General practitioners should recognize early RA symptoms and refer patients to rheumatologists quickly, particularly because available rheumatology appointments are scarce. Some rheumatology clinics may designate acute appointment times. Other clinics may direct internists under rheumatologist supervision about RA management to facilitate oral DMARD initiation before rheumatology appointments.

**Ms Dilliard:** AEs and administration techniques of biologics are discussed with patients to allow participation in prescribing decisions. However, cost is typically the driving force in patient decisions. As compared to self-administration, infusion clinics are more favorable for monitoring, particularly for undetected infections (ie, foot blisters). Some patients opt for subcutaneous injections in clinics because nursing examinations are also performed. The recommended dosage range for infliximab may offer more flexibility than some biologics because it can be titrated for therapy response.

**Ms Dexter:** Dose flexibility is favorable clinically; however, increasing dosing can increase patient copayment obligations.

**Ms Dilliard:** Biologics increased from once every other week to weekly will essentially double copayment obligations.

**Ms Ruffing:** Rheumatology specialists at larger academic centers are often consulted by patients who travel great distances. When patients return home for therapy at local infusion clinics, the monitoring policies of these clinics is not typically known. Standardized prescriptions, protocols, or order sets for biologics could ensure that patients receive consistent optimal care.

**Ms Dawn:** Standardized protocols could also be valuable for patients coming from skilled nursing centers to infusion clinics. Prescreening status, such as tuberculosis testing and travel history, would be shared, and post-infusion instructions could be communicated to skilled nursing centers.

**Ms Dolan:** In-services presented by academic centers to local infusion centers could convey best practice information in addition to new drug information.

**Ms Ruffing:** Telephone consultation could also disseminate information to local centers, especially helpful information not defined in clinical guidelines.

**Ms Neuberger:** Practical experience of larger centers may provide valuable observations to smaller centers, such as the most common side effects observed during infusions and how these effects can be avoided or treated.

**Ms Dilliard:** Because small infusion practices in physicians’ offices may be staffed by floating medical assistants (MAs), standardized protocols could improve patient safety and quality of care.

**Ms Dexter:** One goal of the RNS is the eventual availability of standardized infusion guidelines to all nurses involved with biologic administration.

**Ms Grace:** These guidelines could be especially useful to hospital infusion nurses because many are not fully trained in RA pathology and drug monitoring requirements. Physician office-based infusions are particularly problem-prone because underqualified MAs or
licensed practical nurses (LPNs) may not fully understand RA therapies.

Ms Daul: State laws governing MA and LPN duties differ, which stresses the importance of standardized guidelines. Nurse infusion societies could provide a central resource for guidelines that emphasize the need for expertise, skill, accountability, and monitoring when infusing biologics.

Patients should understand that in-office based infusion centers are conducive to building patient-nurse relationships, especially on the psychosocial level. However, when offered infusion setting choices, patients should inquire about the credentials of the person administering the biologic agent.

Ms Dilliard: As per state laws, MAs can appropriately share responsibilities in infusion clinics, such as starting peripheral IV sites.

Ms Ruffing: States laws may allow physicians to delegate biologic administration to MAs and LPNs, but physicians should carefully delegate these responsibilities. Errors or inappropriate administration could have unintentional but serious consequences.

Dr Saleh: Credentialing after performing a required number of supervised infusions could be a suitable method of evaluating MA proficiency.

Ms Grace: In summary, education and understanding are key concepts.

Ms Dilliard: Because RA increases the risk of shingles, and zoster vaccination is recommended for most adults aged 60 and older, patients with RA are requesting the vaccine. The vaccine is live and should not be given to patients receiving biologics.

Ms Ruffing: Patients with RA not receiving biologics should receive the shingles vaccine. The human papillomavirus vaccine is not live and may be given to young women as recommended.

Dr Saleh: The Centers for Disease Control and Prevention Web site provides adult vaccination recommendations, including recommendations for the immunocompromised host (Table 1).

Ms Dilliard: Internists may be unaware of live vaccination precautions in patients with RA receiving biologics.

Ms Dexter: Patients with RA receiving biologics and younger than 60 years, including pediatric patients, have contracted shingles.

REFERENCES