Antibiotic Stewardship Strategies: Outpatient Hemodialysis Facilities

Hemodialysis

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Antibiotic use in outpatient hemodialysis facilities

Nearly 500,000 people in the United States receive maintenance hemodialysis in a given year.[1] Patients on maintenance hemodialysis experience disproportionately high rates of colonization and infection with multidrug-resistant organisms (MDROs).[2, 3] Studies suggest that hemodialysis is a risk factor for Clostridioides difficile infection, with higher rates of recurrence.[4, 5] These elevated risks likely reflect a combination of underlying immunocompromise associated with renal failure, frequent antibiotic and healthcare exposures including invasive devices, and altered pharmacokinetics in dialysis patients, often resulting in prolonged antibiotic half-lives.[2, 6]

Antibiotic exposure in this population is common. At least 30% of patients on maintenance hemodialysis receive intravenous (IV) antibiotics annually.[7] Vancomycin is the most frequently prescribed IV agent, accounting for about 70% of initial IV doses in the hemodialysis setting.[8, 9] Some studies estimate that up to 30% of IV antibiotic doses administered to patients on maintenance hemodialysis were unnecessary or inappropriate.[10, 11] A frequent example of inappropriate prescribing is treating β-lactam-susceptible organisms with vancomycin, where more effective alternatives are recommended.[12]

Factors that may impact antibiotic prescribing in outpatient hemodialysis facilities

- **Facility staffing:** Nephrologists cannot always be present during dialysis sessions, so reports from nurses and other frontline staff frequently drive decisions to start antibiotics.
- **Access to specialists:** Most dialysis facilities do not have ready access to infectious diseases or pharmacy expertise to guide prescribing decisions.
- **Care transitions:** Communication and transfer of information between the acute care facilities and outpatient dialysis facilities may be incomplete or inconsistent. Similarly, dialysis providers may be unaware of antibiotics (particularly oral antibiotics) prescribed in other outpatient or ambulatory settings.
- **Clinical guidance:** Standards and guidelines for diagnosing and treating common infections may not always account for hemodialysis populations.

Antibiotic stewardship strategies for outpatient hemodialysis facilities

Antibiotic stewardship strategies can be adapted to the dialysis setting to support safer, more effective antibiotic prescribing. Key strategies include:

- **Support infection prevention and sepsis prevention efforts.** Engage healthcare staff and patients in preventing infections with an emphasis on bloodstream and vascular access infections.[2] Provide clinicians with training on early sepsis diagnosis and management, appropriate empiric antibiotic selection and dosing for bloodstream and vascular access infection, and therapy adjustment based on microbiology results. Ensure patients on hemodialysis are up to date on all recommended vaccines.
- **Standardize blood culture collection.** Implement standardized practices and staff training to improve blood culture collection, emphasizing culture collection prior to antibiotic initiation.[2] This supports accurate diagnosis and targeted therapy.
- **Optimize the treatment of methicillin-susceptible Staphylococcus aureus (MSSA) infections.** For patients with MSSA blood stream infections, β-lactams are associated with better treatment outcomes than vancomycin.[13] However, continuation of vancomycin instead of β-lactams for MSSA bacteremia is one of the most common reasons for inappropriate antibiotic use in dialysis settings.[7] To support appropriate use, facilities can incorporate electronic alerts in prompting clinicians to review MSSA therapy and establish reliable processes to receive and communicate culture results to clinicians.
- **Standardize communication between nursing staff and prescribers.** Implement practices to improve communication between onsite nurses and prescribing physicians or advanced practice clinicians. A structured communication tool, such as the SBAR (Situation, Background, Assessment, and Recommendation), can ensure accurate capture, documentation, and communication of critical information.[14]
- **Enhance communication across care transitions.** Strengthen information transfer across transitions of care between the outpatient dialysis facilities and other healthcare settings. This may include developing standardized transfer forms for use with hospitals and long-term care facilities and establishing local data-sharing agreements to ensure continuity of care.[2]

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