

Some practitioners have responded by using the PVC tubing with the NTG and working around the problem. This is justified by some in that even though a great amount of drug is lost, the amount of drug the patient receives is based on hemodynamic functions. But when the previous set is replaced, retitration of the drug is necessary. To allay this problem, several manufacturers market non-PVC-containing pump administration sets.

In similar fashion to coping with the adsorption phenomenon of drugs to IV containers and/or administration sets, pharmacists must also be cognizant of the absorption phenomenon with flexible PVC materials and take appropriate steps to prevent it. The significance of the loss is magnified with drugs that are used in small quantities because a small amount lost to absorption results in a higher percentage loss of the drug delivered to the patient.

Handling and Disposal of Chemotherapeutic Agents for Cancer

In 1982, health care personnel became aware of environmental contamination from handling cytotoxic agents. Mutagenic and allergic case reports began to emerge in the literature, and in 1985, in response, the American Society of Hospital Pharmacists (now the ASHP) published its initial technical assistance bulletin on handling cytotoxic and hazardous drugs. This was revised in 1990. In 2006, ASHP issued their Guidelines on Handling Hazardous Drugs that replaced the technical assistance bulletin (38). These guidelines provide recommendations for the safe handling of hazardous drugs, environmental and ventilation controls, personal protective equipment, work practices, and hazardous waste containment and disposal. Unlike USP <797>, this is not an enforceable document; however, practitioners should be familiar with the ASHP guidelines along with publications from OSHA and NIOSH. Appendices include use of personal protective equipment, BSCs, and isolators, reducing

exposure to hazardous drugs during administration, spill kits, and treatment of workers with direct skin or eye contact with hazardous drug.

IRRIGATION AND DIALYSIS SOLUTIONS

Solutions for irrigation of body tissues and for dialysis are subject to the same stringent standards as parenteral preparations. The difference is in use. Irrigation and dialysis solutions are not injected into the vein but employed outside of the circulatory system. Because they are generally used in large volumes, they are packaged in large containers, generally of the screw cap type, which permits rapid pouring. Dialysis solutions generally appear similar to IV bags, and irrigation solutions are screw-capped or bagged, so caution is necessary to avoid selecting the wrong product.

It is important to note that hemodialysis and peritoneal dialysis procedures have the capability to enhance the plasma clearance of a drug. In instances of clearance by 30% or more, supplemental dosing may be required or dosing after dialysis should be considered. Variations in duration of dialysis, flow rates, dialysis membrane type, and whether peritoneal dialysis is continuous or intermittent, all affect the extent of drug clearance. Drugs that have been shown to be cleared from plasma by hemodialysis, for example, include acetaminophen, captopril, cefaclor, imipenem, lithium, and metformin.

Irrigation Solutions

Irrigation solutions are intended to bathe or wash wounds, surgical incisions, or body tissues. Examples are presented in Table 15.8.

Dialysis Solutions

Dialysis is separation of substances from one another in solution by taking advantage of their differing diffusibility through membranes. *Peritoneal dialysis* solutions, allowed to flow into the peritoneal cavity, are used to remove toxic substances normally excreted