autoimmune disease, and intravenous administration (8). At some centers, skin testing is used to help assess risk for an HSR. If skin testing is positive or if the prior reaction is consistent with an immediate HSR, the patient should not be re-challenged but may be a candidate for desensitization.

Knowledge of the characteristic HSRs for the specific chemotherapeutic agent employed will facilitate prompt and appropriate interventions (see Table 2, previous page). HSRs are most common with the following agents, in order of descending incidence: platinums (carboplatin, oxaliplatin, cisplatin), taxanes (paclitaxel, docetaxel), L-asparaginase, epipodophyllotoxins (teniposide, etoposide), and procarbazine (2, 8, 9).

Like chemotherapy, the administration of monoclonal antibodies is commonly associated with infusion reactions, some of which can be severe. Immediate reactions to monoclonal antibodies usually provoke a characteristic infusion syndrome, occurring within a few minutes to hours of the first infusion. Most reactions are mild to moderate and present with fever, chills, rigors, nausea, headache, and rash; they are usually immediate, although 10% to 20% of infusion reactions to monoclonal antibodies are delayed, suggesting close observation is necessary for each patient during every infusion (5).

The incidence of these reactions seems highest with rituximab and trastuzumab (9). The exact mechanism is not well understood and appears to be multifactorial, including IgE-mediated phenomenon and cytokine-release syndromes. Although HSRs are less common with cetuximab, fatal anaphylaxis has been reported. This is particularly true in the southeastern United States due to regional triggers leading to preexisting IgE antibodies to the galactose-alpha-1, 3-galactose portion of the cetuximab molecule (10).

**SOLUTIONS**

For patients who experience recurrent infusion reactions despite appropriate pre-medication and slower infusion rates, or for those with severe reactions, options are limited. Some oncologists advocate discontinuing the offending chemotherapy and choosing alternative regimens. Others refer patients for drug desensitization. The appropriate course is usually chosen on the basis of factors related to the severity of the reaction, the circumstances of the patient, the disease, and the chemotherapy options and outcomes.

When a drug that has provoked an immediate HSR is clearly indicated and alternative medications are less desirable, drug desensitization is an option to re-introduce the offending medication in a relatively safe manner. Desensitizations induce temporary tolerance of the offending agent through mechanisms that remain elusive. Participation of an allergist with expertise in these high-risk procedures is essential to determine whether the patient is an appropriate candidate and to tailor existing protocols.

**When a drug that has provoked an immediate [hypersensitivity reaction] is clearly indicated and alternative medications are less desirable, drug desensitization is an option to re-introduce the offending medication in a relatively safe manner.**

The key issues are the clinical status of the patient and whether the reaction was immediate or delayed. Immediate HSRs are generally amenable to desensitization. The positive and negative predictive values of skin tests to chemotherapeutic agents remain unclear. Skin testing with these cytotoxic agents can be