include edema, muscle cramps, hemorrhage, and musculoskeletal pain. But these have been mild compared with those of other chemotherapeutic agents.

Nilotinib (Tasigna)

Nilotinib, a Bcr-Abl tyrosine kinase inhibitor, was approved in late 2007 for the treatment of chronic and accelerated-phase CML in adults resistant or intolerant to prior therapies, including imatinib. The dosage regimen of nilotinib is 400 mg orally every 12 hours, and the capsule dosage form should be swallowed whole at least 2 hours after a meal. The patient should then refrain from eating for 1 hour. Grapefruit juice should not be consumed while taking this drug.

Nilotinib is metabolized by the CYP3A4 liver enzymes, and therefore, patients should consult their health care provider prior to initiating any other drug therapy. Similarly, patients receiving concurrent therapy with CYP3A4 inhibitors or inducers should be monitored closely and dosage adjustments made accordingly. Nilotinib can cause QT prolongation, and patients are educated to be aware of possible symptoms, for example, irregular heartbeat and fainting.

Vaccines

Genetically engineered vaccines use a synthetic copy of the protein coat of a virus to fool the body's immune system into mounting a protective response. This avenue avoids the use of live viruses and minimizes the risk of causing the disease the vaccine was intended to prevent. Further, these vaccines will all but eliminate concern about the natural vaccine, which could be derived from blood donor carriers who may harbor the AIDS virus.

The first genetically engineered vaccine for use in the United States was approved by the FDA in 1986 for hepatitis B, a widespread liver infection. This vaccine has now replaced the plasma-derived vaccine.

Hepatitis B Vaccine Recombinant (Engerix-B, Recombivax HB)

The plasma-derived hepatitis B vaccine is no longer being produced in the United States, and its use is limited to hemodialysis patients, other immunocompromised patients, and persons with known allergies to yeast. Recombinant hepatitis B vaccine has demonstrated an ability to induce antibody to hepatitis B surface antigen (anti-HBs) that is biochemically and immunologically comparable to antibody induced by the plasma-derived hepatitis B vaccine. Studies demonstrate that the two are interchangeable in use.

Hepatitis B recombinant vaccine is indicated for immunization of persons of all ages against infection caused by all types of hepatitis B virus. A dialysis formulation (Recombivax HB Dialysis Formulation) is indicated for immunization of adult predialysis and dialysis patients. The vaccine should be administered by intramuscular injection into the deltoid muscle (outer aspect of the upper arm) for immunization of adults and older children. The anterolateral thigh is recommended for infants and younger children. For patients with a risk of hemorrhage following intramuscular injection, the vaccine may be administered subcutaneously, although the subsequent antibody titer may be lower and there may be an increased risk of a local reaction.

Haemophilus B Conjugate Vaccine (HibTITER, Liquid PedvaxHIB, ActHIB)

Prior to the introduction of *Haemophilus B* conjugate vaccines, *Haemophilus influenzae* type B (HIB) was the most frequent cause of bacterial meningitis and leading cause of serious systemic bacterial disease among children worldwide. HIB disease occurred primarily in children <5 years of age in the United States prior to the initiation of a vaccine program and was estimated to account for nearly 20,000 cases of invasive infections annually, about 12,000 of which were meningitis. The mortality rate from HIB meningitis is about 5%. Among children, the most prevalent cause of *H. influenzae* meningitis is by the capsular strains of type B. In addition to meningitis, *Haemophilus B* is responsible for numerous other invasive disease processes (e.g., epiglottitis, sepsis, septic arthritis, osteomyelitis, pericarditis).

HIB conjugate vaccines use a new technology, covalent bonding of the capsular