The treatment options for bcr-abl positive chronic myelogenous leukemia (CML) include chemotherapy, immune therapy, allogeneic stem cell transplantation, and molecular therapy. The tyrosine kinase inhibitor imatinib was approved for the treatment of CML in 2002. Data from clinical trials allow a comparison of treatment options. The literature on the treatment and monitoring of CML was selectively reviewed. A total of 94 original articles were analyzed, along with the recommendations of an international expert committee and the medical societies. This review is current as of November 2009. In a clinical phase 3 trial of imatinib treatment for patients in the chronic phase of CML, the rates of progression-free and overall survival at 6 years were 93% and 88%, respectively. Thus, imatinib is clearly superior to interferon-alpha, hydroxyurea, and busulfan with respect to survival. Allogeneic stem-cell transplantation is only a fall back option because of transplantation-associated mortality. One in four patients in the chronic phase of CML has an inadequate cytogenetic response to imatinib and therefore requires a change of treatment. Most imatinib-resistant patients in the chronic phase of CML go into remission again after switching to one of the new tyrosine kinase inhibitors, dasatinib and nilotinib. Imatinib is now the standard initial first-line treatment for CML in the chronic phase. Regular hematologic and cytogenetic monitoring during treatment is indispensable so that
patients with an inadequate response can be identified.