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Chronic lymphocytic leukemia (CLL) occurs predominantly in elderly patients. The treatment options for patients with CLL have increased with the introduction of purine analogs, and promising results have been reported with fludarabine and cladribine when these agents are used in newly diagnosed and relapsed disease. Monoclonal antibodies such as alemtuzumab and rituximab are also clinically active in CLL. The use of purine analogs in combination with monoclonal antibodies may provide additional treatment options and this strategy is being studied in patients with relapsed and refractory CLL. Bendamustine is an alkylating agent with properties of a purine analog and is a promising agent in the treatment of CLL. Bendamustine reduces the number of circulating B lymphocytes by over 90% and shows only partial cross-resistance with other alkylating agents, making it an ideal candidate for the treatment of CLL and for use in combination with other alkylating agents. Bendamustine monotherapy can be given to patients whose disease is refractory to standard therapies. The results of a trial using bendamustine as a salvage treatment in patients with relapsed or refractory, heavily pretreated CLL are discussed here. Bendamustine 100 mg/m(2) (days 1 and 2) was found to be an effective treatment for older patients with advanced CLL, with 14 of 21 patients responding. Complete hematologic remission was achieved in six of 21 patients and a further eight patients achieved a partial hematologic remission. The main toxicities were hematologic; nonhematologic side effects were mild and uncommon.