This longitudinal and prospective clinical study determined the decalcification rate during multibracket treatment (mean duration, 22 months) in 80 randomized, selected adolescents divided into 4 groups of 20 patients each. The study had 2 objectives. The first was to establish whether patient selection based on predefined caries risk indicators, ie, plaque index, approximal plaque index, D(3-4)MFT/d(3-4)mft index, initial lesions, and gingiva index, carried out before the start of treatment allows for valid predictions of the decalcification risk associated with multibracket treatment. The second objective was to determine whether an extended prophylaxis regimen, including regular mechanical tooth cleaning by a hygienist, scaling, and chlorhexidine treatment, as an adjunct to an initial prophylaxis introductory program consisting of patient motivation, oral hygiene checkups, and fluoridation, reduces or prevents decalcification more effectively than initial prophylaxis alone. The results showed that patient selection based on caries risk factors provides a simple and effective method for predicting the decalcification risk in multibracket treatment (P <or=.001). The tests showed a sensitivity of 75% and a specificity of 88%, thereby proving the clinical validity of the results. Although extended prophylaxis significantly reduced the decalcification frequency in the risk group (P <or=.05) compared with the control group, decalcification frequency did not reach the low rate found in the low-risk group (P <or=.05).