\(^{125}\text{I}\) and \(^{103}\text{Pd}\) are both used in prostate brachytherapy. Their temporal dose-delivery patterns, however, are drastically different; the half-life of \(^{125}\text{I}\) is about 3.5 times longer than that of \(^{103}\text{Pd}\). This difference is clinically significant because the time scales for cell proliferation and sub-lethal damage repair are shorter than the implant dose-delivery time, as reflected in the current dose prescription, 125 Gy, for mono-therapy \(^{103}\text{Pd}\) implants versus 145 Gy for \(^{125}\text{I}\) implants. This \(^{103}\text{Pd}\) prescription is believed equivalent to that for \(^{125}\text{I}\) for tumors with potential doubling times (\(T_p\)) about 10 days, more effective for \(T_p<10\) days and less effective for \(T_p>10\) days (Ling IJROBP 1992). A systematic re-examination of the dose prescription for \(^{103}\text{Pd}\) implants was performed using a linear-quadratic cell-survival model with explicit considerations of 1) normal tissue responses, 2) differential dosimetric impact of seed displacement and prostate edema on the two implants, and 3) new estimates of radiobiological parameters. It was found that dose prescription for \(^{103}\text{Pd}\) could be increased to 130 Gy when biologically effective dose (BED) of rectum is matched to that of \(^{125}\text{I}\). This new prescription would produce a tumor BED consistently higher than that of \(^{125}\text{I}\) for \(T_p\) up to 70 days. We hypothesize that increasing the prescription dose for \(^{103}\text{Pd}\) implants with an matched rectal toxicity of \(^{125}\text{I}\) could further improve local control based on the recent dose response studies of Stock et al 1998 and Potters et al IJROBP 2001 for \(^{125}\text{I}\) implants with \(D_{90}\) ranging from 100 to 160 Gy.