**Sample size calculation**

The primary objective of this study is to demonstrate that the probability for reduced coverage of the recurrence volume by a radiotherapy plan based on a CTVaMRI, compared to the clinical radiotherapy plan (1.5-cm CTV), is lower than 0.20. Reduced coverage of the recurrence volume indicates that a radiotherapy plan based on the CTVaMRI would not be as effective for targeting tumor infiltration as the clinical radiotherapy plan. Any higher number than 0.20 would not warrant further investigation of this workflow for generation of a CTVaMRI in a randomized trial. From each recruited patient, both the clinical radiotherapy plan and a radiotherapy plan based on a CTV­aMRI will be generated and analysed regarding pattern of failure.

The null hypothesis will be that the probability of reduced coverage of the recurrence volume by the radiotherapy plan based on a CTVaMRI, is more than or equal to 0.20. With a sample size of 48 patients whom have developed tumor recurrence, an exact binomial test with a one-sided significance level (alpha) of 0.025 will have 90% power to reject the null hypothesis if the true probability is 0.050.