Background
Salvage radiotherapy (SRT) is used to treat patients with biochemical failure after radical prostatectomy (RP). SRT may eradicate locally recurrent cancer. The purpose of this study was to identify prognostic factors related to biochemical relapse-free survival after SRT.

Materials and methods
Between 2006 and 2010, 279 patients received salvage radiotherapy (SRT) in Denmark. The patients were treated at five radiation therapy centers located in Aarhus, Herlev, Odense, Aalborg and Copenhagen. The study is a retrospective study analyzing the outcome of patients treated with SRT. Patient age, PSA nadir RP, margin status, pathologic Gleason score, pathologic tumor stage, pre-RP and pre-SRT PSA levels, time from RP to rise of PSA and time from rise of PSA to SRT were analyzed.

Results
Median age of the cohort was 66 years at the time of SRT. Median follow-up from SRT was 9 (0-100) months.
At the end of follow up 58 % of the patients were without biochemical failure. Univariate analysis showed following statistically significant predictors of PSA recurrence after SRT: Surgical margins (p=0.005), PSA nadir RP (p=0.002), pre-SRT PSA levels (p=0.002), patient age (p = 0.008) and time from PSA rise to SRT (p = 0.024).
On multivariate analysis positive surgical margins (p = 0.002), PSA nadir RP ≤ 0.1 ng/mL (p = 0.007) and age ≤ 66 years (p = 0.007), were found to be independently predictive of PSA recurrence.

Conclusion
The study presents a national study including all patients from Denmark. Our findings suggest that patients with positive surgical margins and a PSA nadir ≤ 0.1 ng/mL after radical prostatectomy are the best candidates for SRT, and that SRT should be given at the earliest sign of biochemical failure. At the end of follow-up 58 % of the patients were without biochemical relapse after SRT.