



**Title** Proton Therapy

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## Aim

To review the documentation on the use of proton therapy in treating cancer.

## Conclusions and results

Proton therapy is used in radiation treatment and is an established practice in many countries, but not in Norway. Proton therapy, more than conventional radiation treatment, allows the radiation dose to be limited to within the tumor. This reduces radiation to surrounding normal tissue, potentially yielding fewer complications. Proton therapy also allows delivery of higher radiation doses to the tumor than conventional radiation treatment does. Documentation of the treatment's effect is based mainly on noncontrolled studies. A few randomized controlled studies have been conducted, but only one of these studies has complete data. A significant problem is that studies used different patient groups in comparing proton therapy with other treatments. Also, proton therapy is not fully standardized. Most patients treated with proton therapy have received treatment at basic research laboratories, rather than in established clinical units. This too has limited the research, and may have influenced the studies.

## Recommendations

None given.

## Methods

A group of Norwegian scientists with expertise in radiation biology, physics, oncology, and method evaluation was asked to conduct a systematic review of scientific documentation on the clinical effects of proton therapy in treating malignant and benign tumors. The group conducted a MEDLINE search and searched for ongoing studies in the Cochrane Library or PDQ, National Cancer Institute and current controlled trials. Several inclusion/exclusion criteria were established, and each study was evaluated against checklists prepared by NOKC.

## Further research/reviews required

None of the included studies compared proton therapy with conventional radiant treatment. Hence, it was recommended that randomized controlled studies be conducted to document the clinical utility value of proton therapy, including survival, local tumor control, and complications in normal tissue.