



## Opinion concerning radon therapy for ankylosing spondylitis

### 1. Introduction

Ankylosing spondylitis (also known as Bechterew's disease) is a chronic, painful and incurable rheumatic disease, which in more than 95% of cases is associated with the HLA-B27 gene. It affects the axial skeleton and major joints, especially the sacroiliac joints and the spinal column. The mobility of intervertebral joints is impaired, and intervertebral discs and ligaments become rigid and calcified. Some patients with this condition seek to alleviate pain or improve mobility with the aid of radon therapy. Such treatments involve exposure to radon-rich air, thermal baths, or consumption of radon waters.

In response to a formal request from FOPH Director Pascal Strupler, the Commission for Radiological Protection and Monitoring of Radioactivity (CPR/KSR) prepared the present opinion on the risk/benefit ratio of radon therapy for ankylosing spondylitis.

### 2. Current situation

Various epidemiological studies have sought to assess the efficacy of radon therapy as a symptomatic treatment for ankylosing spondylitis (Tubergen 2001, Falkenbach 2005, Franke 2013). These are subject to numerous confounding factors, whose influence is difficult to estimate. In addition, fluctuations in case-control are relatively large. Overall, the results suggest that radon therapy has modest pain-relieving effects. While some of the findings are statistically significant, they involve considerable uncertainties. Accordingly, radon therapy is not included in the recommendations for the management of this condition issued by the Assessments in Ankylosing Spondylitis International Society/European League Against Rheumatism (Braun 2011).

Radon therapy could conceivably be justified in the absence of clearly demonstrated effects if plausible biological mechanisms could be invoked to explain its effectiveness. But this is not the case. The various hypotheses proposed appear to us to be highly speculative. To be compelling and compatible with the current state of radiobiological knowledge, they would need to be validated by controlled, replicated studies.

From a radiological protection perspective, it should be noted that, as regards patient exposure, only the principles of justification and optimisation are applicable as specified in the Swiss Radiological Protection Ordinance. The effective doses are similar to those seen in diagnostic procedures (<2 mSv) and are thus well below those normally applied in radiotherapy.

In the case of radon therapy, treatment personnel are also exposed to radiation. The effective dose delivered to workers is between 0.5 and 15 mSv per year (Deetjen 2005). These levels are higher than most of the doses received in other professions exposed to ionising radiation in Switzerland. They are thus not negligible and should be appropriately justified.

### 3. Opinion of the Commission

The Commission takes the view that the efficacy of radon therapy for pain relief in ankylosing spondylitis has not been clearly demonstrated, and that no plausible biological mechanism has been proposed.

The Commission believes that, given the lack of evidence of efficacy and the non-negligible doses of radiation to which workers are exposed, the development of radon therapy in Switzerland is neither desirable nor justifiable.

However, the Commission does not consider it appropriate to prohibit access to this therapy at existing treatment centres abroad in cases where, after the failure of other recognised treatment methods, the attending physician believes that it could possibly provide pain relief for the patient concerned. While the Commission recognises that the doses of radiation applied are low, it believes that patients must be informed about the risks involved – in particular, the risk of developing lung cancer.

## 4. References

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