

## EVALUATION OF THERMAL DOSE CONCEPTS IN SUPERFICIAL HYPERTHERMIA: HEATABILITY AND EFFECTIVE DOSE

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### Introduction

In their recent randomized trial, Jones and colleagues [1] used the thermal dose measured in a patient during superficial hyperthermia to distinguish between heatable and non-heatable patients, and to continue heating until an effective dose had been delivered. The possible consequences of this approach are considerable: ‘unheatable’ patients are rejected for hyperthermia, and the application of a flexible treatment schedule has a large impact on patient logistics. The objective of the current work was to evaluate the concepts ‘heatability’ and ‘effective dose’ in a retrospective analysis.

### Methods

The analysis included all patients who received 433 MHz hyperthermia (8 sessions) plus 8×4 Gy radiotherapy for recurrent breast cancer in our clinic between 1986-92 [2]. The thermal dose was calculated from interstitial tumour temperatures and expressed as CEM43T90. Patients who lacked interstitial tumour measurement data were not included in the analysis. Consistent with [1], ‘unheatable’ was defined as a thermal dose < 0.5 CEM during the first treatment. Likewise, ‘effective dose’ was defined as a total thermal dose > 10 CEM.

### Results

522 treatments of 71 patients were included. The median total thermal dose per patient was 4.3 CEM (range 0.1 - 273). Patients who received an ‘effective dose’ (27%) had 78.9% CR. In the group that received less than the ‘effective dose’ CR was 80.0%. 59% of the patients were ‘unheatable’. The CR rate of the ‘unheatables’ was 80.6%, against 81.5% among ‘heatables’.

### Conclusion

In retrospect, the majority of our patients are considered ‘unheatable’ according to Jones’ definitions, and only a quarter of our patients received an ‘effective dose’. However, the CR rate in all subgroups is unvaryingly high: about 80%. Therefore, the current analysis does not support the rejection of patients showing low thermal dose during the first HT, nor the application of a flexible HT schedule.

### References

- [1] Jones EL, Oleson JR, Prosnitz LR, Samulski TV, Vujaskovic Z, Yu D, Sanders LL, Dewhirst MW: Randomized trial of hyperthermia and radiation for superficial tumors. *J Clin Oncol.* 23:3079-85, 2005
- [2] van der Zee J, van der Holt B, Rietveld PJ, Helle PA, Wijnmaalen AJ, van Putten WL, van Rhoon GC: Reirradiation combined with hyperthermia in recurrent breast cancer results in a worthwhile local palliation. *Br J Cancer* 79:483-90, 1999.

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