

Cryotherapy is a new treatment modality for cancer. Thermal waves may be propagated through frozen tissue to enhance the lethal formation of intracellular ice. We present a numerical algorithm that accurately predicts the 3-dimensional thermal distribution about a cryoprobe. Comparisons made between measured data and the simulated behavior of thermal waves in tissue show good agreement. Thermal waves rapidly attenuate with radial distance from cryoprobes and distort in shape.

Their velocity is independent of amplitude but dependent on frequency. Constructive and destructive interference between thermal waves is shown to occur and implies that control of thermal waves to focus their lethal effects on designated regions of the frozen tissue is possible with multiple cryoprobes.