

~~implicating~~ bupivacaine ~~causes as the cause of~~ chondrocyte death, the effect of temperature on chondrocyte viability has been well-recognized in the field of orthopaedics. Good, et al., reported that radiofrequency energy generated during shoulder arthroscopy ~~using monopolar or bipolar probes~~ increased the temperature of the synovial fluid to 45° C regardless of the fluid flow rate or the location of the ~~radiofrequency~~ probe within the glenohumeral capsule.¹¹ Zoric, et al., reported that the irrigation fluid temperature reached > 80° C after two minutes in a no-flow setting,²³ while Voss, et al., found that temperatures exceeding 45° C were sufficient to induce significant chondrocyte death.²⁰ These studies imply that the temperature of the synovial fluid inside a joint will likely exceed 45°C during an arthroscopic procedure that uses monopolar or bipolar radiofrequency probes; ~~and that~~ ~~Therefore, depending on the procedure being done,~~ the chondrocytes will be exposed to temperatures greater than 45°C anywhere from 30 minutes to several hours; ~~depending on the procedure.~~

It is a common practice to inject bupivacaine into the joint immediately following surgery. In some heat-generating procedures, we suspect that the intra-articular temperature may be above 37° C (~~so-called “supraphysiological temperature”~~) when bupivacaine is injected (above 42° C was actually measured – unpublished observation). Because ~~it has been reported that~~ bupivacaine and supraphysiological temperature ~~can~~ ~~each~~ individually ~~can~~ cause chondrocyte death, ~~a question should be raised~~ whether or not ~~at their~~ combination ~~of bupivacaine and supraphysiological temperature~~ causes ~~an even~~ greater reduction in chondrocyte viability than either ~~condition can~~ ~~can~~ alone. ~~This presents a question that~~ has ~~not~~ yet ~~to be been~~ addressed in the current literature.