**ATRIAL FIBRILLATION INFLUENCES RIGHT ATRIAL PRESSURE ESTIMATION BY HAND HELD ULTRASOUND ASSESSMENT OF THE VENA CAVA**

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*Background*: Measurement of the inferior vena cava (IVC) by hand-held ultrasound (HHU) is a validated, non-invasive technique to estimate right atrial pressure at the point of care. The degree to which the presence of atrial fibrillation (AF) or atrial flutter (AFl) affects IVC measurements has not been well characterized in humans but is critical to accurate application of HHU to patient care. Objectives: We evaluated the effect of AF or AFl on maximum IVC diameter and collapsibility as assessed by HHU.

*Methods*: We prospectively enrolled 32 patients undergoing direct current cardioversion (DCCV) for AF or AFl. Using a HHU device (Vscan, GE Healthcare), measurements of maximum IVC diameter were obtained immediately prior to DCCV with a rhythm of AF or AFl and immediately following DCCV in normal sinus rhythm in the same patients. Results: The mean maximum IVC diameter before and after DCCV was 22.4 mm and 20.4 mm, respectively, with a mean difference of -2.0 mm (p<0.0001). 69% of patients were found to have a smaller IVC diameter when in sinus rhythm compared to when in AF or AFl. 44% of patients had a collapsible IVC when in AF or AFl, compared to 72% of patients who had a collapsible IVC when in sinus rhythm. Following DCCV to sinus rhythm, estimated right atrial pressure (low, intermediate, or high) based on maximum IVC diameter and collapsibility changed to a lower category in 44% of patients.

*Conclusions*: The presence of AF or AFl, as compared to normal sinus rhythm, is associated with increased maximum IVC diameter and decreased IVC collapsibility as measured by HHU. The finding of dynamic changes in IVC characteristics offers insight into the use of HHU in assessing changes in intracardiac filling pressures. Further study is indicated to evaluate the relationship of these findings to clinical outcomes.