Physician Certification and In-hospital Complications of ICD implantation

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**Background:** As the indication for ICD therapy expand, determining who should be allowed to implant ICDs remains a controversial issue. Currently there are a number of pathways by which a physician can obtain training to implant ICDs, ranging from completion of an accredited electrophysiology fellowship to industry sponsored training programs that can be completed in less than a week. At the heart of this debate is the question of whether difference in training are associated with clinically meaningful differences in patient outcomes following ICD implantation. Although implantable cardioverter-defibrillators (ICDs) improve survival of populations at risk for sudden cardiac death, the procedure itself carries a small but significant risk of major complications. In the ICD Registry, the overall incidence of a complication was 3.6%. HRS and other proponents contend that physicians with more rigorous training likely have better outcomes, but at present there is limited evidence to support this belief (1-2).

Previous efforts to determine the association of training with outcomes after ICD have been hindered by the lack of a national system for capturing device implantations and the absence of detailed information regarding physician training. The creation of the NCDR ICD Registry provides an excellent opportunity to examine the relationship of implanting physician certification and relation to complications related to ICD implantation.

**Specific Aims:**
To determine the association of level of training and certification of the physician implanting ICDs with the incidence of in-hospital complications.

**Hypotheses:**
1) Implanting physicians with EPS certification have lower incidence of complications related to the implantation of the ICD compared with other physicians.

**Methods / Sample Tables:** We will examine the association of physician training and outcomes using data from the NCDR ICD Registry. For this analysis, we will restrict to patients at least 18 years of age who received an ICD for either primary or secondary prevention of sudden cardiac death. The major independent variables will include individual physician accreditation status. Dependent variables will be any adverse events during the index hospitalization, major adverse events, and in-hospital death. We will first compare the baseline characteristics of patients undergoing ICD implantation stratified by different categories of physician training. We will examine unadjusted rates of each outcome stratified by operator training and perform multivariable hierarchical logistic regression to adjust for differences in patient characteristics, indications for ICD implantation, and hospital characteristics that may be associated with rates adverse events. Covariates will include physician and hospital volume. Analyses will be repeated in specific subgroups of interest including patients receiving an ICD for primary prevention, secondary prevention, and patients undergoing implantation of an ICD with biventricular pacing.

**Results:** The analysis of the data is ongoing, we expect to have results available by May 2008.

**Conclusions:** In progress, analysis is ongoing