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Implantable Defibrillator Therapy and Driving

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Prior to implantable cardioverter defibrillator (ICD) therapy, health care providers [i] had recommended restrictions on driving for patients with a history of potentially life-threatening cardiac arrhythmia, and state and federal guidelines have reflected these recommendations. Restrictions were based on the risk for recurrent arrhythmic events among patients while driving and the associated risks to personal and public safety. While event rates during driving were perceived as quite low, driving restrictions were individualized in view of the variability of risk among patients.

While the results of ICD therapy to prevent sudden death have been impressive, a significant number of patients with implanted defibrillators experience sudden, temporary loss of consciousness. One retrospective study [ii] identified 14.7% of 421 patients who had at least one episode of sudden loss of consciousness during an average follow-up of 26 months.

These observations have important personal and public safety implications. Importantly it is the presence of the medical condition rather than the implantable defibrillator that forms the basis for risk.

Maryland State Regulation: The State of Maryland, Department of Transportation, Article 11.17 Annotated Code of Maryland[iii]

Driving is considered a privilege in the United States, and the State of Maryland. Physicians may report to the Medical Advisory Board individuals who have a disorder that is characterized by lapses in consciousness. In addition, the individual applicant for a driving license has the responsibility to notify the board if diagnosed with a heart condition or stroke among other conditions.

The State of Maryland considers cardiovascular conditions that are contraindications for the safe operation of a motor vehicle to include:

- unstable angina
- myocardial infarction of less than 6 weeks duration
- within three months after heart surgery
- severe uncontrolled congestive heart failure
- critical aortic or sub aortic stenosis
- aneurysms of the aorta or cerebrovascular system
- uncontrolled arrhythmia, pacemaker failure
- transient ischemic attacks.
- survivors of sudden death with ICD therapy still discharging at intervals of less than 3 months.

Individuals with these conditions may submit evidence (including a doctor's certificate) acceptable to the Medical Advisory Board that the condition has been modified or controlled without relapse for a period of at least 3 months. Additional follow-up reports may be required.

Driving and Implantable Defibrillator Therapy

While there are no prospective, longitudinal studies on the safety of driving among patients with implantable defibrillators, significant ethical and legal issues remain [iv] and medical opinion with regard to driving varies. In one European survey [v] a majority of physicians recommended abstinence from driving for 3 to 18 months after ICD implantation or syncopal events and at least a third of patients continued to drive despite the driving proscription. A large survey of US physicians who reported on 12 years' experience (1980-1992) of patients driving with ICDs [vi] found a fatality rate of 7.5/100,000 patient years, Vs 18.4/100,000 for the general public. In this study, 30 of 286 defibrillator shocks (10.5%) delivered to patients while they were at the wheel were associated with motor vehicle accidents. Most of the physicians in the US survey recommended a ban on driving for 7.3 +/- 3.4 months after events.

The likelihood that a patient with an ICD will experience an ICD shock while driving has been difficult to estimate. One study, following some 170 driving patients[vii], identified 8 patients (5%) who experienced ICD therapy while at the wheel during an average follow-up period of 38 months. In this study, there were 11 accidents during the follow-up, only one caused by the driver, and no fatalities or accidents associated with the ICD therapy while driving. A recent report[viii] by the AVID investigators revealed a lower annual rate of motor accidents (3.4%) among patients with ICDs relative to that (7.1%) among the general driving public.

When patients with ICDs are surveyed about driving [ix], it is clear that most patients feel that driving is a right and that restrictions impose undue hardship. They feel that common sense, limiting driving distances and physician input should be considered in setting restrictions. Patients generally return to driving [x] [xi] [xii] despite restrictions.

Conclusions

While the possibility that patients with implanted defibrillator therapy may have motor vehicle accidents while driving is present, the associated risks appear to be quite low by retrospective survey analysis. A small number of patients (possibly 5%) experience ICD discharges while at the wheel, and a small number of these events (approaching 10%) may be associated with a motor vehicle accident, fatalities appear to be rare. Recommendations from physicians vary, and a large number of patients resume driving despite imposed restrictions. The American Heart Association and the North American Society of Pacing and Electrophysiology have published a position statement[xiii] to address the important issues involved.

Advice for patients with implanted defibrillator therapy:

1. Patients should request others to drive when possible to limit the associated risk.
2. Patients with uncontrolled arrhythmia, (e.g. ICD discharges every three months or less) should be advised not to drive.
3. Patients with uncontrolled syncope should be advised not to drive.
4. Patients should be advised not to drive for at least three months after ICD implantation following a significant (e.g. sustained VT or VF) clinical arrhythmia or syncope, and at least three months following a clinical event.

5. Patients with newly implanted ICD therapy, free of symptoms, and without previous clinical events, (e.g. therapy for primary prevention) represent a new group of patients. The risks associated with driving among these patients are unknown, but probably lower in comparison to patients treated for secondary prevention.

Most importantly, driving restrictions should reflect individual patient differences, changes in patients' clinical status, and personal and public safety considerations. Observation periods should generally be at least 90 days.

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