



**Application number/Title:** 43129 - Machine learning to predict outcomes from cardiac imaging

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**Keywords provided by the Applicant PI to describe the research project:**

arrhythmia, cardiac, machine-learning, sudden cardiac death

**Application Lay Summary:**

Some patients with heart problems are at risk of dying from heart rhythm disturbance. The risk is higher, for example in patients with a previous heart attack that has weakened the heart's pumping function. It is important to predict which patients are at substantially increased risk because this influences their treatment. For patients at risk, an implantable cardiac defibrillator (ICD) may be helpful.

ICDs can save a patient's life by providing an electric shock to the heart if there is a life-threatening arrhythmia. However, ICDs have disadvantages too: there are risks with implantation; the patient requires lifelong follow-up; and there is an ongoing risk of infection and device-related complications.

All patients who have an ICD have some form of cardiac imaging to view the heart and its overall pumping function. This is a crude test. We want to look at patients who have had this imaging and also look at their outcomes to see if a Machine-Learning computer algorithm could do better. We would like to create an approach to improve the treatment of patients.