

Deactivating Cardiac Pacemakers and Implantable Cardioverter Defibrillators in Terminally Ill Patients

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A Puzzling Clinical Case

A 68-year-old patient who suffered from gastric cancer diagnosed 8 months earlier presented with multiple peritoneal and hepatic metastasis, despite several rounds of chemo- and radiotherapy. After admission to hospital, his general condition quickly became severely compromised. He was nearly emaciated, despite being on partial parenteral feeding. Four years earlier, due to a cardiac arrhythmia that was refractory to medication, the patient had a cardiac pacemaker (CPM) implanted, regulated to go off at frequencies of below 70 beats per minute. Given the patient's terminal situation, the team started developing some doubts about the pacemaker's effects during his dying process. The patient had mentioned his intention to donate his pacemaker after his death, but had not asked for its deactivation. The specialists were not sure about the effect of the pacemaker in unnecessarily prolonging the patient's final hour. Nevertheless, they opposed deactivation, which they considered ethically uncertain. The family, who had been initially for the deactivation, decided against it. The patient's condition was progressively deteriorating, as he was falling into a state of sopor and, later, into a coma. This moribund phase stretched over 10 days, with a cardiac frequency invariably fixed at 70 beats per minute (BPM), which is explained by the action of the pacemaker.

The case raised doubts among doctors regarding the role of CPMs in terminally ill patients, whether they are able to prolong the period of agony and whether their deactivation is ethically acceptable. To answer these questions our team critically reviewed the literature and the experience available in Chile. In this paper we synthesize such analysis and suggest some orientations and criteria to approach these cases.

Defining the Problem

The care of terminally ill patients frequently poses the difficulty of determining the exact support required to allow a peaceful death. This implies limiting vital support, parenteral nutrition, invasive monitoring, or the treatment of concurring diseases. These decisions are based on criteria of proportionality and futility of care,

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according to the certainty of the diagnosis and prognosis, the indications and contraindications of each therapy, and the patient's wishes, expressed by himself or by a representative. The goal is to achieve the highest benefit for the patient, allowing his or her death in peace when it is imminent, which is one of the ends of medicine.¹ In practice, nevertheless, the moribund patient usually receives excessive treatment, because doctors are better prepared to apply maximalist technologies against death than to limit their curative efforts and start palliative care.² On the other hand, families tend to induce excessive treatments every time they insist: "Do whatever is possible."

Suspending mechanical ventilation is one of the most difficult decisions in limiting treatment, given that death can happen shortly after the ventilator is removed, generating the deceiving impression of causing death. Even if the foundations for withdrawing assisted ventilation are clear,³ experience shows that it is always a troublesome decision. This is very similar in the case of terminally ill patients with implanted CPMs,⁴ because it is assumed that such a device could prolong life. In the case that opens this article, it is nevertheless safe to say that the patient's agony was extended for more than a week only by the pacemaker's action.

Around 1,500 pacemakers are implanted in Chile every year. Thus far, just around 200 Implantable Cardioverter Defibrillators (ICDs) have been implanted. Deactivating or reprogramming these systems in terminal patients has not been discussed in Chile, and has been explored very little in the specialized literature, where there is only one retrospective study about the management of ICDs in terminal patients.⁵ In our experience, many patients and families express their concern that, because of the pacemaker, the heart could remain beating after death, which is very conflictive when death is perceived as the absence of a heartbeat.

The Pacemaker and the Possible Prolongation of Dying

A CPM is a device indicated to provide support to the heart of patients who suffer from persistent or intermittent alterations of the cardiac rhythm. Modern pacemakers are automatically activated every time the patient's cardiac rhythm becomes irregular.⁶ ICDs detect ventricular arrhythmias and produce high-energy electric impulses to restore the cardiac activity. The current indications for CPMs and ICDs vary according to the patient's pathology.⁷ In case of permanent atrioventricular blocking with permanent inhibition of the heart automatism, the CPM actually sustains the cardiac activity, and its deactivation can produce asystolia and death.⁸ However, if the heart still has the capacity for generating its own rhythm, it regains control of the heart beating, permitting the cardiac function to become progressively more insufficient until death.

Although the physiologic alterations of the process of death could produce a lack of heart response to the CPM,⁹ such changes would have to be very severe, which is rare. The death of terminal patients is preceded by abnormalities in the cardiac rhythm due to hypoxia, metabolic changes, and other alterations of normal physiology.¹⁰ It is therefore logical to conclude that the presence of a CPM can actually postpone death. This is what is described in the few reported cases of CPM deactivation in terminally ill patients¹¹ and what happened in the case of our patient.

ICDs are highly effective in reverting ventricular fibrillation. Such devices can therefore prevent or put off death.¹² The ICD's electric impulses produce pain and severe discomfort, which increases the patient's suffering and the family's anguish.

The number of terminal patients who have CPMs increases with life expectancy. Its incidence is expected to increase significantly in Chile, given that the implantation of CPMs has recently been included among the basket of government-financed, universally accessible medical practices. Nonetheless, the literature about what to do in these cases is very limited and based on isolated experiences.¹³

Deciding to Deactivate a CPM

Deactivating a CPM or an ICD by no means implies the surgical removal of those devices. On the contrary, they are switched off by a noninvasive, remotely controlled procedure that causes no pain or discomfort to the patient. The immediate consequences of the deactivation depend on the patient's disease and cardiac rhythm. In terminal patients with an ICD, for whom the very action of the device will produce painful electric impulses and will prolong the death throes, deactivation should be considered as medically indicated.¹⁴ Deactivating a conventional CPM requires a closer look.

In terminally ill patients, bradyrhythmias are frequently observed, which would be prevented by the action of the CPM, thus prolonging the dying process. Among those patients who are totally dependent on the CPM, life is actually prolonged by the action of the device, whose deactivation would be analogous to the disconnection of mechanical ventilation.¹⁵ In patients with a cardiac rhythm that is slow per se, deactivating the CPM could provoke the sufferings associated with pulmonary congestion. It is, therefore, not always true that deactivating a terminal patient's CPM necessarily favors a peaceful death. But determining that extreme is clinically difficult in every case. However, it must be considered that the device can be deactivated in a series of steps, assessing the heart's response each time it is reprogrammed, in order to avoid suffering.¹⁶

When doctors conclude that the CPM or the ICD can prolong the agony and increase the patient's suffering, they should discuss with the patient and his family the benefits of deactivating the device.¹⁷ In practice, however, only a minority of doctors and patients converse in advance about these possibilities. As a result, in most cases the suspicion is that the CPM or the ICD might have prolonged the process of dying.¹⁸

The decisionmaking process should recognize the patient's wishes when they have been expressed in advance, respecting the principle of autonomy. As in every complex clinical decision, the process should be one of shared decisions.¹⁹

In Chile, where living wills have not yet become mainstream, the opinion of the family is of critical importance in practice. As in the case that motivated this paper, it is usually the family members who express the patient's preferences or wishes, although almost invariably they delegate most of the final decision to the attending physicians. In the most complex cases, taking the case to the ethics committee has proved to be a very valuable option in our own experience. This is amply feasible in Chile, where all major hospitals—public and private—have functioning clinical ethics committees.

Ethical Validity of CPM Deactivation

Deactivating a terminally ill patient's CPM or ICD can generate moral reservations, particularly if it is perceived as a manner to hasten death. But decisions of this caliber cannot be based on estimations or emotions. They require sound foundations, and respect for the patient's autonomy and values, together with the family's opinions and honest feelings.

Deactivating a CPM or an ICD is a limitation of the therapeutic effort, and such decision must be sustained by the principles of proportionality and avoiding futility.²⁰ In the final phases of a terminal disease, it is evident that a CPM or an ICD can turn into futile therapy that produces no benefit for the patient. The criteria of proportionality, which assesses the benefits and risks of each medical intervention and which is a new shade for the old concept of ordinary and extraordinary measures, has its origins in Catholic doctrine and is widely understood and accepted in Chile. Finally, it is necessary to know the patient's wishes and his or her demands regarding the physical, psychological, spiritual, and economic aspects of care.

The opportunity for decisions is particularly relevant here. Ideally, attending physicians should discuss in advance with terminally ill patients the possibility of deactivating their CPM or ICD if they happen to become futile or prevent a peaceful death. Terminally ill patients' death should neither be hastened nor be artificially prolonged. If the CPM sustains the patient's life by means of an artificial cardiac rhythm, its deactivation should be considered just a way to avoid therapeutic obstinacy, not a way to cause death. The substantial ethical foundation that justifies deactivating a CPM or an ICD in a dying patient is found in a basic respect for the ends of medicine and for the patient's dignity.

It should also be noted that in Chile there are no legal impediments to withholding useless, artificial measures that only prolong the process of dying. Chilean jurisprudence respects the *lex artis* regarding indications and contraindications of medical treatments. On the other hand, the Chilean Parliament is about to pass a bill that consecrates the individual right to reject medical care.

In conclusion, deactivating a CPM or an ICD in a terminally ill patient can be considered an ethically correct indication in those cases where it is clinically determined that all the device is doing is just maintaining the heart rate artificially, preventing the progressive bradyrhythmias that precede death. In any case, the final decision should rely on the patient's advance directive, or—if they do not exist—on a shared decision between doctors and patients with their families, fully informed and supported by their attending physician.

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