



# Considerations for the Deactivation of the Stimulation Function of Pacemakers and Defibrillators in End Stage Disease

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## Abstract

**Background:** The deactivation of anti-tachycardia functions of implantable cardiac devices such as pacemakers

**Methods:** To collect information about possible consequences of the deactivation of stimulation we retrospectively

**Results:**

**Discussion:**

## Results

Table 1 showed that device patients with routine follow-up and later deceased patients are comparable for age at implantation ( $76.6 \pm 9.4$  vs  $74 \pm 7.7$ ) and sex (females 26% vs 26%). The duration of device implants was significantly shorter in the later deceased patients compared to routine follow-up ( $4.6 \pm 3.5$  vs  $6.1 \pm 5$  years,  $p=0.00009$ ).

Table 2 showed that patients were divided in three groups: group A) no expected sequelae from deactivation (spontaneous heart rate  $>50$ /min, 51.5%), group B) expected reduced quality of life (spontaneous heart rate 30-50 and / or presence of CRT; 34.7%) and group C) expected timely death (spontaneous heart rate  $<30$ ; 13.8%). Much lesser patients of group C had ESD than in group A or B ( $p<0.0001$ , Table 1). As expected group C) patients had no measurable escape rhythm and accordingly more AV blocks were present. Resynchronization function was important in group B) patients (with expected deterioration).

Only 9 of the 119 (7,5%) device patients deceased later due to terminal illnesses – as to our knowledge - requested for deactivation of tachycardia functions. Antibradycardia functions were never deactivated, also not in the lady under discussion in the background

paragraph. She later died peacefully in our hospice department. A discussion with our palliative team covering the northwest of the Hamburg, Germany region revealed that deactivation of pacing function was only sporadically requested in the last 10 years.

Our use of the broader, nuanced definition of palliative care has several consequences. First, according to this definition, health care may sometimes be simultaneously curative and palliative. Second, the broader definition admits that palliative care is not the exclusive purview of palliative care specialists. All health care providers, including those focused on curative care, can and do frequently provide palliative care. On the other hand, it is important that providers who are not palliative care specialists as well as the general public are aware of the unique competencies that palliative care specialists beneficially provide.

care is not restricted to hospitals; rather, palliative care is provided in a broad range of venues, including both clinical and community settings.

The uses of palliative care in diverse settings can be understood by considering the broad scope of this special form of care.

## Discussion

According to our results only a minority of device patients (13.8%) are “truly” pacemaker dependent and were expected to die shortly after deactivation of stimulation (Table 2; Group C). A third of patients (34.7%) may survive, but with a reduced quality of life either due to insufficient heart rate or loss of CRT (Table 2; Group B). For more than a half of the patients, a deactivation of antibradycardia - stimulation seems to be irrelevant (Table 2; Group A). Whether group C patients really come to death within minutes could not be securely deduced from our data. According to a study of Lelakowski et al. forcing spontaneous heart rate for a longer time, this cohort may comprise only a minority of 2-3% [13]. This would fit to the data of Buchhalter et al. [14] where out of 32 patients who underwent deactivation of bradycardia therapy only 4% were pacemaker dependent. Therefore, most patients will survive stimulation deactivation of devices due to a sufficient spontaneous basal heart rate, but this for the cost of a