

# Implementation and titration of quadruple heart failure therapy prior to and after cardiac device implantation

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**Introduction:** Guideline-directed medical therapy (GDMT) with beta-blockers, mineralocorticoid receptor antagonists (MRA), angiotensin convertase inhibitors (ACEi) or angiotensin receptor–neprilysin inhibitors (ARNI), and sodium-glucose cotransporter-2 inhibitors (SGLT2i) represents a cornerstone for heart failure with reduced ejection fraction (HFrEF) treatment. Patients should receive therapy in evidence-based target doses or maximally tolerated doses before cardioverter-defibrillator (ICD) or cardiac resynchronization therapy (CRT) implantation. Therapy prescription practice before and after the device implantation in the era of quadruple GDMT is to be fully examined<sup>1</sup>. The aim of this study is to evaluate the use of disease-modifying drugs in their corresponding target doses in patients with HFrEF before and after the ICD or CRT implantation procedure.

**Methods:** This single-centre retrospective cross-sectional study included all patients with HFrEF hospitalized for ICD or CRT implantation from January 2021 to January 2023. Data was collected through documented patients' medical history and phone calls.

**Results:** We collected data on a total of 107 patients with HFrEF and ICD or CRT implantation. Most patients received beta-blockers (91.6%), MRA (86.0%), ACEi (31.8%) or ARNI (59.8%) and SGLT2i (59.8%) before device implantation. Evidence-based target doses were reached for 10.2% beta blockers, 52.2% MRA, 11.8% ACEi, 32.8% ARNI and 100% SGLT2i. After device implantation, implementation of beta-blockers (99.1%), MRA (97.2%), and SGLT2i (87.9%) increased. More ACEi (19.6%) were replaced with ARNI (75.7%). Target doses were reached for 19.8% beta-blockers, 72.1% MRA, 28.6% ACEi, 37.0% ARNI and 100% SGLT2i.

**Conclusion:** Most of the patients received all GDMT drugs before and after the procedure. Therapy titration was non-compliant with guidelines. A slight improvement in up-titration after the procedure can be explained by more common medication adjustments during device controls and better drug tolerability after cardiac resynchronization. Despite objective obstacles to adequate therapy titration, including intolerance or patients' non-adherence, further effort in up-titrating guideline-oriented medications should be applied.

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## LITERATURE

1. McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, Böhm M et al; 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J.* 2021 Sep 21;42(36):3599-3726. <https://doi.org/10.1093/eurheartj/ehab368>