



ABSTRACTS
NVVC Voorjaarscongres 2026
Donderdag 16 april
09.00 – 10.30 uur

SESSIE 1: EFO & devices

	Zaal: Limousin 1	Voorzitters: dr. Amber Otten, cardioloog Gelre Ziekenhuizen drs. Niels Jongejan, physician assistant, Stichting QuaRijn
1	09.00 - 09.10	Dutch Outcome in Implantable Cardioverter-Defibrillator Therapy – Extended Follow Up (DO-IT-XL): Long-Term Outcomes in a Large Primary Prevention Population <i>Hans Römers, St. Antonius Ziekenhuis, Nieuwegein</i>
2	09.11 - 09.21	Comparison of Two Pulsed Field Ablation Systems for Atrial Fibrillation: One-Year Outcomes from a Multicenter Registry <i>Marisa van der Graaf, St. Antonius Ziekenhuis, Nieuwegein</i>
3	09.22 - 09.32	Retrospective Evaluation of the Prostyle Vascular Closure Device in Patients Undergoing Atrial Fibrillation Ablation: Effects on Hemostasis and Hospital Stay <i>Isabelle Bax, St. Antonius Ziekenhuis, Nieuwegein</i>
4	09.33 - 09.43	Extensive vs. Limited Pulmonary Vein Isolation in Pulsed Field Ablation Using a Circular Over-the-wire Catheter <i>Roos Bolhuis, St. Antonius Ziekenhuis, Nieuwegein</i>
5	09.44 - 09.54	Early Real-World Outcomes of the 2023 Refined Dutch Guidelines for Non-Ischemic Cardiomyopathy Mandating CRT-P Treatment <i>Lianne Broers, Radboudumc, Nijmegen</i>
6	09.55 - 10.05	Clinical and Economic Evaluation of Obstructive Sleep Apnea Screening in Patients with Atrial Fibrillation: A Screening-to-Care Cascade Analysis <i>Younes el Ousrouti, Amsterdam UMC, Amsterdam</i>
7	10.06 - 10.16	Early Rhythm Transitions After Post-First-Shock Asystole in Witnessed Out-of-Hospital Cardiac Arrest <i>Annerice Bakker, Amsterdam UMC, Amsterdam</i>
8	10.17 - 10.27	Wearable-Based Automated Cardiac Arrest Detection: Algorithm Performance in Shockable and Non-Shockable Cardiac Rhythms <i>Catharina Jansen Radboudumc, Nijmegen</i>



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Abstract 1

Dutch Outcome in Implantable Cardioverter-Defibrillator Therapy – Extended Follow Up (DO-IT-XL): Long-Term Outcomes in a Large Primary Prevention Population

Presenting author: J.L.M. Römers

Department: Cardiology

J.L.M. Römers (St. Antonius Ziekenhuis, Nieuwegein); J.L.M. Römers St. (Antonius Ziekenhuis, Nieuwegein); M. van der Graaf (St. Antonius Ziekenhuis, Nieuwegein); V.F. van Dijk (St. Antonius Ziekenhuis, Nieuwegein); M. van Barreveld (Amsterdam UMC, Amsterdam); T. Verstraelen (Amsterdam UMC, Amsterdam); A.A.M. Wilde (Amsterdam UMC, Amsterdam); L.V.A. Boersma St. (Antonius Ziekenhuis, Nieuwegein)

Purpose:

Guidelines are shifting toward more conservative ICD use, especially in non-ischemic cardiomyopathy. We aimed to evaluate long-term outcomes, including survival and ICD-related events, across all ICD implantation indications.

Methods:

This study presents the extended follow-up of the multicenter Dutch DO-IT study, with endpoints including overall survival, (in)appropriate ICD therapy, and device-related complications.

Results:

Of the initial cohort, 759 patients (mean age 67 ± 11 years, 29.9% female) were included in this analysis. Cardiomyopathy (CMP) etiology was ischemic CMP (iCMP) in 52.6%, hypertrophic CMP in 3.7%, dilated CMP in 6.9%; Idiopathic CMP in 23.3%, genetic CMP in 4.1% and other non-ischemic CMP (niCMP) in 9.5%. During a median follow-up of 7.5 years [IQR 4.1; 8.4], 38.3% of patients died (iCMP 45.1% vs. niCMP 30.8%, $p < 0.001$), with 66.2% of deaths due to non-cardiac causes. Cardiac deaths were mostly due to heart failure, with few arrhythmic deaths (iCMP $n = 7$, niCMP $n = 1$). During follow-up, 189 patients (26.5%) received appropriate ICD therapy (iCMP 26.1%, niCMP 23.6%, $p = 0.486$). The annual rate of appropriate therapy was 8.56% for iCMP and 5.76% for niCMP, while the annual rate for inappropriate therapy was 1.3% in both groups. Complication rates during follow-up did not differ between groups.

Conclusion:

Extended follow-up shows that even in modern times with more contemporary heart failure therapy, appropriate ICD therapy is frequently needed in primary prevention ICD recipients. The high annual rate of appropriate ICD therapies in our cohort warrants reconsideration to withhold an ICD in patients with niCMP

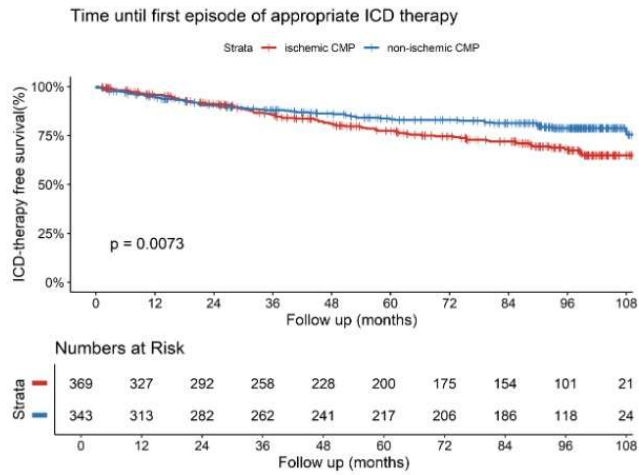
Keywords:

Defibrillator, Cardiomyopathy, Long-term outcome



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Figure:
Time until first episode of appropriate ICD therapy





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Abstract 2

Comparison of Two Pulsed Field Ablation Systems for Atrial Fibrillation: One-Year Outcomes from a Multicenter Registry

Presenting author: M. van der Graaf

Department: Cardiology

M. van der Graaf (St. Antonius Ziekenhuis, Nieuwegein); B.G.S. Abeln (St. Antonius Ziekenhuis, Nieuwegein); J.C. Balt (St. Antonius Ziekenhuis, Nieuwegein); S. Mittal (Valley Health System, Paramus, NJ, USA); B.P. Knight (Northwestern University, Feinberg School of Medicine, Chicago, IL, USA); M.A. Gunawardene (Asklepios St. Georg Clinic, Hamburg, Germany); B. Wilsmore (John Hunter Hospital, New Lambton, NSW, Australia); A. Amardeep (John Hunter Hospital, New Lambton, NSW, Australia); T. Harloff (Asklepios St. Georg Clinic, Hamburg, Germany); M. Liebregts (St. Antonius Ziekenhuis, Nieuwegein); M.M. Malaty (John Hunter Hospital, New Lambton, NSW, Australia); D.L. Musat (Valley Health System, Paramus, NJ, USA); G. Peigh (Northwestern University, Feinberg School of Medicine, Chicago, IL, USA); S. Singh (Northwestern University, Feinberg School of Medicine, Chicago, IL, USA); M.C.E.F. Wijffels (St. Antonius Ziekenhuis, Nieuwegein); S. Willems (Asklepios St. Georg Clinic, Hamburg, Germany); N. Verma (Northwestern University, Feinberg School of Medicine, Chicago, IL, USA); V.F. van Dijk (St. Antonius Ziekenhuis, Nieuwegein); L.V.A. Boersma (St. Antonius Ziekenhuis, Nieuwegein)

Purpose:

While various pulsed field ablation (PFA) systems for atrial fibrillation (AF) ablation have become available in recent years, data comparing long-term efficacy outcomes remain limited.

The goal of this study is to compare long-term efficacy outcomes of two commercially available PFA systems to perform pulmonary vein isolation (PVI) for AF in a multicenter clinical setting.

Methods:

We conducted an international, multicenter, registry study of patients with AF undergoing a first ablation between January 29th, 2024 and September 1st, 2024. Patients were treated with either the pentaspline catheter or the circular over-the-wire catheter in all centers.

Endpoints included time to recurrence of atrial arrhythmias following a 2-month blanking period and repeat ablation outcomes. Factors associated with recurrence were assessed.

Results:

A total of 428 patients were included, of whom 231 (54.0%) were treated with the pentaspline catheter. Most patients (84.6%) underwent a PVI-only procedure, with significantly longer procedure and LA dwell times observed in the circular catheter group ($p < 0.001$). Acute procedural success was achieved in all patients. At 12 months, AF-recurrence was observed in 33.5% of patients overall, with similar rates between groups (pentaspline catheter 34.1% vs. circular catheter 32.8% (log-rank $p = 0.93$)). Longer time since AF diagnosis and persistent AF were associated with recurrence of AF. Repeat ablation was performed in 14.9% of patients.

Conclusion:

In this study, we compared two commercially available PFA systems for primary PVI in AF patients. Both achieved high acute success and similar 12-month AF recurrence rates, indicating comparable efficacy.



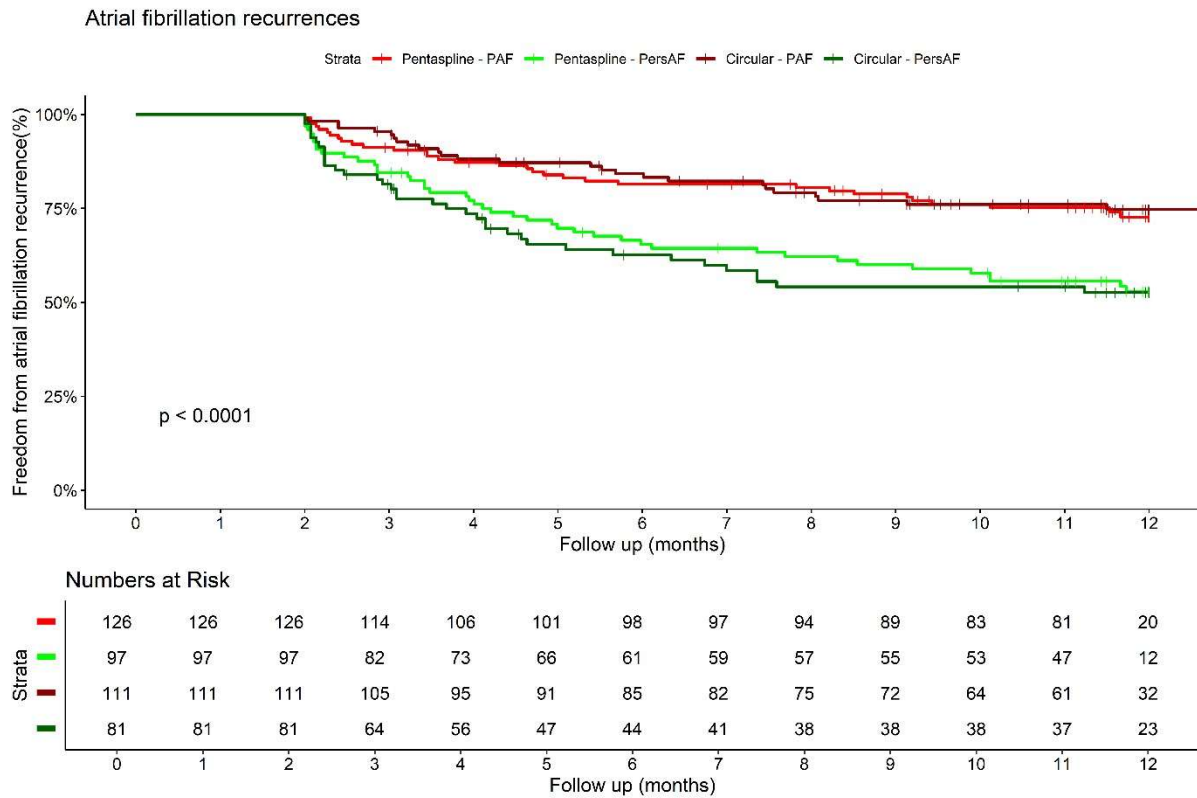
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Keywords:

Atrial fibrillation, Pulsed Field Ablation, Long-term Efficacy

Figure:

Figure 1: Kaplan meier curve - Recurrence of atrial fibrillation by ablation method and type of AF





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Abstract 3

Retrospective Evaluation of the Prostyle Vascular Closure Device in Patients Undergoing Atrial Fibrillation Ablation: Effects on Hemostasis and Hospital Stay

Presenting author: I.N. Bax

Department: Cardiology

I.N. Bax (St. Antonius Ziekenhuis, Nieuwegein); I.N. Bax (St. Antonius Ziekenhuis, Nieuwegein); N.F.T Keijzer (St. Antonius Ziekenhuis, Nieuwegein); M. van der Graaf (St. Antonius Ziekenhuis, Nieuwegein); M. de Lange (St. Antonius Ziekenhuis, Nieuwegein); M. Liebregts (St. Antonius Ziekenhuis, Nieuwegein); L.V.A. Boersma (St. Antonius Ziekenhuis, Nieuwegein)

Purpose:

Pulmonary vein isolation (PVI) for atrial fibrillation (AF) carries bleeding risks and subsequent long bed rest. Vascular closure devices (VCDs) may reduce bleeding and enable earlier mobilization. This study evaluates strategies to minimize access-site bleeding and shorten hospitalization.

Methods:

This single-center registry included patients with AF undergoing a (re-)PVI between April 3rd and October 28th, 2025, at St. Antonius Hospital, the Netherlands. The registry included three phases: phase 1 used a VCD for femoral access ($\geq 8F$, outer diameter 12-17F) followed by 4h bed rest, phase 2 applied the same VCD with 2h bed rest plus 2h seated, phase 3 combined VCD and figure-of-eight suture, followed by 2h bed rest and 1h seated/semi-upright. Outcomes included access-site bleeding complications, same-day discharge and post-procedure length of stay.

Results:

In total 461 patients were included (phase 1: 170; 2: 240; 3: 51) with a mean age of 63.7 ± 9.7 years, 35.4% were female. Baseline characteristics were comparable across all phases. No major bleeding complications occurred. Minor bleeding occurred in 33 patients (19.4%), 49 (20.4%), 4 (7.8%) in phases 1, 2, and 3, respectively, with no statistically significant difference ($p = 0.106$). Prolonged bed rest occurred in 29 (17.2%), 103 (42.9%), and 10 (19.6%) patients, respectively. Unplanned overnight stay due to bleeding was required in 0 (0%), 6 (2.5%), and 0 (0%) patients, respectively.

Conclusion:

Implementation of a VCD reduced bed rest after PVI from 4 to 2 hours, with a slight increase in minor bleeding complications. By adding a figure-of-eight suture we enabled higher same-day discharge rates.

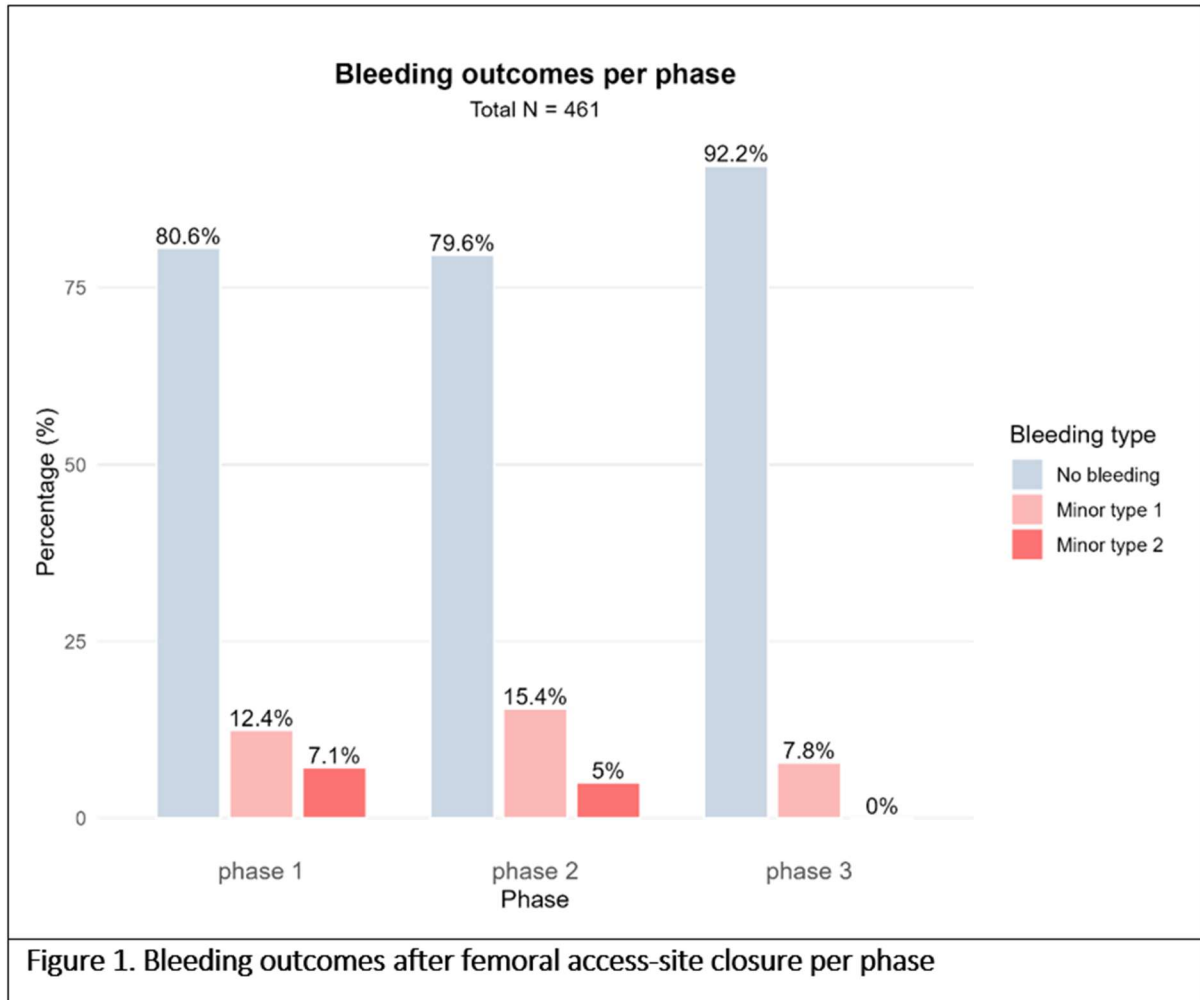
Keywords:

Catheter ablation, vascular closure device,



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Figure:





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Abstract 4

Extensive vs. Limited Pulmonary Vein Isolation in Pulsed Field Ablation Using a Circular Over-the-wire Catheter

Presenting author: R.E. Bolhuis

Department: Cardiology

R.E. Bolhuis, (St. Antonius Ziekenhuis, Nieuwegein); R.E. Bolhuis (St. Antonius Ziekenhuis, Nieuwegein); M.C.E.F. Wijffels (St. Antonius Ziekenhuis, Nieuwegein); M. Liebregts (St. Antonius Ziekenhuis, Nieuwegein); V.F. Van Dijk (St. Antonius Ziekenhuis, Nieuwegein); J.C. Balt (St. Antonius Ziekenhuis, Nieuwegein); L.V.A Boersma (St. Antonius Ziekenhuis, Nieuwegein)

Purpose:

Despite favorable short-term PVI outcomes with PulseSelect (PS) pulsed field ablation (PFA) system, long-term results are still limited. This study compares 8 versus 12 applications to assess durability, efficacy, and safety.

Methods:

Single-center registry of patients with paroxysmal or non-paroxysmal atrial fibrillation (AF) undergoing primary pulmonary vein isolation (PVI) using the PS PFA system at St. Antonius Hospital (March–September 2025). According to local protocol, patients treated before 20 June 2025 received ≥ 8 applications per vein (8-application group), after which the protocol was changed to ≥ 12 applications per vein (12-application group). Endpoints included acute isolation, adverse events, and AF recurrence after a 2-month blanking period, monitored by photoplethysmography or electrocardiograms and analyzed using Kaplan–Meier curves and log-rank tests.

Results:

This analysis included 115 patients (65.9% male; mean age 64 years; 69.6% paroxysmal AF), all undergoing PVI only. Seventy-five patients were included in the 8-application group and 40 in the 12-application group. The 12-application group received more applications (48.0 vs 34.0), had longer procedure duration (42.5 vs 36.0 min, $P < 0.001$) and fluoroscopy times (13.0 vs 10.0 min, $P < 0.001$). Acute isolation was achieved in 100% vs 97.3%. Two minor and one major vascular complication occurred in the 8-application group. Arrhythmia recurrence did not differ significantly between groups ($P = 0.78$), with a non-significant trend toward higher short-term AF freedom in the 12-application group.

Conclusion:

In this preliminary cohort, 12 versus 8 applications per pulmonary vein showed similar acute efficacy and safety, with a non-significant trend favoring 12 applications. Larger cohorts and longer follow-up will allow more robust evaluation.

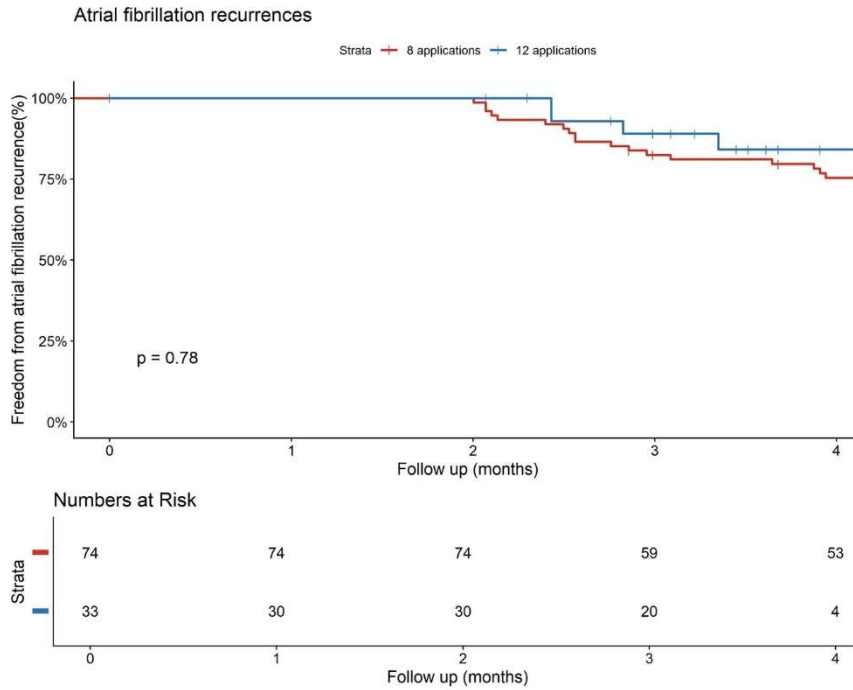
Keywords:

Pulsed Field Ablation, Pulmonary Vein Isolation, Atrial Fibrillation



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Figure:





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Abstract 5

Early Real-World Outcomes of the 2023 Refined Dutch Guidelines for Non-Ischemic Cardiomyopathy Mandating CRT-P Treatment

Presenting author: L.A. Broers

Department: Cardiology

L.A. Broers (Radboudumc, Nijmegen); L.A. Broers (Radboudumc, Nijmegen); L. Almeida-Carrion (Amsterdam UMC, Amsterdam); R. Evertz (Radboudumc, Nijmegen); L.R.A. Olde Nordkamp (Amsterdam UMC, Amsterdam); V.P. van Halm (Amsterdam UMC, Amsterdam); C.P. Allaart (Radboudumc, Nijmegen); L.H.G.A. Hopman (Amsterdam UMC, Amsterdam)

Purpose:

To evaluate real-world adherence of the 2023 Dutch guidelines for patients with non-ischemic cardiomyopathy (NICM) undergoing de novo CRT implantation, recommending cardiac resynchronization therapy without (CRT-P) rather than with defibrillator (CRT-D), and to assess ventricular arrhythmia and mortality outcomes.

Methods:

A retrospective multicenter cohort study was conducted across two academic hospitals in the Netherlands. Consecutive adult patients with NICM, left ventricular ejection fraction <35% despite ≥3 months of guideline-directed medical therapy, and CRT implanted between April 2023 and January 2026 were included. Patients with ischemic cardiomyopathy, secondary-prevention ICD indications, prior device implantation, infiltrative cardiomyopathies, or known high-risk genetic variants for sudden cardiac death were excluded. Outcomes included guideline adherence, reasons for non-adherence, sustained ventricular arrhythmias during follow-up, and all-cause mortality.

Results:

A total of 61 patients were included. Most patients (72%) received CRT-P in accordance with the Dutch guideline, while 28% received CRT-D. Reasons for non-adherence included the presence of late gadolinium enhancement (LGE) on cardiac magnetic resonance (CMR) imaging (71%), long remaining life expectancy (18%), or undocumented deviation from the guideline (12%). During a median follow-up of 12 months (range: 0-31 months), no sustained ventricular arrhythmias were observed. Two patients died of a non-cardiovascular and undocumented event.

Conclusion:

In this real-world multicenter cohort, adherence of the guideline in selected patients was moderate. Particularly those with myocardial fibrosis on CMR continued to receive CRT-D, reflecting ongoing debate in arrhythmic risk prevention in NICM. No sustained ventricular arrhythmias were observed.

Keywords:

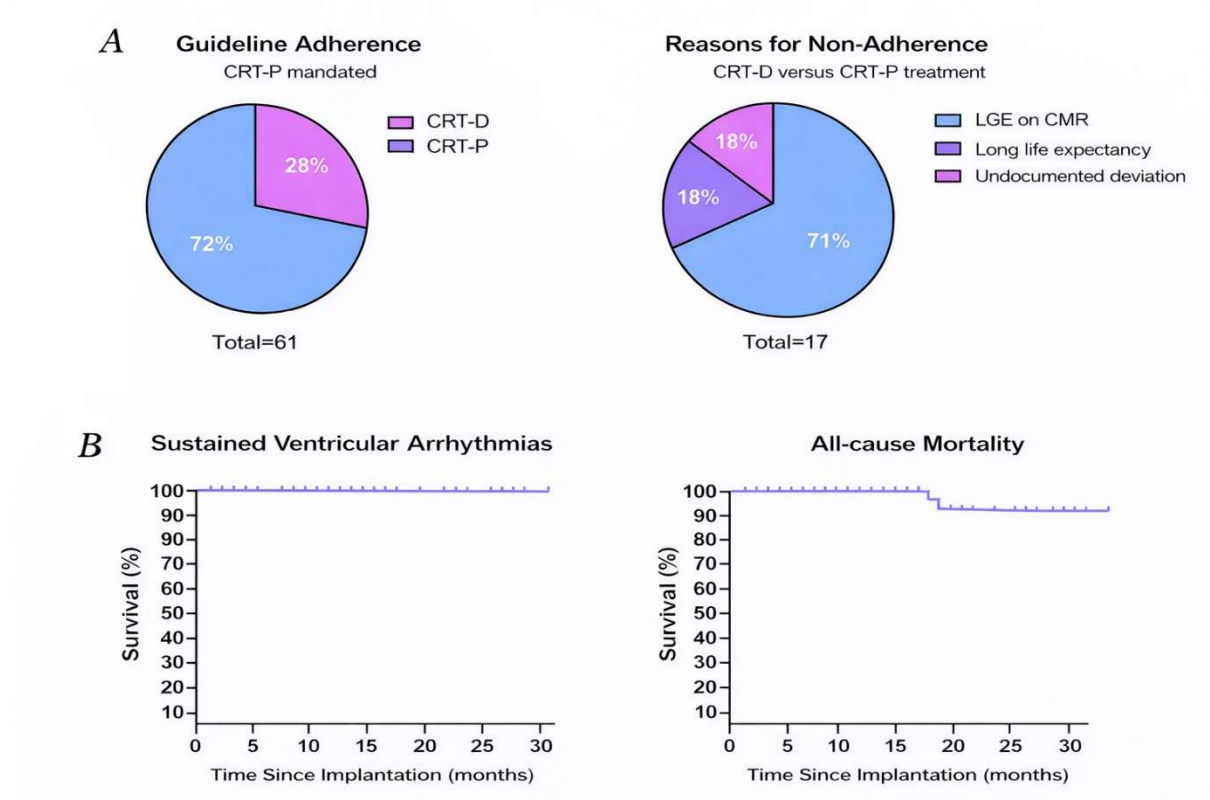
Non-Ischemic Cardiomyopathy, Guideline Adherence, Cardiac Resynchronization Therapy



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Figure:

Figure: A. 2023 Dutch NICM guidelines adherence and reasons for non-adherence. B. Outcomes on sustained ventricular arrhythmia during follow-up and all-cause mortality.





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Abstract 6

Clinical and Economic Evaluation of Obstructive Sleep Apnea Screening in Patients with Atrial Fibrillation: A Screening-to-Care Cascade Analysis

Presenting author: Y. el Ousrouti

Department: Cardiology

Y. el Ousrouti (Amsterdam UMC, Amsterdam); Y. el Ousrouti (Amsterdam UMC, Amsterdam); L.E. Wentrup (Amsterdam UMC, Amsterdam); M.J. Mulder (Amsterdam UMC, Amsterdam); N. van Pouderoijen (Amsterdam UMC, Amsterdam); C.P. Allaart (Amsterdam UMC, Amsterdam); M.J.B. Kemme (Amsterdam UMC, Amsterdam)

Purpose:

Obstructive sleep apnea (OSA) is highly prevalent yet often underdiagnosed in patients with atrial fibrillation (AF). Despite this, data on the clinical and economic value of systematic OSA screening in this population are lacking. This study investigated patient attrition and direct medical costs in an AF outpatient cohort using a screening-to-care cascade model.

Methods:

This retrospective cohort study with longitudinal follow-up examined AF patients presenting to an AF outpatient clinic between 2019 and 2023. OSA screening utilised the STOP-BANG alongside clinical evaluation. Patient flow was tracked across sequential stages: screening, diagnostic sleep study, OSA diagnosis, treatment initiation, and adherence, with adherence assessed through a cross-sectional questionnaire. Direct medical costs for each cascade step were analysed from a healthcare system perspective.

Results:

Screening was conducted in 232 AF patients (age 64.7±9.6 years, 65.3% male). Of these, 159 (68.5%) screened positive for OSA and were referred for diagnostic testing. 63 (39.6% of screen-positives) underwent a sleep study, resulting in 40 new OSA diagnoses. Ultimately, 31 patients initiated treatment, and 19 (8.2% of all screened) remained adherent. The largest attrition occurred between positive screening and diagnostic testing, with 60.4% not proceeding. The total cost from screening through treatment was €192,397.39, corresponding to €10,125.12 per adherent patient.

Conclusion:

Systematic screening detected many AF patients at risk for OSA but was marked by high attrition during the diagnostic phase, limiting confirmed diagnoses and adherence. Targeted strategies to improve diagnostic uptake and long-term adherence are needed to increase the clinical yield of screening.

Keywords:

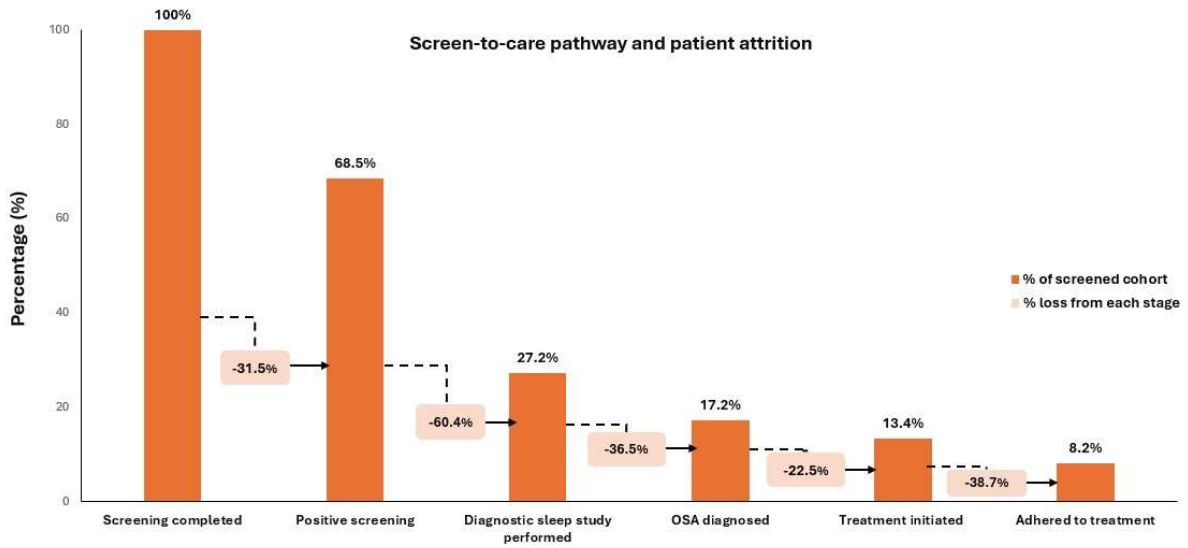
Obstructive Sleep Apnea (OSA), Atrial Fibrillation (AF), Screening



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Figure:

Figure 1. Screen-to-care pathway showing the proportion of patients progressing through each step, expressed as a percentage of the screened cohort and the relative attrition between consecutive stages.





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Abstract 7

Early Rhythm Transitions After Post-First-Shock Asystole in Witnessed Out-of-Hospital Cardiac Arrest

Presenting author: A. Bakker

Department: Cardiology

A. Bakker (Amsterdam UMC, Amsterdam); A. Bakker; B.J. Verkaik; R. Stieglis; J.L. van Schuppen; C. van der Werf (Amsterdam UMC Location AMC, Amsterdam)

Purpose:

Early defibrillation improves survival in out-of-hospital cardiac arrest (OHCA) patients presenting with initial shockable rhythms. However, approximately 55% of patients exhibit asystole directly after the first shock. Here, we studied early rhythm transitions in these post-first-shock asystole patients to determine whether post-shock pacing could be beneficial.

Methods:

We included 606 accurately characterized witnessed OHCA cases with an initial shockable rhythm between 2016-2019 and asystole within five seconds post-first-shock. Rhythm transitions were classified as return of organized rhythm (ROOR) or refrillation (reoccurrence of ventricular fibrillation). Shock delay was defined as time from emergency call to the first shock.

Results:

Post-first-shock asystole persisted in 6/606 (1%) cases. ROOR and refrillation occurred as first transition in 344/606 (57%) and 256/606 (42%) cases, respectively. Each additional minute of shock delay significantly reduced the likelihood of ROOR (adjusted odds ratio [aOR] 0.92; 95% CI 0.87-0.97) and significantly increased the likelihood of refrillation (aOR 1.07; 95% CI 1.00-1.15) as the first rhythm transition. Median time to ROOR was 18 seconds (IQR 11-34) in cases with shock delay <6 minutes and 26 seconds (IQR 15-71) in those with ≥6 minutes ($P<0.001$). Thirty-day survival was 63% in patients with ROOR and 29% in patients with refrillation as the first rhythm transition ($P<0.001$).

Conclusion:

Post-first-shock asystole was transient in nearly all cases of witnessed out-of-hospital cardiac arrest. These findings suggest that post-shock pacing has no significant potential to improve outcome. Subsequent rhythm transitions were significantly influenced by shock delay, stressing the importance of implementing and improving strategies to reduce the time to first shock.

Keywords:

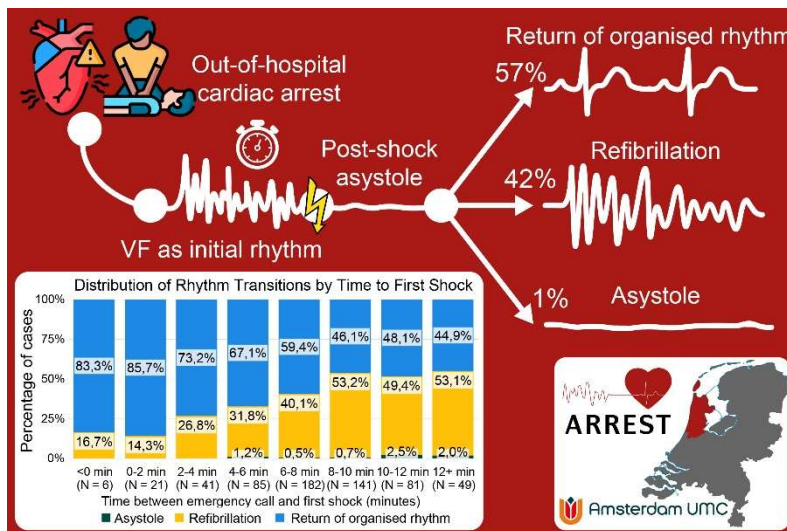
out-of-hospital cardiac arrest, defibrillation, post-first-shock asystole



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Figure:

This graphical abstract illustrates witnessed out-of-hospital cardiac arrests with a shockable initial rhythm, followed by post-first-shock asystole and the subsequent early rhythm transitions. The upper panel shows that post-first-shock asystole persisted in only 1% of patients, while the first transition was a return of organised rhythm in 57% and refrillation in 42% of cases. The stacked bar chart displays the distribution of these first rhythm transitions by time from emergency call to first shock in 2 minute intervals (plus a 'shock before call' category) after post-first-shock asystole. The figure highlights that with increasing shock delay, the proportion of patients with a first transition to return of organised rhythm decreases, whereas the proportion with refrillation as first transition increases.





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Abstract 8

Wearable-Based Automated Cardiac Arrest Detection: Algorithm Performance in Shockable and Non-Shockable Cardiac Rhythms

Presenting author: C.E. Jansen

Department: Cardiology

C.E. Jansen (Radboudumc, Nijmegen); C.E. Jansen (Radboudumc, Nijmegen); R. Edgar (Radboudumc, Nijmegen); L.R. Pol (Radboudumc, Nijmegen); K. Ebrahimkheil (Corsano Health, Den Haag); R.C. van Kaam (Radboudumc, Nijmegen); M.A. Brouwer (Radboudumc, Nijmegen); P.C. Stas (Corsano Health, Den Haag); E. Boersma (Erasmus MC, Rotterdam); C.W.E. Hoedemaekers (Radboudumc, Nijmegen); N. van Royen (Radboudumc, Nijmegen); J.L. Bonnes (Radboudumc, Nijmegen)

Purpose:

Unwitnessed out-of-hospital cardiac arrest (OHCA) has poor survival chances due to delayed recognition. To enable early detection, a wrist-worn device with automated cardiac arrest detection and alerting capabilities is being developed. This study evaluates the performance of a previously developed photoplethysmography (PPG)–based cardiac arrest detection algorithm in patients with shockable and non shockable cardiac arrests in a hospital setting.

Methods:

The study population consisted of patients who underwent ventricular fibrillation (VF) induction during S ICD implantation, VF induction during ventricular tachycardia (VT) ablation, and Intensive Care Unit (ICU) patients in whom life sustaining treatment was withdrawn. Patients wore a PPG wristband (CardioWatch, Corsano Health, Den Haag). Cardiac arrest was confirmed by ECG and invasive blood pressure measurements as reference. Sensitivity for detecting cardiac arrest and false positives were assessed using the previously developed algorithm.

Results:

Twenty-five patients were included (1 VT ablation, 6 S ICD implantation, and 18 ICU patients). In total, these patients experienced 27 cardiac arrests: 9 VF and 18 PEA/asystole. The algorithm correctly identified all 27 arrests, resulting in a sensitivity of 100% (95% CI 87–100%). Three false positive alarms occurred during 140 hours of PPG recordings, of which two in ICU patients and one during the VT ablation procedure.

Conclusion:

Both shockable and non-shockable cardiac arrest were detected with excellent sensitivity. For the first time, this study demonstrates that the cardiac arrest detection algorithm performs equally well in shockable and non-shockable rhythms. Further studies are warranted to evaluate algorithm performance in larger cohorts and under real-world, daily-life conditions.

Keywords:

Out-of-hospital cardiac arrest, Wearable, Automated detection