



Fig. 1 Pacing from the LSPV (lasso 10-1), PCL 600 ms. Introduction of an extra-stimulus (S2: 280 ms). PVPs are clearly distinguished from the pacing artifact. PV capture and exit block are confirmed.

occurred in 4 patients. Clear demonstration of PV capture and exit block was possible in 76% of the patients, but in only 40% of the ablated PVs.

Conclusions The decremental properties of the PVs can be used to distinguish PV potentials from the pacing artifact when testing for exit block. In our experience, PV capture after radiofrequency ablation of the PV becomes quite inconstant and remains possible in only a fraction of the PVs. Moreover, capture of far field structures frequently occurs when pacing at 10mA.

Long-term outcome of atrial fibrillation ablation in 1000 patients. — Y. De Greef, L. Riahi, R. Prisecaru, E. Gabeler, D. Stockman, B. Schwagen (ZNA Middelheim, Antwerp, B)

Background Pulmonary vein isolation (PVI) is an accepted treatment to relieve symptoms in patients with atrial fibrillation (AF). We studied outcome after PVI in a large cohort of patients from 2004 guided by various ablation techniques and follow-up ≥ 1 year.

Methods 1000 patients with symptomatic recurrent AF (age 60 ± 10 , 72% males, CHA₂DS₂-VASc score 1 ± 1) and minimal heart disease underwent PVI (point-by-point RF ablation with Carto (manual, $n = 265$; stereotaxis, $n = 164$) or Ensite (manual, $n = 138$; stereotaxis, $n = 9$), PVAC, $n = 262$, HDMA-Mesh ablator, $n = 59$, Cryoballoon, $n = 93$ and nMarq, $n = 10$). Repeat ablation procedures consisted of point-by-point re-isolation of reconnected PVs and, if necessary, additional atrial ablation. Success was defined as freedom of documented AF after ablation with or without anti-arrhythmic drug treatment (ADT) with a blanking period of 1month.

Results After a mean follow-up duration of 46 ± 47 months, 517 patients (47 still on ADT) remained

free of documented AF after a single procedure. Although most recurrences ($n = 339$, 70%) occurred in the first year after ablation, a substantial N of patients ($n = 144$, 30%) displayed a late (≥ 1 year) recurrence. AF recurrence between years 1-2, 2-3, 3-4, 4-5 and > 5 years occurred respectively in 79 (55%), 33 (23%), 15 (11%), 11 (7%) and 6 (4%) patients.

After repeat ablation procedures, another 282 patients (46 still on ADT) could be rendered free of atrial fibrillation. As a final result, 80% of the patients were free of atrial fibrillation after a mean number of 1,5 ablation procedures per patient.

Conclusion Almost half of the patients undergoing AF ablation will display a documented AF recurrence during long-term follow-up. AF recurrence can still occur even after a time horizon of > 5 years. This has major implications towards “whether or not” and “when” oral anticoagulation can safely be discontinued after a presumed successful ablation in patients with a CHA₂DS₂-VASc score ≥ 1 . To obtain a beneficial clinical outcome multiple procedures are often needed with 11% of patients still on chronic anti-arrhythmic drug therapy.

Patient knowledge about atrial fibrillation and its management: development of a new questionnaire and first results. — L. Desteghe^{1,2}, Z. Raymaekers¹, J. Vijgen², D. Dilling-Boer², P. Koopman², J. Schurmans², P. Vanduyhoven², P. Dendale^{1,2}, H. Heidbüchel^{1,2} (¹Faculty of Medicine and Life Sciences, Hasselt University, Hasselt, B ²Heart Centre, Jessa Hospital, Hasselt, B)

Objectives The fact that atrial fibrillation (AF) patients understand their arrhythmia, its consequences, its treatment and what they have to do in specific situations, may contribute to directed management and ultimately to their outcome. Currently, few instruments exist that easily assess patient’s knowledge and cover all these important aspects. Therefore, the aim of this study was to develop and validate a new patient questionnaire to address these needs, and to evaluate it in a pilot study.

Methods The new Jessa AF Knowledge Questionnaire (JAKQ) developed by our research group contains 24 questions. The first 12 questions address the AF itself, its possible consequences, symptoms and self-management scenarios. These are followed by 7 questions on oral anticoagulation (OAC) therapy, its potential benefits/side effects and specific self-management aspects. Finally, patients get 5 questions about their personal OAC therapy (vitamin K antagonists or non-vitamin K oral anticoagulants). All questions have a multiple choice format, with three possible answers (of which only one is correct) and an ‘I do not know’ option. Before the JAKQ was presented to 101 AF patients (70 ± 10 years; 47 men; 56 outpatients),

it passed through content and face validation. The questionnaire has been implemented on an iPad and is filled out by the patient independently or together with the investigator.

Results The mean score on the AF questionnaire was $53.6 \pm 17.6\%$, with a minimum score of 4.2% (1 out of 24 questions) and a maximum score of 87.5% (21/24). No difference was noted between outpatients and hospitalised patients ($P=0.44$), nor between men and women ($P=0.85$). Intriguingly, one out of four patients (25.7%) was unaware that he/she had a medical condition called “atrial fibrillation”. Although 75.2% of the patients knew the symptoms associated with AF, only 45.5% was aware that AF can be asymptomatic. One third of the patients (30.7%) did not know that AF can lead to stroke. As expected, older patients (≥ 70 years; $n=53$) scored significantly lower than younger ones on the entire questionnaire: $49.0 \pm 19.5\%$ vs. $58.7 \pm 13.7\%$ ($P=0.013$). This was particularly due to the 12 questions about AF in general ($P=0.002$) and not to the other questions about the OAC therapy ($P=0.252$).

Conclusions Many AF patients, and especially the elderly, have important knowledge gaps, both concerning AF itself and its anticoagulant treatment. This opens possibilities for tailored patient education as a means to improve self-care, enhance treatment adherence, and optimise outcome.

AF management using a diagnostic smartphone application: in-hospital validation and remote monitoring study. — C. Hermans^{1,2}, C. Smeets^{1,2}, P. Bertand¹, H. Vanherendael¹, M. Rivero-Ayerza¹, L. Grieten^{1,2}, P. Vandervoort^{1,2}, D. Nuyens¹ (¹Department of Cardiology, Ziekenhuis Oost-Limburg, Genk, B ²Mobile Health Unit, Faculty of Medicine and Life Sciences, Hasselt University, Hasselt, B)

Objectives The recurrence of Atrial Fibrillation (AF) after electrical cardioversion occurs in almost 50% of the cases, especially during the first weeks (Rademacher et al. *J Electrocardiol.* 2012 Mar;45(2):116-22). This work focuses on the development and clinical validation of a smartphone application for the follow-up and management of patients post- AF treatment in a home environment.

Methods In this work we developed and clinically validated a smartphone application to determine irregular heart rhythms based on the photoplethysmographic signal derived by the finger of the user and the smartphone camera. The application was validated in an in-hospital setting on patients eligible for cardioversion. Recordings were compared versus ECG interpretations. Next, a subset of these patients were randomized in a remote monitoring study. This study consists of a remote monitoring arm (RM) with the smartphone application and the usual care arm

(UC). The primary endpoint is the early detection of AF recurrence.

Results The in-hospital validation study included 121 consecutive subjects with a mean age of 66 ± 12 years. 36% was in the possession of a smartphone and 90% of the patients underwent cardioversion. Sensitivity and specificity analysis indicated an accuracy of 97.2% in the identification of AF. The home monitoring study is ongoing with currently 13 subjects from which 6 in the RM arm. Overall, average time of study participation was 31 days where the RM group performed 564 measurements. High compliance, engagement and motivation was found in the RM group. From the 6 included RM patients, 2 subjects had a recurrence of AF prior to their scheduled follow-up visit, and therapy was adjusted accordingly. In the UC group 3 patients were diagnosed with a recurrence of AF that was only detected at first follow-up consultation.

Conclusion The obtained results indicate that a smartphone application can serve as an accurate sensor in the detection of irregular heart rhythms, and more specifically, in the detection of atrial fibrillation. Additionally the use of a smartphone in a post-AF treatment setting enables faster detection of AF recurrence and adjustment of treatment strategies.

Evolution in ICD implantation and effect on appropriate therapy rates. — B. Vandenberg^{1,2}, C. Garweg², G. Voros², V. Floré², T. Marynissen², J. Ector^{1,2}, R. Willems^{1,2} (¹University of Leuven, Department of Cardiovascular Sciences ²University Hospitals Leuven, Cardiology, Leuven, B)

Aims During the last decades the guidelines on ICDs have changed significantly with an evolution from secondary to primary prevention indications first in ischemic and thereafter also in non-ischemic cardiomyopathy and the introduction of cardiac resynchronization therapy (CRT-D). We aimed to study this evolution of ICD implantation and the effect on appropriate therapy (AT) rates by ICDs.

Methods All patients who received an ICD in ischemic or non-ischemic cardiomyopathy in the University Hospitals of Leuven and minimum of 1 year follow-up were included in a retrospective registry with demographic, clinical, electrocardiographic and ICD parameters. We evaluated 3 periods in time from 1996 to 2001 (P1), 2002-2008 (P2) and 2009-2014 (P3). The data of first AT (including both ATP and shock) were documented. Data were compared using *t*-test, chi-square and Kaplan Meier analysis.

Results In total 727 patients (84.9% male, 66.4% ischemic cardiomyopathy and 56% primary prevention) received an ICD. In P1 145 (19.9%, 21/year) ICDs were implanted, in P2 333 ICDs (45.8%, 48/year) and during