

# Bleeding events in Polish cardiology wards: the results of a 2-week survey

Wiktor Kulickowski<sup>1</sup>, Marek Gierlotka<sup>2</sup>, Barbara Zawiślak<sup>3</sup>, Konrad Kaaz<sup>1</sup>, Agnieszka Tycińska<sup>4</sup>

1 Department of Cardiology, Wrocław Medical University, Wrocław, Poland

2 Department of Cardiology, Institute of Medical Sciences, University of Opole, Opole, Poland

3 Department of Cardiology and Cardiovascular Interventions, University Hospital, Kraków, Poland

4 Department of Cardiology, Medical University of Białystok, Białystok, Poland

**Introduction** The increasing use of novel antiplatelet and antithrombotic drugs as well as the constantly growing rate of invasive procedures can result in a higher incidence of bleeding complications, especially among patients hospitalized in cardiology wards. Moreover, there is now convincing evidence that not only thrombotic but also bleeding complications significantly affect treatment outcomes in cardiac patients.<sup>1</sup> However, reliable real-life data on the prevalence and clinical course of bleeding in the Polish setting are lacking. Moreover, little is known about measures implemented in Polish cardiology wards to prevent bleeding. To fill these gaps, a survey study of cardiology wards in Poland was conducted by the Working Group on Bleeding of the Association of Intensive Cardiac Care of the Polish Cardiac Society.

**Methods** This was an online survey consisting of 3 parts. The first part included 6 questions regarding the Bleeding Academic Research Consortium (BARC) classification, clinical course, and number of bleeding events that occurred during the previous 2 weeks in a given cardiology ward. The second part, which consisted of 7 questions, concerned preventive measures taken in a given ward to avoid bleeding complications. The final part included 10 questions regarding the characteristics of a given ward. Participation in the survey was voluntary. Invitations were sent directly to the heads of all cardiology departments in Poland via regional consultants. We only collected aggregated and fully anonymized data. The original survey in Polish is available in Supplementary material S1. The approval of an ethics committee was not required for this study.

**Statistical analysis** The results are presented as number and percentage or median and interquartile range (IQR), depending on data type and distribution. The NCSS 2019 Statistical Software (NCSS, LLC., Kaysville, Utah, United States; [ncss.com/software/ncss](http://ncss.com/software/ncss)) was used for all calculations.

**Results and discussion** Complete survey responses were received from 45 cardiology wards, which constituted 22% of all invitations. The list of respondents and their characteristics are available in Supplementary material S2 (Table S1–S3). Overall, 127 bleeding events in the 2 preceding weeks were reported, which translates to 73 bleeding events per year per ward. The median (IQR) number of bleedings per ward was 2 (1–4). Of all the events, 57 (45%) occurred at the intensive cardiac care unit (ICCU). Moreover, the survey showed that bleeding events occurred in 3.5% of all hospitalized patients and in 4.1% of those hospitalized in ICCU during the study period. Regarding the bleeding classification, BARC 2 bleedings were the most common (80 in total, 34 in ICCU), followed by BARC 3a (39 and 18, respectively) and BARC 3b (6 and 4, respectively). No BARC 4 and BARC 5 bleedings were reported.

The initial clinical presentation of patients that prompted the diagnosis of bleeding included self-reported symptoms (87.5% of cases), abnormal laboratory results (75%), and abnormal hemodynamic parameters, such as blood pressure or heart rate (20%). Other signs of bleeding were reported in 2.5% of cases. The 3 most common sites of bleeding were the access site for vascular interventions and device implantations

**Correspondence to:**

Konrad Kaaz, MD, PhD,  
Department of Cardiology,  
Wrocław Medical University,  
ul. Borowska 213, 50-556 Wrocław,  
Poland, phone: +48 71 736 42 00,  
email: [konrad.kaaz@umed.wroc.pl](mailto:konrad.kaaz@umed.wroc.pl)

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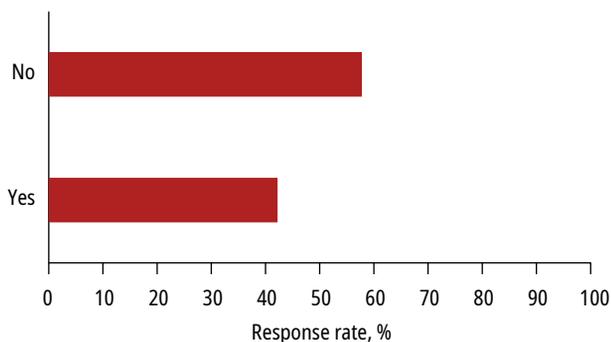
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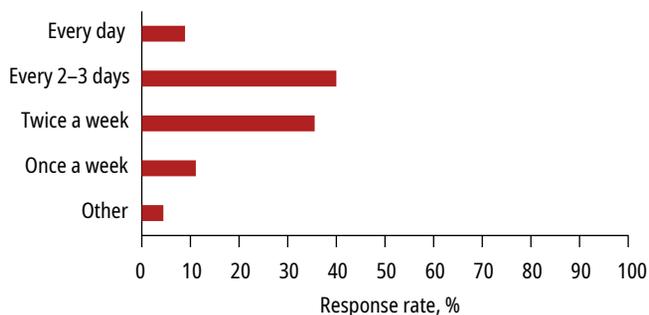
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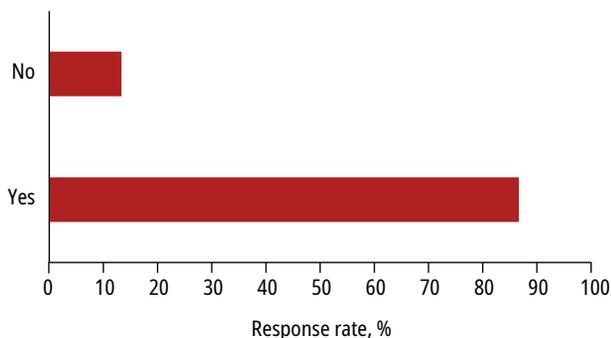
Is the blood group routinely checked on admission at your Center?



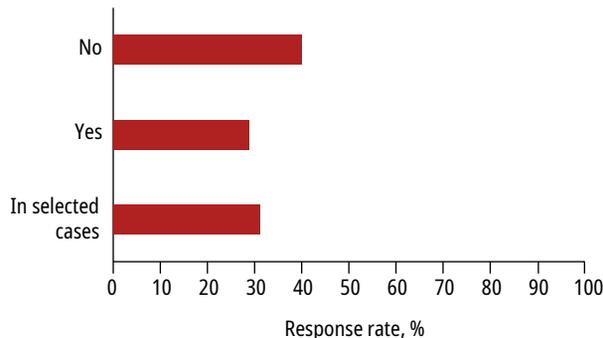
How often is the blood count determined in your Intensive Cardiac Care Unit in patients without suspicion of bleeding (longer stays)?



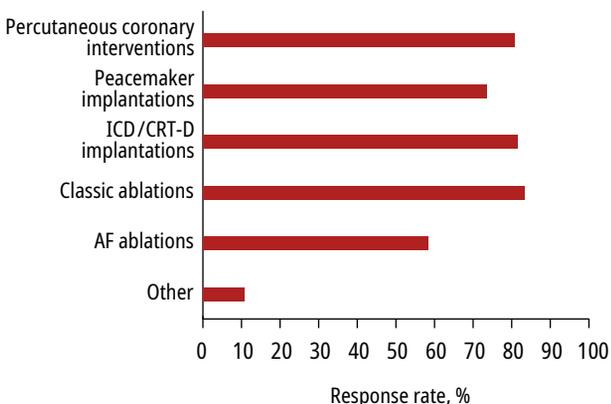
Do you routinely assess patients with the HAS-BLED scale before OAC therapy?



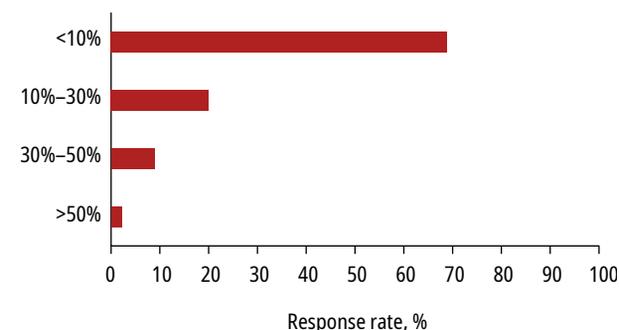
Do you use LMWH bridging therapy during hospitalization in patients requiring chronic OAC therapy?



Which of the following procedures are performed in patients with OAC without bridging therapy at your Center?



How often do you switch from a strong antiplatelet drug (ticagrelor or prasugrel) to clopidogrel in patients after coronary interventions to prevent bleeding?



**FIGURE 1** Measures adopted in cardiology wards to prevent bleeding complications

Abbreviations: AF, atrial fibrillation; CRT-D, cardiac resynchronization therapy defibrillator; HAS-BLED, hypertension, abnormal renal / liver function, stroke, bleeding history or predisposition, labile international normalized ratio, elderly (>65 years), drugs / alcohol concomitantly; ICD, implantable cardioverter defibrillator; LMWH, low-molecular-weight heparin; OAC, oral anticoagulant

(68%) as well as the gastrointestinal (58%) and urinary tracts (30%). Less common bleedings included those to the central nervous system (5%), retroperitoneal space (3%), and bronchial tree (3%). In 10% of cases, other sites were reported, including the pericardial sac, nose, and surgically treated pressure ulcers.

The 5 most common specialists who were consulted about bleeding events were a general surgeon, gastroenterologist, invasive cardiologist, vascular surgeon, and urologist (38%, 33%, 28%, 23%, and 18% of respondents, respectively), while a consultation with a neurosurgeon, electrophysiologist, cardiac surgeon, neurologist, or

an internist was reported less often (by 5%, 5%, 3%, 3%, and 3% of respondents, respectively). Only 10% of respondents did not consult their cases with other specialists.

The most common blood products used in cardiology wards were packed red blood cells (97%). The use of fresh frozen plasma and platelets was reported only in 7% of cases each, while the use of dabigatran-specific antidote, in 3%.

Most respondents (75%) reported that an additional intervention due to bleeding was required (eg, surgery or endoscopy). In 4% of cases, a bleeding event was followed by a thrombotic complication, and in a single case, by death (although it was not reported as BARC 5 bleeding). Stroke and acute respiratory distress were reported as bleeding complications in 8% of cases.

The results regarding measures taken in cardiology wards to prevent bleeding complications are presented in **FIGURE 1** and in Supplementary material S2 (*Figure S1*). The use of proton pump inhibitors was reported by 93% of the wards in more than 80% of patients on triple antithrombotic therapy and by 71% of the wards in more than 80% of patients on dual antiplatelet therapy. According to the survey, prasugrel or ticagrelor was switched to clopidogrel to prevent bleeding in less than 10% of patients in 69% of the wards.

Routine blood group determination was performed only in 42% of the wards, and routine peripheral blood count was measured every 2 to 3 days in 40% of the wards or twice a week in 36% of the wards during prolonged hospitalization. The HAS-BLED (hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio, elderly [ $>65$  years], drugs/alcohol concomitantly) score was routinely calculated before therapy with non-vitamin K antagonist oral anticoagulants (NOACs) in 87% of the wards. Interestingly, bridging therapy with low-molecular-weight heparin was used in patients on chronic NOAC treatment in 60% of the wards. Finally, in 81% of the wards, more than 80% of coronary interventions were performed using the radial access.

Bleedings, especially the clinically relevant ones, are known to prolong hospital stays and increase short- and long-term mortality rates.<sup>2,3</sup> Hospitalized patients are increasingly older, more often have clinically relevant comorbidities, and are more frequently referred for various invasive procedures. The risk of major bleedings in randomized trials has been estimated at 1% to 8% at 30 days in patients with acute coronary syndromes and at 2% to 5% per year in those with atrial fibrillation treated with NOACs.<sup>4</sup> However, the incidence of bleedings in everyday clinical practice may be notably higher than reported in clinical trials.<sup>5</sup> The Association of Intensive Cardiac Care of the Polish Cardiac

Society recommends the use of the BARC classification in daily ICCU practice.<sup>6,7</sup> Overall, our data show that bleedings more frequently occur at ICCUs than in general cardiology wards, where patients are less severely ill.

Importantly, in our survey, the majority of patients treated with dual antiplatelet therapy or triple antithrombotic therapy also received proton pump inhibitors. The satisfactory level of knowledge is also reflected by the fact that most centers used the HAS-BLED score for decision-making about the introduction of oral anticoagulation, and that most of them reported using the radial access for coronary procedures.<sup>8,9</sup> On the other hand, 60% of the wards used bridging therapy, which is not in line with the current guidelines.<sup>8</sup>

The results of this study should be considered in the context of its limitations. First, participation in the survey was voluntary, which may have resulted in selection bias. The survey response rate was quite low, which may affect the generalizability of the data to the Polish population. Second, our data reflect the incidence of bleeding over a relatively short period of time, which makes it impossible to assess long-term outcomes. Finally, the results of our survey provide only general data describing the population of patients with bleedings during hospitalization in cardiology wards, including ICCUs. Therefore, large registry studies are needed to provide more details on bleeding complications, their management, and prevention.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at [www.mp.pl/kardiologiapolska](http://www.mp.pl/kardiologiapolska).

## ARTICLE INFORMATION

**CONFLICT OF INTEREST** None declared.

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