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Dual antiplatelet therapy duration after coronary stenting in clinical practice: results of an EAPCI survey

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KEYWORDS

- acute coronary syndrome
- clopidogrel
- dual antiplatelet therapy (DAPT)
- drug-eluting stent
- stable coronary artery disease

Abstract

Aims: Our aim was to report on a survey initiated by the European Association of Percutaneous Cardiovascular Interventions (EAPCI) concerning opinion on the evidence relating to dual antiplatelet therapy (DAPT) duration after coronary stenting.

Methods and results: Results from three randomised clinical trials were scheduled to be presented at the American Heart Association Scientific Sessions 2014 (AHA 2014). A web-based survey was distributed to all individuals registered in the EuroIntervention mailing list (n=15,200) both before and after AHA 2014. A total of 1,134 physicians responded to the first (i.e., before AHA 2014) and 542 to the second (i.e., after AHA 2014) survey. The majority of respondents interpreted trial results consistent with a substantial equipoise regarding the benefits and risks of an extended versus a standard DAPT strategy. Two respondents out of ten believed extended DAPT should be implemented in selected patients. After AHA 2014, 46.1% of participants expressed uncertainty about the available evidence on DAPT duration, and 40.0% the need for clinical guidance.

Conclusions: This EAPCI survey highlights considerable uncertainty within the medical community with regard to the optimal duration of DAPT after coronary stenting in the light of recent reported trial results. Updated recommendations for practising physicians to guide treatment decisions in routine clinical practice should be provided by international societies.

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Introduction

The importance of dual antiplatelet therapy (DAPT) in patients with acute coronary syndromes and after coronary stent implantation has been substantiated in numerous trials[1,2] and has also been endorsed by international guidelines[3,4]. However, the optimal duration of DAPT after coronary stenting, which maximises the benefits in terms of ischaemic protection and minimises the risks in terms of bleeding, remains unclear.

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Between 2010 and 2014 results have been reported from a number of randomised clinical trials comparing different DAPT duration regimens after coronary stent implantation[5]. Data from these studies failed to show clear evidence of benefit in terms of ischaemic events, in prolonging DAPT beyond one year. Moreover, a DAPT regimen shorter than 12 months was shown to be safer than the currently recommended 12-month DAPT duration[6]. During the American Heart Association Scientific Sessions 2014 (AHA 2014), results from three additional clinical trials investigating the optimal DAPT duration after stenting in an aggregate of approximately 20,000 randomised patients – DAPT, ISAR-SAFE and ITALIC[7-9] – were reported for the first time.

In the light of the anticipated impact of the data from these three trials on clinical practice, the European Association of Percutaneous Coronary Interventions (EAPCI) sought to assess the opinions of the scientific community concerning DAPT duration both before and after AHA 2014. To do this, the association undertook a voluntary web-based survey of the community regarding opinions on DAPT duration after coronary stenting. The current manuscript is a summary of the results.

Methods

This survey initiative was designed to address three major domains concerning DAPT duration: i) clinical practice regarding DAPT duration based on the evidence available before AHA 2014; ii) the expectations of and the reactions to the results of DAPT[7], ISAR-SAFE[8] and ITALIC[9], whose primary findings were presented for the first time during AHA 2014; and iii) the anticipated impact of this new evidence on clinical practice according to the opinion of practising physicians. Accordingly, this survey was built into two sets of questions, distributed before and after the AHA 2014 congress.

The questions included were drafted by the EAPCI Scientific Document Committee and subsequently approved by the EAPCI board. The survey was undertaken using a free web-based survey tool (SurveyMonkey, Palo Alto, CA, USA) and comprised multiple choice questions, including the possibility of adding further comments if required. It was not mandatory to reply to the entire survey. The sample population comprised the mailing list of EuroIntervention – the official journal of the EAPCI. Overall, a total of 15,200 individuals were invited to participate. The invitation to the first part of the survey was sent on the 30th October 2014 and a reminder was sent on the 7th November 2014. For the second part of the survey, the invitation was sent on the 2nd February 2015 and a reminder on the 9th February 2015.

Results

RESPONDENT CHARACTERISTICS

Of the 15,200 invitations sent, a total of 1,134 (7.5%) and 542 (3.6%) physicians responded to the first and the second part of the survey, respectively. Among those, 884 (78%) for the first and 415 (76.6%) for the second part of the survey provided personal and professional information with respect to age, medical and institutional qualification, and geographic region of practice **(Online appendix)**. The characteristics of the respondents are detailed in **Table 1**. Participation in the survey was global, with the majority of respondents being European (65.1% for the first and 71.5% for the second part of the survey) **(Table 1, Online Figure 1)**. The majority of participants were interventional cardiologists at various career stages (87.4% and 90.3%, respectively), followed by cardiologists in training (5.8% and 4.6%, respectively) and non-interventional cardiologists (5.7% and 4.1%, respectively). A minority of responders declared professional qualifications other than cardiological ones (1.2% and 1%, respectively) **(Table 1)**. About half of participants worked in an academic environment, while the remaining 50% were affiliated to non-university-based centres or private institutions **(Table 1)**. The mean age of respondents was 45 years.

DECLARED CLINICAL PRACTICE OF RESPONDENTS CONCERNING DAPT DURATION BEFORE AHA 2014

The main findings of this part of the survey are shown in **Online Table 1**. The majority (53.2%) of respondents indicated a recommendation for a 12-month DAPT duration in all patients treated with drug-eluting stents (DES); one quarter (23.5%) selected

Table 1. Respondent characteristics.

	Survey before AHA (n= 884)	Survey after AHA (n=415)
Age	45.0	46.2
Country of work		
Europe	65.1%	71.5%
North America	8.0%	9.1%
South America	8.4%	8.4%
Asia	13.9%	4.9%
Africa	3.9%	4.2%
Australia	0.7%	1.9%
Professional figure		
Interventional cardiologist (>10 years of experience)	49.8%	56.6%
Interventional cardiologist (>5 years of experience)	20.7%	17.3%
Interventional cardiologist (<5 years of experience)	16.9%	16.4%
Cardiologist in training	5.8%	4.6%
Non-interventional cardiologist	5.7%	4.1%
Other	1.2%	1.0%
Type of practice		
University hospital	49.3%	53.7%
Non-academic public hospital	31.5%	29.6%
Private institution	19.3%	21.2%

a six-month regimen in patients presenting with stable disease and a 12-month regimen for ACS patients; 10.3% routinely prolonged DAPT beyond one year. Three quarters of respondents declared that they take both ischaemic and bleeding risk into consideration when prescribing DAPT. History of stent thrombosis (86%), stenting of the left main or proximal left anterior descending coronary artery (79.7%) and stable versus unstable presentation (74.8%) were the covariates most frequently used in practice to weigh the ischaemic risk **(Figure 1)**. On the other hand, previous bleeding (82.5%), age (76.4%) and renal function (65.3%) have more frequently been identified as important to forecast bleeding **(Figure 2)**. This clinical and/or angiographic set of key covariates used to predict ischaemic or bleeding risk was consistent across institution characteristics (i.e., academic or not academic) and medical qualification/experience (i.e., interventional cardiologist with more than 10 years of experience vs. others, or cardiologist in training vs. others).

With respect to changes to the initially prescribed treatment, 36% of participants reported weighing the occurrence of minor or nuisance bleeding while on DAPT in the decision making on DAPT duration after its prescription, whereas the majority declared adhering to the originally prescribed DAPT duration.

The belief that first-generation DES are more thrombogenic than newer-generation devices and as such require long-term DAPT was widely held (93.5%). However, 54.8% of participants thought that there are still insufficient data to conclude that vulnerability to short DAPT is stent-specific within the class of newer-generation DES. The majority agreed that six-month DAPT is a safe pharmacological strategy after implantation of newer-generation DES, but expressed a need for more clinical data, particularly if a duration shorter than six months is to be recommended, for example after implantation of new-generation non-polymeric DES. The majority also stated that there are insufficient data to draw conclusions on the optimal DAPT duration regimen after bioresorbable everolimus vascular scaffold implantation.

Respondents generally agreed that long-term DAPT exerts protective effects well beyond the prevention of stent-related ischaemic recurrences.

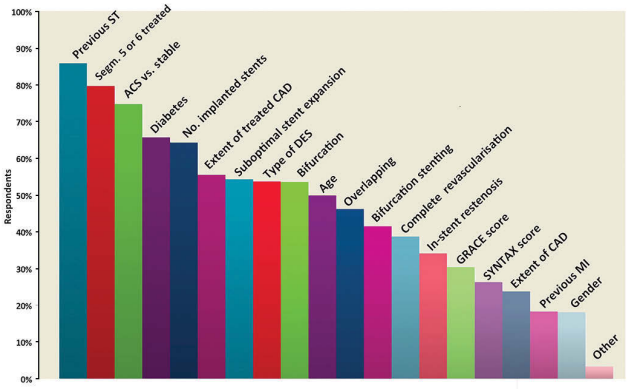

Figure 1. *Please select which of the following variables or scores you generally use to weigh the ischaemic risk after DES implantation (multiple answers allowed).*

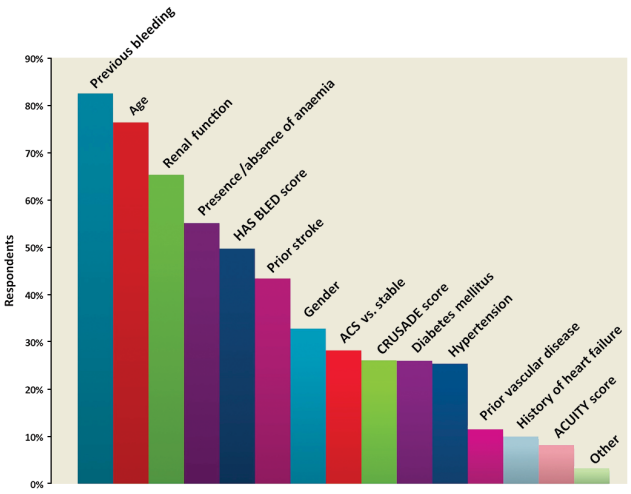

Figure 2. *Please select which of the following variables or scores you generally use to weigh the bleeding risk after DES implantation (multiple answers allowed).*

In patients deemed at high risk of bleeding, six responders out of ten (with a gradient noted across professional activity, 75% non-interventional cardiologists and 55% cardiologists in training) would prefer to implant bare metal stents followed by 30-day DAPT.

ANTICIPATION AND INTERPRETATION OF TRIAL RESULTS PRESENTED AT AHA 2014

Before AHA 2014, 41.4% of respondents believed that the evidence guiding DAPT duration in patients receiving DES was average, and 22.8% asserted that it was confusing. The expectations for the upcoming trials were aligned to the results of previous randomised studies available at that time. Indeed, 72.6% expected the DAPT trial not to show the superiority of 30-month vs. 12-month DAPT and 85% expected ISAR-SAFE to show non-inferiority of a six-month DAPT strategy as compared to a 12-month strategy **(Online Table 1)**.

In relation to the DAPT trial, following AHA 2014, 48.5% of respondents interpreted the results of the trial as showing substantial remaining equipoise between the two treatment strategies (i.e., extended duration [30 months] vs. standard duration [12 months]) in terms of efficacy and safety. Against this, 28.4% responded that a standard 12-month DAPT duration remained the preferred clinical strategy **(Figure 3)**, 23.1% reported that that they were convinced of the superiority of 30-month DAPT duration, and 6.1% believed that it should become the new standard of care. These results were consistent across geographic regions. The reasons reported for not adopting the extended duration used in the DAPT trial as a new standard of care were: concern regarding bleeding risk for 75.4% of respondents, the use of a high proportion of early-generation DES in the trial for 55.4% of respondents, concern about the higher mortality observed in the 30-month group for 41.6% of respondents, limited use of new $P2Y_{12}$ inhibitors for 29.1% of respondents, and

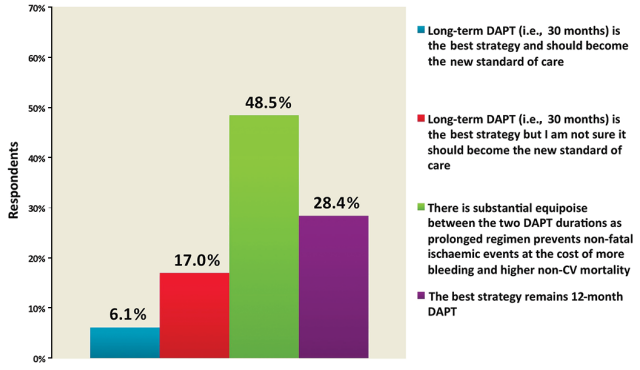

Figure 3. *What is your interpretation of the results of the DAPT trial which were presented at AHA and simultaneously published in the New England Journal of Medicine?*

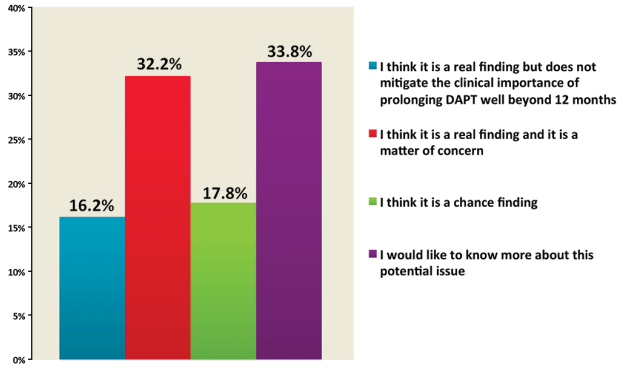

Figure 5. *What is your interpretation of the mortality findings in the DAPT trial (i.e., excess of non-cardiovascular mortality in the 30-month DAPT group)?*

the highly selected patient population for 34.2% of respondents, and/or concerns regarding the reproducibility of these results in clinical practice outside trials for 24.6% of respondents **(Figure 4)**.

The excess of non-cardiovascular mortality observed in the extended duration treatment arm of the DAPT trial was interpreted as a finding which raises concerns by 32.2% of respondents, while 33.8% would like to know more about this issue **(Figure 5)**. The benefit in terms of reduction of stent thrombosis was related to first-generation DES use in the view of 35% of the respondents, while 30.6% thought that it was not applicable to current practice with new-generation DES, whereas 23.8% thought that this benefit applied to all stent types **(Figure 6)**.

Evaluating the results of all three studies presented during AHA 2014 in aggregate, 44.4% of respondents believed that the results were compatible with both the possible benefit of long-term DAPT and also the feasibility of stopping therapy early if needed **(Figure 7)**; 22.7% of respondents did not declare a clear opinion and 20.1% found the results contradictory and/or confusing.

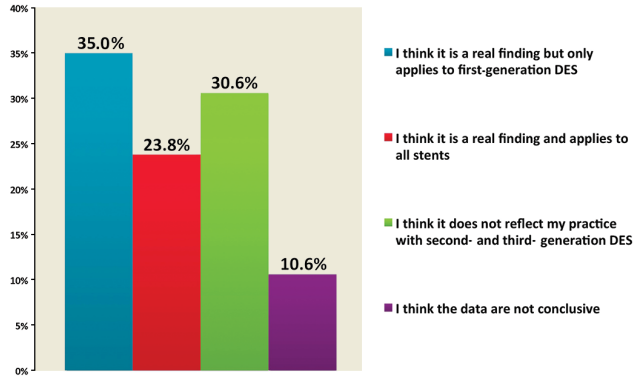

Figure 6. *What is your interpretation of the stent thrombosis findings in the DAPT trial (i.e., lower risk of ST with prolonged DAPT irrespective of stent type)?*

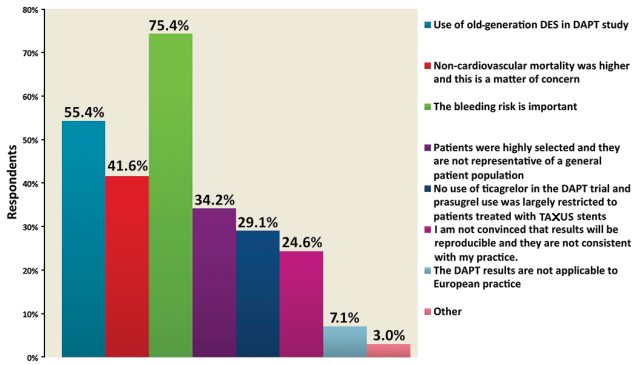

Figure 4. *What is/are the reason(s) behind your belief that 30-month DAPT should not become the new standard of care after DAPT trial (multiple answers allowed).*

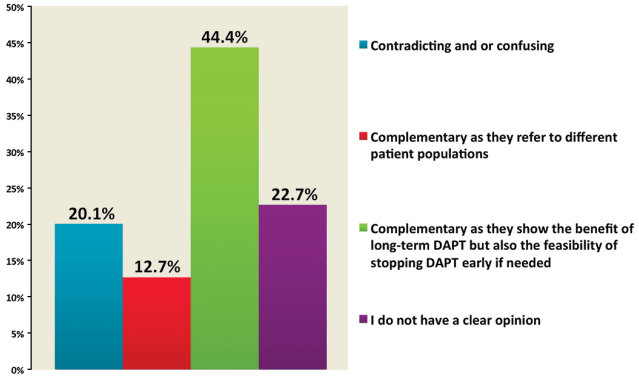

Figure 7. *How do you find the results of the DAPT trial as compared to the ISAR-SAFE and ITALIC/ITALIC+ trials?*

PRACTICE AFTER THE DAPT, ISAR-SAFE AND ITALIC TRIALS

The main findings of this part of the survey are shown in **Online Table 2**. The majority of respondents (58.1%) indicated that DAPT duration should be individualised, i.e., prolonged in selected patients

and shortened in selected patients, as opposed to a 12-month DAPT regimen in all, whereas 12.5% believed that practice and recommendations should not change after the new evidence provided at AHA 2014. Forty percent of respondents believed that a prolonged therapy, beyond one year, should be limited to less than 10% of the patient population; whereas 34% of respondents would treat 10 to 30% of their patients with this strategy **(Online Table 2)**.

Comparing the answers to the parts of the survey delivered before and after AHA, a uniform 12-month DAPT duration in all patients was less frequently selected after AHA 2014 (37.3% before vs. 22.9% after).

The most frequently preferred therapeutic options were: 1) six-month DAPT in stable and 12-month DAPT in ACS patients (24.8% before AHA vs. 29.4% after AHA), 2) DAPT beyond one year in a sizeable proportion of patients (7.4% before AHA vs. 13.0% after AHA), 3) a tailored DAPT duration for individual patients based on ischaemic and/or bleeding risk (9.7% before AHA vs. 16.2% after AHA) **(Figure 8)**. After AHA 2014, the evidence that prolonged DAPT protects against non-stent-related events (64.5% before AHA vs. 71.8% after AHA) was regarded as more compelling than before **(Figure 9)**.

In contrast with the opinions expressed before AHA 2014, after the meeting the quality of evidence on DAPT duration in DES recipients was interpreted as "average" by 27.4% of the respondents (as compared to 41.4% of responders before AHA), whereas the majority regarded it as confusing (22.8% before AHA vs. 46.1% after AHA) **(Figure 10)**.

Overall, 40% of participants called for a change in the guidelines regarding DAPT duration **(Online Table 2)**: the majority of cardiologists working in an academic environment responded in support of a formal change in guidelines supporting practice around DAPT duration, whereas the opposite was voiced by the majority of non-academic cardiologists. When asked about how guidelines should change based on the new evidence, 72% of respondents thought that guidelines should more proactively recommend an individualised therapy in different patient populations **(Online Table 2)**.

Finally, 54.7% of participants believed that new randomised trials testing individualised therapy duration based on ischaemic and bleeding risk are needed, 35.6% expressed the need for trials comparing conventional DAPT versus a $P2Y_{12}$ inhibitor alone long-term treatment strategy, whereas 34.8% solicited a consensus statement based on the evidence available **(Online Table 2)**. The "other" option was selected by a few calling for new "real-world" prospective registries (two respondents), new randomised trials including potent $P2Y_{12}$ inhibitors (two respondents), new-generation DES (one respondent) or the implementation of intravascular imaging in decision making (one respondent).

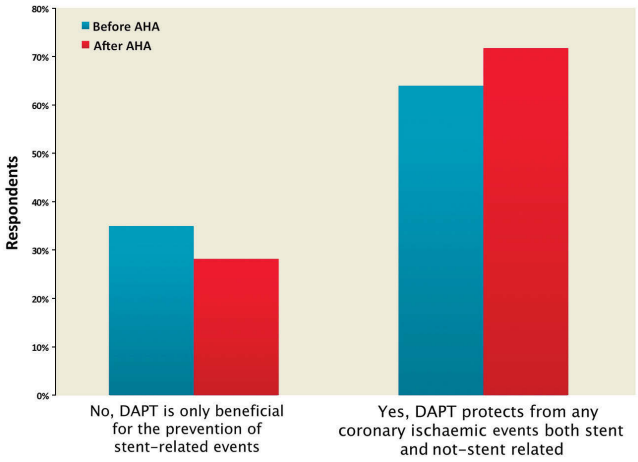

Figure 9. *Comparison of the answers to the question "Do you think prolonged DAPT is beneficial for the prevention of ischaemic events, which are not stent-related?" before and after AHA.*

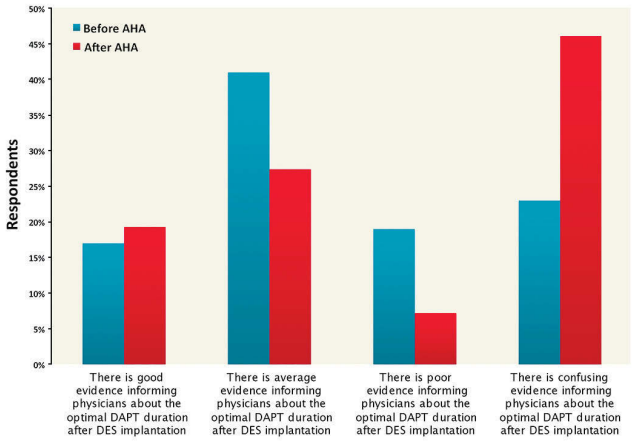

Figure 10. *Comparison of the answers to the question "How do you judge the evidence regarding DAPT duration after DES implantation?" before and after AHA.*

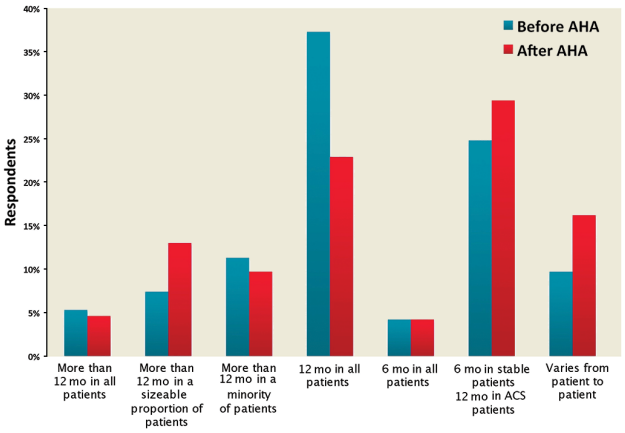

Figure 8. *Comparison of the answers to the question "For how long do you generally prescribe DAPT after DES implantation in patients not requiring oral anticoagulation?" before and after AHA.*

INTERPRETATION OF THE SURVEY RESULTS

The main findings of the EAPCI survey on DAPT duration can be summarised as follows:

– Before AHA 2014, the practice most commonly recommended was 12-month DAPT duration after DES implantation, whereas only one responder out of ten declared a clinical practice consistent with routine DAPT duration beyond one year after stent implantation.
– After AHA 2014, most respondents did not report extended DAPT duration of up to 30 months as representing the preferred approach in comparison with a 12-month treatment duration, and fewer than two responders out of ten believed that this should become the new standard of care.
– After AHA 2014, the evidence regarding DAPT duration was more frequently interpreted as confusing.
– The majority of respondents reported that DAPT should be prolonged or shortened in selected patients according to both ischaemic and bleeding risks and that future guidelines should more proactively recommend strategies in this direction.
– The results of the survey indicate that following the data presented at AHA 2014 considerable confusion exists regarding the optimal duration of DAPT after coronary stenting. The community needs guidance on how DAPT should be individualised and this largely reflects the lack of coordination across DAPT studies performed so far. Many meta-analyses on this topic already exist based on aggregate data, reaching inconsistent conclusions depending on different study selection and methods of analysis. Hence, a collaborative effort among all principal investigators of DAPT studies would be desirable to characterise further the included patient population in each of these and to be able to identify the patients who would most benefit from prolonged versus shortened DAPT and vice versa.

Limitations

This survey has a number of important limitations which should be carefully weighed when interpreting the results. Firstly, only a small percentage of invited practitioners took part in this survey. Therefore, the results are not necessarily representative of the opinion of the whole community. However, low participation rate is a common limitation of surveys in general, especially when the population targeted is that of professionals at an advanced career stage. Secondly, the use of multiple choice questions may lead to question bias. To reduce this effect, respondents were able to add open answers if they felt it was appropriate. In addition, respondents may have been subject to social desirability response bias: for example, this may have overestimated the percentage of those who declared weighing ischaemic and bleeding risks before selecting DAPT duration. Thirdly, the comparison of questions dispensed before and after AHA 2014 was not performed on an individual but on an aggregate basis. As such, it is not possible to evaluate if the single respondent changed his/her opinion or if a new cohort of respondents drove the change in the second part of the survey. However, in view of the relatively high number of contributors, it is likely that we have captured real changes in opinion due to the new evidence provided. Fourthly, this survey was designed and administered before the publication of the results of the PEGASUS trial[10], which explored the effects of a prolonged therapy with ticagrelor in patients with previous myocardial infarction. It is possible that the opinion of the respondents may have changed in the light of this new evidence. Finally, the focus of this survey was on duration and not on type of DAPT (i.e., based on which $P2Y_{12}$ inhibitor). A further EAPCI survey addressing the evidence provided by the PEGASUS study and whether the medical community believes duration of DAPT also to be dependent on type of $P2Y_{12}$ inhibitor is in preparation.

Conclusions

This EAPCI survey highlights considerable uncertainty within the medical community with regard to the optimal duration of DAPT after coronary stenting in the light of recently reported trial results. The medical community surveyed called for new evidence or updated guidance on how DAPT duration should be individualised for each patient.

Impact on daily practice

Against the conduct of ten dedicated randomised studies investigating various durations of dual antiplatelet therapy (DAPT) and the recent publication of the DAPT trial, which enrolled almost 9,500 patients, the optimal duration of dual antiplatelet therapy after coronary stenting remains unclear. This survey highlights uncertainties within the medical community with regard to how DAPT duration should be managed in clinical practice. A joint effort of international societies, leveraging on the contribution of each principal investigator of the available trials to provide outcomes in pre-specified patient subsets, or ideally the performance of an individual patient meta-analysis, may clarify the most suited DAPT duration for each single patient in practice in future. Providing guidance to the clinical community with respect to the individualisation of the antiplatelet therapy based on patients ischaemic and bleeding risk will be crucial to optimise benefits versus risks.

Acknowledgements

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Conflict of interest statement

The authors have no conflicts of interest to declare.

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Online data supplement

Online Appendix. List of respondents.

Online Table 1. Declared clinical practice of respondents concerning DAPT duration before AHA 2014.

Online Table 2. Declared clinical practice of respondents concerning DAPT duration after AHA 2014.

Online Figure 1. Geographic region of practice of the respondents.

Online data supplement

Appendix List of respondents

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Aasa M., *Sweden*
Abdel-Salam A.M., *Egypt*
Abdulwahab H., *Kuwait*
Accardi R., *Italy*
Adel A., *Belgium*
Al Mowafy A., *Kuwait*
Al-Najjar Y., *United Kingdom*
Alaarag A.F., *Egypt*
Aladashvili A., *Georgia*
Alawfi K., *France*
Alcazar De La Torre E., *Mexico*
Alejos R., *Mexico*
Alfonso Jimenez V., *Spain*
Alhashimi H.M.M., *Netherlands*
Aljeboury A., *Iraq*
Almeida De Sousa J., *Brazil*
Almusawi A., *Iraq*
Alshaikha M., *Egypt*
Altaf S., *Pakistan*
Altahmody K.E.A., *Egypt*
Alvarez Contreras L.R., *Mexico*
Amarasena N., *Sri Lanka*
Amoroso G., *Netherlands*
Anderson R., *United Kingdom*
Andò G., *Italy*
Andrade J., *Spain*
Andreou A.Y., *Cyprus*
Angulo J., *Mexico*
Antonio T., *Italy*
Aprigliano G., *Italy*
Aquilina M., *Italy*
Arafa S.E.O., *Qatar*
Aramberry L., *Argentina*
Arampatzis C.A., *Greece*
Araujo J. J., *Portugal*
Asher E., *Israel*
Ates I., *Turkey*
Athanasias D., *Greece*
Auer J., *Austria*
Auffret V., *France*
Ayala F.J., *Chile*
Baba C., *Romania*
Baglioni P., *Argentina*
Bagur R., *Canada*
Balam-Ortiz E, *Mexico*
Balducelli M, *Italy*
Bam Pas G, *Greece*
Barbash I.M., *Israel*
Barbosa A. H. P., *Brazil*
Barbosa R., *Brazil*
Barnay P., *France*
Barroso L., *Brazil*
Basti A., *Switzerland*
Bax M., *Netherlands*
Bayet G., *France*
Beijk M.A., *Netherlands*
Beltran R., *Venezuela*
Berenguer Jofresa A., *Spain*
Berroth R., *Germany*
Berti S., *Italy*
Berumen Dominguez L.E., *Mexico*
Bhasin A., *India*
Bhaya M., *Mauritius*
Bianco M., *Italy*
Biasco L., *Denmark*
Bikicki M., *Serbia*
Bonarjee V.V.S., *Norway*
Bonechi F, *Italy*
Borges Santos M., *Portugal*
Boshev M., *Macedonia*
Bouferrouk A, *Algeria*
Bounartzidi M., *Greece*
Bousoula E., *Greece*
Brie D., *Romania*
Brtko M., *Czech Republic*
Brugaletta S., *Spain*
Brull D.J., *United Kingdom*
Buchter B, *Germany*
Buendia R., *Philippines*
Burzotta F., *Italy*
Butz T., *Germany*
Buzzetti F., *Italy*
Bychowiec B., *Poland*
Cadeddu M., *Italy*
Campanile A., *Italy*
Carneiro J.G., *Brazil*
Carrilho-Ferreira P., *Portugal*
Carrillo Guevara J.E., *Mexico*
Carter A.J., *United States*
Casal-Heredia H., *Venezuela*
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Castro Fabiano L., *Brazil*
Cavalcante Silva R., *Brazil*
Cavalcanti De Oliveira D., *Brazil*
Cavalcanti R.C., *Brazil*
Cavazza C., *Italy*
Centemero M.P., *Brazil*
Chabane H.K., *Italy*
Chamié D., *Brazil*
Chatzis D., *Greece*
Chaves A.J., *Brazil*
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Chinchilla H., *Honduras*
Ciabatti N., *Italy*
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Clifford Cp, *United Kingdom*
Coceani M., *Italy*
Cóggiola J., *Argentina*
Cohen D.J., *United States*
Conway D.S.G., *United Kingdom*
Cornelis K., *Belgium*
Coroleu S. F., *Argentina*
Corral J.M., *Colombia*
Cortese B., *Italy*
Coskun U., *Turkey*
Costa F., *Italy*
Costa R.A., *Brazil*
Coste P., *France*
Coufal Z., *Czech Republic*
Cox S., *Australia*
Cozma A., *Romania*
Crean P., *Ireland*
Crenshaw M.H., *United States*
Cristian U., *Romania*
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Cuculi F., *Switzerland*
Cuenza L., *Philippines*
Cyrne Carvalho H., *Portugal*
D'Ascenzo F., *Italy*
D'Urbano M., *Italy*
Damonte A., *Argentina*
Dan Florin F, *Romania*
Dana A., *United Kingdom*
Dangoisse V, *Belgium*
De Backer O., *Denmark*
De Cock D., *Belgium*
De Vita M., *Italy*
Debski A., *Poland*
Delgado A., *Mexico*
Devadathan S., *United Kingdom*
Dhamrait S., *United Kingdom*
Di Lorenzo E., *Italy*
Di Serafino D., *Italy*
Diego-Nieto A., *Spain*

Dievart F., *France*
Diez J.L., *Spain*
Dimitriadis K., *Greece*
Dina C., *Romania*
Doerner O., *Germany*
Donahue M., *Italy*
Donis J., *Venezuela*
Drieghe B., *Belgium*
Drissi M.F., *Tunisia*
Du Fretay H., *France*
Dziewierz A., *Poland*
Echavarría-Pinto M., *Spain*
Echeverria Romero R.G., *Honduras*
Economou F., *Greece*
Eftychiou C., *Cyprus*
Egdell R., *United Kingdom*
El Hosieny A., *Saudi Arabia*
El Meguid K., *Egypt*
Elabbassi W., *United Arab Emirates*
Elesgerli S., *Azerbaijan*
Elghetany H., *Saudi Arabia*
Elizondo J.C., *Costa Rica*
Elkahlout A., *Romania*
Elrowiny R., *Egypt*
Elserafy A.S., *Egypt*
Emam A., *Egypt*
Emara A., *Egypt*
Emmanouil P., *Greece*
Ercilla J., *Peru*
Erglis A., *Latvia*
Eslam Taha E., *Egypt*
Esmaeil S., *Egypt*
Esposito G., *Italy*
Ettori F., *Italy*
Eugenio N., *Brazil*
Everaert B., *Netherlands*
Ezquerra Aguilar W., *Peru*
Falu R., *Argentina*
Farag E., *Egypt*
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Feldman M., *Argentina*
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Fernández-Rodríguez D., *Spain*
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Ferreira Q., *Qatar*
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Fleischmann C., *Germany*
Flessas D., *Greece*
Formigli D., *Italy*
Fozilov H., *Uzbekistan*
Fraccaro C., *Italy*
Freitas J.O., *Brazil*
Fresco C., *Italy*
Fridrich V., *Slovakia*
Furmaniuk J., *Poland*
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Galasso G., *Italy*
Galeazzi G.L., *Italy*
Galli S., *Italy*
Galvez Villacorta V., *Peru*
Gandolfo C., *Italy*
García E., *Spain*
García-Blas S., *Spain*
Garducci S., *Italy*
Garg S., *United Kingdom*
Garro N., *Italy*
Gatto L., *Italy*
Georgiou M.G., *Cyprus*
Ghanem I., *Egypt*
Ghose T., *India*
Giacchi G., *Italy*
Giang P.T., *Viet Nam*
Giesler T., *Germany*
Giovino M., *Italy*
Girardi P., *Italy*
Girasis C., *Greece*
Giunio L., *Croatia*
Giustino G., *United States*
Glatthor C., *Germany*
Glogar H.D., *Austria*
Golledge P., *United Kingdom*
Gomez Moreno J., *Argentina*
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Grantalis G., *Greece*
Greco F., *Italy*
Grundeken M.J., *Netherlands*
Grunert S., *Germany*
Guðmundsdóttir I., *Iceland*
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Gupta R., *United Arab Emirates*
Gupta S., *India*
Gutièrrez C., *Mexico*
Hafeez I., *India*
Halvorsen S., *Norway*
Hamed Hussein G.A., *Saudi Arabia*
Hammoudeh A., *Jordan*
Hansen P.R., *Denmark*
Harb S., *Austria*
Hawas J.M., *Iraq*
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Hernandez F., *Spain*
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Hildick-Smith D., *United Kingdom*
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Hillani A., *France*
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Homan D.J., *United States*
Hooda A., *India*
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Iftikhar A.K., *Pakistan*
Ilic I., *Serbia*
Imai Y., *Japan*
Imperadore F., *Italy*
Indolfi C., *Italy*
Iorga V., *Romania*
Ipek E., *Turkey*
Ito S., *Japan*
Jacksch R., *Germany*
Jae-Sik J., *South Korea*
James S., *Sweden*
Jamshidi P., *Switzerland*
Jerbi J., *Tunisia*
Jimenez Quevedo P., *Spain*
Jimenez-Navarro M., *Spain*
Jiménez-Santos M., *Mexico*
Jin Q.H., *China*
Joksas V., *Lithuania*
Jovic D., *Serbia*
Junejo S., *United Kingdom*
Kallel R., *Tunisia*
Kamal A., *Egypt*
Kamiya H., *Japan*
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Karjalainen P.P., *Finland*
Karthikeyan V.J., *United Kingdom*
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Kinani T., *Iraq*
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Kleiban A., *Argentina*
Kluck B., *United States*
Kocayigit I., *Turkey*
Kokis A., *Canada*

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Kordalis A., *Greece*
Kozak M., *United States*
Krecki R., *Poland*
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Krizanic F., *Germany*
Krsticevic L., *Argentina*
Kuex H., *Germany*
Kukreja N., *United Kingdom*
Kulić M., *Bosnia and Herzegovina*
Kulikovskikh Y.V., *Russian Federation*
Kulkarni P., *India*
Kumar N., *Netherlands*
Kumar Soni A., *India*
Kuzmenko E., *Russian Federation*
L'Allier P.L., *Canada*
Langner O., *Germany*
Lapin O., *Russian Federation*
Lauer B., *Germany*
Leclercq F., *France*
Leibundgut G., *Switzerland*
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Leon C., *Venezuela*
Leon K., *Egypt*
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Lev E., *Israel*
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Lindsay S., *United Kingdom*
Loh P.H., *Singapore*
Loncar G., *Serbia*
Loo B., *Ireland*
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Lopez-Cuellar J., *Mexico*
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Mendiz O.A., *Argentina*
Meneses A., *Mexico*
Mercado L.A., *Bolivia*
Mereuta A., *Romania*
Mezzapelle G., *Italy*
Milanovic N., *Bosnia and Herzegovina*
Mohamed S.M., *Egypt*
Mohanad A., *Egypt*
Mohanty A., *India*
Moorthy N., *India*
Morales F.J., *Spain*
More R., *United Kingdom*
Moreno Samos J.C., *Spain*
Moreno-Martínez F.L., *Spain*
Moscato F., *Italy*
Mossmann M., *Brazil*
Mrevlje B., *Germany*
Müller-Eichelberg A., *Germany*
Muraglia S., *Italy*
Musumeci G., *Italy*
Nadir Khan M., *Pakistan*
Najim S., *United Kingdom*
Nakamura S., *Japan*
Nakao F., *Japan*
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Nguyen H.T., *United States*
Niess G.S., *United States*
Nikas D.N., *Greece*
Niroomand F., *Germany*
Niva J., *Finland*
Nogueira J.W., *Brazil*
Nombela-Franco L., *Spain*
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Nouri B., *Tunisia*
Nugue O., *France*
Nunes G.L., *Brazil*
Ober M., *Romania*
Ochoa J., *Colombia*
Oh J.H., *South Korea*
Ojeda S., *Spain*
Oktay Tureli H., *Turkey*
Olowe Y., *United States*
Oluseun A., *United States*
Opolski G., *Poland*
Ornelas C.E., *Brazil*
Otasevic P., *Serbia*
Ozturk A., *Turkey*
Padilla F., *Mexico*
Pagny J.Y., *France*
Paolantonio D., *Argentina*
Papaioannou G.I., *Greece*
Parodi G., *Italy*
Patil S.N., *India*
Pavei A., *Italy*
Pavia A., *Mexico*
Pavlidis A., *United Kingdom*
Pell A., *United Kingdom*
Percoco G.F., *Italy*
Pernasetti L.V., *Spain*
Pescoller F., *Italy*
Petropoulakis P., *Greece*
Piatti L., *Italy*
Picardi E., *Italy*
Pieroni D.M., *Argentina*
Pina J., *United States*
Pinheiro L.F., *Brazil*
Pinto F.J., *Portugal*
Pipa J.L., *Portugal*
Piroth Z., *Hungary*
Pisano F., *Italy*
Podbregar M., *Slovenia*
Polak G., *Poland*
Polimeni A., *Italy*
Postadzhiyan A., *Bulgaria*
Postu M., *Romania*
Poulimenos L.E., *Greece*
Pow Chon Long F., *Ecuador*
Poyet R., *France*
Pradhan Ak, *India*
Predescu L.M., *Romania*
Prida X.E., *United States*
Prof. Aly Saad, *Egypt*
Prog R., *Germany*
Pulikal D.G.A, *United Kingdom*
Qiangzhong P.I., *China*
Radu M.D., *Denmark*
Rajendran D., *India*
Ram Anil Raj M.R., *India*
Ramazzotti V., *Italy*
Rapacciuolo A., *Italy*
Ratib K., *United Kingdom*
Raungaard B., *Denmark*
Raviola E., *Italy*
Reppas E., *Greece*
Reyes J.A., *Dominican Republic*
Rezek M., *Czech Republic*

Riess G.J., *Germany*
Rifaie O., *Egypt*
Rigattieri S., *Italy*
Rissanen T., *Finland*
Ristic A.D., *Serbia*
Rittger H., *Germany*
Roberts J., *United States*
Rodríguez Saavedra A., *Argentina*
Roik M., *Poland*
Roshan Rao K, *India*
Routledge H., *United Kingdom*
Rubboli A., *Italy*
Rudolph T., *Germany*
Rudzitis A., *Latvia*
Ruiters Aw, *Netherlands*
Ruiz Ros J.A., *Spain*
Ruiz-García J., *Spain*
Ruiz-Nodar J.M., *Spain*
Sabate M., *Spain*
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Sacra C., *Italy*
Saghatelyan M., *Armenia*
Sahin M., *Turkey*
Said S., *Netherlands*
Salachas A., *Greece*
Salas Llamas J.P., *Mexico*
Salih A., *Saudi Arabia*
Sanchez O.D., *United States*
Sánchez-Gila J., *Spain*
Sanchez-Perez I., *Spain*
Santarelli A., *Italy*
Sardovski, *Bulgaria*
Sarenac D., *Serbia*
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Schäfer A., *Germany*
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Serra L.A., *Spain*
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Sgueglia G.A., *Italy*
Shaheen S., *Egypt*
Shahri H., *Iran*
Sheiban I., *Italy*
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Silva C.E., *Brazil*
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Stipal R., *Czech Republic*
Stochino M.L., *Italy*
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Stoyanov N., *Bulgaria*
Subla R.M., *United States*
Suliman A., *Sudan*
Summaria F., *Italy*
Syarif R., *Indonesia*
Syed A.A., *United States*
Tanaka Y., *Japan*
Tashani A., *Libya*
Tauzin S., *France*
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Tawfik M., *Egypt*
Tayeh O., *Egypt*
Terzic I., *Bosnia Herzegovina*
Testa L., *Italy*
Thevan B., *Bahrain*
Thiam M., *Senegal*
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Tierala I., *Finland*
Tilea I., *Romania*
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Tomasik A.R., *Poland*
Tonev I., *Bulgaria*
Torres Bosco A., *Spain*
Tousek P., *Czech Republic*
Townend J., *United Kingdom*
Tran Ngoc T., *Viet Nam*
Triantafyllou K., *Greece*
Tsigkas G., *Greece*
Tsioufis C., *Greece*
Turri M., *Italy*
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Ugo F., *Italy*
Ultramari F.T., *Brazil*
Urban P., *Switzerland*
Uren N., *United Kingdom*
Uretsky B.F., *United States*
Uribe C.E., *Colombia*
Usman B., *Kazakhstan*
Valadez Molina F., *Mexico*
Van Houwelingen K.G., *Netherlands*
Vandormael M., *United States*
Varvarovsky I., *Czech Republic*
Vassilis V., *Greece*
Velasquez D., *Colombia*
Verdoia M., *Italy*
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Vidal-Perez R., *Spain*
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Violini R., *Italy*
Vista J.H., *Mexico*
Vogt F., *Germany*
Vogt M., *Germany*
Vokac D., *Slovenia*
Vom Dahl J., *Germany*
Vranckx P., *Belgium*
Wahab A., *India*
Wang R., *Brazil*
Wang T.D., *Taiwan*
Wani S., *India*
Weisz S.H., *Italy*
Werner G.S., *Germany*
Wilkinson J.R., *United Kingdom*
Wolf A., *Germany*
Youssef A., *Egypt*
Yumoto K., *Japan*
Zaderenko N., *Argentina*
Zaghloul Darwish A., *Egypt*
Zahn R., *Germany*
Zaro T., *Italy*
Zavalloni D., *Italy*
Zbinden R., *Switzerland*
Zekanovic D., *Croatia*
Zhang B., *China*
Zhang C., *China*
Zhang Y.J., *China*
Zhonghan N., *China*
Zingarelli A., *Italy*
Zueco J., *Spain*
Zuhairy H., *Ireland*

SECOND PART OF THE SURVEY

Aaroe J., *Denmark*
Abbate A., *United States*
Abdel Hamid M., *Egypt*
Abdelmegid M.A.F., *Egypt*
Acuña-Valerio J., *Mexico*
Adriaenssens T., *Belgium*
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Aikot H., *India*
Alameda M., *Spain*
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Zachow G., *Germany*
Zaderenko N., *Argentina*
Zaghloul Darwish A.M., *Egypt*
Zbinden R., *Switzerland*
Zhang Y.J., *China*
Zingarelli A., *Italy*

Online Table 1. Declared clinical practice of respondents concerning DAPT duration before AHA 2014.

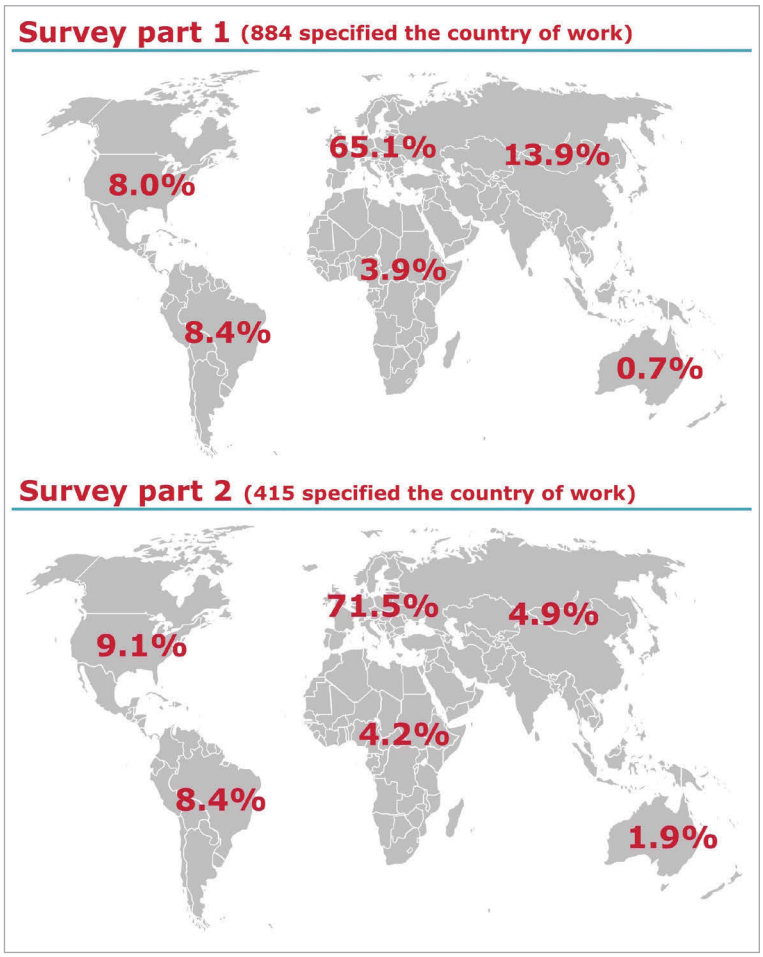
		Response percent	Response count
For how long do you generally prescribe DAPT after DES implantation in patients not requiring oral anticoagulation? *(Answered question 1,134 - skipped question 0)*			
For more than 12 months in all patients		10.3%	117
For 12 months in all patients		53.2%	603
For 6 months in all patients		2.7%	31
For 6 months in stable patients for 12 months in ACS patients		23.5%	267
It varies from patient to patient		10.2%	116
Do you weigh ischaemic and/or bleeding risk in prescribing DAPT duration to your patients not requiring oral anticoagulation? *(Answered question 1,134 - skipped question 0)*			
No, never, I always prescribe a fixed DAPT duration upfront and try to stick to it in all my patients		11.2%	127
Yes, I take into consideration the ischaemic risk		3.5%	40
Yes, I take into consideration the bleeding risk		11.1%	126
Yes, I take into consideration both ischaemic and bleeding risk		74.2%	841
Do you think that the occurrence of a minor actionable or non-actionable bleeding while on DAPT identifies patients at high risk for DAPT-related more relevant bleeding and as such should it trigger shortening of DAPT? *(Answered question 961 - skipped question 173)*			
No, I generally try to stick to the original DAPT prescription even if minor bleeds occur during the course of therapy		63.6%	611
Yes, the occurrence of nuisance or minor bleeding while the patient is on DAPT is a predictor of future major bleeding events and I try to shorten DAPT duration as much as possible in these patients.		36.4%	350
Do you think that the stent thrombosis risk is significantly lower with newer-generation stents as compared with early-generation DES? *(Answered question 961 - skipped question 173)*			
Yes, first-generation DES require longer DAPT than newer-generation DES		611	899
No, all DES are alike		6.5%	62
Do you think that vulnerability to short DAPT duration varies from stent to stent within newer-generation stent platforms? *(Answered question 961 - skipped question 173)*			
Yes, I think duration of DAPT should strictly be stent-specific as thrombogenicity varies from stent to stent.		30.5%	293
No, all newer-generation DES are alike		14.7%	191
There is insufficient data to draw meaningful conclusions about this matter		54.8%	527
Provide your judgment regarding the safety profile (the safer the stent, the shorter DAPT can last after its implantation) of each of the following DES or vascular scaffolds when used in combination of a short (6 months or less) or very short (3 months or less) DAPT duration. *(Answered question 961 - skipped question 173)*			
Durable polymer newer-generation DES	Safe with 3-month DAPT or less	9.2%	88
	Safe with 6-month DAPT or less	54.5%	519
	Insufficient data	17.3%	165
	Not safe with short DAPT	18.9%	180
Biodegradable polymer newer-generation DES	Safe with 3-month DAPT or less	15.9%	152
	Safe with 6-month DAPT or less	52.1%	498
	Insufficient data	26.1%	250
	Not safe with short DAPT	5.8%	56
No polymer newer-generation DES	Safe with 3-month DAPT or less	15.6%	148
	Safe with 6-month DAPT or less	33.9%	322
	Insufficient data	42.3%	402
	Not safe with short DAPT	8.2%	78
Bioresorbable everolimus-eluting Vascular Scaffold	Safe with 3-month DAPT or less	9.5%	91
	Safe with 6-month DAPT or less	19.4%	185
	Insufficient data	46.2%	440
	Not safe with short DAPT	24.9%	237

Online Table 1. Declared clinical practice of respondents concerning DAPT duration before AHA 2014. (continued)

	Response percent	Response count
Do you think prolonged DAPT is beneficial for the prevention of ischaemic events, which are not stent-related? *(Answered question 961 - skipped question 173)*		
Yes, DAPT protects from any coronary ischaemic both stent and not-stent related	64.5%	620
No, DAPT is only beneficial for the prevention of stent-related events	35.5%	341
How do you manage a patient who is at very high risk for bleeding requiring coronary stent implantation? *(Answered question 946 - skipped question 188)*		
I preferentially implant a BMS and go for a 30-day DAPT regimen	60.9%	576
I preferentially implant a newer-generation DES and go for 3-month DAPT and continue with aspirin monotherapy	18.8%	178
I preferentially implant a newer-generation DES and go for 6-month DAPT and continue with aspirin monotherapy	7.1%	67
I preferentially implant a newer-generation DES and go for 1-month DAPT and continue with $P2Y_{12}$ inhibitor monotherapy	5.8%	55
I preferentially implant a newer-generation DES and go for 1-month DAPT and continue with aspirin monotherapy	4.7%	44
I preferentially implant a newer-generation DES and go for $P2Y_{12}$ inhibitor monotherapy without aspirin	2.7%	26
What are your expectations regarding the DAPT trial, which will be presented at the upcoming AHA? *(Answered question 908 - skipped question 226)*		
This study will fail to show the superiority of 30-month DAPT regimen as compared to 12-month therapy duration and I expect a clear excess of clinically significant bleeding liability.	43.7%	397
This study will fail to show the superiority of 30-month DAPT regimen as compared to 12-month therapy duration but I expect no or a clinically acceptable excess of bleeding	28.9%	262
This study will show the superiority of 30-month DAPT regimen as compared to 12-month therapy duration with a trade-off in bleeding	17.6%	160
This study will show the superiority of 30-month DAPT regimen as compared to 12-month therapy duration with no risk of bleeding	9.8%	89
What are your expectations regarding the ISAR-SAFE trial, which will be presented at the upcoming AHA? *(Answered question 908 - skipped question 226)*		
This study will show the non-inferiority of a 6-month DAPT duration versus 12-month therapy with an excess of bleeding in the 12-month therapy arm and no ischaemic risk in the 6-month arm	57.7%	524
This study will show the non-inferiority of a 6-month DAPT duration versus 12-month therapy with an excess of bleeding in the 12-month therapy arm but a slight increase in the ischaemic risk in the 6-month arm	27.3%	248
This study will not show the non-inferiority of 6-month DAPT duration versus 12-month therapy due to a frank ischaemic risk in the 6-month DAPT arm which is not compensated by the bleeding events in the 12-month arm.	7.8%	71
This study will not show the non-inferiority of 6-month DAPT duration versus 12-month therapy due to a frank ischaemic risk in the 6-month DAPT arm and no bleeding difference as compared to 12-month therapy duration.	7.2%	65

Online Table 2. Declared clinical practice of respondents concerning DAPT duration after AHA 2014.

	Response percent	Response count
After the results of DAPT, ISAR SAFE and ITALIC/+, the duration of DAPT should (as compared to current practice/recommendations)? *(Answered question 432 – skipped question 110)*		
Be prolonged in all patients	3.0%	13
Be shortened in all patients	3.7%	16
Be prolonged in selected patients	14.8%	64
Be shortened in selected patients	7.9%	34
Be prolonged in selected patients AND be shortened in selected patients	58.1%	251
Unchanged	12.5%	54
Which proportion of patients according to your interpretation of the data and your personal experience should be considered for DAPT duration well beyond one year? *(Answered question 432 – skipped question 110)*		
None	6.7%	29
A limited proportion up to 10%	40.5%	175
A limited proportion from 10% to 30%	34.3%	148
A proportion from 30% to 50%	9.5%	41
A proportion from 50% to 70%	5.6%	24
A proportion greater than 70%	3.5%	15
Should the guidelines change after DAPT, ISAR SAFE and ITALIC/+, with respect to duration of DAPT? *(Answered question 432 – skipped question 110)*		
No, they should not change	39.4%	170
Yes, they should change	40.0%	173
I do not know	20.6%	89
How should the guidelines change after DAPT, ISAR SAFE and ITALIC/+, with respect to duration of DAPT? *(Answered question 168 – skipped question 374)*		
Guidelines should more proactively recommend a longer DAPT regimen than current recommendations	12.5%	21
Guidelines should more proactively recommend a shorter DAPT regimen than current recommendations	15.5%	26
Guidelines should more proactively recommend a longer DAPT regimen than current recommendations in selected patients AND a shorter DAPT regimen than current	72.0%	121
How do you think the field on DAPT duration should move forward? *(Multiple answers allowed) (Answered question 419 – skipped question 123)*		
New randomised controlled trials with bigger sample size	20.3%	85
New randomised controlled trials testing a truly individualised duration of therapy based on bleeding risk at the time of inclusion	17.2%	72
New randomised controlled trials testing a truly individualised duration of therapy based on ischaemic risk at the time of inclusion	13.4%	56
New randomised controlled trials testing a truly individualised duration of therapy based on bleeding AND ischaemic risk at the time of inclusion	54.7%	229
New randomised controlled trials testing the interruption of aspirin and the continuation of P2Y12 inhibitor as compared to conventional DAPT	35.6%	149
A consensus statement is needed which should provide guidance to physicians based on the evidence so far generated	34.8%	146
I do not know	3.6%	15
Other	2.6%	11



Online Figure 1. *Geographic region of practice of the respondents.*