Clinical guidelines for the management of atrial fibrillation (AF) advocate individual stroke risk assessment with CHA₂DS₂-VASc to determine a patient's suitability for oral anticoagulation (OAC), followed by formal appraisal of their bleeding risk associated with OAC, using the HAS-BLED score (1). Discussion with the patient about their preferences for treatment is also mandated within the guidelines and should be integral to the consultation (1). Indeed, patients' beliefs about their health, their medical conditions, treatment options and healthcare they receive are key determinants of whether or not they accept recommended treatment in general and may be particularly important for stroke prevention in AF, which requires life-long adherence to treatment which can have potentially serious side-effects.

In the current issue of Thrombosis and Haemostasis, LaHaye et al. (2) report the findings of their study which determined patients' minimum absolute stroke risk reduction required to agree to commence antithrombotic therapy (ATT) (so-called “treatment threshold”) and the maximum number of major bleeding events that a patient would be willing to tolerate in order to prevent one stroke. These outcomes were determined using an iPad-facilitated patient questionnaire in 172 non-valvular AF in-patients of one Canadian hospital. Patients were willing to initiate ATT for a minimum annual absolute risk reduction of 0.8% (NNT=125) and a 15% relative risk reduction in stroke and were willing to suffer 4.4 major bleeds in order to prevent one stroke (2).

An important difference in this study compared to previous similar studies (3-6) eliciting patients preferences for ATT, was the use of the patients' own individualised annual absolute stroke risk (based on CHA₂DS₂-VASc) rather than a standardised stroke risk. Research has shown that patients prefer discussions to include individual risk information rather than generic risk (7). Further, patients’ perceptions of risk can be modified considerably by the way in which risk information (benefits and side effects) is presented and explained to the patient, affecting their ability to undertake an individual risk-benefit analysis regarding treatment, and this is fundamental to patients’ decision-making (7, 8). The present study used a variety of approaches incorporating a range of decision aids employing different formats (pictorial, written, visual), utilising technology (iPad) to elicit patient preferences for therapy based on the associated stroke and/or bleeding risk.

The findings of this important study (2) clearly highlight the value of consideration, and discussion of, patient's treatment preferences when selecting ATT therapy for stroke prevention and a number of other points are also noteworthy. Firstly, regarding health utilities, where any type of stroke was viewed by patients as worse than major bleeding (2). Historically physicians have often been more concerned with the risk of bleeding associated with OAC therapy, therefore choosing not to offer and/or prescribe OAC therapy (9). However, the present study clearly demonstrates that patients view a minor stroke as marginally worse than major bleeding, but that a moderate or major stroke are viewed by patients as equal to, or worse than death, respectively. This study confirms previous similar work on AF patients’ health utilities in regard to stroke and bleeding outcomes (3-6) which suggests that patients are often willing to accept a higher risk of bleeding in order to prevent a stroke.

Secondly, patients hold very strong opinions about stroke prevention for AF, responses vary considerably and often opinions are at the extremes of the continuum; findings corroborated by a systematic review on this topic (6). Some patients are 'medication averse' and will refuse ATT even if it is 100% effective whilst others are 'risk averse' and will not consider ATT if there is any increased risk of bleeding compared to no treatment; these patients may require a more in-depth conversation to elicit their reasons for refusal of ATT and further explanation of the benefits of treatment and possible consequences of inaction. Another extreme group of patients evident in the present study (2) are those who are totally ‘risk tolerant’ and willing to accept ATT with any risk of excess bleeding; these patients tended to be younger and male and again may benefit for further education about the associated bleeding risks. The final group comprises patients who are aware of the risks ('risk aware') but
willing to accept ATT; however, the number of excess bleeds they are willing to accept varied greatly (from 1-19) (2), and this may be related to the patients’ knowledge and understanding of AF and stroke prevention strategies; although patients were provided with a very brief introduction regarding AF, stroke and major bleeding in the present study, their understanding of this information was not formally evaluated.

Informed decisions about available treatment options necessitates that patients have at least a basic knowledge and understanding about AF and the benefits (stroke prevention) and risks (bleeding) of treatment (7, 8). Evidence suggests that many patients with AF have limited knowledge about their condition (8, 10-13) and lack understanding of the risks and benefits of ATT (8, 10-13). Elicitation of patients’ preferences facilitates doctor/healthcare provider-patient conversations about AF and treatment options, helping to improve patient knowledge and allows them to make an informed decision, even if that decision is to refuse ATT.

Indeed, our recently published randomised-controlled trial of an educational intervention (TREAT study; ISRCTN93952605) among AF patients found that warfarin control, evidenced by TTR, was significantly better among intervention patients at six months compared to usual care (14). There was a trend towards better levels of knowledge in the intervention group (p=0.07) and knowledge levels at six months significantly predicted TTR at six months, indicating that AF patients with greater knowledge of the disease and its treatment had better adherence to the treatment regimen and better self-management. Obviously, medications perceived as potentially harmful may result in outright refusal or poor adherence. The intervention group viewed their medication as less harmful and perceived that the need to take warfarin was more important than their concerns about medication and improve uptake and adherence.

It is also important to note that the vast majority (78%) of patients in the present study (2) had a history of AF, thus the findings may differ among newly diagnosed patients, as often the diagnosis and decision to initiate OAC occur simultaneously. In addition, one in five patients had a history of stroke or bleeding. Experience of the adverse events associated with AF (stroke) or ATT (serious bleeding) treatment will likely impact on patients’ treatment threshold and the number of excess bleeds they are willing to accept. Further, 59% were already receiving warfarin and are therefore unlikely to choose not to continue with warfarin, as this would likely cause cognitive dissonance - a psychological conflict between what the person believes and what behaviour they undertake (i.e. continuing to take warfarin but believing it is dangerous and/or ineffective); hence the present findings may not extrapolate to ATT-naïve patients.

Individual stroke and bleeding risk assessment for AF patients is mandated and discussion with patients about their treatment preferences for stroke prevention, incorporating their individual stroke and bleeding risk, is essential, presented in a format chosen by the patient. Engaging each patient in treatment-decisions about their own health and eliciting their feelings/beliefs on the subject gives healthcare professionals the opportunity to address any concerns about medication, correct misconceptions, increase patient knowledge about AF and the therapeutic options, and will help patients make informed decisions about their healthcare, and make them fully cognisant about the consequences of action or inaction of accepting ATT for stroke prevention. Such engagement will also improve adherence with treatment, particularly since outcomes with oral anticoagulants such as the vitamin K antagonists (VKAs) are very dependent upon the quality of anticoagulation control as reflected by the average individual time in therapeutic range (TTR) (15-17). For the novel oral anticoagulants, which demonstrate relative efficacy, safety and convenience compared to the VKAs (18-20), medication adherence is even more crucial; if doses of these drugs are missed, the patient would be left non-anticoagulated. In short, patient engagement is clearly essential in our efforts for effective stroke prevention in AF, and this applies whether we are offering anticoagulation with the VKAs (with high TTRs, of course) or one of the NOACs.

Conflicts of interest
DAL has received investigator initiated educational grants from Bayer Healthcare and Boehringer Ingelheim and served as speaker for Boehringer Ingelheim, Bayer Healthcare and BMS/Pfizer. She is also a steeringcommittee member of a Phase IV apixaban study (AEGEAN) and is a panelist on the 9th edition of the American College of Chest Physicians guidelines on antithrombotic therapy in atrial fibrillation.

GYHL has served as a consultant for Bayer Healthcare, Astellas, Merck, Sanoﬁ, BMS/ Pfizer, Daiichi-Sankyo, Biotronik, Portola and Boehringer Ingelheim and as a speaker for Bayer Healthcare, BMS/Pﬁzer, Boehringer Ingelheim, Daiichi-Sankyo and Sando-ﬁ-aventis.

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