# ESC Guidelines – contributing

## to quality in clinical practice

### Dan Atar

ESC Vice President, National Affairs, European Society of Cardiology, Dept. of Cardiology, Oslo University Hospital Ulleval, Oslo, Norway, Institute of Clinical Sciences, University of Oslo, Norway

### Summary

The European Society of Cardiology (ESC) has dedicated itself to the publication and dissemination of clinical practice guidelines. This is regarded one of the core products generated within the ESC, and is intended to reflect updated, topic-related clinical evidence, which should be accessible to any physician free of charge. ESC Guidelines are highly visible and are used worldwide. Quality remains the primary feature of each guideline. Regular updates are required for every topic covered. Guidelines assist physicians in decision-making; however, they do not replace individual clinical judgement, and – importantly – guidelines are not meant to be the law.

Electronic aids for smartphones to enable use of guidelines actively in a clinical situation, for example score calculators or decision algorithms, are an important innovation and are available free of charge via the App Store, Google Play and Amazon.

Key words: ESC; clinical guidelines; cardiology; methodology; review; bibliometric analysis; practice guidelines; ESC guidelines

### Introduction

The European Society of Cardiology (ESC) has dedicated itself to the publication and dissemination of clinical practice guidelines. These are regarded as some of the core products generated within the ESC, and are intended to reflect updated evidence at all times, with high quality and ease of access. The publication scheme for 2015 is shown in table 1a, the one for 2016 in table 1b. Traditionally, these guidelines are launched during the Annual Congress of the ESC in their year of publication, and simultaneously published in the *European Heart Journal (EHJ)* and, when relevant, in one of the subspecialty journals of the *EHJ* as well as in specialty journals in the case of joint guidelines such as the 2015 pulmonary hypertension guideline [1].

### Grading of evidence and strength of recommendations

Usually a guideline does not only summarise the existing evidence in text and figures, but also features recommendations and grading of available evidence [2, 3], which enables clinicians to achieve a quick overview, and to make fast choices. The solution the ESC has chosen for grading and recommendation is presented in this section. The ESC is utilising the following recommendations scheme (table 2) [4].

Class I represents evidence and/or general agreement that a given treatment or procedure is beneficial and/

### Table 1: The publication schedule for the 2015 and 2016 ESC guidelines.

| A: 2015: Five guidelines + one position paper  |  | B: 2016: Four guidelines in writing phase   |  |  |
|--|--|---|--|--|
| Pulmonary hypertension<br>Chairs: Marc Humbert,<br>Nazzareno Galie<br>Review Coordinators:<br>Antonio Vaz Carneiro,<br>Victor Aboyans                            | Acute coronary syndromes in patients<br>presenting without persistent ST<br>segment elevation – (ACS – NSTE)<br>Chairs: Marco Roffi, Carlo Patrono<br>Review Coordinators: Helmut Baumgartner,<br>Oliver Gaemperli | <b>Dyslipidaemias</b><br>Chairs: Ian Graham,<br>Alberico Catapano<br>Review Coordinators:<br>Christian Funck-Brentano<br>and Lina Badimon | <b>CVD prevention</b><br>Chairs: Massimo Piepoli,<br>Arno W. Hoes<br>Review Coordinators:<br>Marco Roffi and<br>Guy deBacker     |  |
| Pericardial diseases<br>Chairs: Philippe Charron,<br>Yehuda Adler<br>Review Coordinators:<br>Stefan Agewall,<br>Stephan Achenbach                                | Infective endocarditis<br>Chairs: Gilbert Habib,<br>Patrizio Lancellotti<br>Review Coordinators: Çetin Erol,<br>Petros Nihoyannopoulos   | Atrial fibrillation<br>Chairs: Paulus Kirchhof,<br>Stefano Benussi<br>Review Coordinators:<br>Stefan Agewall and<br>John Camm             | Heart failure<br>Chairs: Piotr Ponikowski,<br>Adriaan Voors<br>Review Coordinators:<br>John McMurray and<br>Gerasimos Filippatos |  |
| Ventricular arrhythmia and<br>sudden cardiac death<br>Chairs: Silvia Priori,<br>Carina Blomstrom Lundqvist<br>Review Coordinators:<br>Philippe Kolh, Gregory Lip | <b>Cardio-oncology position paper</b><br>Chairs: Pepe Zamorano, Patrizio Lancellotti<br>Review by Committee for Practice<br>Guidelines (CPG)   |   |  |  |

| Classes of recommendations | Definition  | Suggested wording to use         |
|----------------------------|---|----------------------------------|
| Class I                    | Evidence and/or general agreement that a given treatment<br>or procedure is beneficial, useful, effective                           | ls recommended /<br>is indicated |
| Class II                   | Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure               |                                  |
| Class IIa                  | Weight of evidence/opinion is in favour of usefulness/efficacy  | Should be considered             |
| Class IIb                  | Usefulness/efficacy is less well established by evidence/opinion  | May be considered                |
| Class III                  | Evidence or general agreement that the given treatment<br>or procedure is not useful/effective, and in some cases may<br>be harmful | ls not recommended               |
| Levels of evidence         |   |                                  |
| Level of evidence A        | Data derived from multiple randomised clinical trials or meta-analyses  |                                  |
| Level of evidence B        | Data derived from a single randomised clinical trial or large nonrandomised studies   |                                  |
| Level of evidence C        | Consensus of opinion of the experts and/or small studies, retrospective studies, registries   |                                  |

Table 2: The ESC classes of recommendations and levels of evidence that are universally used in all guidelines.

or useful and effective. The suggested wording is "is recommended, is indicated". Class II represents conflicting evidence and/or divergence of opinion about the usefulness/efficacy of a given treatment or procedure. Class IIa indicates weight of evidence in favour of usefulness or efficacy, and the corresponding wording is "should be considered"; Class IIb applies where usefulness or efficacy is less well-established by evidence, and the corresponding wording is "may be considered". Finally a Class III is evidence or general agreement that a given treatment or procedure is not useful and in some cases may be harmful; the wording in this category is "is not recommended".

The levels of evidence are categorised as "A", "B" or "C", where level A represents data derived from multiple randomised clinical trials or meta-analyses, level B denotes evidence derived from a single randomised clinical trial or large nonrandomised studies, and level C means consensus expert opinion, or data based on small or retrospective studies, including registries. Although this is an explicitly simple classification, it predicates the choice of class of recommendation.

Like the ESC, the American College of Cardiology (ACC) and the American Heart Association (AHA) use a class of recommendation graded as class I (strong), a moderate Class IIa and a weak recommendation Class IIb. The Class III indicates no benefit, but there is also an additional Class III which indicates harm [5].

Regarding the levels of evidence, the ACC/AHA use a level "high", meaning high-quality evidence derived from more than one randomised controlled trial, or meta-analyses of high-quality trials. Further, there is a level B-R where R stands for randomised and level B-NR for nonrandomised evidence. The criteria for these levels are moderate-quality evidence from one randomised controlled trial indicating level B-R, or from one well-designed, well-executed nonrandomised study or registry study. Finally the ACC/AHA use the level C for randomised or nonrandomised observational studies or studies with limitations of design or execution. A level E is used for a consensus of expert opinion based on clinical experience when evidence is insufficient, vague or conflicting.

Taken together, the ACC/AHA system is more complicated for the end user than the ESC system, although many aspects are quite similar.

## The choice of guideline topic: how do the topics relate to the core curriculum / ESC syllabus?

The choice of the guideline topics is surprisingly straightforward. First of all, each existing topic will, by design, need an update after a few years, as the general knowledge and evidence constantly evolves. The typical turn-over time is 4 to 5 years, but in certain instances, a so-called "guidelines focused update" is already necessary after 2 years, as occurred with the last two atrial fibrillation guidelines [6, 7]. Equally important is the synchronisation of the topics with the ESC Core Curriculum - the list of topics that mandatorily define the level of certification in general cardiology. Table 3 shows how the 28 core syllabus topics are covered by 21 corresponding guidelines, leaving only 7 with no matching guideline. These are highlighted in bold type in table 3, one example being the topic "Genetics in cardiology". They will eventually also be covered by a position paper or guideline.

Table 3: The ESC Core Curriculum, a list of the mandatory topics to achieve competence in general cardiology.

| Core Curriculum 2013 Topics |  |   | No |
|-----------------------------|--|---|----|
| 2.1                         | History taking and clinical examination                          |   | Х  |
| 2.2                         | The electrocardiogram (standard & exercise ECG, ambulatory, CPX) | Х |    |
| 2.3                         | Non-invasive imaging   |   | Х  |
| 2.4                         | Invasive imaging: cardiac catheterisation and angiography        |   | Х  |
| 2.5                         | Genetics   |   | Х  |
| 2.6                         | Clinical pharmacology  | Х |    |
| 2.7                         | Cardiovascular prevention  | Х |    |
| 2.8                         | Acute coronary syndromes   | Х |    |
| 2.9                         | Chronic ischaemic heart disease                                  | Х |    |
| 2.10                        | Myocardial diseases  | Х |    |
| 2.11                        | Pericardial diseases   | Х |    |
| 2.12                        | Oncology and the heart   |   | Х  |
| 2.13                        | Congenital heart disease in adult patients                       | Х |    |
| 2.14                        | Pregnancy and heart disease                                      | Х |    |
| 2.15                        | Valvular heart disease   | Х |    |
| 2.16                        | Infective endocarditis   | Х |    |
| 2.17                        | Heart failure  | Х |    |
| 2.18                        | Pulmonary arterial hypertension                                  | Х |    |
| 2.19                        | Physical activity and sport in primary and secondary prevention  |   | Х  |
| 2.20                        | Arrhythmias  | Х |    |
| 2.21                        | Atrial fibrillation and flutter                                  | Х |    |
| 2.22                        | Syncope  | Х |    |
| 2.23                        | Sudden cardiac death and resuscitation                           | Х |    |
| 2.24                        | Diseases of the aorta and trauma to the aorta and heart          | Х |    |
| 2.25                        | Peripheral artery diseases                                       | Х |    |
| 2.26                        | Thrombo-embolic venous disease                                   | Х |    |
| 2.27                        | Acute cardiovascular care  |   | Х  |
| 2.28                        | The cardiac consult  | Х |    |
|                             |  |   |    |

### What is the impact of guidelines?

The numbers in which guidelines are accessed are a clear message: of the total of 10.7 million article-downloads from the *EHJ* journal family in the year 2014, guideline downloads alone constituted 13.7%, or 1.47 million. Another aspect of guideline relevance is the number of official endorsements by National Cardiac Societies. Since 2009, 30 countries or more have every year endorsed the new guidelines, with a peak of 37 societies during one of these years. Yet another sign of significance is the number of translations of the Pocket Guidelines that are accomplished by the National Societies. The highest number of translations for one topic was reached with the dyslipidaemia guidelines, of which there have been no fewer than 21 different translations. The electronic age

The Pocket Guidelines App is a new development, which has been embraced by many cardiologists, particularly in the younger segments. The App comes in both a tablet and a smartphone version, and features all the pocket guidelines accessed with one click on the respective topic, which is perceived as useful by many users. More importantly, the App has a large number of calculator engines, algorithms, charts and score computing features that are very patient-oriented. For example, a physician can enter score points for a given patient, select the score-calculation function, and get clear advice as to clinical decision-making based on the entered score. This innovation is most likely a considerable area of growth and will hopefully contribute to dissemination of the guidelines even further. It is free of charge and available to download in the Apple Store, Google Play and Amazon, depending on your type of device.

### Conclusions

The ESC Guidelines are highly visible and are used worldwide. Quality remains the primary feature of each guideline. Regular updates are required for every topic covered. Guidelines assist physicians in decision-making, but, however, do not replace individual clinical judgement, and – importantly – guidelines are not meant to be the law. Electronic aids for smartphones to use guidelines actively are an important innovation and will be cultivated in the future.

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#### References

The full list of references is included in the online version of the article at www.cardiovascmed.ch.

Correspondence: Professor Dan Atar, MD Department of Cardiology B Oslo University Hospital Ullevaal Kirkeveien 166 NO-0407 Oslo Norway dan.atar[at]online.no