# VASCULAR DISEASE MANAGEMENT SURVEY FROM THE ESC COUNCIL FOR CARDIOLOGY PRACTICE AND THE ESC WORKING GROUP ON AORTA AND PERIPHERAL VASCULAR DISEASES

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# Background

The management of peripheral vascular diseases (PVDs, including arterial and venous diseases) is part of the ESC Core Curriculum. Patients with PVDs in Europe are managed by different specialists, according to the affected territory (e.g. cardiologists, vascular surgeons and physicians, neurologists…).
This year, with the publication of the 2017 ESC Guidelines on Peripheral Arterial Diseases, to evaluate the knowledge and the behaviour of a large community of cardiologists working in different settings, both in hospital and in out-of-hospital practice, the Council for Cardiology Practice together with the Working Group on Aorta and Peripheral Vascular Diseases developed a survey to submit to cardiologists who have subscribed to the Council's Newsletter and to the Council's E-Journal of Cardiology Practice.
The aims of the survey were to analyse the knowledge, the application and the behaviour of current knowledge about Peripheral Vascular Diseases (PADs) of Cardiologists in Practice.

# Method

The questionnaire was sent between December 2016 to March 2017 to 50,840 cardiologists who previously subscribed to the E-journal and/or electronic Newsletter of the Council for Cardiology Practice, with a link to the website hosting the questionnaire. Data collected was anonymous.
The questionnaire was composed of two sessions:

***Scientific questions:***

1. *Do you look for vascular (non-cardiac) signs and symptoms when you see a patient for the first time during your cardiology consultation?*
2. *Do you screen for PADs (e.g. carotid disease, lower extremity artery disease) during your clinical examination when you see a patient for a first cardiology consultation?*
3. *Do you measure the ankle-brachial index (at least once) in patients referred to you for a cardiology consultation?*
4. *How do you rate your knowledge about peripheral vascular diseases (arteries and veins)?*
5. *Do you manage patients with the following conditions (clinical and/or intervention) (tick several boxes if necessary)*
6. *Do you perform vascular ultrasound imaging by yourself?*
7. *Who is taking care of patients with PAD in your institution (you can tick multiple boxes if necessary)?*
8. *Would you attend specific CME programs or congress sessions about the management of PADs?*
9. *Have you ever read (partially or fully) the latest (2011) ESC guidelines on PAD?*
10. *A new version of ESC guidelines on PADs will be published in 2017. Will this be of interest to you?*

And

***Demographics questions:***

11. *Gender*
12. *Age*
13. *Activity*
14. *Country*
15. *Geographic area*
16. *Place of work*

Data regarding the answers about the scientific contents of the survey were matched by groups of:

- Age (Under 40 years / From 40 to 50 years / Over 50 years – Groups 1, 2 and 3)
- Place of work (In University or normal Hospital / Cardiologist in practice – Groups 4 and 5)
- Geographic Area (Africa / Asia + Oceania / Europe / North America + South & Central America – Groups 6, 7, 8 and 9)

This was to verify possible differences among the answers by these groups and the possible statistical differences.
Each sub-group data was compared to the overall sample average.
The profile of each group was determined by highlighting significant differences in the answers to questions 1-10.

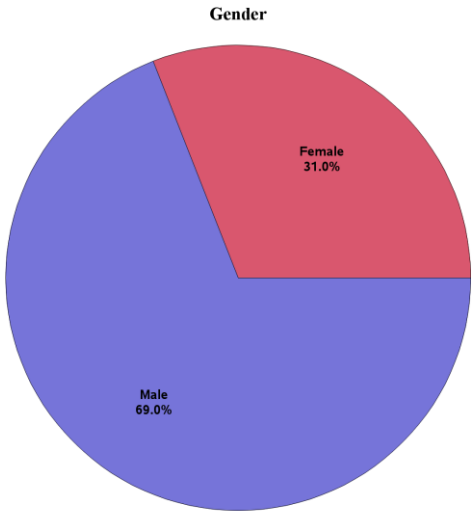
| | | |
|---|---|---|
| +++ | --- | **Significant differences => 99% =>** p-value ≤ 0.01 |
| ++ | -- | **Significant differences => 95% =>** 0.01 < p-value ≤ 0.05 |
| + | - | **Significant differences => 90% =>** 0.05 < p-value ≤ 0.10 |

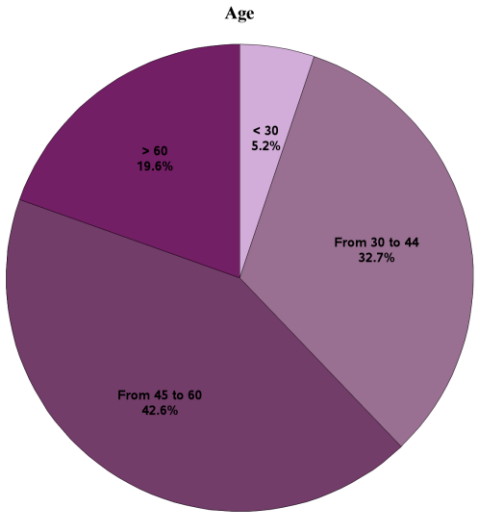
# Results and descriptive analysis

1424 persons answered questions 1-10. 1395 persons answered the questions relating to demographic characteristics. For comparison purposes, the Syncope Survey of the Council for Cardiology Practice received 1474 responses, the Atrial Fibrillation Survey received 2428 and the TAVI Survey received1245.

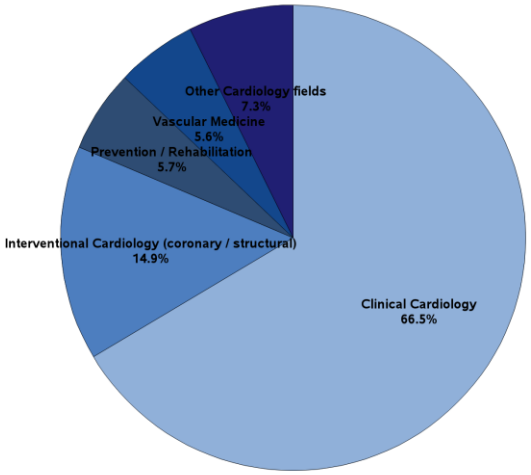
## Demographics characteristics:

These graphs below summarise the demographic characteristics of the sample.

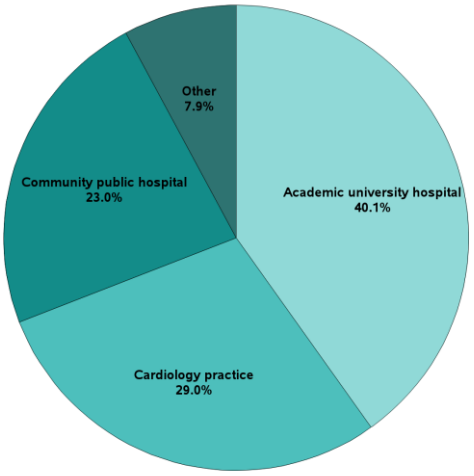


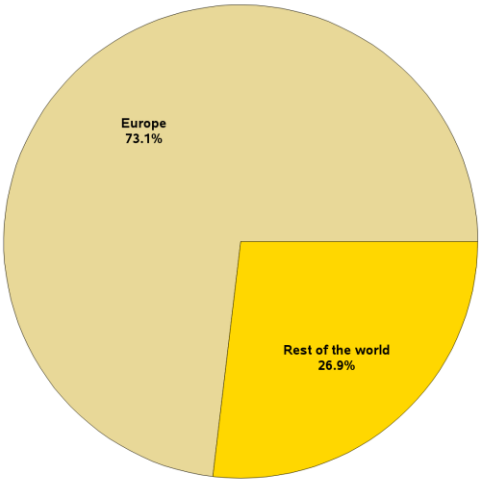
**Main field of activity**




**Place of work**




**Geographic area**



The number of responses received was similar to that of previous surveys of the Council for Cardiology Practice, while a higher number of responses was observed only for the survey about the antithrombotic treatment in Atrial Fibrillation. The distribution of the responders for:

- Sex
- Ages
- Hospital vs non-Hospital
- Countries

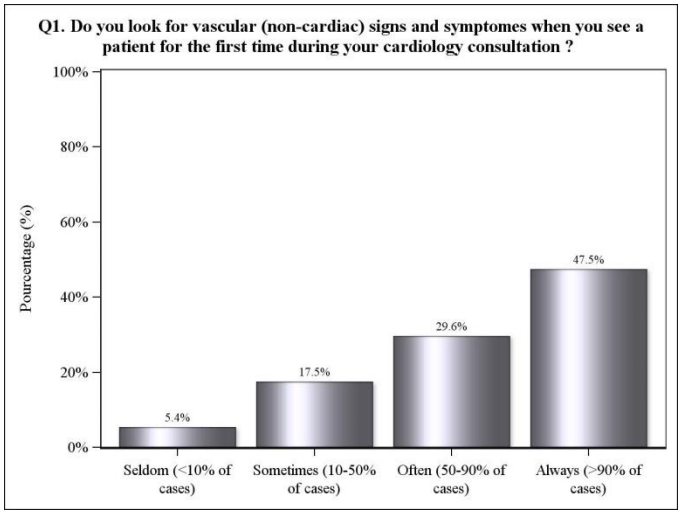
was similar to that of the previous surveys of the Council for Cardiology Practice.

# Results for scientific questions and by group analysis

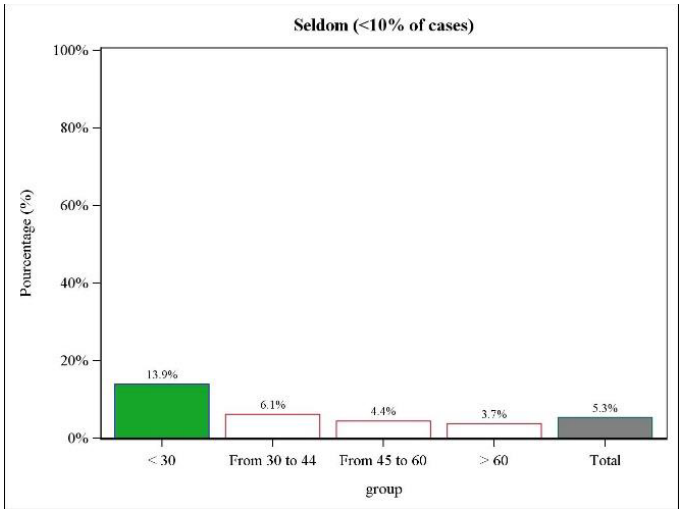
There were 1424 respondents who completed all these questions. Here is a summary of the results considering the answers to the single questions from 1 to 10. The subgroups for the answers to question 1 and 2 are also shown.
The pictures showing the subgroups data report the total data for the answer to the specific question. The data is divided according to the pre-specified subgroups highlighted in red if the result of that group is significantly under the mean data or in green if the result of that group is significantly higher than the mean data.
Please note that the use of green and red is not correlated with “good” or “bad” results – it only has a “mathematical” meaning.

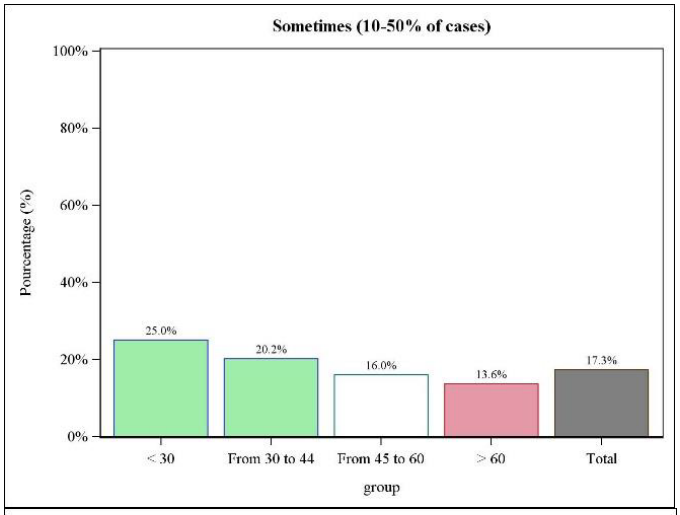
### *1. Do you look for vascular (non-cardiac) signs and symptoms when you see a patient for the first time during your cardiology consultation?*

| **Q1. Do you look for vascular (non-cardiac) signs and symptoms when you see a patient for the first time during your cardiology consultation?** | **Total** |
|---|---|
| Seldom (<10% of cases) | 77/1424 (5.4%) |
| Sometimes (10-50% of cases) | 249/1424 (17.5%) |
| Often (50-90% of cases) | 422/1424 (29.6%) |
| Always (>90% of cases) | 676/1424 (47.5%) |
| ND | 0 |




**Analysis by Age Groups**


Seldom (<10% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
13.9%
6.1%
4.4%
3.7%
5.3%
< 30
From 30 to 44
From 45 to 60
> 60
Total
group


Sometimes (10-50% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
25.0%
20.2%
16.0%
13.6%
17.3%
< 30
From 30 to 44
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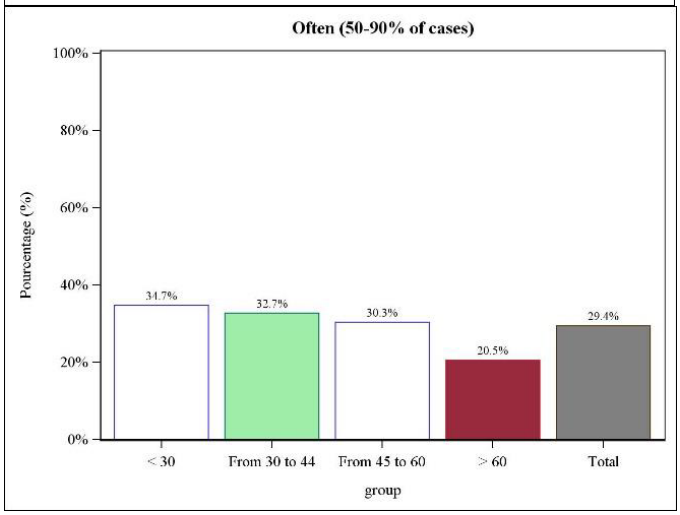
Total
group


Often (50-90% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
34.7%
32.7%
30.3%
20.5%
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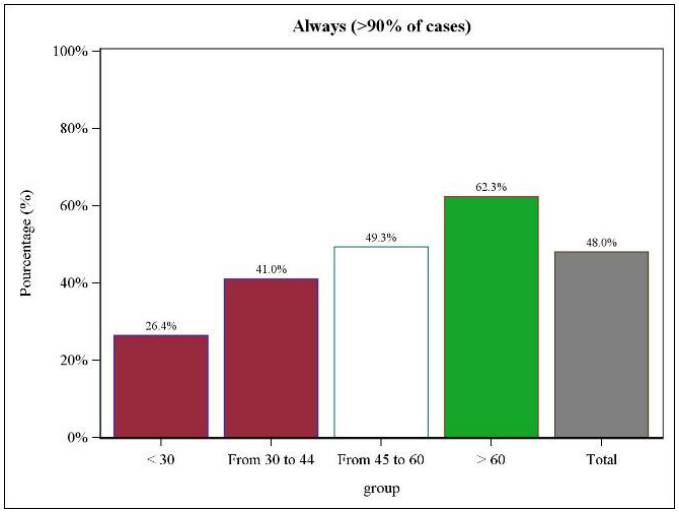
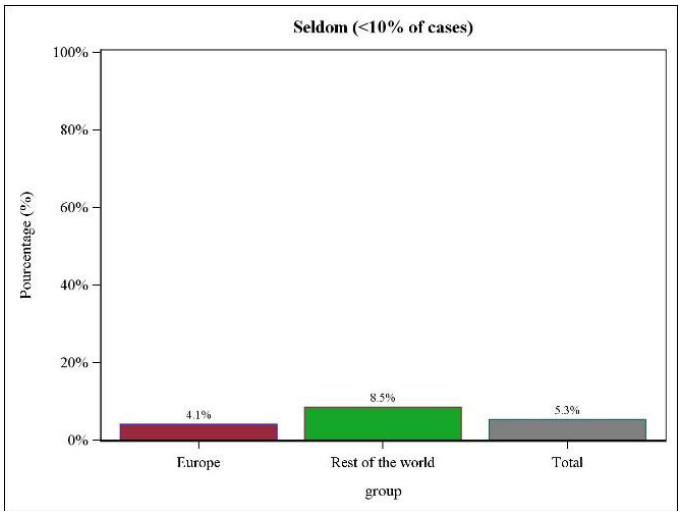
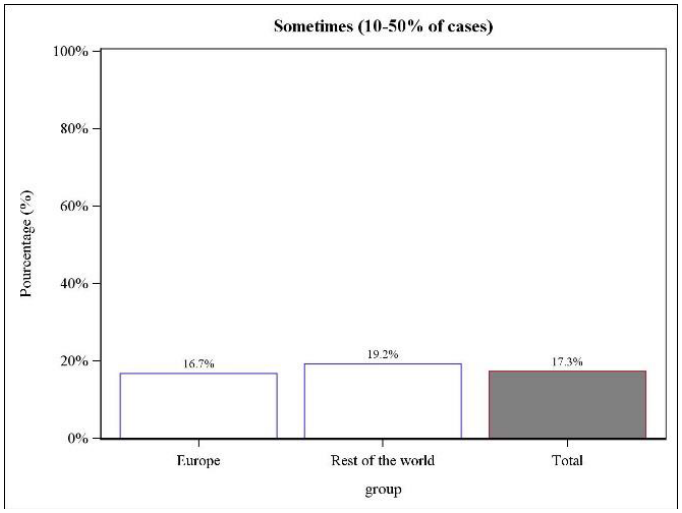
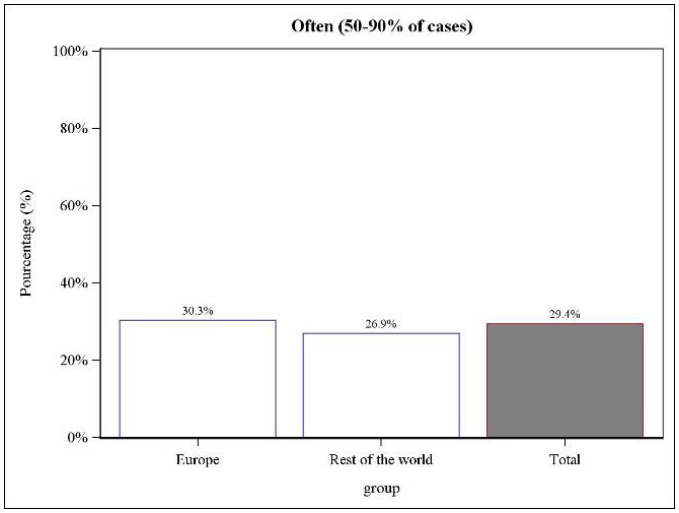
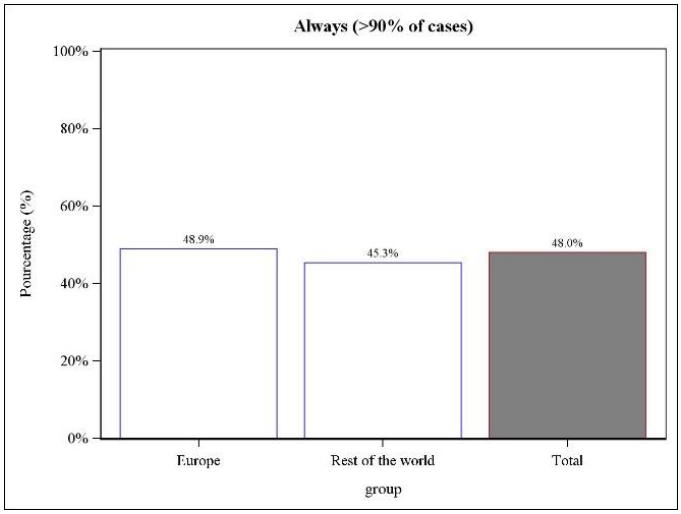



## Analysis by World Region

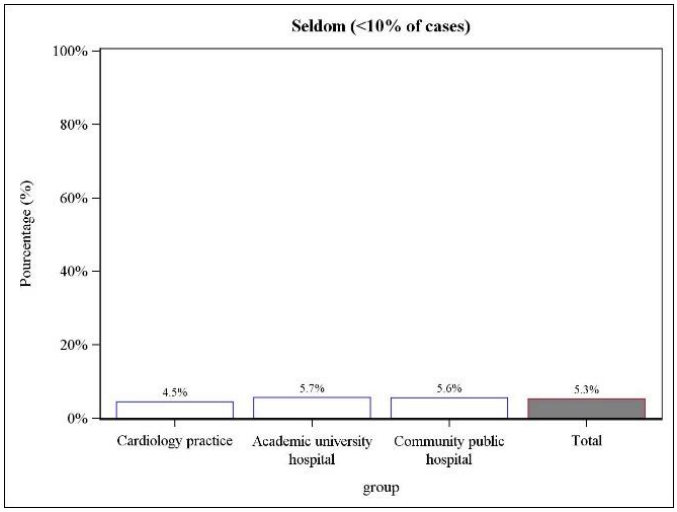


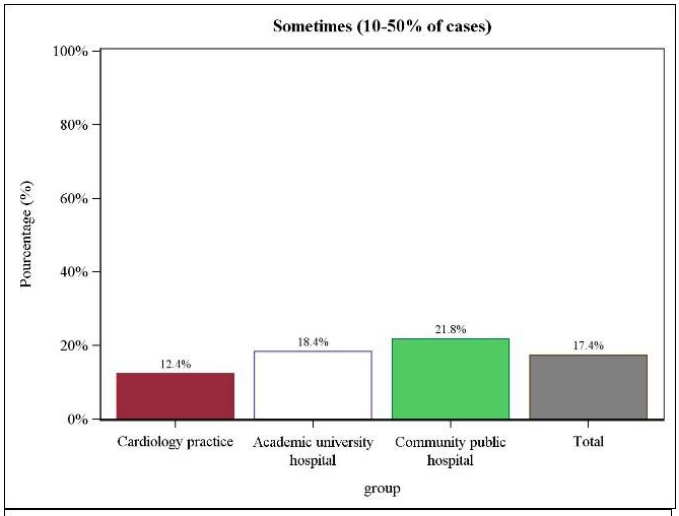



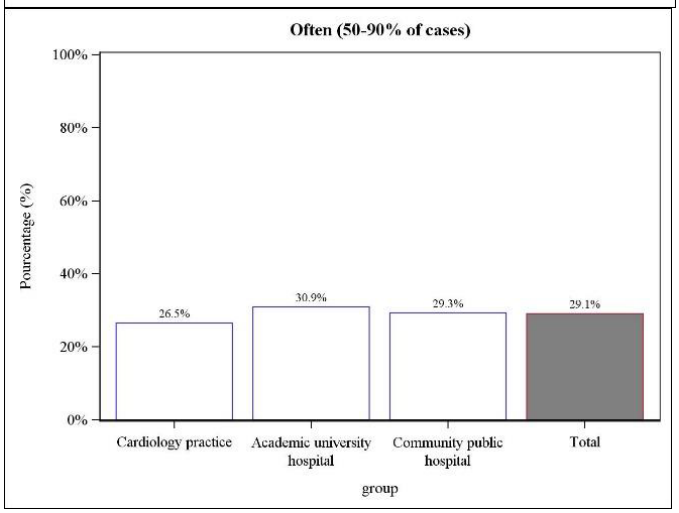


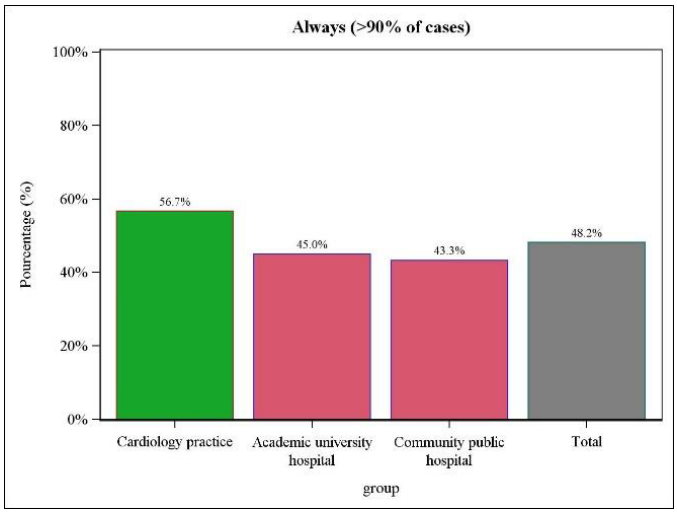




## Analysis by place of work





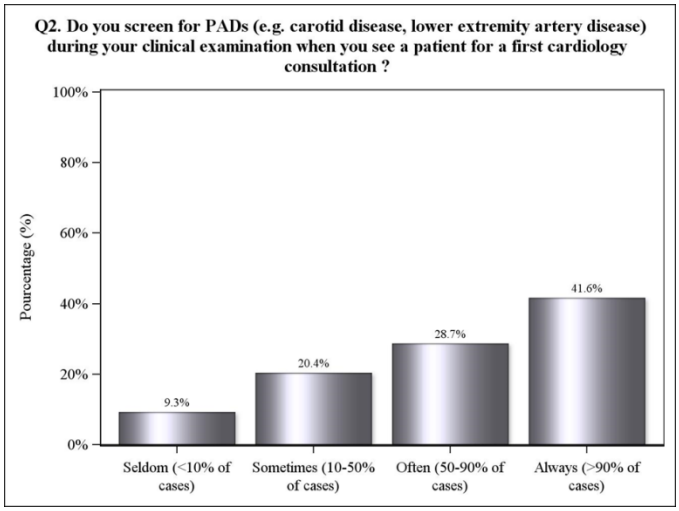

47.5% of the responders are regularly looking for a non-cardiac vascular sign or symptom during the first cardiac consultation while 29.6% of responders look for them in 50-90% of their cases. The total of about 87% may be considered essentially good. However in one of ten cases the cardiologists don't evaluate possible PVDs in their patients.

When analysing the results by age groups, it appears that young cardiologists are significantly less prone to look for peripheral vascular signs than their older colleagues. The analysis by World Region seems to demonstrate that European cardiologists are much more interested in peripheral vascular diseases than the rest of the world. Indeed, European cardiologists are significantly less likely than their colleagues in other countries to select the "seldom" option.

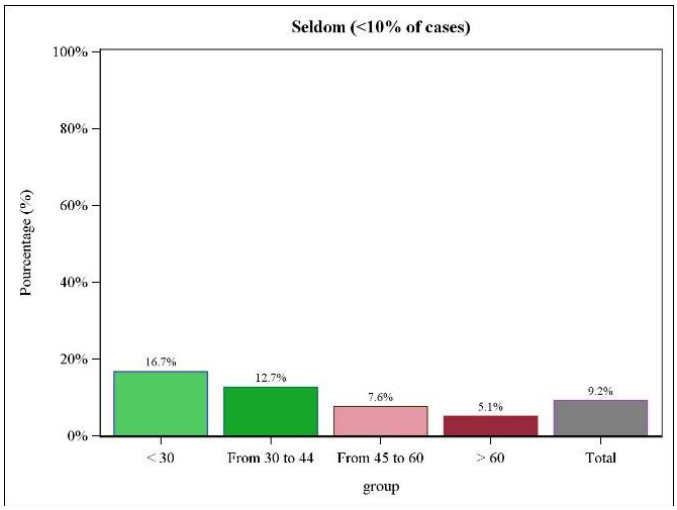
Cardiologists in Practice are significantly looking for PADs more often than their hospital colleagues.

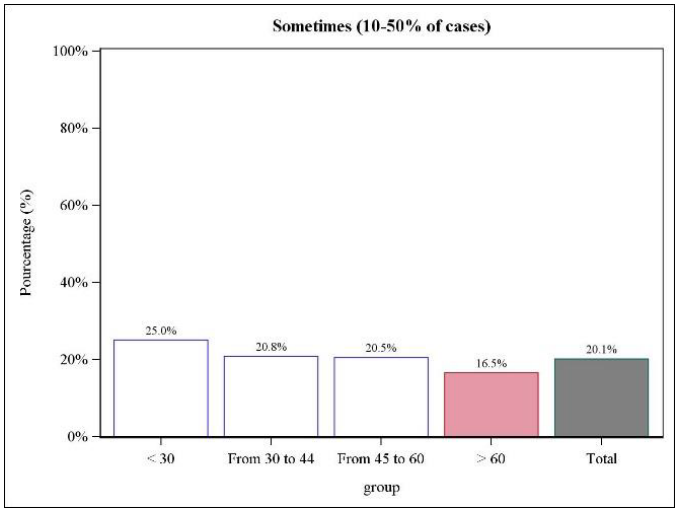
### *2. Do you screen for PADs (e.g. carotid disease, lower extremity artery disease) during your clinical examination when you see a patient for a first cardiology consultation?*

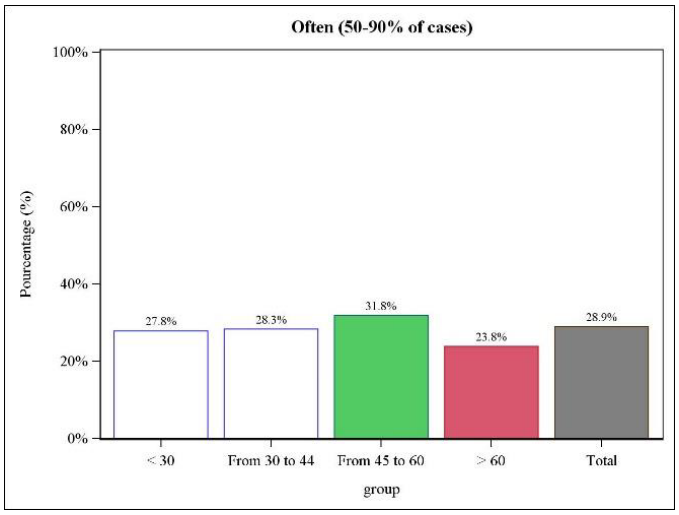
| Q2. Do you screen for PADs (e.g. carotid disease, lower extremity artery disease) during your clinical examination when you see a patient for a first cardiology consultation? | Total |
|---|---|
| Seldom (<10% of cases) | 132/1424 (9.3%) |
| Sometimes (10-50% of cases) | 290/1424 (20.4%) |
| Often (50-90% of cases) | 409/1424 (28.7%) |
| Always (>90% of cases) | 593/1424 (41.6%) |
| ND | 0 |

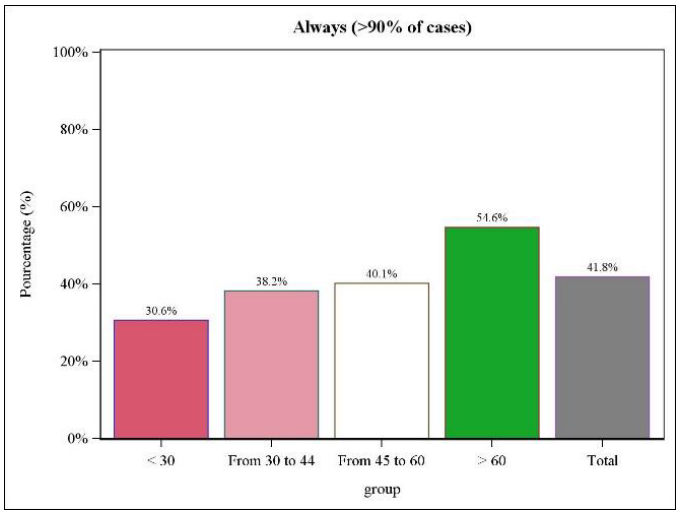



## Analysis by Age Groups

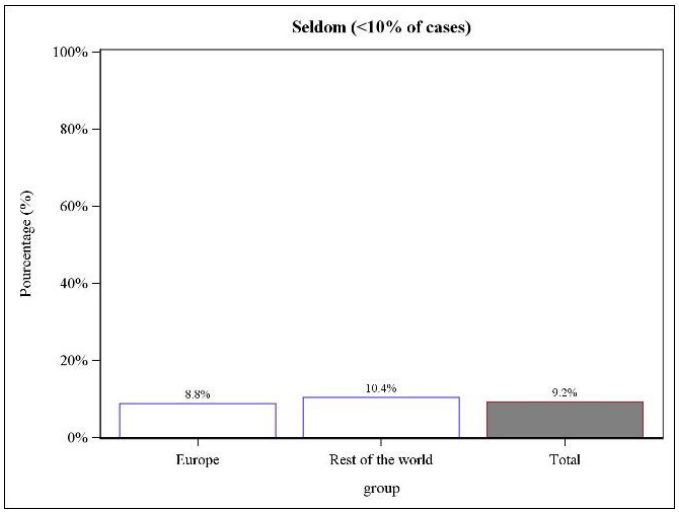


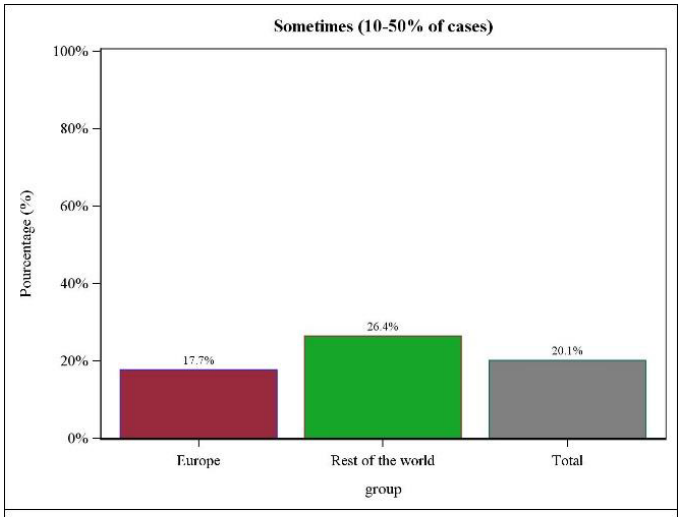

Sometimes (10-50% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
25.0%
20.8%
20.5%
16.5%
20.1%
< 30
From 30 to 44
From 45 to 60
> 60
Total
group

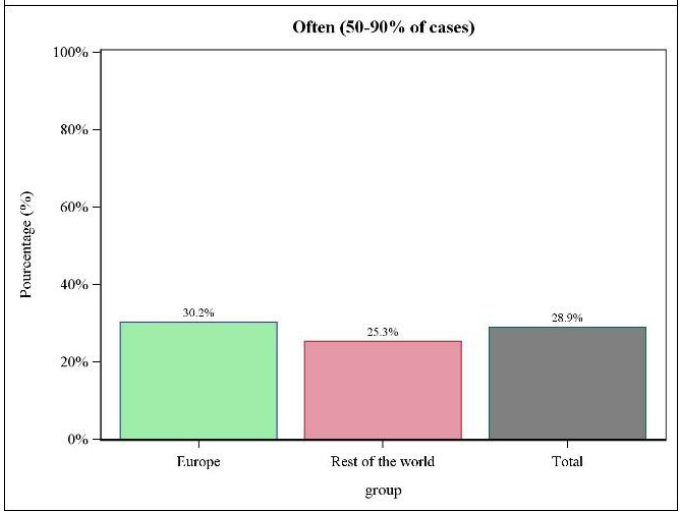

Often (50-90% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
27.8%
28.3%
31.8%
23.8%
28.9%
< 30
From 30 to 44
From 45 to 60
> 60
Total
group

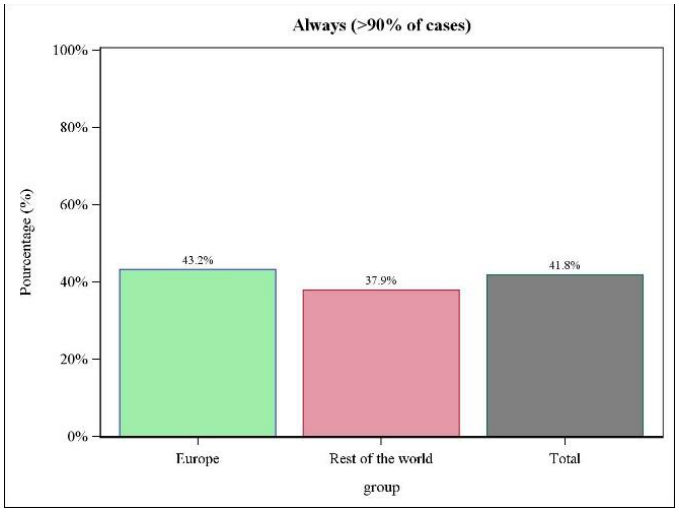

Always (>90% of cases)
100%
80%
60%
40%
20%
0%
Pourcentage (%)
30.6%
38.2%
40.1%
54.6%
41.8%
< 30
From 30 to 44
From 45 to 60
> 60
Total
group

## Analysis by World Region

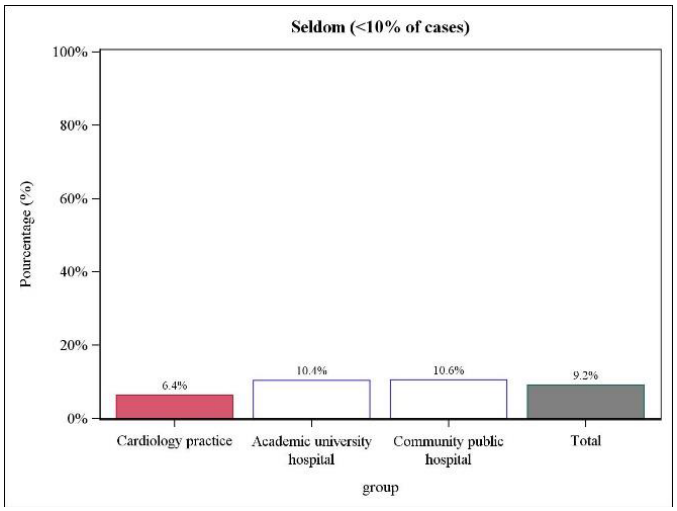


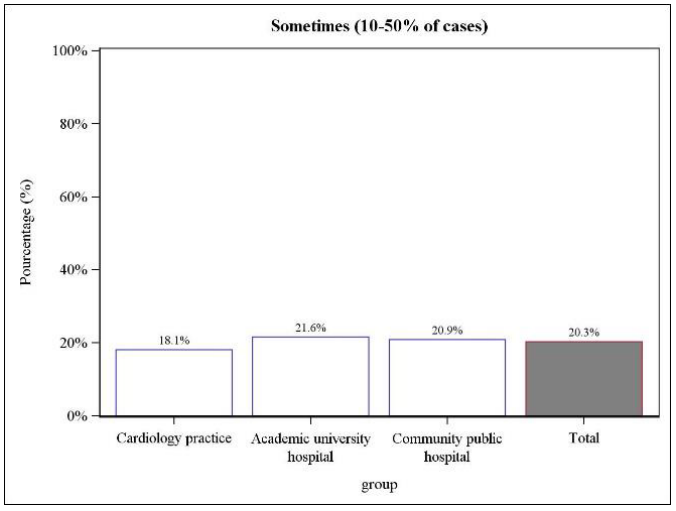



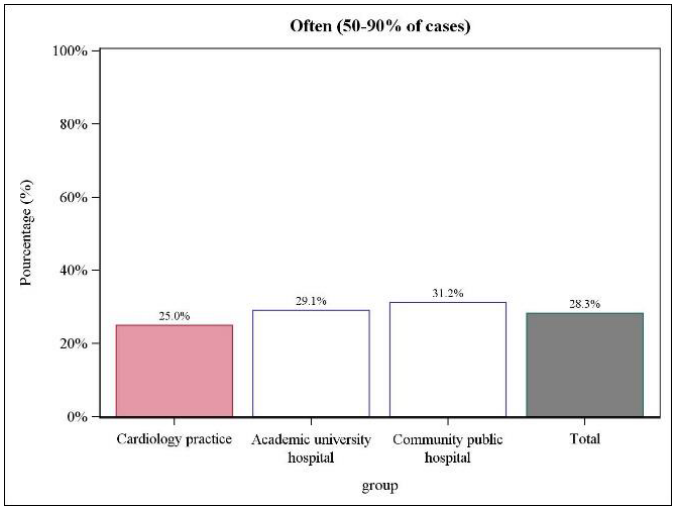



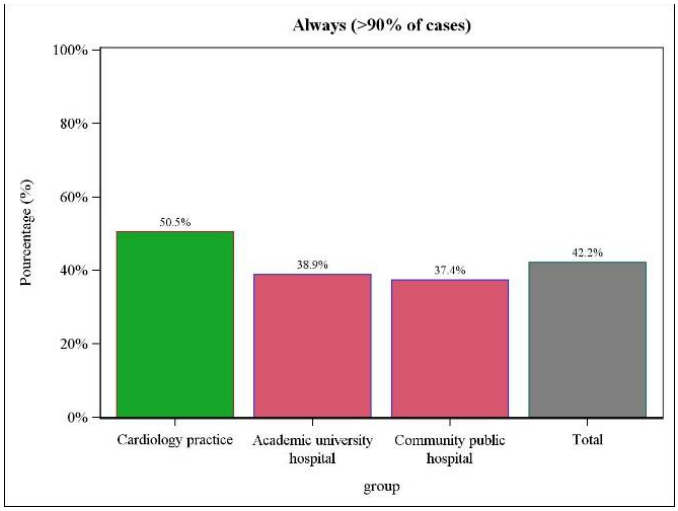



## Analysis by Place of Work



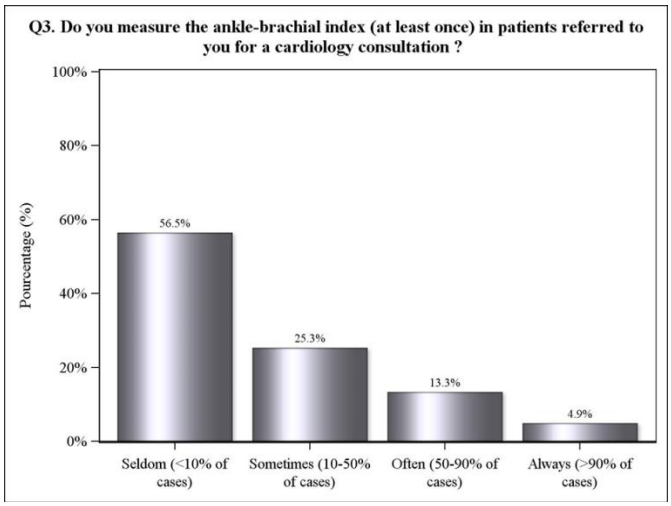



42.2% of the responders regularly screen their patients for PADs during a first cardiac consultation. 20.3% of responders 'sometimes' (from 50 to 90% of patients) perform this screening. Nearly 40% of patients do not receive any form of PADs screening at the first cardiac visit.
Also for the topic of this question, the oldest cardiologists, the European cardiologists and the Cardiologists in Practice seem to be more prone to screen PADs than their equivalent colleagues.

### *3. Do you measure the ankle-brachial index (at least once) in patients referred to you for a cardiology consultation?*

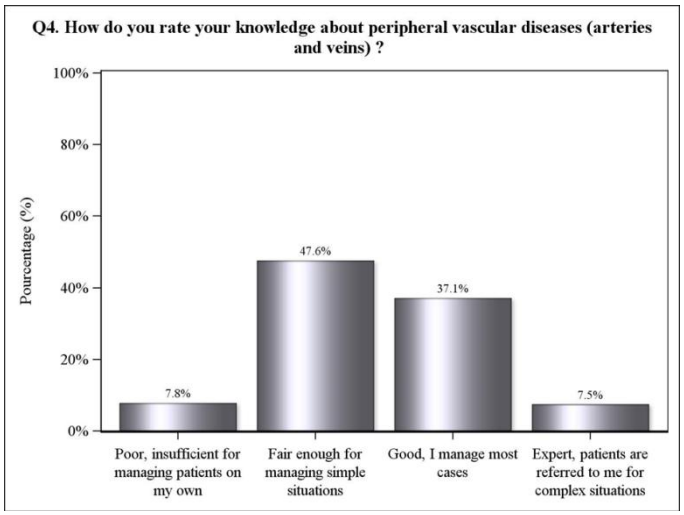
| **Q3. Do you measure the ankle-brachial index (at least once) in patients referred to you for a cardiology consultation?** | **Total** |
|---|---|
| Seldom (<10% of cases) | 804/1424 (56.5%) |
| Sometimes (10-50% of cases) | 360/1424 (25.3%) |
| Often (50-90% of cases) | 190/1424 (13.3%) |
| Always (>90% of cases) | 70/1424 (4.9%) |
| ND | 0 |




The measurement of the ankle-brachial index (ABI) is still not regularly implemented, since more than 50% never measure ABI and less than 5% measure it systematically for risk assessment in all their patients.

## *4. How do you rate your knowledge about peripheral vascular diseases (arteries and veins)?*

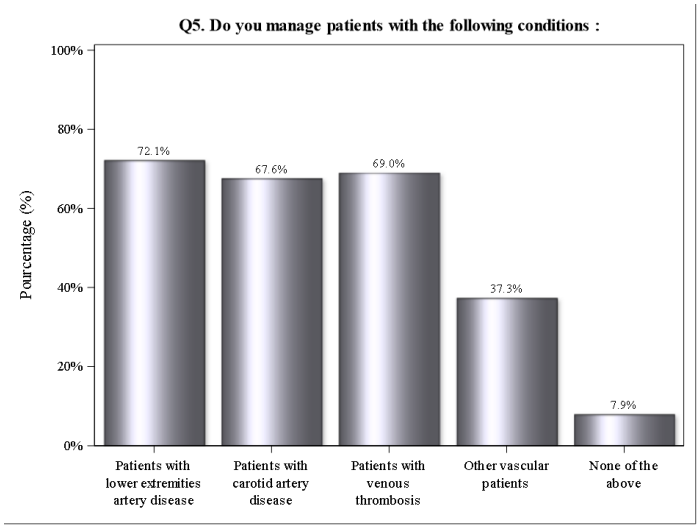
| **Q4. How do you rate your knowledge about peripheral vascular diseases (arteries and veins)?** | **Total** |
|---|---|
| Poor, insufficient for managing patients on my own | 111/1422 (7.8%) |
| Fair enough for managing simple situations | 677/1422 (47.6%) |
| Good, I manage most cases | 528/1422 (37.1%) |
| Expert, patients are referred to me for complex situations | 106/1422 (7.5%) |
| ND | 2 |



47% of responders consider that they have a basic knowledge of peripheral vascular disease and are able to manage simple situations. About 48% judge that they have “good” or “expert” level of knowledge.
Thus, the knowledge level of more than half of the respondents may be improved.

### *5. Do you manage patients with the following conditions (clinical and/or intervention) (tick several boxes if necessary)*

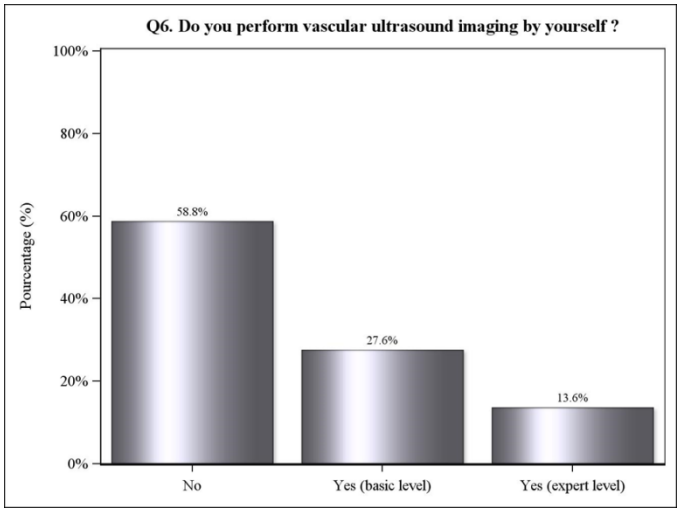
| **Q5. Do you manage patients with the following conditions (clinical and/or intervention):** | **Answer** | **Total** |
|---|---|---|
| Patients with lower extremities artery disease | Yes | 1027/1424 (72.1%) |
| | No | 397/1424 (27.9%) |
| | ND | 0 |
| Patients with carotid artery disease | Yes | 962/1424 (67.6%) |
| | No | 462/1424 (32.4%) |
| | ND | 0 |
| Patients with venous thrombosis | Yes | 982/1424 (69.0%) |
| | No | 442/1424 (31.0%) |
| | ND | 0 |
| Other vascular patients | Yes | 531/1424 (37.3%) |
| | No | 893/1424 (62.7%) |
| | ND | 0 |
| None of the above | Yes | 112/1424 (7.9%) |
| | No | 1312/1424 (92.1%) |
| | ND | 0 |




About two third of responders seem able to manage some very common problems like lower extremities diseases, venous thrombosis and carotid diseases. Only 8% of them declare never taking care of any of the situations proposed.

## 6. *Do you perform vascular ultrasound imaging by yourself?*

| Q6. Do you perform vascular ultrasound imaging by yourself? | Total |
|---|---|
| No | 837/1424 (58.8%) |
| Yes (basic level) | 393/1424 (27.6%) |
| Yes (expert level) | 194/1424 (13.6%) |
| ND | 0 |

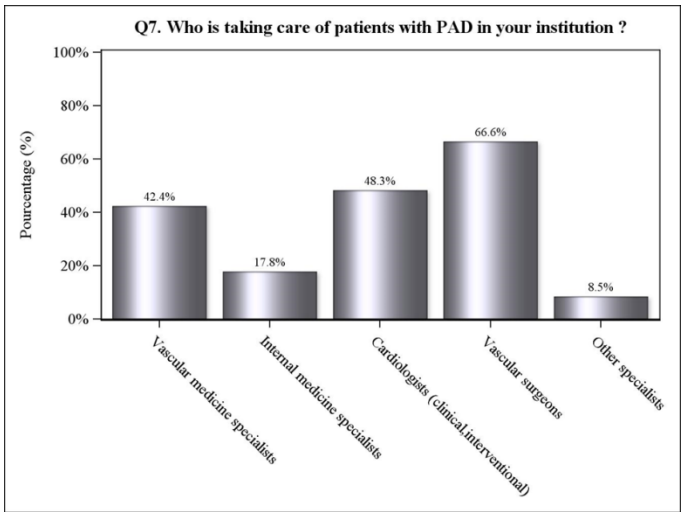



58.8% of responders don't perform vascular ultrasounds by themselves but more than 40% regularly perform vascular ultrasound imaging, and one-third qualify themselves as experts in vascular imaging.

## 7. *Who is taking care of patients with PAD in your institution (you can tick multiple boxes if necessary)?*

| Q7. Who is taking care of patients with PAD in your institution? | Answer | Total |
|---|---|---|
| Vascular medicine specialists | Yes | 604/1424 (42.4%) |
| | No | 820/1424 (57.6%) |
| | ND | 0 |
| Internal medicine specialists | Yes | 254/1424 (17.8%) |
| | No | 1170/1424 (82.2%) |
| | ND | 0 |
| Cardiologists (clinical, interventional) | Yes | 688/1424 (48.3%) |
| | No | 736/1424 (51.7%) |
| | ND | 0 |
| Vascular surgeons | Yes | 948/1424 (66.6%) |
| | No | 476/1424 (33.4%) |
| | ND | 0 |

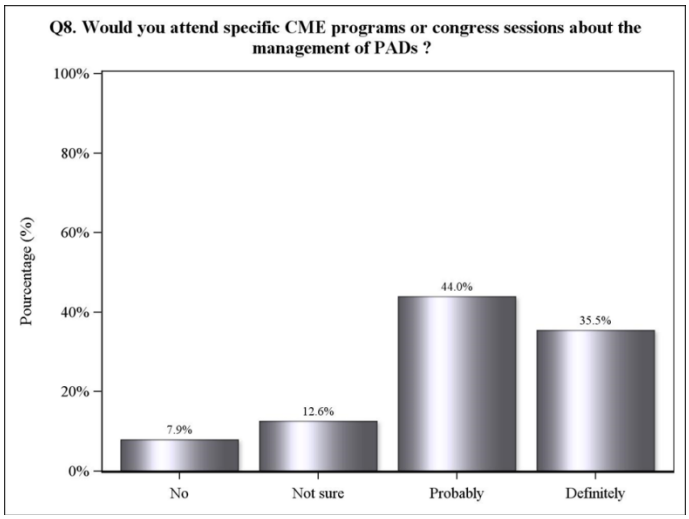
| Q7. Who is taking care of patients with PAD in your institution? | Answer | Total |
|---|---|---|
| Other specialists | Yes | 121/1424 (8.5%) |
| | No | 1303/1424 (91.5%) |
| | ND | 0 |




The results emphasize that most of the time, vascular surgeons are taking care of patients with PAD (66.6%).Cardiologists come up as the second speciality (48.3%), very close to other vascular physicians (42.4%). Cardiologists taking care of these patients were either non-invasive physicians or interventional.

## *8. Would you attend specific CME programs or congress sessions about the management of PADs?*

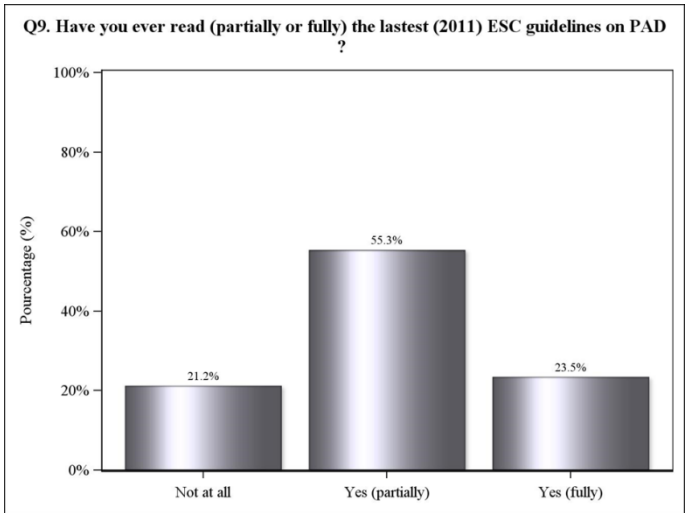
| Q8. Would you attend specific CME programs or congress sessions about the management of PADs? | Total |
|---|---|
| No | 113/1424 (7.9%) |
| Not sure | 180/1424 (12.6%) |
| Probably | 626/1424 (44.0%) |
| Definitely | 505/1424 (35.5%) |
| ND | 0 |




A large majority of respondents are keen to stay updated regarding the management of patients with PADs, since 80% would “definitely” or “probably” attend CME programs or congress sessions about the management of PVDs.

## *9. Have you ever read (partially or fully) the latest (2011) ESC guidelines on PAD?*

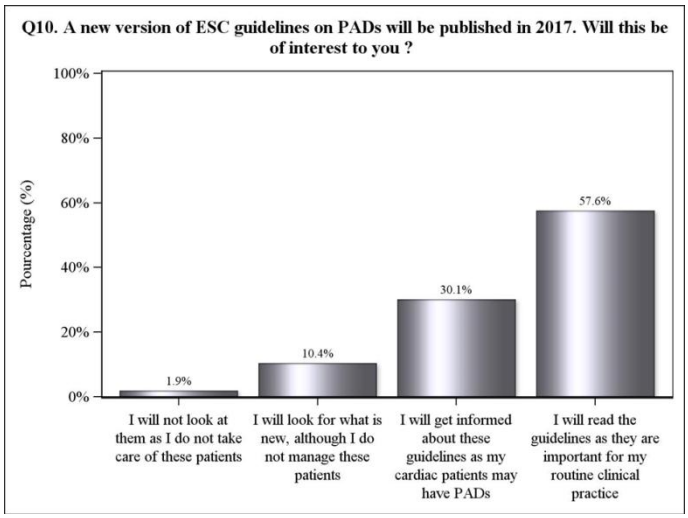
| **Q9. Have you ever read (partially or fully) the latest (2011) ESC guidelines on PAD?** | **Total** |
|---|---|
| Not at all | 302/1424 (21.2%) |
| Yes (partially) | 788/1424 (55.3%) |
| Yes (fully) | 334/1424 (23.5%) |
| ND | 0 |




In line with answers to question 8, more than 70% of responders have at least partially read the previous version of the ESC Guidelines on PADs, and about one-fourth declared having read it completely. This result is approximately the same as other surveys focussing on the knowledge of other guidelines.

### *10. A new version of ESC guidelines on PADs will be published in 2017. Will this be of interest to you?*

| Q10. A new version of ESC guidelines on PADs will be published in 2017. Will this be of interest to you? | Total |
|---|---|
| I will not look at them as I do not take care of these patients | 27/1424 (1.9%) |
| I will look for what is new, although I do not manage these patients | 148/1424 (10.4%) |
| I will get informed about these guidelines as my cardiac patients may have PADs | 429/1424 (30.1%) |
| I will read the guidelines as they are important for my routine clinical practice | 820/1424 (57.6%) |
| ND | 0 |




Accordingly, 88% of the responders declared that they will read the new version of the ESC Guidelines, 58% consider them important for their routine clinical practice and in 30% of cases because their cardiac patients may have a possible PAD.

The analysis based on the age, place of work and world region showed similar results for questions 3 to 10.

# Discussion

The European Society of Cardiology has in the past organized leading surveys about different topics in different settings, for example on prevention like the series of EUROASPIRE or the surveys that are now part of the Cardiac ATLAS of the ESC.
These surveys are generally multi-centre retrospective or prospective analysis of the management of a specific aspect of cardiology; realized using a database of patients followed in a specific time in selected hospital settings.
The surveys proposed by the Council for Cardiology Practice, unlike other commonly published surveys, are based on the direct interview of a population of cardiologists with a wide dissemination of geographic and professional conditions (mainly hospital settings) and not on data derived from patients' database. This way of collecting information about a clinical topic is somewhat different and in our thinking represents a sort of "intention to treat" questionnaire.
The surveys are intended to offer a snapshot of the current clinical practice about a specific topic and their importance will increase over time.
Although they may have their limitations, due to the characteristics of our sample: not randomized and with many selection bias; 100% of this survey's results are obtained on a volunteer base and can be considered honest and representative of a population of cardiologists, both working in hospital (the majority) or in an out-

of-hospital setting. The data derived from the Vascular Disease Management Survey of the ESC Council for Cardiology Practice and the ESC Working Group on Aorta and Peripheral Vascular Diseases, gives, in the view of the authors, some interesting information on the knowledge of this topic.
The rate of adherence to this survey on PVD management (<3%) was still low, less than the survey on atrial fibrillation and anticoagulation treatment, though in line with surveys on other important topics (i.e. TAVI and syncope) previously conducted by the Council for Cardiology Practice. Similarly, the distribution of the responders by gender, age, Hospital vs non-Hospital activity and Countries was similar to that of the previous surveys. This survey mostly included European cardiologists (73.1%).
As for the previous surveys the answers were analysed by age, region of the world and professional subgroups
The Scientific Questions numbers 1 to 10 of the questionnaire explored how PVD issues are felt by the cardiology community.
The answers to these questions showed expected results, but also some results that may be debatable and were partially unexpected and can be summarized as follows:

1. About two responders out of three are looking for signs, symptoms or are screening for PVDs. One third of respondents are less prone to looking for PVDs: this result may be according to specific working situations. This behaviour seems more common amongst young responders than their aged colleagues, more in non-European countries and, surprisingly in hospital cardiologists than in cardiologists in practice.
2. Few respondents (43.5%) are sometimes measuring an Ankle-Brachial Index, a very simple and not time-consuming procedure with great sensibility and specificity for PADs.
3. 47% of the responders are rating their knowledge about PVDs as a basic level but as many as 48% of responders declare themselves at a fair level, or are considering themselves as experts
4. About two thirds of the respondents declare to following and directly managing directly peripheral vessel, carotid artery and venous thrombosis.
5. About 60% of responders are not doing US exams by themselves, but more than 40% are considering themselves at a good or expert level.
6. In most situations (66.6%) of patients with a PVD are managed by a vascular surgeon, but also in 48.3% of the cases interventional Cardiologists take care of PVD patients.
7. 79.5% of responders declare that they would attend (44% probably, 35.5% definitely) a CME course or event about PVD.
8. The majority of the responders did read in a complete way or at least partially the 2011 ESC Guidelines on Peripheral Arterial Diseases and 21% have not read them.
9. 87% of responders declared they will read the new version of the 2017 ESC Guidelines on Peripheral Arterial Diseases, 57% because think that they are important for they cardiology practice in routine and 30%.

# Conclusions

This survey is a first snapshot of the current situation of knowledge and commitment of a large number of cardiologists, most of them European, in the management of vascular diseases.
The survey results were representative of a large general population of cardiologists, both working in hospital (the majority) or in out-of-hospital settings.
The findings of the survey highlight several important issues.
Many cardiologists but not all are deeply concerned about PVDs and are routinely looking for them in general cardiology visits and are directly executing Ultra-Sound tests. Overall these results show the important role of cardiologists in the management of patients with vascular diseases.
However, a simple index like the Ankle-Brachial Index has an incomplete application.
The weaker responses given by the younger responders should be considered as an important warning which should be corrected.
Actions to improve the knowledge of younger cardiologists regarding the main vascular diseases should be encouraged, and “young cardiologists” associations within the ESC can be a key element. The first step would be the promotion and implementation of the 2017 ESC Guidelines on Peripheral Arterial Diseases.
Also hospital cardiologists have room for improvement of their ability to follow PVDs patients
A great action to increase the ability to manage PVDs by all cardiologists has to be undertaken by all institutions, both academic and scientific societies.
The ESC, and especially the Council for Cardiology Practice and the Working Group on Aorta and Peripheral Vascular Diseases which managed this survey, have an important role to enhance the knowledge of cardiologists on the cardiovascular system as a whole beyond the heart itself and on the implementation of the 2017 ESC Guidelines on Peripheral Arterial Diseases.