EUROPEAN SOCIETY OF CARDIOLOGY (ESC) CONGRESS UPDATE

Munich, Germany, 25-29 August 2018

Introduction

The annual meeting of the European Society of Cardiology was held in Munich from 25 to 29 August 2018. Hosting approximately 31 000 delegates this year, it remains the largest cardiology conference with a vast number of lectures, presentations, posters and workshops on offer. Dr Anthony Dalby and Dr Jens Hitzeroth assist in navigating various updated ESC guidelines and current trial studies presented at the meeting.

KEY MESSAGES

- Updated guidelines on the management of arterial hypertension, myocardial revascularisation, cardiovascular diseases in pregnancy, and syncope were issued; as well as the fourth universal definition of myocardial infarction (MI)
- Omega-3 fatty acid supplementation (1g daily) does not provide cardiovascular risk benefit
- Aspirin treatment (100mg daily) in moderate risk heart disease confers no advantage for cardiovascular death, MI, unstable angina, stroke or TIA; compared to placebo
- Treatment of hyperuricaemia with febuxostat reduced cerebral, cardiovascular and renal events by 25%
- Lorcaserin is the first weight loss agent with proven safety for major adverse cardiovascular events
- Use of high-sensitivity troponin I assay does not influence acute coronary syndrome outcomes
- Irbesartan slows the rate of aortic enlargement in Marfan Syndrome
- Tafamidis is an effective therapy for patients with transthyretin amyloid cardiomyopathy
- Prolonged venous thromboembolism prophylaxis with rivaroxaban is not associated with improved outcomes post-hospital discharge.

Guideline updates

Updates to Guidelines on the Management of Arterial Hypertension, Myocardial Revascularisation, Cardiovascular Diseases in Pregnancy and Syncope, as well as the 4th Universal Definition of Myocardial Infarction, were issued at this meeting. The management of the respective conditions is addressed comprehensively in each document (www.escardio.org/guidelines) and is beyond the scope of this review; which highlights only some aspects of each guideline.
2018 ESC/ESH Guidelines for the Management of Arterial Hypertension

The classification of hypertension remains unchanged, with a level of 120-129 mmHg systolic and/or 80/84 mmHg diastolic denoting a normal blood pressure (BP). Patients with 130-139/85-89 mmHg are classified as high normal with any other BP above these levels denoting hypertension. Definitions of hypertension according to setting are outlined in Table 1.

Table 1. Definitions of hypertension according to setting of BP measurement

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office BP</td>
<td>&gt;140</td>
<td>and/or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;90</td>
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<tr>
<td>Ambulatory BP</td>
<td></td>
<td></td>
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<tr>
<td>Daytime</td>
<td>&gt;135</td>
<td>and/or</td>
</tr>
<tr>
<td>Night-time</td>
<td>&gt;120</td>
<td>and/or</td>
</tr>
<tr>
<td>24-hr mean</td>
<td>&gt;130</td>
<td>and/or</td>
</tr>
<tr>
<td>Home BP mean</td>
<td>&gt;135</td>
<td>and/or</td>
</tr>
</tbody>
</table>

In terms of treatment, the guidelines strongly advocate starting dual combination therapy in most patients. Monotherapy should only be considered in low-risk patients with mild hypertension, or in patients older than 80 years or very frail. All other patients should start on 2 agents, specifically an ACE-I/ARB + CCB/diuretic. Escalation would be triple therapy in the form of ACE-I/ARB + CCB + diuretic. If the BP is still uncontrolled, spironolactone should be added, and other antihypertensive agents can be considered. Beta-blockers can be considered at any stage provided they have to be used for another indication, such as heart failure (HF), post-myocardial infarction (MI) and atrial fibrillation (AF). Office BP target ranges are listed in Table 2.

Table 2. Office BP target ranges for age and morbidity

<table>
<thead>
<tr>
<th>Age group</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
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<tbody>
<tr>
<td></td>
<td>HPT</td>
<td>+DM</td>
</tr>
<tr>
<td>18-65</td>
<td>Target to &lt;130-120; NOT &lt;120</td>
<td>Target to &lt;130-120; NOT &lt;120</td>
</tr>
<tr>
<td>65-79</td>
<td>Target to &lt;140-130</td>
<td>Target to &lt;140-130</td>
</tr>
<tr>
<td>&gt;80</td>
<td>Target to &lt;140-130</td>
<td>Target to &lt;140-130</td>
</tr>
<tr>
<td></td>
<td>Diastolic (mmHg)</td>
<td>&lt;80-70</td>
</tr>
</tbody>
</table>

HPT: hypertension; DM: diabetes mellitus; CKD: chronic kidney disease; CAD: coronary artery disease; TIA: transient ischaemic attack

Use of device-based therapies (e.g. renal denervation) is not recommended for treatment of hypertension unless in the context of a clinical study.

Interventions that may improve adherence to drug therapy are specifically addressed and include the following:
- Patient education regarding the risks of hypertension
- Self-monitoring of BP and self-management of therapy
- Use of reminders
- Family and social support
- Provision of drugs at the worksite
- Simplification of drug regimens favouring the use of single pill combination therapy
- Reminder packaging.
2018 ESC Guidelines for the Diagnosis and Management of Syncope

The following questions should be asked in the initial evaluation of syncope:

- Was the clinical event a real transient loss of consciousness (TLOC)?
- Is TLOC of syncopal origin?
- Is there a serious underlying cause that can be identified?
- If the cause is uncertain, what is the risk of serious outcome?
- Should the patient be admitted to hospital?

All patients should be evaluated with a complete history, physical exam (including supine and standing BP) and standard ECG. Prolonged ECG monitoring can be considered if there is a suspicion of arrhythmia. An echocardiogram is recommended to rule out structural heart abnormalities.

Patients with high-risk features should be admitted for aggressive investigation. Low- and high-risk features of syncope are listed in Table 3.

<table>
<thead>
<tr>
<th>Table 3. Risk features of syncope</th>
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<tr>
<td><strong>Low-risk</strong></td>
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<tr>
<td><strong>Syncopal event</strong></td>
</tr>
<tr>
<td>Associated with prodrome typical of reflex syncope</td>
</tr>
<tr>
<td>After sudden unexpected unpleasant sight sound smell or pain</td>
</tr>
<tr>
<td>After prolonged standing or crowded, hot places</td>
</tr>
<tr>
<td>During meal or postprandial</td>
</tr>
<tr>
<td>Triggered by cough, defecation or micturition</td>
</tr>
<tr>
<td>With head rotation of pressure on carotid sinus</td>
</tr>
<tr>
<td>Standing from supine/sitting position</td>
</tr>
<tr>
<td>New onset of chest discomfort, breathlessness, abdominal pain or headache</td>
</tr>
<tr>
<td>Syncope during exertion or when supine</td>
</tr>
<tr>
<td>Sudden-onset palpitations immediately followed by syncope</td>
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Table 3. Risk features of syncope
Carotid sinus massage is an integral part of assessing patients older than 40 years with syncope of unknown origin compatible with a reflex mechanism. Tilt-testing overall has become a less favoured investigation. Prolonged ECG monitoring (external or implantable) is recommended in patients who have the following 3 features:

- Clinical or ECG features suggesting arrhythmic syncope
- High probability of recurrence in a reasonable time
- Patient may benefit from specific therapy if a cause for syncope is found.

Electrophysiological studies are recommended for those patients with unexplained syncope and bifascicular block, or post-MI with suspected tachycardia.

Exercise stress testing should be performed in patients with syncope that occurs during or shortly after exertion.

Treatment of reflex syncope includes education, with teaching of counter-pressure manoeuvres; and stopping or reducing hypotensive drugs. Fludrocortisone or midodrine can be considered. Pacing should be considered if the dominant mechanism is cardio-inhibitory, as demonstrated by asystolic pauses (spontaneous or tilt-test induced).

Patients with syncope, hypertrophic CMO and high-risk features should receive an ICD. ICD implantation for patients with arrhythmogenic right ventricular dysplasia/cardiomyopathy (ARVC) and syncope has however been downgraded to a Class IIb recommendation.

2018 Guidelines for the Management of Cardiovascular Diseases during Pregnancy

The management of pregnant patients with cardiovascular disease is complex and needs to be individualised. Various conditions are discussed in detail in the guideline document.

Pre-pregnancy counselling is important, and pregnancy is not advised in patients with the following conditions:

- Fontan operation and additional co-morbidities
- Pulmonary arterial hypertension
- Severe systemic ventricular dysfunction (EF<30%)
- Severe (re-)co-arctation

2018 ESC/EACTS Guidelines on Myocardial Revascularisation

Immediate coronary angiography and revascularisation is indicated in survivors of out-of-hospital cardiac arrest and an ECG consistent with MI.

Routine revascularisation of non-infarct-related arterial lesions in patients with MI and cardiogenic shock is not recommended.

Radial access should be the standard approach.

Drug-eluting stents are recommended for any percutaneous coronary intervention (PCI).

The bifurcation strategy of choice is provisional stenting of the main vessel, followed by provisional balloon angioplasty with or without stenting of the side-branch if needed. The double-kissing crush technique in true left main bifurcations is probably the best strategy in this setting.

Optical coherence tomography (OCT) for stent optimisation has been upgraded to a Class IIa recommendation.

Distal protection devices for PCI in saphenous vein graft (SVG) lesions have been downgraded to a Class IIa recommendation.

Current-generation bioresorbable scaffolds for clinical use outside clinical studies is not recommended.

In diabetic patients with multivessel disease, coronary artery bypass graft (CABG) are the favoured mode of revascularisation.

Myocardial revascularisation is recommended in patients with severe left
ventricular (LV) systolic dysfunction and CAD suitable for intervention. Completeness of revascularisation should be prioritised. Use of radial artery grafts over saphenous vein graft (SVG) is recommended in patients with high-degree stenosis. Use bilateral internal mammary grafting if there is a low-risk of sternal complications.

**ESC 2018 Fourth Universal Definition of Myocardial Infarction**

The term myocardial injury should be used when there is evidence of elevated troponin values. Myocardial injury is acute if there is a rise and/or fall of troponin values. Reasons for elevation of cardiac troponin values due to myocardial injury are illustrated in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Reasons for myocardial injury-related elevation of cardiac troponin levels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Myocardial injury related to acute myocardial ischaemia</strong></td>
</tr>
<tr>
<td>Atherosclerotic plaque disruption with thrombosis</td>
</tr>
<tr>
<td><strong>Myocardial injury related to acute myocardial ischaemia because of oxygen supply/demand imbalance</strong></td>
</tr>
</tbody>
</table>
| Reduced myocardial perfusion | • Coronary artery spasm, microvascular dysfunction  
|  | • Coronary embolism  
|  | • Coronary artery dissection  
|  | • Sustained bradyarrhythmia  
|  | • Hypotension or shock  
|  | • Respiratory failure  
|  | • Severe anaemia  
| Increased myocardial oxygen demand | • Sustained tachyarrhythmia  
|  | • Severe hypertension with or without left ventricular hypertrophy (LVH)  
| **Other causes of myocardial injury** |
| **Cardiac conditions** | • Heart failure  
|  | • Myocarditis  
|  | • CMO  
|  | • Takotsubo syndrome  
|  | • Coronary revascularisation procedure  
|  | • Cardiac procedure other than revascularisation  
|  | • Catheter ablation  
|  | • Defibrillator shocks  
|  | • Cardiac contusion  
| **Systemic conditions** | • Sepsis, infectious disease  
|  | • Chronic kidney disease  
|  | • Stroke, subarachnoid haemorrhage  
|  | • Pulmonary embolism  
|  | • Pulmonary hypertension  
|  | • Infiltrative diseases (amyloidosis, sarcoidosis)  
|  | • Chemotherapy  
|  | • Critical ill patient  
|  | • Strenuous exercise  

The term myocardial infarction should be used when there is acute myocardial injury with clinical evidence of acute myocardial ischaemia and with detection of a rise and/or fall of troponin levels and at least one of the following:  
• Symptoms of myocardial ischaemia  
• New ischaemic ECG changes  
• Development of pathological Q waves  
• Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality  
• Identification of a coronary thrombus by angiography or autopsy.

Five types of MI can be distinguished according to the underlying mechanism:  
• Type 1: MI due to plaque rupture/erosion with thrombus formation  
• Type 2: MI due to oxygen supply/
New findings from major trials

Prevention

DIET

Current advice about a “healthy heart” diet has called for the restriction of red meat and dairy products. The PURE study (international data) suggested that while carbohydrate restriction was deleterious, fat intake was not. These observations have been extended by combining data from the PURE, ON-TARGET, TRANSCEDE, INTERHEART and INTERSTROKE studies. A total of 218,000 participants from more than 50 countries were studied over a median follow-up of 9.1 years. Participants were divided into 5 groups according to their food quality score, derived from PURE, which took into account the quantity of fruit, vegetable, nut, legume, fish, dairy and meat consumed. Professor Andrew Mente (Hamilton, USA) reported that the highest quality diet (Table 5) was associated with lower risks of major adverse cardiovascular events (MACE) including cardiovascular death, non-fatal MI, stroke and HF.

Table 5 illustrates what a low and high PURE diet score looks like.

<table>
<thead>
<tr>
<th>Unhealthy</th>
<th>Healthy diet score</th>
<th>Healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (Low)</td>
<td>Foods or nutrients</td>
<td>Q5 (High)</td>
</tr>
<tr>
<td>1.8</td>
<td>Fruits &amp; veggies</td>
<td>8.4</td>
</tr>
<tr>
<td>0.7</td>
<td>Nuts &amp; legumes</td>
<td>2.5</td>
</tr>
<tr>
<td>0.2</td>
<td>Fish</td>
<td>0.3</td>
</tr>
<tr>
<td>0.6</td>
<td>Dairy</td>
<td>3.0</td>
</tr>
<tr>
<td>0.3</td>
<td>Red meat</td>
<td>1.4</td>
</tr>
<tr>
<td>69.1</td>
<td>Carb, %E</td>
<td>54.0</td>
</tr>
<tr>
<td>18.5</td>
<td>Fats, %E</td>
<td>28.3</td>
</tr>
<tr>
<td>11.9</td>
<td>Protein, %E</td>
<td>17.9</td>
</tr>
</tbody>
</table>

1servings/day

The fish oil arm of the ASCEND trial randomised 15,480 patients with diabetes, older than 40 years and no baseline cardiovascular risk, to omega-3 fatty acid 1g daily vs placebo. After a follow-up period of 7.4 years there was no difference in the primary outcome (CV death, non-fatal MI, TIA/ischaemic stroke) between the two groups. No effect on cancer was observed. There was also no effect on all-cause mortality. At a dose of 1g daily, omega-3 fatty acid supplements do not seem to provide any benefit. Trial data with a higher dose (4g daily) are awaited.1
**ASPIRIN TRIALS**

It has been common practice to prescribe aspirin for primary prevention of MI and stroke. Recent evidence has drawn attention to the significant risk of gastrointestinal (GI) bleeding with aspirin.

The ARRIVE trial investigated the effects of aspirin 100mg daily vs placebo in 12,546 patients at moderate risk of heart disease over a median follow-up of 60 months. Men aged 55 years or more and women 60 years or more with at least 3 risk factors (but not including diabetes) for heart attack or stroke were included. There was no difference between the aspirin-treated and placebo groups with respect to cardiovascular death, MI, unstable angina, stroke or TIA. Aspirin-treated subjects had double the rate of GI bleeding (0.97% vs 0.46%).

Although 100mg aspirin daily given to high-risk patients with diabetes in the ASCEND trial reduced the risk of MI, stroke, TIA or death from non-intracranial haemorrhage vascular events by 12% over a mean of 7.4 years (8.5% vs 9.6%, p=0.01), the effect was counterbalanced by a 29% increase in major bleeding. In the group of higher risk patients (predicted 5-year risk >10%) both the cardiovascular benefit and rates of haemorrhage were greater, leading to the conclusion that there was no group in which the benefits outweighed the risks.

Majority opinion at the meeting leaned towards restricting the use of aspirin to secondary prevention in patients with established atherosclerotic cardiovascular disease (ASCVD) and perhaps to those at very high risk.

**HYPERURICAEMIA**

The role of hyperuricaemia in promoting cardiovascular disease has been unclear. In the FREED trial, 1,070 elderly patients with hyperuricaemia were randomised to febuxostat or placebo which could be supplemented by 100mg allopurinol or no uric acid-lowering treatment. In the non-febuxostat group, 27% of patients received allopurinol. Febuxostat reduced the primary endpoint of cerebral, cardiovascular and renal events by 25%; with the greatest effect being on impaired kidney function. Cerebrovascular events were not reduced.

**LIPID-LOWERING THERAPY**

Combining results from 63 cohort or case-control studies conducted over 69 years and including 654,783 participants, Professor Brian Ference (Cambridge, UK) studied the effects of triglyceride lowering lipoprotein lipase variants and low-density lipoprotein receptor variants which lower LDL-cholesterol.

He found that the effect of these variants on coronary heart disease, although associated with differences in triglyceride and LDL-C levels, was proportionate to their effect on apolipoprotein B (apoB). He concluded that the clinical benefit of any lipid-lowering therapy should be proportional to the absolute change in ApoB regardless of the change in triglyceride or LDL-C level.

The CRISP-CT study found that measurement of the pericoronary fat attenuation index by standard CT methods enhances the prediction of cardiovascular death compared to standard risk assessment.

**WEIGHT LOSS THERAPY**

Lorcaserin is a selective agonist of the serotonin (5HT)-2C receptor and through hypothalamic activation of the pro-opiomelanocortin pathway results in appetite suppression. CAMELLIA-TIMI 61 studied the cardiovascular safety and efficacy of lorcaserin 10mg bd vs placebo was studied in 12,000 patients with a BMI >27 with established CV disease or diabetes with other CV risk factors. All patients were on a reduced calorie diet and exercise. After a median follow-up period of 3.3 years, patients receiving the treatment had lost 4.2kg as opposed to 1.4kg in the patients receiving placebo. There was no difference in the primary outcomes of cardiovascular death, MI, stroke, HF and coronary revascularisation. There were no increased serious adverse drug events. Lorcaserin is the first weight loss agent with proven safety for major adverse cardiovascular events.
Valvular Heart Disease

**INTRANOVIOUS vs ORAL ANTIMICROBIAL THERAPY FOR ENDOCARDITIS**

The POET trial randomised patients with left-sided endocarditis, who had been stabilised on IV antibiotic treatment for >10 days, to a strategy of oral antibiotic therapy vs continued IV therapy; followed for 6 months. There was a numerical, though not statistically significant, reduction in mortality in the oral group. Relapse of positive blood culture (2.5%) did not differ between the two groups.7

**TRANSCATHETER AORTIC VALVE REPLACEMENT**

Two studies reported results of transcatheter aortic valve replacement (TAVR). PARTNER 2A found that TAVR in intermediate-risk patients was non-inferior to surgical aortic valve replacement (SAVR) for the primary endpoint of death and disabling stroke in the treatment of severe symptomatic AS. Vascular complications, moderate-to-severe paravalvular regurgitation were higher with TAVR. SAVR was associated with greater incidences of new-onset AF, acute kidney injury and bleeding. Although upfront costs were higher, the study found that TAVR was cost-saving over 1 year. Valve performance and symptomatic benefit were similar at 2 years.8

The second study investigated the effect of transfemoral TAVR in 200 low-risk patients (STS mortality risk <3%). Compared to SAVR at 30 days, mortality was 0% vs 1.7% and stroke 0% vs 0.6%. TAVR patients required permanent pacemaker implantation in 5% of cases. Subclinical leaflet thrombosis was detected in 14% of TAVR patients.9

**MITRAL VALVE REPAIR**

Severe functional/secondary mitral regurgitation is commonly encountered in patients with symptomatic HF with reduced EF. The MITRA-FR trial compared percutaneous mitral valve repair with the MitraClip® in 304 patients who were not candidates for mitral valve surgery to patients treated medically. Death or hospitalisation for heart failure occurred in 54.6% of the MitraClip group vs 51.3% in those treated medically over the 12 months of follow-up.10

Coronary Artery Disease

The GLOBAL LEADERS trial in 15 968 patients with stable or unstable CAD, undergoing PCI with a biolimus-eluting stent, were randomised to aspirin + ticagrelor for 1 month; followed by ticagrelor for 23 months vs aspirin + clopidogrel (for stable patients) or aspirin + ticagrelor (unstable patients) for 12 months; followed by aspirin for 12 months. The 1 month aspirin + ticagrelor followed by 23 months of ticagrelor strategy was not superior to the “standard” strategy.11

The most appropriate timing of angiography and intervention after presentation with non-ST segment elevation acute coronary syndrome (NSTE-ACS) has been uncertain. The VERDICT trial randomised 2 147 patients with NSTE-ACS to early (<12 hours after presentation) vs later (48-72 hours) intervention. Follow-up was for a median of 4.3 years. There were no differences between the groups with regard to the primary endpoint (all-cause death, MI, hospitalisation for recurrent ischaemia or HF). Among patients with a GRACE risk score >140 there was a 21% reduction in MACE. Although femoral access was used in 80%, the rate of bleeding was low.12

The High-STEACS trial compared the outcomes in acute coronary syndromes (ACS) using either contemporary troponin assay or high-sensitivity troponin I (hs-TNI) in 48 282 patients with suspected ACS. The study found that outcomes were not influenced by using hs-TNI. Those reclassified as having myocardial injury using hs-TNI were more likely to undergo coronary angiography and have a longer hospital stay, although only one third turned out to have Type 1 MI. Hospitalisation was shortened in those reclassified with no myocardial injury.12

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Contemporary guidelines have recommended that patients with multivessel disease who present with acute MI and...
The clinical benefit of any lipid-lowering therapy should be proportional to the absolute change in apoB regardless of the change in triglyceride or LDL-C level.

Atrial Fibrillation

The GARFIELD-AF registry analysed 25,815 patients with newly diagnosed AF. Although there was a greater prevalence of CAD, ACS and stroke in the 3,133 patients who were prescribed both aspirin and an oral anticoagulant, 56% of these patients did not have CAD or peripheral vascular disease. In this group without an indication for antiplatelet treatment, there was a 65% increased risk of major bleeding, all-cause death and stroke. The combined treatment was not harmful in those in whom antiplatelet therapy was indicated.

Heart Failure

Low-dose rivaroxaban was shown to have beneficial effects in patients with stable CAD. The COMMANDER-HF trial compared rivaroxaban 2.5mg bd to placebo in a randomised trial of 5,022 patients with CAD and chronic HF that had worsened in the preceding 3 weeks. Patients were included if in sinus rhythm with an ejection fraction <45% and with elevated BNP >800. There were no differences in all-cause mortality, MI or stroke over a median follow-up of 21 months. Neither was there any difference in bleeding events.

Marfan Syndrome

Angiotensin receptor blockade in experimental animals has shown protection against aortic dissection. The AIMS trial randomised 192 patients with Marfan syndrome aged 6 to 40 years to irbesartan 150-300mg daily or placebo and followed them for 5 years. Slightly more than half were also on beta blockers. Irbesartan slowed the rate of aortic enlargement although the rate of adverse events including cardiac surgery was unaffected.

Transthyretin Amyloid Cardiomyopathy

Transthyretin amyloidosis cardiomyopathy is an underdiagnosed condition with a high mortality (median survival ±3 years after diagnosis). Tafamidis limits the formation of transthyretin monomers from TTR tetramers. In the ATTR-ACT study, 441 patients with the condition and cardiac involvement were randomised to 80mg or 20mg tafamidis, or placebo. After 30-month follow-up there was a 30% risk reduction of all-cause mortality in the tafamidis group. Patients on tafamidis were also less likely to be hospitalised. Tafamidis was well tolerated with a favourable side-effect profile, making it an effective therapy for patients with ATTR-CM.

Shock should be treated when feasible with multivessel PCI. In the CULPRIT-SHOCK trial, 685 patients with onset of shock <12 hours were randomised to either culprit lesion-only PCI vs multivessel PCI (including chronic total occlusions). Both at 30 days and at 1 year, culprit-only PCI was superior to multivessel PCI in respect of all-cause mortality or need for renal replacement therapy. Based upon their symptoms, clinical status or objective evidence of cardiac ischaemia, only 18% of culprit-only PCI patients subsequently required staged revascularisation. The rate of rehospitalisation for HF was higher among the culprit-only PCI patients.

The BASKET-SMALL 2 trial randomised 758 patients with CAD in a native vessel <3mm in diameter to PCI with drug-eluting stent vs drug-coated balloon. The mean size drug-eluting stent implanted was 2.57mm. There was no difference in the primary endpoint (cardiac death, non-fatal MI, TVR) at 1-year follow-up between the two groups. Drug-coated balloons may hold a long-term advantage as no material is implanted and this may impact very late adverse event rates – longer-term follow-up is needed.
Venous thromboembolism post-hospital discharge

Some patients are at risk of VTE after hospital discharge. In the MARINER study, 12,024 patients were randomised to placebo or rivaroxaban 10mg daily (7.5mg daily if GFR 30-50ml/min) for 45 days post-discharge from hospital. Patients had to be older than 40 years and admitted for 3–10 days. They were given thromboprophylaxis in hospital. Symptomatic VTE and VTE-related death were not significantly reduced in the treatment arm. Major bleeding was not significantly increased in the treatment arm. Prolonged VTE prophylaxis with rivaroxaban post-discharge is not associated with improved outcomes.20

References

1. The ASCEND Study Collaborative Group. Effects of n-3 Fatty Acid Supplements in Diabetes Mellitus. NEJM 26 August 2018; doi: 10.1056/NEJMoa1804988
11. Vranckx P, Valgimigli M, Juni P, et al. Ticagrelor plus aspirin for 1 month, followed by ticagrelor monotherapy for 23 months vs aspirin plus clopidogrel or ticagrelor for 12 months, followed by aspirin monotherapy for 12 months after implantation of a drug-eluting stent: a multicentre, open-label, randomised superiority trial. Lancet 27 August 2018; doi: https://doi.org/10.1016/S0140-6736(18)31858-0