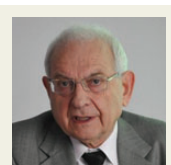


New European Society of Cardiology Guidelines published

HbA_{1c} introduced to diagnose diabetes and OGTT added only when diagnosis is uncertain reports *Jennifer Taylor* MPhil

The '2013 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with EASD' were presented for the first time at European Society of Cardiology (ESC) Congress 2013 by joint Task Force Chairs Professor Lars Rydén (Sweden) of the ESC and Prof. Peter J. Grant (UK) of the European Association for the Study of Diabetes (EASD) and published in the *EHJ*. They were written jointly by the ESC and the EASD.

Previous ESC/EASD Guidelines on diabetes were published in 2007. The 2013 version introduces glycated haemoglobin (HbA_{1c}) to diagnose diabetes. If HbA_{1c} is elevated, the patient is diagnosed with diabetes. If HbA_{1c} is not elevated, patients with cardiovascular disease should receive an oral glucose tolerance test (OGTT).



Lars Rydén said: 'we have simplified diagnosis because many patients may be diagnosed with HbA_{1c}, limiting the numbers who need the lengthier OGTT. But a normal HbA_{1c} does not rule out diabetes in high risk patients, who need to have an oral glucose tolerance test'.

The diagnostics chapter generated the most discussion and debate. Advocates of HbA_{1c} pushed for the OGTT to be removed from the guidelines altogether and advocates of the OGTT wanted to keep HbA_{1c} out of the guidelines. Rydén said: 'These were really tough discussions and we unified at a compromise. We agreed to test first with HbA_{1c} and if it's high that is sufficient to diagnose diabetes. But in patients with cardiovascular disease, if HbA_{1c} is normal, an OGTT is needed'.

Cardiovascular risk assessment has also been simplified and risk engines are no longer advocated. Patients with diabetes are considered at high cardiovascular risk. Patients with diabetes and cardiovascular disease (myocardial infarction, angina pectoris or peripheral vascular disease) are at very high risk of recurrent cardiovascular disease.



Peter Grant said: 'Risk engines which accumulate risk factors and produce a low, medium or high score were produced many years ago and are less useful for patients with diabetes. You can still use risk engines but you don't need to because you can immediately say a patient is at high or very high risk'.

Recommendations on revascularization have undergone two major changes since 2007. In patients with stable coronary artery disease and no complex coronary lesions (according to the SYNTAX score), medical therapy is recommended before

interventions. Rydén said: 'In former days we were quick to do coronary interventions but based on new trial data we now do not advocate bypass surgery and coronary angioplasty until medical therapy has been tried. If symptoms remain you can operate or dilate but not until then'.

Also new is the recommendation that patients with several or complex coronary artery stenoses should be offered bypass surgery before percutaneous coronary dilatation. Rydén said: 'New trial data clearly shows that morbidity and mortality are superior with bypass surgery compared to coronary dilatation even with the use of drug eluting stents. The belief is that too many patients are dilated because it's easy but it's not efficient enough, so the recommendation is much more in favour of bypass surgery now'.

The guidelines strongly underline that each patient should be well informed about the consequences of surgery vs. coronary dilatation and should be part of the treatment decision.

New data have emerged since 2007 on the efficacy of delaying or retarding the onset of diabetes. Lifestyle measures such as weight loss of 7–10% in overweight or obese patients and physical activity of at least 3 h a week may prevent or retard the development of diabetes. These patients have a decrease in both macrovascular and microvascular cardiovascular disease in the long term (10–20 years).

Major changes have been made to recommendations on glucose control. Microvascular complications of diabetes such as in the eye and kidney do benefit from glucose control. But research published since 2007 clearly demonstrates that glucose control has a modest effect on existing macrovascular complications and the effect takes a long time to become established. The guidelines, therefore, do not recommend very tight glucose control if the ambition is to reduce macrovascular complications.

Glycaemic control should be more aggressive in young patients who are untouched by cardiovascular disease and have only recently been diagnosed with diabetes. In older patients with longstanding diabetes and cardiovascular complications, glycaemic control should be modest because of the risk of side effects. Grant said: 'In the previous guidelines we were keen on tight glycaemic control but now we are more individualised. It doesn't seem possible to substantially influence the development of macrovascular disease in longstanding diabetes'.

A new blood pressure target of <140/85 mmHg has been introduced for patients with diabetes, and <130/85 mmHg in patients who also have kidney disease. The previous general target was

<130/80 mmHg. Rydén said: 'Data accumulated after 2007 demonstrates that in some patients you may get an increased number of cardiovascular events if you lower blood pressure too much. Or at least you don't gain more protection'.

The approach to blood pressure has also been individualized. In patients with nephropathy and in those at risk of stroke, the blood pressure target should be stricter.

Weight loss has been tested in some trials and seems difficult to achieve and less rewarding than it was previously thought. The guidelines say the first priority should be stabilization of weight rather than weight reduction in overweight and obese patients. Rydén said: 'We were much keener on weight reduction in the 2007 guidelines but there is some evidence to say that stabilisation of weight is more important'.

Physical activity is important for glucose metabolism and is given more prominence than diet in the guidelines. Both static (weight lifting) and dynamic (running, cycling, etc) physical activity, and particularly in combination, are effective.

Recommendations on diet are less restrictive than in 2007. The 2013 guidelines recommend an ordinary diet that contains a variety of food, is rich in fruit, vegetables and oily fish, and has modest amounts of carbohydrates and fat.

The use of drugs to increase HDL cholesterol is strongly discouraged following new trials which showed serious side effects. Antiplatelet therapy for primary prevention is not advocated for patients

with diabetes unless they also have cardiovascular disease. Rydén said: 'In the previous guidelines we said that everybody with diabetes should have aspirin to protect them from cardiovascular disease but now there is no good evidence for that'.

Also new is the recommendation that novel platelet-stabilizing drugs such as prasugrel or ticagrelor may be more efficient in patients with diabetes than aspirin and clopidogrel especially after an acute coronary syndrome.

A completely new chapter on patient-centred care has been included. This approach is recommended to facilitate shared control in decision-making within the context of patients' priorities and goals. The guidelines advocate multidisciplinary teams and nurse-led programmes to support lifestyle change and self management.

Grant said: 'In a complex disease like diabetes it is very important that cognitive behavioural strategies are built into the treatment strategy so that the patients are empowered to take care of themselves to a large extent'.

In addition to the two joint Chairs, the Task Force had 20 members with expertise in various aspects of diabetology and cardiovascular medicine including epidemiology, arrhythmias, heart failure, and so on. Rydén concluded: 'This group of patients falls in between two fields of expertise and therefore joint guidelines between diabetologists and cardiologists are incredibly important. Being a good doctor to these patients requires building up collaborations'.

ESC Working group on e-Cardiology teams up with the European Heart Rhythm Association

A joint-initiative took place during the annual EHRA (EuroPace 2013) meeting in Athens in June 2013 reports Nico Bruining FESC



The nucleus of the ESC Working group on e-Cardiology at EuroPace 2013. (From left to right): P. Guzik, G. Krstacic (vice-chairman elect), M. Malik (chairman), E. T. van der Velde (past chairman), N. Kachenoura, N. Bruining, C. Chronaki, G. Schmidt (treasurer), F. Lombardi, and A. Bauer.

The European Heart Rhythm Association (EHRA) Congress (EuroPace) June 2013 in Athens, Greece, was attended by many members of the ESC and other organizations as well as by many other specialists in electrophysiology. With over 5000 participants, the meeting was a great success.

In the past, the ESC Working Group (WG) on e-Cardiology and the EHRA have joined forces, as many members of both the WG and EHRA share the same areas of interest and expertise. Although the scope of the WG e-Cardiology is wider and not restricted to the analysis of cardiac electrical activities and diagnosis and treatment of arrhythmia, e.g. imaging and telecardiology, are important areas for the WG, it is a fact that electrophysiologists are heavy users of imaging and are also early adopters of Telemedicine. This makes the annual EHRA Congress a perfect place to exchange science between the more clinically orientated participants and the more technically orientated members of the WG on e-Cardiology. Realizing this, the board of the EHRA and the nucleus of the WG on e-Cardiology teamed up and the EHRA offered the WG to organize several symposia during this year's congress in which the members of the WG

e-Cardiology and other invited experts presented their recent work and shared their knowledge.

A broad spectrum of different topics was addressed, in which Prof. Georg Schmidt took the lead as WG nucleus member in the scientific programme committee of this year's Congress. The topics ranged from 'how-to measure' (scientific performance, complexity in bio-signals, cardiac arrhythmic risk, and clinical usefulness of risk predictors) to more basic research-orientated symposia, for example, 'Channelopathies', in which genetics and genomics of cardiac arrhythmias and sodium channel abnormalities and cardiac conduction diseases were discussed.

Another interesting symposium was in the translational format about multi-modality imaging of cardiac arrhythmias. Here, newly developed imaging and electrophysiology methods were combined, e.g. in visualizing the electrocardiogram on a multi-slice computed

tomography model and integration of three-dimensional mapping and MRI for epicardial ventricular tachycardia ablation. Particularly in these translational scientific areas, it is of great importance that the different WGs and associations within the ESC join forces and work together. The scientific challenges are becoming more and more complex and even experts need to keep a broad scope. Physicians working in electrophysiology need imaging and as that becomes more complex, dedicated imaging experts are necessary to develop the next stage. Engineers working in these two particular fields need to link it all together as the way forward will most likely be, of multi-modality, whether signals or images are concerned.

It is anticipated that this successful initiative will act as a template for future cooperation between different WGs and associations working together, to improve scientific research in Cardiology.

Coronary artery bypass grafting: the past, present, and the future

Coronary artery bypass grafting will have its fiftieth Anniversary in 2014 and is still in favour

In searching for an effective surgical treatment for coronary artery disease many different experimental techniques have been explored since Francois Franck proposed sympathectomy for angina pectoris relief in 1989. Tremendous work has been done by pioneering surgeons (Figure 1) that performed myocardial revascularization using different principles and techniques.

For example, Fieschi redirected blood flow to the heart by ligating the right internal mammary artery (Figure 2A). Beck, O'Shaughnessy, Lezius, and Key sutured different organs to the myocardium to form a new blood supply (Figure 2C). Beck furthermore initiated the formation of adhesions between the pericardium and myocardium, as he believed it would allow angiogenesis and thus increase blood flow to the heart (Figure 2B). Vineberg already focused on using the internal mammary artery for anastomosis and buried it within the myocardium next to the left anterior descending artery in anticipation of spontaneously forming anastomoses (Figure 3).

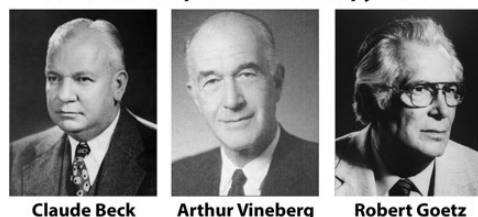
Although it has been debated who was the first to perform the modern coronary artery bypass grafting (CABG) procedure, a number of surgeons need to be acknowledged for their work:

- Vasili Kolesov, who is believed to have been the first to perform a sutured anastomosis of an internal mammary artery to the left anterior descending artery on 25 February 1964.
- Michael DeBakey, who led his team to perform a saphenous vein aorto-coronary bypass with a continuous suture technique on 23 November 1964.
- René Favaloro, who was the first to systematically perform CABG with reproducible results and is considered to be the 'father' of bypass surgery.

Similar to what we currently see with the introduction of transcatheter aortic valves, CABG at that time was a disruptive therapy with a rapidly increasing number of procedures annually (mainly in the USA). But there remained some scepticism around CABG; Eugene Braunwald pointed out in 1976: 'accompanying [the] widespread optimism [with respect to CABG], however, is a growing uneasiness that by simple common consent, rather than by rational analysis of data, we may be adopting for general use a form of treatment that has yet to prove itself. Some fear that even though the long-term effectiveness of direct revascularization has not yet been demonstrated, we may be propelled into a position in which it will be considered poor medical practice to withhold this form of therapy from almost any patient with coronary artery disease ...'.¹

It was not until the late 1970s and early 1980s that there was substantial evidence in favour of CABG, after which it became more popular and performed throughout the world. Bypass surgery has become an indispensable therapy for the treatment of coronary artery

Pioneers in experimental therapy for CAD



Claude Beck

Arthur Vineberg

Robert Goetz

Figure 1 Pioneers in experimental therapy for CAD. Reproduced with permission from *Circulation* 2009;120:1623–32, *World J Surg* 2007;31:1563–1568 and *Ann Thorac Surg* 2000;69:1966–1972.

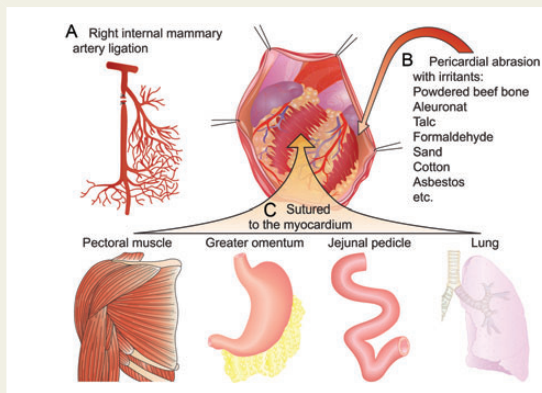


Figure 2 Different attempted surgical techniques to improve coronary artery blood flow.



Figure 3 Pioneers in 'modern' CABG. Reproduced with permission from *Tex Heart Inst J* 2004;31:349–358, *Circulation* 2001; 103:480–481 and *Ann Thorac Surg* 2000;69:1966–1972.

disease and 2014 celebrates its 50th anniversary. The current issue of *European Heart Journal*, therefore, includes a review article on the history of CABG and celebrates the improvements within these decades that have been accomplished by the collaboration between surgeons and cardiologists.²

This collaboration has been particularly fuelled by the revolutionary introduction of percutaneous coronary intervention in 1978 as an additional treatment option for coronary artery disease. The percentage of patients undergoing PCI and not CABG has been ever increasing due to technical advances and continuously improving outcomes. Trials such as BARI, SYNTAX, FREEDOM, and other smaller but important trials have evaluated balloon angioplasty, stenting with bare-metal stents, and subsequently drug-eluting stents, and showed converging outcomes between PCI and CABG.

Still, there is room for improvement of outcomes after CABG. There are a number of old and new concepts that can furthermore

optimize short- and long-term outcomes and should therefore be considered. This issue of the *Journal* includes another review article; 'CABG: Part 2—optimizing outcomes and future directions'.³ This focuses not only on the procedural aspects of CABG, but also on secondary prevention measures of medication and life-style interventions.

An interesting discussion in the review is the role of guidelines on myocardial revascularization with regard to the adoption of developments. There are large differences in recommendations for the use of arterial revascularization, epi-aortic scanning, and intraoperative graft flow assessment, and this is likely to manifest in large differences in practice patterns throughout continents, countries, and even institutions. There is variability in the belief that surgeons have in certain techniques; is it worth changing my practice and investing time and money when there is no evidence to support the use of a certain technique? Where there is considerable evidence for a number of developments that are reviewed (e.g. off-pump vs. on-pump surgery), this review particularly highlights the need for dedicated studies, preferably randomized clinical trials, to evaluate the effectiveness of other procedural developments (e.g. minimally invasive CABG). It, therefore, also presents a framework for future studies.

With converging outcomes and the advent of newer trials comparing PCI with CABG, it is increasingly important to reduce the risk of procedure-related complications, improve health-related quality of life, and long-term survival. Incorporating fractional-flow-reserve-guided revascularisation, the SYNTAX (II) score and other developments will also help define what the best treatment option for each individual patient is. Particularly during the last decade surgeons and cardiologists were drawn closer together into a Heart Team for coronary artery disease,⁴ and the growing interest in hybrid procedures may further facilitate a cooperative structure.

The continuous improvement in outcomes and decision-making is expected to go hand-in-hand with cost reductions in an era of rising healthcare expenditures. Patients, clinicians, insurance providers, and governments have all benefited by learning from the experiences of CABG during the past 50 years. It will be very interesting to see how the role of CABG develops in the next 50.

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The Aswan Heart Centre Project

A new Heart Centre will bring the full range of cardiac services to Southern Egypt



Aswan



River Nile

Ancient Egyptians called it Swen and considered it to be not only the end of the world, but also the sacred source of the Nile and granite from which they built most of their temples. For centuries, Aswan was the gateway to Africa and the lands of Nubia. Today, Aswan is Egypt's southernmost city, and with summer temperatures reaching 46°C, has always been a favoured winter resort. The city lies on the east bank of the River Nile, and the scenery is extremely beautiful. Like many Egyptian cities, Aswan has, for the joy of the tourists, Pharaonic, Greco-Roman, and Islamic sites.

But life in Aswan is not only that of tourists. For many, actually the majority of the local population, life is a struggle against poverty. This is particularly the case for those families who have children suffering from congenital heart disease. Until recently they did not have access to the necessary treatment which would give their children a healthy future, but something happened on 2 April 2013, which will change all of this.

What?



The official opening of the second phase of the Aswan Heart Centre (AHC) from the Magdi Yacoub Foundation (MYF) together with the Chain of Hope and the European Heart for Children (EHC) *Global Forum*.

The AHC is a state-of-the-art heart centre, where adults with CV diseases and children with CHD can be efficiently treated free of charge. Designed by an Italian architect, the AHC is a compact, four-storey building that meets the highest international standards and offers all the subspecialties in cardiology such as cardiovascular imaging, interacting echo, and fully upgraded cardiac cath labs and cardiac surgery rooms, not to mention the paediatric intensive care unit and the new outpatient clinic that preserves the dignity of patients and their family members and at the same time offers them the necessary comfort.

If the building is important, the people who run and manage it are even more important. The clinical team is composed of enthusiastic, tireless young cardiologists and professional nurses. The Chairman of

the Executive Board is Prof. Sir Magdi Yacoub. The hospital has an appropriate audit system including clinical governance, self-appraisal, financial audit, patient charters, and health–safety–quality compliance, with the ultimate aim of creating transparency and accountability.

The mission of the centre is threefold:

- (1) Offering state-of-the-art medical services to Egyptians, particularly the underprivileged and vulnerable age-groups. All services are free of charge.
- (2) Training a generation of young Egyptian doctors, nurses, and scientists to the highest international standards.
- (3) Advancing basic science and applied research as an integral component of the programme and promoting biomedical research in Egypt.

There is no doubt that this has been achieved since the opening of the first phase 2 years ago.

Just a few numbers: 11 000 patients have been examined in the outpatient clinic. To serve the more remote areas, weekly teleconsultation sessions are undertaken; 1326 cardiac catheterizations and 783 open heart procedures have been performed, 40% of which were paediatric procedures.



If these are some of the clinical achievements, Prof. Sir Magdi Yacoub knows better than anyone that medicine is dull without research. The Aswan Heart Centre is not excluded from this duty. All the epi-

demiological, clinical, translational, and basic science research projects are aimed at transforming research into reality as soon as possible. At the AHC, the majority of patients are genotyped. Biopsies are performed and analyzed to determine baseline histological features. International multicentre clinical trials are conducted regularly. Pre-sequencing procedures including DNA extraction, amplification, and purification are available.

At this point the reader will wonder how such humanitarian activities are supported economically. This is the most extraordinary discovery: the total annual budget of €48.1 million comes from the unconditional generosity and donations of the Egyptian population who have managed to make such a dream come true. However, humanitarian solidarity does not have any boundaries.

For example, Chain of Hope, under the supervision of Ms Linda Shaugnessey, contributes by running training programmes for nurses and doctors. Equally, European Heart for Children (EHC) has joined forces by donating two echo systems, one from Siemens (X300) and one from GE Healthcare (Vivid 5) and providing four scholarships. European Heart for Children is also considering support for the third and last phase of the AHC Project. To this end, a film crew has



annual European Heart for Children Fundraising dinner, which took place on 2 September in Amsterdam, which was attended by H.R.H Prince Michael of Kent, EHC Patron. The video is very emotional and has a deep impact on the viewers. Those that attended the dinner learnt more about the project but more importantly, had the opportunity to actively participate in it.

filmed the struggle of the poor families to get the medical treatment that will save their children's lives. The video was shown at the

Sir Magdi Yacoub FRS
Dr Roberto Ferrari FESC

Corrigendum

Corrigendum to: CardioPulse 'The ESC Brussels office takes shape' [Eur Heart J 2013;**34**:2491].



This article mistakenly published a photo of Professor Keith A.A. Fox (2013 ESC Congress Programme Committee Chairman, Edinburgh), instead of Professor Kim M. Fox (ESC President 2006–2008, London), as the second photograph in the story. The text of the accompanying paragraph stating that Professor Kim Fox is chairman of the task force is correct. The editor regrets and apologizes for the error.

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