Heartbeat: Highlights from this issue

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In patients with cyanotic congenital heart disease (CCHD), the risk of thromboembolic events is increased due to the presence of abnormal anatomy with dilated and dysfunctional cardiac chambers, intracardiac shunting and cardiac arrhythmias. In addition, it has been postulated that abnormal erythrocytosis and hemostatic abnormalities might contribute to a pro-thrombotic state. In a cross sectional study of 98 clinically stable adults with CCHD, Jensen and colleagues (*see page 1540*) found evidence for cerebral thrombosis in 47% on imaging although only 22% had a clinical history of a cerebral event. The difference between imaging and clinical history was less striking for pulmonary thrombosis, seen by imaging in 31% of patients, compared to a clinical history of an event in 25%. In this cohort, the complexity of CCHD and low oxygen saturations were associated with an increased prevalence of cerebral thrombosis while age was the only factor associated with pulmonary thrombosis. There was no association between thrombosis and the degree of erythrocytosis, hemostatic abnormalities, chronic anticoagulation, arrhythmias, or previous heart surgery (*figure 1*).

In two accompanying editorials, both authors comment on the paradox that anticoagulation was not associated with a decreased likelihood of thrombotic events in the current or previous studies and that the risk of anticoagulation in CCHD patients is not trivial. Even so,

Gianakoulas and Boutsikou (*see page 1523*) suggest “a more flexible use of antithrombotic therapy in [CCHD] patients with a previous thromboembolic event, history of atrial arrhythmias, congestive heart failure, advanced age, complex CCHD and severe hypoxaemia” and that “acquired cardiovascular risk factors such as smoking, diabetes and hypertension may also contribute to the increased risk of cardiovascular events and should be treated aggressively”. In contrast, Broberg (*see page 1521*) cautions against the routine use of anticoagulation, concluding that “the present study is a provocative reminder that successful survivors of cyanotic heart disease are still susceptible to both thrombosis and ischaemia, that physiological adaptations to cyanosis are far more complicated than our current understanding of them, that our interpretation of clinical signs and symptoms is imperfect and that extrapolation of our own views about the role of treatments such as phlebotomy and anticoagulation remain uninformed”.

The use of moderate sedation by cardiologists now is routine at most medical centers, not only in the interventional cardiology suite but also for electrophysiological procedures and transesophageal echocardiography. This issue of *Heart* provides an updated summary of safe sedation with attention to issues relevant to cardiological practice written by Stephen Furniss, a cardiologist on behalf of the British Heart Rhythm Society, and

coauthored by J Robert Sneyd, an anesthesiologist and chair of the UK Academy of Medical Royal Colleges (*see page 1526*). General recommendations for safe sedation in cardiology include adherence to national consensus guidelines, inclusion of sedation training in the core cardiology training curriculum, active involvement of a cardiologist in an institutional sedation committee, local standards for cardiology sedation, appropriate documentation and auditing of sedation procedures, and the addition of nurse-led sedation services when appropriate training and supervision are available. This document also provides recommendations for the use of propofol in nurse-led cardiological sedation (*table 1*).

We all agree that the goal is ensuring both patient comfort and safety during sometimes lengthy cardiac procedures; the controversy, as Dr Olivier Piot notes in an accompanying editorial (*see page 1525*), is who should be in charge of sedation. The conventional approach of having anesthesia delivered and supervised by an anesthesiologist has become problematic due to by the increasing number of cardiology procedures and the limited availability of anesthesiologists. Thus, supervision of both the cardiology procedure and the needed sedation often falls to the cardiologist and the procedural nursing team. “Irrespective of the educational background, the doctor or the nurse who delivers the sedation must have undergone appropriate training, both in

Figure 1 Computed tomography of thorax of two CCHD patients with central located pulmonary thrombosis (green arrows right and red arrow left).

Table 1 The continuum of sedation

	Minimal Sedation / Anxiolysis	Moderate Sedation / Analgesia ("Conscious Sedation")	Deep Sedation / Analgesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response following repeated or painful stimulation
Airway	Unaffected	No intervention required	Intervention may be required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate
Cardiovascular Function	Unaffected	Usually maintained	Usually maintained
Escalation of Required Competencies			

Figure 2 The risk of death or recurrent infarction at 1 year, as evaluated by Cox regression. The model was evaluated in the overall sample population and in pre-specified subgroups of interest. The number of patients within each stratum is listed in parentheses. Patients from the WEST trial were censored at 90 days (see text for details). EI%, percentage of patients in early invasive arm with death or MI; LCL, lower confidence limit; p, p value for interaction between stratifying variable and treatment strategy (early invasive vs routine care); reMI, recurrent myocardial infarction; Std%, percentage of patients in standard treatment arm with death or MI; UCL, upper confidence limit.

the technique and in patient rescue from a sedation-related adverse event". However, there is sparse evidence to support any one approach so that Dr Piot concludes: "The time has come to develop large registries to address unresolved issues and to produce international recommendations on sedation in interventional cardiology".

Other interesting articles in this issue of *Heart* include a meta-analysis looking at the benefit from an early invasive strategy

after fibrinolysis by Goodman and colleagues (*see page 1554*). This patient level analysis of over 3000 patients, found that the benefit at both 30 days and one year followup from an early invasive strategy after fibrinolysis was similar across all patient subgroups, suggesting that an early invasive strategy should be considered in all patients after fibrinolysis (*figure 2*).

The Education in Heart article in this issue reviews the differential diagnosis and management of recurrent syncope

(*see page 1591*). Be sure to check out the Image Challenge case too! (*see page 1561*).

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