

# Game Changers

## MORE SUGAR TO THE TOP OF THE TABLE.

Al Dorman

The world health organisation advise halving sugar consumption.<sup>1</sup> Although amounts of sugar consumed in the UK is concerning, not all sugar molecules are bad. Cyclical sugars or cyclodextrins have an important role in anaesthesia.

The cyclical structure of this molecule has been previously employed in various industries: In low fat dairy spreads, hydrophobic cholesterol is removed using a process by lodging it inside the cyclodextrin. Hydroxypropyl- $\beta$ -cyclodextrin (HP $\beta$ CD) is the principle active compound in the fabric odour eliminator *Febreze*<sup>2</sup>, the cyclodextrin simply envelops any malodorous molecules leaving even my running shoes tolerable.

Sugammadex is a modified  $\gamma$ -cyclodextrin<sup>3</sup> which envelops the non-depolarizing amino-steroid muscle relaxant rocuronium, leaving it unavailable to bind to the neuromuscular junction acetylcholine receptor thus enabling rapid reversal in the 'can't intubate and can't ventilate' situation with return to spontaneous respiration and relative safety.

High dose rocuronium (0.9mg/kg) has a fast onset time. With the introduction of sugammadex, the rocuronium-sugammadex combination can be used for rapid sequence induction of anaesthesia. Sorensen and colleagues found the offset of neuromuscular blockage significantly quicker when compared with succinylcholine<sup>4</sup>. Debate continues as to the quality of view at direct laryngoscopy with high dose rocuronium compared to succinylcholine and if this technique will replace current practice. If sugammadex does mark the end of the use of succinylcholine, which has been used for rapid sequence induction in Europe since 1951, it will certainly be a Game Changer.

Finally, the ability to reverse the effects of muscle relaxation without the associated autonomic instability caused by neostigmine should not be overlooked, particularly for procedures that involve anastomosis within the gastrointestinal tract.

1. World Health Organization. WHO opens public consultation on draft sugars guideline. Geneva; World Health Organization. 2014. Available online from: <http://www.who.int/mediacentre/news/notes/2014/consultation-sugar-guideline/en/>. Last accessed May 2014.
2. Reis A. The curious case of molecular stealth. How Febreze works. In: The Chemical Blog. Perth, UK; 2012; Nov 17. <http://www.thechemicalblog.co.uk/the-curious-case-of-molecular-stealth-how-febreze-works/>
3. Miller R Sugammadex: an opportunity to change the practice of anaesthesiology? *Anaesth Analg*. 2007; **104**(3): 477-8.
4. Sorensen MK, Bretlau C, Gatke MR, Sorensen AM, Rasmussen LS. Rapid sequence induction and intubation with rocuronium-sugammadex compared with succinylcholine: a randomized trial *Br J Anaesth*. 2012; **108**(4): 682-9.

## VASCULAR SURGERY PROVISION IN NORTHERN IRELAND

Robin Baker

2013 will be seen as a milestone in Vascular Surgery for three reasons. It has now been accredited with independent sub-specialty status, individual surgeon's morbidity and mortality figures are now published and vascular trainees have been appointed to a national vascular training scheme. Vascular Surgery should no longer be regarded as a branch of General Surgery.

In an effort to lower elective and emergency morbidity and mortality rates the Vascular Society of Great Britain and Ireland require all units, providing vascular care, to have 24/7 access to a specialist vascular team (vascular surgeons, specialist nurses, anaesthetists, interventional radiologists, clinical vascular scientists, physiotherapy etc.) with recognition that higher volume centres have better outcomes.

Over the last decade, due to rapid technological advance, the number of units in the province performing arterial vascular procedures has rapidly diminished and it is anticipated that all arterial work will be centralized in Belfast in the near future. However, The Vascular Society also recognize that all patients with vascular disease should be able to access a vascular team rapidly in all parts of the UK. Northern Ireland is actively developing a modern clinical network which will provide equality of access for all patients with vascular disease.

The Vascular Society of Great Britain and Ireland. The provision of services for patients with vascular disease 2012. Edinburgh: Vascular Society of Great Britain and Ireland; 2012. Available online from: <http://www.vascularsociety.org.uk/wp-content/uploads/2012/11/Provision-of-Services-for-Patients-with-Vascular-Disease.pdf>. Last accessed May 2014.

## DEVELOPING CARDIAC SURGERY: "BYPASSING THE LIMITS"

Mark Jones

Cardiac surgery has a long history of innovation thus confounding Paget's 1896 prediction that, "surgery of the heart has probably reached the limits set by Nature to all surgery; no new method, no new discovery can overcome the natural difficulties that attend a wound of the heart". Take the cardiopulmonary bypass machine and deep hypothermic circulatory arrest enabling intracardiac and thoracic aortic surgery, for example.

Current technological advances may by comparison seem more incremental, even small. However, combined with stringent outcomes analysis, today's steady flow of developments is ensuring increasingly complex operations can be performed on sicker patients with excellent survival results.

Recent visits I made to Africa and India highlighted interesting contrasts, whilst both pointed to the transformative power of innovation. In Zambia, cardiac surgery is very limited but is being developed with overseas support. Here I joined a successful international multidisciplinary team, the fruition of New Zealand surgeon Harsh Singh's groundbreaking idea. India, on the other hand, has a vast self-sufficient cardiac surgery program. There I visited Devi Shetty who has applied the "Walmart" concept to heart surgery; at his centre in Bangalore over 30 cardiac surgery cases per day are performed significantly reducing costs. In Belfast we do up to 6 cases per day. Furthermore, Devi Shetty manages to balance the demands entailed with the pursuit of excellence and educational development.

Innovative developments in cellular therapy may compliment more traditional forms of cardiac surgery; gene therapy for ischaemia, heart failure, arrhythmia<sup>1</sup> as well as myoblast transfer. Perhaps even more astounding are Doris Taylor's ghost hearts where a patient's own stem cells populate a decellularised scaffold<sup>2</sup>. Each scientific development is in itself a gamechanger but then again so are individuals like Singh, Shetty and Taylor. For future innovation to flourish we should not only value their creativity but approach our own work with an openness to possibility.

1. Wolfram JA, Donahue JK. Gene therapy to treat cardiovascular disease. *J Am Heart Assoc*. 2013;**2**(4):e000119.
2. Maher B. Tissue engineering: How to build a heart. *Nature* 2013;**499**(7456):20-2.