NEW DRUGS IN CARDIOVASCULAR ANAESTHESIA
Dr. Rob Feneck MBBS FESC FRCA
Consultant, Guys and St Thomas’ Hospitals, London, UK

Despite numerous advances in recent years, the perioperative management of myocardial ischaemia and LV dysfunction remains pivotal problems for the cardiac anesthetist. This lecture will concentrate on three areas:

Control of myocardial ishaemia through heart rate control:
Heart rate control is recognized as an important part of safe cardiac anesthesia, and numerous studies have outlined the benefits of perioperative beta blockade in this setting. Recently a new class of drugs have been released for this purpose - the If channel blockers.
If channels control the inward Na/K depolarizing current in phase IV diastolic depolarization in pacemaker cells, specifically in the SA node. Recent studies have shown an If current blocker – ivaludrine, to be safe and effective as a means of controlling heart rate and limiting angina in appropriate patients. The potential for such drugs in the perioperative period is an exciting development in cardiovascular pharmacology.

Improvements in perioperative LV function:
The importance of drugs that improve calcium release from the sacroplasmic reticulum, either through activation of 3’5 cyclic AMP or through other mechanisms has been well recognized. Drugs which act via 3’5 cAMP are predominantly used in the perioperative setting, and the phosphodiesterase inhibitors and the catecholamines, either alone or in combination, have been shown to be highly effective inotropic agents. However, chronic use of these drugs leads to a reduction in inotropic responsiveness of the contractile myofilaments and also a calcium leak from the SR which may have arrhythmogenic effects.
Recently a new class of drugs, the calcium sensitizers, has been released. Levosimendan, a commercially available compound, acts by sensitizing the myofilaments to pre-existing calcium without causing any further release from the SR, thereby avoiding calcium desinsitisation and cytosol calcium overload. Early studies in both surgical and non-surgical heart failure have been encouraging.

The effects of Nitric Oxide in Heart Failure:
Nitric oxide has numerous beneficial effects in cardiovascular physiology. However, in sepsis or severe inflammatory states, nitric oxide not only has severe adverse effects on the peripheral circulation but also on myocardial contractility. Specific therapies aimed at reducing the impact of nitric oxide excess are being developed.