The Cleveland Clinic: a cardiac centre of excellence

Steve Nissen speaks of The Clinic’s success and his hopes for the future to Emma Wilkinson.

It is pretty fair to say that the Miller Family Heart and Vascular Institute at Cleveland Clinic is one of the largest, and most highly rated, cardiovascular departments in the world. A quick look at the statistics shows that in 2009 alone, clinical staff saw almost 350,000 patients, carrying out many thousands of procedures, including 60 heart transplants.

A look back through its impressive history, starting with the development of coronary angiography in the 1950s, gives you some idea of the important role they have played in the improvements in heart care over the past decades. Other notable achievements include the introduction and refinement of coronary bypass surgery and, more recently, the implantation of the first biomechanically engineered mitral valve replacement. With so many impressive milestones on the résumé, it is difficult to single out an area where the Clinic particularly excels.

Prof. Steven Nissen, chairman of the Department of Cardiovascular Medicine at the Cleveland Clinic, says that there are a few factors which set them apart from their peers but the one that comes first to mind is how the unit is structured. ‘It is a very large department with over 100 faculty members and we are organised differently from other traditional centres. We reorganised about two years ago when cardiovascular medicine, cardiac surgery and vascular surgery were linked together into a single Institute. We are now all together under one roof’.

He goes on to explain that the close ties between the medical and surgical teams, as well as other basic scientists carrying out cardiovascular research, make sense from both an academic and a clinical standpoint. ‘Take, for example, a treatment like percutaneous aortic valve replacement—like so many of the things we do and so much of the research we do, it involves more than just cardiovascular medicine. So by coming together, we have a lot more in common and it makes much more sense than linking cardiology with traditional medical specialties’.

This collaboration has always been present at Cleveland—although maybe not as formally as it is now—but accelerated somewhat in 1991 when Eric Topol became chair of the department. Under his leadership, the clinic also oversaw some pivotal trials, including the impressively large GUSTO trial which showed a 14% reduction in deaths from heart attacks with the use of tissue plasminogen activator and heparin, and the EPILOG trial showing abciximab and low-dose heparin markedly reduces the risk of ischaemic complications in patients undergoing angioplasty. Under his direction, the Institute also became the first hospital in the USA to voluntarily release outcome data and mortality statistics to the public.

But let’s talk about current projects. Nissen points to several areas of work that his department is involved in. ‘We have the Cleveland Clinic Center for Clinical Research which is a classical coordinating centre for multi-centre clinical trials and has about 100 employees, including nurses and administration staff. This department has a dozen or more clinical trials ongoing, some of them involving up to 20,000 patients, covering a relatively wide spectrum of therapeutic areas. One I’m working on is the cardiovascular effects of NSAIDs, but we also do myocardial infarction trials and lipid trials. In addition, we are involved in core laboratory-type research, operating laboratories looking at echocardiography and nuclear medicine and biomarkers. Our intravascular ultrasound core laboratory is considered the most successful in the world’.
He also points to the preventive type work currently being done, specifically the work of Dr Stanley Hazen looking at cardiovascular risk factors such as hyperlipidaemia. That research includes understanding inflammation and oxidant stress in the development of atherosclerosis. Cardiovascular imaging and epidemiological research are two other areas that Nissen points to as being very strong within the department.

Looking to the future, one of the key developments could come from the completion of the PARTNER trial looking at the safety and effectiveness of transcatheter aortic valve replacement in select patients with severe aortic stenosis. ‘Our groups have been part of the leadership of the PARTNER study’, says Nissen. ‘This is a rapidly evolving area and we have been involved right from the beginning in these new ways of replacing aortic valves—they’re doing some really exceptional work.

The other area I should point out is we have received a $60m grant from the state of Ohio for an incubator facility as part of the Global Cardiovascular Innovation Center for Biotechnology. Plus, we obtained matching contributions from industry of $180m. We have opened the building and are attracting companies interested in developing new devices and this will be a great area of future development. This incubator facility within the GCIC will enable start-up companies to develop cutting edge cardiovascular technology’.

Spin-off companies which benefit from this Center and its investment include Juventas Therapeutics which specialize in cell-based, regenerative therapies for treating heart failure and PrognostiX, a company developing molecular biomarkers for diagnosing and treating cardiovascular disease.

But like any major (or minor for that matter) organization, the economic downturn has had a negative impact on funding and therefore the work they have been able to do. ‘I know of no area that hasn’t been affected’, says Nissen. ‘The pharmaceutical industries are struggling in terms of new drugs and government authorities are not overflowing with research dollars, so we have had to become more efficient at finding other ways. One thing we have done is looked to philanthropy and got foundations to support us but it has been challenging’.

In fact this is one of the primary challenges they face—along with many other research institutions—over the next few years; how to maintain these impressive academic and clinical standards and continue with groundbreaking research in such difficult financial times. But Nissen believes that with a little lateral thinking on potential funding sources and clever use of resources, the future of the Clinic is bright.

Emma Wilkinson, MA, freelance journalist

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**Recent pioneering cardiology developments in Japan**

**Japanese cardiologists have discovered Waon therapy for severe or refractory heart failure and extracorporeal cardiac shock wave therapy for severe angina pectoris.**

Waon therapy is a soothing warm therapy for severe or refractory heart failure that was developed by Chuwa Tei, MD, FACC, FAHA, professor and chairman of the Department of Cardiovascular, Respiratory and Metabolic Medicine, Graduate School of Medicine, Kagoshima University, Japan.

In 1989, Tei and his colleagues developed a form of thermal therapy for heart failure using a far-infrared-ray dry sauna with temperature maintained at 60°C (140°F). The temperature is lower than the traditional saunas of northern Europe (usually >80°C and sometimes >100°C) and the temperature is uniform throughout the room. Most sauna rooms experience temperature differences of around 30°C from the ceiling to the floor.

In 2007, they changed the name to Waon therapy to distinguish it from local hyperthermia therapy for cancer.1 ‘Wa means soothing, and On means warmth, hence Waon means soothing warmth which infers warmth that comfortably refreshes the mind and body’, says Tei.

During the therapy, the entire body is warmed and deep body temperature is increased by ~1.0–1.2°C. Afterwards, patients rest supine on a bed outside the sauna where they are covered with blankets for an additional 30 min to continue the soothing effects, and drink ~150–300 mL water to compensate for weight loss through perspiration.

Tei says that the three main advantages to Waon therapy are: high medical value to cost ratio; safe and free from side effects;