Non-invasive positive-pressure ventilation linked to increased hospital mortality rates

Although increased use of non-invasive positive pressure ventilation nationwide has helped decrease mortality rates among patients hospitalized with chronic obstructive pulmonary disease, a small group of patients requiring subsequent treatment with invasive mechanical ventilation have a significantly higher risk of death than those placed directly on invasive mechanical ventilation, according to researchers in the United States who studied patterns of non-invasive positive pressure ventilation use (Chandra et al, 2011).

Researchers reviewed patient data gathered by the Healthcare Cost and Utilization Project Nationwide Inpatient Sample database between 1998 and 2008.

The researchers examined changes in the frequency of non-invasive positive pressure ventilation and invasive mechanical ventilation use, and compared patient demographics, income status, payer type, hospital region and hospital type among patients who initially received non-invasive positive pressure ventilation, invasive mechanical ventilation or no respiratory support after hospital admission. They also compared in-hospital mortality, length of stay and total hospitalization charges.

Although the annual number of hospitalizations for acute exacerbations was relatively constant, there was a progressive increase in the use of non-invasive positive pressure ventilation and a progressive decrease in use of invasive mechanical ventilation; during the entire study period, there was a fourfold increase in the use of non-invasive positive pressure ventilation.

The authors felt that the trend toward greater use of non-invasive positive pressure ventilation was likely the result of several factors, including clinical trial results, increased confidence in using non-invasive positive pressure ventilation and the ability to use non-invasive positive pressure ventilation outside the intensive care unit.

Chandra D, Stamm JA, Taylor B et al (2011) Outcomes of Non-invasive Ventilation for Acute Exacerbations of COPD in the United States, 1998-2008. *Am J Respir Crit Care Med* Oct 20 [Epub ahead of print]

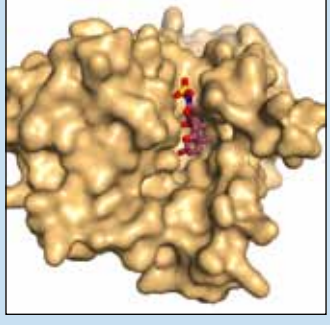
X-rays help advance battle against heart disease

Scientists from Imperial College London and Diamond Light Source have revealed the structure of a cholesterol-lowering drug target (Hu et al, 2011). This finding could lead to much more effective drugs to tackle high cholesterol levels.

The researchers from Imperial College London used intense X-rays, generated by the Diamond synchrotron and the European Synchrotron Radiation Facility, to determine for the first time the structure of bacterial homologue of the apical sodium-dependent bile acid transporter protein, a target for hypercholesterolaemia drugs since it can affect the level of cholesterol in the blood.

In the liver, cholesterol makes bile acids which are used in the intestine to absorb fat. These bile acids are then reabsorbed by apical sodium-dependent bile acid transporter to be transported to the liver and recycled. By blocking apical sodium-dependent bile acid transporter, bile acid levels returning to the liver are lowered, so the liver converts more cholesterol into bile acids, which lowers the level of cholesterol in the blood.

Surface representation of apical sodium-dependent bile acid transporter looking from the inside face of the membrane showing bile acid bound in a deep cavity.



Professor So Iwata, David Blow Chair of Biophysics at Imperial College London, BBSRC Fellow and Director of the Membrane Protein Laboratory at Diamond, said: 'There are currently a number of existing ASBT [apical sodium-dependent bile acid transporter] inhibitors effective in animal models, which were developed without structural knowledge of the protein. Now that we know the shape and size of the drug-binding site within a bacterial model of the protein, this detailed structural information should enable the design of improved drugs which are much more targeted and will "fit" much better.'

Hu NJ, Iwata S, Cameron AD, Drew D (2011) Crystal structure of a bacterial homologue of the bile acid sodium symporter ASBT. *Nature* **478**(7369): 408–11

Indacaterol improves clinical benefits for COPD patients

INTENSITY is the first blinded head-to-head study comparing once-daily Onbrez Breezhaler with Spiriva HandiHaler, an established chronic obstructive pulmonary disease (COPD) therapy. It found that indacaterol was more effective than tiotropium in reducing shortness of breath and use of reliever medication and in improving patients' capacity for day-to-day activities.

Osteoarthritis patients not given long-term options

In the UK 86% of osteoarthritis patients are told to take painkillers by their physicians, rather than being given information about treatment options that could alleviate their long-term pain, according to a new survey of 404 patients conducted by ICM Research and funded by Genzyme.

New emphysema treatment approved

InterVapor System has received CE Mark approval for marketing in Europe. The first endoscopic lung volume reduction system for the treatment of severe emphysema, it uses the body's natural healing processes without leaving foreign materials behind.