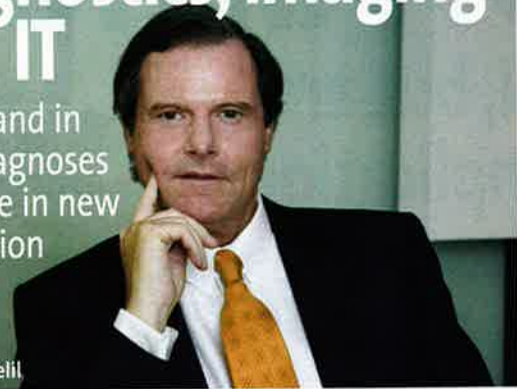


## Integrating lab diagnostics, imaging and IT

In vivo and in vitro diagnoses combine in new innovation



Francisco Belil

Working in partnership to integrate diagnostic imaging, laboratory diagnostics and IT, the Hospital Clinic Barcelona and Siemens Healthcare aim to develop innovative systems to prevent, treat and follow-up for various pathologies.

The project will make Hospital Clinic Barcelona the world's only medical center to apply in vitro and in vivo technology to healthcare in an integrated manner. *Eduardo de la Sota Guimón MD* discussed the new project with **Francisco Belil**, CEO of Siemens Spain and the South West Cluster. 'Our goal is to implement projects that allow the integration of models that combine clinical information with that obtained from diagnostic imaging (in vivo) and laboratory (in vitro) systems,' he explained. 'Implementation of these projects will generate innovative solutions for all aspects of healthcare, including prophylaxis, early detection, diagnosis, therapy and treatment. Initially our work will focus on foetal medicine, colon cancer and hepatic cirrhosis.'

### Colon cancer

In the last decade, colon cancer management has made tremendous strides, largely due to optimized chemotherapy protocols and the advent of new drugs. However, some patients do not respond to these agents, which provoke adverse effects that are serious in some cases. Hence the identification of biomarkers with the capacity to predict patient response to various chemotherapy treatments is a key challenge in the field of oncology. Our project aims to make advances in this area, since it will involve efforts to identify predictive molecular markers for patient response to treatment using 5-fluoruracil and

oxaliplatin, both of which are commonly used to treat colorectal cancer. These markers will allow for more targeted and personalized chemotherapy by enabling doctors to (a) determine which patients are most likely to benefit from the drugs, and (b) offer alternative therapies to likely non-responders. The experience and prestige of our Colorectal Cancer Unit (whose national and international activities are coordinated Dr Castell), combined with Siemens' technological capacity and leadership in the field of biomedical technology, will be a tremendous help in achieving our goals. Moreover, this partnership demonstrates yet again that public-private partnerships can provide direct patient benefits.'

### Hepatic cirrhosis

'This project will involve research aimed at developing and testing non-invasive markers for hepatic cirrhosis. Hepatic biopsy is the most commonly used and widely accepted method for determining hepatic fibrosis gradients. However, since this method is extremely invasive and involves a certain amount of risk for the patient, its use is restricted. Moreover, it has proven difficult to assess the efficacy of the various anti-fibrinogen drugs used to forestall fibrosis. The project will aim to develop a system that combines biochemical methods with image analyses with a view to determining fibrosis gradients accurately and reproducibly in patients with hepatic disorders. The new system will also allow for evaluation of fibrosis gradients in a manner that excludes the risks associated with the invasive methods that are currently used.'

### Foetal medicine

Foetal disorders and other problems during pregnancy can provoke life-long sequelae that have a major impact on the quality of life of the patients affected. The capacity to access the foetus is a crucial precondition for efficacious diagnosis and treatment of foetal disorders. Inasmuch as the foetus is in the womb, diagnostic prenatal investigations necessitate the use of highly sophisticated imaging technology and highly specific biomarkers. An international reference centre for foetal pathology and surgery, Hospital Clinic has a multidisciplinary group of clinicians whose scientific achievements are among the best in Europe. This research group, which is headed by Dr Eduard Gratacós, has the necessary expertise for, and is thoroughly conversant with, the relevant foetal diagnostic methods. The group hopes to combine these methods with Siemens' technological capacity, with a view to developing solutions that can be applied as expeditiously as possible in real clinical settings to improve the quality of life of foetuses and their mothers. The group's research will centre on chromosome defects, growth retardation, and preclampsia. The most promising areas for the development of methods for early diagnosis of the aforementioned maternal and foetal pathologies are biomarkers, new algorithms, and the development of new imaging methods to analyse the foetal brain and heart using classic technology.'

**Patient benefits:** 'Our patients will benefit from a new approach that is more accurate and advanced in that invasive diagnostic methods, such as biopsies, will be supplanted by an integrated in-vivo/in-vitro system that can also be used during the pre-symptomatic phases of a disease. This new approach will also allow for the administration of more targeted prophylactic therapies, and will significantly shorten hospital stays, which in turn will improve the patient's quality of life.'

**Cost saving:** 'The hospital's diagnostic laboratory and imaging services, as well as its clinical services, will be incorporated into the integrated diagnostic systems. Workflow streamlining programmes are bound to reduce costs and improve efficiency, which then means healthcare providers with the capacity to integrate diagnostic solutions and achieve cost savings will have a major competitive advantage.'

## The 1st European Symposium on Quality Management and Accreditation in Laboratory Medicine

12 February 2009  
Paris, France

Organised jointly by the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), the European Federation of Clinical Chemistry and Laboratory Medicine (EFCC) and the French Society of Clinical Biology (SFBC), the two-day symposium served as a platform to address future strategies to promote accreditation for clinical chemists and all professions in laboratory medicine. There was a special focus on the accreditation of medical laboratories in the context of the current French reform to standardise both private and public laboratories. The meeting



Mike Hallworth

was supported by the French Hospital Federation and Bio-Rad Laboratories.

There is renewed interest in Europe, and this year in France in particular, in the importance of accreditation for medical laboratories. The role of the medical laboratory has changed over the years in parallel with the evolution of healthcare facilities. Today, medical laboratories have an important place in improving the standard of care that patients receive from preclinical monitoring, diagnosis to treatment assessment and monitoring. As such, it is of the utmost importance that the quality of the work is standardised, hence the interest in accreditation, which not only serves to provide harmonised care throughout the healthcare community but also can help to improve the work flow of the individual laboratories.

After a lengthy, but incredibly clear session on the history, background and implementation of ISO 15189 from **David Burnett**, individual countries gave reports on how accreditation has or is being implemented by them in both the public and private sector. The whole conference was on live web link to Croatia and Hungary, so that all discussions had a real pan-European relevance.

**Jane McDougall** of *European Hospital* asked **Mike Hallworth**, Consultant Clinical Scientist to the Shrewsbury and Telford Hospital NHS Trust, UK and President of the EFCC about the development of the symposium and critical issues affecting laboratories today.

**What is the major drive behind the meeting?**

**MH:** This is the first European meeting organised purely on the subject of accreditation but the EFCC has a long history of supporting accreditation — we've been providing materials to help accreditation since 1993. This year, with changes in regulations in France, it seemed like an ideal time to bring together all our European experience so that in over-viewing the

collective understanding we could provide positive examples to help the French in this new regulatory environment.

**Why is laboratory accreditation important?**

One can see that accreditation serves a dual purpose. It's in the interests of patients, of society and of governments that clinical laboratories, wherever they are, operate to the same high standards of professional and technical competence. Likewise it is in the interests of competent laboratories to have their aptitude verified by a process of inspection and confirmed by comparison with an appropriate standard.

**What is the standard chosen for accreditation?**

The IFCC recognises ISO 15189 as the standard of choice. This standard encompasses all the necessary assessment criteria specified in the IFCC/EFCC policy statement and therefore it should form the basis of accreditation for all medical laboratories.

**How does a laboratory become accredited?**

If a laboratory wants to become accredited it should select an appropriate accrediting body, operating to appropriate international standards (ISO 17011) and also, which is very important, takes into account the particular requirements of medical laboratories. In reality there is little choice of accrediting bodies, but National Accrediting Bodies (NAB's) in Europe do operate to the correct standards and do have to take into account the special requirements of medical laboratories.

**Are all European countries at the same level of accreditation?**

The levels of accreditation vary enormously. Some countries have a strong tradition of accreditation, while others have come to the process later. Our aim now is to harmonise the procedure throughout Europe and, since the introduction of the ISO 15189 in 2003, this has become much easier.

**France has such a good healthcare system, so why is it one of the less strong countries?**

I think it's a question of the difference in the market. While the UK, for example, had fewer publically funded laboratories under a central management system, France has many more, much smaller private laboratories so the overheads and organisation to harmonise activities has previously been seen as too complex.

**Does the EFCC have other meetings organised, or plans for the coming months?**

Well, we have the EuroMed Lab meeting every two years. But, in addition to this, we are planning a series of themed meetings in conjunction with the European Medical Doctors Organisation, starting in Lisbon which will cover the clinical aspects of laboratory medicine.

We of course also have our vision of advancing clinical laboratory medicine across Europe and expanding the membership of the EFCC. Today we have 34 member countries, and soon Kosovo will be joining us. I hope this meeting will remind and encourage all our members about the value of our goal of harmonisation and cooperation between countries

## PAIN CONTROL

Oral combination of oxycodone and naloxone provides effective analgesia without unwanted constipation side-effect. *Olwen Glynn Owen reports*

The availability of a new opioid-based treatment option, has led pain specialists to believe they may at last be able to solve the age-old problem of how to provide effective chronic pain relief without causing opioid-induced constipation (OIC). A new orally-administered treatment, Targin (Mundipharma), available in Germany since 2006 and now throughout Europe, combines the opioid oxycodone with its antagonist naloxone in an oral prolonged-release formulation. The combination achieves effective analgesia without compromising bowel function, says Dr Kevin Smith, Mundipharma's Head of European Clinical Pharmacology, and is indicated for severe pain, which can be adequately managed only with opioid analgesics. The opioid antagonist naloxone is added to counteract OIC by blocking the action of oxycodone at opioid receptors locally in the gut.

Speaking in London at Targin's European launch, pain specialist Dr Gerhard Muller-Schwefe, Head of the Pain Clinic in Goppingen, Germany and President of the German Association for Pain Relief for the past 12 years, explained oxycodone blocks pain by

binding to endogenous opiate receptors in the brain and spinal cord. But it also binds to these receptors in the periphery, notably in the intestine, where it inhibits peristalsis and stimulates fluid uptake from the bowel. 'The result is a good reduction in pain but usually severe constipation also. It has never been possible to design an opioid that functions only in the CNS,' he explained. When naloxone is administered intravenously, it immediately antagonises the effects of opioids in the gut and CNS, starting at a low dose. However, when oxycodone and naloxone are administered together orally, in a prolonged release preparation, naloxone has a very different mode of action, he explained. It is able to act locally in the intestine, where it competes successfully against oxycodone in binding to receptors on the gut wall, leaving bowel motility intact. But its very low systemic availability (less than 3% is absorbed) effectively leaves oxycodone unopposed in achieving its central nervous system-induced analgesic effects.

Clinical trials supporting the product's development have been exten-

sive, he said. 'Pain intensity measured over 28 days shows no difference is made to pain control regardless of how big a dose of oral naloxone (10 to 40mg) is administered orally alongside oxycodone.'

Double-blind studies, comparing the oral combination of naloxone and oxycodone against oxycodone alone, show no difference between them in analgesic efficacy. Almost three quarters of patients completed an extended year-long study suggesting pain was effectively managed regardless of which treatment was administered. 'Approximately 30% of patients taking opioids alone quit on account of side effects, with constipation being the worst,' Dr Muller-Schwefe commented. In the same study, the bowel function index measuring difficulty in defecation and feelings of incomplete bowel evacuation showed a significant reduction in scores with the combined treatment compared to oxycodone alone. Improvement in bowel function was seen within one week, showing constipation is successfully treated, as well as prevented, by the two drugs in combination.