

# Hospital

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Heinz Kölking

# FACING THE CRISIS

First the financial crisis, now the economic crisis. At this point in time, nobody can possibly predict how long the crisis will continue. Surveys and prognoses are of little help, they increase insecurity and may even aggravate the problem. The development has its roots in the financial sector, it has already reached the real economy, and now it is placing a strain on the global labour market.

So when will the crisis hit the social security systems of European states? It does not take a lot of imagination to note that we will also suffer the consequences in European healthcare. As soon as the job markets announce higher rates of unemployment, the financial basis of our social security systems and hence our hospital care will be affected.

The repercussions can already be felt in hospital management today, especially where the funding of investments is concerned. This is a time that hospital management must – and will – rise to the many additional challenges.

Europe is hitting the election polls this year! Not only for the European development in health- and hospital care does this time between the election and constitution of the newly elected parliament traditionally hold some “time to take a breather”, which will hopefully lead to a necessary rallying of strengths for the future configuration of the “European House”. This will be required for dealing with both the economic and financial crisis as well as with the future design of the EU.

The causes and effects of the financial and economic crisis make it clear to all of us that we need more than just a short-term, “acute” treatment. The questions that need to be asked and answered will have to address the responsibility of the global players with regard to our living together as a

society. In any case, this crisis has shown us – and surely that is a positive thing – that we need Europe, and that there is no alternative!


The Executive Committee and the Board of Directors of the EAHM held the spring meetings in Maastricht and Vaals (NL) on the 25th and 26th of April. These meetings enabled all delegates to join in the celebration of Secretary General Willy Heuschen’s 60th birthday – and his 30 years of service.

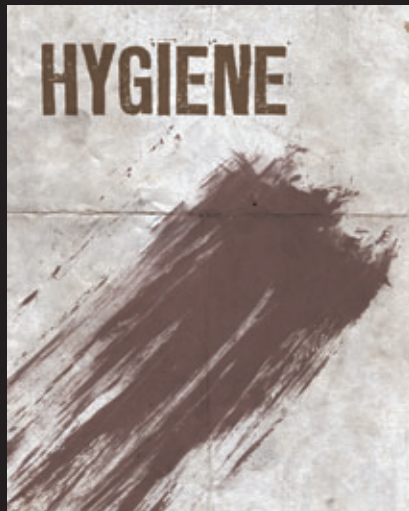
Willy Heuschen has been Secretary General of the EAHM since 1998 and has now completed his 30th year as managing hospital director at the St. Nikolaus Hospital in Eupen. Due tribute was paid to Willy Heuschen for all the work he has done for the institutions at Eupen, the hospitals of Belgium and also for his services at the EAHM.

We would like to take this opportunity to congratulate him again and say thank you for his commitment and dedication, both in the past and in the future, and for all his work for the hospitals of Europe.

Yours,  
**Heinz Kölking**  
Vice President EVKD

Come and join us at our seminar:  
**“Towards a balanced cooperation  
of public and private actors”**  
20th November 2009  
Düsseldorf, Germany

 The editorials in (E)Hospital are written by leading members of the EAHM. However, the contributions published here only reflect the opinion of the author and do not, in any way, represent the official position of the European Association of Hospital Managers.



## Hygiene

With recent news that healthcare acquired infections cost Europe approximately 5.5 billion euros, hygiene is a very fitting topic for this issue's cover story. The articles discuss the hygiene problems faced in European hospitals and offer some classic, and some new solutions for prevention and control of hospital acquired infections. The first article offers a three-pronged approach to cost-effective infection control and our Canadian colleagues tell us about an exciting new technological development: automated hand hygiene monitoring. Xiaobo Quan illustrates how design itself can have a positive effect on hygiene and we are also reminded that food hygiene in the hospital environment must play an important role.

## Integrated Care

Integrated care is becoming more and more important as our health systems are put under increasing pressure from demographic changes and the economic downturn. There is a huge potential with integrated care, it can benefit both the patient and the hospital. David Kwo illustrates the fact that integrated care needs integrated IT to reach its full potential. This article is followed by an example of an integrated care pathway in action, the CHRONIOUS project.

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### Focus: Turkey



Turkey is transforming its healthcare system towards a more European model. This transformation will be achieved through the government's Health Transformation Programme. The aim is to raise the effectiveness of the health services in terms of governance, efficiency and fiscal sustainability. There is also a short-term strategic plan for 2009-2013 with nine main pillars and objectives.

The country focus also introduces us to the new operating system for primary healthcare services- family medicine practices, a hospital management certification programme and OSHAD- the Private Hospitals and Healthcare Organisations Association.

## Hospital Directors

Dredge & Rigg



BUT, MINISTER — DOES THAT IMPROVE HYGIENE?



# HOSPITAL GOVERNANCE

**T**he economic crisis and several scandals have recently increased the public's interest in corporate governance. In healthcare, governance has long been a crucial element in the organisation and management of hospitals. Given the evolution of healthcare and the specific situation of hospitals, the topic of hospital governance deserves a more in-depth analysis.

In 2004 a research project on Hospital Governance was launched by the Catholic University of Leuven with the support of the EAHM and HOPE. About 500 hospital managers around Europe answered the questionnaire. National associations and researchers from countries such as Austria, Bulgaria, Denmark, France, Germany, Greece, Italy, Lithuania, the Netherlands, Spain, Poland, Switzerland... have contributed to this project. Results have been presented by Mr. Kristof Eeckloo in his Doctoral thesis "Hospital Governance in Flanders: explorative study in an international perspective" and has been discussed in the Scientific Subcommittee of EAHM.

The results of the study and their analysis in the thesis provide us with some valuable insights into hospital governance and ensure further debate on the subject. The concept of hospital governance has been defined as "an interaction between persons or groups of persons (actors) where decision-making is not concentrated within one actor and where a system of 'checks and balances' makes it possible to take decisions so that the interests and aims (that are at the foundation of their relationship) are realised."

This concept then needs to be translated to the context of hospitals. Through the perspective of the actors and levels (from macro-economical to Board of Directors) involved, the different governance mech-

anisms affecting the decision-making process within hospitals were positioned in an integrated framework. Three specific mechanisms were analysed through such integrated perspective: 1) the profile of the hospital board, 2) the role of hospital physicians in hospital governance and 3) public accountability.

The study has shown that there are several factors that have an impact on hospital governance: financing system, legal form, decentralisation and privatisation, internal governance structure by law, status and remuneration of hospital doctors. An increasing diversity was found regarding the public/private mix. Also decentralisation is not univocal as some countries are centralising. On the executive level, there is an evolution from the "Troika"/"College" model with a central role for physicians towards a model with a central CEO. Furthermore Hospital Boards seem to be increasing.

Patterns of governance have been identified. Hospital boards for example can be identified as a "forum", the "driver seat", an "expert panel" or "low profile". In the same way categories can be identified concerning the role of physicians in hospital governance ("form over content", "content over form" and "form nor content"). The analysis has revealed that governance configuration is an influencing factor when analysing the relation between the use of an instrument/methodology and the results of the organisation.

So what are the main conclusions from the study? The study has shown that there is a taxonomy of possible governance configurations. A universal preference model for a country or region is not possible so it is the responsibility of each actor to evaluate if his governance-configuration is based

on an adequate system of checks and balances taking into account the specific context and the mutual relation between the governance mechanisms.

The economic definition of good governance means the minimisation of efficiency loss due to mere interaction between actors. "Compensation mechanisms" must be regarded with caution; governance structures to remedy problematic structures are not a long-term solution.

The participation of physicians in hospital governance differs a lot around Europe: from informal to formal structures. The fee-for-service system stimulates the informal structures but form a problem to motivate physicians to take up a managerial role. If the quality and efficiency of the medical profession should be evaluated on a more central level by physicians, it requires a career and financial policy, education and training of the physician in executive function.

The organisational boundaries of the hospital are fading due to technological developments, changes in finance systems and changes in expectations of patients. The resulting network structures will require also adequate systems of checks and balances.

This study has established a foundation for further fundamental analysis and calls for further research based on standardised data. The study also provided concrete examples of insights from macro to local level and recommends all actors in hospital management to make sure that the check and balances are in place, taking into account the mutual interaction and the context.

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**The Netherlands**  
"Striving For a Healthy Crisis"

The Dutch week of public health took place from the 6th to the 12th of April, coinciding with World Health Day. The motto for this year was "Striving for a Healthy Crisis". An initiative of the Dutch Public Health Federation (NPHF), the aim: to generate broad media attention, putting public health on the agenda. The government has said that to survive the crisis we must invest in sustainability and strengthen the knowledge economy. Through the public health week the NPHF want to emphasise that public health is a part of this, stressing that health=wealth.

Healthy eating and living must not be compromised because of hard economic times. Alcohol abuse, neglect and depression are often common consequences during periods of economic downturn and this week was organised to prevent this happening. Events and activities were therefore organised to raise public awareness and motivate the public to invest in their own health.

**UK**  
NHS Pilot Scheme to Bring Health and Social Care Together

Health Minister Ben Bradshaw and Care Services Minister Phil Hope announced that 16 pilot sites will participate in a trial to see how health and social care services can join together to increase the quality of care.

The 4million pounds scheme has been designed to explore how services can be designed to improve patients' experiences, breaking the boundaries between healthcare and social care. The initiative is about catering for local health needs such as dementia, care for the elderly, substance misuse, chronic obstructive pulmonary disease and end of life care through partnerships, new systems and care pathways spanning pri-

mary, community, secondary and social care.

**NHS Celebrate Shortest Waits Since Records Began**

Recent data shows that in England, the NHS has met its target of treating patients within a maximum of 18 weeks from referral by their GP. The average wait for treatment for admitted patients is now just 8.6 weeks.

Health Secretary Alan Johnson described this success as a "tremendous achievement for staff" and stressed their commitment and that of the entire health service. Meeting this target has changed the lives of many patients and also benefited clinicians as the quality of care has also improved.

**Ireland**  
"Whistleblowers" in the Health Service to be Protected

The Minister for Health and Children, Mary Harney has announced that health staff who report concerns about other members of staff regarding patient safety will now be legally protected. This legal protection is provided under the Protective Disclosures provisions of the Health Act 2007. It is a bid to encourage a culture of openness and accountability in the health service, removing the social stigma of reporting a fellow colleague. It is hoped that this new law will help to prevent medical errors and improve the quality of care.

**Germany**  
Golden Helix Award 2009

The motto of this year's Golden Helix award is "Quality is never an accident; it is always the result of intelligent effort." (John Ruskin). The annual German-Austrian competition to discover innovative and quality improving projects to benefit the hospital sector is held in association with the German Association of Hospital Directors. Applications for this

year's competition are still open to all European German speaking countries. The submission deadline is July 1st 2009.

For more information, please visit: [www.vkd-online.de](http://www.vkd-online.de)

**Luxembourg**  
Evaluation Survey of Dependent People Living in Healthcare Institutions

The Centre for Health Studies in Luxembourg has been asked by the Ministry of Social Security to carry out an evaluation survey about the satisfaction of dependent people living in healthcare and long stay institutions in Luxembourg.

A convention was signed between the Ministry and CRP-Santé. The evaluation study will be performed in close collaboration with the insurance unit for the Evaluation and Orientation of Dependence. It will be carried out during the year 2009, in care institutions and integrated centres for the elderly.

**France**  
Crisis Communication

The Association of Regional and University Hospital Directors in France (CHRU) has launched a new guide to hospital crisis communication. The guide is aimed at healthcare professionals (management, doctors, technicians and even students). It has been developed by the French Hospital Federation and MACSF and is distributed free of charge.

The guide contains practical information and guidelines for internal communication, public relations and relations with the press. It has been developed due to the increased attention from the press hospitals are receiving. Hospitals must be prepared for this new media attention, remain transparent and ensure that they do not lose the public's trust. The guide provides information on how to do this.

# IT@ NETWORKING

The IT @ Networking Awards 2009 will select outstanding European healthcare IT solutions in hospitals and healthcare facilities and bring them to the pan-European stage.

## WHERE AND WHEN

Brussels, the centre of European decision-making, will be the location for the IT @ Networking Awards 2009 (*IT @ 2009*). It will be held from 28 - 30 October 2009 during the European Summit in October, ensuring international attention.

## WHO

The attendee roster will include hospital CEOs, CIOs, hospital and healthcare IT managers, physicians with an interest in IT, members of the European Parliament, civil servants from the EU and individual European countries whose mandates cover healthcare IT, as well as members of the specialist healthcare and IT press.

## WHY

Behind its fragmented façade, European healthcare IT includes a number of world-class jewels: cutting edge IT solutions that meet real-world challenges, efficiently and cost-effectively, and not rarely, in an elegant fashion.

Unfortunately, many such jewels remain unknown to the outside world – not just the general public, but ironically, to the healthcare IT community as well.

So too do their designers and architects, unsung heroes who have often invested their creative talents, and dedicated months and years of hard work – to create and build something good, something better, all the way through to the very best. But many such efforts extend beyond job definitions, stretch far above the call of duty.

These pioneers need recognition! Their stories will inspire others. The lessons they have learned can help both avoid mistakes and transform healthcare IT challenges into opportunities, into “Made-in-Europe” success stories. This is the goal of *IT @ 2009*.

## HOW

Several national or European awards are often decided by “experts”, thus not always familiar with real-world challenges. Sometimes, they even make decisions on political grounds.

The European Association of Healthcare IT Managers believes that peers will make the wisest decisions in respect to their own needs. As far as healthcare IT is concerned, the Association considers it to be self-evident that senior healthcare professionals will know what is the best solution for them.

To use familiar terminology for IT professionals, *IT @ 2009* is built on the principles of best-of-breed and peer-to-peer networking.

An on-the-spot, one-person = one-vote electronic system will be used to enable attending CEOs, CIOs and hospital and healthcare IT managers to make their choices.

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# G AWARDS 2009

## ROLLOUT: FROM MINDBYTE TO WORKBENCH

### FIRST DAY: MINDBYTE

All successful submissions for the *IT @ 2009* will be allocated 5 minutes for a short presentation (a Mindbyte) on what differentiates their solution and makes it special.

### VOTING

Voting will immediately follow a synopsis of all presentations, and the finalists will be announced by the Chair of the Organising Committee.

### SECOND DAY: WORKBENCH

Finalists of the *IT @ 2009* will be given 45 minutes to provide an in-depth presentation, followed by a 1/4 hour Q&A session with the audience.

### FINAL VOTING

Final voting will commence immediately after the last presentation followed by the awards ceremony.

### THE IT @ Networking Awards 2009 CEREMONY

Out of the finalists, the 3 top rated IT solutions will be awarded a prize.

#### The winning project will:

- receive the IT @ Networking Awards 2009 Trophy;
- have a detailed presentation of their solution in Europe's leading healthcare management media, and
- be awarded a cash prize of Euro 5,000.

### WHO SHOULD PARTICIPATE

Developers of imaginative, innovative healthcare IT solutions. Solutions can be built on both COTS as well as bespoke designs. However, all entries have to demonstrate a considerable degree of customisation and show ingenuity. All entries must be already implemented in at least one site.

### SUBMISSION DEADLINE

Submissions must be received by **25 September 2009**.

Candidates should send us a brief, 250 word synopsis of their solution – what makes it special and outstanding; what makes it a European answer to a European or global challenge.

*For further information or your project submission please visit our website [www.hitm.eu](http://www.hitm.eu), contact our General Secretariat via email [awards@hitm.eu](mailto:awards@hitm.eu) or call +32 / 2 / 286 8501.*

**▶ Healthcare Associated Infections Cost Europe 5.5 Billion Euros per year**

A round table on patient safety and healthcare associated infections (HCAIs) organised by Health First Europe and cohosted by MEPs Liz Lynne and Amalia Sartori revealed the extent of the burden of HCAIs on Europe's healthcare systems.

The European Centre for Disease Prevention and Control (ECDC) claims that HCAIs cause 37,000 deaths per year and contribute to a further 110,000 deaths across the EU. The result of these infections is an additional 16 million days of hospital stays per year and a cost of 5.5 billion euros per year. This is an enormous burden and if it continues, could cause serious problems regarding the sustainability of healthcare systems in the EU.

MEP Liz Lynne highlighted the need for the exchange of best practice among member states and hopes that the incidence of HCAIs can be reduced by 40% by 2015. Everyone was in agreement that creating clear targets, set guidelines and co-operation between member states is the next logical step. Future actions could include the use of rapid PCR (Polymerase Chain Reaction) MRSA testing on admission to hospital.

**▶ Health-e-child ([www.health-e-child.org](http://www.health-e-child.org))**

The Health-e-child project is an integrated healthcare platform for European pediatrics. Today there is a demand for the integration and exploitation of biomedical information to improve clinical practice, medical research, and personalise healthcare for EU citizens. Health-e-child's aim is to integrate traditional and emerging sources of biomedical information and therefore provide uninhibited access to universal biomedical knowledge for personalised and preventive healthcare, large-scale information-based biomedical research and training, and informed policy making.

The platform will allow a comprehensive view of a child's health by vertically integrating biomedical data, information, and knowledge. The focus is on individualised disease prevention, screening, early diagnosis, therapy and follow-up of pediatric heart diseases, inflammatory diseases, and brain tumours. The project will build a Grid-enabled European network of leading clinical centres that will share and annotate biomedical data, validate systems clinically, and diffuse clinical excellence across Europe by setting up new technologies, clinical workflows, and standards.

**▶ ENISA Analyses Risks of e-Health**

ENISA (The European Network and Information Security Agency) has issued a report presenting major potential Emerging and Future Risks (EFR) concerning remote health monitoring. The report comes after an EFR assessment based on scenario building and

analysis. The e-health scenario was developed and analysed by an international group of interdisciplinary experts.

The report identifies 14 risks including breaches of data protection legislation, mission creep (meaning secondary use of data), intrusive data surveillance and profiling by insurance companies, employers, credit-checking companies, etc, data loss or theft, system failures and service disruption. And the general conclusion is that a cautionary approach to e-health applications is the best option. "Caution seems to be the prudent answer at this point: the benefits are clear, but also the risks entailed cannot be ignored".

**▶ World Health Day: Save Lives. Make Hospitals Safe in Emergencies**

Tuesday the 7th of April was World Health Day. This year's focus was on the safety of healthcare facilities and the readiness of health workers who treat those affected by emergencies. The World Health Organization and its international partners have been emphasising the importance of investing in health infrastructure to cope with emergencies and ensure the continuity of care.

To mark World Health Day, European Commissioner for Health, Androulla Vassiliou visited several community health projects in Kenya on 6 and 7 April. Commissioner Vassiliou taped a video message recalling the close links between health and productivity and the need to foster good health, especially in vulnerable groups, in particular in these times of economic crisis.

**▶ Improving Mental Health Awareness**

The Committee on the Environment, Public Health and Food Safety is calling on Member States to develop awareness-raising campaigns, to combat stigma and social exclusion and to improve mental health legislation. The report calls for more up-to-date mental health legislation in line with international human rights. It also calls for a better awareness of good mental health, specifically targeting healthcare professionals, teachers, parents and employers.

For these initiatives the EU should use the funding facilities available through the Seventh Framework Programme and also the European Social Fund and the European Regional Development Fund.

**▶ European Patients' Rights Day**

For the third year running, on the 18th of April European Patients' Rights Day was celebrated. It is an occasion for Member states to inform, discuss and make commitments to improve patients' rights in Europe. The closing event included a



Medical Equipment and Solutions  
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conference, Patients Rights: A growing European concern and framework for action, held in the European Parliament in Strasbourg on 22 April with the participation of the EU Health Commissioner Androulla Vassiliou.

Created by the Active Citizenship Network, European Patients' Rights Day launches a series of national, regional and local events across Europe with the aim of informing and discussing patients' rights and empowerment. ACN together with a group of European citizens organisations in 2002 established a European Charter of Patients' Rights, which includes the following 14 rights: the right to preventive measures; access; information; consent; free choice; privacy and confidentiality; respect of patients' time; observance of quality standards; safety; innovation; avoidance of unnecessary suffering and pain; personalised treatment; to complain; to receive compensation. All these rights, based on the Charter of Fundamental Rights of the European Union, are fundamental in relation to European citizens and healthcare services.

In order to reinforce these rights the commitment and co-operation of healthcare stakeholders in every EU country is needed. It is believed that celebrating European Patients' Rights Day every year contributes to this goal.

**Draft Directive on Cross-Border Healthcare Adopted**

Parliament has approved plans to give Europeans the right to seek healthcare abroad more easily and for the costs to be reimbursed. The draft report on cross-border healthcare by John Bowis was adopted by 297 votes to 120 with 152 abstentions.

The aim of the draft directive is to remove the obstacles for patients seeking treatment in another EU Member State and to allow the cost of this treatment to be reimbursed. The draft also stresses the need for high quality, safe and efficient healthcare and that healthcare cooperation mechanisms must be developed among Member States.

The legislation is about patient mobility, not the free movement of service providers and MEPs are keen to stress that the directive does not mean an encroachment on national powers. It has been agreed that patients are to be reimbursed up to the level they would have received in their home country. Also, considering the proposed rules would mean that patients would have to pay in advance and be reimbursed later, a provision was added allowing Member States to offer a system of voluntary prior notification.

Finally, the draft directive also calls for better information on all major aspects of such care including the level of reimbursement and the right of redress in the event of medical error. National contact points should also be established for complaints, as should a European Patients Ombudsman.

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**Excerpt:**

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# THE POLITICAL FIGHT AGAINST TB

By Rory Watson

**P**olitical pressure is growing on the European Union and national governments to increase resources in the fight against tuberculosis as new research reveals that 55 people are diagnosed with the disease every hour in Europe.

A cross-party group of members of the European Parliament has tabled a written declaration calling on the European Commission and Member States to take a leading role in coordinating the control of TB. They are looking for sufficient resources to be allocated from the EU's multiannual research programme, its Innovative Medicines Initiative and the European Research Council to promote research into multi or extensively drug resistant TB (MDR/XDR). This would mean increasing existing EU spending on TB research from the current €20 million to €100 million.

The MEPs are also advocating that illegal immigrants entering Europe and suffering from the disease should have proper access to, and possibility of completing, the necessary treatment, which for non-drug resistant cases can last as long as eight months.

The call for a higher political priority to be attached to tackling TB, especially the multidrug resistant kind, coincides with publication at the end of March by the World Health Organisation and the Stockholm-based European Centre for Disease Prevention and Control of their first joint Tuberculosis Surveillance Report on the scale of the disease. According to the new data, there were 477,327 TB cases in Europe in 2007 – the equivalent of 55 every hour. More worryingly, about 43,600 cases are suspected of being multidrug resistant.

Dr Nata Menabde, WHO's deputy regional director for Europe, reminded the 53 WHO European member states of their commitment in Berlin two years ago to provide more political support and resources to control TB. "Health systems face serious challenges in responding to TB and achieving Millennium Development Goal 6: to have halted and begun to reverse the incidence of TB by 2015. We have to make significant efforts if this Goal is to be met," she said.

It is not just governments and international and non-governmental organisations that are active in the fight against TB. Private companies are also lending their support. In 2003, the American pharmaceutical manufacturer, Eli Lilly created the Lilly MDR-TB Partnership. The public-private initiative has 18 partners, ranging from the International Hospital Federation to the World Economic Forum. It provides access to medicines, transfers manufacturing technology of Eli Lilly's two antibiotics for MDR-TB (capreomycin and cycloserine) to the developing world, trains healthcare workers, raises awareness and promotes prevention and research. While present in over 60 countries, the Partnership is particularly active in India, South Africa, China and Russia, which have particularly high incidences of TB.

## Tuberculosis is knocking loudly on the door, but the European Commission is playing deaf

The call for greater funding is being voiced even more strongly by Médecins Sans Frontières. Dr Tido von Schoen-Angerer, the director of MSF's campaign for access to essential medicines, estimates that globally some €1.45 billion needs to be spent on TB research and development, of which the EU share should be over €400 million annually. "We desperately need new vaccines, drugs and diagnostics for TB. This will only happen with more research. Countries right on Europe's doorstep – and even within the European Union – are struggling against resistant strains of the disease. But research budgets remain pitifully low. Tuberculosis is knocking loudly on the door, but the European Commission is playing deaf," he said.

The new data confirm that most European countries are continuing to experience a steady decrease in overall TB notification, but wide differences remain with just five new TB cases per 100,000 population in Iceland, but over 100 per 100,000 in Kazakhstan, Kyrgyzstan, Moldova and Romania.

Commenting on the findings, the ECDC's Director, Zsuzsanna Jakab, said: "Although the overall number of TB cases being reported in the European Union has declined slightly, the proportion of MDR-TB being found is cause for concern. More attention needs to be paid to ensure early diagnosis and treatment, as well as equity of access to treatment for vulnerable populations."

The European Commission is also looking to boost efforts to tackle TB. At the end of June, it will jointly organise a meeting in Luxembourg with the WHO and the ECDC gathering together health ministries, national TB managers and civil society to consider new ways to combat the disease.

Following publication last year of the Framework Action Plan to fight Tuberculosis in the EU, the Commission is helping to build new partnerships between European scientists, industrial partners and researchers from endemic countries. One example is the European and Developing Countries Clinical Trials Partnership which helps test new drugs and vaccines for poverty related and other neglected diseases.



# Healthcare Associated Infections

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# COST EFFECTIVE INFECTION CONTROL: A Three-Pronged Approach

By Ellen E. Stobberingh, Ed E.J. Smeets and Frank H. van Tiel

**H**ospital acquired (nosocomial) infections, i.e. infections developing 48 hours or more after admission to hospital, are a global problem. The proportional rise in the ageing population, and consequently of the patient population in hospital, the ever increasing use of prosthetic materials and of intravascular devices, and increasing prescription of immunosuppressive drugs for various indications are but a few of the important causative factors for the increased prevalence of these infections. Obviously, the result is an increased nosocomial morbidity, and even mortality due to infection. Moreover, nosocomial infections result in a substantial financial burden for both the hospital and society in general. The increased costs can be accounted for by a longer duration of hospital stay, increase in use of diagnostic procedures and therapeutic agents (antibiotics), and in longer absence leave.

To make things worse, the causative micro-organisms of hospital acquired infections are increasingly likely to be antibiotic resistant, due to the worldwide increased use of antibiotics. The financial burden of these infections is higher compared to infections caused by antibiotic susceptible agents. Treatment of infections caused by antibiotic resistant micro-organisms will often result in the use of new, recently developed antimicrobial agents, which are more ex-

pensive and carry a higher risk of side effects.

Therefore, the control of nosocomial infections is a priority in hospital care, but there are several misconceptions regarding this control. Firstly, many believe that nosocomial infections are inevitable and their control very expensive implying that infection control programmes are not cost-effective. The second misconception is that the problem of antibiotic-resistant nosocomial infections cannot be controlled to any meaningful degree, since antibiotic resistance is a natural and inevitable consequence of antibiotic use. We intend to correct these misunderstandings.

Effective control measures require clear understanding of the causes of the (antibiotic resistant) nosocomial infections.

The cornerstones for a cost-effective infection control programme will include amongst others:

- ▶ Education to understand how bacteria spread from healthcare worker or environment to patient and vice versa;
- ▶ Hand hygiene to reduce the risk of transmission to the patient, and
- ▶ Implementation of an antibiotic policy to control antibiotic resistance.

## **i) Education and Training of Healthcare Workers**

Education and training of healthcare workers concerning the ba-

sic principles of infection prevention and control is essential to increase awareness of the risks of a hospital acquired infection for patients and themselves. For an effective education programme, a stepwise approach is advisable. First, lectures regarding the most common causative agents of hospital acquired infections and their route of transmission. Effective methods for the prevention of spread of these micro-organisms (control of cross-infection) need to be addressed. Second, lectures ought to focus on ward-specific problems; a surgical ward encounters other infection problems, involving other possible transmission routes, and therefore other control measures than a haematological ward. Based on this notion, we recommend that the education programme is set up in close cooperation with the infection control physician, infection control nurse and the healthcare workers of the different wards.

In our view further general prerequisites for an effective education programme are:

- ▶ The programme needs to be repeated on a regular basis;
- ▶ The healthcare worker must be actively offered the opportunity to follow the training sessions. Compulsory attendance ought to be seriously considered, and
- ▶ Commitment of the management of the ward and of the higher echelons of management of the hospital is pivotal.

There is ample experience, including papers published in leading journals, that lectures, seminars, posters and/or flyer-reminders on infection control increase awareness of infection prevention and results in improved compliance with infection control measures. In other words, the better the education programme is, the more acute the awareness will be, and the more effective the control of hospital acquired infection will become.

## **ii) Implementation of a Hand Hygiene Programme**

It is well established that most nosocomial infections are spread via hand contact of healthcare workers, and although hand cleansing is the most cost effective infection control measure, its practice is notably poor, especially among (hospital) doctors. The study of Pittet et al. has clearly shown that the implementation of a hospital-wide programme to improve the compliance with hand hygiene resulted in a significant decrease in overall prevalence of nosocomial infection from 16.9% to 9.9% of patients. Importantly, these investigators emphasise that institutional commitment, support of the medical and nursing directors and approval of the senior hospital management are indispensable to designate the programme as a hospital-wide priority and to implement the hospital wide programme successfully.

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### iii) Implementation of an Antibiotic Policy Protocol

Antimicrobial agents are used to prevent an infection (prophylaxis) or to treat patients with a possible or proven infection. Worldwide, the increase of antibiotic resistance is a matter of great concern. In some areas resistance has rendered the treatment of a surgical wound infection caused by its most common cause, the bacterial species *Staphylococcus aureus*, ineffective with the mainstay antibiotics in the majority of cases. The same is true for the treatment of pneumonia, e.g. in Japan *S.aureus* pneumonia cannot be treated with flucloxacillin in 63% of cases, and 4% of cases of *Streptococcus pneumoniae* pneumonia, the most common type of pneumonia, is untreatable with penicillin.

The main risk factor for antibiotic resistance is antibiotic use, whether appropriately prescribed or not. To control the use of antibiotics a rational antibiotic policy needs to be implemented. The aim of a rational antibiotic policy is to prescribe antibiotics in a cost-effective way, i.e. the correct indication, the right choice of the agent and for the appropriate duration. The choice of the agent strongly depends on the antibiotic resistance pattern of the bacterial species causing the infection. As the resistance patterns of the bacterial flora not only differ between countries or provinces, but also between hospitals, and even between individual people, only general recommendations can be formulated on a national level. This implies that hospitals have a task, and a duty to translate these national formularies into

local hospital or regional formularies, into which local resistance data have been taken into account. Every hospital should therefore have a committee appointed, which represents prescribers and advisors of antibiotic treatment, and which has antibiotic policy as its sole responsibility.

In conclusion, our plea is that implementation of effective infection control programme is practically feasible, and will reduce the prevalence of nosocomial infections, including those caused by antibiotic resistant micro-organisms. The individual patient, as well as the quality and economics of healthcare in general will benefit from effective control programmes. Such a programme is based on a) education and training of all healthcare workers, b) the implementation of

a meticulous hand hygiene/disinfection protocol for all healthcare workers, and c) the implementation of an antibiotic policy. Furthermore, the commitment not only of the management of the ward, but also of the higher echelons of management of the hospital is pivotal for a successful programme. Last, the benefits of such a programme outweigh the costs, as long as the programme is designed to reach 90% of the desired achievement, not 100%. The final 10% of desired achievement is disproportionately costly, requiring up to 80% of costs in terms of money and time.

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# AUTOMATED HAND HYGIENE MONITORING

## Perspectives for Healthcare Staff, Management, and Infection Control Specialists

By Veronique M. Boscart, Alexander I. Levchenko, Geoff R. Fernie and Walter P. Wodchis

### Background

Hospital acquired infections (HAI) cause 2 million infections yearly, resulting in 88,000 deaths globally. They are defined as infections occurring 48 hours after being admitted to a health-care facility and are secondary to the patient's original condition. Most HAI must be treated with antibiotics, resulting in increases in antibiotic-resistant organisms, lengthened hospital stays, massive inefficiency in hospital systems, disability and in some cases death. Annual costs of HAI in the United States range between \$5 and \$11 billion. An estimated 5% to 19% of their patients are infected, with 30% in intensive care units. In Europe, reported numbers range from 6.7% to 14%, causing 15,000 deaths a year. Preventing HAI is therefore one of the most important goals of infection control research.

It is estimated that one third of HAI are preventable. Hand washing is the single most important measure to reduce the risks. Hand washing is often neglected or performed incorrectly. Studies observing hygiene practices agree that 40 to 60% of doctors and nurses fail to wash hands between patients. Some of the reasons that have been

listed include the lack of priority over other required procedures, insufficient time, inconvenient placement of hand wash facilities, allergy to hand hygiene solutions, and lack of leadership from senior staff.

Consequently, different approaches have been suggested to improve compliance including education, surveillance and monitoring quantities of disinfection products consumed. Educational programmes have failed to produce sustained improvements. Observational methods are extremely expensive and have shown to be poor predictors of actual compliance. Keeping track of disinfection product consumption does not provide reliable and accurate data on the number of hand wash opportunities.

In recent years, commercialisation of wearable hand hygiene products opened the possibility for more efficient hand hygiene activities by allowing staff to disinfect while moving from place to place. The potential advantages are significant since the convenience and availability of the dispenser enables a stronger habit of hand hygiene. Pilot testing of wearable dispensers found that participants increased the frequency of

hand hygiene between patient contact from an average of 37% to 49% ( $p=.006$ ). This level of improvement is in the range anticipated but still unacceptably low. Sustained compliance greater than 60% seems unlikely unless a radically new technology can be developed. This paper reports on a novel electronic hand hygiene system with monitoring and reminding properties.

### A New Technology

Toronto Rehabilitation Institute, Canada, developed a hand hygiene monitoring system to enhance and record hand wash frequency. The new technology consists of 3 main components: (1) small wearable electronic monitors, (2) protected zones installed to define individual patient environments, and (3) personal wearable alcohol gel dispensers.

The monitors identify when staff enter and leave a patient environment by using infrared communication with controllers installed in the patient zones. The zones are defined by infrared emitters with regulated intensity, mounted inside direction elements that are adhered to the ceiling and arranged in groups to precisely cover the patient

areas. The monitors work in combination with the dispensers and perform monitoring, data logging and hand hygiene prompting functions, according to programmable logic rules. Each monitor records in real-time the events of the user entering and leaving patient areas and hand hygiene actions. These records are later downloaded and performance printouts are generated. Patient zone controllers are configured to transmit zone identifiers and additional specific information (e.g. risk level), so the wearable monitor can provide different prompting options if specific hand hygiene procedures are required. Although the above described system has the potential to radically increase the frequency of hand washing, there are obvious privacy issues since the system can be used to determine how much time staff spend with a patient, not just whether hands are washed. Therefore, the first phase of the larger study focused on exploring the acceptability and usability of the system.

### The Study

An exploratory study was conducted at a large teaching facility in Toronto, Canada. The study consisted of a field test in

which participants tested the device, and focus groups to explore the acceptability of being monitored and the usefulness of the system. Staff felt this technology was a convenient and secure approach to remind them of the hand wash act. Staff also liked the consistency of the system when it provided reminders to disinfect hands before approaching and leaving patients. Overall, staff felt comfortable with

these detailed data are valuable for several reasons. First, a manager can easily identify and compare performance at an individual, unit and facility level. The system can also present frequencies of hand disinfections registered per location and records if this disinfection took place before entering the zone or as a response to a reminder from the system. Different levels of access and anonymous

calculate staffing on a timely basis, taking into account the fluctuating patient conditions, treatments and available staff.

Currently, compliance is calculated based on limited observations of some staff in specific areas within the facility. Not only does the Hawthorne effect interfere with the data collection, the reliability of the data collected is questionable. This nov-

had thoroughly familiarised themselves with the technology and had had an opportunity to adjust their practices to achieve optimal performance.

When a patient suffers or dies from a HAI, there are financial ramifications in addition to the human costs. Based on research endorsed by the World Health Organization, improvements in hand hygiene could reduce infections and costs substantially. Implementation of the new hand hygiene monitoring and reminding system in all hospitals in Ontario, Canada, would cost approximately C\$12 million annually. Given the 77,395 HAI a year in Ontario, with an extra cost of an HAI of C\$6000, the total annual cost of HAIs in Ontario could be over C\$460 million. If this system could increase hand hygiene by only 10%, 3,870 of these HAI could be avoided yearly, resulting in C\$19 million in cost savings.

## When a patient suffers or dies from a HAI, there are financial ramifications in addition to the human costs. Based on research endorsed by the World Health Organization, improvements in hand hygiene could reduce infections and costs substantially.

receiving individual performance data and indicated that the system has capabilities to increase compliance and improve sustainability of hand hygiene.

### Perspectives for Healthcare Staff, Management, and Infection Control Specialists

The data collected have important potential to healthcare staff using the system, management, infection control specialists, and policy makers. The system is able to provide the time of entering and leaving identified patient zones, and also indicates the time hands were disinfected. Subsequently, individual compliance can be calculated. This information can be compared with anonymised unit, facility, or job category performance to provide the individual with a reliable framework of his or her own hand wash behaviour. From the management's perspective,

data can be built in. The system will also allow identification of specific situations (e.g. mealtimes, physician rounds), locations, or times (e.g. night shifts) of hand hygiene. Specific trends can be monitored and subsequently addressed with tailored interventions. The individual data collected automatically can then serve as an evaluation of any given intervention, thereby avoiding expensive and time-limited observations of hand wash compliance.

Another advantage of this system is not directly related to hand hygiene, nevertheless it is one that has potential to improve care and efficiency. The data collected will provide reliable information on the specific healthcare provider's time spent with an individual patient. The duration of specific procedures or therapy can be calculated per patient. These data might be particularly helpful to

el system will be able to provide accurate and timely data for managers and infection control specialists on hand hygiene compliance when entering or leaving a patient zone.

### Discussion

In developing a technology to monitor staff's hand washing activities, the need arose to explore concerns about being continuously aware of hand hygiene. The research team built a prototype version and collected data from staff. Participants were very excited about the new technology. They responded positively because the opportunity to obtain help to improve their performance appealed to their professionalism. The ability to be able to select whether the data is anonymous or is attributed was welcomed. Staff expressed a desire that the data be maintained anonymously for an introductory period until they

### Conclusions

A new hygiene compliance monitoring system has been developed that has the potential to reduce transmission of infections and associated costs. The new solution can provide managers, staff and infection control specialists with hand hygiene performance data collected automatically. The feedback from early testing has given the research team confidence to expedite the completion of the technology and its commercialisation in an effort to increase hand hygiene compliance and reduce transmission of infections with consequent reductions in costs, morbidity, and mortality.

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# IMPROVING HOSPITAL HYGIENE THROUGH ENVIRONMENTAL DESIGN

By Xiaobo Quan

**A** growing body of evidence shows that hospital design directly impacts the cleanliness of the hospital environment and therefore contributes significantly to the reduction of hospital-associated infections. This paper focuses on some of the key environmental measures that improve the hygiene of the hospital environment (air and inanimate surfaces) and personnel.

## Air Hygiene

Aerial dissemination of dust, droplets, and skin scales is a frequent transmission route for many pathogens, e.g. TB, MRSA, Acinetobacter, and C difficile spores. Ventilation, filtration, and disinfection are major environmental approaches to reduce pathogen concentration in air and to reduce the chance of airborne transmission. Ventilation, the movement of air in and out of healthcare spaces, is important not only for operating rooms and special care areas for high risk patients but also for regular care units. The effectiveness of ventilation depends on careful design of the whole heating, ventilation and air conditioning (HVAC) system, including the location of air duct openings and the air flow pattern in addition to ventilation rates. For example, supplying and extracting air through ceiling may be more efficient in reducing bioaerosol concentration than putting ventilation openings on walls, as was found in a

computational fluid dynamics (CFD) simulation study by Beggs et al. (2008).

High-efficiency particulate air (HEPA) filters, either portable or integrated into the HVAC system, effectively remove airborne pathogens as small as 3 µm in diameters. If integrated in the HVAC system, HEPA filters should be located close to the air supply diffusers because air coming out of HEPA filters located centrally in the main air duct may be re-contaminated in the ducts before entering patient care spaces and this re-contamination may lead to high pathogen (e.g. bacteria and aspergillar) concentration in patient care spaces.

Ultraviolet germicidal irradiation (UVGI) is a technology able to inactivate a wide range of airborne pathogens e.g. influenza, measles, and TB. UVGI devices installed on the upper part of hospital rooms can significantly reduce the airborne concentration of pathogens in lower part of the rooms therefore interrupting the transmission of certain airborne diseases. However, some environmental factors, such as humidity, may influence the effectiveness of upper-room UVGI.

## Environmental Surface Hygiene

The inanimate environmental surfaces in hospitals (e.g. floors, walls, furniture, medical equip-

ment, paper towel dispensers, sink faucets) are often contaminated and become reservoirs for pathogens such as MRSA, VRE, and Acinetobacter calcoaceticus. Environmental measures to control the level of surface contamination include cleaning, disinfection, and the use of antimicrobial materials and coatings.

Cleaning is the removal of visible dirt. Disinfection is the process of killing or inactivating pathogens. There are various cleaning and disinfecting methods suitable for different surface materials but these methods are not always able to remove or kill germs, especially the tenacious, such as VRE. Hydrogen peroxide vapor (HPV) is a relatively new disinfection technology used in healthcare settings. It involves filling a sealed room with hydrogen peroxide vapor gas to kill germs and converting the gas into water and oxygen after decontamination. Research shows that HPV is more effective than terminal cleaning in disinfecting patients' rooms contaminated with MRSA and VRE even though recontamination may occur several days after decontamination. Putting patients in single rooms instead of multi-bed rooms may facilitate the use of HPV because using HPV in single rooms after patient discharge eliminates the need of temporarily moving patients out of rooms which is often the case for multi-bed rooms.

Antimicrobial materials or surface coatings (e.g. silver-zeolite) contain anti-bacterial ingredients (e.g. silver) that inhibit the growth of and kill pathogens. Antimicrobial materials and coatings have successfully prevented surface contamination in experimental settings. However, environmental factors such as humidity may significantly affect the effectiveness of anti-bacterial materials. It is not clear how durable and useful these materials and coatings will be in real healthcare conditions.

## Hand Hygiene

The hands of healthcare workers can be easily contaminated when touching patients or environmental surfaces around patients. Proper hand hygiene of healthcare workers has been identified as the single most important measure to prevent contact transmission between patients because patient to patient direct transmission is relatively rare. The problem of low hand hygiene compliance is a complex human behaviour issue. Environmental features that significantly influence hand hygiene behaviors include the type, number, location of hand hygiene facilities and the environmental cues serving as reminders.

Compared with soap-and-water sink, alcohol-based hand rub is more efficient—costing less and requiring less time for hand disinfection. It is small and therefore is easy to carry around

or install at locations accessible to healthcare workers. However, it is not suitable when hands are visibly dirty and contaminated with organic matter, such as blood. Automated sinks and dispensers that are simple to use, e.g. touch-free alcohol-based hand rub dispenser, have been found to increase frequency of hand hygiene. The number and location of hand hygiene facilities determine the accessibility of these facilities and the convenience of hand hygiene. In one study, hand hygiene compliance by nurses after their direct contact with patients and medical equipment

was higher in the intensive care unit with a higher sink-to-bed ratio. Similar positive correlation between sink-to-bed ratio and hand hygiene compliance was also found in other settings.

Several environmental features are able to promptly remind healthcare workers of hand hygiene and increase the compliance rate. One example of such environmental reminders is an electronic device monitoring room entry / exit and producing voice-prompts when hand hygiene is not performed properly. Hand hygiene compliance increases significantly due to the

installation of this type of electronic alerting device.

Based on the above discussion, some environmental design recommendations to enhance hospital hygiene are as follows:

- ▶ Design HVAC system to effectively reduce air contamination by properly placing air duct openings and incorporating HEPA filters and other disinfecting devices;
- ▶ Select materials that are easy to clean and disinfect; follow proper disinfection procedures for particular materials;

- ▶ Design single rooms to facilitate certain disinfection procedures (e.g. HPV);
- ▶ Provide enough alcohol based hand rub dispensers in addition to an ample number of sinks; and carefully consider the locations of the hand hygiene sinks and dispensers in early design phase;
- ▶ Employ environmental cues (e.g. lighting and electronic alerting device) as reminders of hand hygiene.

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## ▶ Infection Control Initiatives

### Design Bugs Out

Design Bugs Out is a competition launched by the UK Design Council in association with the NHS and the UK Department of Health in October 2008. As the name suggests the aim was to encourage designers to use their talent and vision to reduce the number of HCAs in the hospital environment.

The challenge was to design and prototype new furniture, equipment and services for hospitals to improve infection control and prevention. There were five categories to choose from:

- ▶ Hand hygiene;
- ▶ Beside environment;
- ▶ Commode;
- ▶ Patient transport, and
- ▶ An open brief to design a piece of equipment, furniture or system which will reduce HCAs.

Thirty-seven designer/manufacturer teams applied and the submissions were judged by a panel of judges made up of experts in design, microbiology, nursing and patient care. The winning design teams have been chosen and include top designers and manufacturers responsi-

ble for some very well known designs including Parker Pens and Herman Miller chairs. Projects include re-designs of porter's chairs, patient lockers and commodes and new designs for everyday items used by patients, nurses and other staff.

Many of the prototypes are re-designs of essential everyday items in the hospital environment. The focus is on making these items, which regularly come into contact with both patients and staff and therefore pose a significant threat to hygiene, easy to clean. Items such as blood pressure cuffs have been re-designed using waterproof and easily cleanable materials instead of fabric and Velcro and pieces of furniture traditionally hard to clean have been simplified to ensure their thorough cleaning.

The designs will be showcased at 7 NHS hospitals across the UK.

For more information, please visit:  
[www.designcouncil.org.uk](http://www.designcouncil.org.uk)

### Don't be the one to pass it on

University College London Hospital has launched a hard-hitting, interactive in-

fection control campaign. Funded by the UK Department of Health, this is no ordinary campaign; it includes holograms, stickers, posters, a youtube video and even a specially commissioned song! The message: "don't be the one to pass it on".

The campaign is about motivating people to improve hand hygiene and to change their attitudes and behaviour. Both staff and patients agreed that a bold, eye-catching campaign would be a successful way of promoting hand hygiene and contributing to reducing the number of hospital acquired infections.

By disseminating a range of serious and light-hearted messages through both traditional and new media the campaign aims to reach a wide range of audiences—staff, patients and visitors, young and old.

Slogans on posters and badges include:  
*"Don't be the one to pass it on. Every two minutes someone gets infected"*  
*"Give bugs hell- use the gel"*  
*"Soapy not dopey"*  
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# HUMAN OBSTACLES TO FOOD HYGIENE IN HOSPITALS

By Burcu Tokuç and Galip Ekkulu

**H**ospital food service systems are considered one of the most complicated production processes in the hospitality sector as hospital outbreaks of food-borne diseases affect patients, personnel and visitors. It is commonly believed that most outbreaks result from faulty food handling practices.

Mishandling food can permit the proliferation of microorganisms that cause such illnesses, especially among patients with impaired immunity, achlorhydria or both. Therefore, a major goal of the hospital is to provide food that is microbiologically safe because hospitalised patients are more susceptible to infection and consequent morbidity and mortality. In hospital catering, food-services staff are the main food handlers, although nurses and other domestic staff may distribute or serve meals. Food-services staff in hospitals represent a potential source of nosocomial food-borne outbreaks, since they may introduce pathogens into foods during every phase from purchase to distribution.

We conducted a study to evaluate the knowledge, attitudes, and practices among food service staff with regards to food hygiene in hospitals in Edirne, Turkey and to provide baseline data for implementing HACCP in hospital food services by carrying out a questionnaire by face-to-face interview.

## HACCP

Turkey is a candidate country for entrance into the European Union, and great efforts have been made to modify the national legislation to meet new European legislation requirements for improving food hygiene and rendering the Hazard Analysis and Critical Control Points (HACCP) system mandatory to all food operators (ABGS, 2008). HACCP is a structured and rational approach to the analysis and prevention of potential hazard points at every stage of food operation. It requires operators to enumerate and identify all steps in their activities that are critical to achieving food safety and to identify and evaluate safety measures.

The World Health Organization (WHO) has published a definition for prerequisite “practices and conditions needed before and during the implementation of HACCP and which are essential for food safety”. These are described in Codex Alimentarius Commission’s General Principles of Food Hygiene and other Codes of Practice. Prerequisite programmes include supplier control, written specifications, written cleaning and sanitation procedures, and documented employee and employer training. It defines food hygiene training as fundamentally important and says “All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration. Food handlers should have the neces-

sary knowledge and skills to enable them to handle food hygienically. Those who handle strong cleaning chemicals or other potentially hazardous chemicals should be instructed in safe handling techniques”.

## Study Findings

Our study has shown that food service staffs in Edirne hospitals have insufficient knowledge regarding the basics of food hygiene, and also revealed a discrepancy between attitudes and practices towards food safety. There appears to be a lack of knowledge among the food services staff about the critical temperatures of hot and cold ready to eat foods, acceptable refrigerator temperature ranges, periodical control of refrigerators’ and freezers’ thermostat settings, and etiologic agents associated with some food-borne diseases which were very important for HACCP.

A discrepancy between attitudes and practices towards food hygiene was also revealed. Like other previous studies of this kind in Italy and Iran, our study found that although all respondents believed safe food handling is an important part of their job responsibilities and that using protective clothing has reduced the risk of food contamination, in practice, these protective measures have never been fully implemented.

Very little research has been carried out to determine the

barriers and problems that may be preventing food handlers from implementing good practice in hospital settings, or even in commercial settings. The majority of food handlers perceived there to be no disadvantages to carrying out food safety actions. Most studies, ours included, identify the main barriers to carrying out food safety actions as time constraints, lack of resources, the design of the work space and the need for recognition of the problem by the management.

Many of the staff were aware of the need to wash their hands, to clean surfaces, utensils and equipment but they also expressed the need for better location of sinks and said they required more cloths and towels. Many of the food handlers in hospitals suggested they needed more space to work to prevent cross-contamination.

## Training and Education

We thought it might have been the consequence of a lack of specific training and empiric adoption of safe attitudes and behaviours based on skill in working and domestic settings. None of the respondents in our study had attended any educational courses on food hygiene and food borne diseases. The need for more information regarding food hygiene through educational courses has been well established by our study and all of the food services staff felt the need for more informa-

tion. However, in some previous studies no differences were detected between the staff who attended an educational course and those who did not.

Indeed there is uncertainty regarding the efficacy of current food hygiene training. A number of studies have indicated that although training may bring about an increased knowledge of food safety this does not always result in a positive change in food handling behaviour. Food handlers may be aware of the need to carry out certain practices but without the provision of adequate resources these practices become difficult. It has been suggested that knowledge alone is probably insufficient to promote positive attitudes and safe behaviour.

Rennie suggested that this disparity between knowledge and practice occurs because much of the existing training, partic-

ularly formal certificated training, is designed using the KAP model. This approach assumes that an individual's behaviour or practice (P) is dependent on their knowledge (K) and suggest that the mere provision of information will lead directly to change an attitude (A) and consequently a change in behaviour. It has been suggested that this model is flawed in its assumption that knowledge is the main precursor to behavioural change. Researchers have argued that the effectiveness of food hygiene training could be greatly improved if it was designed using health education and psychological theory.

In order to design effective training for food handlers there is a need to fully understand all the factors underlying current food hygiene behaviour in the work place. All cognitive theories assume that a person's behaviour is determined by examining their

knowledge, attitudes and beliefs and that these factors need to be examined within social and environmental conditions. Consequently, in order to reduce food borne illnesses it is crucial to gain an understanding of the interaction of prevailing food safety beliefs, knowledge and practices of food handlers.

## Conclusion

Most of the food handlers in different studies said that they do not always carry out all the safety practices they know they should be implementing. However, it is difficult to estimate the risk attached to the non-implementation of these practices because our knowledge is dependent on reports of the staff themselves. Future research is needed to observe the behaviour of food handlers in their natural work setting. The human obstacles for implementing food safety practices need to be tak-

en into consideration when developing strategies to change food handling practices.

Food hygiene training needs to embody the concept of risk to food handlers, especially those in managerial roles. They need to be aware of the level of risk associated with their business. It should not be forgotten, training in food hygiene would only be effective if the resources and systems were in place to encourage food handlers to implement good practice because the effectiveness of a training programme is dependent on the attitude of managers and the hygiene culture of an organisation.

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# ELECTRONIC PATIENT RECORDS ACROSS THE CARE CONTINUUM

By David Kwo

The National Health Service (NHS) in the UK is moving towards vertical integration of its healthcare services as exemplified by the 'Integrated Care Pilot Programme' launched by the Department of Health in October 2008. Vertical integration is where the full range of health providers (hospital and community services, GPs, mental health providers, home health services, social services, etc.) in a geographically contiguous region, such as a health economy or care community, join together to deliver services in a patient-centric manner. This type of integration requires collaborative clinical service delivery integration with or without correspon-

ding organisation integration. The main principle of this paper is: integrated care organisations require integrated information systems, in particular integrated Electronic Patient Record (EPR) systems.

The Electronic Patient Record (EPR) systems market is becoming active again in the UK after several years of being dormant. The reason is that the National Programme for IT (NPFIT) is severely delayed in delivering EPR solutions and hospitals are looking outside of NPFIT for alternatives. To help hospitals re-enter the EPR market, it is useful to understand the shape of the EPR market

today and where it is going in the future.

## The EPR Market in the UK

The customer market for hospital EPRs in the UK is classified into 3 tiers according to the hospital's underlying business model.

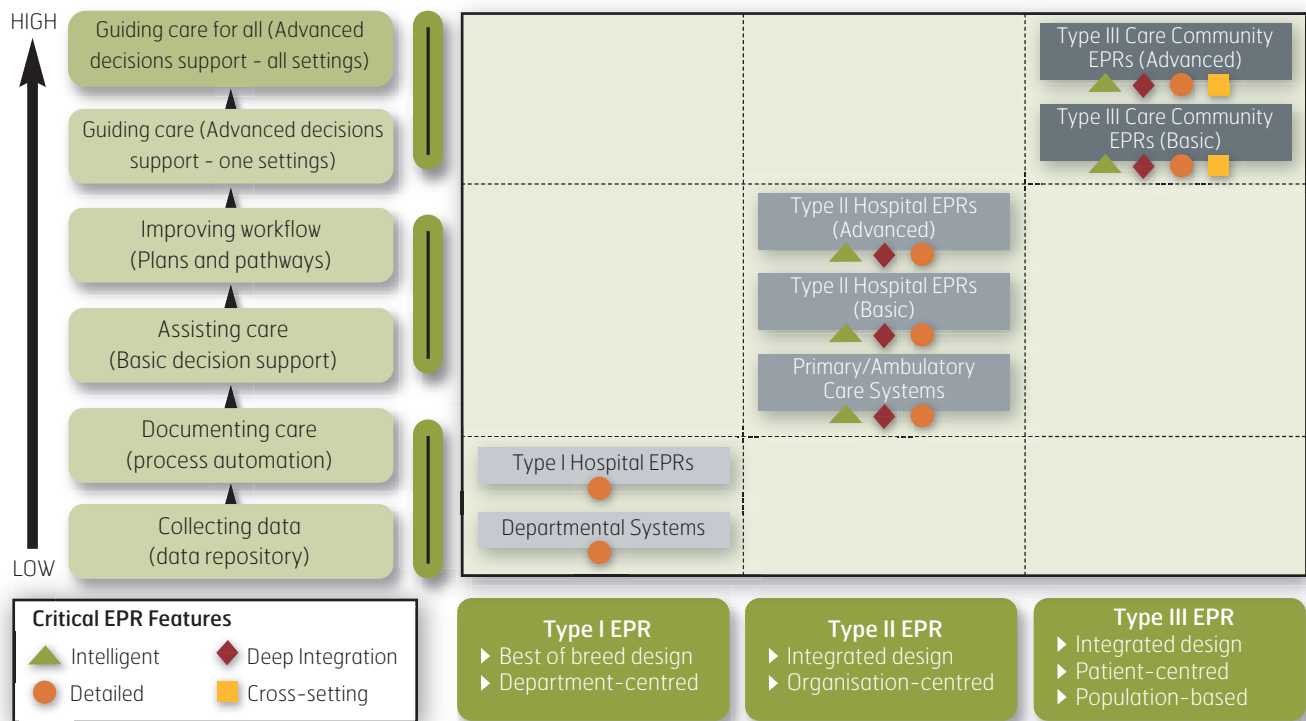
**Tier I hospitals** adopt a "Hospital Departments" business model and view EPRs as a technology to maintain hospital operations and activity reporting by replacing aged (and/or introducing new) PAS (Patient Administration System) and departmental systems such as A&E (Accident and Emergency), maternity,

operating theatres, cancer, pharmacy, etc.

**Tier II hospitals** adopt a "Hospital Integration" business model and view EPRs as a technology as well as an organisational change agent for improving (or transforming) the way the hospital does business, integrating processes across departments, improving the quality of care in multidisciplinary ways and improving the safety and experience of patients across the patient journey through the hospital.

**Tier III hospitals** follow a "Vertical Integration" business model and view EPRs as a technol-

Figure 1. EPR demand, supply, critical features and quality impact.



\*Following Gartner



ogy, an organisational change agent, and a tool that supports the vertical integration of care with other healthcare organisations across the local care community or health economy. The EPR is a collaborative tool for supporting, and indeed stimulating, integrated care across care settings and care organisations, in the manner of an Integrated Care Organisation (the new pilot programme established by the Department of Health in late 2008). Kaiser Permanente and Intermountain Health in the US exemplify the Tier III hospital business model.

**The supplier market for EPRs** is classified into 3 corresponding product segments and supplier business models:

**Type I EPR suppliers** follow the "Best of Breed" business model and develop EPR products to meet the demands of Tier I hospitals. They offer collections of departmental systems and an interface engine to exchange patient, orders and results data using HL7 messaging. They tend to offer more decision support functionality within, and less across, departments.

**Type II EPR suppliers** follow the "Integrated EPR" business model and develop EPR products to meet the demands of Tier II hospitals. They offer an integrated suite of EPR modules that satisfy the needs of hospital departments AND provide an additional level of cross-department or enterprise-wide (i.e. integrated) benefits such as: (a) hospital-wide decision support; (b) hospital-wide scheduling; and (c) hospital-wide integrated care pathways.

**Type III suppliers** follow the "Vertical Integration EPR" business model and develop EPR products to meet the de-

mands of Tier III hospitals and other healthcare organisations. There are no 'pure-play' Type III EPR suppliers in the UK but some of the more established Type II suppliers are likely to claim that they already have Type III EPR products available, particularly from their overseas product catalogue, but have not sold them in the UK due to lack of sufficient Tier III demand.

### EPR Impact on Quality of Care

There are 4 critical success factors that enable EPRs to improve the quality of care. EPRs need to:

- (a) Be intelligent (i.e. offer advanced real-time and proactive clinical decision support);
- (b) Offer deep integration (i.e. functions need to be integrated seamlessly by design and at all levels of EPR function);
- (c) Be detailed (i.e. the full set of up to date and relevant clinical details need to be available, not just a subset where important clinical data will regularly be missing), and
- (d) Be cross-setting (i.e. operate wherever the patient is, not just within the bounds of certain organisations or clinical offices).

These critical success factors highlight the need to ensure 'materiality of impact' when designing and deploying EPR systems. EPR benefits (such as reducing adverse drug events and medical errors, improving patient safety, enhancing the patient experience, improving outcomes) need to be measured in terms of [level of benefit from EPR] x [numbers of patients likely to benefit from EPR]. Applying Type III systems across a care community is more likely to achieve a HIGH [level of benefit], based on research evi-

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dence, and for HIGH [numbers of patients likely to benefit]. Summary records, or passive clinical data repositories have low impact because they lack detail and intelligence.

Most hospitals in the UK drift along as Tier I hospitals and consider Type I EPRs to be sufficient for their needs. Many hospitals have slowly progressed to Tier II mind-sets and can see the benefits of the well integrated Type II EPRs as promised by the LSPs for the past 6 years. However, the greater benefits underlying integrated care and Tier III hospital business models are beginning to be recognised by a few hospitals (and associated organisations). These benefits should be stimulated and realised.

There is a growing trend to discharge patients from hospitals

back to their homes so that they are rehabilitated in a familiar environment. Such trends require Type III systems that operate across healthcare providers and enable clinicians (e.g. nurses, GP's, therapists) to deliver treatment seamlessly across acute, community and primary care settings. Chronic diseases also require Type III EPRs with clinical pathway and case management functions. Over the years there has been a proliferation of disease specific solutions but which do not work across the care continuum (they are Type II and not III).

**The key conclusions from the above considerations are:**

1. Healthcare needs to be more patient-centric. Hospitals should think Tier III and plan for local vertical integration in

clinically and organisationally practical ways. The Darzi Review's clinical pathways are an expression of this objective. Virtual care teams at the clinical pathway level should work across care settings in multidisciplinary ways. To facilitate such collaborative working, hospitals and other providers should form EPR procurement consortia and share in the design, costs and benefits of Type III EPR systems.

2. The higher the EPR Type the higher the quality of care but also the higher the quality of information that will be generated as a by-product of that improvement. Reliable information is best obtained from systems that are relied upon.

3. EPRs should be procured against a local EPR vision and strategy. Years of frustration and disillusionment have led to disinterest in IT strategy at local levels. This trend must be

reversed so that the progression from Type II to Type III systems can be designed, developed and deployed.

4. Type III EPRs should be sought directly from EPR suppliers, not the LSP. The LSP model of EPR deployment has failed because LSPs lack EPR experience and interfere with the EPR customer/EPR supplier relationship.

5. In the future higher tiers of EPR demand will emerge including EPRs that work across geographies (e.g. Tier IV: National EPR needs) and Tier V: Global EPR needs). Corresponding EPR types will emerge to meet this demand. In any case, the EPR is more than just a 'record'; it offers intelligent and proactive functionality that will guide and predict care across patient populations, clinicians, organisations and countries.

6. Bringing data together does not in itself integrate care, either at the organisation, regional or national levels. Deliberate and collaborative efforts to integrate care across local settings, designed around the patient, driven by local care givers, is required first.

7. EPR vendors will not develop new systems until they see real demand from the market. A more cohesive and visionary approach to EPR procurement is therefore needed across care communities (primary, secondary and acute).

EPRs will have the next highest impact on quality of care when Tier III demand is matched by Type III products because that is where integrated products support integrated care. And more integrated care is what patients desire and deserve.

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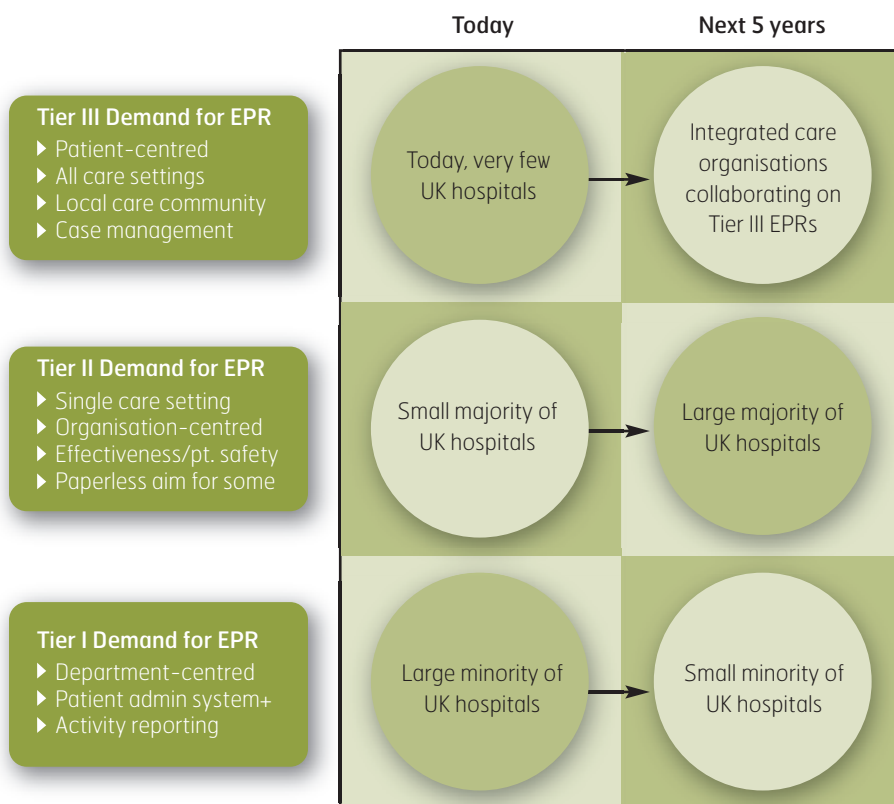


Figure 2 The EPR Market in the UK - Demand

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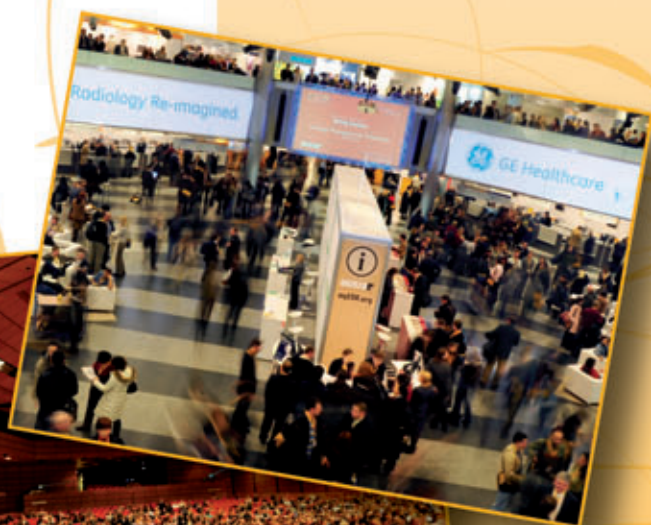
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# THE CHRONIOUS PROJECT

## An Open, Ubiquitous and Adaptive Chronic Disease Management Platform for COPD and Renal Insufficiency

By Roberto Rosso

**L** launched in Venice on February 1, 2008, CHRONIOUS is a highly innovative Information and Communication Technology (ICT) research project that aims to implement its vision for ubiquitous health and lifestyle monitoring of people with chronic diseases at a European level. CHRONIOUS is partially funded by the European Commission (under the 7th Framework Programme) and expected budget counts up to 10,598 million euros. The European Commission's expected contribution is 7,250 million euros. The project will last for 42 months.

The CHRONIOUS team is a consortium of internationally renowned research labs in Europe, hospitals, universities and private companies.

CHRONIOUS consists of designing and implementing a wearable platform, based on multi-parametric sensors processing, for monitoring people suffering from chronic diseases.

In particular CHRONIOUS will be tested with patients suffering from chronic obstructive pulmonary disease (COPD) and chronic kidney disease (CKD) in their home. These two pathologies have been chosen because they are widespread and highly expensive in terms of social costs.

### Project Reasoning and Development

CHRONIOUS's primary goal is to define a European framework for a generic health status monitoring platform schema, addressing people at risk or with chronic health conditions. This goal will be achieved by developing a multidisciplinary, sophisticated, and adaptive chronic disease platform that integrates state of the art sensors and services in order to cover both patient and healthcare professional needs.

Data will be collected at home using monitoring sensors, mostly wearable, that continuously control vital parameters, sounds and activities performed by patients suffering from COPD and CKD. A Bluetooth network will link environmental monitoring, wearable devices, patient interface and sensor data management. Every abnormal health condition will be noticed and reported by the system. In particular this system has the main objective of reporting deviations and all conditions differing from those that are expected.

The main elements of the project that have to be highlighted are:

**a)** Development of wearable sensors in order to monitor pa-

rameters concerning health status, environmental context and social context;

**b)** Very simple and friendly interfaces as expected users are old people with very limited technological knowledge and abilities;

**c)** New algorithms and methodologies for assessing information coming from the monitoring device; new decision mechanisms and instruments aiming at enhancing both patients' and physicians' possibilities in deciding in real time how to react;

**d)** Collection and management of appropriate, shared and validated medical knowledge, and

**e)** Interoperability with existing ICT systems based on common standards to exchange useful information.

Once the CHRONIOUS wearable monitoring prototype and the general infrastructure are ready, the resulting innovative device will be tested by implementing specific clinical trials in Italy and Spain.

### Ethical and Legal Issues

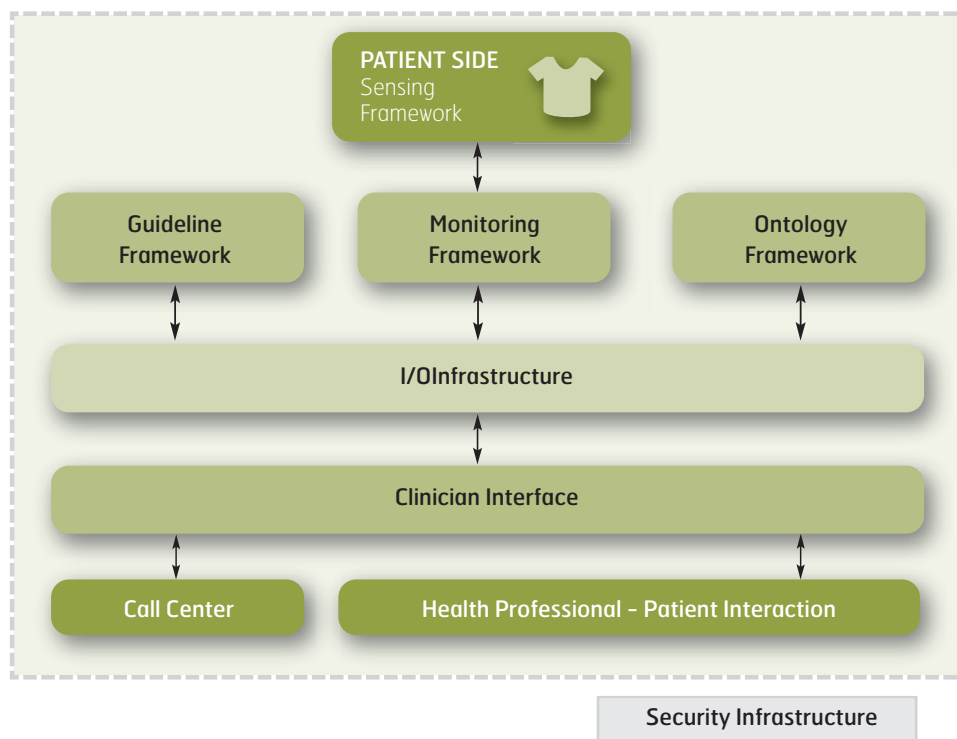
CHRONIOUS is highly sensitive to what is considered to be the ethical use of human beings by the scientific community and confidentiality issues with specific reference to information on patients.

The legal aspects related to CHRONIOUS project concern regulations regarding medical devices, clinical trials and privacy protection of personal data. The Declaration of Helsinki, the European directives and all related national laws passed in Italy and Spain are being taken into consideration in designing and implementing the Chronious system. Full compliance with these rules is requested to address the protection of human dignity; the related controls are assigned to local ethical committees.

The first problem concerns the anonymity of users. It means that the information concerning personal or material circumstances can no longer, or only with a disproportionate amount of time, expense and labour, be attributed to an identified or identifiable individual.

A second important issue concerns wearable medical monitoring applications and how not to disclose the information collected about the user. Since the user would like the data collected to remain private, the data will be encrypted and made physically secure.

But simply wearing the device may disclose to the user's employer/insurer/acquaintances that the user is suffering from a



medical condition and in more cases it is not desirable for the patient. In order to reduce risk of such disclosure, the wearable monitoring device is being designed to be as unobtrusive as possible. The use of encryption technologies and the use of closed networks for the transfer of personal health data are some of the additional measures that the CHRONIOUS system is considering.

Moreover, the system will be designed to ensure that the CHRONIOUS elements are safe to use and do not generate any adverse effect to the human body. The device will comply with the international quality system standards and all EC directives, which apply to the manufacture and use of the product.

Also transparency in decision mechanisms can help all actors involved and make them aware of what the system is and how it evolves. For this reason an advisory board on ethical issues has been constituted and will pay attention to respect interna-

tional and national rules dealing with the protection of subjects involved in the clinical trial. The first task of the advisory board on ethical issues has concerned the preparation of an appropriate template for informed consent for the distribution of questionnaires among patients in order to properly address user requirements issues.

### Benefits Expected

- Raising quality of life and providing highly qualified and efficient, holistic healthcare services to all EU citizens (e.g. through disease prevention, ubiquitous and seamless to the user monitoring, adaptive interaction based on user characteristics and context of activity, reduction of unnecessary visits to hospitals and complexity of self-care especially for patients with chronic diseases);
- Advancing medical research through the provision of advanced disease prediction and diagnosis tools and the exploitation of the vast pool of

monitored parameters (e.g. vital signs recorded for various user groups under diverse contexts and conditions) for the production of new diagnostic models and protocols;

- Reducing formal care burdens, and hence improved formal care (e.g. through the reduction of patients' visits for routine examinations, the prevention, diagnosis and in some cases prognosis of diseases, immediate intervention in emergency or time-critical situations);
- Penetrating neighbouring future markets and creating new business opportunities by integrating various actors (e.g. microelectronics industry and telecommunication providers or research institutes) and reinforcing competitiveness;
- Improving informal care effectiveness without increasing intrusion;
- Reducing the cost of informal care, which is particularly high for people suffering from chronic diseases, and
- Involving the care recipient in health promoting activities and decision-making.

### Impact on patients' life

- ▶ Non-invasive monitoring;
- ▶ Reduces routine visits to hospitals for diagnostic purposes;
- ▶ Provides more tranquillity thanks to the reduction of time of intervention in time-critical situations;
- ▶ Integrates an alert and reminder service linked to particular behaviours such as drug intake, eating and activities performed;
- ▶ Requires an active participation of patients both in monitoring and decision-making, and
- ▶ Needs availability of adequate ICT equipment at home and a friendly approach to new technologies by patients and their families.

### Impact on health institutions and professionals:

- ▶ Reduction of acute events and related hospitalisation costs up to 20-30%;
- ▶ Significant rationalisation of medical prescriptions for diagnostic routine examinations;
- ▶ Stronger integration with home care service providers both in terms of shared clinical pathways and technological interoperability;
- ▶ Sensible growth in cooperation and multi-actor approach to chronic diseases, and
- ▶ Enhancement in ICT investments.

While depicting the testing framework and outlining the related scenarios, a prototype of the CHRONIOUS wearable monitoring device is being developed.

Once it is ready, it will be possible to assess in a more concrete manner all potentialities and problems concerning the project.

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# POSTPONING IS POISON

## Conflict Resolution Patterns in Hospitals

By Hans Martin Hasselhorn, Peter Tackenberg and Sascha Schmidt

### Introduction

Workplace conflicts are part of work reality. Research shows that conflicts at work have a negative effect on the employee's job satisfaction and constitute an important source of stress. However, in recent years it was argued that it might not be the conflict per se that is detrimental to health and health consequences but the way in which conflicts are resolved. Three different ways of conflict solving may be distinguished:

- i) discussion style,
- ii) using authority, and
- iii) postponing (= "not solving").

Which method of conflict resolution is the best? Current research finds that unresolved conflicts (here: "postponing") have the most negative impact on the worker. Is this also the case in nursing in hospitals, where team work prevails?

The European NEXT-Study has shown that European countries differ to a high degree with respect to work organisational factors and their consequences on nursing staff. NEXT has also found that leadership quality is essential for numerous relevant outcomes such as nurses' health, attitudes and behaviour. Not surprisingly, promotion of leadership quality is called a key target of sustainable and successful workplace health promotion in healthcare. Little attention, however, has been put so far on conflict resolution style and their consequences in healthcare.

In this contribution NEXT follow up data is used to investigate the impact of different conflict resolution styles on hospital nurses in 7 European countries. Outcomes of interest are organisational factors, namely sickness absence, the "intent to leave the current institution" and burnout.

### Results: Conflict Resolution Style by Country

On average, almost one in four nurses (24%) reported frequent 'postponing CR style'. About one in five nurses (21%) stated that 'authoritarian CR style' was frequently used (Table 1). Rare 'discussion CR style' was less frequent: one out of 6 nurses (16%) reported this. However, differences between the countries were striking. Most participative and active CR patterns were reported from the Netherlands, whereas in Poland and especially in Slovakia the least participative conflict resolution was reported. Interestingly, 'postponing' was similarly frequent (ranging from 27 to 31%) in all countries except the Netherlands and Poland. In Poland the very frequent authoritarian style (34%) conflict resolution may have

prevented a higher frequency of postponing.

### Impact of Conflict Resolution Style by Country

From a hospital administration view, not only the frequency of adverse CR style is of interest but also its impact on staff and relevant outcomes such as burnout. For example, we find that Polish and Slovakian nurses were to a very high degree exposed to adverse CR styles, but interestingly, this was only moderately associated with effects such as burnout or the intent to leave the institution.

**Sickness Absence:** Slovakian nurses reported the lowest (3) and German nurses the highest (10) number of sickness absences days in the past 12 months. Differentiated analysis revealed that that in NEXT leadership style did not have a strong influence on sickness absence.

### Intent to Leave the Institution:

Between 12% (Slovakia) and 27% (France) of all respondents considered frequently (= "several times a month or more") to leave their current institution. Here, our analyses indicate a considerable influence of the conflict resolution style, especially of the postponing CR style. If – theoretically - leaders of nurses who often, always or sometimes postponed conflict decisions would only rarely do

	N	Proportion (%) of respondents reporting...		
		DISCUSSION "seldom/ hardly ever"	POSTPONING "often/ always"	USING AUTHORITY "often/ always"
Belgium	904	16	29	14
Germany	1585	15	29	17
France	1337	12	27	18
Italy	2776	16	31	18
Netherlands	1329	5	16	5
Poland	3603	23	16	34
Slovakia	853	22	31	32
<b>Total</b>	<b>12387</b>	<b>16,5</b>	<b>24,3</b>	<b>20,9</b>

**Table 1:** Participants by country and percentage of respondents reporting adverse conflict resolution style (only registered nursing staff working in hospitals without leading function)

so, the proportion of nurses considering leaving the institution would be clearly reduced in most of the countries, in Germany for example from 19% to 8%. Authoritarian CR style showed a similar effect.

**Burnout:** The CR styles were clearly associated with the proportion of burned out nurses, especially in Germany, Italy, Poland and Slovakia. Whereas in Germany and Italy postponing seemed to have the highest impact on burnout, it was the authoritarian CR style in Poland and Slovakia where, for example, our calculations imply that the rate of 32% burned out nurses could – in theory – be reduced to 25% if all nurses were rarely or never exposed to authoritarian CR style.

## Conclusions

Our results indicate that the conflict resolution style may have a substantial effect on nurses in hospitals, however the effect size of negative conflict resolution differs substantially between CR style, country and outcome.

Clearly, postponing conflict resolution has the strongest impact on nurses' psychological well-being (burnout) and especially on their institutional and professional withdrawal attitudes. Healthcare requires frequent immediate decision making and then postponing can be poison. High degree of authoritarian conflict resolution has about the same negative effect as a low degree of discussion conflict resolution.

The outcomes intent to leave the institution and also intent to leave the profession showed the highest sensitivity to CR style. This is not surprising as it reflects the nurses' own coping with adverse work organisational aspects, namely by developing withdrawal intentions.

Burnout is a rather unspecific reaction and many factors besides CR style contribute to this, therefore the association with CR style is less pronounced. The consistent absence of association with self reported sickness absence days was surprising as it contradicts previous findings.

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# Healthcare requires frequent immediate decision making and then postponing can be poison.

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We have found pronounced differences between the countries with respect to degree of exposure and theoretical impact. The example of the Netherlands indicates that a widespread participatory CR style is possible (see table). Germany and Belgium showed the highest potential for improvement. There, exposure to adverse CR style was medium high and it was highly associated with intent to leave the institution and with burnout.

Results from Poland and Slovakia showed a very high exposure to non-participatory CR style, however, the association with the outcomes was low. Obviously, other reasons explain the very high rate of burnout in these countries and the high rate of those who want to leave the institution in Poland.

Conflict resolution is one among several aspects of a comprehensive leadership culture. This culture is composed by attitudes and expectations of the workers, by individual characteristics of the leader, by the leadership culture of the institution and – as we clearly can show – by a societal culture. Societal leadership culture reflects long lasting processes during which certain behaviours and strategies have shown to be more likely to fit better with the dominant norms and values of a society and therefore to be more successful. In consequence, a German solution may not fit Poland and vice versa. But both countries have one aspect in common: the change. The question is whether the consis-

tency of norms and values still prevails in times of rapidly changing nurses' work environment, economic downsizing in healthcare and consequently a decreasing skill mix at many hospitals. Change always implies high demands for decision making among all involved. Our findings imply that this issue might be worth addressing in organisations. Change may be regarded as an opportunity for improvement. The findings presented in this article may stimulate organisational awareness for CR style.

Can CR style in hospitals be improved? Conflict resolution requires the leaders' authority, empathy, decision latitude and not least qualification and competence. Consequently, CR style is no isolated part which can be improved by targeted measures alone. Instead, the personal development of nurse leaders in hospitals is the key target. Within this personal development process, our findings may help to visualise and to quantify a daily and highly relevant, yet widely neglected aspect of work in hospitals: conflict resolution.

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## The NEXT-Study

The NEXT-Study investigated work, health and professional prospects of nursing staff in ten European countries. It was conducted between 2002 and 2006 and financed by the European Commission (QLK6-CT-2001-00475). In the follow up questionnaire circulated in 2004-2005 the following questions about the conflict resolution (CR) were asked:

*"If there are problems in your working team: How are they being dealt with in general?"*

- a) by discussing them among those involved.
- b) by postponing them.
- c) by using authority.

The response categories were "hardly ever", "seldom", "sometimes", "often", and "always". We have limited the analysis to in total 12386 registered hospital nurses in 7 countries. Ward sisters (the leading nurse on the ward) were excluded, since they would have rated their own leadership style in the questionnaire. ([www.next-study.net](http://www.next-study.net))

# MANAGING INFORMATION SYSTEMS SECURITY

## Compliance Between Users and Managers

By Karin Hedström, Dr. Fredrik Karlsson and Ella Kolkowska

**U**sers are often viewed as an obstacle, a problem, within information systems security. One problem often raised is the users' low awareness of information systems security (ISS) regulations. The purpose of ISS is to, through technical, administrative or managerial means, protect an organisation's information resources. Having good ISS measures is important in hospitals, both for patient security and patient privacy. ISS routines that do not work can lead to mal-treatments due to incorrect information, or disclosure of sensitive information to unauthorised people. To analyse how users comply with ISS regulations and policies is important if we want to gain an understanding of the impact, and use, of ISS measures. It is equally important to identify whether users have developed their own routines to deal with security risks.

The results in this article are based on a compliance study at the surgery clinic and medical clinic at Karlskoga hospital – a small Swedish county hospital in central Sweden. The hospital serves approximately 90 000 citizens, and is located in the County of Örebro, responsible for the healthcare of its 274 000 inhabitants. The two clinics were chosen as they handle a large amount of patients, and com-

plement each other in terms of ICT (information and communication technology) use. The surgery has yet to introduce electronic health records (EHR), while the medical clinic regularly uses EHRs. Apart from the medical records, the clinics also handle patient information for e.g., operation planning or discharge notes. The study focused on the users' handling of patient information and whether they followed ISS regulations or not.

Regulations and policies regarding ISS measures were identified by analysing hospital-wide, as well as clinic specific formal routines found in documents as well as through interviews with regulators (e.g., quality manager, ISS manager). Users' ISS measures were identified through interviews with nurses, doctors, and administrators at each clinic. The interviews were further contrasted and complemented with observations of how the users work with patient information.

### ISS Regulations in Practice

We identified three compliance areas. The first is when users follow the ISS measures put forward in formal regulations and policies, the second is when users' actions are in conflict with

formal regulations and policies, and the third and final compliance area illustrates instances when users have developed their own ISS measures. These three areas demonstrate that users are aware of formal ISS regulations and policies, but that they sometimes choose, consciously or unconsciously, to deviate from them, and that there are important ISS issues that the formal regulations and policies fail to cover.

### Users Follow Formal Regulations and Policies

We found that users normally follow formal ISS regulations and policies. There was high compliance with formal measures regarding rules describing how to maximise the integrity of patient information, the availability of patient information and confidentiality of patient information. A formal routine to ensure the integrity, the correctness, of patient information can be formulated as 'test results must be signed before they are put into the medical journal.' Observations of the daily routines at the medical clinic confirmed that the users followed this routine. One rule describing how to make information available is written as 'everything that is of importance has to be documented in the medical journal.' We found many

user actions following this specific rule. To ensure confidentiality of patient information was also an important formal ISS measure. One such routine was to make sure that sensitive patient information, such as copies of the medical journal, was destroyed, and not thrown in the bin, risking disclosure to unauthorised people. Interviews as well as observations confirmed that this rule was followed by users in the clinics.

### Users in Conflict with Formal Regulations and Policies

Users sometimes failed to follow the formal regulations and policies. It is common with conflicts between formal rules aiming at maximising integrity of patient information and the nurses' and doctors' efforts to spend as much time as possible with the patients. The chief physicians were for instance exempted from signing dictates, which is a specific requirement in several formal documents regulating the ISS routines, as they prioritised meetings with the patients. Another conflict area is between formal regulations and policies regarding maximising confidentiality of patient information, and doctors and nurses need for patient information that is easily available. ISS measures regard-



ing confidentiality of patient information is often written in the formal regulations and policies as 'medical journals shall be handled in a way that prevents unauthorised people from accessing them.' Even though this is acknowledged as a very important rule by doctors and nurses, they sometimes deviate from this rule in order to make their daily work more efficient. It is, for instance, quite common that medical journals are placed in easy accessible, but not very secure, places in order to make it quicker and easier for the doctor to access the medical journals before a patient consultation.

### Users Develop Their Own ISS Measure

Our last compliance area describes when users develop ISS measures that formal policies and regulations fail to cover. Almost always, this concerns ISS measures regarding the availability of patient information. It

is very important for doctors and nurses to have easy access to patient information. This means patient information must be well-arranged. The users arrange for instance the medical journals in alphabetical order. The medical journals are arranged in alphabetical order. It is important that the medical journals are in order. Otherwise it is difficult to find the information you need.' Another important thing is to have complete patient information before the doctor's consultation with the patient. 'The day before [a patient consultation] we go through all the medical journals, make sure all journals are there, all referrals, and all test results.'

### Conclusion

Our work at Karlskoga hospital has shown us that users are, contrary the prevalent view, aware about the importance of ISS, and that doctors, nurses and administrators normally follow the prescribed ISS meas-

ures. What surprised us was, however, how little the formal rules and regulations addressed the users' need for easy and timely available patient information. The need for available patient information was often stronger than the urge to follow prescribed rules, which sometimes made them deviate from the formal regulations. Another observation was that the formal rules and regulations were focused mainly on electronic patient information, which made the formal view on ISS and the need for ISS measures very limited as they failed to address information that is handled manually. An exception to this was the manual medical records that were regulated in a separate document. ISS is much more than only electronic information, and a large part of the patient information is handled manually, which makes it important that formal rules and regulations cover manual patient information as well.

It is important to acknowledge, and be aware of users' compliance with ISS regulations and policies, in order to develop the secure management of patient information. Hospital managers need to understand doctors' and nurses' priorities and work practices. Our study has for instance shown the need for timely and efficiently available patient information in health-care institutions. This illustrates the importance of including users' (here doctors and nurses) values in the management of ISS. If we fail to do so, there is a risk that we create ISS regulations and policies that are ignored or in the worst case, violated. Another risk is that we miss out important and central knowledge that users have and that could be of great value for creating measures for the protection of patient information.

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## ► CIA Triad

The core principles of information systems security are widely known to be confidentiality, integrity and availability. This is known as the CIA triad.

### Confidentiality

Information stored in the system, especially in the hospital environment must be kept confidential. Patient confidentiality must not be breached with the implementation of new and advanced information systems. Therefore creating appropriate levels of access to the information is important.

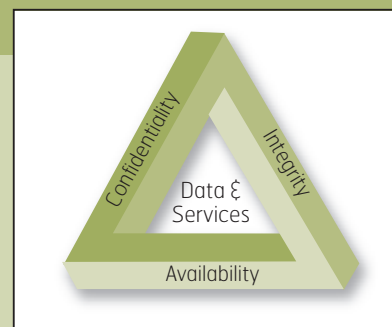
### Integrity

Integrity in the context of information systems means preventing information from being modified without authorisation. This

is particularly important regarding the accidental or malicious modification or deletion of files. For this reason processes must be appropriately tested before implementation to avoid errors, which in the hospital environment could have fatal consequences. Potential user mistakes should also be easily fixed.

### Availability

The information stored in the system must be available when needed. The system must function properly at all times, giving its users access to the information they need within the appropriate timeframe while keeping in line with its security controls and coping with emergencies, power shortages etc. Availability also means usability, is the system hard or easy to use?



The CIA triad is the point of reference for information systems security for both system design and management. However, it must be remembered that the triad is a limited model. In order to ensure successful security for your information systems the triad may be useful as a starting point but must be adapted accordingly. It does not, for example take into account the specifics of hospital information systems.

# Development of CT-like Imaging Function for BRANSIST *safire* Angiography System

Shimadzu Corporation, Medical Systems Division

## Introduction

Much attention is being given to CT-like imaging, a technique whereby cross-sectional images like those obtained with CT are constructed from rotational images gained from a C-arm angiography system with an FPD. This article reports on Shimadzu's development of this function for the BRANSIST *safire* VC17 angiography system with a 17-inch direct-conversion FPD (Fig. 1)

## The Aim of CT-like Imaging Performed with an Angiography System

The main aim of CT-like imaging is, by allowing 3D information to be acquired during IVR treatment without moving the patient, to help increase the safety of examinations and treatments and improve therapeutic efficacy. 3D-angiography is another technique that allows 3D information to be reconstructed from rotational images obtained with a C-arm. It is mainly used, however, to visualize blood vessels illuminated with contrast medium, whereas CT-like imaging offers much greater low-contrast resolution, making it possible to visualize tumor stains. Because of this characteristic, CT-like imaging is mainly used for the following two applications:

- 1) The identification of feeding vessels in the execution of chemotherapy for a tumor and

the determination of the appropriate amount of drugs for chemotherapy to be used from the size of the affected area.

- 2) Evaluation of efficacy and checking for bleeding after IVR treatment.

Patients used to be moved to the CT room during IVR treatment for the above reasons. With CT-like imaging, the risk of this movement is avoided and information can be acquired quickly. An IVR-CT system has the same functions, but both in terms of cost and operation, CT-like imaging attains superior cost-effectiveness. Fig 2 shows a clinical image obtained with this system using CT-like imaging during arterial portography. A defect of contrast medium in the liver tumor can be seen clearly.

## CT vs. CT-like Imaging

CT-like imaging is by no means superior to CT. Table 1 shows a comparison of the basic performance of the two modalities. CT-like imaging is, in fact, inferior to CT in terms of low-contrast resolution. This is because it is based on the use of an angiography system, and consequently the data bit length and the number of exposures are limited. Also, with CT, the scattered radiation that enters the sensor is reduced to around 1% by a grid, whereas with an angiography system, the basic mechanical structure makes this kind of reduction impossible, and roughly half of the X-rays that enter the FPD consist of scattered

radiation component. Although this scattered radiation component can be corrected to some extent with image processing, it cannot be removed accurately, and this results in inaccuracy of the CT values of reconstructed images. At present, CT-like imaging does not produce absolute CT values, but rather visualizes the relative differences in the X-ray absorption coefficients of different objects. As the name implies, it is a technique that produces images that are comparable to, but not the same as, those produced with CT. On the other hand, CT-like imaging is superior to CT in some aspects. One such aspect is high-contrast resolution (spatial resolution). With CT-like imaging, it is possible to create isotropic 3D images with a high level of spatial resolution. Also, the system that we developed can perform acquisition for CT-like imaging with an exposure level of no greater than one fifth to one half that of CT. This yields clinical benefits. For example, in cases where there are multiple feeding vessels, CT-like imaging is acceptable for each one.

## The Principle of CT-like Imaging

Fig. 3 shows the flow of the imaging data processing performed by this system. Broadly speaking, the rotational images obtained are converted to CT-like images in three stages. In the first stage, the pixel values of the rotational images are converted to X-ray absorption coefficients. The pixel values are first sub-

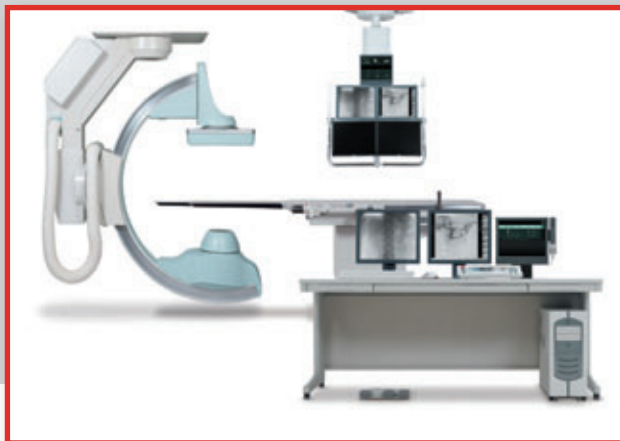


Fig. 1

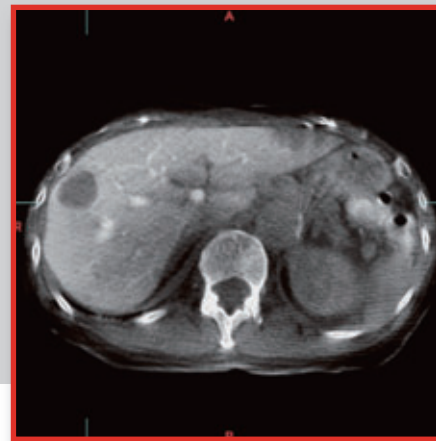


Fig. 2

Specification	CT-like Imaging Performed with BRANSIST safire VC17	Multislice CT
X-ray detector	17-inch FPD	Scintillator + Photodiode
Rotation mechanism	C-arm	Gantry
Rotational imaging range of imaging system	225°; continuous rotation not supported	360°; continuous rotation supported
Exposure time (1 scan)	10 or 20 s	0.5 to 1.5 s
Number of exposures (number of views)	Approx. 300 or 600	800 to 1,200 min.
Data bit length	14 bits	20 bits min.
Low-contrast resolution (16cm-dia. CATPHAN)	Approx. 10 HU/10 mm	Approx. 3 HU/3 mm
High-contrast resolution (10% MTF)	0.45 mm min. (isotropic)	0.6 mm min. (non-isotropic)
Exposure dose	Approx. 1/5 to 1/2 of CT dose	—

**Table 1**

Performance Comparison of CT and CT-like Imaging

jected to gain correction, and then after the scattered radiation component is removed by scattered radiation correction processing, beam hardening correction is applied to complete the conversion to X-ray absorption coefficients. In the next stage, the following four types of correction are performed:

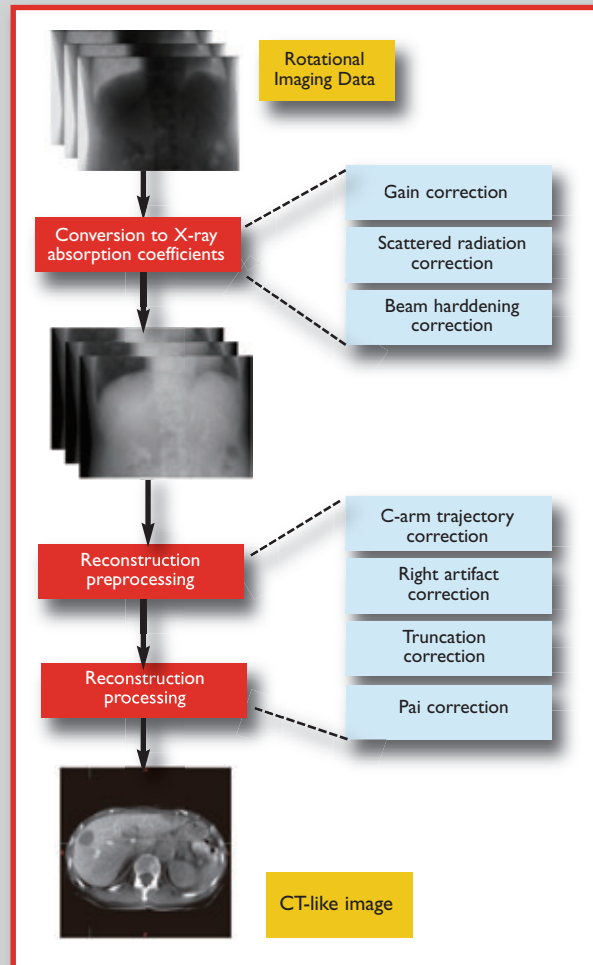
- C-arm trajectory correction, which corrects the displacement from the ideal trajectory
- Ring artifact correction, which removes noise in the sinogram
- Truncation correction, which interpolates the sinogram for parts that protruded outside the exposure range during rotational imaging
- Pai correction, which corrects differences in the amount of acquired data that arise between the center and periphery in half-scan reconstruction due to the cone-beam effect.

After the above corrections are performed, the data is converted to 3D information via reconstruction processing. The reconstruction algorithm is based on the FBP (filtered back projection) method as illustrated in Fig. 4. This method of combining projected images in 3D space is called “back projection”. FBP is a more precise version of back projection in which filtered projected images are used instead of projected images themselves in order to reconstruct 3D information about the original object that includes density infor-

mation (X-ray absorption coefficients). This system uses a type of FBP method called the “Feldkamp” method. Shimadzu developed a CT-like imaging function (including a 3D-angiography function) as an optional workstation for BRANSIST safire VC17 angiography system. After C-arm rotation, reconstructed images can be displayed in as little as 90 sec. A CT viewer is used for image observation, and in addition to the 2D display of axial images, MPR, CPR (curved MPR), MIP, volume rendering (VR), and virtual endoscopy (VE) are supported. Various types of masking, the creation of cine images, and distance measurement are also available.

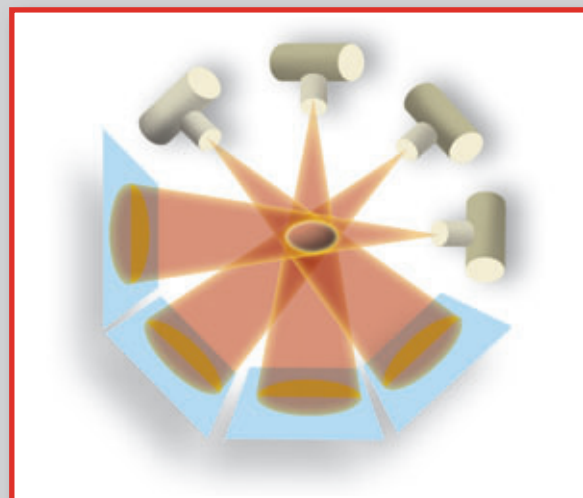
### Summary

CT-like imaging performed by an angiographic C-arm system is a new technology. It offers low exposure and high spatial resolution, and is expected to be used in an increasingly wide range of applications. In the future, Shimadzu plans to improve the processing time, low-contrast resolution, and accuracy of CT values etc. furthermore. Special thanks to the University of Occupational and Environmental Health (Japan) for providing clinical images used in this article.



**Fig. 3**

Flow of Data Processing



**Fig. 4**

# INNOVATIVE IT SOLUTIONS FOR ASSET MANAGEMENT

By Daniël Loos and John F. Wilder

**A**sset management and control is an enduring challenge for all hospitals. The scope and scale of hospital 'assets' is both vast and heterogeneous. Nevertheless IT has been increasingly deployed, often in imaginative ways, to meet such challenges. This article provides a working example of asset management: the control of an expensive product found in most hospitals, the anti-decubitus mattress. Lessons from this case were applied by

the hospital's IT management to other items such as wheelchairs and infusion pumps, and could in theory be extended to any non-fixed asset.

## THE REGIONAL HOSPITAL ST. TRUDO, BELGIUM

Daniël Loos is IT Manager at the Regional Hospital St. Trudo, Belgium.

The Regional Hospital St Trudo (RSZT) is the result of a merger between the St. Anna and St.

Joseph hospitals in St-Truiden, Belgium. The hospital has 310 beds and is the main regional hospital for the Belgian region of South-West Limburg and southern Flemish Brabant.

With more than 700 employees, including about 90 physicians, it provides about 11,000 patients with healthcare services per year. The hospital is equipped with an electronic patient record system and continuously invests in innovative medical equipment and systems.

## Anti-decubitus Mattresses to Infusion Pumps and More

The RSZT strives to constantly improve care for its patients. In this context, we at the IT department sought a method for the management of rather expensive anti-decubitus mattresses. These are used to prevent wounds by patients who need to stay in bed for prolonged periods.

The biomedical department of the RZST has 24 standard anti-decubitus mattresses in stock. Unfortunately, these mattresses frequently disappeared after discharge of a patient, and it required considerable amounts of time for the biomedical department to track the missing mattresses. The management of the mattresses was not always optimal, which sometimes resulted in the need for making extra rental orders from an external supplier. Together with network partner NextiraOne, we installed a pow-

erful wireless network from Cisco. This wireless network makes it possible for doctors to consult the electronic patient records at the bedside of the patient and also have access to most up-to-date medical and nursing information.

WiFi RFID tags of AeroScout have been deployed to help the biomedical department to quickly locate critical materials.

All mattresses now get a small wireless RFID tag attached that is permanently connected to the wireless network. Thus the biomedical department now always knows where each mattress is, and does not need to waste time with unnecessary searches or face the need to order extra units. This was welcome news from a business point of view, since the rental of anti-decubitus mattresses had been generating wholly unnecessary costs.

Other critical materials such as wheelchairs and infusion pumps have also been given a RFID tag, saving time for receptionists. At the reception, there are about ten wheelchairs available for the transport of patients. Previously, when all wheelchairs were in use, receptionists had to make a physical search to track a free wheelchair. Currently, it suffices to open the AeroScout web application and locate all wheelchairs. The IT department has set up the system to generate an alarm when there is only one wheelchair left, or when a wheelchair has been parked at a place other than the reception beyond

## ▶ Asset Management

Asset planning and management, in the context of a health-care organisation, is a detailed and structured approach to the long-term management of assets, from the valuation, purchase, and operation, to the sale of assets. The aim is to enable efficient and effective delivery of health services while respecting and following strategic objectives.

Asset management is thus a process that includes:

- ▶ Identification of a need for the asset;
- ▶ A decision that is based on evaluation of alternatives that takes into account full life cycle costs, benefits and risks of the asset;
- ▶ Provision of the asset, including its operation and ongoing maintenance, and
- ▶ The disposal of the asset.

Even before the present economic crisis, hospitals across the world have been confronted with equipment financing pressures and asset management challenges.

Classically, the goals of a good asset management programme are to minimise the need for new capital expenditures, while increasing utilisation rates and reducing offline maintenance for existing equipment. An equally important, but 'softer' issue is to maximize the time physicians and nurses spend on direct patient care (the latter, typically, spend up to half their hours on administrative tasks). Finally, asset management programmes in hospitals also seek to improve regulatory compliance and enhance patient safety and healthcare outcomes.

a specified period of time. This ensures that patients with mobility assistance requirements always have a wheelchair available when they visit the hospital.

The RFID tags are configured to regularly transmit a localisation signal via the wireless network. To monitor these signals the hospital has installed about 259 wireless access points in its new WLAN network, which will soon also be used for monitoring cardiac patients as well as telephony.

### Human Assets: Tracking Geriatric Patients

The new technology is now also being harnessed by us to allow geriatric patients to leave their wards without a risk of getting lost or confused in the hospital – a not uncommon occurrence. In the future, such patients will have a RFID tag so that the nurses will get a warning when they leave the department. Through triangulation of the antennas the system can determine within a few metres where a RFID tag is located.

### Spinoffs From Modernisation

The asset management functionalities offered by the RSZT are spinoffs from modernisation of the wireless infrastructure at the hospital. These have provided us with the technical means to master a multitude of other challenges.

Staff now complete electronic patient records at the bedside of a patient. When the lab delivers new results, the doctor has these results immediately available in a patient's room. Previously the results had to be printed and delivered to the doctor. The hospital soon intends to launch an application for doctors to prescribe medication at the bed of the patient and directly send this to the

hospital pharmacy. The pharmacy can prepare the new drugs, or adapt certain doses to the new, recent lab results.

Closer to our IT department, RFID tags are also being used by the RSZT to monitor temperatures in different server rooms. Over the years, a rising number of servers had sometimes overloaded the cooling system. Overheating, in turn, led to errors in the system log files. Currently, an alarm is sent to the IT department to adjust the server cooling systems in time.

### The Future

By 2012, the merger of both hospitals St. Anna and St. Joseph will be located on one campus. The IT department examined the infrastructure changes needed to promote the work of the hospital staff and the welfare of the patients. A new wireless network which supports RFID technology was one of the first items on the agenda. This network is ready for the future, it only just has been taken in use and we are already getting more questions of other departments that see lots of benefits for their business.

### YOUVILLE HOSPITAL AND REHABILITATION CENTER CAMBRIDGE

John F. Wilder, Director of Information Systems.

Assets are not always material objects like the expensive anti-decubitus mattresses or the porter's chair mentioned in the previous article. Computer software is also an asset, moreover it is an asset that can prove hard to manage and one that is often overlooked. John F. Wilder, Director of Information Systems at Youville Hospital and Rehabilitation Center Cambridge, Massachusetts, tells of his experience.

When I was hired as the Director of Information Systems at Youville Hospital and Rehabilitation Center, I knew that one of my first tasks was to assess the resources. One of the key resources is of course, software. I was concerned about the Microsoft software. I had read enough about businesses being fined through various audits for not having the proper number of licenses to match the number of installed copies. By doing a quick check, I could see that over time, the hospital had purchased licenses through various channels at various times.

It is not a unique problem for IS Director's or CIOs to have licenses and software not in compliance when you have a facility with 600+ employees and 350 PCs deployed. As you change vendors and make purchases of computers and software, tracking and filing licenses can sometimes take a backseat to more important issues.

As the new IS Director for the Hospital, I needed to know what software was in house, where it was installed and what was actually documented. I also wanted to make sure our 600+ users had the "tools" they needed to do their job. In addition, I was concerned that we were at risk and may not be in compliance and this would clearly be recognised in any audit. Lastly, I wanted to do this once and do it right.

The solution to this problem was Soft-Aid, a Microsoft® Gold Certified Partner for Licensing Solutions. Soft-Aid installed an inventory tool on the network, which, through an automated discovery process, compiled a precise inventory of software throughout the network. The next step was to check our physical inventory and records to see what documented licenses we had in house and what had been

previously purchased by my predecessor. After a detailed comparison of licenses and installed software, I could see we were lacking in quite a few areas.

Of course this presented another problem with the available budget for software. I needed more licenses than I had available funds. Working with Microsoft, I found that we were able to qualify for the Microsoft Open-License Charity programme. The programme allows eligible organisations to acquire multiple software licenses at reduced prices. I was able to purchase the necessary software licenses within the existing budget.

### Benefits:

- ▶ I received a thorough inventory without expending resources I couldn't afford and time I could not commit. The estimated cost savings of performing a manual inventory was approximately \$5000;
- ▶ Through the assessment I was able to bring the hospital in compliance and eliminate the risk and liability issues;
- ▶ I received expert advice on how to manage my software inventory. As a result of the recommendations I updated software acquisition policies and procedures;
- ▶ And of course, learning that we were eligible for Charity pricing will benefit the hospital going forward. During the first purchase, we realised a savings of \$15,000.

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# TRANSFORMING THE TURKISH HEALTHCARE SYSTEM

## Aspects of Health Reform in Turkey

By Banu Küçük

It is not realistic to allege that health policies are not influenced by global trends. The Turkish healthcare system is in transition towards a more European model. The engine of this transition is doubtless the Government's Health Transformation Programme. The programme aims to raise the effectiveness of the health services in terms of governance, efficiency and fiscal sustainability.

### The Health System

Before illustrating the reform programme it is useful to examine the state of the healthcare system in Turkey, the number of hospitals, physicians, the health insurance system and also government spending on health.

In comparison with population, there is a significant lack of health human resources. Physician den-

sity was half of OECD average in 2006. Also nurse density is only one-fifth of the OECD average. Besides the lack of human resources, human resources are inadequately distributed among provinces (this is especially true before 2003.) The graphs included provide us with some statistics about the Turkish healthcare system.

There are also important issues concerning social insurance funds. Historically, there were three different social insurance funds:

(i) **emekli sandığı** - government employees and retirement fund, (ii) **sosyal sigortalar kurumu (SSK)** - blue and white collar workers in public and private sector and (iii) **bağ-kur** - social security organisation for artisans and self-employed.

There has also been a programme called Green Card, its objective being to provide health services for poor citizens.

There are, however serious contradictions concerning the coverage of health insurance; according to the Turkey Statistical Institute, 64% of the population is covered by health insurance where the ratio is 85% according to National Planning Organisation. These discrepancies are

### Turkey Facts and Figures

#### Geography

Turkey is a Eurasian country that stretches across the Anatolian peninsula in southwest Asia and the Balkan region of southeastern Europe. Situated between 36-42° northern latitudes and between 26-45° eastern longitudes, its area is 814.578 square kilometres.

#### Administration

Republic with a parliamentary system and will of people is vested in the Grand National Assembly of Turkey (GNAT). Constitution adopts basic individual, social and political rights and the principle of separation of powers (legislative, executive, and judiciary).

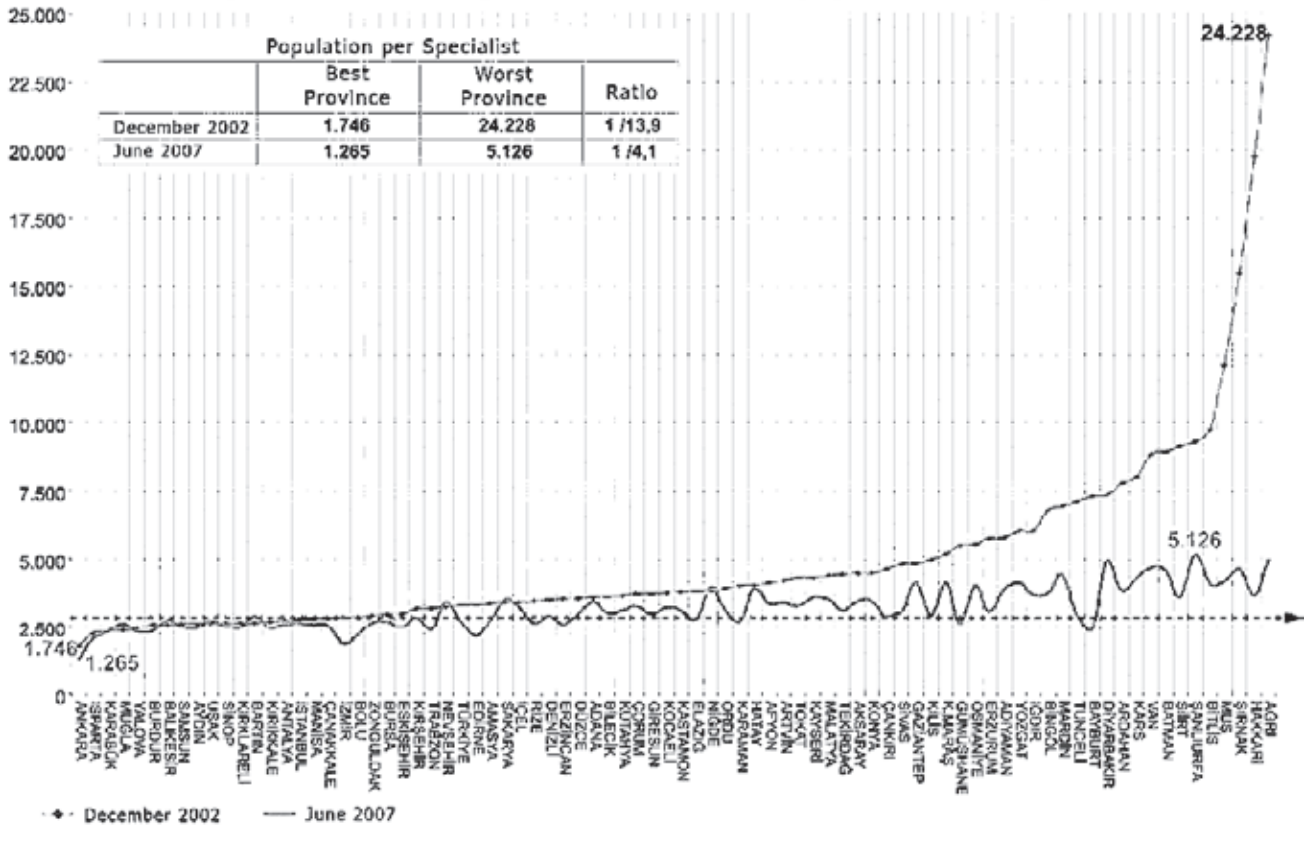
#### Demographics

Estimated population in 2006 was 72.974. Population growth 1.26%. Dependency rate is decreasing (64.7 in 1990, 56.3 in 2003) implying that the economic burden of elderly and young population on the productive population has been significantly alleviated. Life expectancy on the increase from 1970 but still very low compared to OECD averages.

#### GDP

Total expenditure on health per capita (Intl \$, 2006): 645  
Total expenditure on health as % of GDP (2006): 5.6

## Population Per Specialist in Turkey (2002-2007)



especially noticeable in the information concerning coverage of SSK and Bağkur. Their total coverage is 46,2% according to Turkey Statistical Institute and 68,6% according to the National Planning Organisation.

Public health expenditures were 4% of the GDP. According to the 1999-2000 National Health Ac-

counts (NHA) private expenditures on health in Turkey constituted approximately 37% of total health expenditures. Half of health expenditures were on the curative care.

Access to healthcare was not equal among the regions of the country, delivery of healthcare services was strongly influenced

by the fragmentation of the insurance institutions and also the quality of healthcare services was poor at the beginning of 2003. Also health indicators were significantly lower compared to the other OECD countries.

To summarise, the fragmented structure of health financing, with the majority of the health

expenditures on curative service rather than primary healthcare services, the regional inequalities in access to healthcare services and governance were the main imperfections of the Turkish healthcare system. These long standing problems need to be addressed by a comprehensive reform programme. The Health Transformation Pro-

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gramme is designed to address these problems.

### Health Transformation Programme

The basic principles of the Health Transformation Programme are:

- (i) Human orientation, which refers to individual needs and expectations as a basis of planning the health services, and also the “family health” concept are the keystones of the health services;
- (ii) Sustainability, which refers to fact that the restructuring of the health services should be compatible with the domestic conditions as well, especially for the sustainability of the fiscal policies;
- (iii) Continuous quality improvement;
- (iv) Participation of all stakeholders;
- (v) Conciliation of health service providers and other civil institutions;
- (vi) Volunteerism;
- (vii) Separation of authorities such as financing, planning, supervising;
- (viii) Decentralisation, and
- (ix) Competitiveness in service.

The Health Transformation programme is offering to enhance the role of the Ministry of Health in terms of planning, controlling, monitoring and evaluating rather than service providing. The responsibility of a state department involves policy making, priority setting, data collection, and analysis, financing and overseeing the local public health activities. Also in the re-organisation process, enhancing the autonomy of hospitals is the key factor. Social security reform is designed to avoid inefficiencies of insurance and duplications of health insurance. Also family medicine practice is designed to

mediate improvement in primary healthcare services. E-health was one of the other key factors to monitor the effects of the regulations and the outcomes to the policy makers.

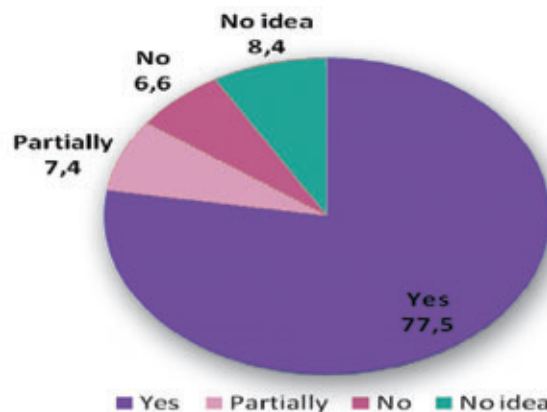
The Health Transformation Programme (HTP) has a framework of eight themes;

1. Rearranging the Ministry of Health as a planning and supervising authority;
2. Unifying all citizens under a single social security institute;
3. Increasing the accessibility of healthcare services;
4. Improving the motivation of health personnel and increasing knowledge and skills;
5. Supporting the system through education and scientific institutions;
6. Advancing the qualification and efficiency of the healthcare services by means of quality management and accreditation;
7. Institutional restructuring in rational management of medicine and supplies, and
8. Providing access to effective information for decision making, through the establishment of an effective Health Information System.

### Primary Healthcare

For Turkey, a new operating system for primary healthcare services, family medicine, was first implemented in Düzce in 2005. Today, in 23 provinces, meaning about nine million citizens, are benefiting from the practice. Approximately 20% of Turkish citizens are enrolled with family doctors. Family medicine practices put primary care services at the top of the public agenda, make primary care attractive and thus facilitate easy and widespread provision of these services. Success of the system will reduce the number of patients

Are You Contented with Services That You Recieve? (%)



Source: Family Medicine Survey in Düzce (ANAR)

visiting hospitals and alleviate excessive workload at hospitals.

The biggest barrier to the effectiveness of the implementation of family medicine is the shortage in numbers of practitioners. In provinces where family medicine is under implementation, community health centres are being established. These centres provide integrated, preventive, diagnostic, curative and rehabilitation services and are responsible for overseeing preventive health services such as vaccination campaigns, and reproductive and child health services.

In a survey conducted under family medicine studies in Düzce, people were asked to what extent they were contented with family medicine services given so far and answers revealed their level of satisfaction (Family Medicine Survey).

Expenditures on primary healthcare have also increased. In 2002, total budget allocated to preventive and the primary healthcare services was 578 million dollars and in 2007 total budget allocated to preventive and the primary healthcare services increased to 1,720 million dollars.

As part of the programme all public hospitals except university hospitals and the hospitals belonging to Ministry of Defence were integrated under control of Ministry of Health. Thanks to this regulation obstacles concerning patient accessibility to the healthcare services were eliminated, as was discrimination among different social insurance coverage. Also unbalanced workloads among hospitals were regulated. Today all hospitals deliver service to all people homogenously. Hospitals have also become more autonomous and their procurement methods more flexible.

To fulfil its aim of improving the management of healthcare institutions, the Turkey Health Institute arranges an education programme for public hospital managers called the Hospital Management Certification Programme. The programme consists of lectures such as finance management in health institutions, human resource management, information systems management, total quality management in hospitals, financial accounting health institutions, marketing strategy for hospitals, supply chain



management in hospitals and health law.

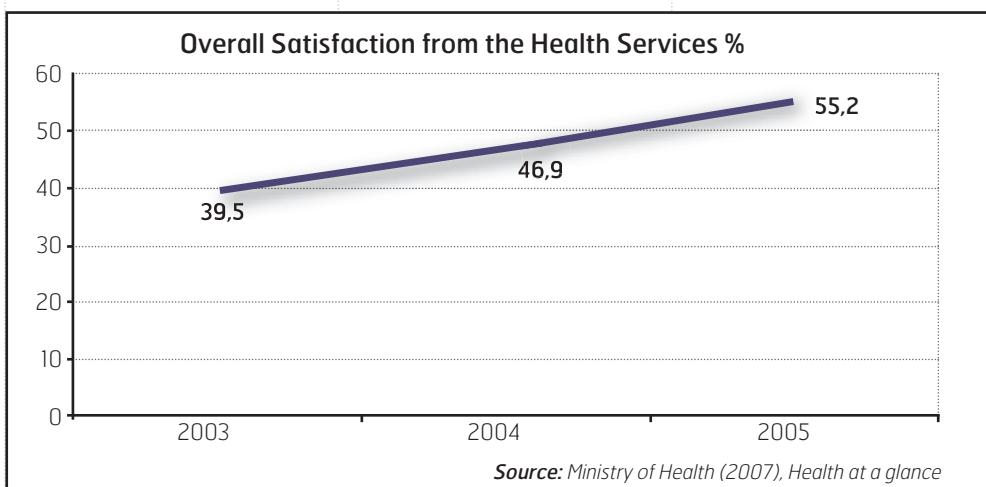
Law 5502 was adopted by the Turkish Grand National Assembly in 2006. This law, which was meant to accompany Law 5510 (Law on Social Security and Universal Health Insurance), aimed at unifying the three different social security and health insurance schemes (SSK, Bağ-Kur and Emekli-Sandigi) into one unified social security institute. Implementation of this law had been underway since 2006. As a result, there currently exists within the SSI, a Universal Health Insurance Fund (UHI Fund).

As a short-term plan, the Ministry of Health developed a strategic plan for the period 2009-2013 which consists of nine main pillars and strategic objectives:

1. Decreasing the risks of illness and protecting public health by improving preventive and primary healthcare;
2. Delivering effective, efficient, accessible and equal curative services;
3. Performance management and quality improvement in healthcare services;
4. Re-organising and capacity improvements of both public and private health institutions;
5. Improving medicine and medical device services;
6. Establishing, processing and developing e-health and decision support system;
7. National and international collaboration to improve the health services;
8. Encouraging health tourism, and
9. To complete covering all citizens under the social security insurance.

## Conclusion

The effects of the Health Reform Programme cannot be seen in



the base health indicators such as infant mortality rate, life expectancy at birth. However it is obvious that overall satisfaction concerning health services has risen dramatically. The rise in overall satisfaction indicates health reform has revealed positive short-term effects. It is however, vital that not only policy makers but also other stakeholders such as investors keep monitoring the system to ensure long-term improvements.

## OHSAD Private Hospitals and Healthcare Organisations Association

The Private Hospitals and Healthcare Organisations Association is a service-provider with the strongest voice of the private healthcare sector. Although our association was established in 1991, it became a legal establishment in 2004, using its previous knowledge, experience and know-how. Our association has been going under the umbrella of OHSAD since 30.12.2004 as a result of four associations in the healthcare sector merging together to create one stronger organisation. These four associations are The Private Hospital's Association, Healthcare Organisations As-

sociation, Tourist Regions Healthcare Institutions and Organisations Association and The South-East Anatolian Private Healthcare Institutions Association. After this conglomeration was established, 80% of the private hospitals and 850 healthcare organisations joined the same association.

In recent years, the importance of non-governmental organisations (NGO) and their participation has increased in reaction to existing laws and regulations. This increased participation led to some difficulties regarding organisation but they were rapidly solved during the period of re-organisation of NGOs. But there are still some problems including financial sources, education, culture, lack of communication and confusion which are the factors that affect the development of NGOs.

We have established our association's centre office in Elmadağ, Taksim Istanbul in May 2005. This is a central place for our meetings that will serve our "strong association-strong sector" principle to deal with the outstanding problems. Professionals were hired to carry out these projects.

Our main aim is to use the country's limited healthcare resources in the best way possible and to develop the healthcare sector to improve the health level of society by providing effective and qualified healthcare service representation. The way in which our aim can be achieved is through providing a strong base for changes to occur in the healthcare sector with the support of members. Our achievements are based on our institutional structure and professional staff. Our guidance is provided by our distinguished members, suggestions and ideas, like Mr.Yaşar Yıldırım and Mrs.Banu Küçükkel who represent us in EAHM. OHSAD has been a member of EAHM since 2003 and the 82nd Executive Committee Meeting was organised successfully in April 2006 by OHSAD in Istanbul, with the leadership of Mr.Yaşar Yıldırım.

All our achievements are for a healthier community and a continuously improving health sector in Turkey.

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Heinz Kölking

## COMBATTRE LA CRISE

D'abord la crise financière, et puis la crise économique. A l'heure actuelle, personne ne peut prédire la durée de cette crise. Les enquêtes et les pronostics ne sont pas d'une grande aide, ils augmentent seulement l'incertitude et accentuent même le problème. Le problème a pris sa source dans le secteur financier, a déjà atteint l'économie réelle et pèse maintenant sur le marché de l'emploi au niveau mondial.

Quand surviendra la crise des systèmes sociaux nationaux en Europe? Il ne faut pas avoir beaucoup d'imagination pour affirmer que le secteur européen des soins de santé sera également touché. Au plus tard lorsque le marché de l'emploi sera affecté par une hausse du chômage, les bases financières de nos systèmes de sécurité sociale et donc de nos hôpitaux seront aussi touchées.

Le management hospitalier en perçoit déjà aujourd'hui les effets, en particulier lorsqu'il s'agit du financement d'investissements. Nous traversons une période où les gestionnaires des hôpitaux devront faire face à de nombreux défis supplémentaires.

L'Europe vote cette année! Ce n'est pas seulement pour l'évolution des soins hospitaliers et de santé au niveau européen que ces quelques semaines qui nous séparent des élections et de la constitution d'un nouveau parlement élu constituent un «temps de pause». Il faut espérer qu'il mène aussi à un rassemblement nécessaire pour la concep-

tion de la future «maison européenne». Ce processus est rendu indispensable par la crise économique et financière autant que par la construction future de l'UE. Les causes et les effets de la crise économique et financière nous démontrent d'ores et déjà qu'un «traitement d'urgence» ne suffira pas.

Des questions se posent aussi en termes de responsabilités des acteurs de notre vie en communauté, des questions qui exigent des réponses. En tout cas cette crise nous prouve (et ceci est très positif) que nous avons besoin de l'Europe et qu'il n'y a pas d'alternative!

Le bureau et le comité exécutif de l'AEDH ont tenu leur réunion de printemps à Maastricht et Vaals (Pays-Bas) le 25 et 26 avril. Cette réunion a permis à tous les délégués de participer à la célébration du 60ème anniversaire et des 30 ans de carrière de notre Secrétaire Général Willy Heuschen. Willy Heuschen est Secrétaire Général de l'AEDH depuis 1998 et Directeur de l'hôpital Saint Nicolas d'Eupen depuis 30 ans.

Le dévouement de Willy Heuschen aux établissements d'Eupen, aux hôpitaux belges ainsi que ses activités au sein de l'AEDH ont été unanimement reconnus. Nous nous joignons à ses félicitations et le remercions pour son engagement passé et futur ainsi que son travail en faveur des hôpitaux européens.

Cordialement,  
**Heinz Kölking**  
 Vice-Président de l'AEDH



Les éditoriaux d' *(E)Hospital* sont rédigés par des membres des instances dirigeantes de l'AEDH. Les contributions publiées ici ne reflètent cependant que l'opinion de leur auteur et ne représentent en aucune façon la position officielle de l'AEDH.

## GOVERNANCE HOSPITALIÈRE

La crise économique et plusieurs scandales ont affiné l'intérêt du grand public pour la gouvernance au sein des entreprises. Dans le secteur des soins de santé, la gouvernance est depuis longtemps un élément crucial dans l'organisation et la gestion des hôpitaux. Vu l'évolution des soins de santé et la situation spécifique des hôpitaux, le sujet de la gouvernance hospitalière mérite une analyse plus attentive.

En 2004 un projet de recherche sur la Gouvernance hospitalière a été lancé par l'Université catholique de Leuven avec le soutien de l'AEDH et de HOPE. Environ 500 gestionnaires hospitaliers de toute l'Europe ont répondu au questionnaire. Des associations nationales et des chercheurs autrichiens, bulgares, danois, français, allemands, grecs, italiens, lituaniens, néerlandais, espagnols, polonais, suisses, etc, ont contribué à ce projet. Les résultats ont été présentés par Mr. Kristof Eeckloo dans sa thèse de doctorat «Gouvernance hospitalière en Flandres: étude exploratoire dans une perspective internationale» et ont fait l'objet de discussions au sein du sous-comité scientifique de l'AEDH.

Les résultats de l'étude et leur analyse nous permettent de mieux comprendre la gouvernance hospitalière. Le concept de gouvernance hospitalière a été défini en tant qu'«interaction entre des personnes ou des groupes de personnes (acteurs) où la prise de décision n'est pas concentrée sur un acteur et où un système de poids et contrepoids permet de prendre des décisions qui respectent les intérêts et objectifs qui sont les fondements de leur relation.

Le concept doit alors être appliqué au contexte hospitalier. A travers la perspective des acteurs et des niveaux impliqués (depuis le niveau macroéconomique jusqu'au conseil d'administration), les différents mé-

canismes de gouvernance qui affectent le processus décisionnel au sein des hôpitaux ont été positionnés dans un cadre intégré. Trois mécanismes spécifiques ont été analysés au moyen de cette perspective intégrée: 1) le profil du conseil d'administration, 2) le rôle des médecins hospitaliers dans la gouvernance hospitalière et 3) la responsabilisation publique.

L'étude a montré que différents facteurs avaient un impact sur la gouvernance hospitalière: le système de financement, le statut légal, la décentralisation et la privatisation, la structure légale de gouvernance interne, le statut et la rémunération des médecins hospitaliers. Une diversité croissante a été constatée dans la répartition public/privé. La décentralisation n'est pas unanime, puisque certains pays sont en train de centraliser. Au niveau exécutif, il y a une évolution du modèle collégial/Troika avec un rôle central des médecins vers un modèle concentré autour du directeur général. En outre, les conseils d'administration hospitaliers semblent prendre de l'importance.

Des modèles de gouvernance ont été identifiés. Les conseils d'administration par exemple peuvent se décrire en tant que «forum», «siège du conducteur», «panel d'experts», ou «profil bas». De la même façon, le rôle des médecins dans la gouvernance hospitalière peut être catégorisé («la forme avant le contenu», «le contenu avant la forme», «ni forme ni contenu»). L'analyse a révélé que la configuration de gouvernance avait une influence sur l'analyse de la relation entre l'utilisation d'un instrument/méthodologie et les résultats de l'organisation.

L'étude a montré qu'il existe une taxinomie de configurations possibles de gouvernance. Un modèle universel de préférence pour un pays ou une région n'est pas pos-

sible et il relève donc de la responsabilité de chaque acteur d'évaluer si sa configuration de gouvernance est basée sur un système approprié de poids et de contrepoids, en prenant en compte le contexte spécifique et la relation entre les mécanismes de gouvernance.

La définition économique de la bonne gouvernance est la réduction des pertes d'efficacité dues à la seule interaction entre les acteurs. Les «mécanismes de compensation» doivent être considérés avec prudence; les structures de gouvernance censées pallier les problèmes structurels ne sont pas une solution à long terme.

La participation des médecins à la gouvernance hospitalière prend des formes très différentes, informelles ou formelles, en Europe. Le système de paiement à l'acte stimule les structures informelles mais constitue un frein à la motivation des médecins à assumer un rôle managérial. Si la qualité et l'efficacité de la profession médicale devaient être évaluées à un niveau plus central par les médecins, une politique financière et de carrière deviendrait nécessaire, ainsi qu'une formation du médecin aux postes exécutifs.

Cette étude constitue une base en vue d'une analyse plus fondamentale ainsi qu'un appel à des recherches plus poussées sur base de données standardisées. L'étude a également fourni des exemples concrets de perspectives au niveau global ou local, et recommande à tous les acteurs de la gestion hospitalière de s'assurer que les poids et contrepoids sont en place, en tenant compte des interactions et du contexte.

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### ▶ **Rentabilité du Contrôle de l'Infection: une Approche Triple**

*Par Ellen E. Stobberingh,*

*Ed E.J. Smeets et Frank H. van Tiel*

Les infections contractées à l'hôpital sont un problème global qui débouche sur un accroissement de la morbidité nosocomiale et de la mortalité, ainsi que sur une augmentation de la charge financière de l'hôpital et de la société. Un contrôle de l'infection efficace et rentable nécessite une approche triple: formation, hygiène des mains et politique antibiotique. Ceci profitera non seulement aux patients, mais aussi à l'économie de santé en général. Les avantages du programme l'emportent sur son coût à condition qu'il soit conçu pour atteindre 90% de son objectif. Pour réussir, le programme de contrôle doit être soutenu par le management des services et les plus hautes instances dirigeantes.

### ▶ **Surveillance Automatisée de l'Hygiène des Mains** *Par Veronique M. Boscart, Alexander I. Levchenko, Geoff R. Fernie et Walter P. Wodchis*

Les infections nosocomiales se montent à 2 millions de cas par an et causent 88.000 morts au niveau mondial. Se laver les mains est un acte primordial pour réduire les risques. Le problème réside dans le respect des programmes d'hygiène des mains par les praticiens de santé.

Le Rehabilitation Institute de Toronto (Canada) a développé un système de surveillance de l'hygiène des mains pour en augmenter et enregistrer la fréquence. Cette nouvelle technologie consiste en trois éléments: (1) de petits moniteurs électroniques portables, (2) des zones protégées conçues pour définir les environnements individuels des patients, et (3) des distributeurs personnels de gel alcoolisé portable. Le système fournit l'heure d'entrée et de sortie des zones identifiées et indique l'heure où les mains ont été lavées.

### ▶ **Améliorer l'Hygiène Hospitalière par la Conception de l'Environnement**

*Par Xiaobo Quan*

Il est de plus en plus clairement prouvé que l'architecture hospitalière a un effet direct sur la propreté de l'environnement hospitalier et contribue donc de façon significative à la réduction des infections nosocomiales.

Les recommandations concernant une conception de l'environnement destinée à améliorer l'hygiène hospitalière comprennent des indications sur les systèmes

HVAC afin de réduire efficacement la contamination aérienne; la sélection de matériaux faciles à nettoyer et à désinfecter; le cloisonnement en chambres individuelles pour faciliter certaines procédures de désinfection (p. ex. HPV) et un examen attentif des emplacements des lavabos et distributeurs dès les premiers stades de la conception.

### ▶ **Obstacles Humains à l'Hygiène Alimentaire dans les Hôpitaux** *Par Burcu Tokuc et Galip Ekuklu*

Les crises d'empoisonnements alimentaires à l'hôpital affectent patients, personnel et visiteurs. Une étude a été menée pour évaluer les connaissances, attitudes et pratiques parmi le personnel de cuisine dans les hôpitaux d'Édirne (Turquie). Cette étude a révélé une connaissance insuffisante des notions de base de l'hygiène alimentaire et un décalage entre les attitudes et les pratiques. Les obstacles principaux à l'application de mesures de sécurité alimentaire sont les contraintes de temps, le manque de ressources, la conception de l'espace de travail et la reconnaissance nécessaire du problème par le management. L'étude a également souligné l'incertitude entourant l'efficacité de la formation actuelle en hygiène alimentaire.

### ▶ **Dossiers Patients Electroniques et Soins Intégrés** *Par David Kwo*

Des soins intégrés nécessitent un IT intégré. Cinq facteurs critiques de réussite permettent aux DPEs (dossiers patients électroniques) d'améliorer la qualité des soins. Les DPEs doivent être intelligents (offrir un soutien avancé à la décision, proactif et en temps réel); permettre une intégration complète (les fonctions doivent être intégrées de façon fluide dès la conception et à tous les niveaux de la fonction DPE); détaillés (disponibilité de l'ensemble des détails cliniques pertinents et actualisés et pas seulement une sélection dont les données cliniques importantes seront régulièrement absentes); et universelles (accessibles où que soit le patient, et pas seulement dans les limites de certaines organisations ou unités cliniques).

### ▶ **Solutions IT Innovantes pour la Gestion des Actifs**

*Par Daniel Loos*

La gestion et le contrôle des actifs est un défi permanent pour tous les hôpitaux. Néanmoins, l'IT est de plus en plus fréquemment utilisé, souvent de façon créative, pour venir à bout de tels défis. L'hôpital régional St Trudo en Belgique a recherché une méthode de gestion des matelas anti-decubitus, qui sont relativement coûteux et qui disparaissaient

régulièrement après le départ des patients. On passait alors beaucoup de temps à essayer de les localiser et on dépensait de l'argent pour en louer de nouveaux. Les matelas sont maintenant étiquetés et peuvent être localisés facilement grâce à un puissant réseau sans fil. D'autres équipements essentiels, comme les chaises roulantes et les pompes à perfusion, ont également reçu un étiquetage RFID, afin de faire gagner du temps aux réceptionnistes. Cette nouvelle technologie est actuellement envisagée pour les patients gériatriques, afin de leur permettre de quitter leur service sans courir le risque de se perdre dans l'hôpital.

### ► **Le Projet CHRONIOUS** *Par Roberto Rosso*

CHRONIOUS consiste à concevoir et implémenter une plateforme portable, sur base de senseurs multi-paramètres, afin de surveiller des patients souffrant de maladies chroniques. Le projet soulève certaines questions légales et éthiques qui doivent être réglementées mais on en attend de multiples avantages. Le projet va améliorer la qualité de vie, faire avancer la recherche médicale, réduire les charges formelles liées aux soins et les coûts et surtout augmenter l'efficacité des soins informels et impliquer le patient. L'équipement offrira un coup de pouce spécifique aux établissements de santé et à leurs gestionnaires en réduisant les épisodes aigus et leur coût hospitalier de 20 à 30%.

### ► **Gérer la Sécurité des Systèmes d'Information** *Par les Dr. Karin Hedström, Dr. Fredrik Karlsson et Ella Kolkowska*

Les utilisateurs sont souvent considérés comme un obstacle à la sécurité des systèmes d'information (SSI). Des mesures relatives à la SSI sont essentielles à la sécurité et à la protection de la vie privée du patient. Les procédures SSI qui ne marchent pas peuvent déboucher sur des traitements inappropriés à cause d'informations erronées ou sur la divulgation d'informations sensibles à des personnes non autorisées. Les données révélées dans cet article proviennent d'une étude de conformité effectuée dans le département de chirurgie et médecine de l'hôpital Karlskoga.

Trois zones de conformité ont été établies: les utilisateurs qui suivent les règlements officiels, les utilisateurs en conflit avec ces règlements et ceux qui développent leurs propres mesures SSI. L'étude a montré que les utilisateurs sont conscients de l'importance de la SSI mais que ces procédures et règlements ne

répondent pas aux besoins des utilisateurs en termes d'accès facile et opportun aux informations sur le patient.

### ► **Reporter est Toxique. Schéma de Résolution de Conflits à l'Hôpital** *Par Hans Martin Hasselhorn, Peter Tackenberg et Sascha Schmidt*

La recherche démontre que les conflits au travail ont un effet négatif sur la satisfaction professionnelle des employés. Les données de suivi de l'étude européenne NEXT ont été utilisées pour examiner l'impact des différents styles de résolution de conflits sur les infirmières hospitalières dans 7 pays européens.

On a découvert que retarder la résolution de conflits a l'impact le plus fort sur le bien-être psychologique des infirmières et particulièrement sur leurs attitudes de repli institutionnel et professionnel. Les soins de santé requièrent de fréquentes prises de décision immédiates et le report peut alors être toxique. Un niveau important de résolution de conflits autoritaire a plus ou moins le même effet négatif qu'un faible niveau de résolution de conflits par la discussion.

### ► **Focus: Turquie**

La Turquie est en train de transformer son système de santé grâce au Programme gouvernemental de Transformation de la Santé. Le Programme PTS est composé d'un cadre autour de huit thèmes: réorganiser le Ministère de la Santé en tant qu'autorité de planification et de supervision; unir les citoyens sous une organisation unique de sécurité sociale; améliorer l'accessibilité des services de soins de santé; augmenter la motivation des personnels de santé ainsi que leurs connaissances et compétences; soutenir le système par le biais des établissements éducatifs et scientifiques; faire avancer la qualification et l'efficacité des services de santé au moyen d'un gestion qualité et de l'accréditation; restructurer la gestion de la médecine et de l'approvisionnement dans les institutions, et fournir un accès à des informations efficaces pour la prise de décisions en établissant un Système d'Information pertinent.

L'Association des Hôpitaux et Organismes de Soins de Santé Privés (OSHAD) est le résultat de la fusion de 4 associations du secteur de la santé en un organisme plus solide. Ces quatre associations sont l'Association de l'Hôpital Privé, l'Association des Organismes de Soins de Santé, l'Association des Institutions et Organismes de Soins de Santé des Régions Touristiques, et l'Association des Institutions de Soins de Santé Privés de l'Anatolie du Sud-Est. Suite à la création de ce conglomérat, 80% des hôpitaux privés et 850 organismes de soins de santé ont rejoint l'association.



Heinz Kölking

## DER KRISE ENTGEGEN

Zunächst die Finanzkrise dann die Wirtschaftskrise. Keiner kann zur Zeit voraussagen, wie lange die Krise andauern wird. Umfragen und Prognosen helfen wenig, sie erhöhen die Unsicherheit und verschärfen das Problem sogar. Die Entwicklung hat im Finanzsektor begonnen, hat die Realwirtschaft schon erreicht und belastet nun den Arbeitsmarkt weltweit. Wann folgt die Krise der Sozialsysteme der Staaten in Europa? Es gehört nicht viel Phantasie dazu festzustellen, dass wir auch im Bereich der Gesundheitsversorgung in Europa von den Folgen betroffen sein werden. Spätestens wenn die Arbeitsmärkte höhere Quoten der Arbeitslosigkeit vermelden, werden auch die Finanzierungsgrundlagen unserer Sozialversicherungssysteme und damit unsere Krankenhausversorgung betroffen sein. Schon heute spürt das Krankenhausmanagement die Auswirkungen, insbesondere wenn es um Finanzierungen für Investitionen geht. Es ist eine Zeit, in der sich das Management im Krankenhaus vielen zusätzlichen Herausforderungen stellen muss und wird.

Europa wählt in diesem Jahr! Nicht nur für die europäischen Entwicklungen in der Gesundheits- und Krankenhausversorgung ist die Zeit bis zur Wahl und Konstituierung des neue gewählten Parlaments eine gewisse „Verschnaufpause“, die hoffentlich dazu führt, dass die notwendigen Kräfte für die künftige Gestaltung des „Europäischen Hauses“ gesammelt werden. Dies wird notwendig sein, denn sowohl die Wirtschafts- und Finanzkrise wie auch die

künftige Gestaltung der EU erfordern dies. Gerade die Ursachen und die Wirkungen der Finanz- und Wirtschaftskrise zeigen uns allen, dass wir nicht nur eine „Akutbehandlung“ benötigen. Vielmehr sind auch Fragen im Hinblick auf die Verantwortung der Akteure im Hinblick auf unser gesellschaftliches Zusammenleben zu stellen und Antworten zu geben. Auf jeden Fall zeigt uns diese Krise (und das ist sicher positiv), dass wir Europa brauchen und es dazu keine Alternative gibt!

Das Präsidium und der Vorstand der EVKD hatte am 25. und 26. April die Frühjahrstreffen in Maastricht und Vaals (NL) abgehalten. Diese Treffen ermöglichte es allen Delegierten an der Feier des 60. Geburtstages sowie des 30. Dienstjubiläums unseres Generalsekretärs Willy Heuschen teilzunehmen und den Jubilar zu feiern. Willy Heuschen ist seit 1998 Generalsekretär in der EVKD und nunmehr 30 Jahre Krankenhausdirektor im St. Nikolaus – Hospital in Eupen. Das Wirken von Willy Heuschen für die Einrichtungen in Eupen, für die Krankenhäuser in Belgien sowie für die Arbeit im EVKD wurde eindrucksvoll gewürdigt. Auf diesem Wege gratulieren wir noch einmal und sagen Danke für das geleistete und künftige große Engagement und die damit verbundene Arbeit für die Krankenhäuser in Europa.

Ihr  
**Ihr Heinz Kölking**  
 Vizepräsident der EVKD



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## DIE FÜHRUNG EINES KRANKENHAUSES

Die Wirtschaftskrise und verschiedene Skandale haben das öffentliche Interesse an jeglicher Unternehmensführung verstärkt. Im Gesundheitswesen ist die Unternehmensführung seit jeher ein Schlüsselfaktor für die Organisation und das Management eines Krankenhauses. Angesichts der Evolution des Gesundheitswesens und der speziellen Situation der Krankenhäuser gebührt dem Thema der Krankenhausführung eine tiefgehendere Analyse.

In Jahr 2004 initiierte die Katholische Universität Leuven mit Unterstützung der EAHM und HOPE ein Forschungsprojekt über Krankenhausführung. Etwa 500 Krankenhaus-Führungskräfte aus ganz Europa beantworteten den entsprechenden Fragebogen. Nationale Verbände und Forscher aus Ländern wie Österreich, Bulgarien, Dänemark, Frankreich, Deutschland, Griechenland, Italien, Litauen, die Niederlande, Spanien, Polen, Schweiz... haben zu diesem Projekt maßgeblich beigetragen. Die Ergebnisse wurden von Hr. Kristof Eeckloo im Rahmen seiner Doktorarbeit „Die Krankenhausführung in Flandern: Explorative Studie aus einer internationalen Perspektive“ vorgestellt und im Wissenschaftlichen Subkomitee der EAHM diskutiert.

Die Studienergebnisse und deren Analyse in dieser Doktorarbeit vermitteln uns einige wertvolle Einblicke in die Führung eines Krankenhauses. Das Konzept der Krankenhausleitung ist als „eine Interaktion zwischen Personen oder Personengruppen (Akteure)“ definiert worden, „wobei die Entscheidungsfindungen nicht innerhalb eines Akteurs konzentriert sind, und ein System der gegenseitigen Kontrolle es erlaubt, Entscheidungen so zu treffen, dass Interessen und Ziele (welche die Basis ihrer Beziehung bilden) realisiert werden.“

Dieses Konzept muss nun für den Kontext von Krankenhäusern umgeschrieben werden. Unter Berücksichtigung der Perspektive der beteiligten Akteure und Ebenen

(von makro-ökonomisch bis hin zum Verwaltungsrat) wurden die verschiedenen Führungsmechanismen, die den Entscheidungsprozess innerhalb eines Krankenhauses beeinflussen, in einem integrierten Rahmenwerk positioniert. Diese integrierte Perspektive wurde sodann für die Analyse von drei spezifischen Mechanismen eingesetzt: 1) das Profil des Krankenhausvorstands, 2) die Rolle der Krankenhausärzte und 3) die öffentliche Verantwortung.

Die Studie hat gezeigt, dass es mehrere Faktoren sind, die einen Einfluss auf die Krankenhausführung haben: das Finanzierungssystem, die rechtliche Grundlage, Dezentralisierung und Privatisierung, die interne rechtliche Führungsstruktur und der Status und die Bezüge der Krankenhausärzte. Eine verstärkte Vielfältigkeit wurde in Bezug auf den Mix aus öffentlich und privat gefunden. Außerdem ist die Dezentralisierung nicht einstimmig, da manche Länder im Begriff sind, zu zentralisieren. Auf der geschäftsführenden Ebene gibt es eine Evolution vom „Troika“/„College“-Modell mit einer zentralen Rolle für Ärzte hin zu einem Modell mit einem zentralen CEO. Zusätzlich scheint die Anzahl der Krankenhausdirektoren im Steigen begriffen zu sein.

Spezifische Führungsmuster wurden identifiziert. Beispielsweise können Krankenhausvorstände jeweils als „Forum“, „am Steuer sitzend“, „Expertenausschuss“ oder „unauffällig“ identifiziert werden. Ebenso können Kategorien für die Rolle von Ärzten in der Krankenhausleitung identifiziert werden („mehr Form als Inhalt“, „mehr Inhalt als Form“ und „weder Form noch Inhalt“). Die Analyse hat aufgedeckt, dass die Führungsstruktur für die Beziehung zwischen Einsatz eines Instruments / einer Methodologie und den Resultaten einer Organisation ein beeinflussender Faktor ist.

Weiters ergab die Studie, dass es eine Klassifizierung möglicher Führungsstrukturen gibt. Ein universell einsetzbares bevorzugtes

Modell für ein Land oder eine Region kann nicht angegeben werden, daher liegt es in der Verantwortung jedes Akteurs, zu evaluieren, ob seine Führungsstruktur auf einem adäquaten System der gegenseitigen Kontrolle beruht, unter Berücksichtigung des spezifischen Kontexts und der gegenseitigen Beziehungen zwischen den Führungsmechanismen.

Die wirtschaftliche Definition einer guten Führung bedeutet die Minimalisierung eines Effizienzverlustes aufgrund der reinen Interaktion zwischen den Akteuren. „Kompensationsmechanismen“ müssen mit Vorsicht betrachtet werden; Führungsstrukturen als Abhilfe für problematische Strukturen sind keine langfristige Lösung.

Die Beteiligung von Ärzten an der Krankenhausführung weist innerhalb Europas starke Unterschiede auf, und spannt einen Bogen von informellen bis hin zu formellen Strukturen. Das System der Einzelleistungsvergütung stimuliert die informellen Strukturen, stellt aber ein Hindernis für die Motivation der Ärzte dar, eine Managementrolle aufzunehmen. Wenn die Qualität und Effizienz des medizinischen Berufs auf einem mehr zentralen Niveau von Ärzten evaluiert werden soll, so setzt dies eine berufliche und finanzielle Politik sowie Aus- und Fortbildung des Arztes in leitender Funktion voraus.

Diese Studie hat die Basis für weitere fundamentale Analysen und Forschung geschaffen, basierend auf standardisierten Daten. Sie hat außerdem konkrete Erkenntnisse vom Makro- bis zur lokalen Ebene geschaffen, und empfiehlt allen Akteuren im Krankenhausmanagement sicherzustellen, dass ein System der gegenseitigen Kontrolle implementiert wurde, unter Berücksichtigung der wechselseitigen Interaktion und des Kontextes.

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[www.eahm.eu.org/hospogv](http://www.eahm.eu.org/hospogv)

### ► **Kosteneffektive Infektionskontrolle: ein Drei-Zangen-Ansatz**

Von *Ellen E. Stobberingh, Ed E.J. Smeets und Frank H. van Tiel*

Im Krankenhaus erworbene Infektionen sind ein globales Problem, das zu erhöhter nosokomialer Morbidität und sogar Mortalität führt, und die finanzielle Belastung für sowohl das Krankenhaus als auch die Gesellschaft im Allgemeinen verschärft. Zur erfolgreichen, kosteneffektiven Infektionskontrolle bedarf es eines Drei-Zangen-Ansatzes: Ausbildung, Handhygiene und Antibiotika-Richtlinien. Davon profitieren nicht nur die Patienten, sondern es hat auch Vorteile für die Wirtschaftlichkeit der Gesundheitsversorgung. Der Nutzen des Programms überwiegt die Kosten, vorausgesetzt, das Programm erbringt 90% der erwünschten Leistung. Um erfolgreich zu sein, braucht das Kontrollprogramm die Unterstützung der Stationsleitung und der Führungsetage des Managements.

### ► **Automatisiertes Überwachen der Handhygiene** Von *Veronique M. Boscart, Alexander I. Levchenko, Geoff R. Fernie und Walter P. Wodchis*

Nosokomiale Infektionen weisen eine Inzidenz von zwei Millionen pro Jahr auf und verursachen 88.000 Todesfälle weltweit. Das Händewaschen ist die bei weitem wichtigste Einzelmaßnahme zur Senkung des Risikos. Das Problem ist die Compliance der im Gesundheitsbereich Tätigen in Bezug auf entsprechende Programme. Das Toronto Rehabilitation Institute, Kanada, hat ein Monitorprogramm für Handhygiene entwickelt, um die Häufigkeit des Händewaschens zu verbessern und aufzuzeichnen. Diese neue Technologie setzt sich aus drei wesentlichen Komponenten zusammen: (1) kleine, tragbare elektronische Monitore, (2) geschützte Zonen, die das individuelle Patienten-umfeld definieren, und (3) persönliche tragbare Alkoholgel-Spender. Das System liefert den Zeitpunkt des Eintretens und des Verlassens der identifizierten Bereiche und zeigt die Dauer des Händewaschens an.

### ► **Verbesserung der Krankenhaushygiene durch Umfeldgestaltung**

Von *Xiaobo Quan*

Die Gestaltung eines Krankenhauses hat einen direkten Einfluss auf die Sauberkeit seines Milieus, und trägt daher wesentlich zur Verminderung

nosokomialer Infektionen bei. Empfehlungen bezüglich der Umfeldgestaltung zwecks Verbesserung der Krankenhaushygiene sind unter anderem das Entwerfen von HVAC Systemen zur wirksamen Verminderung der Luftverschmutzung; die Auswahl einfach zu reinigender und zu desinfizierender Materialien; Einzelzimmer so zu gestalten, dass bestimmte Desinfektionsmaßnahmen (z.B. gegen HPV) einfacher durchzuführen sind; und die Standorte der Waschbecken und Spender zur Handhygiene bereits früh in der Entwurfphase sorgfältig zu planen.

### ► **Der Mensch als Hürde: Lebensmittelhygiene in Krankenhäusern** Von *Burcu Tokuc und Galip Ekuklu*

Durch Lebensmittel übertragende Krankheiten ziehen in einem Krankenhaus Patienten, Personal und Besucher in Mitleidenschaft. Eine Studie evaluierte nun das Wissen, die persönlichen Einstellungen und Gebräuche des Essenspersonals in Krankenhäusern in Edirne, Türkei. Aufgezeigt wurden eine ungenügende Kenntnis über Grundlagen der Lebensmittelhygiene und eine Diskrepanz zwischen der persönlichen Einstellung einerseits und Gebräuchen andererseits. Die wichtigsten Hindernisse für die korrekte und sichere Handhabung von Lebensmitteln sind Zeitnot, mangelnde Ressourcen, die Gestaltung des Arbeitsplatzes und die Notwendigkeit, dass das Managements das Problem auch anerkennt. Die Studie beleuchtete auch die Unsicherheit bezüglich der Effektivität aktueller Ausbildungsprogramme zur Lebensmittelhygiene.

### ► **Elektronische Krankenakten (EPR) und integrierte Pflege** Von *David Kwo*

Integrierte Pflege verlangt integrierte IT. Es sind vier Schlüsselfaktoren, die es EPRs erlauben, die Qualität der Pflege zu verbessern: Sie müssen intelligent sein (d.h. fortschrittliche aktive klinische Entscheidungshilfen in Echtzeit liefern); Tiefenintegration bieten (d.h. Funktionen müssen nahtlos und auf allen Ebenen integriert sein); detailliert (d.h. der gesamte Satz an relevanten klinischen Details muss verfügbar sein, nicht nur ein Teil, bei dem wichtige klinische Daten regelmäßig fehlen); und vernetzt (d.h. funktionieren, wo immer der Patient ist, nicht nur innerhalb der Grenzen bestimmter Organisationen oder klinischer Praxisräume).

### ► **Das CHRONIOUS Projekt**

Von *Roberto Rosso*

CHRONIOUS besteht aus dem Entwurf und der Implementierung einer tragbaren Plattform, basierend auf multi-parametrischen Sensoren, für das Monitoring von Menschen mit chronischen Erkrankungen. Das Projekt wirft bestimmte rechtliche und ethische Fragen auf, die einer Reglementierung bedürfen, doch sind vielfältige Vorteile zu erwarten. Das Projekt wird die Lebensqualität steigern, die medizinische Forschung vorantreiben, die



Belastung durch institutionelle Pflege reduzieren, Kosten vermindern und, noch wichtiger, die Effektivität nicht-institutioneller Pflege verbessern und die Patienten miteinbeziehen. Bezüglich des spezifischen Nutzens für Gesundheitseinrichtungen und deren Manager wird das Gerät akute Ereignisse und damit verbundenen Kosten eines Krankenhausaufenthalts um bis zu 20-30% senken.

### ▶ **Management der Sicherheit von Informationssystemen**

*Von Dr. Karin Hedström, Dr. Fredrik Karlsson und Ella Kolkowska*

User werden oft als Störfaktor für die Sicherheit von Informationssystemen gesehen. ISS Maßnahmen in Krankenhäusern sind entscheidend für die Sicherheit und Privatsphäre von Patienten. Nicht funktionierende ISS Programme können zu Fehlbehandlungen wegen inkorrekt Information führen, oder sensible Information an nicht autorisierte Personen offenbaren. Die Ergebnisse dieses Artikels basieren auf einer Compliance-Studie an den Kliniken für Chirurgie und Innere Medizin am Karlskoga Krankenhaus.

Es zeigte sich, dass es drei Bereiche der Compliance gibt: User, die formalen Regulationen folgen, User, die in Konflikt mit diesen Regulierungen stehen, und solche, die ihre eigenen ISS Maßnahmen entwickeln. Die Studie hat ergeben, dass Usern die Bedeutung der ISS bewusst ist, doch dass diese Regeln und Regulierungen dem Bedürfnis der User für einfache und zeiteffizient verfügbare Patienteninformation nicht Rechnung tragen.

### ▶ **Aufschieben ist Gift. Konfliktlösungsmuster in Krankenhäusern**

*Von Hans Martin Hasselhorn, Peter Tackenberg und Sascha Schmidt*

Konflikte am Arbeitsplatz haben eine negative Auswirkung auf die Jobzufriedenheit der Arbeitnehmer. Mithilfe von Daten der europäischen NEXT Studie wurde der Einfluss verschiedener Konfliktlösungsmodelle auf Krankenschwestern in sieben europäischen Ländern untersucht. Es zeigte sich, dass das Aufschieben einer Konfliktlösung den stärksten Einfluss auf das psychische Wohlbefinden der Krankenschwestern hat, vor allem auf ihre Einstellung bezüglich eines institutionellen und professionellen Ausstiegs. Die Gesundheitsversorgung verlangt oftmals unmittelbare Entscheidungen, und diese dann aufzuschieben kann Gift sein. Ein hohes Ausmaß an autoritärer Konfliktlösung hat in etwa denselben negativen Effekt wie ein niedriges Ausmaß an Konfliktlösung mittels Diskussion.

### ▶ **Innovative IT-Lösungen für Anlagen Management** *Von Daniel Loos*

Das Management und Controlling von Anlagen stellt für alle Krankenhäuser eine dauerhafte Herausforderung dar. Nichtsdestoweniger wird IT vermehrt und oft erfindersich eingesetzt, um sich diesen Herausforderungen zu stellen. Das Regionale Hospital St. Trudo in Belgien war auf der Suche nach einer Methode für das Management durchaus teurer Anti-Dekubitus Matratzen, da diese nach Entlassen eines Patienten häufig verschwand, was wiederum zu Zeitverschwendung beim Suchen und oft auch zu Geldverschwendung wegen zusätzlicher Mietkosten führte.

Die Matratzen wurden gekennzeichnet und können, dank eines leistungsstarken Drahtlosnetzwerks, problemlos ausfindig gemacht werden. Andere wichtige Gegenstände wie Rollstühle und Infusionspumpen wurden nun ebenfalls mit einer RFID Kennzeichnung versehen, was den Rezeptionisten Zeit spart. Die neue Technologie wird jetzt auch bei geriatrischen Patienten eingesetzt, damit sie die Station verlassen können, ohne Risiko, sich im Krankenhaus zu verirren.

### ▶ **Fokus auf die Türkei**

Die Türkei wandelt derzeit ihr Gesundheitssystem mithilfe des regierungseigenen ‚Health Transformation Programme‘ um. Das Programm (HTP) umfasst acht Themen: das Gesundheitsministerium als Plan- und Kontrollautorität neu zu strukturieren; alle Bürger innerhalb eines einzigen Sozialversicherungsinstituts zusammenzufassen; den Zugang zur Gesundheitsversorgung zu verbessern; die Motivation von im Gesundheitsbereich Tätigen zu verbessern, ebenso deren Wissen und Fertigkeiten; das System mithilfe von Bildungs- und Forschungsinstitutionen zu unterstützen; die Qualität und Effizienz der Gesundheitsangebote durch Qualitätsmanagement und Akkreditierung zu verbessern; institutionelle Restrukturierung des rationalen Managements von Medizin und deren Betriebsmittel; und den Zugang zu effektiver Information bezüglich Entscheidungsvorgängen bereitzustellen, durch Einrichtung eines effektiven Gesundheitsinformationssystems.

Die ‚Private Hospitals and Healthcare Organisations Association‘ (OSHAD) ist das Ergebnis eines Zusammenschlusses von vier Verbänden auf dem Gesundheitssektor: die ‚Private Hospital’s Association‘, die ‚Healthcare Organisations Association‘, die ‚Tourist Regions Healthcare Institutions and Organisations Association‘ und die ‚South-East Anatolian Private Healthcare Institutions Association‘. Nach Errichtung dieses Konglomerats traten 80% der Privatkrankenhäuser und 850 Gesundheitsorganisationen derselben Organisation bei.

**June**

**16 Congreso nacional de Hospitales Extremadura 2009** ..... 2-5  
*Caceres, Spain*  
[www.16congresohospitales.org](http://www.16congresohospitales.org)

**EuroMedtech 2009** ..... 3-4  
*Düsseldorf, Germany*  
[www.ebdgroup.com/emt](http://www.ebdgroup.com/emt)

**Euromedlab 18th European Congress of Clinical Chemistry and Laboratory Medicine** ..... 7-11  
*Innsbruck, Austria*  
[www.innsbruck2009.org](http://www.innsbruck2009.org)

**«Health Professionals in Europe, new roles, new skills»** ..... 14-15  
*Lisbon, Portugal*  
[www.hope.be](http://www.hope.be)

**MCC Health World 2009** ..... 22-24  
*Aachen, Germany*  
[www.health-world.info](http://www.health-world.info)

**Success in a Changing Market: innovation, funding, communication** ..... 24-26  
*Innsbruck, Austria*  
[www.ehma.org](http://www.ehma.org)

**Top Clinica** ..... 24-26  
*Stuttgart, Germany*  
[www.topclinica.de](http://www.topclinica.de)

**NI2009 10th International Congress on Nursing Informatics** ..... 28-1  
*Helsinki, Finland*  
[www.ni2009.org](http://www.ni2009.org)

**July**

**MEDcongress Baden-Baden** ..... 5-11  
*Baden-Baden, Germany*  
[www.medcongress.de/de/veranstaltungen/overview.php?koid=4](http://www.medcongress.de/de/veranstaltungen/overview.php?koid=4)

**CRID «Technology and Health : Law and Ethics»** ..... 6-8  
*Namur, Belgium*  
[www.crid.be/UEE2009](http://www.crid.be/UEE2009)

**September**

**ESC 2009- Annual Congress of the European Society of Cardiology** ..... 29-2  
*Barcelona, Spain*  
[www.escardio.org/Pages/index.aspx](http://www.escardio.org/Pages/index.aspx)

**12th European Health Forum Gastein** ..... 30-3  
*Salzburg, Austria*  
[www.ehfg.org](http://www.ehfg.org)

**October**

**11th European Health Forum «Creating a better future for health in Europe», Gastein, Austria** ..... 1-4  
[www.ehfg.org](http://www.ehfg.org)

**HOSPITAL St. Petersburg 14th International Healthcare Exhibition** ..... 7-9  
*St.Petersburg, Russia*  
[www.primexpo.ru](http://www.primexpo.ru)

**REHACARE International** ..... 14-17  
*Dusseldorf, Germany*  
[www.rehacare.de](http://www.rehacare.de)

**World Medical Tourism and Global Health Congress** ..... 26-28  
*Los Angeles, USA*  
[www.medicaltourismcongress.com](http://www.medicaltourismcongress.com)

**IT @ Networking Awards 2009** ..... 29-30  
*Brussels, Belgium*  
[www.hitm.eu](http://www.hitm.eu)

**Healthcare Design 09** ..... 31-3  
*Orlando, Florida, USA*  
[www.hcd09.com](http://www.hcd09.com)

**November**

**IHF Rio 2009 36th World Hospital Congress** ..... 10-12  
*Rio de Janeiro, Brazil*  
[www.ihfrio2009.com](http://www.ihfrio2009.com)

**ESICM - 22nd Annual Congress of the European Society of Intensive Care Medicine** ..... 11-14  
*Vienna, Austria*  
[www.esicm.org](http://www.esicm.org)

**Saving Lives: Reducing Avoidable Deaths in Hospital** ..... 12  
*Manchester, United Kingdom*  
[www.healthcare-events.co.uk](http://www.healthcare-events.co.uk)

**Medica 2009** ..... 18-21  
*Düsseldorf, Germany*  
[www.medica.de](http://www.medica.de)

**EAHM Seminar «Towards a balanced cooperation of public and private actors»** ..... 19  
*Düsseldorf, Germany*

**RSNA 2009** ..... 29-4  
*Chicago, USA*  
[www.rsna.org](http://www.rsna.org)

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