ICU MANAGEMENT

THE OFFICIAL MANAGEMENT AND PRACTICE JOURNAL

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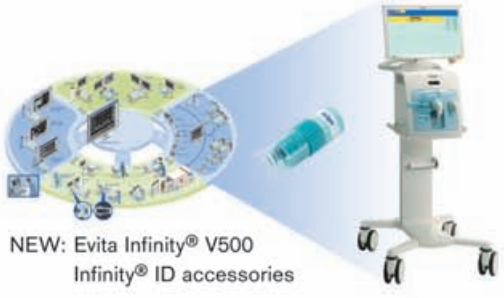

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EDITORIAL

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For the last few decades there has been an increasingly louder and more urgent discussion underway in the healthcare sector –that of our aging population and moreover, the difficulties and costs involved with treating this expanding group of patients.

As critical care managers we are faced with a growing challenge to maintain a high level of quality of care within our units, while dealing with increasing numbers of vulnerable elderly patients who are susceptible to a host of infections. In addition, we must balance the patients' treatment wishes with those of their family and the medical consensus of our own team.

In this ICU Management, Dr. Csomos tackles the issue of the cost-effectiveness of providing quality care to elderly patients, while Dr. Michaelson offers some thoughts on end-of-life care for these patients. Dr. Barraco brings us the final installment of his series on elderly care with an eye-opening focus on treatment of the frail elderly.

As many of us have seen the photo of the cardiac patient covered with frozen products from a supermarket freezer, we acknowledge that cooling of patients outside of the hospital has been done. In his contribution to this issue, Mike Clumpner discusses the studies – outlining the benefits, challenges and costs attached to using therapeutic hypothermia in the pre-hospital setting.

In our Management section, Dr. Vandijck and colleagues outline ways of measuring quality of life in the ICU; while Dr. Ondategui-Parra explains what every manager should know when it comes to cost-effectiveness analysis.

Dr. Pronovost takes time out of his busy schedule to discuss the simple (and not so simple) aspects of critical care with Managing Editor Sherry Scharff and reminds us of the powers we all have to initiate change within our teams.

We travel to France this issue for our Country Focus for a discussion of current trends and reforms underway in hospitals throughout the country and the healthcare system as a whole. Dr. de la Fournière and colleagues highlight how France is dealing with the problems associated with an increasing number of elderly patients within their borders in his article on governance and geriatrics. To round out this focus, Philippe El Sair describes the mandates of the organisation he heads, the national union of hospital managerial staff (SNCH): an independent group which represents all hospital managerial staff, including administrative and technical staff, as well as doctors and nurses.

The challenge of caring for a rapidly aging population is just one of the struggles foreseen in the coming decades in our field. A common thread in this issue is the need within our community of critical care providers to join together, share data, experiences and challenges. It is only through this collaborative exchange, whether it be at congresses and symposia, through associations, networks or joint research projects that we will be able to obtain our communal goal of improving efficiency, safety and quality of care despite the changing environment of our ICUs.

Jean-Louis Vincent

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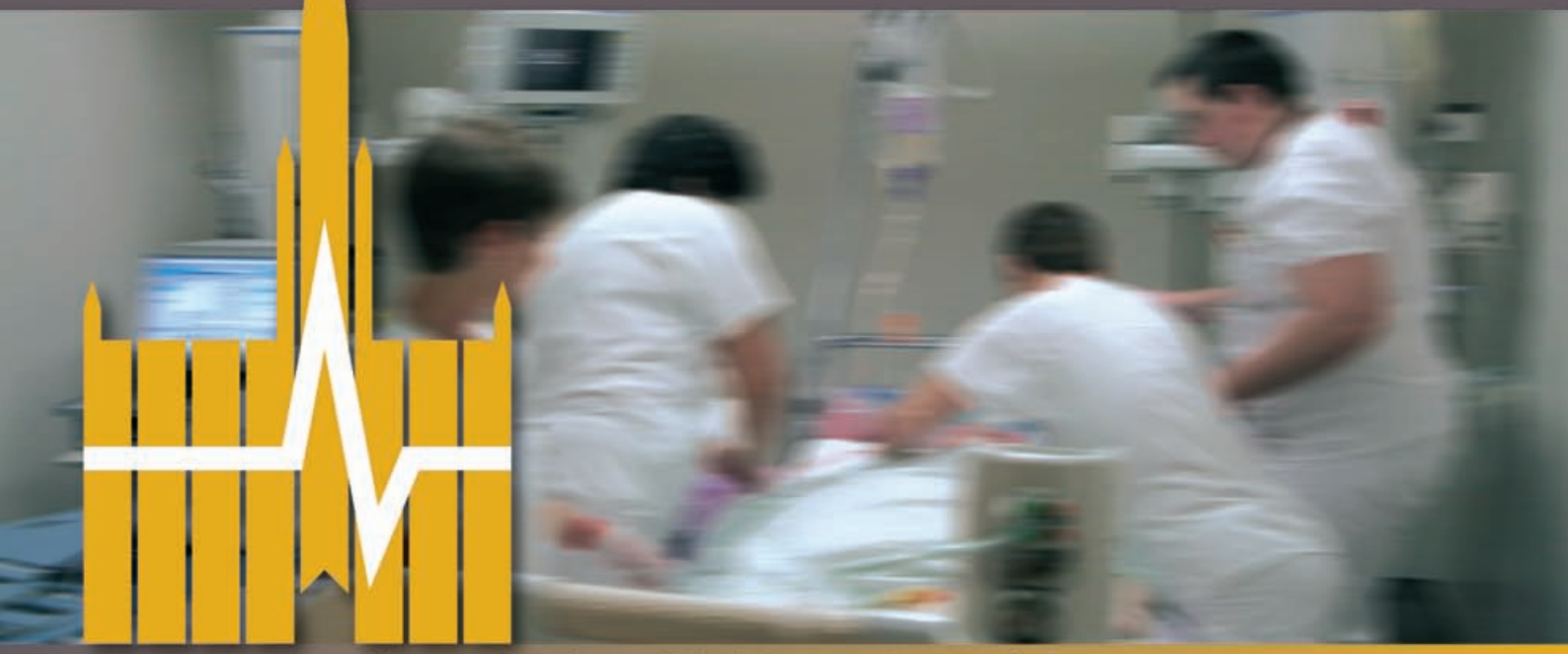

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ICU Management

is the Official Management and Practice Journal of the International Symposium on Intensive Care and emergency Medicine and was previously published as Hospital Critical Care.

RESEARCH

Scientists Discover Gene Responsible For Brain's Aging

Will scientists one day be able to slow the aging of the brain and prevent diseases such as Alzheimer's and Parkinson's? Perhaps -- at least once the genetic coding associated with neuronal degeneration has been unraveled.

According to a new study published in The Journal of Neuroscience, a research team from the Université de Montréal, Maisonneuve-Rosemont Hospital and Lawrence Berkeley National Laboratory have identified a mutation in mice that dramatically accelerates the process of aging in the brain and the eye. The new study reveals that neurons in the retina and cerebral cortex require a gene called Bmi1 to prevent activation of the p53 pathway and the accumulation of free radicals.

University of Montreal. "Scientists Discover Gene Responsible For Brain's Aging." www.sciencedaily.com (January 18, 2009)

Predicting Risk Of Stroke From One's Genetic Blueprint

A new statistical model could be used to predict an individual's lifetime risk of stroke, finds a study from the Children's Hospital Informatics Program (CHIP). Using genetic information from 569 hospital patients, the researchers showed that their predictive model could estimate an individual's overall risk of cardioembolic stroke -- the most common form of stroke -- with 86 percent accuracy. The findings are reported in the March issue of Stroke.

CHIP researcher Marco Ramoni, PhD, an Associate Professor at Harvard Medical School, in collaboration with Karen Furie, MD, the director of the stroke unit at Massachusetts General Hospital (MGH), and Rachel Ramoni, DMD, ScD, of the Harvard School of Dental Medicine, identified 569 patients that had presented to MGH's emergency department and outpatient neurology clinics between 2002 and 2005 with symptoms of suspected stroke. They collected genetic information from the 146 patients with confirmed cardioembolic stroke, and 423 controls who were followed and found not to have stroke, and looked for 1,313 genetic variants (called single nucleotide polymorphisms or SNPs) known to correlate with stroke. The SNPs that each patient had were then entered into the model -- known as a Bayesian network -- which not only identified the genetic variants that correlated with stroke, but also determined how these factors interplayed and the strength of these interactions.

Children's Hospital Boston. "Predicting Risk Of Stroke From One's Genetic Blueprint." **www.sciencedaily.com** (March 6, 2009)

INDUSTRY

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Chris Lowery, General Manager/Vice President, Patient Monitoring division of Covidien, stated, "The integration of our OxiMax system into Dräger monitors offers greater value to customers by providing access to the best in class technology of both organisations. We are especially excited to extend the reach of our specialty sensors which are in such high demand and will now be available to support an even greater number of clinicians for improved patient outcomes."

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1 Sibbald GR, Campbell K, Coutts P, Queen D. Intact skin – integrity not to be lost. Ostomy/Wound Management. 2003;49(6):27-41.

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COST-EFFECTIVENESS
OF PROVIDING QUALITY ICU CARE TO ELDERLY PATIENTS

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The aging population creates an ever-increasing demand for quality healthcare, which has its effect on critical care services as well. Limiting care to the elderly would raise ethical issues – so, it is best to first explore whether quality ICU care is cost-effective or not?

It is well known by clinicians that both expenditures on intensive care and the percentage of the elderly population are dramatically increasing. These are two different issues and both require attention from healthcare policy-makers. There is however, a possibility that in the future, elderly patients will be denied intensive care treatment if restrictions on healthcare resources are introduced. Cost-benefit analysis is therefore important in the evaluation of intensive care treatment for the elderly patients. In order to answer this, we will take three steps.

1. What is the Outcome of Elderly Patients Treated in ICU?

For years, there had been no consensus in the literature regarding prognosis, functional outcome, and costs of elderly patients admitted to ICU. Some articles have suggested that after an adequate correction of their natural mortality reference, there was no significant difference between the young and the elderly, whereas other authors have found a positive correlation between age and outcomes. Most of these early studies included elderly patients within their ICUs from a pre-selected and therefore biased population, i.e. the patients included were either the less elderly patients or the elderly who had an excellent premorbid status. So, where are the others? In a Canadian survey (Essebag et al. 2002), when elderly patients were questioned about end-of-life decisions, up to 41% choose to limit certain life-sustaining therapies including cardiopulmonary resuscitation, ventilation and ICU admission. This trend is further confirmed by Yu et al: They analysed Medicare data on 89,667 patients about the percentage of different age groups admitted to ICU in the population.

The outcome of elderly on ICU has been studied recently even in countries of higher healthcare spending, like France (Garrouste et al. 2006), Spain (Torres et al. 2006) or Netherlands (De Rooij et al. 2006): they all explored the short and long term outcomes of elderly in intensive care units. As a result, it can be concluded that age alone is not a major determining prognostic factor and should not prevent treatment from being offered.

	Hospitalised patients	
Age Group	Number of patients (x1000)	ICU use, in %
All ages	6,142	26,8
65 - 74 yrs	2,708	28,8
75 - 84 yrs	2,361	27,2
> 85 yrs	1,073	20,8

2. Do we Spend More on Elderly Patients treated in ICU?

The costing studies are consistent that older age is associated with lower hospital costs and resource intensity (Hamel et al. 1996; Boumendil et al. 2005). Mechanical ventilation in ICUs implies long length of stays and high treatment costs, so it would be interesting to see if age has an impact on the hospital cost of patients receiving mechanical ventilation? Chelluri et al. analysed this in a single centre prospective observational study including 813 patients. They found that total cost for hospitalisation as well as cost per day was less for the older patients compared with younger patients. One would think that the lower hospital cost was due to higher mortal-

ity and consequent shorter ICU length of stay of elderly – but it is not the case! The relationship between age and costs was independent of hospital mortality, resuscitation status and discharge location.

This study as well as other costing studies showed that elderly on ICU receive fewer resources than other age groups; this contributes to the lower daily ICU costs found with regards to elderly patients. Less resource use in the elderly can be explained from different perspectives:

Physicians' perspective:
- Using age as a co-morbidity in deciding on treatment.
- Underestimating older person's preferences and using fewer treatments.

Patient perspective:
- Preferring less aggressive care and fewer treatments.
- Older patients admitted to ICU being healthier and having fewer complications.

Other:
- Age bias

3. Is it Cost-Effective to Treat Elderly Patients in ICU?

This is the most difficult question to answer, because it implies quality of life data as well as life expectancy. Older patients are at higher risk for poor functional outcomes, not just by failure to recover activities of pre-ICU daily living, but also by additional impairments during ICU stay (Covinsky et al. 2003). To make it more complicated, there is a wide variety of expected quality of life in individual elderly patients. This explains why there is no data on cost-effectiveness in this group of patients. However, we know that intensive care in general is cost-effective (Ridley et al. 2007) and we also know that we spend less on the elderly, so I do not refuse admitting elderly patients to my intensive care unit.

Finally, another interesting issue in this respect is how to define the elderly population when life expectancy is low? As far back as 1875, in Britain, the Friendly Societies Act, enacted the definition of old age as, "any age after 50", but in this century there is a general consensus that elderly is considered to be over retirement age, e.g. >65 years. Should be increased to >70 years, since the life expectancy has increased in the last 10 years? Additionally, should we consider a lower elderly age limit in those countries where life expectancy is lower? This would have an impact on the cost-effectiveness studies in this patient group as well.

Are Sitters the Solution for Staffing Issues?

With current staffing and resource shortages, many hospitals have only one or two nurses working in a unit at a given time- often handling many patients in a long shift. While this is sufficient for basic quality care, it is not as comprehensive as continuous individual monitoring. As in-hospital falls are a particular issue for elderly patients who while disoriented and medicated, are at increased risk for accidentally injuring themselves by falling or removing IVs. **In fact a staggering ten percent of fatal falls for seniors occur in hospitals.**

At least one company in the service industry is seeking to remedy this- with a "hospital sitter"- a specialised caregiver who provides round-the-clock companionship and monitoring for a patient. But while safety concerns are central, Dr. Jim Johnson of Home Care Assistance insists that hospital sitters can more than help prevent falls and alert nurses. "Companionship makes great medicine," he says.

The addition of outside members of the healthcare team inevitably opens the door for other issues with regards to responsibility and liability. Hospital sitters cannot directly care for patients and remain under the direction of the on-duty nurse, who would be immediately summoned if the patient has an urgent need or medical emergency.

For more information about hospital sitters:
www.homecareassistance.com

References

Boumendil A, Aegerter P, Guidet B. (2005) Treatment intensity and outcome of patients aged 80 and older in ICU. J Am Geriatr Soc 53:88-93.

Chelluri L, Mendelsohn AB, Belle SH et al. (2003) Hospital costs in patients receiving prolonged mechanical ventilation: Does age have an impact? Crit Care Med 31:1746 –1751.

Covinsky KE, Palmer RM, Fortinsky RH et al. (2003) Loss of independence in activities of daily living in older adults hospitalized with medical illnesses: increased vulnerability with age. J Am Geriatr Soc 51:451-458.

De Rooij SE, Govers A, Korevaar JC et al. (2006) Short-term and long-term mortality in very elderly patients admitted to an intensive care unit. 32:1039-1044.

Essebag V, Cantarovich M, Crelinsten G. (2002) Routine advance directive and organ donation questioning on admission to hospital. Ann R Coll Phys Surg Canada 35:225-231.

Garrouste-Orgeas M, Timsit JF, Montuclard L et al. (2006) Decision-making process, outcome, and 1-year quality of life of octogenarians referred for intensive care unit admission. 32:1045-1051.

Global Action on Ageing: www.globalaging.org

Hamel MB, Phillips RS, Teno JM et al. (1996) Seriously ill hospitalized adults: do we spend less on older patients? J Am Geriatr Soc 44:1043-1048.

Ridley S, Morris S. (2007) Cost-effectiveness of adult intensive care in the UK. Anaesthesia 62:574-554.

Torres OH, Francia E, Longobardi V et al. (2006) Short and long-term out comes of older patients in intermediate care units. Int Care Med 32:1052-1059.

Yu W, Ash AS, Levinsky NG et al. (2000) Intensive care unit use and mortality in the elderly. J Gen Intern Med 15:97-102.

SOME THOUGHTS ON INTENSIVE CARE FOR ELDERLY PATIENTS

AT THE END OF THEIR LIVES

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Over the last decades, increasingly more elderly and often chronically ill patients are being cared for in hospitals during the last weeks or months of their lives. "Elderly patients" in this article refers to patients above 65 years of age. There are other cut-off ages used, yet with regards to treatment options and prognoses, the numerical age of elderly patients is less influential than their biological condition – as mirrored by their previous health as well as their mental and functional status. The elderly are the fastest growing age-group worldwide, and the increase in hospital treatment of elderly is due, amongst others, to this global demographic change towards ageing societies, the implementation of public health policies, for instance regarding certain vaccination programmes, improved sanitation and better availability of adequate nutrition, as well as medical and technological progress (World Health Organisation). Furthermore, there is also a societal trend towards transferring birth and death from the home environment to institutional environments. Allegedly, the majority of elderly would prefer to die at home, however, a minority really does.

When elderly patients are being treated in hospitals, the predominant and primary intention of the healthcare team is to improve or at least maintain their quality of life. This is often achievable by comparatively small measures, such as exchanging one drug for another to minimise side effects, prescribing an antibiotic to overcome an acute infection or supporting daily activities through the help of medical home care services. If their vital functions are threatened or compromised, however, elderly patients usually need to be treated invasively in specialised units, such as cardiac care or intensive care units (ICUs).

The primary task of intensive care medicine is to temporarily treat patients whose vital functions are compromised with the intent to stabilise or restore those functions, so that the patients can continue their lives at their prior level of independence. Owing to the achievements of medicine and medical technology, disrupted vital functions can be sustained for a comparatively long time these days by invasive measures, especially in ICUs.

The fundamental question regarding an intended invasive treatment is, whether the respective individual patient can thereby expect mitigation of or even cure his/her ailments and whether subsequently a restitution to his/her prior health status or at least to a quality of life acceptable for him/her can be achieved (Michalsen 2008). In the elderly, prognostication of the medical course often is more difficult than in other age groups; also, age-specific benefits and burdens of treatment need to be taken into account. If there is a realistic chance of restitution for the individual patient under the circumstances prevailing, then intensive care treatment appears warranted – provided that the patient gives his/her informed consent. Unfortunately, knowing an elderly patient's own preferences and choices can be very difficult (Nelson and Nierman 2001). Perhaps treatment is also justifiable, if a decision cannot be deferred due to urgency, even though there is insufficient information about the patient at that time. But if there is no realistic chance for benefit, then the indication for intensive care therapy needs to be reviewed. The pure availability of intensive care treatment modalities does not justify their general usage – they must benefit the individual patient in question (Michalsen 2008; Strätling and Schmucker 2005).

In daily practice, this rather puristic directive of treatment application is not always implemented for several more or less comprehensible reasons. For instance, there is insufficient clarity as to whether the patient has given or is able to give informed consent; there is variable interpretation of his/her living will; there is insufficient clarity as to the potential benefit of the intended invasive measures; there are conflicts amongst staff or between staff and family as to the goals and the extent of treatment; there is fear of litigation; there is insufficient knowledge of the respective legal stipulations amongst the treating physicians; there is a variability of values and beliefs amongst the healthcare team and/or the family; and there is insufficient knowledge about widely accepted ethical principles and ethical reasoning amongst staff (Michalsen 2008; 2007; Nelson and Nierman 2001; Sprung et al. 2003; Beauchamp and Childress 2001).

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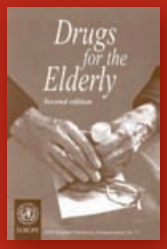
Each of these reasons to implement or continue non-beneficial life-sustaining therapies would merit a more comprehensive discussion beyond the scope of this article. Based on the four well-established ethical principles – non-maleficence, beneficence, respect of the patient's autonomy, and justice (Beauchamp and Childress 2001) – the following general approach regarding decisions on intensive care treatment for elderly at the end of their lives can be recommended to healthcare teams:

1. If a patient is capable of decision-making and does not give his/her informed consent, then treatment is not justified.
2. If a patient is incapacitated and if his/her wishes and choices cannot be ascertained otherwise, for instance through a living will, then a statement by a legal representative of the patient must be sought (according to the prevailing legal stipulations).
3. If there is insufficient information on the patient's medical history, present health status or prognosis and if treatment is urgent, then treatment may well be justified – at least, until more information is available.
4. Numerical age alone generally does not preclude treatment (Nelson and Nierman 2001).
5. If treatment is warranted, then it needs to be implemented timely and appropriately. If treatment is not warranted or if treatment does not prove beneficial after implementation, withholding or withdrawing treatment are acceptable alternatives (Michalsen 2008; Strätling and Schmucker).
6. Concurring with the principles of shared decision-making and family-centred care, the patient and his/her family need to be informed about and involved in the treatment process as comprehensively as possible (Michalsen 2008; Fassier and Azoulay 2007; Evans et al 2009).
7. Conflicts amongst the healthcare team or between the team and the family need to be acknowledged and dealt with pro-actively. An open communication strategy especially with regards to the patients' values and wishes as well as to truthful prognostication is a very important means to solve conflicts and move forward – as is the willingness to build consensus. If a conflict appears to be insurmountable for the healthcare team, then it may be helpful to ask an ethics committee for advice (Michalsen 2008; Fassier and Azoulay 2007).

DRUGS FOR THE ELDERLY

BOOKS **in review**

WHO Regional Publications, European Series, No. 71



The second revised edition of a popular practical guide first introduces the basic principles of good prescribing practices for elderly patients with the goal of making physicians more aware of when and how standard-prescribing practices must be altered for this age group. A discussion of the problems surrounding drug therapy in the elderly is followed by an explanation of the ways in which the aging process can affect drug action. A chapter on choosing the right preparations alerts prescribers to the many problems with formulations and containers, such as childproof lids that are difficult to open and tablets that are too large for the elderly to swallow, that may reduce patient compliance and compromise therapeutic efficacy. The first part concludes with a chapter on adverse drug reactions in the elderly, which includes a tabular presentation of drugs known to have potentially severe or unusual side effects in the elderly.

The main part consists of detailed monographs for each of 41 categories of drugs frequently prescribed to elderly patients. Each monograph includes concise information on indications and prescribing rules, classes of drug preparations, drug-related symptoms, and possible alternative therapies. An index of drug names, with reference to those appearing in the WHO Model List of Essential Drugs, concludes the book.

www.who.int

In the future, many more elderly will seek and require intensive care therapy. It does not appear justified to preclude them from invasive treatment at the end of their lives on the mere basis of their numerical age. But it does not appear justified either, to apply or continue life-sustaining technology without a realistic chance of benefit. Therefore, after weighing age-specific benefits and burdens of the proposed intensive care treatment for each patient individually, in some patients it will not be implemented, and in others it will fail. In both scenarios, the treatment goal will have to be changed from curative to palliative care. It needs to be remembered, though, that patients do not die from withholding or withdrawing non-beneficial treatment – they die from the underlying diseases. And perhaps, some can still die at home.

References

Beauchamp TL, Childress JF. Principles of biomedical ethics (5th ed.). New York, Oxford University Press, 2001.

Evans LR, Boyd EA, Malvar G et al. Surrogate decision-makers' perspectives on discussing prognosis in the face of uncertainty. Am J Respir Crit Care Med 2009; 179:48-53.

Fassier T, Azoulay E. Communication with families in the ICU. In: Kuhlen R, Moreno R, Ranieri M, Rhodes A (eds.). 25 years of progress and innovation in intensive care medicine. Berlin, Medizinisch Wissenschaftliche Verlagsgesellschaft, 2007, pp. 481-492.

Michalsen A. Care for dying patients – German legislation. Intensive Care Med 2007; 33:1823-1826.

Michalsen A. Intensivmedizin am Lebensende. In: Kuhlen R, Putensen C, Quintel M (Hrsg.). Interdisziplinäre Intensivmedizin Aktuell – Band 1. Nürnberg, MEPS; 2008, S. 299-315.

Nelson JE, Nierman DM. Special concerns for the very old. In: Curtis JR, Rubenfeld GD (eds.). Managing death in the intensive care unit. New York, Oxford University Press, 2001, pp. 349-367.

Sprung CIL, Cohen SL, Skokvist P et al. End-of-life practices in European intensive care units. The Ethicus Study. JAMA 2003; 290:790-797.

Strätling M, Schmucker P.Entscheidungen am Lebensende in der Intensivmedizin. 2. Medizinisch-objektive Grundlageden der Behandlungsbegrenzung. Anästhesiol Intensivmed Notfallmed Schmerzther 2005; 40:361-378.

World Health Organization. Topics: ageing. www.who.int/topics/ageing/en/, accessed January 2009.

World Health Organization. World population prospects – the 2006 revision population database. www.esa.un.org/unpp, accessed January 2009.

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*Pontes-Arruda A, et al. *JPEN J Parenter Enteral Nutr.* 2008;32:596-605.

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THE AGING OF OUR ICUs PART III
THE FRAIL ELDERLY: A SPECIAL SUBGROUP WITH SPECIAL NEEDS

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In our third and final instalment in a series of articles in ICU Management concerning the impact of the aging population in our ICUs, we focus on an important subgroup whose special requirements in the critical care environment need to be addressed: The frail elderly.

The frail elderly is a particularly problematic group of patients. Multiple definitions existed over the years. Frailty concerns the combined effects of the natural aging process and medical comorbidities. Frailty is a global problem, with incidence rates approximating 7% (Fried 2007; Avila-Funes 2008). Incidence increases with age, approaching one-third of those patients more than 90 years old (Walston 2002). Fried et al. in 2001 defined frailty by a combination of 3 or more of the following factors:

- Unintentional weight loss (10 pounds or more in a year);
- General feeling of exhaustion;
- Weakness (as measured by grip strength);
- Slow walking speed, and
- Low levels of physical activity.

> **"Pitkala et al. found that delirium in the frail elderly was an independent predictor for mortality at 1 year and for permanent institutionalisation."**

They found that frailty was a reliable predictor of a general decline in health. The frail were prone to falls, deteriorating mobility, disability, hospitalisation and death. The increased incidence of functional decline after hospitalisation exhibited in this group may be due to iatrogenic illness, immobility, disturbed sleep-wake cycles, an unfamiliar environment, and inadequate nutrition (Palmer 1998). Fried also found that frailty was highly associated with cardiovascular disease, low education and poverty. Cognitive dysfunction, psychiatric problems and pre-existing functional impairment further increase the risk of decline during hospitalisation (Palmer 2004). This functional decline leads to increased hospital mortality.

Identifying these patients at or before admission then becomes very important. There are several scales which attempt to quantify frailty. They generally contain elements relating to cognition, functionality and general health status. In one study of the Edmonton Frail Scale (EFS), scores greater than 7 were associated with increased complications and decreased chance of being discharged to home (Dasgupta 2009). The EFS is only one of several frailty screening tools which uses the clock drawing and the timed get up and go tests for cognitive and functional state as well as questions on general health status and independence, mood, nutrition/weight loss, medications, continence and social support to total 17 possible points, greater totals signifying increased frailty. However, in many of our trauma centres and ICUs, this information may be hard to come by given the clinical state of the patient and ability to give history or perform the tasks involved. Simple inquiry regarding functional status and age may serve to identify patients at risk.

We spoke earlier in our series about the use of comprehensive geriatric assessments and a different paradigm for preoperative clearance. This is particularly important for the frail elderly. In addition, ICU management becomes more difficult. For instance, post-operative pain management requires more attention to detail, with starting dose adjustments of one-third to one-half normal adult dose necessary in the frail elderly.

Careful management of delirium can also impact the care of the frail elderly. The incidence of delirium in the elderly is 10-15% at admission, 21-63% after hip fracture surgery and 20% after gynecologic oncology surgery (Maldonado 2008). Pitkala et al. found that delirium in the frail elderly was an independent predictor for mortality at 1 year and for permanent institutionalisation. Prevention and prophylaxis are best accomplished by treating associated diseases, being vigilant for occult infection, judicious medication usage, including avoidance of anti-cholinergic drugs, adequate treatment of pain and alteration of environmental factors in the hospital itself. Prophylactic haloperidol may reduce severity and duration of delirium in the elderly, but does not prevent its development (Kalisvaart 2005). Low dose haloperidol, 0.5 to 1 mg IV, can be used for treatment of delirium with caution until agitation is controlled. One must recognise the extended half-life of haloperidol in the elderly, up to 72 hours.

There is no specific treatment for frailty. However, exercise, stretching, resistance training and tai chi have been shown to have beneficial effects on frailty. Exercise three times a week for up to 6 months has improved frailty markers (Binder 2002; Wolf 1996; 2003). However, true outcomes studies have not been done to show any difference in morbidity and mortality. Therefore, the use of exercise preoperatively may be of benefit and deserves further study.

Since the frail elderly are at such increased risk for further functional decline, postoperative complications and mortality, palliative care is an important adjunct in the care of this fragile group of patients. Practitioners must be attuned to when the threshold from curative to palliative care has been crossed. Patient wishes are of paramount importance and if the clinical status precludes direct communication of those wishes by the patient, then advance directives and/or appropriate surrogate decision-makers must be sought out. Symptom management, relief of suffering and comfort are the mainstays of treatment. Palliative care should be in the toolbox of all ICU practitioners and appropriate consultation should be initiated when necessary and available.

"Palliative care should be in the toolbox of all ICU practitioners and appropriate consultation should be initiated when necessary and available."

As a final consideration in our series on the aging of our ICUs, it is important to remember the goals of care for the elderly patient when examining treatment options. In the Principles and Practice of Geriatric Surgery, Dr. Zenilman sums the goals up quite effectively: maximise or maintain potential life span, maintain dignity of life, maximise self-esteem, maximise independent function, minimise dependence and relieve suffering with particular attention to pain. When cure might not be possible, palliation and comfort are just as important (Rosenthal 2001). If we as practitioners keep these goals in mind, then the result will be the best care possible for our elderly patients and their families.

References

Avila-Funes JA, Helmer C, Amieva H, Barberger-Gateau P, Le Goff M, Ritchie K, Portet F, Carrière I, Tavernier B, Gutiérrez-Robledo LM, Dartigues JF. Frailty among community-dwelling elderly people in France: the three-city study. J Gerontol A Biol Sci Med Sci. 2008;63:1089-1096.

Binder EF, Schechtman KB, Ehsani AA, Steger-May K, Brown M, Sinacore DR, Yarasheski KE, Holloszy JO, Effects of exercise training on frailty in community-dwelling older adults: results of a randomized, controlled trial, J Am Geriatr Soc. 2002;50:1921-1928.

Dasgupta M, Rolfson DB, Stolee P, Borrie MJ, Speechley M. Frailty is associated with postoperative complications in older adults with medical problems, Arch Gerontol Geriatr. 2009;48:78-83. Epub 2008 Feb 20.

Fried LP. Chapter 21: Epidemiology of aging: Implications of the aging of society Goldman: Cecil Medicine, 23rd ed. Elsevier, 2007.

Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: Evidence for a phenotype. J Gerontol A Biol Sci Med Sci. 2001;56:M146–M156.

Kalisvaart KJ, de Jonghe JF, Bogaards MJ, Vreeswijk R, Egberts TC, Burger BJ, Eikelenboom P, van Gool WA. Haloperidol prophylaxis for elderly hip-surgery patients at risk for delirium: a randomized placebo-controlled study. J Am Geriatr Soc. 2005;53:1658-1666.

Maldonado JR. Delirium in the acute care setting: characteristics, diagnosis and treatment. Crit Care Clin. 2008; 24:4:657-722.

Palmer RM, Counsell S, Landefeld CS. Clinical intervention trials: the ACE unit. Clin Geriatr Med. 1998;14:831–849.

Palmer RM, "Management of Common Geriatric Disorders in Geriatric Patients" and "Interdisciplinary Medicine", ACP Medicine Online, 2004.

Pitkala KH, Laurila JV, Strandberg TE, Tilvis RS, Prognostic Significance of Delirium in Frail Older People, Dement Geriatr Cogn Disord 2005;19:158-163.

Walston J, McBurnie MA, Newman A, Tracy RP, Kop WJ, Hirsch CH, Gottdiener J, Fried LP; Cardiovascular Health Study. Frailty and activation of the inflammation and coagulation systems with and without clinical comorbidities: results from the Cardiovascular Health Study. Arch Intern Med. 2002;162:2333-2341.

Wolf SL, Barnhart HX, Kutner NG, McNeely E, Coogler C, Xu T. Reducing frailty and falls in older persons: an investigation of Tai Chi and computerized balance training. Atlanta FICSIT Group. Frailty and Injuries: Cooperative Studies of Intervention Techniques.J Am Geriatr Soc. 1996;44:489-497.

Wolf SL, Sattin RW, Kutner M, O'Grady M, Greenspan AI, Gregor RJ. Intense tai chi exercise training and fall occurrences in older, transitionally frail adults: a randomized, controlled trial. J Am Geriatr Soc. 2003;51:1693-1701.

Principles and Practice of Geriatric Surgery, Rosenthal, Ronnie Ann; Zenilman, Michael E.; Katlic, Mark R. (Eds.), New York: Springer, 2001.

THE IMPORTANCE OF UNDERSTANDING IT VALUES IN ELDERLY CARE

IT SYSTEMS DEVELOPED IN SWEDEN

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Elderly care is one area where information technology (IT) is rapidly gaining ground. An increase in the number of elderly, and a demand for more advanced help and support, together with a desire to make it possible for the elderly to live in their own homes for as long as possible, force decision makers and healthcare professionals to develop better and more efficient elderly care. Many advocate the use of IT for management and administration of elderly care as a solution for coming to terms with many of the problems facing elderly care. An instrumental perspective is dominant in studies on IT such as the electronic health record (EHR), and values for stakeholders are often discussed in financial terms. However, in order to achieve successful implementation of IT, it is also important to study the values of IT in a broader sense.

Using four IT-projects as a basis, this article discusses the value of IT in elderly care, ending with a conclusion on the influence of values on IT in elderly care.

Sofia Omfale

Sofia Omfale is an organisation-wide, off-the-shelf IT-system for administration of elderly care, and consists of optional modules. The case-site organisation has chosen to use Sofia Omfale for 'assignments', 'living', 'clients', 'staff', 'debiting', 'population record', and 'miscellaneous'. The users are mainly section managers, nurse aids, LPNs (licensed practicing nurses), and administrative staff. The section managers use Sofia Omfale for accessing information about clients, accessing or reporting statistics and information on fees and charges. Nurse aids, LPNs, and administrative staff use Sofia Omfale mainly for registering and accessing client information. The IT-project started in 1996, and was going to meet the following objective: 'A modern IT support tailored for the organisation, together with appropriate technology for registration of time that electronically create basic data for debiting and invoicing, will result in savings from a more efficient administration'. Sofia Omfale was implemented and in use by 1998. Sofia Omfale has improved registered data, making information more accurate and up-to-date.

Mini-pAKT

Mini-pAKT was developed in-house by a section manager, nurse aids and LPNs in collaboration with the municipality's IT department. The section manager saw the need for an IT-system as a support for the nurse aids' and LPNs' communication and documentation. Mini-pAKT supports documentation of elderly care carried out, as well as planning elderly care. Mini-pAKT consists of the following documents: 'client information', 'notes', and 'work plan'. 'Client information' gives details on the clients, were they live, and what type of help they are entitled to. 'Notes' is equivalent to a health record containing day-to-day record entries. The 'work plan' is a detailed account on how the client wants to be treated, and how to carry out the help needed. Every nurse aid, LPN, and section manager used mini-pAKT on a daily basis. Mini-pAKT was introduced 1998-2000, and created a mutual organisational memory accessible for all authorised personnel. This contributed to improved client documentation, which resulted in better knowledge about clients and their needs, developing staffs' competences, and an increased awareness of their organisational roles. 'You are a representative for the local government and cannot, therefore, write the documentation anyway you want. You have to be objective […] and the information has to concern the contact between the nurse aids and the client'.

DocIT

DocIT is an off-the-shelf organisational wide IT-system for administration and management of elderly care. One important objective with the new IT-system was to create 'a mutual entrance for all' meaning that all authorised staff would access the same information. This would hopefully increase cooperation between staff, improve the quality of elderly care, and contribute to a more efficient administration. The system consists of a basic module that supports administration of clients and assignments according to the Swedish Social Services Act. The optional modules include 'debiting', 'living', 'social record', 'transportation service', etc. DocIT is used on a daily basis by all staff working with elderly care. The system was gradually implemented 2002-2003, and has contributed to 'Increased understanding for different professional groups as the users can see what various professional groups do vis-à-vis a client'. The users also state that DocIT has made administration more efficient, as DocIT makes information available irrespective of time and place, decreasing the need for phone-calls as well as eliminate double-work in terms of recording information: 'Only one person records information, making it available for all'.

SAVA

SAVA is an IT-system, developed in-house, by IS- (information systems) researchers in col-

HIGH TECH HEALTH GADGETS

GADGETS **in review**

Camera pills and ultrasound creating maps of the body: health has become high technology. Here are some of the recent advances in medical technology.

Ultrasound Maps For Surgeons

A new IT-base window on the inside of the body exists, which makes a patient transparent on a screen while a surgeon operates. The system transforms X-ray and nuclear magnetic resonance (MR) images into three-dimensional maps by which the surgeon can navigate when he performs keyhole surgery in the abdominal cavity. The technique enables the surgeon to select a more lenient keyhole approach in operations that would otherwise demand large, open interventions.

Like navigation systems for shipping and aviation, this navigation technology has been developed in order to improve safety: the maps show the surgeon exactly where a cancerous tumour for example is located, relative to the tip of the instruments inside the patient's body; and no less important, the location of the tip relative to vital organs and to major blood vessels that absolutely must not be damaged by the surgical intervention.

Camera Pills or "SMART CAPSULES"

Camera pills that can be swallowed already exist. They travel naturally through the digestive system and may take several days to make the passage. Unlike these, however, the smart capsule will be controlled by the doctor or by a computer system, which will allow it to be stopped or even reversed when something is seen that needs to be examined more closely.

The pill's sensor package will include sensors based on ultrasound, spectroscopy, and possibly also biosensors, and it will also collect tissue samples. Earlier diagnosis of colorectal cancers is one of the potential benefits of the capsule, which will thus help to save lives. If everything goes according to plan, we will be able to "open wide" for the smart pill in about four years.

Sensors @ home

Many of today's hospital patients do not need to remain in hospital, but do so while being monitored for response to medications. Within a few years, patients who are not ill, but require observation and/or follow-up will be able to simply wear a little sensor on their body. With wireless transmission, the patient would be able to move around quite freely, and technologies that permit measurements to be made on a continuous basis. If critical values are passed, the sensors could be read remotely and medical personnel warned.

Lab on a Chip

Today, most blood samples are sent to major laboratories for analysis, a process that can take a great deal of time. SINTEF scientists are now developing equipment that performs chemical and biological analyses of bodily fluids in the course of a few minutes. A doctor or nurse can place a biological sample on a credit card-sized plastic chip that acts as a microlaboratory and utilises optical sensor technology in the analytical instrument that will read data from the chip. A reader of this type could be installed in every doctor's office, so that the doctor and the patient could obtain the results without delay. From a single drop of blood, even cholesterol and glucose levels could be analysed at home with the aid of such a "lab on a chip".

Adapted from materials provided by SINTEF, via AlphaGalileo, ScienceDaily.

laboration with nurse aids, and section managers. SAVA supports communication between care professionals about the clients, their needs, and events and actions related to their lives. The objective with SAVA was to improve knowledge transfer between care employees in order to ensure safe and adequate care, with the possibility for evaluation. SAVA supports documentation (social record and registering events), client information, planning, and follow up, and is used by nurse aids, LPNs, and section managers. SAVA is mainly used for documentation and client information. 'We use SAVA for documentation and client information, when you register a new client, search for family. We use SAVA several times every day. It is the first thing you do in the morning, so you know what has happened since you worked last.' The IT-project started in 1999 and the system was gradually implemented in 2002. Using SAVA has resulted in a more efficient communication, as the information is accessible by all authorized personnel, irrespective of time and place. One major result of this IT-project was the staff's relation to computers. This was an organisation with users with none or little computer experience. Many were initially very hesitant about using IT-systems for elderly care, but this changed completely. At the end of the project there was a dramatic increase in computer skills, and a very positive attitude towards using IT for the administration of elderly care.

IT Values in Elderly Care

The values embraced by the new IT-system depend on the initial goals, driving actors, and experienced problems, as illustrated by the case studies above. Sofia Omfale mainly relates to administrative values as administration and efficiency are the main problems addressed by the new IT-system. Mini-pAKT on the other hand, has had most impact on communication routines, and the nurse aids' knowledge about clients and their view on their professional role. This means that mini-pAKT is seen as an IT-project that supports values related to administration, communication, care and the elderly care profession. The purpose of DocIT was to support co-operation, and information transfer, which would contribute to more correct care, cost savings, as well as a safer care. DocIT therefore supports values related to efficiency, administration, cooperation, and care. SAVA, with its focus on quality assurance and knowledge transfer, embraces values related to communication, documentation, competence, as well as administration.

Conclusion

An IT-system includes social as well as technical aspects that need to be considered. Implementation of IT invariably involves making decision about communication patterns and routines – elements that are by their very nature social. A successful IT-system for elderly care needs to encompass not only values related to administration, efficiency, and co-operation, but also values such as improved care and correct care, as well as values related to the elderly care profession. Different actors are carriers of different values, depending on their organisational position. If we want to promote and support certain actors' interests and values by an IT-system, it is necessary to include these early in the process. Otherwise they will be more difficult to embrace and incorporate in the design.

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PRE-HOSPITAL THERAPEUTIC HYPOTHERMIA:

WILL IT SAVE A LIFE?

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Therapeutic hypothermia has emerged as one of the hottest topics in critical care medicine and although a few continue to debate the proven benefits of induced hypothermia, many have accepted its use as a treatment modality for multiple illnesses and injuries. As the benefit has become more evident within the hospital, practitioners have looked for ways to expand this treatment to even more patients.

One of the ways to expand this treatment and possibly increase survival following sudden cardiac arrest is to implement the protocol in the pre-hospital setting. When looking at pre-hospital therapeutic hypothermia, one must first look at the literature to see if the treatment is warranted outside of the hospital, and then they must look at the obstacles that may prevent implementation.

In 2001, King County Medic One in Seattle, Washington USA started a two-year trial study of the benefits of therapeutic hypothermia for patients that had return of spontaneous circulation (ROSC). The King County Medic One study demonstrated a twenty percent increase in survivability in the ventricular fibrillation patient population (n=29, 69% of ventricular fibrillation patients with therapeutic hypothermia versus 45% of ventricular fibrillation patients without therapeutic hypothermia) (Kim et al. 2008). In 2004, King County Medic One discontinued to the trial study in order to evaluate the data and make appropriate recommendations.

In October 2002, the European Resuscitation Council, and the International Liaison for Committee for Resuscitation endorsed therapeutic hypothermia after cardiac arrest. In 2005 the American Heart Association endorsed therapeutic hypothermia as a Class IIA treatment for all ventricular fibrillation and ventricular tachycardia arrests, and made a Class IIB treatment for pulseless electrical activity and asystole arrests that were cardiac in origin. Following the American Heart Association recommendation, Regional One Air Medical Services in Spartanburg, South Carolina USA (a helicopter EMS service staffed with a pilot, flight nurse and flight paramedic) began this treatment for all adult cardiac arrest patients whose etiology was presumed medical in nature.

It is important to note that although therapeutic hypothermia has been endorsed by the American Heart Association, European Resuscitation Council, and the International Liaison Committee on Resuscitation, there was no specific verbiage by any of the recommending bodies regarding the efficacy of starting therapeutic hypothermia in the pre-hospital setting. Instead, the recommendations simply stated, "must be initiated as soon as possible" and left the interpretation regarding time of induction to the individual physicians. Because the recommendations did not specifically address therapeutic hypothermia induction in the pre-hospital setting, many physicians hesitated to push early induction outside of the hospital. A recent study in the United States found that 21 percent of EMS physicians who do not advocate therapeutic hypothermia by paramedics do so only because of the lack of specific wording within the American Heart Association guidelines stating that it should be started pre-hospital (Clumpner and Mobley 2008).

Another stumbling block to the widespread implementation of pre-hospital cooling was the lack of available research clearly indicating increased survivability with early induction. One of the first research trials conducted for pre-hospital therapeutic hypothermia was the Rapid Infusion of Cold Hartmann's for Hypothermia following Cardiac Arrest (RICH Trial) con-

ducted by Dr. Stephen Bernard in Melbourne, Australia. The results of the trial showed no significant increase in survivability with the early induction of therapeutic hypothermia by paramedics. The results of this study were quoted widely by physicians who did not advocate early induction of therapeutic hypothermia. However, upon closer examination of the study, it was found that the lack of increase in survivability was due in part to the failure of the receiving hospitals to continue therapeutic hypothermia. In order for pre-hospital therapeutic hypothermia to be successful, it must be continued in the hospital.

"Our findings not only demonstrate beneficial outcomes for victims of cardiac arrest, but also suggest the possibility that such treatment plans can be implemented for other medical conditions."

Dr. Brent Myers, *Medical Director for Wake County EMS*

The lack of published data following the RICH trial was because of few pre-hospital agencies practicing the protocol, and the hesitation by EMS physicians to publish data with a small patient population. However, in the last two years, more research has become available from pre-hospital agencies as they have treated more patients and have been practicing the protocol longer. In early 2005, Regional One Air Medical services became the first pre-hospital provider in the world to implement a non-trial therapeutic hypothermia protocol for all adult post-cardiac arrest patients with return of spontaneous circulation who arrested because of non-trauma etiology. Data from this program has shown a three-fold increase in survivability to discharge since protocol implementation.

Data from Wake County EMS (Raleigh, North Carolina, USA) has shown an impressive four-fold increase in survival to discharge following their pre-hospital therapeutic implementation in late 2007. As Dr. Brent Myers, Medical Director for Wake EMS stated, "Our findings not only demonstrate beneficial outcomes for victims of cardiac arrest, but also suggest the possibility that such treatment plans can be implemented for other medical conditions."

It is important to note that successful pre-hospital therapeutic hypothermia must look at survival to discharge from the hospital, not simply the return of spontaneous circulation upon discharge at the emergency department. Many EMS services, which do not have a therapeutic hypothermia protocol boast survival rates from cardiac arrest nearing twenty percent. However upon closer examination this only takes into account a patient delivered to the hospital with a pulse following cardiac arrest. When the survival to discharge rate with no neurological deficit is examined, it is often found to be similar to the United States national average of three percent.

Pre-hospital services that have implemented a therapeutic hypothermia protocol average a survival to discharge (with no neurological deficit) success rate of twelve percent, nearly four times that of the national average. It is critical to point out that therapeutic hypothermia is not the magical treatment to increase cardiac arrest survivability. Therapeutic hypothermia needs to be used in tandem with best practices in resuscitation. These best practices include effective chest compressions with minimal interruptions, controlled ventilations with deliberate prevention of hyperventilation (rate of 8-10 breaths per minute with end tidal CO2 between 35-45 mm Hg), and therapeutic hypothermia induction. Introduction of best practice resuscitation can immediately double or triple survival to discharge (Martin 2008).

Best practice resuscitation is no more evident than with Seattle Washington's King County Medic One with a survival to discharge rate of 16 percent. In 2007 Detroit, Michigan had 561 patients who experienced sudden cardiac arrest and resuscitation was attempted. One patient survived to discharge (Polderman 2008). Implementation of therapeutic hypothermia in this service with 100 percent increase in survivability would still be a statistical anomaly. You have to correct problems in resuscitation to see results in implementation of a therapeutic hypothermia protocol. One of the keys to success in good practices of resuscitation is frequently train and test personnel in CPR. Dr. Marvin Wayne from Whatcom County Medic One, a suburb of Seattle, Washington (USA) said one of the secrets to increasing their cardiac arrest survival rates was to train and test their personnel in CPR three times a year.

Will early induction of therapeutic hypothermia by pre-hospital personnel increase survivability? A study conducted in 1993 showed that some of the most beneficial effects of therapeutic hypothermia are achieved if hypothermia is initiated within 15 minutes of ROSC (Kuboyama et al. 1993). In 2005 the American Heart Association stated, "A clear biological rationale for the earliest possible induction of therapeutic hypothermia exists." A 2008 study by Wollf et al demonstrated that patients who had a lower starting temperature at the beginning of hypothermia induction, and who reach therapeutic temper-

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ature sooner showed better neurologic outcome. Furthermore, his study demonstrated that any sixty-minute delay in reaching therapeutic temperature would worsen the likelihood for favourable outcome by 27 percent (Wolff et al. 2008). Although the study was retrospective and had a low patient population (n=28), the results are still promising and warrant further research. It will be of interest to determine if therapeutic hypothermia initiated during resuscitation will increase survivability. This treatment is currently being studied by several EMS services, and hopefully the data will soon be published.

When EMS agencies want to start a therapeutic hypothermia protocol, one of the first questions they want to know is the cost. Therapeutic hypothermia is a relatively inexpensive treatment with a proven outcome (NNT=6) (Nolan et al. 2003). Large EMS systems have implemented therapeutic hypothermia for as little as €3 per patient with total system costs less than €3800. Start up costs are dependent upon the ability to chill fluids, monitor internal temperatures, use of sedative and/or paralytic medications, and external cooling devices such as gel pads or ice packs. Despite the start up costs, therapeutic hypothermia remains as one of the cheapest treatments that can be initiated with the best outcome.

When deciding whether or not to implement therapeutic hypothermia in the pre-hospital setting it is important to review the current recommendations by various committees. The European Resuscitation Council stated that pre-hospital hypothermia is "safe and effective even if there is a lack of experience." Research articles have concluded that "therapeutic hypothermia is safe and feasible and that a prospective and randomised trial in the pre-hospital setting is not feasible nor is it justifiable" and that "withholding therapeutic hypothermia in a pre-hospital control group would be unjustifiable from an ethical point of view" (Schefold et al. 2008). To underscore this point, there are now lawyers in the United States who are suing medical providers who do not offer therapeutic hypothermia as a treatment modality.

Will pre-hospital therapeutic hypothermia save lives? The data that is currently being published from pre-hospital providers who are practicing the protocol has shown a remarkable four-fold increase in survival to discharge. Therapeutic hypothermia must be employed in tandem with good resuscitation practices in order to achieve optimal success. As we continue to strive to learn the optimal method to resuscitation patients from sudden cardiac arrest, we must continue to explore every potential treatment modality that may increase survival to discharge.

References

A Practical Guide to Therapeutic Hypothermia. CMAJ. March 13, 2007. 176(6)

Briggs and Counsel Law Firm. http://rockport.injuryboard.com/medical-malpractice/therapeutic-hypothermia-in-maine-when-is-it-malpractice-not-to-offer-the-big-chill.php

Clumpner M, Mobley J. "The Dead Shall Be Raised: Therapeutic Hypothermia" EMS Mag 2008 Sep; 37(9):52-60

European Resuscitation Council: European Resuscitation Council guidelines for resuscitation 2005. Resuscitation 2005, 67:S1-S189.

Hinchey P. Therapeutic Hypothermia. Air Medical Transport Conference, October 20-22, 2008. Minneapolis, MN

International Liaison Committee on Resuscitation: Therapeutic hypothermia after cardiac arrest. An advisory statement by the Advancement Life support Task Force of the International Liaison committee on Resuscitation. Resuscitation 2003, 57:231-235

Kim F, Olsufka M, Nichol G, Copass M, Cobb L. Jour. of Neurotrauma. DOI:10.1089/neu.2008.0558

Kuboyama K, Safar P, Radovsky A, Tisherman SA, Stezoski SW, Alexander H. Delay in cooling negates the beneficial effect of mild resuscitative cerebral hypothermia after cardiac arrest in dogs: A prospective, randomized study. Crit Care Med 1993;21:1348-1358.

Martin PS. "Translating Cardiac Arrest Research". Air Medical Transport Conference, October 20-22, 2008. Minneapolis, MN

Myers B. "Out-of-Hospital Cardiac Arrest Survival after the Sequential Implementation of 2005 AHA Guidelines for Compressions, Ventilations, and Induced Hypothermia". 2008 SAEM Annual Meeting, May 29-June 1, 2008, Washington, D.C

Nolan J, et al. Therapeutic Hypothermia after Cardiac Arrest. Circulation. 2003;108:118-121

Polderman K. Therapeutic Hypothermia. Therapeutic Temperature Management Congress. October 1, 2008. Barcelona, Spain

Schefold J, et al. Prehospital Therapeutic Hypothermia in Cardiac Arrest: Will There Ever Be Evidence? Critical Care 2008. 12:413

University of Washington School of Medicine. "Survive Cardiac Arrest: 46-Fold Difference in Cardiac Arrest Survival". Retrieved online 15 January 2009 from http://blacklistinc.com/survive/46fold.php

Wayne M. Therapeutic Hypothermia. Therapeutic Temperature Management Congress. October 1, 2008. Barcelona, Spain

Wolff B, et al. Early achievement of mild therapeutic hypothermia and the neurologic outcome after cardiac arrest, Int J Cardiol (2008), doi:10.1016/j.ijcard.2007.12.039

2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2005; 112(suppl 4):IV6-IV11; (24 Suppl):IV 1-203

A MATTER OF COST OR OF EFFECTIVENESS?

ACCESS TO NEW TECHNOLOGIES IN EUROPE

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In this article, we will firstly present the case of two patients for whom, despite similar medical conditions, different therapies were advised, to highlight the inequality in access to medical technologies in Europe. Then, we will look at the matter of cost-effectiveness – are patients being differently treated in the same cases, due to financial pressures and despite thorough guidelines?

The case we present here not only shows that clinical use of electrical devices in Europe may not be homogeneous, but also highlights the fact that the relatively high cost of electrical devices may represent a factor that can condition, sometimes to a considerable extent, the decision to implant an electrical device "in the right patient, at the right time".

Cases Highlight Differences in Therapy in Europe

A male patient, Luigi, aged 58, living in Italy, was diagnosed as being affected by dilated cardiomyopathy with depressed left ventricular ejection fraction (26%), in the absence of coronary artery disease. He was followed for the last three years by a team of physicians working in a heart failure clinic, but in the last year his condition worsened (NYHA class III), with repeated hospitalisations for acute heart failure and recurrent atrial fibrillation.

Eight months ago, he underwent implantation of a device for cardiac resynchronisation therapy and in the following weeks his clinical condition improved markedly, with no further need for hospitalisation, no recurrences of atrial fibrillation and the possibility of reducing the use of diuretics. Quality of life and exercise capacity improved and he is now able to perform moderate physical activity without difficulty.

Twenty days ago he was informed that his closest friend had died suddenly, during sleep, at the age of 61. As soon as he received this news, he had a sudden loss of consciousness, followed by delivery of a shock by the implanted device, with prompt resumption of consciousness. He was admitted to the emergency department and the physicians ruled out any coronary or major cardiovascular event; interrogation of the device revealed that loss of consciousness was due to high rate ventricular tachycardia at 230 bpm. The cardiologist said that the appropriate and prompt device activation had "saved his life".

Luigi is in contact with his sister Anna, aged 62, who left Italy 25 years ago, moving to France. She too is affected by dilated cardiomyopathy (left ventricular ejection fraction 28%) and after a diagnostic work up (echocardiogram, exercise test, myocardial scintigraphy), was followed by her GP. She has been in stable condition for one year, but in the last six months, her condition worsened with shortness of breath requiring increasing dosages of diuretics, ace-inhibitors and carvedilolol. The GP sent her for a series of consultations with the specific request of deciding about device therapy.

Unfortunately, the patient received conflicting advice: a first cardiologist suggested implanting a defibrillator, a second, after an echocardiogram showing ventricular dyssynchrony, advised implantation of a biventricular pacemaker (CRT-P device) and a third cardiologist told her that "The ideal device would be a device for biventricular pacing & defibrillation (CRT-D device) but the budget of our hospital is limited and since we are in October it is better to wait for the beginning of next year". Anna is confused by the different suggestions coming from the cardiologists who examined her and has difficulties in understanding why there are discrepancies in decision-making; she is also worried about the potential risk of waiting before a decision.

Evidence-Based Guidelines Recommend Electrical Devices

The use, in clinical practice, of electrical devices to prevent sudden death by terminating ventricular tachyarrhythmias or to improve heart failure by resynchronising the left ventricle, is currently supported by strong evidence (Boriani et al. 2007). This evidence has been the basis for consensus guidelines (Vardas et al. 2007), which should constitute the reference for daily clinical practice.

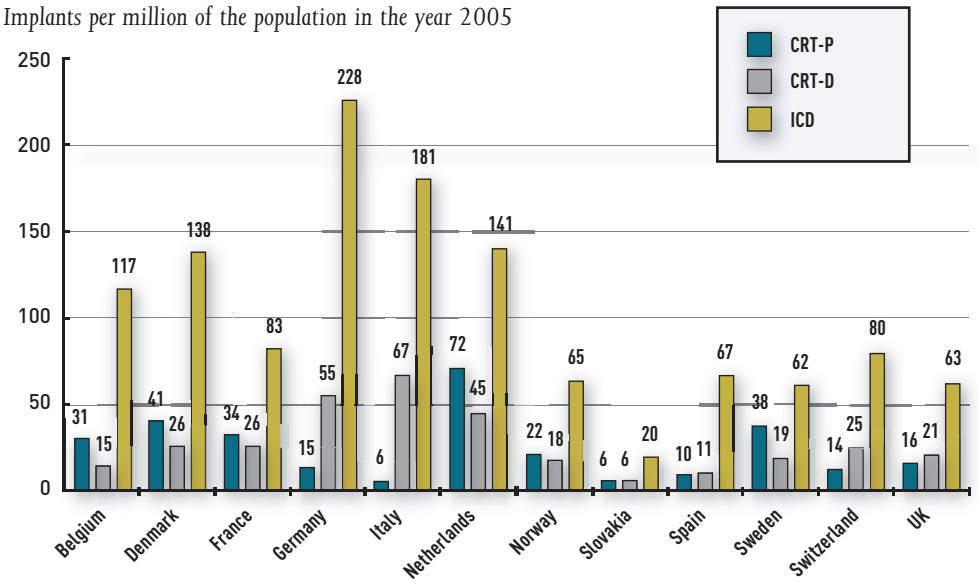

Figure 1.
Implant rates in different European countries for CRT-P, CRT-D and ICD devices, according to the Registry of the European Heart Rhythm Association (EHRA) (Ector and Vardas, 2007).

Despite this, appropriate implementation of guidelines on the use of electrical devices in clinical practice is still an open issue and wide heterogeneity exists in implant rates. Implantable defibrillators (ICDs) and especially devices delivering both biventricular pacing for cardiac resynchronisation and defibrillator back-up (CRT-D devices) still have relatively high up-front costs and, in the absence of any economic analysis, their costs represent a limitations to widespread clinical use in the context of national or local financial constraints (Boriani et al. 2002).

Guidelines Do Not Govern Resource Usage

European guidelines, according to general policy, do not incorporate considerations on resource allocation and do not analyse the financial implications of device implementation, since all these evaluations are dependent on the specific national context where implementation has to be considered and they should thus be done at a regional/national level and not at a European level (Priori et al. 2003).

While in some countries this topic was directly addressed through national policy (this is the case of NICE), in others no precise rules were defined, leading to considerable variations in device therapy adoption, depending on local conditions (regional or hospital budgets, physicians' judgement, reimbursement, etc.). Extensive variations in ICD or CRT-D device implant rates exist among the various European countries, also with some differences between ICD and CRT-D or CRT-P implant rates (see figure 1) (Ector and Vardas 2007).

Economic Tools May Help

Today, a series of tools for economic analysis (cost-effectiveness, cost utility and cost benefit analysis) may help in appropriate resource allocation at a national or regional level, according to a defined setting of healthcare priorities. Economic analyses are available also for ICD, CRT-D and CRT-P therapies (Boriani at al. 2002; 2007) in order to better analyse the relationship between the clinical effectiveness attainable with these therapies and the cost of these devices.

In view of the benefit, confirmed by clinical trials, it appears that despite the high initial cost these devices may constitute a valuable investment for the healthcare systems in appropriate patients. Unfortunately, economic analyses do not at present seem to represent the basis for device therapy adoption in most European countries (Kearney et al. 2006; Boriani et al. 2007).

Continues on page 35

References

Boriani G, Biffi M, Martignani C, et al. Cardioverter-defibrillators after MADIT-II: the balance between weight of evidence and treatment costs. Eur J Heart Fail. 2003;5:419-25.

Boriani G, Ricci R, Toselli T, et al. Implantable cardioverter defibrillators: from evidence of trials to clinical practice. Eur Heart J suppl. 2007;9(suppl. I):I66–I73.

Ector H, Vardas P. Current use of pacemakers, implantable cardioverter defibrillators, and resynchronisation devices: data from the registry of the European Heart Rhythm Association Eur Heart J suppl. 2007; 9(suppl.I):I44-I49.

Kearney P, Stokoe G, Breithardt G, et al. Improving patient access to novel medical technologies in Europe. Eur Heart J. 2006;27:882-5.

Priori SG, Klein W, Bassand JP. Medical Practice Guidelines. Separating science from economics. Eur Heart J. 2003;24:1962-4.

Vardas PE, Auricchio A, Blanc JJ, et al. Guidelines for cardiac pacing and cardiac resynchronisation therapy. Europace. 2007;9:959-98.

ECRI Institute
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MULTIPLE MEDICAL GAS MONITORS, RESPIRED/ANAESTHETIC:

ECRI INSTITUTE RECOMMENDATIONS

Included in the accompanying comparison chart are ECRI Institute's recommendations for minimum performance requirements for Multiple Medical Gas Monitors (MMGMs). The MMGM should continuously sample and measure inspired and expired concentrations of respiratory and anaesthetic gases during and immediately following anaesthetic administration. The device may also include monitoring of other variables such as oxygen saturation (SpO_2), airway pressure, and volume monitoring. The MMGM should display inspired and expired gas concentrations of CO_2 and halogenated agent, inspired (or mean) concentrations of O_2 and N_2O, and respiration rate. Monitors should accurately measure gas concentration over the range that is encountered clinically and should compensate for the interference effects between gas constituents. The range that a monitor should be able to measure and the accuracy that it should achieve for each of the analysed gases should be as follows:

- 0-6% halothane with an accuracy of 0.25 volume %.
- 0-6% enflurane with an accuracy of 0.25 volume %.
- 0-6% isoflurane with an accuracy of 0.25 volume %.
- 0-10% sevoflurane with an accuracy of 0.25 volume %.
- 0-20% desflurane with an accuracy of 0.25 volume %.
- 0-80% nitrous oxide with an accuracy of 10% of reading or 5 volume %, whichever is greater.
- 0-10% carbon dioxide with an accuracy of 10% of reading or 0.4 volume %, whichever is greater.
- 0-100% oxygen with an accuracy of 5% of reading or 2 volume %, whichever is greater.

Interference with measurements caused by the presence of water vapour, aspirated fluid, or pressure in the breathing circuit should be eliminated or automatically compensated for by the MMGM. The MMGM should remain zeroed and calibrated for at least six months. Measurements should remain accurate over commonly used ventilation rates (i.e., 25 breaths/min for adults and up to 60 breaths/min if the monitor is intended for neonatal or paediatric applications). Alarm limits should be easy to review and set. The anaesthetist should be able to view all alarm limits and gas concentration displays simultaneously while reviewing and setting alarm limits. Alarms should be available for all parameters that the MMGM monitors. The unit should alarm to indicate an occluded sampling line or a system failure. For safe, effective monitoring, units should meet several minimum critical alarm criteria:

- The apnea alarm (associated with CO_2 monitoring) and the low O_2 alarm limit are critical in all situations and should be impossible to disable while a patient is connected.
- For low O_2, it should not be possible to lower alarm limits to values that are not clinically useful (minimum settings of 18%).
- Monitors should allow flexibility in setting alarm limits and help minimise the use of inappropriate settings, and the alarm limits should be easy to review on a single screen.

If the displayed CO_2 concentration is changed between mm Hg and percent CO_2, the actual alarm-limit setting should

not be altered, and preferably, the alarm limit will be converted into the new units. It should not be possible to indefinitely silence the apnea alarm. Agent monitoring should activate automatically when the unit is turned on. It is acceptable, however, for the unit to require that agent be selected before monitoring begins, provided that the unit warns the user when agent is detected but has not been selected.

The MMGM should display the CO_2 waveform. It is preferable that the unit allow the user to select at least two additional graphical displays (e.g., waveforms and trends). Exhaust gas from the MMGM must be returned to the patient's breathing circuit or scavenged. Performance should not be affected by attachment to a scavenger. When gas is to be scavenged, an easy-to-access port to which the sampling tube cannot be connected should be provided with the monitor. Manufacturers should provide tubing (of a smaller diameter than the breathing circuit) with the appropriate fittings to connect the exhaust port to the expiratory breathing circuit (22 mm tee) or a scavenger (19 mm tee).

Other Considerations

MMGMs are produced as either a configured unit or a modular part of a physiologic monitoring system. A facility should consider the status of its present physiologic monitoring system before purchasing an MMGM. A modular MMGM may allow all information and alarms to be integrated into one display. MMGMs can also be integrated into anaesthesia delivery units. The variety of MMGM configurations available permits a facility to add modules to expand the capabilities of its monitoring equipment. For example, if a hospital has pulse oximeters, it can purchase units without the pulse oximeter option. If a facility is planning to replace its current anaesthetic delivery equipment, it may want to consider an anaesthesia system with optional modules for combined CO_2, N_2O, and agent monitoring and/or for pulse oximetry. To achieve the degree of accuracy and performance reliability necessary for anaesthetic monitoring, MMGMs require careful maintenance by qualified biomedical engineering personnel. Users may want to check the availability of service and the repair turnaround time before selecting multigas monitors for their facilities.

Stage of Development

IR analysers have been used for many years to identify and assay compounds for research applications. More recently, they have been adapted for respiratory monitoring of CO_2, N_2O, and halogenated agents. Some instruments are now designed to both identify and quantify specific agents. A monitor using IR photoacoustic technology has been developed that can quantify all commonly respired/anaesthetic gases except N_2 and water vapour; like some other MMGMs, it also has a built-in pulse oximeter. Alarms alert OR personnel in the event of gas concentration delivery outside the set limits. In addition, some monitors are made from nonferrous materials and are marketed for use during magnetic resonance imaging procedures.

Reported Problems

The accumulation of water-vapour condensation or other materials in the sampling chamber can interfere with the accuracy of MMGMs. Some monitors circumvent this problem by trapping condensate before it reaches the chamber, while others use special tubing (Nafion) and hydrophobic filters to prevent water vapour from affecting monitor performance; however, some manufacturers still recommend periodically cleaning the chamber, particularly to prevent the accumulation of secretions or other foreign matter. The presence of nitrogen (N_2) in the inspired gases indicates that air is being aspirated into the breathing circuit, thereby diluting the delivered gas concentration. Although most MMGMs do not monitor N_2 concentration, such leaks can often be identified from changing O_2 and CO_2 trends. For MMGMs that cannot identify halogenated agents, the user must set the agent selection control according to the halogenated anaesthetic being used. Clinical personnel must be relied on to fill the vapourisers with the proper agent (a keyed filling system will help prevent errors) and to connect the breathing circuit correctly to preclude accidental use of the wrong or multiple anaesthetics.

The presence of alcohol or other organic vapour in the room, in a sample line, or in a patient's breath can cause inaccurate concentration readings on monitors that cannot distinguish these compounds from anaesthetic agents. MMGMs that both identify and quantify halogenated agents can eliminate interference from these compounds because these monitors measure concentrations of halogenated agents at a wavelength where organic vapours do not have a peak in the IR absorption spectrum.

Multiple Medical Gas Monitors

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ECRI Institute is a totally independent nonprofit research agency designated as a Collaborating Center of the World Health Organisation (WHO). Such organisations are appointed to contribute to WHO's public health mission by providing specialised knowledge, expertise, and support in the health field to the WHO and its member nations. ECRI Institute is widely recognised as one of the world's leading independent organisations committed to advancing the quality of healthcare with over 240 employees globally.

ECRI Institute is pleased to provide readers of ICU Management with sample information on Multiple Medical Gas Monitors from its Healthcare Product Comparison System (HPCS), which contains over 280 reports. The HPCS reports contain extensive information about the technology, its purpose, its principles of operation, stage of development specifications and reported problems. The Multigas Monitors comparison charts include ECRI Institute's 'Recommended Specifications' (generic templates) which can be used for comparison and tendering purposes. The comparative tables overleaf are extracted from ECRI Institute's 2005 database and have additionally been reviewed and updated by the respective manufacturers.

For more information, visit **www.ecri.org**

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[1]*These recommendations are the opinions of ECRI Institute's technology experts. ECRI Institute assumes no liability for decisions made based on this data.*

SUPPLIER	ECRI Institute's Recommended Specifications[1]	DATASCOPE
MODEL	Basic Multigas Monitor	Gas Module 3
WHERE MARKETED		Worldwide
FDA CLEARANCE		Yes
CE MARK (MDD)		Yes
MODULAR/CONFIGURED	Any	Module
OPERATING PRINCIPLES	NDIR, paramagnetic cell/sensor	NDIR, paramagnetic cell/sensor. Pressure , temperature and full spectral inerference correction.
SAMPLING FLOW, mL/min	≥50	Adult: 250 ml/min, Child: 120 ml/min
AUTOMATIC ANESTHETIC AGENT ID	Preferred	Yes
GAS CONCENTRATION RANGE, volume %		
Halothane	0-6	0-5%
Enflurane	0-6	0-5%
Isoflurane	0-6	0-5%
Desflurane	0-20	0-18%
Sevoflurane	0-10	0-8%
N_2O	0-80	0-100%
CO_2	0-10	0-10%
O_2	0-100	0-100%
RISE TIME, msec		
Agent		Des, Hal, Iso, Sevo: 300ms @ 200 ml/min Enf: 350 ms @ 200 ml/min Des, Hal, Iso, Sevo: 300ms @ 120 ml/min Enf: 350 ms @ 120 ml/min
N_2O		250 ms @ 200 ml/min
CO_2		250 ms @ 200 ml/min
O_2		500 ms @ 200 ml/min
ACCURACY		
Agent, volume %	0.25	0 - 1% of Volume: ± 0.15% of reading 1- 5% of Volume: ± 0.2% of reading
N_2O, volume %	5	0 - 20% of Volume: ± 2% of reading 20- 100% of Volume: ± 3% of reading
CO_2, mm Hg	0.4	0-1% of Volume: ± 0.1% of reading 1-5% of Volume: ± 0.2% of reading 5-7% of Volume: ± 0.3% of reading 7-10% of Volume: ± 0.5% of reading
O_2, volume %	2	0-25% of Volume: ± 1% of reading 25-80% of Volume: ± 2% of reading 80-100% of Volume: ± 3% of reading
CALIBRATION	<2/year	Once per year
WATER TRAP VOL, mL	>8	Adult / Ped: 10ml, Neonate: 5ml
OPERATING TEMPERATURE, °C (°F)		+10 to +40° C (+50 to +104° F)
DISPLAY TYPE	No preference	Gas Module 3 is designed for use with Passport 2, Spectrum and Spectrum OR Patient Monitors
ALARM LIMITS HIGH/LOW, %		
Agent	User selectable	High: Off, 2-10 / Low: Off, 0.5-5
N_2O	User selectable	High: Off, 10-80 / Low: Off, 5-70
$ETCO_2$	User selectable	High: Off, 2-10 / Low: Off, 1-6
Inspired CO_2	User selectable	High: Off, 2-10 / Low: Off, 0.5-5
O_2	18-100	High: Off, 40-100 / Low: 18-60
ADDITIONAL ALARMS	Apnea, SpO_2, pulse; as required by clinician	Apnea
ALARM SILENCE Temporary/permanent	Temporary	Temporary
AUXILIARY OUTPUTS	Analog, RS232	Serial
LINE POWER, VAC	Standard	100 VAC to 240 VAC
Watts		< 10 Watts
BATTERY		
Type (number)		Not Apllicable
Operating time, hr		Not Apllicable
Rechargeable		Not Apllicable
Recharging time, hr		Not Apllicable
Low-battery notice		Not Apllicable
H x W x D, cm (in)		7.63 cm (H) x 30.16 cm (W) x 26.35 cm (D) / 3" (H) x 11.9" (W) x 10.4" (D)
WEIGHT, kg (lb)		2.8 kg / 6.1 lbs
PURCHASE INFORMATION		
List price		TBA
Warranty		1 or 2 Years
OTHER SPECIFICATIONS		
LAST UPDATED		2008
Footnotes		Gas Module 3 is designed for use with Passport 2, Spectrum and Spectrum OR Patient Monitors

SUPPLIER	ECRI Institute's Recommended Specifications[1]	Dräger medical	Dräger medical	Dräger medical
MODEL	Basic Multigas Monitor	Scio Four Gas Module[2]	Vamos	Vamos Plus
WHERE MARKETED		Worldwide	Worldwide	Worldwide
FDA CLEARANCE		Yes	Yes	Yes
CE MARK (MDD)		Yes	Yes	Yes
MODULAR/CONFIGURED	Any	Modular, with or without auto ID and O_2	Configured with options	Configured with options
OPERATING PRINCIPLES	NDIR, paramagnetic cell/sensor	Solid-state infrared / paramagnetic	NDIR	NDIR
SAMPLING FLOW, mL/min	≥50	200	200	200
AUTOMATIC ANESTHETIC AGENT ID	Preferred	Yes	No	Yes
GAS CONCENTRATION RANGE, volume %				
Halothane	0-6	0-10	0-8.5	0-8.5
Enflurane	0-6	0-10	0-10	0-10
Isoflurane	0-6	0-10	0-8.5	0-8.5
Desflurane	0-20	0-24	0-20	0-20
Sevoflurane	0-10	0-10	0-10	0-10
N_2O	0-80	0-100	0-99	0-99
CO_2	0-10	0-10	0-10	0-10
O_2	0-100	0-100	N/A	N/A
RISE TIME, msec				
Agent		<500	<500	<500
N_2O		<500	<500	<500
CO_2		<350	<350	<350
O_2	0.25	<600	N/A	N/A
ACCURACY	5	according to ISO 21647		
Agent, volume %	0.4	±(0.2 + 15% relative)	±0.2 + 15% relative	±0.2 + 15% relative
N_2O, volume %	2	±(2 + 8% relative)	±2 + 8% relative	±2 + 8% relative
CO_2, mm Hg		±(3.3 + 8% relative)	±(3.3 + 8% relative)	±(3.3 + 8% relative)
O_2, volume %		±3	N/A	N/A
CALIBRATION	<2/year	Automatic	Automatic	Automatic
WATER TRAP VOL, mL	>8	13 (reusable)	13 (reusable)	13 (reusable)
OPERATING TEMPERATURE, °C (°F)		10-40 (50-104)	10-40 (50-104)	10-40 (50-104)
DISPLAY TYPE	No preference	Color TFT with INFINITY Modular Monitoring Series	Electroluminescent	Electroluminescent
ALARM LIMITS HIGH/LOW, %				
Agent	User selectable	0-7.5 (isoflurane, enflurane, halothane), 0-20 (desflurane), 0-9 (sevoflurane)	0.1-7; 0.1-9.8 (sevoflurane), 0.1-21.9 (desflurane)	0.1-7; 0.1-9.8 (sevoflurane), 0.1-21.9 (desflurane)
N_2O	User selectable	Not specified	82 vol% (fix high limit)	82 vol% (fix high limit)
$ETCO_2$	User selectable	5-95 mm Hg	1-75 mm Hg	1-75 mm Hg
Inspired CO_2	User selectable	2-10 mm Hg	1-20 mm Hg	1-20 mm Hg
O_2	18-100	18-100	N/A	N/A
ADDITIONAL ALARMS	Apnea, SpO_2, pulse; as required by clinician	Via INFINITY Modular Monitoring Series	Apnea, SpO_2, pulse	Apnea, SpO_2, pulse
ALARM SILENCE	Temporary	Yes	Yes	Yes
Temporary/permanent		Yes/no	Yes/no	Yes/no
AUXILIARY OUTPUTS	Analog, RS232	RS232 (physiologic monitoring system)	RS232	RS232
LINE POWER, VAC	Standard	100/240, 0.8/0.4 A	100-240	100-240
Watts		Not specified	<55 during warm-up; <45 during operation	<55 during warm-up; <45 during operation
BATTERY		None	Optional	Optional
Type (number)		N/A	Lithium ion (not specified)	Lithium ion (not specified)
Operating time, hr		N/A	>1	>1
Rechargeable		N/A	Yes	Yes
Recharging time, hr		N/A	10	10
Low-battery notice		N/A	Yes	Yes
H x W x D, cm (in)		11.5 x 19 x 27 (4.5 x 7.5 x 10.6) with water trap	16.6 x 24 x 16.6 (6.5 x 9.5 x 6.5)	16.6 x 24 x 16.6 (6.5 x 9.5 x 6.5)
WEIGHT, kg (lb)		3.5 (7.6)	1.9 (4.2)	1.9 (4.2)
PURCHASE INFORMATION				
List price		€8,500 (US$11,600) with auto ID and oxygen measurement	€6,170 (US$8,430)	€7,670 (US$10,500)
Warranty		1 year	1 year	1 year
OTHER SPECIFICATIONS		None specified.	Optional pulse oximetry, battery backup.	Optional pulse oximetry, battery backup.
LAST UPDATED		Mar-09	Mar-09	Mar-09
Footnotes		[2] Part of the INFINITY Patient Monitoring System.		

GE HEALTHCARE	GE HEALTHCARE	GE HEALTHCARE
C(AI)O(V)(X) Module[3]	**Cardiocap 5[3]**	**SAM : SAM80 (without O_2)**
Worldwide	Worldwide	Worldwide
Yes	Yes	Yes
Yes	Yes	Yes
Modular	Configured	Modular
IR for CO_2, N_2O, agents; paramagnetic for O_2	IR for CO_2, N_2O, agents; paramagnetic for O_2	IR for CO_2, N_2O, agents; paramagnetic for O_2
200 ±20	200	250, 150 with no O_2
Yes	Yes	Yes
0-6	0-6	0-7
0-6	0-6	0-7
0-6	0-6	0-7
0-20	0-20	0-20
0-8	0-8	0-7
0-100	0-100	0-100
0-15 (0-113 mm Hg)	0-15 (or 113 mm Hg)	0-10 (0-76 mm Hg)
0-100	0-100	0-100
<400	<600	<600
<450	<400	<600
<400	<400	<400
<400	<400	<600
±(0.15 vol% + 5% of reading)	±0,2 vol%	±0.2% ABS or ±5% of reading, whichever is greater
±(2 vol% + 2% of reading)	±(2 vol% + 2% of reading)	±5% ABS
±(0.2 vol% + 2% of reading)	±(0.2 vol% + 2% of reading)	±0.2% ABS or ±5% of reading, whichever is greater
±(1 vol% + 2% of reading)	±(1 vol% + 2% of reading)	±2% ABS
Biannual	Biannual	Biannual
Not specified	Not specified	7-8 (disposable)
10-40 (50-104)	10-40 (50-104)	15-30 (59-86)
CRT, digital flat panel or LCD (host monitor)	Color LCD	CRT, digital flat panel or LCD (vital signs acquisition system)
Adjustable within measurement range	Adjustable within measurement range	Adjustable within measurement range
Adjustable within measurement range	Adjustable within measurement range	Adjustable within measurement range
Adjustable within measurement range	Adjustable within measurement range	Adjustable within measurement range
Adjustable within measurement range	Adjustable within measurement range	Adjustable within measurement range
18-100	18-100	Adjustable within measurement range
Respiratory rate, occlusion, apnea	Apnea, occlusion, respiratory rate	Respiratory rate, occlusion, automatic reset, no-breath alarm
Yes	Yes	Yes
120 s, 300 s via host monitor	120 s, 300 s	via host: 1 min, 5 min, 15 min, off
RS232 (via bedside monitor)	Analog, serial	RS232 (via the bedside monitor)
Not applicable	100-240	90-270
< 14.6 W from host	80	via bedside monitor, not specified
Not applicable	Yes	Not applicable
Not applicable	Not specified	Not applicable
Not applicable	> 15 min	Not applicable
Not applicable	Yes	Not applicable
Not applicable	5 h	Not applicable
Not applicable	Not specified	Not applicable
11.2 x 7.5 x 22.8 (4.4 x 3 x 9)	30.1 x 33.2 x 22.2 (11.8 x 13 x 8.7)	8 x 11.2 x 27 (3.2 x 4.4 x 10.6)
1.6 (3.5)	10.2 - 11.2 (22.6 - 24.8)	2.7 (6)
1 year	1 year	1 year
Inspired/expired oxygen; rapid warm-up; minimal room-air calibrations.	Fully integrated modular monitoring system; automatic identification for 5 agents; 6 waveforms; color, configured monitor; optional sidestream spirometry and neuromuscular transmission monitoring.	Inspired/expired oxygen; rapid warm-up; minimal room-air calibrations.
Feb-09	Feb-09	Feb-09
[3] Formerly sold under Datex-Ohmeda.	[3] Formerly sold under Datex-Ohmeda.	

SUPPLIER	ECRI Institute's Recommended Specifications[1]	PHILIPS HEALTHCARE	PHILIPS HEALTHCARE	PHILIPS HEALTHCARE
MODEL	Basic Multigas Monitor	IntelliVue G1 Anesthetic Gas Module	IntelliVue G5 Anesthetic Gas Module	M1026B Anesthetic Gas Module
WHERE MARKETED		Worldwide	Worldwide	Worldwide
FDA CLEARANCE		Yes	Yes	Yes
CE MARK (MDD)		Yes	Yes	Yes
MODULAR/CONFIGURED	Any	Modular (with IntelliVue monitors)	Modular (with IntelliVue monitors)	Modular (with IntelliVue and CMS monitors)
OPERATING PRINCIPLES	NDIR, paramagnetic cell/sensor	NDIR technology (CO_2, N_2O, 5 agents), paramagnetic (O_2)	NDIR technology (CO_2, N_2O, 5 agents), paramagnetic (O_2)	DIR technology (CO_2, N_2O, agents), paramagnetic (O_2)
SAMPLING FLOW, mL/min	≥50	200	200	150
AUTOMATIC ANESTHETIC AGENT ID	Preferred	No; manual selection of agent used (from all 5 agents available)	Yes, automatic identification of all 5 agents	Yes, automatic identification of all 5 agents
GAS CONCENTRATION RANGE, volume %				
Halothane	0-6	0-8.5	0-8.5	0-7.5
Enflurane	0-6	0-10	0-10	0-7.5
Isoflurane	0-6	0-8.5	0-8.5	0-7.5
Desflurane	0-20	0-20	0-20	0-20
Sevoflurane	0-10	0-10	0-10	0-9
N_2O	0-80	0-100	0-100	0-85
CO_2	0-10	0-76 mm Hg	0-76 mm Hg	0-76 mmHg
O_2	0-100	5-100	5-100	0-100
RISE TIME, msec				
Agent		<500	<500	<540 DES, 570 SEV, 610 ISO, 620 ENF, 900 HAL
N_2O		<500	<500	<510
CO_2		<350	<350	<410
O_2		<500	<500	<640
ACCURACY				
Agent, volume %	0.25	0.15 ± 15% relative	0.15 ± 15% relative	0.1 ± 4% relative
N_2O, volume %	5	2% + 8% relative	2% + 8% relative	1.5% + 5% relative
CO_2, mm Hg	0.4	0.5% or 12% relative (whichever is greater)	0.5% or 12% relative (whichever is greater)	1.5 mmHg (0-30 mmHg) +/- 5% relative (30 -76 mmHg)
O_2, volume %	2	±3	±3	±3
CALIBRATION	<2/year	Not required (check once per year)	Not required (check once per year)	Not required (check once per year)
WATER TRAP VOL, mL	>8	>20	>20	>20
OPERATING TEMPERATURE, °C (°F)		10-40 (50-104)	10-40 (50-104)	15-40 (59-104)
DISPLAY TYPE	No preference	Color CRT or TFT color LCD (various sizes)	Color CRT or TFT color LCD (various sizes)	Color CRT or TFT color LCD (various sizes)
ALARM LIMITS HIGH/LOW, %				
Agent	User selectable	Halothane, isoflurane, enflurane, 0.1-7.5 vol%/0-7.4 vol%; sevoflurane, 0.1-9 vol%/0-8.9 vol%; desflurane, 0.2-20 vol%/0-19.8 vol%	Halothane, isoflurane, enflurane, 0.1-7.5 vol%/0-7.4 vol%; sevoflurane, 0.1-9 vol%/0-8.9 vol%; desflurane, 0.2-20 vol%/0-19.8 vol%	Halothane, isoflurane, enflurane, 0.1-7.5 vol%/0-7.4 vol%; sevoflurane, 0.1-9 vol%/0-8.9 vol%; desflurane, 0.2-20 vol%/0-19.8 vol%
N_2O	User selectable	0-82 (high)	0-82 (high)	0-82 (high)
$ETCO_2$	User selectable	20-76 mm Hg (high), 10-75 mm Hg (low)	20-76 mm Hg (high), 10-75 mm Hg (low)	12-80 mm Hg (high), 10-78 mm Hg (low)
Inspired CO_2	User selectable	0-20 mm Hg (high)	0-20 mm Hg (high)	0-20 mm Hg (high)
O_2	18-100	19-100 vol% (high), 18-99 vol% (low) (optional)	19-100 vol% (high), 18-99 vol% (low)	1-100 mm Hg (high), 0-99 mm Hg (low)
ADDITIONAL ALARMS	Apnea, SpO_2, pulse; as required by clinician	Apnea, AWRR, various technical alerts	Apnea, AWRR, various technical alerts	Apnea, AWRR, various technical alerts
ALARM SILENCE	Temporary	Yes	Yes	Yes
Temporary/permanent		Configurable: temporary 1, 2, or 3 minutes, or infinite	Configurable: temporary 1, 2, or 3 minutes, or infinite	Configurable: temporary 1, 2, or 3 minutes, or infinite
AUXILIARY OUTPUTS	Analog, RS232	RS232 (RJ-45 connector)	RS232 (RJ-45 connector)	RS232 (D-Type connector)
LINE POWER, VAC	Standard	100-240 +/-10%	100-240 +/-10%	100-240 +/- 10%
Watts		45	45	35
BATTERY		No	No	No
Type (number)		N/A	N/A	N/A
Operating time, hr		N/A	N/A	N/A
Rechargeable		N/A	N/A	N/A
Recharging time, hr		N/A	N/A	N/A
Low-battery notice		N/A	N/A	N/A
H x W x D, cm (in)		8.5 x 30.0 x 23.2 (3.35 x 11.81 x 9.13)	8.5 x 30.0 x 23.2 (3.35 x 11.81 x 9.13)	9 x 37 x 46.7 (3.5 x 14.5 x 18.4)
WEIGHT, kg (lb)		<4 (8.8)	<4 (8.8)	6.3 (13.9)
PURCHASE INFORMATION				
List price		Not specified	Not specified	Not specified
Warranty		1 year	1 year	1 year
OTHER SPECIFICATIONS		Modular component of a physiologic monitoring system (IntelliVue family). Complies with CSA, IEC, and UL.	Modular component of a physiologic monitoring system (IntelliVue family). Complies with CSA, IEC, and UL.	Modular component of a physiologic monitoring system (IntelliVue and CMS family). Complies with CSA, IEC, and UL.
LAST UPDATED		Mar-09	Mar-09	Mar-09
Footnotes				

MEASURING QUALITY OF LIFE

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Patients developing critical illness have been associated with substantial attributable mortality rates. However, it may drastically impact quality of life (QOL) as well. Therefore, intensivists should also be concerned with health status and functioning after discharge of the critical care department. In this overview, the impact of critical illness on QOL, and potential ways to measure QOL before and after critical illness will be shortly highlighted.

QUALITY OF LIFE AND CRITICAL ILLNESS

Modern critical care medicine offers a wide spectrum of high-tech and innovative possibly life-saving and prolonging treatment modalities. Since caring for patients with critical illness is primarily targeted on survival, it is mainly assessed by physiologic surrogates of failure or success and predominantly measured by means of mortality (respectively ICU, 28-day, in-hospital, or 6-month mortality), which are, as primary endpoint under study, relatively easy to assess (Graf et al. 2003). However, for all healthcare providers involved in patient care, and for both the patient and his relatives as well, this may not be the only endpoint of interest. Over years, patients' QOL following critical illness has gained importance besides outcome in terms of survival. For instance, some interventions can maintain life in the protected critical care environment, but the resultant health state may be valued as worse compared to death (Gill et al. 1994; Graf et al. 2003; Patrick et al. 1994). Consequently, intensivists should not only be concerned by simply prolonging patients lives, but should be concerned about their health status perspective as well (Vandijck et al. 2008).

HOW TO ASSESS QOL

Assessing patients' individual QOL is a complex and often difficult task as the process encompasses health status, but also other related determinants such as employment status, social relationships, the well-being of relatives and other proxies, or financial aspects (Testa et al. 1996). As such, a considerable range of possible instruments) have been proposed to assess patients' outcome other than survival (Hayes et al. 2000; Rubenfeld 2007):

- spirometry (physiologic measures);
- six-minute walk (functional measures);
- St. George's Respiratory Questionnaire;
- Sickness Impact Profile (disease specific measures);
- Center for Epidemiologic Studies Depression Scale(symptom inventories);
- Medical Outcome Survey Short-Form 36 (SF-36), and
- EuroQol-5 and -6 dimensions survey (generic health related quality of life instruments)

A discussion of the advantages and disadvantages of selecting from this battery are beyond the scope of this article, but researchers are discouraged to use self-developed tools unless they are being evaluated alongside accepted measures.

After international and interdisciplinary consensus, the SF-36 is, besides its restraints, the most extensively validated, and therefore, one of the most accepted instruments and has been recommended as a global measurement of health status and for appraising non-mortality outcome in general (Neugebauer et al. 2002). This survey contains 36 questions that evaluate respectively eight health domains considered to be important to patient well-being and health status, concepts that reflect

physical health, mental health, and the impact of health on daily functioning (Ware et al. 1992). In brief, the eight multiple-item domains encompass physical- and social functioning, role limitations caused by physical- and emotional problems, mental health, energy and vitality, pain, and finally the individuals' general perception of health. For each variable item, scores are coded, summed, and transformed on to a scale from 0 to 100 (i.e. from worst to best possible health state). Additionally, scores can be combined to summary measures representing a physical health (including physical functioning, physical role, pain, and general health) and a mental health summary scale (including vitality, social functioning, emotional role, and mental health) (Graf et al. 2003; Ware et al. 1992). Finally, all SF-36 profiles can be transformed to a so called, preference score from 0 to 1, based on which quality adjusted life years can be calculated (Brazier et al. 2002; Vandijck et al. 2007).

QOL BEFORE AND AFTER CRITICAL CARE ADMISSION

Once an individual becomes seriously ill and, accordingly, his condition imposes admittance to the critical care department, the intensivist needs to be informed of the patients' QOL before the illness. To be able to correctly assess the extent to which life-sustaining treatment options should be started or not, intensivists must know the pre-morbidity QOL and the patients' preferences in the case of an acute deterioration of his health, in order to respect the patients' preferences (Capuzzo et al. 2000). In this regard, previous research has already shown that low QOL prior to critical care admission is associated with a grim prognosis in terms of survival, and leads to deterioration in the QOL (in the short-, mid- and long-term) after discharge (Oeyen et al. 2007; Goldstein et al. 1986; Yinnon et al. 1989; Vazquez Mata et al. 1992; 1996). Above, some specific critical care cohorts (e.g. patients with trauma and burn injuries) are usually healthy prior to their critical illness meaning that their perceived QOL after discharge may even drop more substantially as compared to other patient cohorts often having an already impaired QOL prior to critical care admittance (Cuthbertson et al. 2005; Flaatten et al. 2006). Contrary to the common perception of intensivists, QOL after critical illness is worse than before. Hence, it could be argued that it is important to systematically assess patients pre-morbidity QOL, (or at least specific subgroups of patients) at the time of critical care admittance. This is a major challenge, not only for patients, but for all healthcare providers taking care for these patients as well. As interventions aimed to improve long-term outcomes after critical illness are not widely documented and research on this topic is still in its infancy, this should become a high priority in the near future.

References

Brazier, J., Roberts, J. & Deverill, M. The estimation of a preference-based measure of health from the SF-36. J Health Econ 2002; 21 (2):271-92.

Capuzzo, M., Grasselli, C., Carrer, S., Gritti, G. & Alvisi, R. Quality of life before intensive care admission: agreement between patient and relative assessment. Intensive Care Med 2000; 26 (9): 1288-95.

Cuthbertson, B. H., Scott, J., Strachan, M., Kilonzo, M. & Vale, L. Quality of life before and after intensive care. Anaesthesia 2005; 60 (4):332-9.

Flaatten, H., & Ulvik, A. Quality of life after intensive care in trauma patients. Minerva Anestesiol 2006; 72 (6):479-81.

Gill, T. M. & Feinstein, A. R. A critical appraisal of the quality of quality-of-life measurements. Jama 1994; 272 (8):619-26.

Goldstein, R. L., Campion, E. W., Thibault, G. E., Mulley, A. G. & Skinner, E. Functional outcomes following medical intensive care. Crit Care Med 1986; 14 (9):783-8.

Graf, J., Koch, M., Dujardin, R., Kersten, A. & Janssens, U. Health-related quality of life before, 1 month after, and 9 months after intensive care in medical cardiovascular and pulmonary patients. Crit Care Med 2003; 31 (8):2163-9.

Hayes, J. A., Black, N. A., Jenkinson, C., Young, J. D., Rowan, K. M., Daly, K. & Ridley, S. Outcome measures for adult critical care: a systematic review. Health Technol Assess 2000; 4 (24):1-111.

Neugebauer, E., Bouillon, B., Bullinger, M. & Wood-Dauphinee, S. Quality of life after multiple trauma--summary and recommendations of the consensus conference. Restor Neurol Neurosci 2002; 20 (3-4):161-7.

Oeyen, S., Vandijck, D., Benoit, D., Decruyenaere, J., Annemans, L. & Hoste, E. Long-term outcome after acute kidney injury in critically-ill patients. Acta Clin Belg Suppl 2007; (2):337-40.

Patrick, D. L., Starks, H. E., Cain, K. C., Uhlmann, R. F. & Pearlman, R. A. Measuring preferences for health states worse than death. Med Decis Making 1994; 14 (1):9-18.

Rubenfeld, G. D. Interventions to improve long-term outcomes after critical illness. Curr Opin Crit Care 2007; 13 (5):476-81.

Testa, M. A. & Simonson, D. C. Assesment of quality-of-life outcomes. N Engl J Med 1996; 334 (13):835-40.

Vandijck, D. M., Annemans, L., Oeyen, S., Blot, S. I. & Decruyenaere, J. M. Cost-effectiveness in critical care. ICU Management 2007; 7 (2):6-8.

Vandijck, D. M., Benoit, D. D., Depuydt, P. O., Offner, F. C., Blot, S. I., Van Tilborgh, A. K., Nollet, J., Steel, E., Noens, L. A. & Decruyenaere, J. M. Impact of recent intravenous chemotherapy on outcome in severe sepsis and septic shock patients with hematological malignancies. Intensive Care Med 2008; 34 (5):847-55.

Vazquez Mata, G., Rivera Fernandez, R., Gonzalez Camona, A., Delgado-Rodriguez, M., Torres Ruiz, J.M., Raya Pugnaire, A. & Aguayo De Hoyos, E. Factors related to quality of life 12 months after discharge from an intensive care unit. Crit Care Med 1992; 20 (9):1257-62.

Vazquez Mata, G., Rivera Fernandez, R., Perez Aragon, A., Gonzalez Camona, A., Fernandez Mondejar, E & Navarrete Navarro, P. Analysis of quality of life in polytraumatized patients two years after discharge from an intensive care unit. J Trauma 1996; 41 (2):326-32.

Ware, J. E. JR. & Sherbourne, C. D. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30 (6):473-83.

Yinnon, A., Zimran, A. & Hershko, C. Quality of life and survival following intensive medical care. Q J Med 1989; 71 (264):347-57.

ICU MANAGEMENT

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COST-EFFECTIVENESS ANALYSIS:
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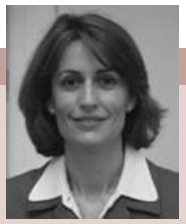

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The fundamental principle of economic analysis is that choices have to be made between alternative uses of resources, as there is a finite pool of resources with which to provide all medical care possible to each individual. This principle is not debated. By providing estimates of outcomes and costs, these analyses illustrate the tradeoffs involved in choosing among a variety of clinical interventions to provide the best healthcare. Never before has it been more apparent than in our current healthcare environment that these tradeoffs are inevitable.

The application of economics to clinical practice in healthcare does not necessarily mean that less money should be spent, but rather that the use of resources might be more efficient. Broadly speaking, the tools of clinical economics can be applied to the analysis of medical practice to improve decisions on how to allocate resources for clinical interventions.

Here, we will define each type of economic evaluation, highlight the basic similarities and differences, and then focus on the principle components of conducting and reporting a cost-effectiveness analysis, one of the most commonly used economic evaluations used in clinical medicine.

Cost-Identification or Cost-Minimisation Analysis

Cost-identification analysis is used to describe and quantify the cost of a particular type of medical care or the economic burden of a disease. This type of analysis, also referred to as "cost-minimisation analysis," asks the question, "What is the cost?". An implied assumption is that the health outcomes of different preventive, diagnostic or therapeutic strategies are considered equivalent. E.g., an analysis that assumes the effectiveness of abdominal hysterectomy and laparoscopic-assisted vaginal hysterectomy are equivalent, and that women's preferences for each are equivalent, might simply report the costs associated with each. Although these types of analyses may identify the least costly way of obtaining an appropriate outcome, they cannot specifically predict what the relationship of cost to health outcome will be.

Cost-Effectiveness Analysis (CEA)

Cost-effectiveness analysis incorporates information about both costs and health outcomes to describe the value of a particular healthcare programme. CEA evaluates an intervention through the use of a cost-effectiveness ratio. In the ratio, all health outcomes (compared with a clearly stated alternative intervention) are included in the denominator, and all costs or changes in resource use (compared to a clearly stated alternative intervention) are included in the numerator.

This type of analysis can be used to compare more intensive forms of an intervention with less intensive forms (e.g., screening every year vs. every three years for cervical cancer); a new technology with the standard of care (e.g., laparoscopy vs. laparotomy); prevention of a problem versus treating it (e.g., behavioural school interventions to reduce rates of sexually transmitted diseases in teens vs. a school-based clinic to provide early treatment of these infections). These types of analyses define the "opportunity cost" of each choice, and provide important data to decision-makers in diverse settings for making informed decisions about interventions.

The particular type of cost-effectiveness analysis that uses Quality-Adjusted Life Years (QALYs) as the measure of outcome is sometimes referred to as a cost-utility analysis (CUA), although may alternatively be referred to as one type of cost-effectiveness analysis. Cost-utility analysis is a methodological approach to assessing the value of a given health technology programme, or intervention. As such, it can be considered a process innovation designed to inform decisions about utilisation and coverage of medical interventions.

Cost-Benefit Analysis

Cost-benefit analysis differs from CEA in that it values both health outcomes and costs of medical interventions in dollars. Because clinical benefit is measured in terms of currency, a net benefit or net cost can be calculated by subtracting the cost from the benefit. The criteria that cost-benefit analysis relies on is whether the benefits of a preventive, diagnostic or therapeutic programme outweigh the costs, the premise being that if clinical programmes that fulfil those criteria are adopted, decisions will be made that will result in an "optimal" solution within the economic welfare framework.

The most common methods of assigning dollar value to health outcomes are willingness to pay and human capital. Willingness to pay, a monetary measurement obtained by estimating an individuals willingness to pay for life-saving or health-improving interventions, can be assessed by a survey that relies on an approach called "contingent valuation", or it can be indirectly inferred from decisions that have actually been made that involve tradeoffs between health and money. Human capital values health in terms of the productive value of individuals in the economy.

Despite these difficult measurement issues (i.e., the assignment of a dollar value to outcomes like mortality, functional status and quality of life), cost benefit analyses do appear in the clinical literature. Because it requires valuing all outcomes in monetary terms, it allows for comparison to other sectors of society where benefits are not clinical health outcomes (i.e., environment, education, and defence spending).

Cost-Effectiveness Ratio

Cost-effectiveness ratio is the measure used to express the results of a cost-effectiveness analysis and represents the incremental price of obtaining a unit health effect (i.e., dollars per year of life saved or per quality-adjusted life year saved) as a result of a given clinical intervention when compared to the next best alternative. In this ratio, two alternatives are being compared with the difference in their costs being divided by the difference in their effectiveness. Cost-effectiveness ratios should be reported as dollar per unit of effectiveness stating the year of the costs, for example, 25,000 dollars per life year saved (1998 dollars).

Cost-effectiveness analyses are always incremental with the ratios comparing each intervention to the next most effective alternative. This means that the costs and clinical benefits associated with the intervention of interest should be compared to existing practice and to all other reasonable options. When all possible alternatives are not included, there is a risk of coming to an incorrect conclusion that an intervention is cost-effective, but only because it was compared with a cost-ineffective alternative.

"The criteria that cost-benefit analysis relies on is whether the benefits of a preventive, diagnostic or therapeutic programme outweigh the costs..."

Cost-Effectiveness Analysis and Resource Allocation

A systematic consideration of cost-effectiveness in decisions concerning the implementation of healthcare technologies would contribute to the efficiency of the healthcare system. This goes further than the initial decision to finance a new healthcare technology based on a favourable cost-effectiveness ratio. A systematic approach should raise and solve questions of broader resource allocation. The opportunity costs involved with implementing a new technology should not be restricted to the 'old' substituted technology but to all resources available to the healthcare funder.

An imaging test with highest diagnostic accuracy is not necessarily the test of choice in clinical practice. The decision to order a diagnostic imaging test needs to be justified by its impact on downstream health outcomes. Decision analysis is a powerful tool for evaluating a diagnostic imaging test on the basis of long-term patient outcomes when only intermediate outcomes such as test sensitivity and specificity are known. The basic principles of decision analysis and "expected value" decision-making for diagnostic testing are introduced.

The appearance of more CEAs in the literature in the future will create new insights into the reasons for the high cost of medical care and uncover ways to decrease unnecessary expenditures. Readers of this literature must become familiar with the basic vocabulary, rationale, and standard methods of CEA. By improving our knowledge and understanding of this state-of-the-art research tool, the healthcare community will have a greater ability to participate in healthcare policy setting and decision-making locally and nationally.

Interviewee
Dr. Peter Pronovost
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HOW TO SAVE LIVES AND INFLUENCE PEOPLE

Dr. Peter Pronovost, Medical Director at the Center for Innovation in Quality Patient Care, Professor in the Department of Anaesthesiology/ Critical Care Medicine at Johns Hopkins University's School of Medicine and ICU Management Editorial Board Member explains to Sherry Scharff how one simple strategy has not only saved patients and improved safety in his institution – but made some people rethink the way they do their job.

By first studying the growing catheter-related bloodstream infection rate in Johns Hopkins' hospital over time and implementing a simple strategy- a checklist, Dr. Pronovost has made a drastic impact on the rate of infection, costs and mortality rates. The programme was then implemented in hospitals in the State of Michigan, where it nearly eliminated these infections and saved the state over 200 million dollars (U.S.) a year and countless lives.

Touted as one of TIME Magazine's 100 World's Most Influential People of 2008, Dr. Pronovost is using his influence to benefit critical care patients by striking at the heart of one of its' greatest challenges- standardising quality care around the world.

HOW DOES IT FEEL TO BE NAMED ONE OF THE WORLD'S MOST INFLUENTIAL PEOPLE OF THE LAST YEAR?

To be honest, it's a bit daunting. I find the work I do rewarding as it is-without the accolades. Taking concepts from research and finding ways to apply them to patient care, involves examining sometimes-complex studies and boiling them down into key steps, which can be applied at the bedside is surprisingly simple as an idea. But as a colleague said to me, the reality is that its' simplicity is the genius of it.

WHY DOES SOMETHING THAT SEEMS SO SIMPLE HAVE SUCH DRASTIC RESULTS?

The idea of a checklist is indeed a simple one. But the success of it is not due to noting five simple points on a piece of paper and checking them off as you go. The checklist itself is just a tool. There are really three components key to the success here: In the case of line infections, there are over 80 behaviour-specific actions that are currently listed in the guidelines to lessen the chance of contamination during insertion. First, we chose five, which we agreed were the most important in reducing infections, and having the lowest barrier to use and worded them as behaviours. Then (secondly), we provided a system to measure and provide feedback to the doctors and nurses, which was an important component to keep them invested in the system- seeing the results over time. Finally, we imbedded in the concept of teamwork. Initially the idea of nurses questioning doctors about missing steps in the checklist was not entirely welcomed, as doctors are often concerned with "saving face". Many people say that doctors fear change. I disagree. If you or I won the lottery, our lives would inevitably change. Does this mean we would neglect to cash-in our ticket? Of course not, because people (and doctors alike) don't fear change, they fear perceived loss. And the loss in this case is the loss of power. If a nurse questions them, it is perceived as losing the power or the status in the unit. If we refocus this "loss of power" into advocating for your patient (a goal of both doctor and nurse)-and a team win, this issue of saving face dissipates.

I'VE READ THAT THE CHECKLIST SYSTEM HAS/IS BEING IMPLEMENTED IN SPAIN AND ELSEWHERE...

Yes, in fact it is launching in Spain as well as various other countries around the world: Peru, Pakistan, and the UK, as well as in 30 states here in the U.S. It is being organised through state hospital associations in the States and abroad, hospital participation is being initiated through the ministries of health. We will be guiding these projects-the launch, the collection of data, as well as providing materials and technical information. While these projects will be centralised in nature, the participants are empowered to initiate their own strategies in the collection of data, and in the decision-making process as to which components of the system they find efficient in practice. This is just the start of a three-year undertaking.

ARE THERE ANY OTHER PROBLEMS THAT YOU FEEL COULD BE SOLVED WITHIN THE ICU BY EMPLOYING A SIMPLE PROTOCOL/CHECKLIST SYSTEM?

There is an infinite list…to highlight a few that we are working on creating checklists for at the moment: End of life/palliative care, MRSA, and ventilator-associated pneumonia. In the interest of improving quality of care, I am always attempting to find the "sweet spot" of what is scientifically sound and practically feasible, a balance between the two. In my background in clinical research I understand that those in the field believe that science is finding new drugs and identifying genes, which can work in early diagnosis and preventive medicine. I think science goes far beyond this idea of simply gene and drug solutions and that there is a science in behaviour-based medicine as well. An article was recently published in JAMA, called "Translating evidence into practice: a model for large-scale knowledge translation". In this article my colleagues and I set out a model for all protocols, with the approach, similar to that of drug trials, being central to success. The phases: (1) Summary of evidence; (2) Piloting and measurement; (3) Making the treatment available to appropriate patients.

WHAT DO YOU SEE AS THE GREATEST CHALLENGE IN CRITICAL CARE?

There really is a wealth of information out there, and I know that there are a number of institutions that are doing really good work in particular areas. The challenge is to link these centres, create a pipeline to practice. Often good ideas are lost in translation into practice; to this end, we are actually working creating a software tool, which can pool information and utilise the wisdom of the masses. If I personally focussed on one disease at a time, studied it and the numerous guidelines connected to it- creating checklists for each, it would be incredibly inefficient- surely I would die before completing my tasks! The vision of this software tool, which we are calling the "checklist maker" is that everyone who uses it contributes-ranking the top seven behaviours to eliminate MRSA, for example. By pooling all this data, and giving intensivists and nurses the opportunity to list/rank what they see as priorities we can make knowledge more readily available and certainly more efficient.

ARE YOU CONCERNED THAT YOU WILL BE FOREVER KNOWN AS DR. CHECKLIST?

Ha ha…no, not really. Improving quality of care and standardising this high level of care is the ultimate goal, and as healthcare professionals we need to learn from situations when things go wrong. If a tool like a checklist is the first step in highlighting our role in the process, then the title is just fine for me.

WHAT DO YOU THINK ABOUT CRITICAL CARE MANAGEMENT?

Leadership is important. There are many practicing doctors, like myself who are trying to implement evidence-based management strategies. That is why there is such a need for tools like this journal, ICU Management -to bridge the gap between management strategies and practice.

THANK YOU VERY MUCH FOR YOUR TIME.

CHECKLIST:

TO REDUCE INFECTIONS WHEN INSERTING A CENTRAL VENOUS CATHETER
Doctors should:

- ☐ Wash their hands with soap.
- ☐ Clean the patient's skin with chlorhexidine antiseptic.
- ☐ Put sterile drapes over the entire patient.
- ☐ Wear a sterile mask, hat, gown and gloves.
- ☐ Put a sterile dressing over the catheter site.

Continued from page 22

Health Technology Assessments Essential

A closer relationship between physicians, administrations and health economists, who often do not share the same language, and increased use of data coming from Health Technology Assessments and economic analyses, in the form of single studies or meta-analyses, may provide the basis for a more rational approach to the affordability of therapies, such as ICD and CRT-D, with a high initial financial burden but proven, evidence-based benefits.

This may be of value for ensuring fairness in access to these therapies, particularly for some less favoured subgroups of patients (females, the elderly, minority groups, etc.). In addition, national and international registries focused on daily clinical practice may help in verifying and monitoring implementation of current guidelines in the real world. Such steps will constitute essential components of the complex pathways that by moving from the evidence derived from clinical trials will lead to the delivery of appropriate care to individual patients.

ICU MANAGEMENT

Content

Articles may focus on any management or practice issue in intensive care related to economics, quality of care or patient outcome. We only accept scientific papers with a clear connection to management and practise issues. We also invite viewpoints for publication in our Forum section, which can be personal opinions of the author and/or reactions to articles published in prior issues. These are published at the discretion of the Editors. Submissions may not have been published previously or be currently submitted for publication elsewhere. Articles must be written by independent authorities and any sponsors for research must be named. If manufacturers are named in an article, the text must present an unbiased view, not in support of any particular company.

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Length

- Articles: maximum 1000 words (less if figures or tables are included)
- Viewpoints: maximum 700 words
- News/research/product updates: maximum 200 words

Please note that contributions longer than the specified number of words may not be accepted.

Structure

Article texts must contain:

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- Summary of one or two sentences (no more than 30 words) describing the content
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- Website, if appropriate
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Example of within text citation: (Edwards 2004; Edwards and Miller 2002; Miller et al. 2003).

Reference lists should be alphabetised by lead author and included at the conclusion of the submission.

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It is always at the discretion of our editorial board to accept or refuse submissions. We will respond to submissions within 8 weeks of receipt. We reserve the right to revise the article or request the author to edit the contents, and to publish all texts in any EMC Consulting Group journal, on the Internet and to list them in online literature databases.

Thank you,
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THE FRENCH HEALTHCARE SYSTEM

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Social Protection System

The social protection system was created in 1945 aimed primarily at workers and their families. The expansion of health insurance coverage was implemented in stages during the 1960s. The Universal Health Coverage Act (CMU) concluded this process in 1999 by establishing universal health coverage. Today, three main health insurance schemes are dominant: the general scheme for employees and their families (84% of the population) and for CMU beneficiaries (1.6% of the population); the agricultural scheme for farmers and agricultural employees and their families (7.2% of the population); the scheme for non-agricultural self-employed people (5% of the population).

Although run by employers and employees, the social protection system always faced a strong influence of the State in the financial and operational management of health insurance. This was reinforced by two aspects of the 1996 reform: a new income tax to fund the system instead of full financing by wage contributions; a more active role for parliament in determining policy directions and expenditure targets.

Health Policy Management

The responsibility to define the health policy and to regulate the healthcare system is divided between the State, the statutory health insurance funds and the local communities.

Since 1996, the parliament adopts every year an Act that defines a projected ceiling for health insurance spending for the following year, known as the ONDAM. The Ministry of Health then controls a large part of the regulation of healthcare expenditure. It divides the budgeted expenditure between the different sectors and for hospital care between the different regions. It approves the agreements signed between the health insurance funds and the unions representing self-employed healthcare professionals and sets the prices of specific medical procedures and drugs. The State also defines the number of medical students to be admitted to medical school each year (numerus clausus), the planning of equipment and priority areas for national health programmes.

The Ministry of Health has services at local level: directorates of health and social affairs in the regions and departments. A process of deconcentration of the organisation and management of the French healthcare system began in the early 1990s. Regional hospital agencies are responsible since 1996 for hospital planning (for both public and private hospitals), financial allocation to public hospitals and adjustment of tariffs for private for-profit hospitals (within the framework of national agreements). The directors of those agencies are appointed by the Council of ministers and are directly responsible to the Minister of Health.

Until 2003, hospital planning involved a combination of two tools: the healthcare mapping as a quantitative tool and the regional strategic health plan as a more qualitative tool. The healthcare mapping divided each region into healthcare sectors and psychiatric sectors. In 2003, the government decided to integrate all planning tools into the regional strategic health plan. It sets out the goals for the development of regional provision over a five-year period in areas corresponding to national or regional boundaries.

Trends and Reforms

The health system faces numerous challenges, many of which are common to other European countries. Health expenditures continue to increase more than resources, leading to budget deficits. The number of doctors will significantly decrease in the near future, coupled with the persistent unequal distribution in existing medical professionals across the country. The excessively high rates of mortality in the population under 65 show an urgent need to develop preventive actions within a coherent public health framework.

To tackle these challenges and to improve health system organisa-

tion and management, several major reforms have been introduced since 2004. They aim to change the behaviour of the stakeholders, focusing on the renewal of the organisation and management of the health system and on financial measures and incentives. The 2004 Public Health Policy and Health Insurance Reform Acts insist on the role of the state and parliament in priority setting in the health sector. They give more power to local and/or dedicated structures for implementation.

The 'new hospital governance' gives more flexibility and relative internal organisational freedom to public hospitals, despite relatively strict controls on hospital management. At a higher level, a strategic plan for health workforce development promotes group practice and also experiments with the transfer of tasks away from doctors to paramedical staff.

The reforms emphasised also on health information systems with the creation of a comprehensive electronic patient record, coupled with the referring doctor system in primary care. The implementation of a French-type non mandatory gatekeeping system is also built on a system of financial incentives mainly directed towards patients. Healthcare "franchises", a new out-of-pocket payment, have been put in place in 2007 and 2008 on medical consultation, medicines, non-medical care and transports Pharmaceutical regulations also include financial incentives for pharmacists to substitute generic products for original medications when these are prescribed by doctors, as well as charging levies on the pharmaceutical industry related to advertising, sales promotion expenditures and turnover.

The French Hospital System

Hospitals in France can be public, private non-profit or for-profit. But in any case patients are free to choose their hospital and will get more or less the same social insurance coverage.

Public hospitals account for a third of the 2,890 hospitals (1,599 of which acute care hospitals) but for two thirds of inpatient beds. They are legally autonomous and manage their own budget. There are four levels of public hospitals: local, general, regional and specialised. Local hospitals provide health and social care at community level. Most of their doctors are self-employed private practitioners. General hospitals provide a range of acute care services (medicine, surgery, and obstetrics), rehabilitation, long-term care and in some cases psychiatric care. 32 regional hospitals, with a higher level of specialisation and the technical capacity are in charge of more complex cases. 29 of them are linked to a university and operate as teaching and research hospitals. In addition, there are 93 psychiatric hospitals.

Non-profit hospitals are owned by religious organisations, foundations or mutual insurance associations. They represent one third of hospitals and 15% of inpatient beds. Most non-profit hospitals are "collaborating to public service" (PSH), since they carry out public activities such as emergency care, teaching and social programmes for deprived populations. The range of services provided by non-profit hospitals varies. In total, they account for one third of rehabilitation capacities, but less than 10% of acute care beds. 20 specific non-profit private hospitals are specialised in cancer treatment.

Private for-profit hospitals account for 40% of all hospitals in France but 20% of all inpatient beds. They tend to specialise in certain areas such as elective surgery, where they cover 2/3 of the activity. This sector invested in relatively minor surgical procedures, carrying out three quarters of cataract surgical procedures for example but more than 60% of admissions for digestive system disorders.

Resources and Activities

Hospitals, public and private, employ more than one million people: 80% of them in public hospitals. 14% of these employees are medical staff. Part-time work is increasing and concerns for example 20% of non-medical staff in public hospitals.

With an average of 8.4 hospital beds (including long-term care) per 1000 inhabitants, less than half of which are acute beds, France faced a rapid downward trend in the number of hospital beds between 1980 and 2000, linked to a reduction in the average length of stay. However, there are important inequalities in bed numbers. The number of acute beds in the departments varies from 2.5 to 6 beds per 1000 inhabitants, excluding Paris, which has more than 9.

During the same period, the number of people admitted to hospitals continued to increase. A number of policies have been implemented to encourage methods of providing care that are alternatives to inpatient care, such as day care surgery or home care. The private for-profit sector is particularly active in this field.

Since the 1960s, mental health policy in France has been based on a continuous movement towards de-institutionalisation. A key process in this movement has been to divide the country into geographical zones or areas serving a particular population and to establish a multi-disciplinary team in each zone to provide preventive care, treatment, follow-up care and rehabilitation for people living in that area and suffering from psychiatric disorders. Each psychiatric zone is linked to a hospital (either a public hospital or a private hospital participating in the public hospital service).

Quality of care has become a significant concern since the 1990s. Since 1996, all hospitals have been following a certification process, originally called accreditation. This mandatory procedure, carried out by a specific agency, the Haute Autorité de Santé, is an external evaluation of procedures. The hospital is evaluated on several dimensions: quality of care, information given to the patient, medical records, general management

(human resources, information systems, and logistics), risk prevention strategies, etc.

Reforms

A reform plan, known as 'Hôpital 2007', had set major changes in the late 1990s with the objective of improving overall efficiency and management within the hospital sector.

The first element was the modernisation of healthcare facilities by boosting investment on buildings and equipments. Total investment in hospitals has doubled between 2003 and 2006. In parallel, the organisational structure and planning of healthcare facilities have been simplified, and the health mapping, that controlled the number of beds and medical equipment authorised for each hospital was stopped. Regulatory powers have been shifted from the central level to the regional hospital agencies.

The second measure was the introduction of an activity-based payment system both for public and private hospitals. Previously, resources were allocated to public and private hospitals by two different methods. The public and most private non-profit hospitals had budgets allocated by the regional hospital agencies based on historical costs, with limited incentive for efficiency. Private for-profit hospitals had a billing system with different components: daily tariffs and a separate payment based on diagnostic and treatment procedures. In addition, doctors working in for-profit private hospitals were (and still are) paid on a fee-for service basis unlike those working in public and non-profit hospitals, who are salaried.

A new activity-based payment system has been implemented step by step for public and private non-profit hospitals from January 2004. A payment is made for each patient treated in acute care based on the Groupes Homogène de Séjour (an equivalent of diagnosis-related groups) prices for the public sector. The activity-based element of the payment was supposed to increase gradually each year: 10% in 2004, 25% in 2005 and 35% in 2006. Private for-profit hospitals have been paid entirely using the new case-mix based system since 1 March 2005. However, a transition period was allowed where 'national prices' have been adjusted, first taking into account the prices for the private sector, and second using a transition coefficient for each provider based on its own historical costs. The objective was to harmonise the prices for all providers (public and private) by 2012.

The third element has been to give public hospitals flexibility to deal with this new financial environment. The goal was to simplify the management of public hospitals and to integrate medical staff in managerial decisions. Hospitals now have the opportunity to create large clinical departments in order to organise their medical activities in a more efficient way. Although public hospitals have obtained some freedom over their internal organisation, their autonomy is still strictly limited in other ways. The boards and executives of hospitals are still under the control of the Ministry of Health and the ARHs (Agences régionales de l'Hospitalisation). Resource allocation and most of the management rules concerning recruitment, investment strategy and the use of new interventions are still constrained.

France: Facts and Figures

Capital
Paris

Area
674,843 square kilometres

Administrative divisions
26 regions (22 are in metropolitan France; one is the territorial collectivity of Corsica and four are overseas regions)

Total population
61,330,000

Gross national income per capita (PPP international $)
32,240

Life expectancy at birth m/f (years)
77/84

Healthy life expectancy at birth m/f (years, 2003)
69/75

Probability of dying under five (per 1 000 live births)
5

Probability of dying between 15 and 60 years m/f (per 1 000 population)
124/57

Total expenditure on health per capita (Intl $, 2006)
3,554

Total expenditure on health as % of GDP (2006)
11.1

Tuberculosis incidence per 100000 (2007)
8.72

Hospital beds per 100000
716.78

Physicians per 100000 (2007)
341.63

In-patient care admissions per 100
18.75

Figures are for 2006 unless indicated. Source: World Health Statistics 2008

GOVERNANCE AND GERIATRICS

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Can hospitals deal with an aging population and a rising prevalence of Alzheimer's disease? The new governance structure, Hospital 2007*, strives to meet this pressing challenge. It will undoubtedly produce other care sections, more gerontology networks, provide better support for the local hospital and regulations for general and regional hospitals. However, beyond the structural level, these governance processes are complex and are torn between unity and diversity. Talk of transdisciplinary care must no longer be empty rhetoric between those who are responsible for service provision clusters and representatives for caregivers and administrators. This applies particularly to those on hospital executive boards, who are a new decision-making force.

A Demographic Overview

People over 75 years of age represent nearly half of all general hospital admittances and the majority of unscheduled early re-hospitalisations. The PAQUID-Bordeaux study** projects that this age segment will increase from 7.7% of the population in 2003 to 9.6% in 2010 and 18.1% in 2050. In conjunction, the prevalence of dementia (be it Alzheimer's or similar conditions) will increase from 6.5% between 75 and 79 years old, to 15.1% between 80 and 84, and to 27.9% between 85 and 89. For its part, life expectancy is still on average 3 years for 90 year-olds. These figures are higher for rural areas, which is a particular cause for concern because in these outlying areas, health services are already offered at a lower level, with fewer general practitioners, fewer nurses, etc.

The main epidemiological conclusion made from both the PAQUID study coordinator and a parliamentary report is that the State is failing to institute measures aimed at prevention, early diagnosis and subsequent care of dementia. There are cases of loss of opportunity for the patient and his or her family, disorganised recourse to the healthcare system and a lack of adequate study regarding those not seeking treatment. There are also increasingly high numbers of household accidents and maltreatment cases. With the current numbers of vulnerable groups set to increase, the number of accidents (household, automobile and other) is also expected to rise, despite national campaigns set on prevention.

Hospital Care and Geriatrics

The level of geriatric care in hospitals is insufficient: Few hospitals offer a complete range of short-term stay care (including Alzheimer's and daytime admittance beds), follow-up and rehabilitation care, long-term care, mobile units attached to the emergency ward, out-of-hospital gerontology networks with the hospitals' participation, among other necessary services.

Hospital missions are increasingly technical in nature, with a gradual divestment from their social role. Senior citizens take up a great deal of resources but count for few points under the new rating system. This situation has already been studied in two regions and used as a test of new measures for resource distribution for the follow-up and rehabilitation care sectors. However our aim is to partner with the ad-

ministrative, medical and caregiving stakeholders of the hospital sector to envision a new governance structure centred on gerontology.

Transdisciplinarity, Intercultural Approaches and Geriatrics

Within hospitals, there are three sub-groups: doctors, caregivers and administrators. Older patients who are hospitalised are cared for in a general hospital setting half the time, and much more often in a local hospital setting. It is not standard practice for executive boards to include a geriatric specialist among their 6 or 8 members, however the board must periodically define the institution's policy on geriatrics. Therefore, hospital specialists in geriatrics wield little influence over decisions, even if they lead their departments. Whether they strive to create geriatric day beds (or increase their numbers), encourage investment of more resources into another typical aspect of geriatric hospital care or to create specialised assessment consultations in liaison with networks within or beyond the hospital setting, often, geriatric specialists are facing an uphill battle.

The commonality between all the hospital-based gerontology public health necessities is their real financial impact. This impact is minimal in comparison with that of an emergency room restructuring or a capacity increase for an intensive care unit or an operating theatre, but as the medical and administrative community sees the field of geriatrics as being subordinate and a secondary priority, its value is often underrated and misunderstood. What is then to be done in the case of those over 75, and even more urgently the "very old" in Anglo-Saxon parlance, those over 80, when they are no longer "capable" of leaving hospital for socio-medical reasons?

The Pau Experiment

Let's study the real world case of the Pau Hospital, where despite having 40 short-term stay geriatric beds (over 2000 admittances a year) and 4 geriatric day hospitalisation beds, current needs for emergency and specialised services continue to outstrip geriatric care offerings. The coefficients of occupancy and length of stay are both incompressible.

After 2 years of planning (2002-2004), an official working plan was signed at the Regional Hospitalisation Agency (ARH) in 2005. The objective was to replace 10 beds in a closing department with a short stay geriatric hospitalisation unit as of 2006. Length of stay would be considerably shorter (4 days); services offered would be coordinated with other hospital departments (i.e. geriatric day beds, emergencies) and coordination with structures outside of the hospital (i.e. social and socio-medical services, developing local level gerontology networks) would be optimised.

Over 800 admittances were received over the first full year of operation (2007). All of these admittances were processed from emergency cases, thus alleviating the pressure on the latter service. The unit has also implemented collaborative measures with other hospital departments and organisations outside the hospital setting (follow-up services, home care). In fact, in cases in which a stay in this unit was initially meant to be brief but was underestimated, a transfer to another branch of geriatric care can ensue. In most cases, this short hospital stay allows for the main clinical diagnosis to take place without affecting the functional autonomy or worsening the level of dependency of these patients.

Nonetheless, the Achilles heel of the structure established in Pau and in all other institutions of this type is a significant re-admittance rate (33% at approximately 6 months). This leads one to question, why there is a quasi-absence of home-based healthcare specific to geriatrics in France, and more generally why the need for care before and after hospitalisation is not being addressed?

This accomplishment shows that when doctors, even those in less common fields such as geriatrics, strive to communicate with administrators and caregivers, they can convey their messages and trigger change that benefits all.

Gerontology Networks

Additionally, a Béarn-based gerontology network centred on palliative care has existed in one county since 1996, and in six counties since 2004. Its survival depends on financing allocated by authorities according to decisions made by State service providers. In 2005, the region's social services promoted a network that complemented their programmes, though they did not finance it. While it gathers together many health institutions, currently this network only exists at the institutional level. To be truly effective, it should enable real collaboration between general practitioners, independent nurses and hospitals as well create an easily accessible structure for all geriatric care providers.

Such networks act before and after hospitalisation:
- To assess of the senior citizen;
- To coordinate caregivers in order to avoid certain hospitalisations (for example, admittance to retirement homes);
- To foresee problems (admittance without being processed by emergency services), and
- To take steps to avoid unnecessary re-hospitalisation.

Gerontology networks are a highly desirable complement to short stay geriatric hospitalisation and are an important part of a good public health governance plan.

This example of the pairing of short stay geriatric units with gerontology networks illustrates:
- An alternative to standard hospitalisation;
- An attempt at finding answers to issues related to demographic aging for hospitals;
- A decompartmentalisation of hospital caregivers in relation to each other and to outside agencies, and finally
- A genuine attempt to adopt a interdisciplinary approach.

This melding of expertise is indubitably at the core of Hospital 2007 and cannot be ignored in the fields of gerontology and geriatrics in particular. Following the new hospital governance is clearly also a question of learning how to think and act with complexity in mind. It all flows from keeping track of the fundamental regulations, which oversee its vital equilibriums.

* In 2003, the government launched an ambitious reform plan, known as "Hôpital 2007" for improving overall efficiency and management within the hospital sector. The measures introduced not only modified the mode of financing public and private hospitals but also the rules of hospital sector planning and the governance of public hospitals.

** To study the relationship between body mass index (BMI) and risk of dementia, a cohort of 3,646 individuals aged ≥65 years living at home and without cognitive disorders at baseline were followed up for 8 years (the PAQUID [Personnes Agées Quid] Study).

EFFECTIVE ORGANISATION: NATIONAL UNION OF HOSPITAL MANAGERIAL STAFF

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The National union of hospital managerial staff (SNCH) is an organisation, which exclusively represents managerial staff working in hospitals. The SNCH was founded in 1947 by head storekeepers. Gradually, it started accepting all hospital managerial staff, and now covers administrative and technical staff, as well as doctors and nurses.

The definition of "manager" was already set out in our charter in 1994: "a manager is a person who, as a result of a certain level of training and his hierarchical position, manages, leads, encourages, coordinates and decides. He may have operational (financial, legal, technical, etc.), human, relational or medical or care giving responsibilities which translate in particular to exercising functions involving people management."

Independence

The SNCH provides the opportunity to join or become actively involved in an independent organisation set up to defend the interests of managerial staff, and which actively listens to its members.

The organisation is the only hospital trade union exclusively devoted to managerial staff, and the only one to be fully independent with no connection to a confederation and no political affiliation. Financed by its members, its national leaders are elected by all members.

The SNCH's values and effectiveness reinforce its representative character. More hospital managers are represented by the SNCH than by any other organisation. It draws in 50% of votes in professional elections and holds seats in national committees consulted by the ministry with regard to legislation and reforms, which affect hospitals and their staff.

Values

The values advocated by the SNCH are based on:

1. Its political independence, enabling it to act freely;
2. The defence of its members with regard to professional ethics and statutory rights;
3. The desire to promote and have recognised the value of managerial staff in hospitals;
4. The involvement and participation of managerial staff in decisions concerning the operation of their hospital;
5. The effectiveness of the public service in hospitals, and
6. The promotion of public hospitals in a social and healthcare system suited to the needs of patrons

Actions

The SNCH sets itself apart with its drive for progress and the link it maintains between hospital modernisation and statutory improvements for hospital managerial staff. The governance reform of healthcare establishments and the introduction of a new pricing structure created an opportunity for the SNCH to put forward a modern and innovative approach to management. The SNCH pushed for negotiations on the statutes applicable to hospital managers, and this led to a very important development in 2005, which placed their professional category in a top position.

The SNCH is an advocate of a public service that guarantees access to healthcare and equal treatment for all and that adapts its methods. In the opinion of the SNCH, hospital staff have the responsibility of continuing to educate themselves throughout their career. The quality of individual and group internal management is the condition sine qua non for the quality of service which patients deserve. The SNCH is at the forefront of new ideas on managing methods for the Public service and the healthcare system. It campaigns to reform management tools in order to make them more effective. SNCH's reflections affect all areas: hospital environment, role of the State, place and role of financing providers and elected officials, methods of regulation, scope of activity, status of facilities, etc. The SNCH sees itself as a laboratory, which generates suggestions that should become part and parcel of the developments of public hospitals. Its members are aware that public services are now in a context where performance requirements and international comparison are the norm.

Through its actions, the SNCH demonstrates the sense of responsibility of hospital managerial staff and their commitment to defending a humanistic and efficient idea of national solidarity in public service hospitals.

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REPORT FROM THE 2ND THERAPEUTIC TEMPERATURE MANAGEMENT CONGRESS;

BARCELONA, SPAIN, OCTOBER 1-4 2008

The attention for the role of temperature in the development of tissue injury is increasing. Large observational studies show that development of fever is linked to an increase in the severity of neurological injury, and to an increased risk of adverse outcome in ischaemic stroke, subarachnoid haemorrhage, traumatic brain injury and post-anoxic injury following cardiac arrest. Numerous studies have shown that artificially lowering body temperature following cardiac arrest (i.e., mild therapeutic hypothermia) significantly improves neurological outcome. Practical issues and new developments in this field were discussed at the 2nd therapeutic temperature management congress that was held in Barcelona from October 1st until October 4th 2008.

More than 150 experts from around the world attended the second therapeutic temperature management meeting (TTM) to discuss their new research findings and experiences, and to debate implementation strategies and new research findings. The faculty included clinicians from various specialities ranging from critical care medicine, neonatology, neurology neurosurgery, and cardiology to trauma care and emergency medicine. Basic researchers were also well represented.

The congress opened with a comprehensive lecture on the mechanisms underlying the protective effects of hypothermia, which was given by Bernd Böttiger from Cologne, Germany. This was followed by a state-of-the-art lecture on clinical applications of therapeutic cooling, given by Kees Polderman from Utrecht, the Netherlands.

The first full day of the congress was devoted to general concepts of temperature management and to initial stabilisation of the brain-injured patient in the ambulance and emergency room. General concepts as well as specific strategies were discussed by distinguished speakers from Europe and the United States including Eldar Soreide (Stavanger, Norway), Armand Girbes (Amsterdam, the Netherlands), Michael Wanscher (Copenhagen, Denmark), Kjetil Sunde (Oslo, Norway), Hans Friberg (Lund, Sweden), Marvin Wayne (Bellingham, United States), Pascal Vrancx (Hasselt, Belgium), Juan Sahuquillo (Barcelona, Spain), Stephan Mayer (New York, United States) and David Gaieski (Philadelphia, United States). The topics included such diverse issues as application of the concept of treatment bundles in neurologically injured patients, use of percutaneous interventions following cardiac arrest and the combination of these with cooling strategies, combining hypothermia with decompressive surgery, as well as initial stabilisation and subsequent management of circulation and ventilation. Data from the hypothermia registry, a 1000-plus database registering outcomes and interventions in patients cooled following cardiac arrest, was presented by Niklas Nielsen from Malmø, Sweden.

The second day was devoted to hypothermia for indications other than cardiac arrest – traumatic brain injury (TBI), stroke, subarachnoid haemorrhage, neonatal asphyxia, and others. Data on the use of hypothermia in severe TBI in China was presented by Wusi Qiu (Hangzhou, People's Republic of China), and management of brain-injured patients in the battlefield was discussed by Rocco Armonda (Bethesda, United States). The afternoon was devoted to fever management protocols and hypothermia implementation issues (numerous speakers) and cooling methods (William Coplin, Detroit, United States). Much time was devoted to panel discussions and nursing perspectives (Mary Kay Bader, Mission Viejo, United States; Mike Clumpner and Jim Mobley, Spartanburg, United States).

The last day was devoted to new developments and planned/ongoing trials, as well as presentation of oral abstracts. Marianne Thoresen (Bristol, United Kingdom) discussed current status and ongoing trials in neonatal asphyxia; the upcoming ESICM Eurotherm trial for severe TBI which plans to start enrolment of patients in 2009 was presented, as well as a European study for cooling awake patients with ischaemic stroke and possibilities for combining hypothermia with other neuroprotective strategies such as Xenon were discussed by Mervyn Maze, London, United Kingdom.

Many other topics were dealt with during this 3-day congress; too many to discuss everything here. The meeting ended with a call to implement existing evidence for cardiac arrest patients throughout the world, and encouraged centres to join the upcoming Eurotherm study (details of which can be found at **www.esicm.org**).

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For physicians, nurses and other allied healthcare professionals

Abstract submission deadline
15 April 2009

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EUROANAESTHESIA MEETING:
MILAN, ITALY JUNE 6TH – 9TH, 2009

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For the first time in 2009, the Euroanaesthesia congress will be held in Milan, Italy, at the Milano Convention Centre (MIC). This meeting, the largest anaesthesiology congress in Europe, will again have a large programme of intensive care topics. It will be organised once more under the leadership of Professor Gernot Marx, recently appointed to the Chair of Intensive Care at the University of Aachen, Germany. Refresher courses on minimally invasive haemodynamic monitoring, nutritional support, and percutaneous tracheostomy will give updates on these very topical areas of this subspeciality. Importantly, particular attention will be paid in one refresher course (Schuerholz, Jena) to the management of the elderly critically ill patient: an ever-increasing challenge to acute medical practitioners.

Symposia have been organised on the treatment of sepsis; strategies for mechanical ventilation; and management of severe infection in the ICU. The challenging and topical subject of end-of-life decision making in the critically ill will be addressed from a religious as well as a clinical viewpoint. New end-of-life protocols, first developed in Liverpool, UK in conjunction with palliative care physicians, will be discussed by Lawrence McCrossan who has significant experience of this widely accepted approach to management of the dying.

An attempt will be made to assess the improvement of quality in intensive care, with different perspectives being presented from Spain, France, Germany, Italy and the UK. Workshops will consider the use of vasopressin in septic shock, and monitoring of ScvO2 in this condition.

The Resuscitation and Emergency Medicine Subcommittee of the SPC, chaired by Professor Bottinger (Cologne, Germany) have produced a programme that will also be of interest to intensivists. Trauma management in the emergency room, post-resuscitation care, and the causes of coma are all to be discussed in Milan.

Very sick children will also be considered, with a refresher course on the management of children with brain injury (Orliaguet, Paris), and a symposium on challenging airway problems in this age group.

Perhaps the most interesting session for intensivists in Milan will be the one organised by the National Organising Committee. Chaired by the new President of the ESA, Paolo Pelosi (Milan), an update on mechanical ventilation in ALI/ARDS will undoubtedly attract much interest. For the world famous expert in this field, Luciano Gattinoni (also from Milan), will address the conference on controlled mechanical ventilation in ARDS. Get to this session early to be very sure of a seat! Every intensivist must hear this great man lecture at least once! Assisted mechanical ventilation and non-invasive ventilation will also be discussed in this session by two other major contributors to the field, Antonio Pesenti (Monza) and Giorgio Conti (Roma). I am sure that this session on Sunday, June 7th, at 10.30 AM, will set the standard for the whole conference. Our new President, who is also an expert in this field, will lecture on guidelines for postoperative ventilation support in another session as well.

Monitoring is an important aspect of managing the critically ill. New technologies in haemodynamic monitoring will be discussed in a workshop by Andreas Hoeft (Bonn, Germany), together with point-of-care laboratory monitoring (David Reich, New York), an ever-expanding area of our practice. World experts (Wouters, Belgium, and Guarracino, Italy) will also discuss the use of transoesophageal echocardiography and Guarracino and Arrowsmith (Cambridge, England) will lead a workshop to update mechanical support of the heart.

Neurocritical care will get much mention, with discussion of cerebral injury and inflammation, intracerebral haemorrhage and optimisation of cerebral blood flow after subarachnoid haemorrhage. Some interesting advice will also be available on conflict resolution between the patient's family and members of a healthcare team (Azoulay, Paris). So there is something for every intensivist in Milan in June (in addition to the excellent cuisine). I look forward to seeing you all again in this wonderful Italian city! (oh, and the shops…!)

This is the last year that I will be responsible for planning the scientific programme for Euroanaesthesia meetings. I am to be replaced by Professor Benedikt Pannen (Dusseldorf, Germany) in a few months' time, and he will give you details next year of the intensive care programme for Euroanaesthesia 2010 in Helsinki (June 12th – 15th). I wish him every success with this demanding but most enjoyable task, and trust that I will continue to see you all at Euroanaesthesia meetings.

European Society of Anaesthesiology

ESA

Milan, Italy

Euroanaesthesia 2009

The European Anaesthesiology Congress

June 6-9

Symposia
Refresher Courses
Workshops
Industrial Symposia & Exhibition
Abstract Presentations

CME Accreditation
EACCME - UEM

Deadline abstracts:
December 15th 2008
Online submission:
www.euroanesthesia.org

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AGENDA

APRIL 2009

23-24 6th Annual Critical Care Symposium
Ramada Piccadilly Hotel - Portland Street,
Manchester, UK
www.critcaresymposium.co.uk

23-24 11th SCCM/ATS/ERS/ESICM/SRLF – International Consensus Conference in Intensive Care Medicine
Therapeutic Hypothermia - To Cool or Not To Cool?
San Juan, Puerto Rico
www.sccm.org/Conferences/Topics/2009ICC/Pages/default.aspx

23-25 3rd Scandinavian Update on Trauma, Resuscitation and Emergency Medicine
Stavanger, Norway
www.scandinavian-update.org/2009/

MAY 2009

29-30 7th Critical Care and Emergency Medicine Greek Army Medical Corps meeting
Athens, Greece
www.armyicu.gr

JUNE 2009

6-9 Euroanaesthesia 2009
Milan, Italy
www.euroanesthesia.org

10-13 30th Congress Scandinavian Society of Anaesthesiology and Intensive Care Medicine
Odense, Denmark
www.ssai.info

14-17 ESPNIC 2009 Verona – The 20th ESPNIC Medical & Nursing Annual Congress
Verona, Italy
www2.kenes.com/espnic/pages/home.aspx

25-27 4th World Congress Abdominal Compartment Syndrome
Dublin, Ireland
www.wsacs.org

AUGUST/SEPTEMBER 2009

28-1 10th Congress of the World Federation of Societies of Intensive and Critical Care Medicine and 63° Italian National Congress of SIAARTI
Florence, Italy
www.wfsiccm-florence2009.it

2-5 3rd International Hypothermia Symposium
Lund, Sweden
www.hypo2009.com

OCTOBER 2009

11-14 22nd Annual Congress European Society of Intensive Care Medicine
Vienna, Austria
www.esicm.org

NOVEMBER 2009

11-13 The Critical Care Canada Forum 2009
Toronto, Canada
www.criticalcarecanda.com

In our Next Issue

COVER STORY
-Medical Errors

HYPOTHERMIA SERIES
-From Ambulance to ICU: Therapautic Hypothermia in Transition

PRODUCT COMPARISON CHART
-PCA Infusion Pumps

COUNTRY FOCUS
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CONGRESS PREVIEW
-ESICM

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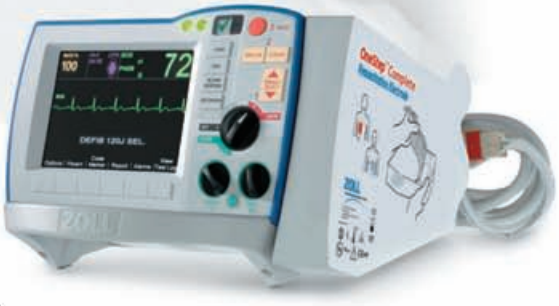

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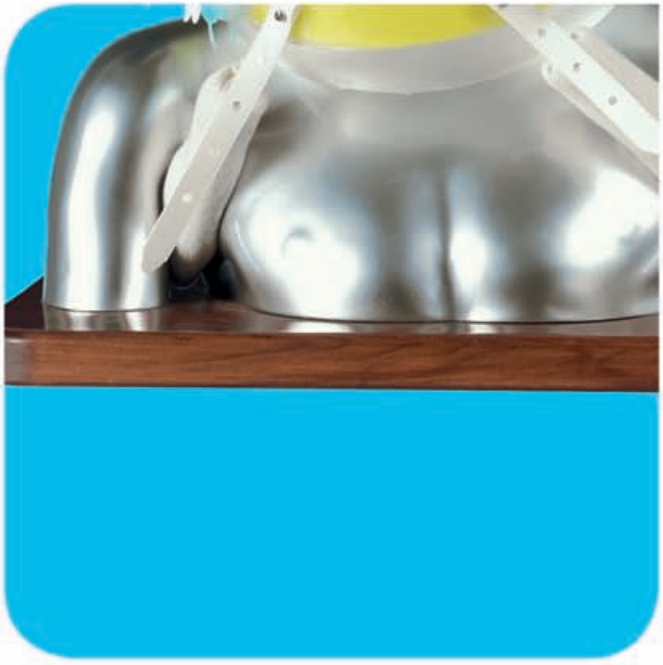

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