

## Hong Kong Association of Critical Care Nurses Limited (HKACCN Ltd)

Vol. 13, No. 1, Mar 2012

### President's Message

LEUNG Fung Yee  
President  
HKACCN

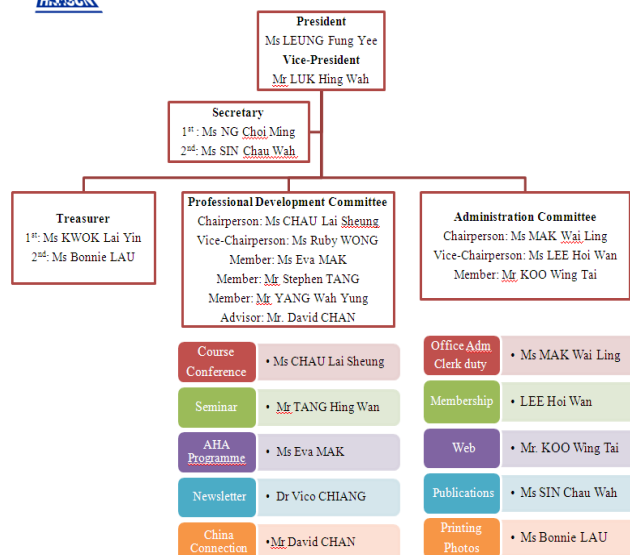
Dear Members,

We celebrated the 14<sup>th</sup> Anniversary of HKACCN on 4<sup>th</sup> November 2011 with the honor of presence from Ms. Sylvia FUNG, Chief Manager (Nursing); Dr Shao Hai LIU, Chief Manager (Infection, Emergency & Contingency) & Co-Chairman of COC (ICU); Dr. Kin Ip LAW, COS (ICU/UCH) & Chairman of COC (ICU) and the honorary advisors of HKACCN. With all your unfailing support, HKACCN is proud to step into the 15<sup>th</sup> year of establishment!

I, again, wholeheartedly seek your support and advice to us to excel our function of office.



### Hong Kong Association of Critical Care Nurses Board of Directors (2011/2013)



Honorable Guests and HKACCN Board of Directors at the Anniversary Dinner 2011

The 14<sup>th</sup> anniversary was embellished by the formation of the new Board of Directors (2011/2013). This term, first time of HKACCN, is marked by an open election of directors by members at the Annual General Meeting. I am now delighted to introduce them all to you and sketch their posts in the preceding diagram.

Immediately after the establishment of the new board, a strategic workshop was held on 17<sup>th</sup> December 2011 to formulate a 2-Year Strategic Plan. We have defined our way ahead to serve our members whilst fulfilling the HKACCN mission to promote high quality and standard of critical care nursing in Hong Kong through coll-

aboration with other organizations and networking.

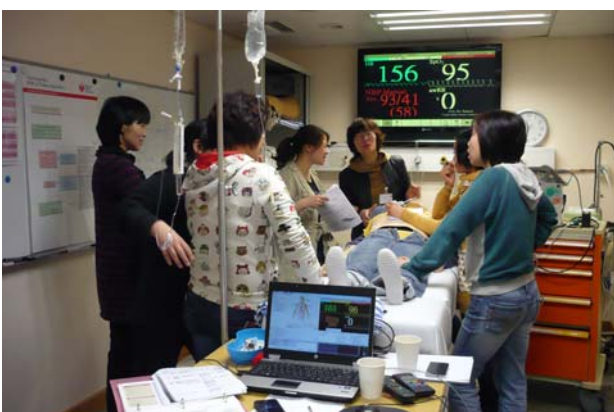


New Board of Directors at the Strategic Workshop

To actualize our plan, our first activity was to receive a group of 25 critical care nurses from Suzhou. They were led by 楊惠花主任 to attend the BLS and ACLS courses organized by our Association. After completion of the course, a professional visit to ICU and A&E department in HK was arranged. Nurses experienced great excitement during the visits. A lot of sharing and learning among nurses between HK and mainland were achieved.



A group of Critical Care Nurses from Suzhou attending the ACLS & BLS courses organized by HKACCN



Nurses from Suzhou participating in the scenario-based training

To expand our horizon, we organized a Guangzhou Hospital Visit on 18 February 2012. With enthusiastic response from members, a group of 20 visited the 廣東省人民醫院 and 中山大學附屬第一醫院.



Professional visit to 中山大學附屬第一醫院



成守珍主任及 HKACCN 考察團攝於中山醫學院

We were well received by nurse leaders in Guangzhou. We held an open forum with nurses from both HK and Guangzhou to share critical care practices with particular attention in infection control and outcome measurements in ICU. The discussion was fruitful and exploratory. We are looking for some collaborative studies to be done in ICU across the border.

Following the hospital visit, we have visited the Simulation Training Centre and learned a lot



Simulation Training Facilities in 中山醫學院

from their new mode of training in medical and nursing schools.

As you may be aware that hyperbaric oxygen therapy is becoming a topic of discussion nowadays in our local setting. During the visit, we purposely visited the Hyperbaric Oxygen Medicine in 中山醫學院. The hyperbaric oxygen therapy has been in use for years and it has saved many lives from acute stroke and other critical illness. We all agreed that it was an eye-opening experience for all of us!



Hyperbaric Oxygen Therapy



Hyperbaric Oxygen Chamber

Here, I am glad to share with you the HKACCN journey in the past 4 months and I am sure the way ahead is even more exciting and beneficial for the development of critical care nursing in HK. Let's work hand-in-hand to advance our specialty and provide the best care to the critically ill patients. Before the next issue of this newsletter, I would like to invite you for active participation in the 5<sup>th</sup> International Infection Control Conference of which HKACCN is one of the co-organizers. It will be held in August in the Hong Kong Convention Centre. Moreover, HKACCN is invited to join the 上海長征醫院護理部國際危重症護理高峰論壇. Up to now, a number of our members has agreed to show up and present in this conference (also in August) and your involvement and submission of paper are encouraged. For more details, please kindly visit our website <http://www.medicine.org.hk/hkaccn/>.

### *Message from the Editor*

CHIANG Chung Lim Vico  
Chief Editor  
HKACCN

After our last issue of Newsletter in November

2011, I trust that you all enjoyed the festive season of Christmas and New Year(s). We have then returned to our critical care nursing duties in terms of different roles. The HKACCN does not miss this opportunity to wishing you all a very successful and prosperous Year of the Dragon!

For years, we have a serious shortage of nurses and we care for the development of our new nursing graduates for their smooth transition to the professional workforce. It is now not uncommon to see newly graduated registered nurses who enter ICU as their first clinical setting for practice. In this connection, we need to assure that good support is provided to them for their successful learning and adaptation to the critical care nursing field.

There is a growing body of literature about the experience of new graduate nurses transiting to the clinical practice (Doelling, Levesque & Clifford, 2010; Rheame, Liette & Noelline, 2011; Wolff, Pesut & Regan, 2010). We, of course, do not want to see them separating early or developing burnout (Rudman & Guslavsson, 2011) from the nursing profession. And there is no substantive reason to believe that the early separations or burnouts cannot be prevented. In this issue of the Newsletter, a couple of relatively new nursing colleagues share their experiences of transiting to work as a nurse in the ICU. On the other hand, Miss Eva Mak provides us a clear account of the historical development of therapeutic hypothermia (TH), and she also discusses in details the application and care of critically ill patients under such therapy. I hope you all enjoy reading this new issue of the HKACCN Newsletter and are inspired by the sharing of our new graduate nurses working in the ICU. Your reflection on any support the experienced critical care nurses may offer for the smooth transition of new colleagues is essential and means so much to them, as well as the profession.

### **Reference**

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# Post-resuscitation Therapeutic Hypothermia

MAK Eva  
RN, ICU  
Union Hospital

## Background

Therapeutic hypothermia (TH) improves oxygen supply to ischemic areas of the brain and decreases intracranial pressure. Also, this technique has shown beneficial effects during procedures in which cerebral blood flow needs to be interrupted, such as cardiac and intracranial surgery. Therapeutic hypothermia was introduced in the 1950s as a protective measure for the brain, and has been used routinely in the operating room in an attempt to provide anesthesia surgery (Bernard & Buist, 2003; Kawamura et al., 2000; Sealy, Brown & Young, 1958). More recently, TH has been used in patients with traumatic brain injury and increased intracranial pressure who are refractory to medical management (Tisherman, 2004). Most recently, evidence found that TH during the first 24 hours after resuscitation from cardiac arrest had a significant effect on survival and neurological recovery (Bernard et al., 2002; HACA, 2002). However, not all ICUs currently take up this practice in Hong Kong.

## History of Therapeutic Hypothermia

1803	The Russian method of resuscitation consisted of covering a patient with snow hoping for ROSC (Liss, 1986).
1812	TH was used by Baron de Larrey during Napoleon's Russian campaign in an effort to preserve injured limbs as well as for its numbing effects during amputation (Modercai et al, 1992).
1937	Dr. Temple Fay cooled a female patient to 32°C for 24 hours, in an attempt to prevent cancer cells from further multiplying (Fay, 1940).
1940	Smith and Fay (1940) reported the physiologic effects that induced TH caused in a series of cancer patients (Alzaga, Salaza & Varon, 2006).
1953	Bigelow and McBirnie (1953) published a study reporting the beneficial effect of TH for the brain and the heart during cardiac surgery.
1955	Rosomoff and Gilbert (1955) demonstrated a direct effect between body temperature, and intracranial pressure and brain volume. These early investigators confirmed that TH reduced the cerebral oxygen consumption blood flow, and metabolic rate of a normal dog brain.
1959	Induced TH was widely used by neurosurgeons for head and spinal cord injuries as well as during cardiac surgery (Sealy et al., 1958).
1959	Benson and colleagues (1959) described a case series of cardiac arrest victims who had a positive outcome after TH had been used. However, a great number of complications were also noted, including cardiac irritability and ventricular fibrillation (VF) with deep hypothermia (<30°C). Therefore, the technique was essentially abandoned.
1960 — 1990s	The use of TH decreased because of its potential for complications.
1996	Animal models revealed that induced TH improved neurologic outcome and survival after cardiac arrest. The positive data supporting the benefits of TH once again attracted research in this area (Marion et al., 1996).
1997	Bernard, Jones & Horne (1997) studied, with a historical control group, and reported a beneficial effect on outcome from use of therapeutic hypothermia in comatose survivors of out-of-hospital cardiac arrest associated with any arrest rhythm.
2000 — 2010	Over the past decade, there have been numerous studies focusing upon the use of hypothermia following cardiac arrest. <ul style="list-style-type: none"> <li>The two landmark studies were published in The New England Journal of Medicine in 2002 (Bernard et al. 2002; HACA, 2002): One good randomized trial and a pseudo randomized trial reported improved neurologically intact survival to hospital discharge when comatose patients with out-of-hospital ventricular fibrillation (VF) cardiac arrest were cooled to 32°C to 34°C for 12 or 24 hours beginning minutes to hours after ROSC (return of spontaneous circulation).</li> <li>Additional studies with historical control groups show improved neurological outcome after therapeutic hypothermia for comatose survivors of VF cardiac arrest (Belliard et al., 2007; Castrejon et al., 2009).</li> <li>Four studies with historical control groups (Don et al., 2009; Busch et al., 2006; Oddo et al., 2006; Storm et al., 2008) reported a beneficial effect on outcome from use of therapeutic hypothermia in comatose survivors of out-of-hospital cardiac arrest associated with any arrest rhythm.</li> </ul>
2010	AHA guidelines recommend the use of therapeutic hypothermia in all comatose survivors of cardiac arrest (Peberdy et al., 2010). Comatose is defined by the AHA as a lack of meaningful response to verbal commands.

## Nursing Care and Intervention

There are several physiologic effects from TH and a summary of the physiologic effects of TH is listed in Box 1. Throughout the preparation, induction, maintenance and re-warming phases of TH, correlated nursing care and intervention should be considered and performed as follows.

### 1. Preparation for cooling

Before initiating cooling, nurse should ensure arterial and central venous catheters are inserted because once the patient is cooled it is difficult to place arterial or central venous catheters. Furthermore, baseline vital sign, laboratory result and skin integrity assessment should be evaluated.

### 2. Monitor core temperature

Nurse should continuously monitor the patient's core temperature. Monitoring axillary, oral or tympanic temperatures is not adequate in the patient in whom therapeutic hypothermia is being induced (Peberdy et al., 2010). Clinicians should continuously monitor the patient's core temperature using an esophageal thermometer, bladder catheter in non-anuric patients, or pulmonary artery catheter if one is placed for other indications (Bernard, et al., 2002; HACA, 2002). However, a rectal thermometer may be used if no other option for core temperature monitoring is available.

### 3. Cooling methods

There are external cooling technique and internal cooling technique for inducing hypothermia (Box 2) but no single method has proved to be optimal (Peberdy et al., 2010). The advantages of external cooling technique are simple, non-invasive, and easy to initiate but it takes longer to achieve the target body temperature and high incidence of shivering. On the other hands, internal cooling technique is relatively fast to induce cooling, stable for maintenance and less shivering for the patients. However, it requires invasive procedure skilled personnel for catheter placement and the possible adverse effects are risk of infection and high cost.

### 4. Induction and maintenance phase

The goal is to decrease the patient's body temperature to 32-34°C as quickly as possible and maintain for 24 hours. Patient receiving post cardiac arrest therapeutic hypothermia should be cooled as soon as possible. Data from the two landmark studies (Bernard, et al., 2002; HACA, 2002) suggested that the window

for therapeutic hypothermia is between 2 and 8 hours following ROSC. Patient should be cooled to a target temperature between 32-34°C (Bernard, et al., 2002; HACA, 2002; Peberdy, 2010). Although the ideal temperature is not clear, a temperature less than 32°C may result in greater risk of complications without a clear morbidity or mortality benefit.

Once patients achieve the target temperature of 32-34°C, the second phase (maintenance phase) of hypothermic therapy begins. The optimal duration of the maintenance phase of therapeutic hypothermia is unknown. Based on AHA guideline and the two landmark studies recommend that the duration of therapy should be between 12 and 24 hours (Bernard, et al., 2002; HACA, 2002; Peberdy, 2010). The effect of a longer duration of cooling on outcome has not been studied in adults, but hypothermia for up to 72 hours was used safely in newborns (Gluckman et al., 2005; Shankaran, 2005).

Ongoing neurological examination, pain assessment and level of sedation/ agitation should be performed. Patient shivering can be problematic when attempting to reach goal temperature and should be treated aggressively. Sedation and neuromuscular agents can be used to prevent shivering. If the patient continues to shiver despite aggressive sedation and analgesia, neuromuscular blockade may be necessary in intermittent bolus doses (Peberdy et al., 2010). However, hypothermia can reduce medication clearance, which is especially important when using neuromuscular agents and sedatives. Hypothermia can reduce the clearance of these agents by as much as 30% (Polderman, 2009).

It is important to continue monitoring oxygenation, ventilation and hemodynamic optimization. Patient should remain on continuous cardiac monitoring, pulse oximetry and end-tidal carbon dioxide with the goals of maintaining SpO<sub>2</sub> greater than 94%, MAP greater than 65mmHg, and PetCO<sub>2</sub> of 35 to 40mmHg.

Cooling has significant effects on the kidneys and can induce diuresis, resulting in hypovolaemia and electrolyte abnormalities such as hypophosphatemia, hypokalemia, hypomagnesemia and hypocalcemia (Polderman, 2009). Therefore, urine output and electrolyte levels should be monitored frequently and aggressive IV fluid repletion and

electrolyte replacement may be required as the prescribed order.

It has been recommended that enteral feedings may be delayed as gut motility is impaired during hypothermia (Bernard & Buist, 2003). Nevertheless, intensive glucose control may be required and more frequent monitoring while cooling because hypothermia can induce insulin resistance and decreased insulin secretion (Polderman, 2009).

Cooling may interfere with the clotting cascade and prolong bleeding times (Polderman, 2009). Abnormal bleeding and coagulation parameters such as prothrombin time, activated partial thromboplastin time and platelets should be monitored. Furthermore, there is an increased incidence of neutropenia and susceptibility for infections, particularly in patients with pneumonia that has been associated with the use of TH (Bernard & Buist, 2003; Zeriner et al., 2000). VAP bundle can be used to prevent ventilator associated pneumonia. Since induced hypothermia may mask an underlying infectious process, surveillance blood cultures may be sent as prescribed order.

Last but not least, skin integrity may be compromised due to vasoconstriction from cooling and must be monitored frequently. Appropriate interventions should be preformed to prevent skin breakdown.

#### 5. Re-warming phase

Following 12 to 24 hours of hypothermia, patients should be rewarmed. Current guidelines recommend rewarming patient at a rate of 0.25 - 0.5°C/ hr (Neumar et al., 2008). Re-warming too rapidly can cause vasodilatation, hypotension, and rapid electrolyte shifts. The goals are normothermia and avoid hyperthermia. Ongoing vital sign should be monitored. Since K<sup>+</sup> shifts to extra cellular compartment during re-warming, all K<sup>+</sup> containing fluids should be eased during such process. However, hypokalemia and other abnormal electrolyte levels should always be corrected to the normal ranges. Serum glucose levels should be closely monitored as insulin resistance resolves, increased risk for hypoglycemia.

#### 6. Provide patient and family education and emotional support

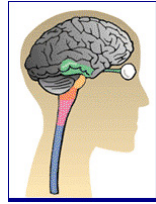

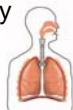



The purpose of hypothermia and the need for pharmacologic paralysis should be explained to patient's family. Furthermore, pastoral care support may be offered to the family and



patient if necessary. Communication between the family and the physician should be one of the care objectives to facilitate by the critical care nurses.

### Conclusion

With the current evidence, hypothermia therapy should be considered as the standard of care for post-cardiac arrest patients irrespective of their initial cardiac rhythms as recommended by the guideline. The successful application of hypothermia requires the use of strict protocols, vigilance and close attention to the prevention of side effects.

Reference (available upon request)

Box 1	
<p>CNS</p> 	<ul style="list-style-type: none"> <li>Induced hypothermia allows cells to endure anoxic no-flow state</li> <li>Each 1°C decrease in temperature the cerebral metabolic rate decreases by 6-7%</li> <li>Improves oxygenation to areas of ischemic brain &amp; decreases intracranial pressure</li> <li>Decreases concentration of excitatory amino acids &amp; lactate during ischemia &amp; reperfusion injury</li> </ul>
<p>CVS</p> 	<ul style="list-style-type: none"> <li>Decrease heart rate and increase in the systemic vascular resistance</li> <li>Maintains the stroke volume and the mean arterial pressure</li> <li>Arrhythmia, more common with moderate to severe hypothermia</li> </ul>
<p>Respiratory system</p> 	<ul style="list-style-type: none"> <li>Decrease the minute ventilation in response to decrease metabolic rate and maintain PCO<sub>2</sub></li> </ul>
<p>Renal system</p> 	<ul style="list-style-type: none"> <li>Increase in renal blood flow accounts for the increase diuresis</li> <li>Increase uptake of potassium inside the cells, leading to hypokalemia</li> <li>Decreases phosphate concentrations</li> </ul>
<p>Gastrointestinal system</p> 	<ul style="list-style-type: none"> <li>Delay enteral feeding is recommended as gut motility is impaired during hypothermia</li> <li>Hyperglycemia from decrease insulin release</li> </ul>
<p>Hematologic system</p> 	<ul style="list-style-type: none"> <li>Increase incidence of neutropenia and susceptibility for infection</li> <li>Decrease platelet numbers and function</li> <li>Prolongs clotting</li> </ul>

Box 2	
External cooling techniques	Internal cooling techniques
<ol style="list-style-type: none"> <li>1. Caps or helmets</li> <li>2. Cooling mattress &amp; blanket</li> <li>3. Ice packs</li> <li>4. Cold water immersion</li> </ol>  <p>Figure 1: Cooling blanket</p>	<ol style="list-style-type: none"> <li>1. Large volume, ice-cold intravenous fluid</li> <li>2. Intravascular heat exchange device</li> <li>3. Peritoneal or gastric lavage</li> <li>4. Extracorporeal cooling (cardiopulmonary bypass, hemodialysis)</li> </ol>  <p>Figure 2: Intravascular heart exchange device</p>

### *Anxious, yet Excited...*

CHAU Yuen Chi  
RN, ICU  
Yan Chai Hospital

Hello! I am a new RN graduated in 2011. I have worked in ICU for about six months and I would like to share my feelings about working in the ICU. I had never been to an ICU when I was a student nurse. ICU was like a sacred place to me. Visitors may be restricted to go inside. Patients there are very ill and there are a lot of monitors and machines. When I was notified to work in ICU, I felt very anxious, yet excited. As a freshly graduated nurse, I can't imagine why I can go to work in ICU.

As a new nurse, I felt stress from the work in ICU. The range of diseases that patients have for intensive care is wider than that I encountered in the general wards. Many patients in ICU have multiple organs failure. The needs of my knowledge are great, either for the signs and symptoms, pathology, treatment or investigation, or the critical thinking skills to interpret complex vital signs, monitor waveforms and laboratory results. It is a totally different area of knowledge than what I learnt from the university about general nursing. However, my stress about knowledge deficit is the motivating power for me to learn more.

The ICU is practically different from the general wards. The required one-to-one

intensive practice of patient care triggers me to continuously learn more about the diverse conditions and dynamic needs of critically ill patients. It is easier to understand the pathophysiology, and complex care and interventions of patients with the actual encounters and practice of care with them in the real context. Although I may feel a little bit dry sometime for my care being focused very much on one patient, I am overall so glad to work in ICU. I hope that I can quickly and fully adapt to the setting and become a very competent critical care nurse.

### *Becoming a Registered Nurse*

LAM Yuen Ting Cindy  
RN, ICU  
Yan Chai Hospital

Time flies. It has already been six months after I became a registered nurse (RN). Looking back to the past six months, there seems to be challenges all along the way. At the very beginning, I tried to urge myself to work by the RN standards as soon as possible: to work fast and prioritize my works in a proper way, etc. On the other hand, I needed to learn how to communicate and work with my colleagues, too. As a result, stress has come along with me. This probably happens to most of the new graduates. And for me, I think patience and the care from my family supported me to cope with the stress.

I have convinced myself that there are always changes in my life, and becoming a RN is just one of those. Just to have confidence in myself, trying my best and waiting till the time passes by patiently, I could always get used to the changes eventually. Furthermore, with time, my colleagues started to know me. Our communication has become easier. As I mentioned, support from my family helps me a lot, too. They have spent time with me during my day-offs, listened to and sharing about my work, and not to mention that they have kept quiet when I am sleeping between the A-Night shifts. They are always the source of my strengths.

Being a fresh graduate and works in the ICU has scared me. In the ICU, there are more complicated patients for me to take care of, and more emergency moments. Besides, it also requires me to handle more machines, especially the ventilators, and using the com-

puter system for patient monitoring and data recording. These are all great challenges for me. However, with the preceptorship program, there has been time for me to learn and practice, and to reflect, and I can have the chance to get familiarized with the routines and practices in the ICU. I have got more confidence to work here and I am glad to be part of the team!

I had learnt a lot in the past six months, and there is still a long way to go. I will keep learning and continue to strive for the best for my patients and my nursing career.

## **UPCOMING PROGRAMS**

### **I) ECG Course for Beginners**

**Date:**

ECG 2012-2 3, 10, 17, 24, 31 May – 7 Jun 2012

ECG 2012-3 2, 9, 16, 23, 30 Aug – 6 Sept 2012

ECG 2012-4 1, 8, 15, 22, 29 Nov – 6 Dec 2012

### **II) Elementary Critical Care Nursing ECCN Series Module 2 – 3**

- Module 2: Cardiovascular Care  
**7 May – 25 Jun 12**
- Module 3: Reno-Neuro-Trauma Care  
**6 Aug – 24 Sept 12**

### **III) Health Assessment Course**

**Date:**

4 May – 8 Jun 12

### **IV) Basic Life Support and Advanced Cardiac Life Support Courses**

#### **a) Basic Life Support (for Health Care Provider) (BLS – HCP) Course**

**Target Groups:**

- Health care providers, such as nurses, doctors, paramedics, and ambulance personnel
- Nursing and medical students
- Other interested personnel

**Date** (8:30am – 1:00pm / a half-day program):

5 May; or 2 Jun 2012

#### **b) Advanced Cardiac Life Support (ACLS) Provider Course**

**Target Groups:**

- Health care providers, such as nurses, doctors, paramedics, and ambulance personnel
- Nursing and medical students
- Other interested personnel

**Date** (8:30pm – 4:30pm / a 2-day program):

28 – 29 Apr;

30 – 31 May;

or 23 – 24 Jun 2012

### **ENQUIRIES for ALL COURSES:**

2861 2972 (Mr. Leo LAM)

Email: [hkaccn@yahoo.com.hk](mailto:hkaccn@yahoo.com.hk)



For detailed information and application form:

<http://www.medicine.org.hk/hkaccn/activities.htm>

(報名及繳費:填妥報名表格,連同劃線支票,親自遞交或郵寄至HKACCN Ltd.)

### **CONFERENCE ANNOUNCEMENT**

#### **25 – 26 April 2012**

ICCCN 2012: International Conference on Critical Care Nursing

Place: Paris, France

Website: <http://www.waset.org/conferences/2012/paris2012/icccn/index.php>

#### **1 – 2 Jun 2012**

Critical Care Nursing Continuing Education 13th Annual Meeting ICE 2012

Place: Melbourne, Australia

Website: <http://www.mvdmc.com/hkicna/>

#### **24 – 26 Aug 2012**

5th International Infection Control Conference

Place: Hong Kong

Website: <http://www.accn.com.au/content/view/243/280/>

#### **10 – 11 Sept 2012**

4th International BACCN Conference

Place: Brighton, UK

Website: <http://www.baccnconference.org.uk/>

### **USEFUL LINKS**

#### **International Nurses Day 2010**

Theme: Closing the gap: From evidence to action

<http://www.icn.ch/publications/2012-closing-the-gap-from-evidence-to-action/>

#### **Australian Collage of Critical Care Nurses**

(ACCCN) <http://www.acccn.com.au/>

#### **Australian & New Zealand Intensive Care Society**

(ANZICS) <http://www.anzics.com.au/>

#### **British Association of Critical Care Nurses**

(BACCN) <http://www.baccn.org.uk/>

#### **Canadian Association of Critical Care Nurses**

(CACCN) <http://www.caccn.ca/en/index.html>

#### **European Federation of Critical Care Nurses**

(EfCCNa) [www.efccna.org](http://www.efccna.org)

#### **World Federation of Critical Care Nurses (WFCCN)**

[www.wfccn.org](http://www.wfccn.org)

