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The Bulletin is an official publication of the Hong Kong College of Anaesthesiologists (HKCA). Acceptance of manuscripts submitted to *Bull HK Coll Anaesthesiol* is based on significance, originality, and validity of the material presented. Types of submissions accepted include reviews, clinical and laboratory investigations, case reports, technical communications, letter to the editor and other special articles describing the historic, social and current trends in anesthesia, intensive care and pain medicine.

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#### Summary and Key Words

The second page should have an abstract. All articles (except editorials) must include unstructured abstracts consisting of one complete paragraph. Summary should be no more than 300 words for all articles including case reports and reviews.

The summary should state the purposes of the investigation, basic procedures, main findings and the principal conclusions. Emphasize new and important aspects of the study or observations. Below the abstract, provide (and identify as such) 3 to 10 keywords that will assist indexers in cross indexing the article.

#### The Text

The text of observational, experimental, and general articles is usually but not necessarily divided into sections with the following headings: Introduction, Methods, Results, and Discussion.

*Introduction:* State the purpose of the article. Summarize the rationale for the study or observation.

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*Results:* Present the results in logical sequence in the text, tables, and illustrations.

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#### Abbreviations and Units of Measurement

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All references must be available to all readers. Cite only references to books and articles or abstracts published in peer-reviewed journals. Number references consecutively in the order in which they are first mentioned in the text. Doublespace between all lines of each reference and between references when typing the reference page. Identify references in text, tables, and legends by arabic numerals. References must be verified by the author(s) against the original documents, and the entire list must be checked for nonduplication. Use the style of the examples below:

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Type each table double-spaced on a separate sheet. Number tables consecutively and supply a brief title for each. Give each column a short or abbreviated heading. Place explanatory matter in footnotes, not in the heading. In footnotes, define all abbreviations that are used in each table. Repeat definition if the abbreviation is used in a subsequent table. For footnotes, use lower-case italicized letters in alphabetical order. Cite each table in the text in consecutive order.

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# Editorial

# Bull HK Coll Anaesthesiol 2005;14:183-5. How Many Anesthetists do We Need in Hong Kong?

Any over planning is a daunting task. Nonetheless, this has been one of the top priorities in the agenda of the College business. We certainly do not want an oversupply of anesthetists because this will be damaging to the profession. But it is also harmful to the society if we have a severe shortage in specialists. Is it possible to strike the balance? The purpose of this editorial is to review the basics in manpower planning. We aim to inform our fellows and members the calculations that could have been used in predicting future anesthetic workforce.

#### The principles

Many different models have been developed for planning of human resources. These models are based on the fact that ultimate deliveries of service are dependent upon *demand* (the service requirements) and *supply* (the available workforce). Unfortunately, both of these factors are affected by many uncertain issues.<sup>1</sup>

Service requirement is related to the population at risk and include factors like trends in emerging diseases, growth in the population, problems of aging and the indications (whether it is real or perceived) for the service. On the other hand, workforce supply will depend on the characteristics of the anesthetic workforce. This includes the age and gender distribution of the anesthetic community and our ability to attract new medical graduates into the anesthetic practice and retain the good ones in the field. The latter is related to the credibility of our training program, the potential scope of future anesthetic practice and the lifestyle of the average anesthetist. A decade ago, the issue of emigration would have introduced the biggest error in manpower planning.

The models

Although much has been written on manpower planning, the various forecasting models usually fall into one of the three categories or combinations thereof:<sup>1,2</sup>

(1) Supply-based forecasting model

This model uses historic or current numbers of doctors in a particular region and projects the future needs based on population growth in that region. This is commonly refers as the "*Anesthetist : Population ratio*".

(2) Demand forecasting model

This model also utilize the "Anesthetist : Population ratio". In addition, the model includes patterns and actual utilizations of services together with the needs of workforce supply in the projections.

(3) Benchmarking

This model assesses an index region that is considered to have excellent care. The population health index is then calculated. Forecasting builds on this benchmark to project future manpower requirement according to this ideal population health index.

In order to illustrate the complexity in manpower calculation, we will attempt to predict the manpower requirement in 10 years time (i.e. 2015).

# *The demand forecast* – how many anesthetists do we need to meet the current requirement?

In 2004, the Hospital Authority provided 175,000 anesthetics.<sup>3</sup> If on average, each of the anesthetic take 2 hours to complete and another hour is required for pre-operative assessment and postoperative review. Then we need to provide  $175,000 \times 3$  or 525,000 hours of

The viewpoints expressed in this editorial do not represent the official policy of the Hong Kong College of Anaesthesiologists.

Country	Number of	practicing	Anesthetists :	Population
	Anesthetist	S	Ratio	
	1994-6	2004-5	1994-6	2004-5
Italy			1:6,410	
France			1:7,246	
Austria			1:8,333	
Australia	1,948		1:9,652	
United States	33,318	32,531	1:10,000	1:9,073
Canada	2,206		1:13,553	
United Kingdom		7,078	1:14,285	1:8,420
Singapore	130	212	1:24,000	1:20,001
Hong Kong	127	241	1:38,461	1:28,612
Japan	3,543		1:38,750	
Malaysia	225		1:89,000	
New Zealand		433		1:9449

 Table 1. Anesthetists : Population ratios. Data are provided by the Hong Kong Academy of Medicine and are reproduced here with permission.

anesthetic service. Assuming each anesthetist works 44 hours per week and 46 weeks per year (21 days annual leave plus 12 statutory holidays), then every full time equivalent (FTE) anesthetist should be able to provide 2,024 hours of service per year. In order to satisfy the workload requirement, we need 525,000/2,024 or 260 specialist anesthetists. This is certainly an underestimate of the manpower requirement because anesthetists also cover the intensive care units (ICU) and the pain clinics. If one specialist is required for every two ICU beds, and that about 80 ICU beds are currently managed by the anesthetists, then we need another 40 FTE anesthetists for the ICU service alone. Similarly, we will expect to have another 10 FTE specialists to look after the pain clinics. In addition, there are 60 colleagues working in the private sectors. Taken together, we will expect to have a total of 370 (260+40+10+60) FTE anesthetists to meet the demand. An alternative model, as also referenced by the College, will be to determine demand by the total number of service sessions (elective and emergency; operating and non-operating) covered.

A third approach is to look at demand by a population based calculation. Table 1 summarizes the *Anesthetists : Population ratio* 

among different countries. If we use the US standard (1:10,000) as the ideal figure, we should require 690 FTE anesthetists in Hong Kong. Perhaps, this is not a realistic figure because the workload pattern is somewhat different between the regions. In particular, fewer patients in Hong Kong choose surgical treatment (as opposed to the alternative traditional Chinese medicine) and fewer procedures (e.g. endoscopy) are performed during anesthetic care. Nonetheless, even if we accept a "lower standard" by using Singaporean figure (1:20,000) as the benchmark, we still require 345 FTE anesthetists to serve the entire 6.9 million populations. Finally, it is possible to find out the required number of specialists by the Anesthetist : Surgeons ratio. In this regard, one may consider a FTE anesthetist for every two operating surgeons (including all surgical specialties, obstetrics, etc.). But this calculation does not include ICU or pain work. Therefore a wide range of numbers can be produced according to the formula used. A realistic estimate would be that we need 345-370 FTE anesthetists to fulfill the service requirements in 2005. Given that there are only 280 specialist anesthetists\* practicing in Hong Kong, with an Anesthetic : Population ratio of 1:28,612, we have a current deficit of at least 100 FTE anesthetists. How many more anesthetists do we need in year 2015?

<sup>\*</sup>This includes 241 FHKCA; 18 FHKCA(IC) and 21 individuals registered with the Hong Kong Medical Council as specialists.

2004.

Year	Number of new trainee	Attrition Rate (%)*
1998	27	25.9
1997	25	36.0
1996	32	25.0
1995	7	14.3
1994	15	26.7
1993	16	0

Table 2. Attrition rate

\*Percentage of trainees unable to complete training after 7 years

#### The supply forecast

Will our existing training system replace the current deficits and the ongoing loses? At the end of 2004, the College has 137 trainees. Unfortunately, not all the trainees will be able to complete the training requirement in 6 years. Between 1993-8, the median (range) attrition rate was 25.9% (14.3-36.0) (Table 2). Based on the median figure, we will expect to generate about 100 new fellows from the existing pool of trainees in 6 years, i.e. year 2011 [137×(1-25.9%)] = 107]. Have we solved the problem of manpower shortage?

This is more complicated because there is "ongoing loses". The predicted growth rate of the Hong Kong population is currently 0.7% per year. If we assume the growth rate is fixed, then we will require an extra 2.6 FTE anesthetists every year  $(370 \times 0.7\%)$  to compensate for the population growth alone (i.e. the maintenance rate). Furthermore, our senior fellows will retire at some stage. Table 3 shows the age distribution of the College fellows at the end of 2004. If we set the retirement age as 60 years, nine fellows will retire in 2005. In the next 5 years, another 10 fellows will be retiring. By 2015, we estimate that 47 of the existing fellow specialists will have retired. We also expect that the number of surgical patients will increase by 0.5-1% per year as the general population gets older. Therefore, by 2015, we will require an addition of 99 FTE specialists to meet the maintenance requirement (i.e. 10 new specialists per year). Taking the attrition rate (25.9%) into account, it would appear that an intake of 12-13 new trainees per year will be required to maintain the balance.

Age	Number of fellows
31-35	44
36-40	52
41-45	56
46-50	42
51-55	28
56-60	10
61-65	4
>65	5
Total	241

Table 3. Age distribution of fellows in the Hong

Kong College of Anaesthesiologists at the end of

This is obviously a simplistic view of manpower planning. The calculation is based on multiple assumptions and many possible weak links in a long chain. Nevertheless, it provides some insights as to how tedious the calculation can be. The basic requirement of effective manpower planning is that all key drivers of supply and demand are carefully identified. We also need an ongoing and systematic collection of good-quality data to monitor changes over time. Finally, our data must be considered along with those derived from our colleagues: surgeons, ophthalmologists, emergency and critical care physicians, otorhinolaryngologists, interventional radiologists, endoscopists, dentists, orthopedic surgeons, obstetricians and gynecologists. Lastly, but not the least, we must not forget the development of nursing profession.

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- 3. Hospital Authority Annual Report 2004.

# Bull HK Coll Anaesthesiol 2005;14:186-8. **Future of Medicine in Hong Kong**

Keynote lecture delivered by Professor Grace Tang, President of the Hong Kong Academy of Medicine, at the 20<sup>th</sup> congregation of the Hong Kong College of Anaesthesiologists.

Professor Gin, President of Hong Kong College of Anesthesiologists, Council Members of the College, Presidents of Academy Colleges, Fellows of the Academy of Medicine, Trainers and Trainees, Distinguished Guests, Ladies and Gentlemen

It gives me great pleasure and privilege to attend this Congregation and to personally congratulate all the candidates who have passed the assessments to become Fellow of the College of Anesthesiologists, a status that makes them eligible to be Fellow of the Hong Kong Academy of Medicine and a Specialist of the Hong Kong Medical Council. This Fellowship is not attainable by the mere payment of fees. You have proven that you have reached the required professional standard. Congratulations again, and I sincerely hope that you will maintain this standard in the next few decades of your career through continuous professional development.

Today, I would like to take this opportunity to share with you my thoughts about the **Future of Medicine in Hong Kong.** I do not have the crystal ball to tell me what the future will be exactly; I only conjecture based on what I know now. What is very certain is that the **Future of Medicine in Hong Kong** is in each and everyone of your hands. You certainly can influence and modify it.

# The two-tier structure - General Practitioners and Specialists

In Hong Kong, the medical profession comprises private practitioners and public doctors working in the Medical and Health Department in the past, and the Hospital Authority and Department of Health in the present. This is not the two-tier system where every person has his/her general practitioners (GP) and when appropriate, he/she will be referred for specialist care. Many a time specialists, in particular those in the private sector, practice in a manner similar to that of general practitioners. They see patients outside their own specialty. The Specialist Register is indicative and not restrictive.

The recent document on health-care reform *"Building a Healthy Tomorrow"* advocates the concept of *"family doctor"* who can be a general practitioner, a family physician specialist or any specialist. These are all primary care doctors who are at the first point of contact for patients.

This concept of "family doctor" is different from that of the GP in health-care systems such as the National Health System (NHS) of the United Kingdom. Nonetheless, this concept is a pragmatic approach to encourage individuals to find their own doctors who have а comprehensive understanding of their biopsycho-social aspects and will be able to deliver a holistic care. This approach also caters for the existing health-care situation in Hong Kong where the demarcation between GP and specialists is not so clear cut. Will the situation remain as such in the future?

### The statistics of specialists in Hong Kong

Hong Kong has about 10,100 doctors. The number of Academy Fellows is 4,570 with a very small number of double/triple fellowships. All Fellows of the Hong Kong Academy of Medicine are eligible for the Specialist Register. However, only 3,596 doctors (79%) are registered as specialists. Out of these 4,570 Fellows, 1,234 (27%) are working in the private sector.

There are 2,277 doctors in various specialist training programs of the Academy and they are working largely in the Hospital Authority. Within 6 years, they shall have completed their specialist training program and many would have attained the specialist status.

Every year, there are some 250-300 graduates from the two medical schools and 95% of them are employed by the Hospital Authority where they can receive specialist training in various disciplines.

In other words, in some years to come, large majority of doctors in Hong Kong shall have had specialist training and become Fellows of the Hong Kong Academy of Medicine. The percentage of non-specialists who are currently called GP is unlikely to increase, and may even decrease. The non-specialists to specialists ratio will definitely become smaller.

What will be the manpower projection of specialists given the working situation in Hong Kong and the concept of *"Family Doctors"* proposed by the recent consultative document?

# The training statistics and facts in the Academy Colleges

The numbers of specialists and trainees vary greatly in different Colleges. Amongst many reasons to explain the differences, the history of the specialty and the manpower to deliver service to the Community are key factors.

Currently, the College of Physicians, which has 17 specialty categories, has the largest number of trainees (711) followed by the College of Family Physicians (264). While the numbers of basic and higher trainees are similar in the Physician training, the number of higher trainees for Family Physicians (FP) is at the moment only 18% of the number of basic trainees (40 versus 224). To interpret the figures, it may mean that there are fewer FP trainees willing to pursue, or do not have the optimal opportunity to pursue, higher training to become FP specialists. But, it does not mean that they are not competent primary care doctors or family doctors after 4 years of basic training. It also does not mean that they will not be able to pick up the higher training within 3 years after their basic training to become FP specialists.

Out of the 17 specialty training programs in the College of Physicians, the category of

"internal medicine" has the largest number of trainees. These are the doctors who have more breadth than depth in their knowledge-base. Community physician is one of the career paths of these trainees.

Other Colleges such as Pediatricians and Obstetricians and Gynecologists are also pursuing and placing emphasis on community care.

Will there be a need for reorganization not only the number of trainees for each specialty, but also the training programs which currently tend to be more hospital-oriented?

The competition with other health-care providers

In the past, only doctors have tertiary education. Today, other health-care providers also have university education and degree. They also seek some sort of specialist training in their field, e.g. Nurse Specialist in Transplant. In the current multi-disciplinary approach to patient care, can doctors still take the leadership role?

In the recent health-care reform consultation meetings, there are voices suggesting that not only doctors can be primary care givers, other health-care providers can also play the same role at less cost, for doctors receive the most expensive pay in the entire health-care community. The implication is one of "value for money" and "cost-effectiveness". While costing is a factor, the standard of health care provision must be of overriding importance.

In the entire health-care system in Hong Kong at the moment, only medicine and dentistry have an Academy that is given the statutory power to ensure professional standard through structured training, accreditation, assessment and life-long learning through continuous medical education and professional development. It is only in medicine and dentistry that there is Specialist Registration serving as a guide for the Public.

Are doctors more competitive because of their structured postgraduate training and registration? Are they then become more competent as leaders from primary care to multi-disciplinary approach? What about the need for mandatory CME and CPD which other health-care professions are pursuing?

#### The Scope of Practice

Like trade, medicine is undergoing globalization change. Hong Kong is a small place and it must have exchanges and interflow with the rest of the World so as to maintain the medical standard that is internationally recognized and acknowledged.

For a long time, this is done through in the United Kingdom training and examination in the Royal Colleges. Today, opportunities for overseas training and exposure may be affected by employment, or by examination taking place within Hong Kong. Certainly, the limitation of practice through licensure is not conducive to academic exchanges.

Recent development through dialogue with the Ministry of Health PRC and key universities has unfolded opportunities for exchange of training as well as specialist examinations. The CEPA has allowed for Hong Kong doctors to work in the Mainland with renewable limited registration of 3-year duration, though other conditions also prevail at this moment. Opportunities of training in the Mainland are invaluable, as young doctors can then develop networking for their future career. There is a bigger scope of choice in work in an environment of growth.

Are our doctors ready to work in the Mainland?

#### The Future of Medicine in Hong Kong

I have probably provided more questions than answers.

The current undergraduate medical curriculum provides students with the ability of self-directed and life-long learning, adequate knowledge base, and communication and clinical skills all of which are essential for postgraduate education. Large majority of the medical graduates have the opportunity to pursue postgraduate education which is structured for 6 years with basic and higher (exit) assessments. Only medical graduates have such provision in Hong Kong. Such postgraduate education provides for a doctor to be competent in a particular specialty, and can be registered as a Specialist who is expected to spend over 50% of his/her time in their specialty field.

Based on the current health-care provision, it is unlikely that there will be a 2-tier system of GP and Specialists. All Specialists should be capable of the holistic care approach and assuming the family doctor role. In fact, a doctor is not a doctor but a technician if he is blind to the psycho-social aspects of his/her patients, or see them as merely an organ. All training programs need to ensure that there is not just exposure in holistic care, but also assessment on it as well.

Our doctors, be they Specialists or otherwise, need to be competitive in the health-care provision. With the Academy and Colleges, there are structured systems of training, accreditation, assessment and CME/CPD for specialists and non-specialists. We have impeccable professional code of practice and ethics. We need to sustain our position and status in the Society through continuous medical education and professional development so that the Public can be assured of our skills and expertise. There is no way to claim leadership unless efforts are shown. There is no way to claim professional autonomy if we do not impose professional self-regulation.

The Future of Medicine in Hong Kong is challenging as well as uncertain. Let us not be discouraged or demoralized. With changes come opportunities. It is incumbent upon us to find the best way for the future of medicine in Hong Kong, not only for the doctors but also for its citizens. Being the highest professional body, the and its Colleges Academy have the responsibilities in this regard. As I said in the beginning, the future of medicine is in each and everyone of your hands. I shall end by saying again "the Future of Medicine in Hong Kong" is in your hands. Thank you.

Professor Grace Tang President The Hong Kong Academy of Medicine

# **Outside Qualified Anesthesiologists Working In China (3)**

#### <sup>1</sup>Anne KWAN

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Bull HK Coll Anaesthesiol 2005;14:189-92

In my previous articles,<sup>1,2</sup> I have reviewed the hospital system, the training programs, the set up of the operating theatres, the anesthetic machine and drugs available in Mainland China. In this article, which is the final of the series, I would like to describe the last but not the least important aspect of anesthetic care, that is, postoperative pain and chronic pain management. The other areas of interest I would like to this article mention in are hospital administration and the unique Chinese culture.

#### Post-operative pain management

Despite the large number of operations and anesthetics performed in Mainland, postoperative pain management is not well developed. A number of factors may contribute to the reduced emphasis and availability of the service. Firstly, the concept of adequate pain relief in the post-operative period is still not widely accepted and it is not considered as part of a good anesthetic care. Pain, to some people, is still regarded as part of life and it is unreasonable to demand an almost pain-free state after a major operation. Secondly, some patients still believe an intramuscular injection is the most effective way to take away serious pain.

At present, pethidine IMI is still the most popular form of postoperative injection for pain relief. Although the use of all opioids should be documented clearly and its sales regulated, only pethidine parenteral solutions are tightly controlled. One can only purchase pethidine by returning the empty ampoules for the purpose of counting. For other opioids, one can easily buy them over the registered pharmacy counter without too much problems. These include morphine, fentanyl and related drugs. Another old drug, ketamine is widely used for sedation and pain relief. Despite the vast local experience with the use of ketamine, complications like postoperative confusion, aspiration and hypoxia do occur frequently.

If patients in the immediate post-operative period can tolerate oral intake, oral analgesics are usually prescribed. Patients in Mainland believe in replenishing their energy as soon as possible and the preferred route is by mouth. The commonly used postoperative pain management technique, epidural analgesia for abdominal procedures is not popular. It is partly due to the fact that a combined technique of general and epidural anesthesia is not a preferred practice. The other issue related to this is the relatively lack of anesthetic manpower in out of office hours to look after acute pain. Intravenous patient controlled analgesia (PCA), however, is provided on demand if patient can afford the cost of the pump and drug. The PCA pumps are usually the disposable pumps made locally. The design is very similar to the Baxter disposable pumps using the plastic recoil property of a rubber balloon. The infusion rate

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depends on the size of the small channel. One can choose a continuous regime or a PCA mode. The pumps can be used to deliver drug intravenously or epidurally. The most popular drug for the intravenous route is a mixed agonist antagonist, nalbuphine for fear of respiratory depression. As the disposable pumps are rather expensive, the use of these for postoperative analgesia depends on the affordability of the patients. For all the major operations, I tend to use the Graseby M16 pumps to deliver either a mixture of bupivacaine and fentanyl or just plain pethidine for continuous epidural infusion to patients who have undergone orthopedic operations. I run the pump for 2 days or so after the operation. The most common regimen I have used was 10 ml of solution over 12 hours. The mixture depends on the body weight of the patient. Most patients also receive regular paracetamol or nonsteroidal anti-inflammatory agent as COanalgesics. Although the regimen is not flexible, it is reasonably safe in an environment where there is no experienced anesthetist on site. The pain relief of most patients seems adequate.

Chronic pain management is provided in most of the major hospitals I have worked. The approach is very much anesthesia based. One or two clinical staff from the department of anesthesia usually takes up the role as the pain clinician on a part time basis. He/she may run a couple of pain outpatient sessions every week in addition to normal anesthetic service. Most patients attending the Pain Clinic are middle aged persons with non-cancer pain. Apart from oral medications, invasive techniques such as nerve or plexus blocks with neurolytic agents are frequently employed. Radiofrequency lesioning is done in some centers. So far, I have not seen implantation of spinal cord stimulators and intrathecal morphine pumps but I am sure they would be used in some patients who can afford them very soon. Most of the chronic pain patients are also receiving complimentary Traditional Chinese Medicine (TCM) therapy concurrently for the optimal benefit. Apart form taking herbal teas, acupuncture is used frequently. Physiotherapy is enjoying increasing

popularity but the number of well established physiotherapy departments with modern facility remains small. Psychological assessment and therapy do not seem to enjoy popularity. Its poor acceptance is probably due to the misconception of psychology is for treatment of problems in the mind. More advanced mode of therapy such as group therapy and cognitive therapy is not well accepted. Perhaps this is related to the fact that most Chinese like to keep things among themselves or within the family. Family support, however, is very strong. One often finds the wards and outpatient crowded with patients' relatives. It is not unusual to find one patient surrounded by a few family members at any time of the day. The family members can often come up with not just the tender loving care, but real financial support for expensive treatment.

### The hospital administration

Similar to most of the hospitals outside China, the Superintendent, that is our equivalent of Hospital Chief Executive in the Hong Kong Hospital Authority, is a medical specialist who has well established him/herself in the clinical field and moves up to the respected position as the chief of administration of the hospital. As the Superintendent is very experienced with clinical matters and rather senior in age, he/she is authoritative and provides very strong leadership. Apart from the hospital administrative team, there is a team of administrators from the Health Ministry appointed by the central government. The two teams work together to provide check and balance. The administrators from the Health Ministry also act as communication link and offer advice on health care policies. As I mentioned in my previous articles,<sup>1,2</sup> the central government only provides a very basic salary package to the staff, the hospital administration has a major portion of its salary coming from the revenue generated by the clinical departments. The exact percentage and distribution of the resources are negotiable. With the rapid change of economy, wealth distribution and service demand, one can imagine that the process is getting tougher over time. As all the hospital

staff work for the government, they are entitled for pensions when they reach retirement age. Although they would no longer be given bonus for good work performance, their basic pay may be higher than pre-retirement pay. This is because they are not required to pay for the health insurance. Some of them may remain in the hospital quarters and regularly join in the hospital function. This well meaning arrangement effectively make the total number of staff very large. Generally the hardware of the health care in terms of buildings and equipment in Mainland are not as advanced as that of Hong Kong. The software in terms of policies and guidelines are updated and abundant. When one walks around the hospital, one would not have trouble in sighting the organization chart of every department. The guidelines on the duties of every staff are often written clearly and displayed in the obvious locations (Figures 1 and 2).

#### The culture

The Mainland Chinese culture in a way is similar to how things are done in Hong Kong as most citizens in Hong Kong are Chinese. However, there are subtle differences as Hong Kong has been a colony of Britain for quite some time and people in Hong Kong have become more westernized. It is important to learn the Mainland culture in order to avoid miscommunication which may lead us ending up in embarrassing situations. Sometimes the misunderstanding may be interpreted as arrogance. Strange it may sound, despite the communist rule, Mainland people are still very much "Confucius" in that a lot of respect is shown to the senior members of the society. Face value is taken very seriously. Senior and respected staff of the clinical department are often addressed as teachers. Teachers are often invited to all the important functions and ceremonies. They are seated at the head table next to the Superintendent and the Health Ministry officials. To show respect, expensive wine is often served at the dinner. Rounds of speech and wine are mandatory before food is served. Banquet of Chinese food is the usual choice. The number of dishes is often

phenomenal. The dishes are served one at a time. When a dish is served, it is often placed in front of the most important person at the table. The host would push it towards the guest of honor to show respect. The guest of honor would then push the dish back to the host and somehow food is transferred to one of the two important person's bowl. The other person would quickly respond to transfer similar amount of food to the other bowl. Unlike the Hong Kong or western custom, sweets or dessert is served in the middle of the course rather towards the end. Several types of soup may be served at the same dinner. Dumpling and noodles are served towards the end in case the guests are still hungry. White wine of alcohol content up to 60% is the usual choice of beverage. There is a general increase consumption of red wine but the local reds tend to be very sweet and some local people like to further dilute the red wine with lemonade. Although small glasses are used to hold the powerful white wine, one would be definitely almost anaesthetized and enjoying oneself after a few glasses. In order to show respect, it is polite to lower one's glass to a lower level than the host's. Also, to show respect, the guest of honor would return a toast to the host and other important guests. In order to avoid the embarrassment of getting anaesthetized by alcohol too prematurely, I have no good advice but to try to take as small sip at a time as possible. Having some fatty food before trying the wine also helps. The other way is to have lots of training and liver enzyme induction before embarking such an adventure.

As mentioned earlier, this is my last article on outside qualified anesthesiologists working in China. I understand China is a vast country and the anesthetic practice differs from place to place. I hope the writing of my limited experience may stir some interests in some anesthetists. If you want to join me in this adventure, you are most welcome to contact me.

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Figure 1. Guidelines for operating theatre staff

像作松杉,急救之新,等方面做到推奋。

Figure 2. Guidelines on duties of anesthetists

于术室工作制度 1. 化至辛术宫工作人类,以役严裕建字无菌反刻。保持宝肉(果)静和李法,进 手控》、银管数手术至63鞋 18.隐离狂风口罩。 2、进车米室允习,参纯,二人吻肉树常住种茎穿贵人和种茎并士民同惑,三 人以比似雾报课会往径业务副院告租准。参九戎元司并不愿意挂续碳方区 务上在15指年,2得位素特美国主义 3. 采水星纲指品,置柄,禁約,购应有末上页类保资 放生周点住置,哈 "最急救音术们全察器材,电黑和反龙漫音委经常松益,心伴证并不正常进行。 手术皇东·弑一般不谋·仲竭·呐·叶·谔吋·高健乡术垕非士虎同志, 神科宿6 剧毒 彭立育州呈标志,细梭保深,杨坛玉磨彩往过保伽畫对方可使用。 4.禾匮6畜勤养术应引重进行,如元条件对,关做无菌主术,坑做育菌主术。 异苯酮腙辛本重护士各译细情点辛水器械,繁料等43数目,等态尿时收拾干 守核住限污染的黑人的和整种 5.并术宽时强计并不的两天立体详细澄的,按目强计上现。林同有 美的重确完备采原因,及时到正。 6. 手术宽氛爆细质清扫消盘一次,名融放伽菌储悬-次(色横定)、昆波63 年、消暑石化343品)。 7 夏季保府和建设单水津暮好标本。 8. 牙术通知宰换于术疴-相应子术重以便推动,急运手术通知:颁行深重44 外植风星的爱旨。 9. 接爭生病人时,要要死力并接对病之間者, 其持, 在住, 和言族和都 住、防止差线、病人震容医综合服进入手术意。

The Editorial Board would like to thank Dr Anne Kwan for spending an enormous amount of her time and effort in putting together three interesting and unique articles. We hope you will agree that this is an important topic. We would like to encourage fellows and members to write to the Bulletin and share with your colleagues your experience (social or scientific).

# A Cohort Study of Maternal Fever after Labor Epidural Analgesia and Its Impact on Maternal and Neonatal Outcomes

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#### SUMMARY

We conducted a study to find out the local incidence of maternal fever complicating labor epidural analgesia and its effects on neonatal sepsis evaluation. Forty-one epidural and 52 non-epidural parturients were recruited. The rate of maternal and neonatal fever in the labor epidural and non-epidural groups were 12% (n = 5) *versus* 0% (n = 0), P = 0.014 and 7.3% (n = 3) versus 1.9% (n = 1) with P = 0.32, respectively. The temperature returned to normal one hour after delivery in most febrile neonates. The neonatal sepsis evaluation rate was 2.4% (n = 1). No correlation was found between chorioamnionitis and maternal fever (P = 0.28). Neonatal sepsis evaluation was not affected by the presence of maternal fever.

*Keywords*: Epidural analgesia; Maternal; Neonatal sepsis; Fever; Anesthesia: Obstetric

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Aternal fever after labor epidural analgesia (LEA) is a common problem with an estimated incidence between 12% and 16%.<sup>1.6</sup> The exact mechanism is largely

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unknown and both physiological and pathological causes have been described. In some centers, it is also associated with an undesirable increase in the incidence of neonatal fever and sepsis.4-6 We therefore conducted a prospective observation study to find out the between maternal relationship fever and sepsis. The neonatal primary outcomes measured were the incidence of maternal and neonatal fever, rates of neonatal septic workup and intensive care admission. The secondary outcomes measured included the Apgar scores and the incidence of histological confirmed chorioamnionitis.

#### **Materials and Methods**

The study was approved by the Regional Hospital Ethics Committee and written informed consent was obtained from all participated patients. The labor epidural group (LEA) consisted of full-term (> 37 weeks) primigravida with normal singleton pregnancy admitted for elective induction of labor during a four month period. Patients who preferred alternative methods of labor pain relief were assigned to the non-epidural group (NE). Exclusion criteria included preterm or multiple pregnancies (< 37 weeks, twins or triplets), known congenital syndromal fetal or abnormalities and febrile parturients prior to the labor ward admission.

Epidural analgesia was managed according to the standard protocol using strict aseptic technique. Written consent for epidural analgesia was obtained with detailed patients explanations. All received oral ranitidine and sodium citrate before the procedure. Routine noninvasive arterial pressure and pulse oximetry were applied. All parturients received a preload of lactated Ringer's solution 10 ml/kg and were positioned in the left lateral position. A Tuohy needle, 16G or 18G (B. Braun Medical Inc., Bethlehem, PA) was inserted at either L2/3 or L3/4 interspace using the midline approach and loss of resistance technique to air or saline. Five to 10 ml of ropivacaine 0.2% was injected through the epidural catheter after negative aspiration for blood or cerebrospinal fluid. Analgesia was maintained with patient-controlled epidural analgesia (PCEA) of plain bupivacaine 0.0625% and fentanyl 2 µg/ml. Rescue analgesia was provided by ropivacaine 0.2%, 5-10 ml.

Body temperatures were measured on admission to labor ward, then every four hours, after delivery and before discharge to the postnatal ward by oral route, using standard mercury thermometer. The oral route was chosen for the study because oral, tympanic and vaginal temperatures have been shown to reflect core body temperature accurately.<sup>2,3</sup> Maternal and neonatal fever were defined as oral temperature greater than 38.0°C. The ambient temperature was maintained at 24-26°C. We recorded maternal age, parity, gestation weeks, pre-morbid disease, time and mode of membrane rupture, cervical dilatation and duration of delivery. Neonatal axillary temperature were measured at and one hour after delivery. All the placentas were sent for pathological examinations. The parturients and infants were also followed up by the investigators, noting the investigations made and the treatment received.

The primary objective was to identify the neonatal septic workup rate, hence the standard difference used for the sample size estimation was based on the studies by Liberman<sup>6</sup> who found that the incidences of neonatal sepsis evaluation were 34.0% and 9.8% for LEA and NE groups, respectively. Power analysis showed that 30 patients for the LEA and 60 patients for the NE group would have 80% power to detect a 33% difference at 0.05 level of significance. Student t-test was used for parametric data.  $\chi^2$  and Mann-Whitney tests were used for non-parametric data. To adjust for potential confounding factors, multiple logistic regressions were used to examine the factors associated with maternal and neonatal fever.

#### Results

Patient characteristics of the labor process were similar between groups except from the body weight which was lower in the LEA group (Table 1). The mode of delivery was similar between the two groups (Table 2). Maternal and neonatal outcomes are shown in table 3 and 4. Maternal fever occurred in 12.2% of parturients with epidural analgesia. However, the incidence of chorioamnionitis was similar between LEA and NE groups. Among the 17 parturients with pathological evidence of chorioamnionitis, only one patient developed fever and the fever subsided soon after treatment.

Four neonates were febrile at delivery (two from LEA febrile mothers, one from a LEA mother who did not have fever and the remaining one from a NE afebrile mother). Maternal fever was associated with neonatal fever (P = 0.013). Using multiple logistic

	Labor epidural	Non-epidural	P value
	analgesia	analgesia	
Number of patients	41	52	
Mean age (years)	$26.8\pm5.2$	$27.7\pm5.1$	0.40
Mean weight (kg)	$68.45 \pm 9.1$	$64.64 \pm 9.2$	0.05
Mean height (cm)	157.1 ±5.0	$156.5\pm5.1$	0.57
Mean gestation weeks	$39.9 \pm 1.2$	$40.2\pm1.2$	0.27
Mean duration of membrane	$10:6\pm3:5$	9:5 ±3:2	0.12
rupture (hh:mm)			
Mean duration of labor (hh:mm)	$7:1 \pm 3:3$	$7:1 \pm 3:4$	0.99
Mean temperature on admission to	$36.7\pm0.3$	$36.8\pm0.3$	0.71
labor ward (°C)			
Mean temperature at delivery (°C)	$37.0\pm0.5$	$36.6\pm0.4$	merged
Mean temperature on discharge	$37.0\pm0.5$	$36.8\pm0.3$	0.05
from labor ward (°C)			

**Table 1.** Demographic data and labor process in patients receiving labor epidural analgesia and non-epidural analgesia.

Values are mean ± standard deviation

regressions, the duration of rupture of membrane (P = 0.038) and the presence of maternal fever (P = 0.008) were positive predictive factors for neonatal fever. The temperatures of all the febrile neonates were below 38.5°C and the temperature returned to normal within an hour after delivery. Therefore, all did not require further investigations and workups except for the one in the LEA group. She did not have antenatal check-up. Labor was induced for premature rupture of membrane. The duration of membrane rupture was 14 hours 50 minutes. Apgar scores were 8 at 1 min and 9 at 5 min. Temperature at birth was 38.0°C He was admitted to neonatal intensive

**Table 2.** Mode of delivery. ( $\chi^2$  test= 0.09)

	Labor epidural	l Non-epidural
	analgesia	analgesia
Number of patients	41	52
Normal spontaneous delivery	20 (48.8%)	37 (71.2%)
Vacuum extraction	7 (17.1%)	5 (9.6%)
Lower segment Cesarean section	14 (34.1%)	10 (19.2%)
Total	41	52

care unit (NICU) for observation. Temperature at one hour after delivery was 38.2°C. Sepsis workup was done. Empirical ampicillin and netromycin were administered intravenously. Fever subsided after a few hours. All cultures were negative. He was discharged uneventfully from the NICU 4 days later. Besides, three afebrile neonates (2 from LEA and 1 from NE) were admitted into NICU for other reasons: one had mild asphyxia; one had a sacral mass while the remaining one had poor respiratory effort and needed ventilatory support for 30 minutes. Otherwise, all the other neonates in this study were discharged home uneventfully.

#### Discussion

The incidence of maternal fever in our hospital was similar to that of overseas institutions but the incidence of neonatal fever and sepsis workup were much lower. We also found that the duration of membrane rupture and maternal fever were the positive predictors for neonatal fever. Maternal fever complicating labor epidural analgesia was found to be associated with various factors, namely, epidural analgesia,<sup>1-6,8,10</sup> chorioamnionitis,<sup>8-10</sup> nulliparity,<sup>5,11</sup> long duration of labour<sup>5,11</sup> and long duration of ruptured membranes.<sup>5,11</sup>

	Labor epidural	Non-epidural	P value
	analgesia	analgesia	
Number of patients	41	52	
Maternal fever	5 (12.2%)	0 (0%)	0.01
Maternal culture done	1 (2.5%)	0 (0%)	0.40
Maternal antibiotics used	8 (19.5%)	0 (0%)	0.001
Maternal sepsis workup done	0	0	merged
Placental pathology (chorioamnionitis)	5 (12.2%)	12 (23.1%)	0.28

#### Table 3. Maternal outcomes

For epidural analgesia induced fever, it is believed an increase in non-physiological shivering,<sup>10</sup> decreased sweating,<sup>1,2</sup> decreased hyperventilation of labour,<sup>1,2</sup> altered hypothalamic response and additional blankets with shivering<sup>1-3</sup> may all contribute to the rise at about 5 hours after onset of labor at a rate of 0.1-0.2°C per hour.<sup>3</sup> Our findings confirmed that the hyperthermia is usually of mild intensity (< 38°C) and maternal body temperature returns to normal within a few hours after delivery.<sup>1</sup>

Neonates may show a corresponding rise in temperature if maternal temperature increases. The core fetal temperature is approximately 1°C higher than that of the mother.<sup>12</sup> Macaulay showed that the rise in fetal temperature correlated significantly with the duration of epidural analgesia and the maximum fetal skin temperature also correlated with the maximum maternal oral temperature reached.<sup>13</sup> Some fetuses had a skin temperature as high as 39.5°C though there were no differences in Apgar score,

birth weight or umbilical artery pH between the epidural and non-epidural groups. We had not measured the intra-uterine or fetal temperature but all the neonates had a temperature below 38.5°C and the incidence of neonatal fever was also lower. This might be related to the higher ambient temperature (24-28°C) used in their labor rooms.

Some studies suggested that the rates of neonatal sepsis evaluation and NICU admission were increased in the mothers with fever. The criteria for neonatal sepsis evaluation were not reported in their studies.<sup>4,6</sup> Indeed, no difference was found in the incidence of actual confirmed sepsis between the epidural and non-epidural groups in the above studies (0.24% *versus* 0.72%). The criteria used by our neonatologists were persistent fever 1 hour after the delivery and or presence of other septic features. Only 1 neonate fulfilled this criterion and cultures were subsequently found to be all negative. The other 3 febrile neonates were discharged back to

	Labor epidural analgesia	Non-epidural analgesia	P value
Number of patients	41	52	
Mean birth weight (kg)	$3.2\pm0.4$	$3.2\pm0.4$	0.89
Mean neonatal temperature at birth (°C)	$37.1\pm0.6$	$36.8\pm0.4$	0.01
Mean neonatal temperature on discharge from labor ward (°C)	$37.2 \pm 0.3$	$37.1\pm0.3$	0.32
Median Apgar score 1min (range)	8 (3-9)	8 (5-10)	0.12
Median Apgar score 5min (range)	9 (6-10)	9 (7-10)	0.74
Neonatal fever	3 (7.3%)	1 (1.9%)	0.32
Neonatal fever persisted	1 (2.4%)	0	0.44
Sepsis workup done	1 (2.4%)	0	0.42

#### **Table 4.** Neonatal results

Values are mean ± standard deviation

ordinary postnatal wards without further sepsis investigations when the temperature returned to normal. The temperatures at delivery of the 4 febrile neonates were all below 38.5°C. Causes other than maternal epidural fever may be more likely if the temperature is higher than 38.5°C.<sup>24,6</sup> Therefore, the rate of unnecessary sepsis evaluation could be significantly reduced if the pattern of neonatal fever could be taken into consideration.

Placental infection had been suggested as the cause of maternal fever by some studies.8,9 In a non-randomized study, Dashe et al<sup>8</sup> found that placental inflammation was higher in the epidural group (61% versus 36%, p=0.002) whilst such a difference was not found in the afebrile patients (11% versus 9%, p= 0.61). However, the presence of other confounding factors like duration of ruptured membrane that was longer in the epidural group might have accounted for the difference found in their study. In a retrospective study by Vallejo et al, maternal fever was associated with epidural analgesia clinical only the presence of in chorioamnionitis.9 They only used the data from patients with clinical evidence of amnionitis. As the incidence of clinical chorioamnionitis was quite low, about 1%,<sup>14</sup> they might have omitted a larger number of subclinical infections. Our findings showed that histological evidence of chorioamnionitis was present in 35% of all the patients and no correlation was found between maternal fever and this.

The incidence of neonatal fever was low (7.3% *versus* 1.9%). Though we had recruited almost 100 patients for our study, a statistically significant difference will only be detected if there are at least 280 patients for each group. If further studies are required for the effects of maternal fever on neonatal outcomes, a randomized prospective study using intention to treat analysis will be required.

In conclusion, our data indicated that maternal fever complicating LEA was common but not a serious condition. The exact cause had not been confirmed though many possible mechanisms were postulated. The incidence of neonatal fever was far lower than the maternal fever. The temperatures were usually below 38.5°C and both mothers and neonates ran a smooth clinical course. As the fever subsided rapidly after delivery, no adverse neonatal outcomes were seen. The rate of neonatal sepsis evaluation of LEA group was not statistically different from the NE group. Therefore, we believed that the decision for neonatal sepsis evaluation based on a single neonatal temperature at birth was not justified. This had been our practice since the study and no evidence of delayed treatment so far was found.

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# Thank you...

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# Factors Affecting Chinese Patients' Choice of Postoperative Analgesia: Patient-Controlled *versus* Epidural Analgesia

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#### SUMMARY

We surveyed 250 patients scheduled for elective abdominal or thoracic surgery about their choice of postoperative analgesia in a major regional hospital. Patients were interviewed individually in the evening before surgery. Each of them was given thorough explanation on the risks and benefits of patient-controlled analgesia (PCA) and epidural analgesia. A standard explanatory pamphlet was also provided. Each patient filled out a questionnaire asking their choices of postoperative analgesia. Over fifty percent patients chose PCA, another 38.5% of patients chose epidural analgesia, and the remaining patients were unable to make a decision. Patient characteristics did not differ between patients choosing PCA or epidural analgesia. However, there were significant differences in various psychological factors influencing their choice of analgesia methods. All the near-significant factors were then recruited into a stepwise logistic regression model to determine the reasons why patients choosing one of the two analgesic methods. Our data indicated that "the preference for self control" and "the fear of adverse epidural complications" are the most important factors for those choosing PCA. This survey highlights the importance of patient communication and education.

*Keywords:* Pain, postoperative; Patient-controlled analgesia; Epidural analgesia; Psychological factors.

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Pepidural analgesia are commonly used methods for postoperative pain management.<sup>1,2</sup> The advantages and disadvantages of each method have been well documented in literature.<sup>3</sup> During usual clinical practice, the attending anesthesiologist decides

on the appropriate method of postoperative analgesia for the patient. With increasing awareness of patient participation, this choice is now seen as a joint decision between the anesthesiologist and the patient. It is therefore important to understand the factors affecting the patient's choice for postoperative analgesia. Few studies have explore the influence of specific psychological characteristics such as anxiety level and locus of control on the effectiveness of patient-controlled analgesia.4,5 However, it is not known what affects patient's choice on analgesic methods. This study aims to inform anesthesiologists the important factors that may influence the decision-making process. Such information will allow us to assist the patient in making a rational choice on

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postoperative analgesia.

### Materials and Methods

The study was approved by the Hospital Ethics Committee and informed consent was obtained from all patients. Two hundred and fifty consecutive patients undergoing elective abdominal or elective thoracic operations entered the study. All patients were aged 18-70 years, American Society of Anesthesiologists physical status Class 1 to 3. Patients were excluded if they have problems with language comprehension and cannot complete a simple questionnaire. We also excluded patients with a history of chronic analgesics usage, drug and alcohol abuse, psychiatric diseases.

All patients were interviewed individually in the ward in the evening before surgery. All structured interview was conducted by one of the authors (EKNC) and took place before the routine anesthetic assessment. A standard explanatory pamphlet on PCA and Epidural analgesia in Chinese was offered to the patient. We then explained in detail the procedures of PCA and epidural analgesia. The respective advantages and complications of either technique were in accord to the pamphlet. After thorough explanation, patients were asked to complete a structured questionnaire. Apart from basic demographic data, pain history, experience of different analgesia methods, the questionnaire also asked patients to rate the different statements using a 3-point scale (disagree, neutral, agree). At the end of the questionnaire, the patient was asked to choose their preferred analgesic method (i.e. PCA, epidural analgesia or others). All patients were asked to complete the Chinese version of Beck Anxiety Inventory. The validity of this

**Table 1.** Preferred mode of postoperativeanalgesia

	Number (%)
Patient controlled analgesia	141 (57.1)
Epidural analgesia	95 (38.5)
Others	
Intramuscular injection	4 (1.6)
To be decided by anesthetist	7 (2.8)

instrument has been established previously.6

### Statistics

We estimate the sample size based on our past experiences. Since about 35% of patients chose epidural analgesia, we estimated that a sample size of 250 should detect an association of factors with odds ratio (OR) > 1.5, using a one-sided  $\alpha$  error of 0.05 and 80% power.

Data were analyzed using SPSS statistical package (SPSS Inc., Chicago, IL). We dichotomized the data based on the preferred mode of analgesia. Initial univariate exploratory analysis was performed using Mann-Whitney U test or  $\chi^2$  test for non-parametric data. We looked for significant factors associated with the choice of a particular mode of analgesia. Factors with a *P* value < 0.2 were then used for a multivariate analysis using a stepwise logistic regression model. A final model was developed with backward elimination until P < 0.05. We reported the odds ratios of the major predictor factors can be derived from the final model.

### Results

Over a period of 3 months, 251 patients were recruited into the study. Four patients were subsequently excluded because of incomplete data. Data from 247 patients were available for analysis. Majority of patients (57.1%) chose PCA as their preferred mode of analgesia and epidural analgesia was preferred by 38.5% (Table 1). Since the number of patients choosing other mode of analgesia (e.g. intermittent intramuscular injection) was small, only patients choosing PCA or epidural analgesia were included in the final regression model. Most of the subjects (61.9%) were worried about postoperative pain. About sixty percent of patients agree with the possible role of postoperative pain on recovery process. Table 2 shows the demographic data of patients choosing either PCA or epidural analgesia. Patient characteristics did not differ between groups. There were however, fewer patients undergoing thoracic surgery chose epidural analgesia as the preferred technique (P = 0.002). The mean (± standard deviation) Beck's anxiety

	Patient controlled	Epidural	P value
	analgesia	analgesia	
Number of patients	141	95	
Age (years)	$52 \pm 12$	$51 \pm 11$	0.36
Gender, number (%)			
Male	62 (44)	40 (42)	0.78
Female	79 (56)	55 (58)	
Education Level (%)			
Primary or below	79 (56)	41 (43)	0.085
Secondary or above	62 (44)	54 (57)	
Type of surgery (%)			
Abdominal	89 (63)	78 (82)	0.002
Thoracic	52 (37)	17 (18)	
Beck anxiety score			
Median (Interquartile)	2 (0-6)	2 (0-4)	0.105
Range	0-22	0-17	

**Table 2.** Patient characteristics and anxiety score among the patients choosing patient controlled analgesia and epidural analgesia. Values are mean ± standard deviation and number (%).

score for all patients of was low  $(3.9 \pm 4.8)$ . There was no difference in the anxiety score between the PCA and Epidural groups. (*P* = 0.11)

Tables 3 summarize the difference in patient's knowledge and attitudes towards PCA and epidural analgesia. In this univariate analysis, patients who chose PCA because they prefer a sense of self control (P < 0.001), they believed PCA had better analgesic efficacy (P < 0.001) and reduced respiratory complications (P = 0.01). On the contrary, those who chose epidural analgesia stated that they required support from health care workers (P < 0.001) and they were unfamiliar with the PCA operation (P < 0.001).

In a multivariate analysis, sense of self control is the major factor that was considered in patients choosing PCA, while the presumed superior analgesic efficacy made patients choose epidural analgesia.

#### Discussion

Over 60% of patients worried about postoperative pain and agreed with the influence of postoperative pain on the recovery process. It is interesting to know how patients work through the decision process when ask to choose a postoperative analgesic method.

Based on the multivariate analysis, we were able to demonstrate that ability to "self control" is the most important reason for patient choosing PCA. This is consistent with previous studies. Kluger reported that 20% of patients claimed that the advantage of using PCA is to feel "in control of one's own pain relief".7 Similarly, Johnson found that individuals with an internal locus of "control" have increased satisfaction with PCA.5 However, both studies were performed on postoperative patients after using PCA. It is however uncertain whether patients with an internal locus of control will be more likely to choose PCA. Future studies using specific psychological tests like the Multidimensional Health Locus of Control (MHLC) Scales is required to evaluate this hypothesis.8,9

We also showed that the negative perception of potential complications may change patient's choice for postoperative analgesia. More than half of the patients in both PCA and epidural analgesia group were bothered with minor side effects due to the use of opioids (e.g. nausea and vomiting) and epidural local anesthetics (e.g. motor weakness and numbness). This is in contrast to Kluger that only a minority of patients interviewed (2.5%)

### **Table 3.** Summary of the responses to the questionnaire.

	Patier	nt controlled nalgesia	Eŗ an	oidural algesia
Number of patients	u	141		95
er of parento	No.	(%)	No.	(%)
Analgesic efficacy		(10)		(,,,)
Superior analgesia				
neutral	82	(58.2)	47	(49.6)
agree	37	(26.2)	43	(45.4)
disagree	22	(15.6)	5	(5.0)
Faster mobilization				. ,
neutral	26	(18.4)	12	(12.6)
agree	106	(75.2)	83	(87.4)
disagree	9	(6.4)	0	(0)
Less respiratory complication				
neutral	31	(22)	26	(27)
agree	107	(75.9)	69	(72.3)
disagree	3	(2.1)	1	(0.7)
Past experience				
Own past unpleasant experience				
neutral	134	(95)	90	(94.7)
agree	0	(0)	0	(0)
disagree	7	(5)	5	(5.3)
Other's past unpleasant experience		.,		. ,
neutral	137	(97.2)	87	(91.6)
agree	0	(0)	1	(1.1)
disagree	4	(2.8)	0	(0)
Characteristics of analgesic methods		< ,		( )
Self control				
neutral	2	(1.4)	11	(11.6)
agree	139	(98.6)	77	(81.1)
disagree	0	(0.0)	7	(7.4)
Incident pain		()		
neutral	5	(3.5)	8	(8.4)
agree	136	(96.5)	87	(91.6)
disagree	0	(0)	0	(0)
Wait for nurses		(*)		(*)
neutral	5	(3.5)	14	(14.7)
agree	135	(95.7)	76	(80.0)
disagree	1	(0.7)	5	(5.3)
Inadequate power				()
not fear at all	134	(95.0)	74	(77.9)
moderate fear	7	(5.0)	9	(9.5)
most fear	0	(0)	12	(12.6)
Controlled by others	2	× /		
neutral	18	(12.8)	22	(23.2)
agree	5	(3.5)	69	(72.6)
disagree	118	(83.7)	4	(4.2)
Potential complications	110	(30)	I	()
Respiratory depression				
not fear	32	(22.7)	24	(25.3)
moderately fear	100	(70.9)	64	(67.4)
most fear	9	(6.4)	7	(7.4)
Nausea and vomiting	,	(3.1)	,	(* • • •)
not fear	34	(24.1)	21	(22.1)
moderately fear	87	(61.7)	48	(50.5)
most fear	20	(14.2)	26	(27.4)
Dizziness	20	()	20	()
not fear	47	(33.3)	31	(32.6)
moderately fear	47 97	(61.7)	54	(58.0)
most fear	- 57	(51.7)	00	(8 1)
Constinution	/	(3.0)	8	(0.4)
consupation motifican	(0	(48.0)	4.4	(46.2)
not lear	69	(48.2)	44	(40.3)
moderately lear	68	(40.2)	51	(33.7)

#### Table 3. (continued)

	Patier	nt controlled	Ep	oidural
	a	nalgesia	an	algesia
Pruritus				
not fear	55	(39.0)	39	(41.1)
moderately fear	76	(53.9)	42	(44.2)
most fear	10	(7.1)	14	(14.7)
Addiction				
not fear	135	(95.7)	91	(95.8)
moderately fear	6	(4.3)	4	(4.2)
most fear	0	(0)	0	(0)
Equipment problems				
not fear	130	(92.2)	90	(94.7)
moderately fear	10	(7.1)	4	(4.2)
most fear	1	(0.7)	1	(1.1)
Low back pain				
neutral	37	(26.2)	16	(16.8)
agree	42	(29.8)	0	(0)
disagree	62	(44.0)	79	(83.2)
Pain on insertion				
not fear	17	(12.1)	23	(24.2)
moderately fear	86	(61.0)	70	(73.7)
most fear	38	(27.0)	2	(2.1)
Headache			0	
not fear	19	(13.5)	26	(27.4)
moderately fear	90	(63.8)	67	(70.5)
most fear	32	(22.7)	2	(2.1)
Limb weakness				
not fear	28	(19.9)	33	(34.7)
moderately fear	79	(56.0)	59	(62.1)
most fear	34	(24.1)	3	(3.2)
Numbness or paraesthesia				
not fear	29	(20.6)	33	(34.7)
moderately fear	76	(53.9)	60	(63.2)
most fear	36	(25.5)	2	(2.1)
Urinary retention		-		
not fear	59	(41.8)	46	(48.4)
moderately fear	77	(54.6)	49	(51.6)
most fear	5	(3.5)	0	(0)
Inadequate block				
not fear	12	(8.5)	33	(34.7)
moderately fear	73	(51.8)	57	(60.0)
most fear	56	(39.7)	5	(5.3)
Understanding the technique				
Unfamiliar				
neutral	21	(14.9)	10	(10.6)
agree	101	(71.6)	83	(87.2)
disagree	19	(13.5)	2	(2.1)
Difficult to understand				
neutral	30	(21.3)	31	(32.6)
agree	20	(14.2)	32	(33.3)
disagree	91	(64.5)	32	(34.0)
Lack of confidence				. ,
neutral	7	(5.0)	13	(13.5)
agree	0	(0)	0	(0)
disagree	134	(95.0)	82	(86.5)

worried about the minor side effects.<sup>7</sup> The point to consider is whether the information in the explanatory pamphlet is too extensive for the patients, so that they may be overwhelmed by the time they are asked upon to make a choice. The argument here is to decide on the appropriate amount of information that should be released to patients. Currently, there is no consensus as to the extent of informed consent. However, despite the risk of nerve damage and other major neurologic complications, 38.5% patients continued to choose epidural analgesia. It suggested that when handled properly, major permanent complications will not alter patients' choice of postoperative analgesia. Our data led us to believe that this risk should be routinely addressed in all patients going to receive postoperative epidural analgesia. Patients should be informed of the local incidence and the possible measures to prevent these complications.

The choice of "new therapeutic" method is likely to be associated with patient understanding and certainty on the effectiveness. Our data and those from others showed that patients usually have high degree of confidence in the expertise of healthcare providers to treat postoperative pain.<sup>10</sup> Educational pamphlets, video shows, opportunity to play around with dummy equipment or simulator workshops are means to improve patient education.

Our patients were well aware of the misconceptions regarding postoperative analgesia, the fear of addiction was shown to be unimportant. In other studies, between 3.8 to 4.2% of patients were concern about addiction after PCA.<sup>7,11</sup> Equipment failure is not a concern for patients choosing either form of postoperative analgesia.

common Contrary to believe, past experiences, be it personal or that from others, appeared to have no role in making choice of postoperative analgesia. Similarly, the information delivered by the explanatory pamphlet and the interviewer have limited value. In this context, anesthesiologists when providing this information to the patients should reconsider the contents of the pamphlet. We also believe the perceived advantages of analgesic method are essential information to patient. Nonetheless, our data suggested this is unimportant.

Anxiety has been shown to affect patient's perception of pain.<sup>12-16</sup> Sources of preoperative anxiety come from separation from family, hospitalization, underlying disease (especially malignancy), uncertain treatment outcome, treatment complications, anesthesia *per se* and postoperative pain and other sufferings. Thomas and Heath showed that anxious patients received the biggest benefit from PCA with large reduction in pain.<sup>4</sup> Nevertheless, our

patients reported low anxiety score and the anxiety score did not affect patient's choice of analgesic method.

In conclusion, this study revealed that the ability to control analgesia for oneself was also an important element for patient to choose PCA. Whereas patients who chose epidural analgesia, considered the perceived efficacy of analgesia the associated complications and were important factors. The process of decision making can be viewed as a balance of all these factors. Our study highlights the importance of education, patient reassurance and communication.

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# Regional Anesthesia in Children for Lower Limb Surgery – Experience in a Mainland Chinese Hospital

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#### SUMMARY

We reported a series of 47 children undergoing lower limb surgery during regional anesthesia. Spinal, epidural and combined spinal-epidural block were performed over a 2-year period by four anesthetists in a mainland Chinese hospital. Five blocks were considered inadequate and general anesthesia was induced. Sedation using intramuscular ketamine was required in 32 patients. There was no serious complication. Hypotension was uncommon. The incidence of urinary retention, intraoperative nausea and vomiting was comparable to those reported in the adult literature. We concluded that neuraxial block can be safely performed in children.

*Keywords:* Regional anesthesia, pediatric; Spinal anesthesia; Epidural anesthesia; Combined spinal epidural anesthesia; Sedation.

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euraxial block for surgery has been used for over 100 years since Beir's description in 1899 on the subarachnoid cocaine injection.<sup>1</sup> Ten years later in 1909, Tyrrell-Gray published his experience

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with spinal anesthesia in 300 infants and children.2 However since then with the onset of safer anesthetic agents and monitoring, general anesthesia became the norm for pediatric anesthesia. There was a resurgence of interest in neuraxial anesthesia in the 1970's and Abajian published on the use of spinal anesthesia for premature infants.<sup>3,4</sup> Apart from this indication, regional techniques are usually used in with combination general anesthesia in pediatrics.

Regional anesthetic techniques have been recommended for difficult circumstances, such as in developing countries where the anesthetic support is limited.<sup>5</sup> For several years a group of volunteer medical workers have been visiting the Henan province in Mainland China. We have been using regional anesthetic techniques for children undergoing orthopedic surgery of their lower limbs. In this study, we reported a series of 47 pediatric regional anesthetics performed over a 2-year period by four anesthetists. We aim to review the use, efficacy, safety and complications of regional anesthetic techniques for pediatric lower limb orthopedic surgery in a mainland Chinese hospital.

#### **Materials and Methods**

The study was approved by the city of Louyang's first people's hospital, a large district hospital. Pediatric patients, aged 12 years or less, scheduled for either unilateral or bilateral lower limb orthopedic surgery were selected for the study. patients were American All Anesthesiologist Association physical status class 1 or 2. Many of the patients however had stable neurologic diseases such as deformity associated with poliomyelitis and cerebral palsy. Exclusion criteria included contraindication to regional technique, such as infection. coagulopathy and cardiac disease. We also excluded patients requiring both upper and lower limb surgery and surgery that that was planned to be performed in the prone position.

#### Regional anesthetic technique

All patients received oral diazepam 0.2 mg/kg, and EMLA cream was applied to both hands and over the back about one hour before surgery. Standard monitoring including pulse oximetry, automated non-invasive arterial pressure electrocradiography was recorded using a Propaq 100 monitor (Protocol systems, Beaverton, OR).

In the operating rooms, intravenous access was established in all patients and normal saline 10 ml/kg were infused. Regional techniques performed were spinal, epidural or combined spinal anesthesia. The choice between techniques was made by the list anesthetists, according to the operative requirements and individual preference.

Spinal anesthesia was performed by either 25G Quinke tip needles (Spinocan, B.Braun, Melsurgen, Germany) or 25G pencil point needles (Whitacre, Becton Dickinson, Franklin Lakes, USA). We used bupivacaine 0.5% at 0.5 mg/kg to a maximum dose of 15 mg. Epidurals were performed using 16G to 19G Tuohy needle. A loss of resistance to saline technique was used to define the epidural space. The epidural regime was left to the discretion of the list anesthetists. Bupivacaine and lignocaine were available.

Combined spinal epidural block were also performed with a separate puncture for the spinal using 25G Quinke tip needles and the other epidural sets. The intrathecal dose was the similar to that used in spinal anesthesia.

We recorded the quality of anesthesia (by the number of patients with successful block, those requiring conversion to general anesthesia, and the number of patients requiring sedation). Side effects were also recorded, hypotension is defined as arterial pressure < 30% of baseline and respiratory depression is < 12 breaths/min. Other complications include the incidence of vomiting, pruritis, urinary retention, headaches, limb weakness and neurological sequelae. Baseline characteristics of the patient cohort were tabulated using summary statistics.

### Results

A total of 82 patients presented for surgery, 63 patients were  $\leq$  12 years. Among them, 16 required general anesthesia for surgical indications (surgery involving both upper and lower limbs 7; surgery required prone position 8; uncooperative patient 1). Therefore, 47 patients (Male: Female = 25:22) fulfilled the entry requirements. The median (range) age and weight were 9 (3-12) years and 25 (14-63) kg, respectively. The main preoperative diagnoses were poliomyelitis (48%), cerebral palsy (26%), clubfoot (11%) and burns (4%). Surgery included soft tissue release (41%), tendon transfer (23%), osteotomy (15%), arthrodesis (11%), and Z-plasty (4%). The median (range) duration of surgery was 196 (35-540) min.

### Regional techniques

We performed 47 regional anesthetics (spinal 11; epidural 7; combined spinal epidural 26). Satisfactory blocks were obtained in 42 patients. Five patients had inadequate block and required general anesthesia (ketamine 2; enflurane 3) for surgery (combined spinal-

	Spinal block	Epidural block	Combined spinal-epidural block
Hypotension	1	0	2
Vomiting	0	0	4
Urinary retention	2	1	4
Headache	1	0	0

**Table 1.** Incidence of complications after regional anesthesia in children.

Values are number of patients

epidural 1; spinal 4). Sedation was required in 32 patients. Five patients required intramuscular ketamine 3.1 - 5.3 mg/kg before epidural block was performed. Another 27 patients required ketamine 0.2-2.5 mg/kg IMI during the procedure. Complications are listed in Table 1. In general, adverse events were uncommon and readily reversible.

#### Discussion

We chose regional anesthesia in these children because regional techniques are considered to be more cost effective than general anesthesia in remote settings.<sup>6</sup> In this regard, epidural techniques are widely used in Mainland China. In a survey, 50.7% of operations in a busy Children's Hospital were performed during epidural anesthesia.<sup>7</sup> Similar incidence were reported throughout the nation.<sup>8</sup> Furthermore, regional techniques provided postoperative pain control.

#### Efficacy of regional anesthesia in children

The duration of spinal anesthesia in our study lasted from 60 to 150 minutes with an average of 99 minutes. This is consistent with previous studies where spinal anesthesia typically lasts for a shorter duration in children. In one series, the time taken to regain motor function following spinal anesthesia was 70 minutes in children less than 2 years, 114 minutes in children over 5 years and 336 minutes in adults.<sup>9</sup> The height of spinal anesthesia blockade also varied markedly for the same dose injected. In our study the block height ranged from T2 to L3.

Some patients had epidural anesthesia alone, this was usually performed because of individual preference. In this series 55% had combined spinal epidural block. It is the opinion of the author that combined spinal epidural offers a number of advantages in this setting. It confers the speed of onset, dense blockade and reliability of spinal anesthesia, with the prolonged anesthesia and postoperative analgesia with an epidural catheter. In 4 of 33 cases the spinal block was inadequate for surgery and the epidural was used prior to surgery. This was due to technical difficulty in locating the intrathecal space, or may have been due to positioning of the patient. Usually a needle through needle technique was used. Alternatively a separate puncture for the spinal could be used. This offers some advantage as a spinal injection is often quicker and less painful for the child who will then be anesthetized and less mobile to perform the epidural injection. One disadvantage of this technique is the lack of test dose of the epidural catheter. Therefore the first dose should be given as a test dose. Another concern is of breaching the dura and the risk of infection. The incidence of serious infection in the literature is very low.

#### Conversion to general anesthesia

In the majority of cases regional anesthesia adequate surgical provided conditions. However, in five of the 47 children there was inadequate block requiring conversion to general anesthesia. This was mostly due to poor choice of technique as the duration of the spinal anesthesia was inadequate for the surgery. One converted case was a patient with severe scoliosis due to post poliomyelitis deformity, where an epidural or a spinal needle could not be inserted due to technical difficulties. The procedure was done successfully with general anesthesia.

#### Sedation

The use of sedation to site neuraxial blockade is controversial. It is argued that an awake patient is the best indicator of block complications. Nerve damage, total spinal or high block, intravenous injection and convulsion are better recognized in the awake patient. However the pediatric anesthetist consensus is that it is acceptable to perform regional techniques in children under general anesthesia for the comfort and co-operation of the children. In our study, all children received diazepam, which had variable levels of sedation. Only five were also given ketamine to perform the block.

The duration of the operation ranged from 35 to 540 minutes. During the course of surgery, 20 patients required sedation with ketamine injection. It is not surprising then that some children will find it difficult to lie on the operating table for substantial period of time. It took an intense effort to keep the children comforted for the duration. In the longer cases even with sedation, it was difficult to keep the children comfortable.

#### Side effects

Hypotension occurred in 3 patients who were 11 and 12 years old. This is consistent with the literature findings of hemodynamic stability in children up to the age of 8 years having neuraxial anesthesia. This may be related to the lower sympathetic tone in children and the smaller amount of circulating volume going to the lower limbs.<sup>11</sup> Vomiting occurred in 3 children, two of them were associated with hypotension. Again this was a problem of the older child (> 10 years). There was one case of postoperative nausea and vomiting. This was a patient receiving epidural bupivacaine 0.1% and fentanyl 5 µg/ml boluses for analgesia.

Urinary retention was a particular problem occurring in seven patients, and occurred in all types of anesthesia. Four children required urinary catheters. The true incidence of urinary retention attributable to epidural analgesia is unknown, and varies with age, opioid use and the definition. One series of patients receiving bupivacaine 0.125% and diamorphine for postoperative analgesia, averaged 11% and ranged from 18% in infants to 62% in 10-17 years.<sup>9</sup>

There was one case of superficial epidural catheter site infection in patient who had

postoperative epidural boluses of bupivacaine 0.1% and fentanyl 5  $\mu$ g/ml for 72 hours. After removal of the catheter, we found a bead of pus and redness of the injection site. This was treated by parenteral antibiotics and settled without any sequelae. A large prospective audit of epidural analgesia in 1,620 children found one case of epidural infection, who was terminally ill and found colonization with Candida albicans.<sup>12</sup>

There were no reports of unintentional dural puncture, high spinal, respiratory depression, desaturation, neurological deficit, leg weakness, or pruritis. One patient had an episode of hyperventilation with dizziness and tingling of hands, which responded to reassurance.

### Conclusion

Regional anesthetic techniques are suitable for the mainland Chinese district hospital setting. The combined spinal-epidural technique offers a number of advantages, with a variable success of spinal blockade and short duration of effect, the epidural can prolong and complement the spinal block. The spinal provides dense block especially for sacral nerve roots. Postoperative epidural analgesia is facilitated. Most patients required sedation. As a few patients required general anesthesia, this facilities should be available. We have demonstrated that complications were minor and predictable after regional anesthesia in children.

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# Severe Hypokalemia in a Patient with VIPoma: A Rare Cause of Watery Diarrhea

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#### SUMMARY

We reported a case of severe hypokalemia associated with watery diarrhea in a patient with VIPoma. Octreotide therapy was started with good symptomatic control. Curative operative treatment was given and resulted in complete resolution of her diarrhea. We reviewed the pathophysiology of VIPoma and outlined the management of initial resuscitation.

Keywords: VIPoma, VIP, Neuroendocrine tumor, Secretory diarrhea, Hypokalemia, Octreotide

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atery diarrhea is widely regarded as a common medical or infectious disease. Occasionally, it can also be a rare surgical cause. Few cases of diarrhea are due to active intestinal fluid secretion - secretory diarrhea. Patient unexplained with and persistent watery diarrhea should undergo a period of fasting and if diarrhea continues, a secretory process is suspected. Secretory diarrhea is confirmed by a raised stool sodium concentration. In the developed countries, the occult VIPoma is one of the likely explanations for persistent secretory diarrhea. We report a case of VIPoma causing profuse acute diarrhea and severe hypokalemia. The pathophysiology,

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investigation strategies and management options were reviewed.

#### Case report

A 55 year-old lady presented to a private hospital with a history of mild diarrhea for about one month. She denied relevant history of traveling or food poisoning. She had 7 to 8 times of non-blood stained watery diarrhea per day. This was associated with upper abdominal pain, vomiting and low-grade fever. Vital sign was stable on admission.

investigations including Several chest X-Ray, hematology, renal, liver and thyroid function tests were normal. The stool was negative for ova, cyst and culture. A colonoscopy showed mildly inflamed ascending colon and multiple diverticula. Supportive treatment such as oral rehydration fluid, supplement, intravenous fluid lomotil, koapeclate and holopon were administered initially. Intravenous metronidazole and

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ciprofloxacin was also administrated to cover for pseudomembraneous colitis.

By day 5, the watery diarrhea had deteriorated (> 5.7 L/day) and complicated with hypokalemia, hypotension and acute renal failure (serum creatinine concentration has risen to 511  $\mu$ mol/L). Subsequent investigations had excluded other infectious causes of diarrhea such as cholera, *Clostridium difficle* and parasites. The patient became severely dehydrated, hypotensive, tachycardic, anuric and confused. A repeated renal function test showed severe hypokalemia (< 1.5 mmol/L), elevated creatinine concentration (347  $\mu$ mol/L) and severe metabolic acidosis (pH 6.93). The patient was transferred

to the intensive care unit (ICU) for continued fluid resuscitation. The patient also received adrenaline and dopamine infusion. Renal replacement therapy was started and large amount of potassium was infused (Table 1).

An urgent computed tomographic scan of the abdomen showed a 3-5 cm mass at the pancreatic body. In view of possible tumor of neuroendocrine origin, an octreotide (100  $\mu$ g subcutaneously) challenge test was performed. Interestingly, diarrheal output decreased from 900 to 200 ml/hr over a three-hour period. Octreotide 100  $\mu$ g was then injected subcutaneously every 8 hours for the control of diarrhea. The patient eventually made an

Table 1. Changes in electrolytes and potassium replacement regimen during the hospital stay.

Days in	Time	Plasma concentration			Potassium replac	ement	
Intensive		Sodium	Potassium	Urea	Creatinine	Maintenance	Bolus
Care Unit		mmol/L	mmol/L	mmol/L	µmol/L	mmol/h	mmol
1	13:33	128	2.1	26.7	526	4.0	20
	16:09	138	1.7	25.2	483	4.0	30
	16:50	Started continue	ous veno-veno hem	odialysis			30
	19:19	133	1.7	23.7	439	4.0	
	23:19	138	<1.5	20.1	347	4.0	40
		Daily potassium	input = 168 mmol				
2	01:04	140	1.9	18.3	305	4.0	20
	02:10					4.0	30
	03:42	139	2.1	17.5	285	4.0	20
	05:00					4.0	30
	07:20	141	2.2	15.8	249	4.8	20
	08:00					4.8	30
	08:45					4.8	20
	11:40	138	2.8	15.3	257	4.8	20
	15:18	141	3.1	14.7	249	4.8	
	20:04	142	2.9	14.2	239	4.8	30
	22:49	144	3.3	15.3	258	4.8	
		Daily potassium	input = 330 mmol				
3	02:50	140	3.2	15.0	248	4.8	
	07:21	140	3.5	15.4	251	4.8	
	10:59	138	3.6	15.8	256	4.8	
	16:43	141	3.7	15.2	247	4.8	20
	21:06	142	4.6	15.0	222	5.0	
	23:03	144	4.5	15.3	230	5.0	
		Daily potassium	input = 135 mmol				
4	03:07	144	4.8	15.9	225	Stoppe	d
	07:29	144	4.7	16.8	226		
	11:19	146	4.5	16.8	218		
	16:02	146	4.3	6.5	211		
	23:26	147	4.2	15.8	188		
5	07:29	148	4.1	15.5	171		
	15:04	148	3.9	13.3	138		
	23:06	147	3.5	12.7	127		
6	07:05	146	3.6	10.7	108		
	14:50	145	4.2	8.8	96		
	22:35	146	4.2	8.3	86		
7	06:47	144	4.4	7.0	85		
	12:00	Discharged from	the intensive care	unit			

Hormone	Result	Reference range
Vasoactive intestinal peptide (VIP)	345 pg/ml	<100 pg/ml
Pancreatic polypeptide (PP)	1,409 pmol/L	<100 pmol/L
Gastrin	<25 pg/ml	—
Pancreatic Glucagon	98 pg/ml	46 - 166 pg/ml
Somatostatin	24 pg/ml	10 - 22 pg/ml
Chromogranin A (Neurotensin)	41 unit/L	2 - 18 unit/L

 Table 2. Plasma concentrations of intestinal hormone.

uncomplicated recovery. Subsequent biochemistry confirmed the diagnosis of VIPoma (Table 2). The patient subsequently underwent distal pancreatectomy. At six months, there was no evidence of tumor recurrence.

#### Discussion

Vasoactive intestinal polypeptide secretory tumor (VIPoma), belongs to a group of neuroendocrine malignancy known as the pancreatic endocrine tumor.<sup>1</sup> It is a rare neuroendocrine tumor. To our best knowledge, this is the first reported case of VIPoma in Hong Kong.

VIPoma is derived from a primitive stem cell. The tumor secretes multiple peptides that may change with times.<sup>2</sup> However, only some of the secreted peptides have biological activities. This may explain some of the patients remain asymptomic for a long period of time and then presented with acute symptoms. It could also be the reason why the tumor is usually large in size (≥ 5 cm diameter) when it is diagnosed. In adult, VIPoma usually originates from the pancreas, but it could also grow along the sympathetic chain.

Vasoactive intestine peptide (VIP) is a potent stimulant of adenylate cyclase. This causes an increase in cAMP, followed by hypersecretion of water and electrolytes by intestinal mucosa leading to the secretory diarrhea.<sup>3</sup> In contrast to osmotic diarrhea, the secretory diarrhea persists during fasting.<sup>4</sup>

Severe hypokalemia associated with secretory diarrhea is also a typical feature of

VIPoma. In the literature, hypokalaemia ranged from 1.7 to 2.8 mmol/L had been reported.<sup>4,5</sup> Our patient had a plasma potassium concentration of 1.5 mmol/L, and is one of the lowest record in VIPoma. Hypokalemia is a measure of the severity of illness. Severe disease may progress to acute renal failure, rhadomyolysis, myoglobulinaemia.<sup>6</sup>

Somatostatin receptor (SR) scintigraphy using a radionuclide-labeled somatostatin analogue, such as octreotide scan, is a sensitive and specific technique for localizing VIPoma.<sup>7</sup> In addition, an elevated plasma concentration of VIP supports the diagnosis.<sup>8</sup> Unfortunately, VIP concentration does not correlated with the tumor size or malignancy.<sup>9</sup>

In addition to surgery, medical treatment for VIPoma is SR antagonist. Currently, octreotide is the drug of choice. It is a long acting somatostatin analog, first introduced in the 1980's.<sup>1</sup> Octreotide has high affinity to SR-2 and SR-5. It has only moderate affinity to SR-3.<sup>10</sup> Other somatostatin analogs include lanreotide, vapreotide have been tested in clinical trials in Europe.<sup>10</sup> These drugs have different affinity to specific SR subtypes. Apart from the antidiarrheal effect, octreotide also have anti-tumor activities.<sup>11</sup> It is postulated that octreotide increases the activity of intrinsic G-protein dependent tyrosine phosphatase and thus prevents tumor cell mitosis.<sup>12</sup>

In conclusion, we presented a case of severe hypokalemia after profuse watery diarrhea in a patient with pancreatic VIPoma. Octreotide is the treatment of choice for symptomatic control.

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# Postoperative Neuropathy After Combined Spinal-Epidural Anesthesia in a Patient Undergoing Pelvic Tumor Resection

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#### SUMMARY

Postoperative neuropathy is an uncommon complication in daily anesthetic practice. It might occur after major neuraxial block, major pelvic surgery or as one of the disabling complications of pelvic tumor. We reported a case of a 14-year-old female who presented with lumbosacral plexopathy following combined spinal epidural anesthesia for salpingo-ophrectomy of a right ovarian tumor.

Keywords: Postoperative neuropathy; combined spinal-epidural; pelvic tumor

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14-year-old girl with good past health was diagnosed to have malignant mixed teratoma of her right ovary and was scheduled for right salpingo-ophrectomy. She presented with one month history of progressive abdominal distension. Ultrasonography of the abdomen reviewed an ovarian mass measured  $18 \times 16 \times 10$ cm. On admission, she has right-sided pleural effusion and low-grade fever of 37.5°C. There was no documented preoperative neurological

complaint. Pleural tapping was performed and arterial blood gases were normal. The platelet count and the clotting profile were unremarkable.

Combined spinal-epidural anesthesia (CSE) was performed under aseptic technique in left lateral position. An 18-gauge Tuohy needle was sited at L3-4 level in the midline using loss of resistance to air technique. A 27-gauge spinal needle was introduced through the Tuohy needle with free flow of clear cerebrospinal fluid. Hyperbaric bupivacaine 0.5% (5mg/ml) 2 ml was administered. A 20-gauge epidural catheter was introduced, leaving about 4 cm inside the epidural space. No symptom of paresthesia or pain was elicited throughout the procedure. The sensory level was up to T5 after 5 minutes. Fentanyl 30 µg and isobaric bupivacaine 0.5% 18 ml were administered intermittently through the epidural catheter. She was put in supine position and remained hemodynamically stable

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throughout the 2 hours of operation with blood loss of 400 ml. The epidural catheter was removed postoperatively with no top up. Her vital signs were stable and she was then transferred back to the general ward.

Twelve hours after surgery, she complained of right leg numbress and inability to move her right ankle and toes. Physical examination revealed numbness along the L4-S1 dermatomes. Motor power was decreased on knee flexion and extension (MRC grade 4/5), right ankle flexion and extension (MRC grade 3/5). The ankle planter reflexes were absent. The epidural site was non-tender with no signs of superficial infection. Magnetic Resonance Imaging (MRI) of the lumbosacral spine did not show any epidural abscess, hematoma, or compression on the thecal sac. A neurologist's opinion was sought and suggested to rule out brain metastases or meningeal infiltration. The computed tomography of the brain was normal. marked Nerve conduction test showed reduction in the amplitude of compound muscle action potential (CMAP) in both right peroneal nerve and right posterior tibial nerve with absent right sural nerve response. The extensive involvement of the lumbosacral plexus was compatible with retroperitoneal mass compression.

Her motor weakness improved with physiotherapy and she was able to walk with crutches. After three months, MRI of the pelvis and lumbosacral spine was normal and the somatosensory evoked potential showed no response elicited in the right posterior tibial nerve and the numbness was mainly confined to the right S1 dermatome. She could walk slowly unaided. She subsequently received chemotherapy and underwent total abdominal hysterectomy and left salpingo-ophrectomy. Her paresthesia resolved with mild foot drop one year after the initial surgery.

### Discussion

Managing central neuraxial block related neuropathy is challenging as the causes are usually multi-factorial. According to our departmental protocol, it begins with reviewing of the patient's medical history and performing a detailed neurological examination, which often pinpoint to the culprit of the problem. Neurophysiological examination is an important investigative technique which provides additional information and may be able to localize the anatomical site and type of nerve damage. Imaging of the lumbosacral area and pelvis preferably by MRI scan may also be required. Liaison with neurologists is also important for the management of complicated clinical pictures.

The increasing popularity of the CSE technique should make us more aware of the management of its associated problems. CSE combines the major advantage of spinal and epidural anesthesia. It provides rapid profound neuraxial block, allows flexible drug titration and provision of postoperative analgesia. The actual incidence of neurological sequel attributed to it remains unknown because of the small sample sizes and retrospective methods. The incidence of neurological damage after CSE anesthesia ranges from 0.1 to 0.66%<sup>1</sup> The widely accepted mechanisms of injury include maldistribution of larger doses of local anesthetics, catheter migration with sacral pooling.1 Other proposed predisposing factors of postoperative neuropathy include preexisting neurological conditions such as lumbar radiculopathy, peripheral neuropathy,<sup>2</sup> intraoperative arterial hypotension leading to spinal ischemia and inadvertent spinal administration of higher concentration of local anesthetics.3

Pre-existing neurological conditions like spinal stenosis and spinal metastasis of tumor present potential management dilemmas for anesthesiologists considering central neuraxial blockade, and are therefore considered as relative contraindication. Tumor metastasis to the spinal cord may go insidiously without neurological symptoms. A case of spinal cord compression after CSE for right knee arthroplasty has been reported in a patient with prostatic cancer who was found to have epidural invasion postoperatively that was responsible for the neurological deficits.<sup>4</sup> Gemma et al. reported a patient with spinal stenosis who received epidural anesthesia for hemorroidectomy developed postoperative saddle hypoesthesia. The authors proposed that the narrow spinal canal with multiple discal protrusions could lead to mechanical compression and small ischemic damage of the spinal cord and roots which could be aggravated if diffusion of fluid was hampered by the restriction of interlaminar foramina.<sup>5</sup>

Several cases of unexplained neurological deficit following CSE have been reported.<sup>6,7</sup> These reports mainly come from pregnant patients receiving CSE for Cesarean delivery, in which other confounding factors need to be taken into account, such as the lithotomy position, position of fetal head and surgical or retractor-induced trauma to the nerve plexus.

Other risk factors for neurological complications associated with central neuraxial blockade should also be considered (Table 1).<sup>2</sup> Possible mechanisms in this case can be related to the technique, the drug administered, surgical trauma and the existing disease.

With regard to the technique, paresthesia elicited during needle insertion has been shown to have more frequent long-term neurological sequelae.<sup>8</sup> Casati *et al.* reported 8-10% spinal needle paresthesia whether needle-throughneedle or separate-needle CSE.<sup>9</sup> Caudal migration of catheter was found to increase the incidence of sacral neuropathy due to pooling of local anesthetics in small area leading to neurotoxic concentrations.<sup>10,11</sup>

Damage to the lumbosacral plexus during needle placement or advancement of the epidural catheter could occur. Presence of needle paresthesia during placement significantly increases the risk of persistent paresthesia.12 Concern has also been raised about initiating subarachnoid blockade before placing an epidural catheter because it may mask the paresthesia and therefore increase the risk of neurological complications.13 The theoretical inadvertent migration of the epidural catheter into the subarachnoid space resulting in delivery of large volume of local anesthetic could also contribute to the postoperative neurological deficit. The risk of catheter

**Table 1.** Risk factors for neurological complication.

	History or signs of generalized artherosclerosis
	Diabetes mellitus
	Uremia
	Advanced age
ת ת	Auvalieu age
<i>Б. D</i> 1	soruers of the spine
	Detormation
	Limited range of mobility
	Previous surgery of the spine
	History of symptoms indicative of spinal stenosis
	Previous X-ray indicative of disc degeneration, spondylosis, spondylitis, osteoporosis,
	malignant process
C. Po	lyneuropathy
	Disturbed sensory function in lower extremities or sphincter function.
	Abnormal reflexes in lower extremities
D. Bl	eeding disorders
	History of bleeding diathesis or current therapy possibly affecting haemostasis
E. Pr	olonged continuation of block
	Risk for complications may increase with duration of therapy
F. Dr	us therany affecting hemostasis
2,	Therapy with low-dose henarin Non-steroidal anti-inflammatory drugs or dextran may
	inclup, marton dos repaint, ton service and manifestory drugs of deviating

migration during CSE block has been studied by Holmstrom *et al.* using percutaneous epiduroscopy in cadavers. This study found that multiple dural punctures with the spinal needle (25G) for more than 5 times and the dural hole made by the Tuohy needle increased the chance of the epidural catheter penetrating the perforated dura. The fat distribution also influences the course of the epidural catheter in the epidural space.<sup>14</sup> This is unlikely to be the cause in our patient as the CSE was uneventful with a single attempt and no paresthesia was elicited during needle and catheter insertion.

All local anesthetics are potentially toxic.<sup>15</sup> Lidocaine and tetracaine are potentially neurotoxic in clinically used concentrations.8 In 1985, Ready et al. evaluated the neurotoxic effects of single injections of local anesthetics in Histopathologic and rabbits. changes neurological deficits did occur with higher concentrations of tetracaine and lidocaine.16 Recent studies of electrophysiologic toxicity of local anesthetics in desheathed peripheral nerve models demonstrated that clinically used concentrations of 5% lidocaine and 0.5% tetracaine caused irreversible conduction block whereas 1.5% lidocaine, 0.75% bupivacaine, and 0.06% tetracaine did not.17-19 Although experimental studies in animals have provided ample evidence that some local anesthetics in clinically relevant concentrations can injure nerve tissue, the exact mechanisms of injury are unclear. The postulated mechanism of neurotoxicity in Johnson and Uhl et al. studies could be due to the increase in intracellular calcium and was not likely from sodium channel blockade.<sup>20</sup> Subsequent work in this model also noted moderate increases in calcium, probably from the endoplasmic reticulum. Different laboratory models have proven that all local anesthetics can be neurotoxic but that lidocaine and tetracaine are potentially more neurotoxic than bupivacaine.<sup>21</sup> However, Paech reported a case of unexplained neurological deficit after CSE for Cesarean delivery, which might be subarachnoid administration related to of hyperbaric bupivacaine.<sup>6</sup> The incidence of with intrathecal peripheral neuropathies bupivacaine in 329 patients undergoing spinal

anesthesia was 0.7% in the Hampl's studies compared with 37% after hyperbaric lidocaine.<sup>22,23</sup> The neuropathies were transient and confounded by independent risk factors, such as the lithotomy position. In animal and invitro models, bupivacaine causes less changes than hyperbaric lidocaine,<sup>24,25</sup> and there is no histological changes with clinically relevant doses and concentrations.<sup>26</sup> Hence the possibility of bupivacaine related neurotoxicity is unlikely in our patient for the dosage we used.

Nerve roots from T12 to L4 contribute to the lumbar plexus, and those from L4 to S4, to the sacral plexus. These are commonly considered as the lumbosarcal plexus. It lies posterior to the psoas muscle and travels deep into the pelvis. Direct trauma is rare and reported cases are associated with radical pelvic dissection.<sup>27</sup> The ovaries lie on the lateral wall of the true pelvis. They are held in place by the peritoneum of the broad ligament, and to some extent, the connective tissue that runs to the lateral wall of the pelvis. Due to the proximity of the ovaries to the lumbosarcal plexus, mass effect of the ovarian tumor of our patient could possibly exert pressure on the lumbosarcal plexus.

Nerve damage secondary to compression is a complex process. It could result from mechanical stretching during operation, ischemia due to arterial hypoperfusion and metabolic derangements on a microanatomical level. The effect of nerve damage depends on the duration of the insult, the force imparted and the size of the affected nerve fiber.28 These effects can be primary or secondary and the extent of these injuries determines the potential for recovery. The time course for nerve compression induced neuropathy was noted by Lundborg et al., who demonstrated 6 to 8 hours of compression as the time period before occurrence of structural damage.29

Another factor that needs to be considered is the neoplastic lumbosacral plexopathy. Also known as lumbosacral carcinomatous neuropathy, it is a complication associated with pelvic tumors. Plexus involvement occurs as a result of tumor extension or invasion and heralds a progressive disease course. Lumbosacral plexus involvement occurs most commonly due to intraabdominal tumor extension.<sup>30,31</sup> Croft *et al.* reviewed 33 patients with carcinomatous peripheral neuropathy.<sup>32</sup> In one group of patients with mild peripheral neuropathy, they found a variable interval after the first symptoms of the carcinoma, and the lower limbs were most frequently affected leading to some degree of weakness, peripheral sensory impairment and diminished tendon reflexes. Electrodiagnostic testing revealed acute and chronic denervation of the lumbosacral plexus. Considering the malignant nature of the ovarian teratoma of our patient, we still have this suspicion in mind.

### Conclusion

In this patient, we applied CSE to avoid general anesthetic in view of her pleural effusion. She has no preoperative neurological complaints. We believed that her postoperative neuropathy was likely resulted from her ovarian tumor causing compression injury to the nerve plexus and possibly the coincident malignancy related peripheral neuropathy. The administration of central neuraxial blockade may complicate the clinical picture in this group of patients. The signs and symptoms of pre-existing neurological deficit should be sought preoperatively. A thorough history and complete physical examination should be performed especially in those at risk for nerve injury. The choice of using major neuraxial blockade in patents with pelvic tumor should be carefully evaluated with preoperative neurological status welldocumented. Patient should be informed of the associated risks, and postoperative evaluation is pertinent to look for complications.

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# **Board of Education**

### Continuing Medical Education / Continuing Professional Development

In the past few HKAM Education Committee meetings, Continuing Medical Education / Continuing Professional Development (CME/CPD) requirements for the fellows of different Colleges were reviewed. In principle, HKAM will plan to move in the direction of incorporating mandatory CPD activities for future CME/CPD cycles.

The following activities are defined by our College as CPD activities for future reference:

- (1) Self-study College approved self study programmes and or self assessment programmes.
- (2) Active Participation Speaker, chairman, panelist or presenter in Formally College Approved Activity
- (3) Publications In peer reviewed journals approved by the College (e.g. the Bull HK Coll Anaesthesiol)
- (4) Research With publication in peer reviewed journals approved by the College

- (5) Development of New Technologies or Services
- (6) Postgraduate Teaching
- (7) Conducting Examinations
- (8) Quality Assurance and Medical Audits Clinical/surgical review and audit Clinical governance Activities that examine and evaluate the clinical care of patients
- (9) Mortality and Morbidity Meetings
- (10) Postgraduate Courses
- (11) Development of CME/CPD Materials
- (12) Activities for Improvement of Patient Care Information technology training Interpersonal and communication skill training Skills laboratory learning Virtual reality learning Grand Rounds in Training Units

We would like to provide fellows with flexible and wider choices of learning and to facilitate our Fellows in gaining CPD points. Fellows will be informed and consulted of further progress.

YF Chow Chairman, Board of Education

# Formal projects

The College has recently received a number of enquires regarding access to the membership database. The Council has resolved to release the membership database only after:

- 1. a written communication in an acceptable form is received;
- 2. that the request is related to an approved formal project;
- 3. that the membership database cannot be obtained by other alternative means;
- 4. that the membership database will be used specifically for the purpose of conducting the approved project proposal.
- 5. that a disclaimer be communicated to the applicant that the College does not guarantee the accuracy of the contents of the membership database provided.

Please contact the College office for further queries.

Daniel Tso Administrative Assistant

# **Board of Accreditation**

As the year 2005 draws to a close, I have the pleasure to update our college members on recent developments in the area of college accreditation.

The new HKCA module-based training system was rolled out in early 2005. From my impression, individual hospital's concerns and fear about the change turned into enthusiasm and support when it became clear that the new system offered clearer objectives and ease of administration for the Supervisors of Training. Some nagging problems will always be there, and is being tackled slowly. Parts of the HKCA Administrative Instructions related to college accreditation have been modified and approved by council recently to coincide with changes in guidelines of the Boards of Education. The aim, overall, is to raise standards of supervision and training to a level comparable to other worldrenowned anesthetic colleges.

A list of approved hospitals and their

accreditation status is available in the College website (www.hkca.edu.hk) for members' perusal. The outstanding reports for the Kowloon Central Cluster (Queen Elizabeth and Hong Kong Eye Hospitals) and United Christian Hospital are absent due to technical problems and they will be included in the next issue of the *Bull HK Coll Anaesthesiol*.

I wish to thank all members of the Board of Accreditation for their cooperation, patience and efforts in the tedious process of inspection and report writing. In particular, Dr Chow Yu-Fat helped me with the inspection for Tung Wah Hospital on a rainy Saturday morning when we got soaking wet, but his umbrella and wit eventually saved the day for us!

Merry Christmas and Happy New Year.

John Liu Board of Accreditation Chairman

### **Revision Tutorial Courses 2005**

The Revision Tutorial Course in Basic Sciences and Clinical Anaesthesiology 2005 were held at the Queen Elizabeth Hospital from 14-25 November and 26 November-3 December, respectively. Both courses were again conducted by Professor Peter Kam, Professor of Anaesthesia, St George Hospital, University of New South Wales, Australia. Twenty-nine trainees from 9 different hospitals attended the Basic course, and 19 registrants, all in their preparation for the final examination attended the Clinical course.

The goals of these courses are to prepare trainees presenting for their Fellowship examination in 2006, and ran on a lecture/tutorial/mock viva basis and active participation are expected from the participants.

Overall the feedbacks were positive. A few trainees commented on the early start of the course at 08:00 hour. However, it was necessary to cover the vast amount of materials. Professor Kam was very pleased with the performance and readiness of many participants this year. He was certainly a very tired man after three weeks of teaching, and as I recall, this is probably the first time he did not catch a flu during the three weeks.

I would also like to take this opportunity to thank all departments for releasing their trainees to attend the Revision Courses and making it a successful one. The College is most grateful to Professor Kam for his time and effort in running these courses.

Course Organizers CH Koo, Douglas Fok

# **Board of Pain Medicine**

The Diploma of Pain Management examination was held on 5 November 2005. Seven candidates sat for the examination and six passed. Congratulation to:

CHAN Hing Tsuen CEUNG Chi Wai CHU Suk Yi HUI Kit Man, Grace YEO Patricia YUEN Man Kwong

At the recent Board of Pain Medicine meeting held in November, the Board had decided to review the Diploma of Pain Management training programme and examination over the next 6 months. I shall report to you when the new changes have been deliberated and approved by HKCA Council.

A HKCA Pain SIG meeting was held on 2 December 2005 at the Prince of Wales Hospital. Professor Michael Nicholas of University of Sydney, Royal North Shore Hospital gave a talk on "Work Conditioning and Functional Restoration in the Injured Worker". Over forty registrants from different disciplines attended the meeting.

The Pain Seminar entitled "Essentials of chronic pain management" organized by the Board of Pain Medicine was held at the Penthouse Ballroom of Miramar Hotel on 4 December 2005. One hundred ninety five registrants from over 15 medical specialties and related disciplines attended the meeting. A multidisciplinary faculty comprising of local and overseas experts presented 10 lectures at the full-day seminar. I would like to thank all members of the Organizing Committee, invited speakers and sponsors for making the meeting a successful first multidisciplinary pain meeting.

PP Chen Board of Pain Medicine

# **Board of Intensive Care Medicine**

The Final Fellowship Examinations in Intensive Care Medicine were recently completed on 3<sup>rd</sup> December 2005. One of three candidates passed the examination. The Hong Kong College of Anaesthesiologists would like to congratulate Dr Gladys Kwan from Queen Elizabeth Hospital on her success.

Our College would also like to thank Dr Wong Kwan Keung from the Hong Kong College of Physicians for his hard work as our external examiner. The Board of Intensive Care looks forward to working more closely with our counterparts from Critical Care Medicine in the future. The Final Fellowship Examinations has also introduced the Objective Structured Clinical Examination format for the first time this year. This was preceded by a workshop on the 5<sup>th</sup> November 2005 at Queen Mary Hospital. The purpose of the workshop was to allow candidates some practice to become familiar with some of the details.

Peggy Tan Board of Intensive Care Medicine

# "Fellow ad eundem"

The Council has resolved on the admission for "**Fellow** *ad eundem*"2006. The same applies to application for both the specialty of *Anaesthesiology* and the sub-specialty of *Intensive Care Medicine*. Details on the **New Policy** can be found on the College website and HKCA Newsletter 2004; 13(1):11.

- 1. All applications are to be received by the published deadline of **13 April 2006**. (Late application will not be considered)
- 2. The applications will be vetted by a select committee approved by the College Council
- 3. Only short-listed applicants will be invited to attend the next available *Exit Assessment* (i.e. **15 June 2006).**
- 4. The Exit Assessment panel will make a final recommendation to the College Council
- 5. The resolution of College Council will be ratified at the Annual General Meeting 2006 (no later than **28 July 2006**).
- 6. Seniority date of Fellowship will be the date of the Annual General Meeting.
- 7. Fellowships *ad eundem* will then be recommended to the Academy for admission as fellow in the respective specialty.

### **Final Fellowship Examination July / September 2005**

FUNG Nga Yin MARK Ching Sze, Veronica CHEUNG TSE Kin Chung WONG Yee Yan, Ian YIP Kim Ho

Five out of 14 candidates passed the examination. The HKCA Final Fellowship Examination Prize was awarded to Dr WONG Yee Yan, Ian.

The College is grateful to Dr Keith Myerson of RCA, and Dr Kenneth Sleeman of ANZCA for their assistance as External Examiners during the examination.

## Fellowship Examinations 2006

#### **Intermediate Fellowship Examinations**

Examination Fee: \$ 6,000

Feb / March	Date
Written	10 February 2006 (Fri)
Oral	31 March/1 April 2006 (Fri/Sat)
Closing Date	10 Jan 2006 (Tue)

July / August	Date
Written	7 July 2006 (Fri)
Oral	25/26 Aug 2006 (Fri/Sat)
Closing Date	7 June 2006 (Wed)

### **Final Fellowship Examination in Anaesthesiology** Examination Fee: \$ 9,500

March / May	Date
Written	17 March 2006 (Fri)
Oral/OSCE	19-21 May 2006 (Fri-Sun)
Closing Date	17 February 2006 (Fri)

July / September	Date
Written	21 July 2006 (Fri)
Oral/OSCE	1-3 Sept 2006 (Fri-Sun)
Closing Date	21 June 2006 (Wed)

### **Exit Assessments for Year 2006**

Date		
12 January 2006	Thursday	
13 April 2006	Thursday	
15 June 2006	Thursday	
12 October 2006	Thursday	

*Trainees who qualified to apply for fellowship are <u>recommended</u> to have their applications arrived at the HKCA office at least 21 days before the scheduled Exit Assessment, to allow time for processing.* 

Application forms are available from Supervisors of Training and HKCA Office.

# Future Meetings: Anesthesia, Intensive Care & Pain Medicine Local meetings 2006

11 and 14 January, 2006	<b>LECTURE ON INTERVENTIONAL PAIN MANAGEMENT</b> Guest speaker: Dr Philip Finch, Medical Director, Perth Pain Management Centre, Australia Venue: Lecture Theatre, 10/F., New Wing, Kwong Wah Hospital Contact: Ms Vivian Chan, Phone: 35175056; Fax: 35175269
14-15 January, 2006	<ul> <li>2<sup>ND</sup> ASIA PACIFIC NATA SYMPOSIUM ON TRANSFUSION MEDICINE AND ALTERNATIVES</li> <li>Venue: Lecture Theatre, M/F, Hospital Authority Building, 147B Argyle Street, Kowloon, Hong Kong</li> <li>Contact: NATA Secretariat c/o LMS Group, 75, rue Guy Môquet, 92240 Malakoff – France, Phone: +33 1 42 53 03 03 - Fax: +33 1 42 53 03 02;</li> <li>E-mail: nata.secretary@lms-group.com</li> </ul>
21 January, 2006	<b>COMMISSIONED TRAINING IN ANAESTHESIOLOGY 2005-6</b> Theme: Ultrasound and Regional Anaesthesia Venue: Lecture Theatre, HA Building Guest Speaker: Professor Vincent Chan, Toronto Western Hospital Contact: Maria Tang, HAHO, Email: tangsm@ha.org.hk
18 February, 2006	DIFFICULT AND ADVANCED AIRWAY MANAGEMENT WORKSHOP (DAAM) Venue: To be advised Contact: Room 807, Hong Kong Academy of Medicine Building, 99 Wong Chuk Hang Road, Aberdeen, Hong Kong Phone: (852) 2871 8833. Fax: (852) 2814 1029, Email: office@hkca.edu.hk, website: www.hkca.edu.hk
25 February, 2006	HKAM's THIRD INTER-COLLEGIATE SCIENTIFIC MEETING Theme: Disaster – How well prepared are we?" Venue: Hong Kong Academy of Medicine Jockey Club Building, 99 Wong Chuk Hang Road, Aberdeen, Hong Kong Contact: HKAM Conference Department, Hong Kong Academy of Medicine Building,; Phone +(852) 2871 8787; Email: lenora@hkam.org.hk
8-9 May, 2006	HOSPITAL AUTHORITY CONVENTION 2006 Theme: "From Policy to Practice, 政策與實踐" Venue: Hong Kong Convention and Exhibition Center Contact: Hospital Authority Convention 2006 Secretariat Room 209N Hospital Authority Building, 147B Argyle Street, Kowloon, Hong Kong SAR. Tel: (852) 23006808; Fax: (852) 28950937; Email: hac@ha.org.hk
17-19 November, 2006	ANNUAL SCIENTIFIC MEETING 2006 Theme: Cardiothoracic and vascular anesthesia Venue: Hong Kong Convention and Exhibition Center Contact: ASM 2006 Secretariat, c/o International Conference Consultants, Ltd. Unit 301, 3/F The Centre Mark, 287-299 Queen's Road Central, Hong Kong, Tel (852) 25599973; Fax: (852) 25479528; Email: asm2006@icc.com.hk

# **Overseas Meetings 2006**

San Diego, USA 14-18 January, 2006	6 <sup>TH</sup> ANNUAL INTERNATIONAL MEETING ON MEDICAL SIMULATION Venue: San Diego Sheraton. Contact: Society for Medical Simulation, PMB 300 223 N. Guadalupe, Santa Fe, NM 8750 USA. Tel: 1 505 983 492 Fax: 1 505 983 5109 Email: info@SocMedSim.org Website: www.socmedsim.org
<b>Hobart, AUSTRALIA</b> 18-19 February, 2006	<b>THE 2006 COMBINED ANZCA/ASA ANNUAL SCIENTIFIC MEETING</b> Venue: Henry Jones Art Hotel. Contact: Di Cornish, Regional Administrative Officer. C/- AMA House, 2 Gore Street, South Hobart TAS 7004. Tel: +61 3 6223 8848 Fax: +61 3 6223 5019 Email: Dianne.Cornish@surgeons.org
San Francisco, USA 24-28 March, 2006	INTERNATIONAL ANESTHESIA RESEARCH SOCIETY 80 <sup>TH</sup> CLINICAL AND SCIENTIFIC CONGRESS Venue: Hyatt Regency San Francisco Embarcadero Center. Contact: International Anesthesia Research Society, 2 Summit Park Drive #140, Cleveland, OH 44131 , USA. Phone: 1 216642 1124 Fax: 1 216 642 1127 Email: iarshq@iars.org Website: www.iars.org
<b>Adelaide, AUSTRALIA</b> 13-17 May, 2006	2006 ANZCA ASM Theme: All in a Day's Work? Venue: Adelaide Convention Centre. Contact: Mr Christopher Boundy, South Australian Postgraduate Medical Education Association Inc (SAPMEA) Tel: 08 8274 6060 Fax: 08 8274 6000 Email: admin@sapmea.asn.au Website: www.sapmea.asn.au/conventions/anzca/index.html
<b>Rotterdam, NETHERLANDS</b> 21-25 May, 2006	8 <sup>th</sup> INTERNATIONAL NEUROTRAUMA SYMPOSIUM Main themes: Impact of neurotrauma; Cross talk; Dynamics of lesion progression; Pediatric TBI: a developing concern; Ethics and trials; Genes and destiny; Breaking barriers Contact: Scientific secretariat, Erasmus MC, Dept. of Neurosurgery, Room Ba- 463, P.O. Box 2040, 3000 CA Rotterdam, The Netherlands; Phone: +31 (0)10 - 463 40 75; Fax +31 (0)10 - 463 40 75; E-mail: m.vangemerden@erasmusmc.nl
Madrid, SPAIN 3-6 June, 2006	EUROANAESTHESIA 2006 Contact: Phone: +44 (0) 870 0132930 Fax: +44 (0) 870 0132940 Email: info@optionsglobal.com Website: www.optionsglobal.com
<b>Toronto, CANADA</b> 16 - 20 June	<b>CANADIAN ANAESTHESIOLOGISTS' SOCIETY ANNUAL MEETING.</b> Venue: Toronto. Contact: 1 Eglinton Avenue East, Suite 208, Toronto, Ontario Canada M4P 3A1. Tel: 416 480 0602 Fax: 416 480 0320 Email: meetings@cas.ca Website: www.cas.ca
<b>Queensland, AUSTRALIA</b> 20-24 October, 2006	65 <sup>тн</sup> NATIONAL SCIENTIFIC CONGRESS OF THE AUSTRALIAN SOCIETY OF ANAESTHETISTS Contact: Organizers Australia. PO Box 1237, Milton, Qld 4064. Tel: +61 (0)7 3371 0333 Fax: +61 (0)7 3371 0555
SINGAPORE 6 -10 November, 2006	12 <sup>th</sup> ASIAN-AUSTRALASIAN CONGRESS OF ANESTHESIOLOGISTS Venue: Suntech City Convention Center Email: gancyw@sgh.com.sg

### WORKSHOPS ORGANISED BY THE INSTITUTE OF CLINICAL SIMULATION

A Collaboration between the Hong Kong College of Anaesthesiologists and the North District Hospital

Date:	First Saturday of each month (please check with HKCA Secretariat)	
Time:	08:00 - 18:00	
Venue:	The Institute of Clinical Simulation	
CME points:	HKCA 10 points	
Max participants:	4	
Fee:	HK\$2000 per head	
Format:	Each registrant will participate in	
	(1) An introduction on the METI Simulator, the anesthetic machine for use in the workshop and the theories of crisis management	
	(2) Allocated time for hands-on crisis scenario management on the METI Simulator, rotating through different roles and handling different scenarios	
	(3) A group debriefing session at completion of each scenario	

a confidentiality statement.

# Difficult and Advanced Airway Management Workshop (DAAM)

DATE:18th February, 2006TIME:8:45 a.m. - 12:30 p.m.VENUE:The Institute of Clinical SimulationCME:HKCA 3 pointsFEE:HK\$600

Deadline of application: 1st February, 2006

Airway management is a critical aspect of clinical practice. Complicated by co-morbidities and different clinical scenarios, thorough understanding of the logic of tackling different airway problems is the key to successful management of anticipated or unanticipated airway problems. In this workshop, participants are not only introduced to the basic knowledge on recognition of potential difficult airways and practical information in handling airway crisis, there are also hand-on practical sessions on different airway gadgets as well as demonstration on establishing surgical airways.

Registration will be on first come first served basis. For enquires, please contact HKCA secretariat at 28718833

(Application form can be downloaded from the College website: *www.hkca.edu.hk*)

# **Missing Fellows**

The College has lost contact with the following Fellows and Members. If you happen to know their whereabouts, please contact the College office by phone: (852) 2871 8833; fax: (852) 2814 1029; email: office@hkca.edu.hk or ask the fellow or member concerned to contact the College office directly.

LI, Kai ChungWAI,KWOK, Che LingKHOOGUNAWARDENE, W.M.S.FUNOHWEE, Mun FoonYI, ChHO, Kwok MingLEUNYIP, EricLAU,LAW, Chung LungKWAILIU, Kwok KuenKONOCHAU, Ching PingMA, WTONG, Ka Fai HenryLUKE

WAI, Chor Keung KHOO, Chun Beng FUNG, Yiu Tung YI, Chung Yiu LEUNG, Kam Kin LAU, Chun Hong KWAN, Sau Man KONG, Kau Fung Vincent MA, Wai Han LUKE, David Baw

Fellows and members are reminded that annual subscription must be paid as scheduled. Outstanding balance over 15 months will lead to termination of membership or fellowships, according to the Articles of Association and By-laws of the College. Any subsequent reinstatements will be subject to Council approval and a fee to be determined by Council.

# ASM 2006

Dear friends and colleagues,

On behalf of the Hong Kong College of Anaesthesiologists and the Society of Anaesthetists of Hong Kong, I am delighted to invite you to take part in the Annual Scientific Meeting 2006. The main theme is Cardiothoracic and Vascular Anesthesia.

The two organizations had worked together to host the scientific meeting for years. The past occasions had been very well attended and received. We hope the coming meeting will again provide an opportunity for all those who are interested in cardiothoracic and vascular anesthesia to keep abreast of the latest developments in these specialties. It is our pleasure to have many leading overseas and local speakers to present at the meeting. We are confident that participants will find the program not only rich in medical knowledge, but also of value in clinical practice.

Please mark on your calendar this exciting and informative event, and register early to take advantage of the "early-bird" concession.

We look forward to seeing you at the Meeting!

Dr CF Fung Chairman Organizing Committee

### HONG KONG COLLEGE OF ANAESTHESIOLOGISTS VOCATIONAL TRAINING GUIDE FOR ANAESTHESIOLOGY

#### 1. VOCATIONAL TRAINING PROGRAMME

- 1.1 Only Members of the College who are registered as trainees with the Board of Education of the College may have their experience accredited towards their vocational training programme requirements as described hereunder.
- 1.2 These requirements will apply to all trainees joining the training programme on or after 1st January 2005 unless otherwise specified.
- 1.3 Members of the College must register as trainees with the College within six months of the start of training for the training experience to be accredited, otherwise they will have their experience assessed and accredited as for anaesthetists being trained overseas as specified under Section 1.4.
- 1.4 Trainees with previous training in overseas training programmes or other non-approved positions will have their experience considered and accredited individually. A fee for such an assessment will be charged in proportion to the duration retrospectively approved subject to a minimum charge. The fee will be determined by Council from time to time. They will need to become Members of the College and register as trainees before any further experience can be considered for accreditation.
- 1.5 Vocational training in anaesthesiology shall consist of not less than six years after full registration with the medical registration authority.
- 1.6 The six-year vocational training programme in anaesthesiology shall be full-time and shall consist of the following components:-
  - 1.6.1 Non-anaesthetic clinical experience 6 months
  - 1.6.2 Clinical Anaesthesia 48 months
  - 1.6.3 Intensive / Critical Care Medicine 3 months
  - 1.6.4 Elective Options 15 months
- 1.7 Non-anaesthetic clinical experience [referred to under section 1.6.1] must be obtained in training units approved by an Academy College in Hong Kong. Training in the other units will be individually approved by the College. Internal medicine, paediatrics, emergency medicine, intensive care and pain medicine are examples of recognised non-anaesthetic clinical experience.
- 1.8 The Clinical Anaesthesia experience [referred to under section 1.6.2 and 1.6.4] must include an adequate exposure to all of the following CORE areas in anaesthesia. To ensure adequate exposure, a trainee is expected to have managed a minimum number of cases

in each core subspecialty<sup>1</sup> (as defined in the brackets) over the 6 years of training

- 1.8.1 anaesthesia for general surgery / urology / gynaecology (500 cases)
- 1.8.2 anaesthesia for orthopaedics and traumatology (500 cases)
- 1.8.3 obstetric anaesthesia (100 cases) and obstetric regional analgesia (50 cases)
- 1.8.4 neuroanaesthesia (100 cases)
- 1.8.5 thoracic anaesthesia (50 cases)
- 1.8.6 paediatric anaesthesia (100 cases of children ≤ 6 years, including neonates)
- 1.8.7 anaesthesia for Head and Neck/ENT/Oro-faciomaxillary (100 cases)
- 1.8.8 emergency/trauma anaesthesia (500 cases)
- 1.8.9 acute pain management (300 patient-days)
- 1.9 Apart from the CORE areas, some experience in each of the following NON-CORE subspecialties<sup>1</sup> would be required, particularly for future subspecialty development. Trainees will be required to complete two modules from category 1 and a minimum of 20 cases from category 2.
  - 1.9.1 Category 1 NON-CORE modules
    - 1.9.1.1 ophthalmic anaesthesia (50 cases)
    - 1.9.1.2 day surgery anaesthesia (100 cases)
    - 1.9.1.3 anaesthesia in non-operating theatre locations including but not limited to Organ Imaging Suite, Endoscopy Suite, Cardiac Catheterisation Laboratory, ECT (50 cases)
    - 1.9.1.4 pain medicine (50 chronic/cancer pain cases)
  - 1.9.2 Category 2 NON-CORE Modules
    - 1.9.2.1 major vascular anaesthesia
      - 1.9.2.2 cardiac anaesthesia
      - 1.9.2.3 transplant anaesthesia
      - 1.9.2.4 neonatal anaesthesia

#### 1.10 Elective options [referred to under Section 1.6.4]

- 1.10.1 Trainees may undertake the following or a combination of the following as part of their elective training:-
  - 1.10.1.1 clinical anaesthesia
  - 1.10.1.2 intensive / critical care medicine
  - 1.10.1.3 pain medicine
  - 1.10.1.4 other clinical specialties apart from anaesthesia, intensive / critical care medicine and pain medicine (most of the hospital based specialties will be accepted except pathology)
  - 1.10.1.5 research related to anaesthesia and / or intensive / critical care medicine and / or pain medicine

- 1.10.2 With effect from 1<sup>st</sup> July 2004, training in elective options in clinical anaesthesia, intensive/critical care medicine and pain medicine must occupy a training post approved by the College. Training in elective options in other clinical specialties must be in training units approved by the College or the respective specialty College in Hong Kong. In case of doubt, prior approval from the College will have to be sought. Research positions must have prior approval of the College.
- 1.10.3 Elective options are subject to the following limitations:-
  - 1.10.3.1 Not more than 12 months may be spent in research.
  - 1.10.3.2 Not more than 6 months in any clinical specialties referred to under 1.10.1.4
- 1.11 The minimum period of hospital appointment for approved training is three months.
- 1.12 Vocational trainees shall undergo rotational training in accredited hospitals in approved rotation schemes / programmes endorsed by the College.
- 1.13 All trainees are required to carry out and submit a Project to the Education Committee to demonstrate an understanding of research and research methods in medical practice. The submitted Project must have received approval from the Education Committee before vocational training is considered complete.
- 1.14 All trainees joining the training programme on or after 1<sup>st</sup> January 2005 are required to complete satisfactorily the Effective Management of Anaesthetic Crisis (EMAC) course or its equivalent.
- 1.15 Registered trainees may sit the Intermediate Fellowship examinations of the College at any time. The Final Fellowship examination may be taken after completing at least four years of approved training with at least three years of approved anaesthetic training.
- 1.16 If trainees fail to complete all requirements for Fellowship at the end of their six-year vocational training period, they are given a further period of three years to complete their Fellowship requirements without the need to occupy a training post. If they fail to complete Fellowship requirements within that time, they must rejoin the vocational training programme for at least one year and until completion of all requirements. During the three-year non-training period pending completion of Fellowship requirements, they must be in clinical appointments, otherwise they must be individually considered by the Education Committee.
- 1.17 Trainees who repeatedly fail at examinations should be counselled after every third attempt for the same examination or at the end of the six-year vocational

training period if they have not completed all examination requirements.

- 1.18 Trainees who, for whatever reason, stop vocational training and restart training must not have an interruption of more than three years in order to have their previous approved training counted fully. The period of interruption must have been spent in clinical appointments. If these conditions are not fulfilled, their case will be assessed individually by the Education Committee.
- 1.19 Vocational trainees shall acquire their necessary clinical anaesthetic training experience at accredited hospitals within the rotation programme involving more than one accredited hospital.
- 1.20 Each vocational trainee shall keep a LOG BOOK in the approved format to document all cases handled. The HKCA electronic log-book will be compulsory for trainees receiving their training in Hong Kong with effect from July 2004. The log book should be audited by the Supervisor of Training of accredited hospitals at least annually to ensure adequate exposure to the various CORE and NON-CORE sub-specialties available in the hospital, having regard to the previous training experience of the trainee. The Supervisor of Training is responsible for the certification that the case load experience meets the requirements that may be stipulated by the Education Committee from time to time. The Log Book(s) will be subject to the scrutiny of the Education Committee on demand.
- 1.21 For the purpose of accreditation of training, individual hospitals shall be accredited for training in clinical anaesthesia referred to under 1.6.2 in the different CORE / NON-CORE subspecialties.
- 1.22 All trainees have to undergo regular In-Training Assessments (ITA) with effect from 1st July 2004, in accordance with Administrative Instructions for In-Training Assessment. This assessment complements formal College Examinations and is intended to focus primarily on the attainment of clinical skills, attitudes and behaviour for competent professional practice. The College designated specialist trainers and the Supervisor of Training will undertake ITA with formal documentation. All trainees should have completed ITA satisfactorily before being allowed to attempt the final fellowship examination or exit assessment. When a trainee consistently (2 or more unsatisfactory ITAs) performs below expected standard, not withstanding repeated documented attempts at remediation, the Education Committee needs to be consulted. The trainee can appeal to the College or the Hong Kong Academy of Medicine for any dispute of ITA.

#### 1.23 Part-time Training

Part-time training can be allowed during fellowship vocational training with effect from 1st Jan 2006 in accordance with Administrative Instructions for Part Time Training.

- 1.23.1 Part-time training will be considered on an individual basis and must have prospective approval from the Board of Education.
- 1.23.2 The specific part-time arrangements must be documented and supported in writing by the Trainee's Head of Department.
- 1.23.3 The trainee must have completed 12 months full time clinical anaesthesia training.
- 1.23.4 No training duration beyond one year of effective full-time equivalent (FTE) clinical anaesthesia training will be recognized in general.
- 1.23.5 Part-time training must result in the equivalent total training duration and training content as is required for full-time equivalent (FTE) Trainees. Out of hours duties may not be mandatory.
- 1.23.6 Duties of Part-time training must be assigned on a pro rata basis and must comprise a minimum of 50% of the commitment of a fulltime trainee In general, one year of Full Time Equivalent Clinical Anaesthesia training can be converted to a maximum of two years of Part Time Clinical Anaesthesia training.
- 1.23.7 The minimum duration of part-time training applied for accreditation is 6 months.
- 1.23.8 Normally, the part-time trainee needs to occupy half a FTE training post, and two half-time trainees can share one FTE training post accordingly.
- 1.23.9 Part-time training must involve participation in cluster or hospital teaching activities.
- 1.23.10 Part-time Trainees must maintain an appropriate training record including eLogbook and In Training Assessment to be submitted to the Training Officer so that the workload and training experience can be evaluated accurately.
- 1.23.11 Part-time training requires registration with the College and normal payment of the full Annual Membership Fee as determined by the Council.

#### 2. FELLOWSHIP EXAMINATIONS

- 2.1 Candidates for all examinations must be Members and registered trainees of the College.
- 2.2 A candidate would only be considered for admission to the examination if his application to sit the examination is received together with the prescribed fees on or before the deadline for application to sit the examination, which shall not be more than eight weeks or less than three weeks before the date of the written examination. Late applications will not be considered.
- 2.3 There shall be at least one overseas external examiner at each examination at the invitation of the Hong Kong College of Anaesthesiologists.
- 2.4 Intermediate Fellowship Examination in Anaesthesiology
  - 2.4.1 The Intermediate examination may be attempted at any time.
  - 2.4.2 The Intermediate examination shall consist of written papers and oral examinations in the following subject areas:-
    - 2.4.2.1 Physiology and Principles of Measurement
    - 2.4.2.2 Pharmacology and Principles of Statistics
  - 2.4.3 The oral examination shall be held after the written part of the examination. The interval between the two parts of the examination shall be determined by the Board of Examinations and shall not be more than eight weeks.

#### 2.5 Final Fellowship Examination in Anaesthesiology

- 2.5.1 Candidates for the Final Fellowship examination must be a Member of the College and a registered trainee at the time of application. He/she shall also occupy an approved training position at the time of the examination, except for the provisions under Section 1.16 of the Vocational Training Programme.
- 2.5.2 Candidates must have completed at least three years of approved anaesthetic training at the time of the examination, and in their fifth or last year of vocational training, except for the provisions under Section 1.16 of the Vocational Training Programme.
- 2.5.3 The Final Fellowship examination shall consist of written, oral, and clinical examinations, the format of which will be determined by the College Council from time to time on the recommendation of the Board of Examinations. Candidates will be examined in all aspects of Anaesthesia and Clinical Practice.

2.5.4 The oral/clinical examinations shall be held after the written part of the examination. The interval between the two parts of the examinations shall be determined by the Board of Examinations and shall not be more than eight weeks.

#### 3. <u>ACCREDITATION</u>

- 3.1 Members of the College, who fulfill all requirements for training and examinations as required under the applicable College Regulations a Bye-laws, are eligible to apply for Fellowship of the College subject to its Memoranda and Articles of Association.
- 3.2 The application by an eligible Member for Fellowship must be supported by two current Fellows of the College. The application shall be considered by the Board of Censors and the Council of the College in accordance with the Memoranda and Articles of Association and the Regulations & Bye-laws of the

College then in force. The decision of the Council to elect such a Member to Fellowship or otherwise shall be final.

- 3.3 Fellows of the College are considered trained and qualified specialists in the specialty.
- 4. The contents of this document is taken from the relevant documents of the College for the guidance of trainees and Supervisors of Training. If any part of this document conflicts with the Memorandum and Articles of Association, Regulations & Bye-laws, and Administrative Instructions of the College, the latter documents shall prevail.

Promulgated:	January 1995
1 <sup>st</sup> Revision:	September 1997
2 <sup>nd</sup> Revision:	February 2004
3 <sup>rd</sup> Revision:	November 2005



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- 12. Approved Product information



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Organizer, Basic Science Course: CH Koo, Aaron Lai

Organizers, Clinical Anaesthesiology Courses (Informative course and Crash course): Douglas Fok and Eric So Chairman, The Institute of Clinical Simulation: KM Ho (Chairman)