

Prof. Davy Cheng: Evidenced-based perioperative management in cardiac surgery

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Prof. Davy Cheng (Figure 1) is recognized as a world expert in perioperative outcomes and resource utilization in cardiovascular anesthesia and surgery, blood management, minimally invasive and robotic cardiac surgery, and perioperative evidence-based medicine. His pioneer work in fast track cardiac anesthesia and recovery has become the standard of cardiac anesthesia and recovery practice around the world. Prof. Cheng established the Evidence-Based Perioperative Clinical Outcomes Research Group (EPiCOR) and the MEDICI Centre (Medical Evidence, Decision Integrity, Clinical Impact) at Western and London Teaching Hospitals, Canada and continues to release a number of pivotal publications to direct evidence-based medical and surgical practice. He is a recognized healthcare leader in the forefront of research, practice and healthcare policy. In 2014, he has received the honor of Elected Honorary Member, The German Society of Anaesthesiology and Intensive Care Medicine (DGAI) and Canadian Society of Physician Executives Excellence in Medical Leadership Award for his great contribution to the field of anesthesiology. Annals of Translational Medicine (ATM) editor was much honored to invite him to share some of his insights in the 2014 Chinese Heart Congress (CHC).



Figure 1 Professor Davy Cheng.

ATM: What's the take home message from your speech on "Knowledge translation: new evidence impacting your practice in 2014" in the 2014 CHC?

Prof. Cheng: What I have outlined in my speech is regarding the background on evidence-based medicine, and I talked briefly what are the challenges for evidence and knowledge translation to impact patient care. Often enough we have best practice and best evidence but patients is not benefiting. So there is a gap for the knowledge translation despite the best science being published. For example, we have one of the question section talked about blood transfusion and blood management in carrying out surgeries. Why every hospital has a different transfusion rate for the same procedures? That's because despite the same evidence for how to conserve blood and avoid blood transfusion and manage patient, the evidence is sometime

not translated or applied to benefit patients. So there is a challenge regarding the knowledge translation, which by itself is a big topic for a one-hour presentation.

But my highlight for the speech is about the latest evidence so that people can use in their day-to-day practice. I outlined five key essentials of perioperative management. First one is the perioperative risk assessment of patients undergoing non-cardiac surgery. Those patients who don't have any CVS risk factors shouldn't be subject to unnecessary noninvasive stress test or they will have ultimate results of increased harm instead of benefit because as it turns out, more tests will do more harm on patients with false positive results for unnecessary interventions. So the guidelines I present on perioperative assessment is to be more selective in ordering cardiac tests on patients. The second point I raised this morning for the new guidelines in 2014 for non-cardiac surgery is on the perioperative hemoglobin to prevent patients have anemia. Anemia is bad, adversely increased complications and mortality of patients. One simple thing we can do is to measure and optimize the

perioperative hemoglobin of patients before surgery. And those are the things we can use in our day-to-day practice to reduce their morbidities in surgery. The third thing is on perioperative beta-blocker and medication. In the POISE I trial and POISE II trial, that beta-blocker is good to be used in patients having cardiac risk, but we have to carefully treat those factors because we cannot use them indiscriminately as in the non-cardiothoracic surgery. When patients have no previous exposure or use of aspirin or even they have probably used it, the new data of randomized control trial is supposed to show us that aspirin acts onto the patients by increasing the risk of bleeding and reducing the risk myocardial infarction. So our first priority is to ensure there is no harm to patients. Also in the perioperative medication, we need to pay attention to beta-blocker and clonidine. So we need to ensure they are not given to patients because their assumption on the physician practice to reduce the workload and the myocardial adverse event. The randomized control trial or the evidence tells us that is not the case. Therefore it's the class III strong negative recommendation: not to use of clonidine.

The last outcome I talked about is transcatheter aortic valve implant (TAVI), the surgical procedure with two subgroups: TAVI surgery verses open-heart surgery for aortic valve replacement, and TAVI versus medical treatment only. The evidence with PARTNER A and PARTNER B trial, European Trial, FDA data and a new trial showed that no inferiority regarding TAVI verses surgical AAVR though there are some risks increased in stroke and aortic regurgitation. But the latest RCT paper just came out two month ago show some benefits in mortality. It may be useful for TAVI in high-risk patients only, not for all severe aortic stenotic patients. Then the other groups are patients who are not amendable for surgery, and the surgeon refuses to operate. TAVI demonstrates to reduce 1-yr mortality (40% to 30%) and functional status.

In summary, people need to be aware of the evidence which changes with new publication and better designed study. We need to apply the evidence and translate to patient care. An anesthesiologist is in a key position to guide the perioperative practice in a team for better patient outcomes.

ATM: *What is the role of anesthesiology in cardiac surgery?*

Prof. Cheng: Anesthesiologist is one of the key perioperative physicians in the cardiac surgery team which composed of surgeon, anesthesiologist, perfusionist and nurses. We are the physician who optimize the patients

preoperatively, monitor and manage the cardiopulmonary physiology (or pathophysiology) of the patients to facilitate the surgical procedures, as well as postoperative care and recovery of the cardiac surgical patients. So we know the whole continuum of patient care and we should be able to adopt the team pattern and try to be a key partnership leader of the team.

ATM: *You have presented the new evidence that guides us to better practice. What kind of evidence is the true evidence from your point of view? How to be aware of the new evidence more timely?*

Prof. Cheng: We cannot select evidence because they are where the practice and opinion come in. If it's a valid scientific publication and study, all evidence is recorded; but in some cases, especially in the industry-sponsored study, sometime studies are not published if it's negative. So we should be cautious, when looking at the evidence. We should be comprehensive and respect all other evidence including both positive and negative ones and tease out the evidence base and give it a proper label, so that people get a better idea of your recommendation statement: what is the background for that statement and what exactly that recommendation is, so that they could apply it to their patients, thus better guided to a proper patient outcome care.

ATM: *We understand you are member of the guideline writing committee. It happens that one conclusion in a country may not be suitable to another country. Would you like to share your experience this regard?*

Prof. Cheng: That's a very important question. The majority of the western medical publication, especially cardiology literatures, they are on white Caucasians, middle-aged men. That's where all the study comes out. You can see the new evidence or the best current evidence change and they have to be applied individually. You cannot just pick up a study and use it for a Chinese female patient when it is only a male-based study. So always be cautious when you as a physician use it on your own patient, this is where the knowledge translation practice comes in. The skills we need to learn as a physician is not only about doing study, which is not enough, but knowing how to deduce the study into evidence. With the evidence applied to your patients, you are able to do a close look at action-knowledge translation and a visit is the practice benefiting the patient. So always having a close look, you have your patients next

week better than this week.

The new guideline development in a global aspect is to start to have countries like China, which enjoys a tremendous opportunity to be a leader in the medical field, to conduct proper randomized control trial for intervention and be aware of the scientific validity and the scientific integrity. Meanwhile it is also important to ensure the data integrate together with the outcome and an international population so that the guideline reflects all patients instead of subset locations. Still we can do some subset analysis to ensure that some of the transfusion practice for example is suitable for the general Chinese patients, because due to some of its smaller body size and common herbal medications used in China, the transfusion mechanism may not be completely applicable. Therefore the bottom line is that “evidence-based” doesn’t matter how the evidence covers: what race, what gender, what population, you need to have the basic integrity of science performed. You cannot bias in study nor pick only the good study and apply to your patients because the whole volume of the negative study not published are missing. There are many changes in nowadays practice because we miss the outcome of negative study. Evidence change has to be adopted, adapted and applied to patients with an open evidence-based outcome mind.

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ATM: What are your comments on the 2014 CHC? And what’s your advice for the young anesthesiologists?

Prof. Cheng: Well, the CHC is the largest world congress for cardiac care where cardiac surgeons, cardiologists, cardiac physician, cardiac anesthesiologist, critical care physicians and related specialists take part in. It is all the system approaches to patients and it is a new format for working as a team. This is also the new future for outcome improvement. Meanwhile, it is important for young physicians and doctors to understand the importance of team work as well as being open-minded to work in and have well training in evidence base and study design, so they can be continually involved in their own CME and better outcome for their patients.

ATM: Thank you very much for sharing your insights!

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