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Guidelines for the Training and Practice of Percutaneous Coronary Interventions

From The Council of Hong Kong College of Cardiology

Introduction

Percutaneous coronary angioplasty has had major development and advancements since the first procedure performed by Andreas Gruentzig, more than two decades ago. With the continuous evolution of techniques and devices, it has become an important mode of coronary revascularization. As an academic body, one of the College's objectives is to promote the standard of training and practice of cardiology. In this respect it has the responsibility to develop standards for the practice of coronary intervention to assure the public of the availability of quality services. The College has all along also emphasized on the provision of continuous educational activities for the professional community. This can be supplemented by the formulation of clinical practice guidelines.

Various renowned national cardiac societies and colleges have published similar guidelines. However, due to the variations in disease pattern, socio-economical status, organization of service delivery and the availability of alternatives, those guidelines may not be entirely applicable to Hong Kong. Establishment of College guidelines will represent the opinion of the College based on medical evidence, experts' views and also with consideration of their applicability in the local medical system.

Guidelines on case selection have been discussed in detail in various texts and publications and will not be repeated here. However, it should be noted that there have been important advances over the years and there will certainly be further development in the future. We may need to modify them as the medical technology continues to evolve.

Training Requirement for Competence

It is essential for a competent interventional cardiologist to have the cognitive and technical skills as listed below:

Cognitive Skills Required to Perform Coronary Intervention:

- Knowledge of current indications for the procedure and likelihood of success in individual cases
- Knowledge of contraindications to the procedure
- Knowledge of the strength, limitations and the applicability of commonly used devices
- Knowledge of preprocedural evaluation, including reasons for selecting percutaneous revascularization over potential alternatives
- Knowledge of the anatomy, normal physiology and pathophysiology of the coronary circulation
- Knowledge of ventricular physiology
- Ability to recognize complications of cardiac catheterization and intervention promptly
- Knowledge of and experience in the management of complications
- Ability to communicate in the risk, benefits and results of the procedure to the patients, to the medical record and to others involved in the care of the patient so that appropriate informed consent can be obtained

Technical Skills Required to Perform Coronary Intervention

- Manual dexterity
- Operational skill in the use of x-ray and the relevant imaging equipment in a safe manner
- Significant experience in cardiac catheterization and coronary angiography
- Demonstrated competence to perform coronary intervention
- Technical skill for the management of complications

Recommendations of Proficiency for Cardiologists Currently Practicing Percutaneous Coronary Intervention

In accord with the Adult Cardiology Training Guidelines of the College in 1992, further dedicated training in coronary intervention is required after the
GUIDELINES FOR THE TRAINING AND PRACTICE OF PERCUTANEOUS CORONARY INTERVENTION

completion of the 3-year program of general cardiology training. A minimum of 125 procedures should have been performed under supervision, with 75 of them as the primary operator.

As prior cardiology training in Hong Kong may not have included specific programs in coronary intervention, a currently practicing cardiologist can be considered to have acquired proficiency in percutaneous coronary intervention by fulfilling the following:

- A minimum of 2 years of experience in performing cardiac catheterization independently. This experience should include a minimum of 500 diagnostic cardiac catheterization and coronary angiographic procedures with acceptable standard; and
- Performed 125 procedures of coronary intervention with 75 of them as primary operator; and preferably had,
- Attended one or more formal courses on coronary intervention

Standards for Cardiology Trainees with Intention to Acquire Proficiency in Percutaneous Coronary Intervention

The trainee should have completed 3 years of general cardiology training and should undertake a structured training program in coronary intervention of at least one-year duration in an environment as specified hereafter in this document. Satisfactory training would require one being involved in a minimum of 150 coronary interventional procedures including 75 of which with primary responsibilities.

Maintenance of Competence

Coronary intervention is a skilled operation; its outcome is related to the operator’s expertise and judgement. It is essential that those who actively practice the service should be properly trained and should maintain their competence by continued practice. It is controversial to define a definite number of procedures to be undertaken annually to maintain the necessary skills. The thresholds for different coronary intervention providers are probably different. Establishment of a minimum volume requirement could increase the incentive for relatively inappropriate procedures by marginal providers. Moreover, the major determinant of outcome of an intervention is the patient’s own clinical profile. Thus, it is more important for a coronary intervention provider to select case complexity deemed appropriate to his skill level.

We recommend that coronary intervention providers should keep and further improve their skills by actively engaging themselves in the practice of these procedures and by maintaining the necessary continuous medical education in this discipline. It is also desirable for low volume operators to be prudent in their case selection and to make possible arrangements for accessing opinions and expertise of high volume operators when necessary.

Further, it is common clinical practice locally and worldwide that these procedures are performed by a team of operators with at least one of the team members having acquired the standards of proficiency as aforementioned. The College strongly encourages the cardiology community to adhere to this principle.

Institutional Requirement

There have been reports supporting the relationship of procedural outcome to the caseloads of provider institutions. However, this sort of relationship could not be consistently found in other studies. Such evaluations shared the common limitations that important confounding variables were not known and could not have been adjusted in the analysis: e.g. level of training/experience of operators, access to and the use of devices, and the quality of the supportive medical care. Also, the absolute differences in the clinical outcome in those positive studies were small in magnitude. Given the total volume of coronary intervention performed in Hong Kong annually, it is the opinion of the College that it is not practical to define a minimum recommended volume for provider institutions in the present system of health service delivery in Hong Kong.

It is essential that each provider institution should have a quality assurance program in place to determine the quality and the efficacy of its overall performance and that of its individual operators. Appointment of a co-ordinator for such purpose in each hospital is desirable.

Albeit small, there is a finite chance for the need of emergency surgical support when procedural complications arise. In the United States on-site cardiac surgical facilities are considered mandatory. However, in United Kingdom and Europe, there are numerous centers performing coronary interventions without on-site surgical support. Whether the patient is salvageable by the emergency surgery depends on two factors. Firstly, the speed and the degree of deterioration, which
determines the reversibility. Secondly, the time required enabling a patient to be put under cardio-pulmonary bypass. It is worldwide practice now to offer emergency bypass surgery on a next-room-available basis rather than on a genuine standby basis. Given the local geographical scene, the waiting time for the next available room in most cases would usually allow effective transfer of such a patient to a nearby facility. To suit the best interest of Hong Kong, it is the opinion of the College that on-site surgical cover is desirable but not mandatory, particularly if arrangement for prompt patient transfer is effective with minimal delay in putting a patient in need under cardio-pulmonary bypass.

Training Institution Requirement

It is essential for the training institution to have a well-equipped cardiac catheterization laboratory and facilities to cater for optimal peri-operative care. The annual intervention volume should be over 200 cases. The program should be conducted by at least one qualified trainer. Trainers are experienced interventional cardiologists with a career experience of over 300 cases. In two years after publication of these guidelines, a higher expectation of 500 cases is required.

References