



Perioperative Cardiopulmonary Exercise Testing (CPEX) Practitioner Certificate Programme

Version	Effective Date
1	16 December 2025

Document No.	HKCA – POM1 – v1
Prepared by	Perioperative Medicine (POM) Committee
Endorsed by	HKCA council
Next Review Date	TBC



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1. Background

- 1.1. The Hong Kong College of Anaesthesiologists (HKCA) is dedicated to post-fellowship development and interdisciplinary collaborations. And this Certificate programme has been developed to provide local training and recognition to perioperative CPEX practitioners who have interest in perioperative CPEX in their anaesthetic practice.

2. Objectives

- 1.2. To provide training to develop perioperative CPEX practitioners at various stages.
- 1.3. To ensure quality assurance and standards of training on perioperative Cardiopulmonary Exercise Testing (CPEX) practice under anaesthetic care.
- 1.4. To establish a local community of trained CPEX practitioners of different stages to facilitate training collaboration among physiotherapists, perioperative nurses, and perioperative physicians.

3. Scope

- 1.1. This certificate programme provides training for the development of CPEX practitioner to conduct, interpret and report Cardiopulmonary Exercise Testing in perioperative settings under anaesthetic care.

4. Governance Structures

- 1.1. This certificate programme should be under the governance of Perioperative Committee and should be reported to HKCA Council meeting annually.
- 1.2. A subcommittee should be formed to take care of the training by curriculum and the local registry of trained CPEX practitioners.

5. Local Registry

- 1.3. A local registry of trained CPEX practitioners should be kept up to date.

6. Learning Outcomes different stages

6.1. Stage 1 CPEX Practitioner

- 6.1.1. Stage I CPEX practitioner will be trained to demonstrate the core competency in CPEX **test performance**, including calibrating and



operating the CPEX equipment, deciding and undertaking the exercise protocol, and maintaining quality control.

- 6.1.2. All trained CPEX practitioners should be able to identify patients having high anticipated risks, and he/ she should be able to seek help before the test.

6.2. Stage 2 CPEX Practitioner

- 6.2.1. Stage 2 CPEX practitioner will be trained to possess the core competence of a Stage 1 CPEX practitioner in **test performance** as stated in session 6.1, AND the core competency in **test interpretation** as demonstrated by the ability to:

- 6.2.1.1.integrate the physiological data to make justifiable comments on the exercise efforts and test quality,
- 6.2.1.2.identify oxygen consumption at peak exercise and at AT, stating the relationship between oxygen consumption and work rate (VO₂/WR), oxygen pulse, and ventilatory equivalent for carbon dioxide, AND
- 6.2.1.3.propose the main cause(s) of exercise limitations or identified abnormalities during CPEX.

6.3. Stage 3 CPEX Perioperative Physician

- 6.3.1. Stage 3 CPEX perioperative physician should be trained to possess the core competence of a Stage 2 CPEX practitioner in **test performance** and **interpretation** as in 6.2, AND the core competency to **report the clinical implications** for the intended perioperative interventions and management, based on CPEX results.
- 6.3.2. This is recommended for CPEX physicians who need to conduct CPEX for high risk patients and trained CPEX perioperative physician should beware of the high anticipated risks and should communicate the CPEX targets among the CPEX team prior to starting the test.

7. Targeted Learners

7.1. Stage 1 CPEX Practitioner

- 7.1.1. Nurses, physiotherapists, and clinicians are eligible to apply for training as a stage 1 CPEX practitioner, if he/ she has:
- attended a basic life support course or equivalent, AND
 - attended a CPEX course, AND
 - undertaken a minimum of 25 CPEX tests under direct supervision by any



certified CPEX practitioner, AND

- demonstrated the core competency for a stage 1 CPEX practitioner.

7.2. Stage 2 CPEX Practitioner

7.2.1. Nurses, physiotherapists, and clinicians are eligible to apply for training as a stage 2 CPEX practitioner, if he/ she has

- attended an advanced life support course or equivalent,
- attended a CPEX course, AND
- undertaken a minimum of 25 CPEX tests under direct supervision by any certified CPEX Practitioner, AND
- interpreted a minimum of 25 CPEX results under direct supervision by a certified Stage 2/ 3 CPEX Practitioner, AND
- demonstrated the core competency for a stage 2 CPEX practitioner.

7.3. Stage 3 CPEX Perioperative Physician

7.3.1. Clinicians are eligible to apply for training as a Stage 3 CPEX perioperative physician, if he/ she has

- practiced in acute clinical settings, AND
- attended a CPEX course, AND
- undertaken a minimum of 25 CPEX tests under direct supervision by any certified CPEX Practitioner, AND
- interpreted a minimum of 25 CPEX results under supervision by a certified Stage 2/ 3 CPEX Practitioner, AND
- reported a minimum of 25 CPEX tests under supervision of an accredited Stage 3 CPEX perioperative physician, AND
- demonstrated the core competency for a stage 3 CPEX perioperative physician.

8. Documentations

8.1. Trained CPEX practitioner who fulfils the respective requirements should submit logs for the intended stage of CPEX practitioner on completion of the training

8.2. Trained CPEX practitioner will be registered under the HKCA Perioperative CPEX Practitioner Certificate Programme.

9. References

- 12.1 POETTS Accreditations
- ARTP Statement on cardiopulmonary exercise testing 2021



10. Appendix I: Learning Outcomes for Different Stages of CPEX Practitioners

	Stage 1 CPEX Practitioner	Stage 2 CPEX Practitioner	Stage 3 CPEX Physician
Learning Outcomes	✓ Undertaking CPEX tests	✓ Undertaking CPEX tests ✓ Interpreting CPEX results	✓ Undertaking CPEX tests ✓ Interpreting CPEX results ✓ Reporting CPEX
Description:	Undertaking CPEX tests: The practicalities of <u>test performance</u> , including the exercise protocol, equipment operation and <u>maintenance</u> and quality control.	Undertaking CPEX tests Interpreting CPEX results: <u>Integration of the physiological data</u> to provide a comprehensive interpretation of the patient's exercise capacity and the main causes of exercise limitation, including the identification of undiagnosed pathology.	Undertaking CPEX tests Interpreting CPEX results Reporting CPEX: <u>Interpretation of the clinical implications</u> of the patient's exercise limitation for their perioperative interventions and perioperative care.
Core Competency on completion of training	A stage 1 CPEX practitioner should be able to: ✓ Calibrate the equipment ✓ Decide the exercise protocol ✓ Undertake CPEX tests independently	Building on the core competency of Stage 1 CPEX practitioner, a stage 2 CPEX practitioner should be able to: ✓ Interpret CPEX results: ✓ Exercise efforts ✓ VO ₂ peak ✓ VO ₂ at AT ✓ VO ₂ /WR ✓ O ₂ pulse, HR response ✓ VE/VCO ₂ at AT	Building on the core competency of Stage 2 CPEX practitioner, a stage 3 CPEX practitioner should be able to: ✓ Interpret the clinical risk implications ✓ Propose perioperative interventions and perioperative care



		✓ Propose the main cause(s) of exercise limitation and identify abnormalities	
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Appendix II: Application Form for CPEX Certificate Programme

Basic Information		
Name of Applicant:	Dr Chan Tai-man	
Role & Disciplines:	e.g. Specialist (Anaesthesiology)	
Site:		
Year(s) of CPEX Experience:		
CPEX Course Attended	Course Title, Organizer, Date of attendance	
Intended Certificate Stage:	Stage 1/2/3	
Achievement :		
Stage 1 CPEX Practitioner	Stage 2 CPEX Practitioner	Stage 3 CPEX Physician
☐ BCLS qualifications ☐ certificate of attendance of a CPEX course ☐ undertaking a minimum of 25 CPEX tests ☐ Attaining the core competency for a stage 1 CPEX practitioner: ☐ calibrate the CPEX equipment,	☐ ACLS qualifications ☐ certificate of attendance of a CPEX course ☐ Undertaking AND interpreting a minimum of 25 CPEX tests ☐ Attaining the core competency for a stage 2 CPEX practitioner:	☐ Practicing in acute clinical settings ☐ certificate of attendance of a CPEX course ☐ Undertaking, interpreting, AND reporting a minimum of 25 CPEX tests ☐ Attaining the core competency for a stage 3 CPEX practitioner:



- | | | |
|--|---|---|
| <ul style="list-style-type: none">☐ decide the exercise protocol, and☐ undertake CPEX in the presence of another certified stage 2 CPEX practitioner or CPEX perioperative physician. | <ul style="list-style-type: none">☐ Core competency of stage 1 CPEX Practitioner☐ Interpret CPEX results in terms of exercise efforts, identify VO₂ peak, VO₂ at AT, VO₂/WR, O₂ pulse, HR response and VE/VCO₂ at AT etc.☐ Propose the main cause(s) of exercise limitation | <ul style="list-style-type: none">☐ Core competency of stage 2 CPEX Practitioner☐ Interpret the clinical risk implications☐ Propose perioperative interventions and perioperative care |
|--|---|---|

		Stage Training 1 Logs		Stage 2 Training Logs	Stage 3 Training Logs
#	Date of CPEX	Indications and Contraindications	Comment on test quality	Test Interpretations	Proposed Management
1					
2					
3					
4					
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The Hong Kong College of Anaesthesiologists
Perioperative CPEX Practitioner Certificate Programme

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