



# Certification in Clinical Engineering

BOK/Certification Promotion Committee

April 2021



## About the moderator

- Kim has been the Director of the Regional Clinical Engineering Service Program based out of the Children's Hospital of Eastern Ontario (CHEO) in Ottawa, Canada since 1997. The current team provides external services to 19 hospitals at 26 sites in Eastern Ontario.
- Under his leadership, the CHEO Clinical Engineering Department was selected as the winner of the 2016 International Federation of Medical and Biomedical Engineering (IFMBE)'s outstanding clinical engineering teamwork award.
- Kim was the recipient of the 2017 ACCE Advocacy Professional Achievement in Management / Managerial Excellence Award and was made a Fellow of the Engineering Institute of Canada in 2018, a Fellow of the Canadian Medical and Biological Engineering Society in 2020. Kim has served as a Board Member at Large with the ACCE Board of Directors since 2018.
- Kim holds a Master's degree in Biomedical Engineering from Carleton University.
- Kim is an Adjunct Professor in the Department of Mechanical Engineering at the University of Ottawa.

Kim Greenwood, MSc, CCE, CBET, P.Eng, FEIC,  
FCMBES

# Logistics

- ❖ **All attendees have their microphones muted during the presentation.**
- ❖ **Questions to the panelists must be submitted via the “Q&A” feature in Zoom at any time.**
- ❖ **If there is any urgent issue, please use the “chat” feature to communicate with the panelists.**
- ❖ **Please remember to complete the webinar evaluation after attending. A link will be provided at the end.**

# About the panelists

Bhaskar is the Vice President of healthcare technology management & Quality Assurance at RENOVO SOLUTIONS LLC in Irvine, CA and has been in the HTM field for the past 10 years.

He is a member of AAMI's Technology Management Council and chair of ACCE's Body of Knowledge Committee. Bhaskar received his B.S. degree from Jawaharlal Nehru Technological University and M.S. degree from the Wright State University. Bhaskar is Certified Clinical Engineer and a Certified Healthcare Technology Manager.



- **Bhaskar Iduri, MS, CCE, CHTM**

# About the panelists

Katherine Navarro is a Biomedical Engineer with the VHA Office of Healthcare Technology Management (HTM) where she supports the Biomedical Engineering field in the VA from a national level. Katherine has been with the VA in the Healthcare Technology Management field for twelve years. She began her career in the VA at the Central Texas Veterans Healthcare System in Temple, Texas as a trainee in the VA's Technical Career Field (TCF) Biomedical Engineering program. Upon completion of the TCF program, Katherine moved to San Antonio, Texas and was a Biomedical Engineer at the South Texas Veterans Healthcare System for approximately ten years, supporting the Biomedical Engineering department as a project manager for new medical equipment implementations. In 2020, Katherine began her new role for the Office of HTM, working virtually from San Antonio.

Katherine served as the chair of the ACCE's Body of Knowledge Committee from 2017 – 2019 and is currently on the ACCE Board as a Member at Large. Katherine earned her Bachelor of Science degree in Biomedical Engineering from Texas A&M University. She has also earned professional certification in federal program/project management and is a Certified Clinical Engineer.

A portrait of Katherine Navarro, a woman with long brown hair, wearing a white top and a red and white patterned scarf. She is smiling and looking directly at the camera. The background is a blue and white checkered pattern with a portion of an American flag visible on the right side.

**Katherine Navarro, CCE, FAC-P/PM**

# About the panelists

Timothy Zakutney is a Professional Engineer with a specialty in Systems Design from the University of Waterloo along with a Masters in Health Science in Clinical Engineering from the University of Toronto. With over 20 years' experience in providing leadership and guidance surrounding medical and biomedical technology issues for healthcare, his portfolio of responsibilities include Information Technology, Cardiac Imaging, Biomedical Engineering, Radiation Safety, and Radiochemistry. Timothy oversees the synergies between Digital Health and Advanced Cardiac Technologies Management for both the University of Ottawa Heart Institute and Ottawa Heart Institute Research Corporation to achieve outstanding patient care, cardiovascular research, and education.

Timothy is an internationally Certified Clinical Engineer (CCE). He serves on several boards and committees. He is a member of and former chair of the Canadian Board of Examiners for Clinical Engineering Certification, member of the Canadian Medical & Biological Engineering Society (CMBES), and American College of Clinical Engineering (ACCE). He was awarded the Outstanding Canadian Biomedical Engineer of the Year Awards in 2008 by the CMBES. Timothy is an Adjunct Research Professor in the Department of Systems and Computer Engineering at Carleton University, and has been published in numerous reviewed journals.

CLINICAL ENGINEERING CERTIFICATION (CCE)



Timothy Zakutney, MHSc, PEng, CCE, FCMBES  
Senior Vice President, Digital Health  
and Cardiac Technology and CITO  
University of Ottawa Heart Institute



# About the panelists

Katrina Jacobs is a Senior Clinical Systems Engineer with Kaiser Permanente in Northern California where she currently manages a regional capital equipment portfolio ensuring the strategic planning, acquisition, and implementation of clinically reliable, safe, and cost-effective healthcare technology.

Katrina has over ten years of diverse experience working with the nation's largest healthcare delivery organizations. She is recognized for her award-winning contributions improving patient safety and advancing healthcare technology management. Additionally, she is an active member in several professional organizations, including the Association for the Advancement of Medical Instrumentation, Health Sector Coordinating Council, Medical Device Servicing Community, and the United States Board of Examiners for Certification in Clinical Engineering

Katrina earned her Bachelor of Science in Biomedical Engineering from Marquette University and a joint Master of Science in Healthcare Technologies Management from Marquette University and the Medical College of Wisconsin. She has also earned professional certifications in program and project management, federal acquisition and contracting, information technology security, and clinical engineering.

- **Katrina Jacobs, MS, CCE**



# Agenda

- Certification Program Governance
- Why?
- Certification Process
- Eligibility and Application Documentation
- Certification Attainment, Registry, & Renewal
- Certification Status Changes
- Demographics
- Preparation – 2021 BOK Survey
- Questions



# Governance



- American College of Clinical Engineering (ACCE) is the sponsoring legal entity for the Certification Program
- Healthcare Technology Certification Commission (HTCC) oversees the Certification Program
- Two Boards of Examiners:
  - United States Board of Examiners
  - Canadian Board of Examiners

# Definition of a Clinical Engineer

HTCC and the US & Canadian Board of Examiners have adopted the definition of a clinical engineer as set forth by ACCE:

*A Clinical Engineer is a professional who supports and advances patient care by applying engineering and managerial skills to healthcare technology.*

Clinical engineers generally have:

- backgrounds in engineering applied to the healthcare industry,
- completed a period of defined education in engineering, and
- experience as practicing clinical engineers leading to mastery of a defined core of knowledge.

# Certification in Clinical Engineering (CCE)

The purpose of certification is to:

promote healthcare delivery improvement through the certification and continuing assessment of competency of professionals who support and advance patient care by applying engineering and management skills to healthcare technology.

The certification process includes:

- Establishing and measuring the level of knowledge required for certification as a clinical engineer.
- Providing a standard of knowledge requisite for certification; thereby assisting the employer, public, and members of the health professions in the assessment of the clinical engineer.
- Recognizing formally those individuals who meet the eligibility requirements of the Boards and pass the Examination Certification for Clinical Engineering.
- Requiring continued personal and professional growth in the practice of clinical engineering to maintain certification.

# Why?

- Bringing the Clinical Engineering profession in line with other regulated US/Canadian healthcare professions.
- Recognition of initial and ongoing professional competency in the role of Clinical Engineers.
- Aids career advancement opportunities both at home and abroad.
- Personal choice in the absence of a mandatory framework.
- Setting a good example for others within our professional field.
- Promoting better visibility of our profession amongst healthcare leadership and peer healthcare professions.

# Certification Process (CCE-US & CCE-CA)

Clinical engineering certification is a three-step process administered by the Boards, which involves:

1. **Application**: The Board's determination of the applicant's eligibility to pursue certification in clinical engineering by assessing the information contained in the Application in comparison to defined eligibility requirements, which includes review and verification of college or university transcripts, and review of three references that attest to the applicant's clinical engineering experience and abilities.
2. **Written Examination**: If the Boards deem the applicant eligible to pursue certification in clinical engineering upon completion of the Application process, the candidate must then pass a written examination consisting of 150 multiple-choice questions based on the ACCE Body of Knowledge survey for clinical engineering practice.
3. **Oral Examination**: Candidates that pass the written examination must then pass an oral examination based on the same content areas of the ACCE Body of Knowledge survey for clinical engineering practice. Upon successful completion of the Oral Examination process, the Board shall recommend the candidate for Certification in Clinical Engineering by the Commission.

➤ **For more details:**  
**<https://accenet.org/CECertification/Pages/Default.aspx>**

# Certification Eligibility Requirements

To be eligible for certification in clinical engineering, individuals must have the required professional and educational credentials in addition to meeting a minimum number of years of engineering and clinical engineering experience.

## CCE-US

<b>Professional Credentials Educational Credentials</b>	<b>Engineering Experience Clinical Engineering Experience</b>
Licensure in the United States as a Professional Engineer (PE)	3 or more years of clinical engineering practice
BS or higher degree in engineering (ABET/EAC-accredited program)	4 or more years of engineering practice, including 3 or more years of clinical engineering practice
BSET degree in engineering technology (ABET/ETAC-accredited program)	8 or more years of engineering practice, including 3 or more years of clinical engineering practice

## CCE-CA

<b>Professional Credentials Educational Credentials</b>	<b>Engineering Experience Clinical Engineering Experience</b>
Licensure as a Professional Engineer in the province in which the applicant practices	3 or more years of clinical engineering practice



# Required Documentation for Application

Applicants must have complete applications with all the required documentation submitted electronically to the HTCC via email at: [certification@accenet.org](mailto:certification@accenet.org). Applications will be considered incomplete if any of the required documentation is not received by the application deadline.

- Application for Clinical Engineering Certification Examination (Part I)
- Application for Clinical Engineering Certification (Part II)
- Résumé / Curriculum vitae (CV)
- Clinical Engineering Certification Renewal Policy
- Official College / University Transcripts
- International Degree Equivalency Evaluation (if applicable)
- Confidential Reference Statements

# Certification Attainment, Registry, & Renewal

- Candidates that meet all the requirements for certification and pass the examinations, shall be recommended by the respective Board of Examiners for Certification in Clinical Engineering (CCE-US or CCE-CA) by the HTCC.
- A registry of individuals certified in clinical engineering is maintained by the HTCC and is posted on the ACCE website at:  
<http://accenet.org/CECertification/Pages/Default.aspx>.
- Certification is valid for three years at which time it must be renewed. Certified individuals are responsible for keeping track of their renewal date.
- Certified individuals can notify HTCC of any changes in contact information via email at: [certification@accenet.org](mailto:certification@accenet.org).

# CCE-US & CCE-CA Renewal – Every 3 Years

- Actively certified individuals choosing to retain their active certification status must submit a renewal application every 3 years for evaluation against renewal eligibility criteria for maintaining or enhancing their clinical engineering skills.
- CCE-US & CCE-CA renewal applicants must achieve a minimum of 15 points over a period of 3 years with at least 2 points in at least 3 categories in order to maintain certification and apply for renewal. Continuing practice activity categories include the following:
  - I. **Employment (15 pt. max.)**
    - Hospital/Non-hospital based Clinical Engineer or Manager
    - Clinical Engineering Professor/Teacher or Consultant
  - II. **Continuing Education (10 pt. max.)**
    - Educational courses (e.g., academic classes, webinars, workshops) & self-study
  - III. **Professional Activities (10 pt. max.)**
    - Professional conferences/seminars attendance (virtual / in-person)
    - Professional society/association membership
    - Publications, presentations, patents
  - IV. **Miscellaneous Activities (10 pt. max.)**
    - Other clinical engineering professionally enhancing activities
- CCE-US & CCE-CA renewal applicants must document continuing practice activities via the current CCE Renewal Application form located on the ACCE website (<https://accenet.org/CECertification/Pages/Default.aspx>) and submit it electronically to HTCC via email at: [certification@accenet.org](mailto:certification@accenet.org). CCE-CA renewal applicants must also include a copy of their current Professional Engineer (PE) registration.

## IMPORTANT!

*It is the responsibility of each certified individual to keep track of their certification expiration and renewal date.  
Failure to renew prior to the certification expiration date will result in loss of active certification.*

# CCE-US & CCE-CA Certification Status Changes

	Retired Status	Emeritus Status
<b>Designation:</b>	CCE-R	CCE-E
<b>Purpose:</b>	Recognizes actively certified individuals that have retired from active employment and wish to retain certification.	Recognizes certified individuals for their lifetime contribution to the field of clinical engineering.
<b>Eligibility:</b>	<ul style="list-style-type: none"> <li>Actively certified in clinical engineering.</li> <li>Retired (i.e., left active, full-time employment) from the clinical engineering field.</li> </ul>	<ul style="list-style-type: none"> <li>Certified in clinical engineering.</li> <li>Earned lifetime achievement:               <ul style="list-style-type: none"> <li>at least thirty (30) combined years of actively working in the clinical engineering field AND years actively certified in clinical engineering,</li> <li>- or -</li> <li>at least fifteen (15) years of documented continuous active</li> </ul> </li> </ul>
<b>Certification Status:</b>	Not active	Not active – <i>Not to be referenced as a professional qualification.</i>
<b>Status Change Fee:</b>	\$100	\$0
<b>Application Deadline:</b>	June 30 <sup>th</sup> – <i>On or before your Renewal Expiration Date.</i>	None – <i>Applications are accepted anytime.</i>
<b>Expiration Period / Renewal Requirements:</b>	None	None
<b>Ability to revert to Active Status:</b>	Yes – <i>Requires proof of continuing practice and additional renewal fee.</i>	No

# Demographics

- Total of 224 CCE
- Majority of CCE professionals work in Hospitals/Health systems
- List of CCE's:  
[https://accenet.org/CECertification/Documents/CCEs\\_Certified\\_February\\_2021\\_for\\_web.pdf](https://accenet.org/CECertification/Documents/CCEs_Certified_February_2021_for_web.pdf)

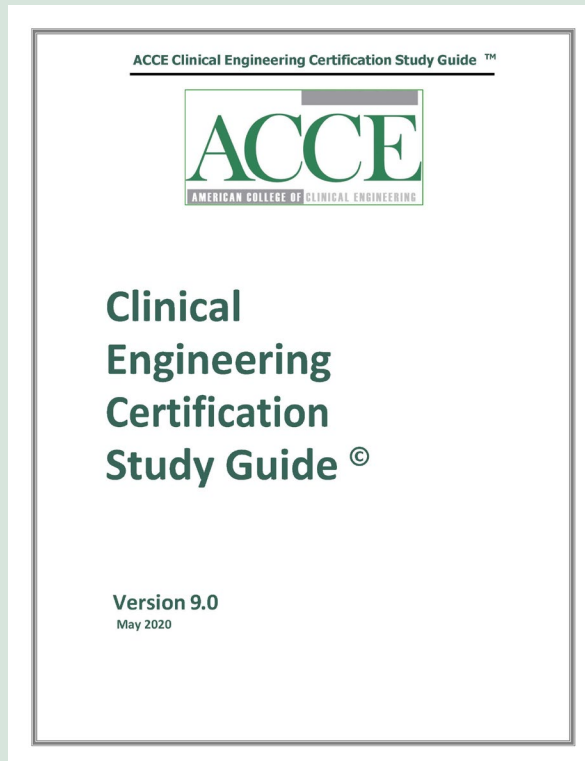
Country	Total
USA	196
Canada	21
Japan	1
Bahamas	1
Peru	1
Brazil	1
UAE	1
Colombia	1
Hong Kong	1
Total	224





# Preparation (by ACCE)

- ACCE's annual CCE Webinar Series (10 weekly 1-hr session), starting August 11, 2021
- CE Certification Study Guide V9.0



The image is a promotional graphic for the '2021 CCE Exam Review Webinar Series'. It features a dark green header with the ACCE logo. Below the header, the text reads '2021 CCE EXAM REVIEW WEBINAR SERIES', 'Date: Wednesdays, Aug 11 - Oct 13, 2021', 'Time: 12:00 pm - 1:00 pm (EDT)', and 'Location: Online'. There are four small portrait photos of the speakers: Elena Buckley, Ted Cohen, Tobey Clark, and Frank Painter. Below the photos, there is a QR code and a registration link: 'To register: complete the online registration form. https://www.surveymonkey.com/r/2021CCEwebinar'. At the bottom, a disclaimer states: 'Disclaimer: This webinar is prepared and offered by individuals who are not involved in the preparation of the CCE Exam.'

<https://accenet.org/Mall/Pages/EducationalOfferings.aspx>

**Disclaimer:** The ACCE administers its certification review webinar program independently of the Boards of Examiners and the Healthcare Technology Certification Commission

# Body of Knowledge (BOK) Survey


## Purpose

- To develop the scope of practice for Clinical Engineers
- Survey results are used to design the Clinical Engineering Certification (CCE) exam to closely match the knowledge needed for clinical engineering roles.
- Previous surveys performed approximately every 3-5 years:
  - 2005, 2010, 2015, 2018




# Body of Knowledge (BOK) Survey

- Please complete the 2021 ACCE BOK survey.
- In exchange for your time, your name will be entered to a random drawing to win
  - \$30 Amazon gift card
  - One-year complimentary ACCE Membership (new or renewal)




**CLINICAL ENGINEERING**  
**Body of Knowledge**

Complete the 2021 ACCE BOK survey to provide valuable data on how clinical engineering is practiced today. It will take no more than 15 minutes of your time. In exchange for your valuable time, you will be entered to a drawing to win one of 3 prizes:




amazon \$30  
Streak Gaming

One-year complimentary ACCE Membership (new or renewal)



amazon \$30  
Streak Gaming

 or go to [https://www.surveymonkey.com/r/2021BOK\\_Survey](https://www.surveymonkey.com/r/2021BOK_Survey)

[https://www.surveymonkey.com/r/2021BOK\\_Survey](https://www.surveymonkey.com/r/2021BOK_Survey)



# ACCE

AMERICAN COLLEGE OF CLINICAL ENGINEERING

*Thank  
you*



Please complete evaluation/attendance form and email to: [secretariat@accenet.org](mailto:secretariat@accenet.org)

or complete the online survey at <https://www.surveymonkey.com/r/2021-CCE>

Or scan the QR code to complete the online evaluation

