U.S.-China Standards and Conformity Assessment Cooperation Program
The United States Trade and Development Agency (USTDA)
美国贸易开发署(USTDA)
中国-美国标准与合格评定合作项目(SCACP)

Ultrasound Education and Certification: West China Hospital

中美超声教育与专业资质认证研讨会 华西论坛

Sponsored by/主办单位：

US Trade and Development Agency / 美国贸易发展署（USTDA）

West China Hospital / 四川大学华西医院

Organized by/承办单位：

American National Standards Institute / 美国国家标准标准化机构（ANSI）

Inteleos

Sichuan Association of Ultrasound in Medicine and Engineering / 四川省超声医学工程学会

October 20, 2018, Chengdu
2018年10月20日，成都

Content / 目录

Agenda

会议议程

Ultrasound Education and Certification: West China Hospital
Sponsored by the United States Trade and Development Agency (USTDA)
and West China Hospital
Organized by the American National Standards Institute (ANSI) and Inteleos
October 20, 2018

Guang Yi Hall of Angel Hotel
10th Dianxin South Street
Wuhou District
Chengdu

Registration	**8:30 AM – 9:00AM**
Welcome and Introductions *Michael Lilly, MD, RPVI, RVT, Executive Committee Member Board of Directors, Inteleos; Chief of the Department of Surgery, Director of Vascular Center and Medical Director of the Non-Invasive Vascular Lab, University of Maryland Medical Center*	**9:00 AM – 9:10AM**
Opening Remarks from USTDA and ANSI	**9:10 AM – 9:20 AM**
Remarks from West China Hospital	**9:20 AM – 9:30 AM**
Proficiency and Standards in a Global Community *Mr. Dale R. Cyr, MBA, CAE, CEO and Executive Director, Inteleos*	**9:30 AM – 9:45 AM**
The Importance of Psychometrics in Measuring Provider Proficiency *Yu Meng, EdD, Senior Psychometrician, Inteleos*	**9:45 AM – 10:15 AM**
West China Sonographer Certification Model *Dr. Yan Luo, Director of Department of Ultrasound, West China Hospital*	**10:15 AM – 10:45 AM**
Morning Tea Break	**10:45 AM – 11:00 AM**
The Career of a Sonographer in the United States *Dr. Traci Fox, RT(R), RDMS, RVT, Thomas Jefferson University*	**11:00 AM – 11:30 PM**
Overview of Ultrasound Continuing Education Program in China *West China Hospital*	**11:30 AM – 11:45AM**

Why Online Education? **11:45AM – 12:00PM**
Thomas Binder, 123sonography
Klaus Müller, Chief Executive Officer, 123sonography
Federica Ognissanti, Corporate Sales Account Executive, 123sonography

Lunch **12:00 PM – 1:00 PM**

Role of Simulation in Ultrasound Education and Training and Hands-on Demonstration of Simulator **1:00 PM – 1:45 PM**
Cristina Wong,Associate Product Marketing Manager,CAE Healthcare
Joyce Gao, Country Manager, China, *CAE Healthcare*
Winnie Ng, Product Specialist, APAC, CAE Healthcare

Putting Simulation Research into Practice **1:45 PM – 2:15 PM**
Kevin Evans, Ph.D., R.T., (R) (M) (BD), R.D.M.S, R.V.S., FSDMS
Professor and Researcher, The Ohio State University

Afternoon Tea Break **2:15 PM – 2:30 PM**

The Application of Ultrasound in Obstetrics and Gynecology **2:30 PM – 3:00 PM**
Professor Hong Luo, West China Second Hospital

Ultrasound-guided Interventional Therapy of Vascular Disease **3:00 PM – 3:30 PM**
Michael Lilly, MD, RPVI, RVT, Executive Committee Member
Board of Directors, Inteleos; Chief of the Department of Surgery,
Director of Vascular Center and Medical Director of the
Non-Invasive Vascular Lab, University of Maryland Medical Center

Next Steps Discussion: How to Use Education, Simulation, and Certification to Improve Patient Care and Provider Proficiency in China **4:30 PM – 5:00 PM**
Facilitated by Inteleos

Closing Remarks **5:00 PM – 5:15 PM**
Inteleos, ANSI, West China

Adjourn **5:15 PM**

中美超声教育与专业资质认证研讨会--华西论坛

由美国贸易发展署和华西医院主办
美国国家标准协会和 Inteleos 共同组织、
2018 年 10 月 20 日

成都华西天使酒店，12 楼广益会堂
成都武侯区电信南路 10 号

注册签到 **8:30 – 9:00**

致欢迎辞 **9:00 – 9:10**
Michael Lilly ，医学博士、 注册血管技师、血管超声诊断注册医师、
Inteleos 董事会执行委员、
马里兰大学医学中心外科主任，血管中心主任和非侵入性血管实验室医学主任

开幕致辞 **9:10 – 9:20**
美国贸易发展，美国国家标准化机构

华西医院领导致辞 **9:20 – 9:30**

资质认证标准的重要性 **9:30 – 9:45**
Dale R. Cyr 先生 ，工商管理硕士、Inteleos 首席执行官及执行董事

心理量表的应用 **9:45 – 10:15**
Yu Men，教育学博士、Inteleos 高级心理测量师

华西医院超声技师的资质认证模式 **10:15 – 10:45**
罗燕教授，主任医师、博士生导师、四川大学华西医院超声科主任

茶歇 **10:45 – 11:00**

美国超声医师的职业生涯 **11:00 – 11:30**
Traci Fox ，教育学博士、放射科注册技师、血管超声注册技师、
注册诊断超声技师血管超声注册医师、超声诊断注册医师、
托马斯杰斐逊大学放射科

中国超声继续教育项目概览 **11:30 – 11:45**
彭玉兰教授，主任医师，硕士研究生导师，四川大学华西医院超声科副主任

线上教育：现在与未来 **11:45 - 12:00**

Thomas Binder，123sonography
Klaus Müller， 123sonography 首席执行官
Federica Ognissanti，123sonography 公司客户销售经理

午餐 **12:00 - 13:00**

临床环境的模拟以及仿真模拟的实操演练 **13:00 - 13:45**

Cristina Wong，CAE Healthcare 产品市场副经理
Joyce Gao, CAE Healthcare 中国地区经理
Winnie Ng, CAE Healthcare 亚太地区产品专员

临床等价学习的讨论 **13:45 - 14:15**

Kevin Evans, 哲学博士、 放射科注册技师、血管超声注册技师、
超声诊断技师学会会员、俄亥俄州立大学教授级研究员

茶歇 **14:15 - 14:30**

超声在妇产科的应用 **14:30 - 15:00**

罗红教授，医学博士、主任医师、硕士生导师、
四川大学华西第二医院超声科主任

血管超声专题演讲 **15:00 - 15:30**

Michael Lilly ，医学博士、 注册血管技师、血管超声诊断注册医师、
Inteleos 董事会执行委员、
马里兰大学医学中心外科主任，血管中心主任和非侵入性血管实验室医学主任

进展性探讨：中国如何通过教育、仿真模拟及资质认证提升医疗服务及操作者熟练度 **16:30 - 17:00**

Dale R. Cyr 先生 ，工商管理硕士、Inteleos 首席执行官及执行董事
邱逦教授，博士生导师、四川大学华西医院超声科 副主任
卢强副教授，硕士研究生导师、四川大学华西医院超声科副主任

致闭幕辞 **17:00 - 17:15**

Inteleos， 美国国家标准化机构，华西医院罗燕教授

休会 **17：15**

Hosts and Supporting Agencies Overview

主办单位介绍

U. S. Trade and Development Agency (USTDA)

The U.S. Trade and Development Agency (USTDA) helps to promote U.S. technologies and expertise for priority development projects in emerging economies. USTDA links U.S. businesses to export opportunities by funding project planning activities, pilot projects, and reverse trade missions while creating sustainable infrastructure and economic growth in partner countries.

USTDA promotes economic growth in emerging economies by facilitating the participation of U.S. businesses in the planning and execution of priority development projects in host countries. The Agency's objectives are to help build the infrastructure for trade, match U.S. technological expertise with host country development needs, and help create lasting business partnerships between the United States and emerging economies.

USTDA's Program Activities

Project Development

Project identification and investment analysis generally involves technical assistance, feasibility studies and pilot projects that support large investments in infrastructure that contribute to host country development. Key sectors in China include the transportation, energy, and healthcare sectors.

Trade Capacity Building and Sector Development

Trade capacity building and sector development assistance supports the establishment of industry standards, rules and regulations, market liberalization and other policy reform. In China, USTDA has supported activities to support increased protection of intellectual property rights, fair and transparent government procurement practices, science-based agricultural biotechnology regulations, and standards across a wide range of industry sectors.

International Business Partnership Program

Under the Agency's International Business Partnership Program, USTDA has increased its support for programs designed to bring procurement officials to the United States to witness U.S. technology and ingenuity firsthand and develop the relationships with U.S. companies necessary to spur increased commercial cooperation with emerging economies. These investments include reverse trade missions, technology demonstrations, training and specialized sector-specific workshops and conferences.

Cooperation Programs

The Agency's success in China is due in part to the public-private cooperative programs that USTDA supports in country. These programs provide a forum wherein government agencies and private companies from both the U.S. and China can share technical, policy, and commercial knowledge relevant to a specific field. USTDA has successfully established programs based on this model in the aviation, standards and conformity assessment, energy, and healthcare sectors.

By adapting to the evolving needs of China's market and closely coordinating with Chinese decision makers, these public-private partnerships have enjoyed long-term success, providing continued trade opportunities and enhancing the development of China's key industries.

美国贸易发展署 (USTDA)

美国贸易发展署(USTDA) 致力于在新兴经济体推动经济发展和美国的商业利益。美国贸易发展署通过对项目前期，试点项目以及反向代表团赴美考察等形式的资金资助，达到在合作伙伴国家推动可持续性基础设施和经济增长的同时帮助美国企业寻找出口机会。

美国贸易发展署鼓励美国公司积极参与新兴经济体项目所在国重点发展领域里的项目规划和实施过程中的机会。目的是帮助美国有技术优势的公司配合项目所在国的发展寻求契机，并建立长期持久合作关系。

美国贸易发展署的项目活动

项目开发

美国贸易发展署支持的项目确认和投资分析通常为了支持项目所在国大型基础设施项目投资决策前以所需要的技术援助，可行性研究分析和试点项目等。在中国的项目集中在交通，能源和医疗卫生领域。

能力建设和行业发展

能力建设和行业发展是为了帮助推动建立行业标准，法规等相关政策需求的活动。在中国，美国贸易发展署支持过的项目内容涉及知识产权，公平透明政府采购，以科学为基础的农业生物技术规范，以及涉及其他更宽泛领域涉及行业标准的内容。

国际商业伙伴关系项目

通过国际商业伙伴关系项目，美国贸易发展署加大资金投入力度，组织更多灵活多样的赴美考察团，技术交流/研讨会和培训等，选择特定的一些行业，帮助中方人员了解美国技术，掌握第一手资料，加深对美国企业的了解并能推动潜在的商务合作。

政府企业合作平台

美国贸易发展署在中国取得成功的部分原因是与其他相关机构共同支持了政府企业合作项目的平台。在这个平台上，美国和中国的政府机构和私营企业均可以共享在特定领域的技术、政策和商业知识。美国贸易发展署已经成功地在航空、标准合格评定、能源和医疗保健等行业推动了该模式。

通过适应中国市场变化的需求，和中国决策者的密切配合，这些公私伙伴关系企业积累了一些长期合作的成功经验，提供持续的贸易机会，并推动中国支柱产业的发展。

U.S.-China Standards and Conformity Assessment Cooperation Program

Sponsored by the U.S. Trade Development Agency (USTDA) and coordinated by the American National Standards Institute (ANSI), the U.S.-China Standards and Conformity Assessment Cooperation Program (SCCP) provides a forum through which U.S. and Chinese industry and government representatives can:

- Cooperate on issues relating to standards, conformity assessment, and technical regulations;
- Foster the relationships necessary to facilitate U.S.-China technical exchange on standards, conformity assessment, and technical regulations; and
- Exchange up-to-date information on the latest issues and developments relating to standards, conformity assessment, and technical regulations.

Over the next three years, ANSI will coordinate 20 workshops in China under Phase V of the SCCP. The workshops will cover a wide range of sectors, as proposed by interested U.S. private-sector organizations. Workshop topics will be chosen in coordination with relevant industry associations, ANSI, and USTDA.

To learn more about the U.S.-China SCCP or to express interest in sponsoring or participating in a workshop, please visit our website at:

www.standardsportal.org/us-chinasccp

FOR MORE INFORMATION

Leslie McDermott
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中美标准与合格评定合作项目

由美国贸易发展署 (USTDA) 提供资助、 美国国家标准化机构 (ANSI) 负责协调的中美标准与合格评定合作项目(SCCP) 在以下几个方面 为中国和美国的相关行业和政府代表提供了一个论坛:

- 标准、合格评定以及技术法规等领域的合作;
- 为促进中美在标准、合格评定以及技术法规等领域的技术交流建立必要的联系;
- 及时交流关于标准、合格评定以及技术法规等领域的最新议题和发展情况的相关信息

未来三年，ANSI 将在中国协调举办 20 场研讨会。根据美国民间业界相关机构组织的建议，研讨会内容将覆盖不同的行业和领域。研讨会的主题将由相关行业组织、 ANSI 以及 USTDA 协调选定。 欲了解该项目的更多情况或有意赞助或参与该项目，请访问下列网站：

www.standardsportal.org/us_chinasccp

欲了解其他信息，请联系

Leslie McDermott

项目经 理

美国国家标准化机构 (ANSI)

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American National Standards Institute (ANSI)

As the voice of the U.S. standards and conformity assessment system, the American National Standards Institute (ANSI) empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment.

The Institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accrediting programs that assess conformance to standards – including globally-recognized cross-sector programs such as the ISO 9000 (quality) and ISO 14000 (environmental) management systems.

ANSI has served in its capacity as administrator and coordinator of the United States private sector voluntary standardization system for the past hundred years. Founded in 1918 by five engineering societies and three government agencies, the Institute remains a private, nonprofit membership organization supported by a diverse constituency of private and public sector organizations.

Throughout its history, ANSI has maintained as its primary goal the enhancement of global competitiveness of U.S. business and the American quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems and promoting their integrity. The Institute represents the interests of more than 270,000 companies and organizations and 30 million professionals worldwide through its office in New York City, and its headquarters in Washington, D.C.

美国国家标准化机构（ANSI）

作为美国标准和合格评定体系的发言人，美国国家标准化机构授权其会员强化美国市场在全球经济中的地位，同时协助保障消费者的安全和健康以及环境保护事宜。

机构对数以千计的标准和指导方针的制定、颁布、实施进行监督，而这些标准和指导方针几乎直接影响商业的每个领域：从声呐设备到建筑设备，从乳制品及家禽产品到能源分配等等。 美国国家标准化机构也积极参与评估合格到标准的委托项目——包括诸如 ISO9000（质量）和 ISO14000（环境的）管理系统等全球认可的跨领域项目。

在过去的一个世纪中，美国国家标准化机构担任美国私营部门自愿性标准化体系的管理者及协调者。自 1918 年由五家工程师协会和三个政府部门成立以来，本机构一直是一个民间、非营利性质的会员制组织，得到来自私营和公共部门的多元化支持。

纵观历史，美国国家标准化机构的首要目标一直是强化美国商业的全球竞争力，通过推进自愿性标准及合格评定体系并对它们进行完善从而提高美国人民的生活质量。机构总部设在华盛顿特区，并在纽约设有办公地点，代表全球超过 27 万家公司及组织和三千万专家的利益。

Inteleos is a non-profit certification organization that delivers rigorous assessments and cultivates a global community of professionals dedicated to the highest standards in healthcare and patient safety. Inteleos is the management and governance organization to the American Registry for Diagnostic Medical Sonography® (ARDMS®) and the Alliance for Physician Certification &Advancement™ (APCA™).

Governed by a volunteer Board of Directors, Inteleos sets the strategic directions, holds fiduciary responsibilities, provides psychometric consulting services, manages all intellectual property and oversees the development of future assessment programs for medical professionals such as nurse midwives, nurse anesthetists, nurse practitioners, physician assistants and many others.

Inteleoshas over 112,000 certified health providers:

- 90,000 sonographers
- 22,000 physicians

Inteleos currently offers the following assessments*(italicized are physician-only):*

- Sonography Principles and Instrumentation
- Abdomen
- Adult Echocardiography
- Breast
- *Cardiac Computed Tomography*
- Fetal Echocardiography
- *Musculoskeletal Sonography*
- Musculoskeletal Sonographer Examination
- *Nuclear Cardiology*
- Obstetrics and Gynecology
- Pediatric Sonography
- Pediatric Echocardiography
- *Physicians' Vascular Interpretation*
- Vascular Technology

International Assessment Programs:

- *Abdomen – Latin America*
- *Obstetrics and Gynecology – Latin America*
- *Physicians Vascular Interpretation – China*

In-Progress Certification Programs:

- Midwife Sonography Certificate
- Accredited Vascular Scientist (AVS)

Future Assessments:

- Advanced Care Provider Ultrasound Assessment

International Experience

Inteleos has extensive experience providing healthcare certification assessments globally. Inteleos has two Latin American assessments, developed and delivered in Spanish, the Vascular Scientist written assessment in Great Britain and Ireland; as well as the Registered Physician in Vascular Interpretation (RPVI) Exam in China. The RPVI-China assessment has been delivered in China since 2006 and was developed in close partnership with the Chinese Ultrasound Doctors Association (CUDA), as well as other physician subject matter experts in China. The RPVI-China certification exam assesses competency in the skills, knowledge and abilities of vascular ultrasound, for the sole purpose of further improving patient care and safety in China. Through a growing network of strategic partnerships, Inteleos hopes to create a global standard of proficiency for ultrasound certification.

Inteleos是一家非营利性的认证机构，提供严格的评估，致力于建立一个医疗和患者安全最高标准的专业人士的全球社区。Inteleos是一家整体性治理和管理美国注册诊断医疗超声医师协会（ARDMS）和医师认证和进步联盟（APCA）的机构。

由志愿董事会管理，Inteleos决定战略方向，承担委托责任，提供心理咨询服务，管理所有的知识产权和监督医疗专业人员如助产师、麻醉师、执业护士、医生助理和其他人员未来评估项目的发展。

Inteleos拥有超过112000名认证的医疗服务提供者：

- 90000名超声技师
- 22000名医生

Inteleos 目前提供以下评估（*斜体仅限医生*）：

- 超声原理与仪器
- 腹部超声
- 成人超声心动图
- 超声检查
- *心脏计算机断层扫描医师考试*
- 胎儿超声心动图
- *肌肉骨骼超音波医师考试*
- 肌肉骨骼超声检查
- *核心脏病学医师考试*
- 妇产科
- 小儿超声
- 小儿超声心动图
- *血管超声医生*
- 血管技术

全球评估项目：

- *腹部-拉丁美洲*
- *妇产科-拉丁美州*
- *血管超声医生 - 中国*

正在进行的认证项目：

- 助产师超声证书
- 认可血管科学家（AVS）

未来评估：

- 先进保健提供者超声评估

国际经验

Inteleos 在提供医疗保健全球认证评估方面有着丰富的经验。Inteleos在拉丁美洲有两个以西班牙语开发并交付的评估项目；在大不列颠和爱尔兰的血管科学家笔试；以及在中国的血管超声注册医生（RPVI）考试。RPVI评估自2006年在中国交付以来，一直与中国超声医师协会（CUDA）以及相关医师专家密切合作开发。RPVI认证考试评估血管超声的技能、知识和能力，以进一步提高中国的患者护理和安全为唯一目的。通过与越来越多的战略合作伙伴的沟通互助，Inteleos希望创造一个超声认证能力的全球标准。

APCA™
Alliance for Physician Certification & Advancement

中国医师血管超声认证考试（RPVI-China）

中国医师血管超声认证考试（RPVI-China）代表了目前中国血管超声诊断的最高标准。

更多信息，请访问www.APCA.org/RPVI-China

RPVI-China认证证书的优势：

- 持有业界公认的证书，享受更多的就业机会。
- 持有全球认可的证书，赢得雇主和同行的关注。
- 履行您为“优质医疗与患者安全”而不断努力的承诺。
- 加入拥有107,000名专业人士的全球社区，专注实现”优质医疗与患者安全“的最高标准。

86% 的RPVI-China认证持有者会向他们的同事推荐此考试。

由于RPVI-China认证能为持有者带来更多就业和晋升的机会，
58%的调查访问者持有该认证。

APCA™
Alliance for Physician Certification & Advancement

APCA™ is part of the non-profit Inteleos™ family of certification alliances.

CAE Healthcare

CAE Healthcare delivers educational tools that help healthcare professionals provide safe, high quality patient care. Our end-to-end spectrum of simulation solutions includes patient, interventional and imaging simulation, audiovisual solutions and learning applications.

With a broad array of products, CAE Healthcare is able to offer targeted training to hospitals, medical schools, emergency response teams, military branches and nursing, respiratory and allied health programs. Each CAE Healthcare product is developed in collaboration with clinicians and clinical educators whose aim is to ensure physiological accuracy and educational relevance.

CAE Healthcare's Ultrasound portfolio consists of Vimedix, a high-fidelity ultrasound simulator; Blue Phantom, a line of realistic ultrasound task trainers; and ICCU, an E-Learning platform with numerous self-directed courses about ultrasound. Its strong partnerships with the medical community have led to the development of key initiatives including, but not limited to, the International Nursing Association for Clinical Simulation and Learning (INACSL) fellowship as well as the Anesthesia SimSTAT screen-based simulation platform with the American Society of Anesthesiology (ASA). With a commitment to quality of care and patient safety CAE Healthcare strives to be your partner of choice in healthcare education.

CAE Healthcare is one of the three core businesses of CAE (NYSE: CAE; TSX: CAE), a global leader in the delivery of training for the civil aviation, defence and security, and healthcare markets.

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Speaker Biographies

演讲人介绍

Michael Lilly, MD, RVT, RPVI
Executive Committee Member, Board of Directors, Inteleos
Chief of the Department of Surgery, Director of Vascular Center
Medical Director of the Non-Invasive Vascular Lab, University of Maryland Medical Center

After receiving his medical degree from Georgetown University School of Medicine, Dr. Lilly completed his residency training in Surgery at Brown University/Rhode Island Hospital in Providence, R.I. including a two-year research fellowship at Brown University in integrative cardiovascular physiology. He completed a vascular surgery fellowship at Northwestern University in Chicago. Currently, Dr. Lilly is a tenured Professor of Surgery at the University of Maryland School of Medicine and serves as Chief of the Department of Surgery, Director of Vascular Center and Medical Director of the Non-Invasive Vascular Lab, all at the University of Maryland Medical Center Midtown Campus, a major unit of the University of Maryland Medical System in Baltimore. His credentials include the Registered Vascular Technologist (RVT) and the Registered Physician in Vascular Interpretation (RPVI) designations from the ARDMS, as well as certification by the American Board of Surgery in both Surgery and Vascular Surgery. In addition to SVS, Dr. Lilly is actively involved in numerous professional societies including the Society for Vascular Ultrasound (SVU) and the American Institute of Ultrasound in Medicine (AIUM). He served as the National Surgical Clinical Consultant to the Centers of Medicare and Medicaid Services (CMS) Fistula First Breakthrough Initiative from 2009-2012. Dr. Lilly was elected to the Board of Directors of ARDMS (now Inteleos) in 2012 and he is currently the Treasurer. During the past 20 years, he has lectured extensively and has co-authored numerous publications, abstracts and book chapters. Dr. Lilly has also served the IAC as a site visitor since 1993.

Michael Lilly，医学博士、注册血管技师、血管超声诊断注册医师
Inteleos 董事会执行委员、
马里兰大学医学中心外科主任，血管中心主任和非侵入性血管实验室主任

在获得乔治敦大学医学院的医学学位后，Lilly 博士完成了他在罗得岛州普罗维登斯市布朗大学/罗德岛医院的外科住院培训，包括在布朗大学获得为期两年的心血管综合生理学研究奖学金。在芝加哥西北大学主攻血管外科的研究。目前，Lilly 博士是马里兰大学医学院的外科终身教授，在马里兰大学医疗中心的市中心院区担任外科系主任、血管中心主任、非侵入性血管实验室主任。他的认证资格包括 DDMS 的注册血管技师（DVT）和注册血管超声诊断医师（DDVI），以及美国外科委员会外科和血管外科的认证。除了血管外科学会（SVS），Lilly 博士还积极参与许多专业协会，包括血管超声协会（SVU）和美国医学超声研究所（AIUM）。2000-2012 年间，他曾担任美国医疗保险和医疗补助服务中心（CMS）瘘管首次突破计划的国家外科临床顾问。Lilly 博士在 2012 当选为美国注册诊断医疗超声技师协会（现在的 Inteleos）董事会成员，担任财务主管。在过去的 20 年中，他广泛地讲学，并共同撰写了大量的论文、摘要和书籍章节。

Mr. Dale R. Cyr, MBA, CAE
CEO and Executive Director, Inteleos

Dale is the Chief Executive Officer and Executive Director for Inteleos, the umbrella governance and management organization for the American Registry for Diagnostic Medical Sonography (ARDMS) and the Alliance for Physician Certification and Advancement (APCA). Dale has been an executive within the certification community for 17 years. Inteleos is a dedicated ANSI-ISO 17024 accredited organization with 115,000 active certificants across 70 countries and delivers computer-based examinations in 28 countries. Inteleos global expansion includes customized examinations in China and is presently developing a Latin American physician-based ultrasound certification program for a diverse physician practice population.

Dale has given numerous lectures and workshops in areas of business and certification throughout the world and presently sits on the Board of Directors for the American National Standards Institute (ANSI) and is the Chair of the Association of Talent Development (ATD) Credentialing Institute. Dale is also a co-inventor of patent for a new type of test question and measurement.

Dale has an MBA in finance from the Albers School of Business and Economics, Seattle, WA and also holds the Certified Association Executive (CAE) credential from the American Society of Association Executives (ASAE).

Dale R. Cyr 先生， 工商管理硕士
Inteleos 的首席执行官和执行董事

Dale 是 Inteleos 的首席执行官和执行董事，Inteleos 是一家整体化管理美国注册诊断医疗超声技师协会（ARDMS）和医师认证和进步联盟（APCA）的机构。Dale 在认证中心担任主管已有 17 年。Inteleos 是美国国家标准化机构 ANSI-ISO 17024 认证及国际标准化组织（ISO）认可的组织，拥有活跃在 70 个国家的 115000 名持证者，并在 28 个国家提供在线考试项目。Inteleos 的全球拓展包括在中国定制考试，目前正在开发一个建立在拉丁美洲医生基础上的针对不同医生执业群的超声认证项目。

Dale 在全球多个商业及认证领域作过讲座和研讨会的报告，现任职美国国家标准化机构（ANSI）董事会，同时还是人才发展协会（ATD）认证机构的主席。Dale 也是一项新型测试问题和测量专利的共同开发人。

Dale 拥有华盛顿州西雅图阿尔伯斯商业与经济学院金融硕士学位，还持有美国经营者协会（ASAE）的注册协会执行证书（CAE）。

Yu Meng, EdD
Senior Psychometrician, Inteleos

Yu Meng, EdD is a senior psychometrician at Inteleos. He received his doctorate in the Research, Educational Measurement, and Psychometrics from the University of Massachusetts Amherst, a nationally renowned program in psychometrics. Prior to joining Inteleos in 2016, Dr. Meng served as a psychometrician at higher education institution and testing company for more than five years. His recent work has involved advanced psychometric analysis, exam security, simulation assessment, and score report. Dr. Meng has expertise in item response theory, standard setting, measurement precision, and computer adaptive testing. His research has been published in technical reports and academic journals. He is an active member, and has presented his work at the annual meetings, of several national and international professional organizations including the National Council of Measurement in Education, the American Educational Research Association, and the Association of Test Publishers.

Yu Meng, 教育学博士
Inteleos 高级心理测量师

Yu Meng 博士是 Inteleos 的高级心理测量师。他获得了 Massachusetts Amherst 大学的博士学位，期间的研究方向是一个全国著名的关于研究、教育测量和心理测量学的计划。在 2016 年加入 Inteleos 之前，孟博士在高等教育机构和测试公司担任了五年多的心理测量专家。他最近的工作涉及高级心理测量分析、考试安全、模拟评估和成绩报告。他的研究已经发表在技术报告和学术期刊上。他在学术领域也很活跃，在年度会议、部分国家和国际专业组织，包括国家教育计量委员会、美国教育研究协会和考试出版商协会上发表的研究成果。

Yan Luo / 罗燕
教授，主任医师，博士生导师，四川大学华西医院超声科主任
DDMS，DDVI

华西-杰斐逊超声教育中心主任
四川省学术技术带头人
中国医师协会腹部分委会副主委
四川省超声医学工程学会会长
中国超声医学工程学会常务理事
四川省医学会超声分会侯任主任委员

担任十余种杂志编委，获得国际及省级课题十余项，发表学术论文 120 余篇，其中第一作者及通讯作者 30 余篇，SCI 收录文章 10 篇，均为第一作者或通讯作者，主编专著一部，副主编专著 2 部，参编学术专著 C 篇，获得一项中华医学会奖项，具有较高的学术水平和影响力。

Traci Fox, EdD, RT(R), RDMS, RVT
Department of Radiologic Sciences, Thomas Jefferson University

Traci B. Fox, EdD, RT(R), RDMS, RVT, is Assistant Professor in the Department of Radiologic Sciences at Thomas Jefferson University and a Research Assistant Professor in the Department of Radiology at the Sidney Kimmel Medical College at Thomas Jefferson University. Dr. Fox has been a sonographer for over 24 years and an educator since 2005. She holds ARDMS certifications in abdomen, obstetrics & gynecology, breast, and vascular. In 2014, Traci earned her Doctorate in Education from Drexel University. Dr. Fox has co-authored or contributed to five textbooks, and is author/co-author of 18 peer-reviewed publications. Traci has spoken at local, national, and international conferences, and in 2015 was an invited lecturer at the University Immersion Program at Sichuan University in Chengdu, China.

Traci Fox，教育学博士，放射科注册技师，血管超声注册技师，注册诊断超声技师
托马斯杰斐逊大学放射科

Traci D. Fox, 教育学博士，放射科注册技师，血管超声注册技师，注册诊断超声技师，是托马斯杰斐逊大学放射科助理教授，也是托马斯杰斐逊大学 Sidney Kimmel 医学院的研究助理教授。Fox 博士从事超声技师工作已有 24 年，并于 2006 年开始从事教育工作。她拥有美国注册诊断医疗超声技师认证的腹部、妇产、乳腺及血管资格证书。2014 年 Traci 获得 Drexel 大学教育学博士学位。Fox 博士参与合著 6 本著作，发表了 18 篇同行评审刊物论文。 Traci 多次在区域性、全国性以及国际性大会上发表演讲。2016 年她受邀成为四川大学国际课程周的国际讲师。

Yulan Peng / 彭玉兰

四川大学华西医院超声科副主任，主任医师，硕士研究生导师
DDMS, DDVI

四川省卫生计生委学术技术带头人
中国医师协会超声医师专业委员会浅表组副主委
中国超声医学工程学会浅表和血管组副主委
四川省医学会乳腺病学专业委员会副主委
四川省超声医学工程学会副会长
四川省抗癌协会超声专业委员会副主委，候任主委
美国 DSMA、ADMDS、WCIO 会员

Thomas Binder, MD
123Sonography

Thomas is a cardiologist, with over 25 years of experience in echocardiography. Author of numerous scientific publications. He is director of the echo lab at the Medical University of Vienna, founder of 123sonography and the creative mind behind the company. Teaching is his passion and he strongly believes that ultrasound should play an even greater role in clinical practice.

Thomas Binder，医学博士
123Sonography

Dinder 博士是知名心脏病专家，有超过 2C 年的超声心动图经验。在学术领域也颇有建树，著作丰富。目前担任维也纳医科大学超声实验室主任，123sonography 的创始人，是公司的创意源泉。他热爱教学，坚信超声在临床实践中应该发挥更大的作用。

Klaus Müller
Chief Executive Office, 123Sonography

Klaus joined 123sonography in 2015 as a partner and has taken over the CEO position from Thomas. Being an Ex-Googler with more than 20 years of experience in the web and online marketing business, he is responsible for leveraging the company to the next level - "Transform Medical Education" by using best in class web technologies and by his "Google Moonshot Spirit".

Klaus Müller
123Sonography 首席执行官

Klaus 于 201C 年作为合作人加入 123sonography，并接替 Thomas 任首席执行官。 作为一名拥有超过 20 年网络和在线营销业务经验的前谷歌员工，他负责通过使用一流的网络技术和“谷歌探月竞赛精神”将公司提升到新的水平----“转变医学教育” 。

Federica Ognissanti
Corporate Sales Account Executive, 123Sonography

Federica joined 123Sonography in September 2017. She is the Corporate Sales Account Executive with a strong believe in e-learning and how its disruptive innovation can change the "face" of the educational system. She is a self-taught language learner: she speaks fluently English, French, Italian, German and is moving forward in Chinese. Therefore, she is the proof that an e-learning self-paced approach is possible. She is your point of contact for potential partnerships and B2B.

Federica Ognissanti
123Sonography 公司客户销售经理，
Federica 于 2017 年 10 月加入 123Sonography。她是企业客户销售主管，对在线学习及其颠覆性创新如何改变教育系统的“面子”有着强烈的信心。 她是一位自学成才的语言学习者：她能说流利的英语、法语、意大利语和德语，并且正在努力地学习中文。 因此，她证明了在线学习的自定进度方法是可行的。 她是您的潜在合作伙伴和 D2D 联系人。

Cristina Wong
Associate Product Marketing Manager, CAE Healthcare

Cristina Wong is a McGill University graduate with a Bachelor’s Degree (B.Sc.) in Physiology. With a strong marketing and commercial background, she joins CAE at their Montreal head office as an Associate Product Manager for CAE Vimedix. Her role is to oversee the development and commercialization of this imaging simulation solution.

Cristina Wong
CAE Healthcare 产品营销副经理
Cristina Wong 是麦吉尔大学的毕业生，拥有生理学学士学位（B.Sc.）。 凭借强大的市场营销和商业背景，她作为 CAE Vimedix 的产品副经理加入 CAE 的蒙特利尔总部。 她的职责是监督成像模拟解决方案的开发和商业化。

Kevin D. Evans, PhD, RT(R)(M)(BD), RDMS, RVS, FSDMS
Professor and Researcher, The Ohio State University

Dr. Kevin D. Evans received his undergraduate and graduate degrees at The Ohio State University. Dr. Evans doctoral degree was focused on Geriatrics and Gerontology. He has extensive clinical practice experience having managed and worked as a sonographer, vascular technologist, and radiographer for 25 years.

Dr. Evans is a tenured Professor at The Ohio State University’s College of Medicine and the School of Health and Rehabilitation Sciences and works as a Researcher/Educator. He is the Chair of the Radiologic Sciences/Respiratory Therapy Division and is the Director of the Laboratory for Investigatory Imaging. Dr. Evans established his own research lab in 2005 and is conducting extramural funded research into the use of image analysis and sonographic contrast agents to enhance the detection of musculoskeletal disorders. In 2010, Dr. Evans received funding from the Centers of Disease Control’s National Institute of Occupational Safety and Health (NIOSH) as the principal investigator for carpal tunnel syndrome in an animal model. Currently funded by NIOSH as co-PI of an R01, Dr. Evans is focused on the redesign of hospital rooms to support clinical work and patient/family needs. Dr. Evans has had sustained funding over the last 6 years, that represents 10-35% of his salary. He has successfully secured over $2.5 million in R-level, Commercial, and Foundation funding.

Dr. Evans has served as the Chair of ARDMS, Chair of the ARDMS Breast Foundation, President of the Society of Diagnostic Medical Sonographers, and of the SDMS Educational Foundation. Dr. Evans serves on the editorial boards for the Journal of Diagnostic Medical Sonography, American Journal of Health Behavior, and Ultrasound in Medicine and Biology. Dr. Evans has over 100 publications that span journal articles, abstracts, multiple textbook chapters, and his own textbook.

Kevin D. Evans， 哲学博士， 放射科注册技师，血管超声注册技师，超声诊断技师学会会员
俄亥俄州立大学教授级研究员

Kevin D. Evans 博士在俄亥俄州立大学获得学士和硕士学位。Evans 博士的博士学位专攻方向为老年病学和老年医学。他作为超声技师、血管专家和放射技师从业 25 年，有着丰富的临床管理和工作经验。

Evans 博士是俄亥俄州立大学医学院和健康与康复科学学院的终身教授，同时也是一名研究者和教育家。他是放射技术部、呼吸治疗部的首席专家，也是影像研究实验室的主任。Evans 博士于 2005 年建立了自己的研究实验室，并正在进行使用图像分析和超声造影剂增强肌肉骨骼疾病检测的研究。2010 年 Evans 博士从国家职业安全与健康研究所（NIOSH）疾病控制中心获得资助，担任首席研究员利用动物模型研究腕管综合症。目前由 NIOSH 资助为 R01 联合项目，Evans 博士专注于医院房间的重新设计，以满足临床工作和病人/家庭的需要。Evans 博士已成功地获得了超过 250 万美元的 R 级、商业和基础基金。

Evans 博士曾担任 ARDMS 主席、ARDMS 乳腺基金会主席、诊断医学超声医师协会主席和 SDMS 教育基金会主席。Evans 博士同时为《诊断医学超声学杂志》、《美国健康行为杂志》和《医学和生物学超声》编辑委员会工作。Evans 博士有超过 100 篇学术成果，涵盖期刊文章、摘要、多个教科书章节和他主编的教科书。

Hong Luo / 罗红
医学博士，教授/主任医师，硕士生导师，四川大学华西第二医院超声科主任

四川省卫计委学术和技术带头人，四川省妇幼保健机构评审专家，四川省产前诊断专家。 以负责人身份获得十余项科研课题，包括国家科技支撑课题一项、国家重点研发计划项目一项。在 SCI、MEDLINE、核心期刊等杂志发表论文 90 余篇，主编、参编学术专著九部。

担任国家卫生计生委超声医学专科能力建设项目专家委员会委员、中国医师协会妇产超声专委会常务委员、中国医学影像技术研究会妇产科专委会委员，中华医学会超声医学会妇产超声学组委员、中国超声医学工程协会妇产科超声专业委员会委员、中国医药教育协会超声医学专业委员会产前超声学组主任委员，四川省医学会超声医学专委会副主任委员。

Mr. Dave Stolte, MBA, RDCS, RDMS
Chair of the Board of Directors, Inteleos
Regional Director, North Sound Regional Clinics, Seattle Children's Hospital

David Stolte is a mission-driven leader with over 19 years of operational expertise in the healthcare and not for profit arenas. David has worked with Inteleos since 2004, ten of those years on the Board of Directors where is currently serving as the Chair. He is the Regional Director of North Sound Clinics for Seattle Children's Hospital. He received his B.S from Seattle University and his MBA from George Washington University. David recently completed a project to build and implement a 37,000 square foot Seattle Children's ambulatory clinic, which will support 20 pediatric specialties.

Dave Stolte 先生，工商管理硕士，注册诊断心脏超声技师，注册诊断医学超声技师
Inteleos 董事会主席
西雅图儿童医院 North Sound 区域诊所主任

David Stolte 是一位以任务为导向的领导者，在医疗保健和非盈利领域拥有超过 10 年的运营经验。David 自 2004 年以来一直与 Inteleos 合作，担任董事会成员十年，目前担任董事会主席。他是西雅图儿童医院 North Sound Clinics 的区域主任。 他获得了西雅图大学的学士学位和乔治华盛顿大学的 MBA 学位。David 最近完成了占地 37,000 平方英尺的西雅图儿童门诊诊所的建造，该诊所将支持 20 个儿科专科。

Li Qiu / 邱逦
医学博士，教授，博士生导师，四川大学华西医院超声科副主任
MD

四川省卫生厅学术带头人，四川省学术带头人后备人选
中国医师协会超声分会委员
中国医师协会肌骨超声组副主任委员
中国超声医学工程学会肌骨超声副主任委员
中华医学会超声专委会青年委员
四川省医学会超声专委会常委
中国医学影像技术研究会超声分会委员
中国医师协会《中国肌骨超声检查指南》编写组副组长
人卫社“十三五”研究生规划教材《肌骨超声诊断学》主编
主持各级科研课题 8 项，包括国家自然科学基金项目 3 项
发表第一及通讯作者论文一百余篇，其中 SCI 收录 23 篇，主编及参编专著及教材 7 部

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Dr. Lu is an ultrasound specialist, graduated from West China School of Medicine, with over 15 years of experience in abdominal/vascular/interventional ultrasound and ultrasound education. He is associate professor in ultrasound, who author/co-authored more than 40 scientific publications. He believes education is the best way to provide better medical care to more patients. He is vice director of the department of ultrasound of West China hospital, Sichuan University. Member of abdominal committee of Chinese Association of Ultrasound in Medicine and Engineering; Member of standing committee of youth council of Chinese Ultrasound Doctor Association; General Secretary of Sichuan Association of Ultrasound in Medicine and Engineering.

卢强　医学博士

副教授，硕士研究生导师，四川大学华西医院超声科副主任

毕业于四川大学华西临床医学院，长期从事超声医学的临床、教学及研究工作。工作期间发表论文 40 余篇；主持及参与多项国家自然科学基金及四川省科技厅课题。担任四川省医学会超声分委会青委会副主任委员；四川省超声医学工程学会秘书长；中国医师协会超声分会青委会常务委员；中国超声医学工程学会介入超声专委会委员；中国超声医学工程学会腹部专委会委员。

Presentations

演讲材料

Inteleos - China Summit
15 October 2018

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- Wireless
- Tethered

HEALCERION

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Interconnected → Interdependent

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The best way to predict the future is to create it.

Peter Drucker

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Inteleos中国峰会
2018年10月15日

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Wireless Tethered

HEALCERION

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互联 → 互助

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SUSTAINABLE DEVELOPMENT GOALS

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预测未来的最好方法就是创造未来

彼得·德鲁克

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华西医院超声技师资质认证模式及超声医技一体&分级诊断的构建

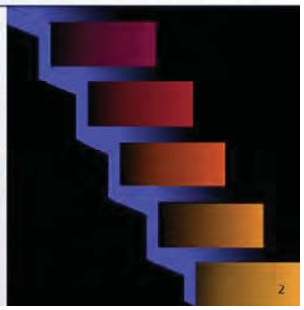
罗 燕

2018.10

内容提要

1、中国超声现状与困惑

2、华西超声技师培养&认证及超声医技一体&分级诊断的构建



2

1.1 2016年中国超声的检查量（人次）：活儿很多

		从业人数	检查人次	操作者
传统超声	体检	14万	~5亿	超声医师+ 极少临床医师 超声技师？
	腹部		~10亿	
	心脏			
	妇产科			
	浅表 （乳腺、甲状腺、肌骨、血管等）			
POC超声 （新兴市场）	麻醉、急诊、ICU、呼吸，等	如火如荼 数据不详		临床 各科医师
	PICC			护士
	产程监测			助产士

3

1.2 中国超声：独特！（活儿由超声医生干）

➢中国超声科

✓独立三级学科：成立之时

✓独立住院医规培：2013年

✓复旦专科排名：2015年

➢中国超声人

✓医师资格证书&医师执业证书

✓从业者多：13万注册医师

✓从业者：主要是医师

4

1.3 中国需要超声技师吗？(超声技师辅助医生一起干?)

➢超声现状

✓ 需求那么多

✓ 缺口那么大

✓ 发展那么快

✓ 形势那么紧

➢ 超声医师

✓ 医疗：诊断、治疗、预防

✓ 学科发展：医、教、研

5

1.4 有没有超声技师？

根据人力资源和社会保障部、国家卫生计生委办公厅下发的《关于2014年度卫生专业技术资格考试有关问题的通知》，明年在临床医学、中药学等65个专业进行人机对话考试的基础上，新增放射医学技术初级（士）、放射医学技术初级（师）、神经电生理（脑电图）技术初级（师）、放射医学技术中级、核医学技术中级、超声波医学技术中级、心电学技术中级和神经电生理（脑电图）技术中级8个人机对话考试专业，人机对话考试时间为....

330	妇产科学	376	放射医学技术
331	中医妇科学	377	核医学技术
332	儿科学	378	超声波医学技术
333	中医儿科学	379	临床医学检验技术
334	眼科学	380	病理学技术
335	中医眼科学	381	康复医学治疗技术
336	耳鼻咽喉科学	382	营养
337	中医耳鼻咽喉科学	383	理化检验技术
338	皮肤与性病学	384	微生物检验技术
339	中医皮肤与性病学	385	消毒技术
340	精神病学	386	心理治疗
341	肿瘤内科学	387	心电学技术
342	肿瘤外科学	388	肿瘤放射治疗技术
343	肿瘤放射治疗学	389	病案信息技术
344	放射医学	390	输血技术
345	核医学	391	神经电生理（脑点图）技术
346	超声波医学		

6

1.5 超声技师教育与培养现状

- 超声技术教育
- ✓本科：
  - 影像技术专业：＞100所学校
  - **超声技术专业**：华西2016年、中大2017、上海健康医学院ing、其他...
- ✓专科：有学校准备开展
- 超声技师毕业后培训
- ✓**超声技师2年规培**：华西2007年始开设
- ✓CME

7

2、华西超声技师培养/认证及医技一体/分级诊断的构建

- 超声技师教育/培养/认证
  - **尝试1**：毕业后培训
  - **尝试2**：学历教育
- 超声医/技一体的构建
- 超声分级诊断的建立

8

1.1 第一个尝试：华西2年规范化超声技师培训项目

- 毕业后2年规培，医院毕业后教育部门统一管理
- 始于2007年，连续招生10年
- 目前主要集中腹部及浅表专业（心脏2月、妇产2月、腹部及浅表20个月）
- 规培生来源：影像技术、影像医学等的大专及本科毕业生
- 已经培养数十名超声技师
- 目前规培毕业生多数在华西医院工作

9

1.2 第二个尝试：本科开设“医学影像技术-超声技术方向”

- **基础及由来**
  - ✓“医学技术”：1998年起，**四年本科，理学**学士
  - ✓ 影像技术（1998年），
  - ✓ 放疗技术（2013年）
  - ✓ 超声技术：2016年
- **目的：培养超声技术专业人才**
  - ✓国内：满足国内需求
  - ✓国际：兼容国际要求
  - 课程国际认证（ing）
  - 学生毕业后申请ARDMS考试与认证（完成）

10

General sonography course (Jefferson)	Professional theory course (medical image)
RS400 ultrasound physics	Radiology(Ⅰ) 4 credit
RSV 401 vascular anatomy	Clinical nuclear medicine 3
RS321 patient care & service in medical imaging and Radiation oncology	Research methodology in medical imaging 2
RSS415 sonographic procedure Ⅰ	ultrasound physics 1
RSS 413 clinical sonography II	ultrasound physics II (Hemodynamic...) 1
RSS 402 abdominal sonography Ⅰ	Sonogrhphic cross sectional anatomy 2
RSS 401 sonogrhphic cross sectional anatomy	Sonography Ⅰ （Abdomen) 4
RS411 clinical sonography Ⅰ	Sonography II(High resolution) 3
RS 404 pelvic sonography	SonographyⅢ (Pelvic) 2
RS403 ultrasound physics	SonographyⅣ (Obstetrics) 4
RS422 abdominal sonography	Sonography Ⅴ (Vascular) 3
RSS 417 sonographic procedure ii	SonographyⅥ (Cardiac) 3
RSS405 obstetrics sonography 3	Sonography Review (elective)
RSS 416 high resolution sonography 2	
RS 414 clinical sonographyⅢ	
RSS408 sonography Review Summer	
	final practice 26
Total credit 46	58（操作和入实习）

11

具体专业课程（9门）及教材（6本引进，3本自编）

- 超声解剖（基法学院）
- 超声物理（物理学院）
- 超声设备（计算机学院）
- Ultrasound Physics and Hemodynamics（JSHP）
- 腹部超声（临医）
- 心脏超声（临医）
- 妇产超声（临医）
- 浅表超声（临医）
- 血管超声（临医）

这三本教材已经正式翻译出版和使用，欢迎使用

12

2.华西超声医/技一体的构建

14

超声科人员组成：医技一体，护、工、辅、学

- **医**师：核心作用，医疗、教学、科研
- **技**师：重要力量，医疗为主（检查/印象）
- **护**士：介入、院感、急救等
- **工**程师：设备、网络、数据
- **辅**助：预约、分诊、录入，随访
- **学**员：培训、检查及初级诊断

15

3. 华西超声分级诊疗尝试

3.1 超声需求“分级”

- **POC(point of care)**：床旁特定目的，迅速排查，（1-2’ ）；
- **体检及筛查**：发现有无问题，初步诊断，快速，，（5-10’ ）；
- **专科需求**：精准、个体化、围绕专病，较慢，，（10-30’ ）；
- **介入诊治**：微创，包括引导、诊断、治疗，慢速，（1-2h ）。

16

3.2 超声诊疗尝试“分级供应”（科内）

- **岗位**

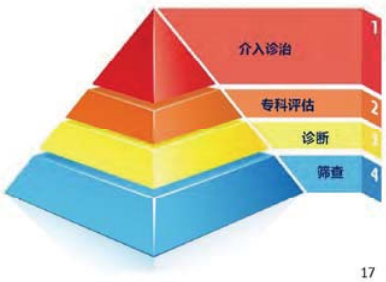
体检/普检、专科与疑难、介入

- **人员**

医师&技师，初、中、高级

- **设备**

手机超、便携、台式、多模态

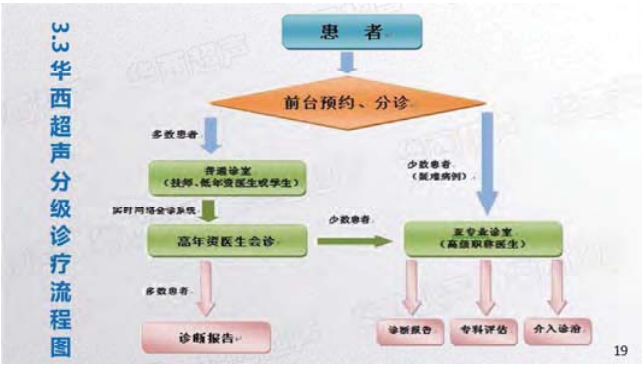


17

华西超声科各级人员分级及权限

	普通超声		专科(疑难)超声		介入超声
	检查	诊断	检查	诊断	
技师/学员级医师	+	-	- / +	-	-
初级医师	+	+	- / +	-	-
中级医师	+	+	+	-	+
高级医师	+	+	+	+	+

18


3.3 华西超声分级诊疗流程图
患 者
前台预约、分诊
多数患者
普通诊室
（技师、低年资医生或学生）
实时网络会诊系统
高年资医生会诊
多数患者
诊断报告
少数患者
（疑难病例）
少数患者
亚专业诊室
（高级职称医生）
诊断报告
专科评估
介入诊治
19


抛砖引玉，
谢谢聆听！

Sonography in the United States

Traci B. Fox, EdD, RDMS, RVT
Associate Professor
Department of Medical Imaging and Radiation Sciences
Jefferson College of Health Professions
Thomas Jefferson University

Thomas Jefferson University

- Department of Medical Imaging & Radiation Sciences
  - New department name as of 2018
- Established in early 1980s as hospital-based program
- Became University-based in late 1980s
- One-year and two-year programs

- Concentrations (tracks) – Each one year long:
  - General sonography (28 students)
  - Vascular sonography (14 students)
  - Cardiac sonography (10 students)

Thomas Jefferson University

- The future:
  - Graduate level ultrasound education
  - Clinical and non-clinical MS programs in sonography

National Accreditation

- **Commission on Accreditation of Allied Health Education Programs (CAAHEP)**
  - Reviews and accredits sonography programs

- **Joint Review Committee on Education in Diagnostic Medical Sonography Programs (JRC-DMS)**
  - Sets the curriculum and standards for accredited ultrasound programs

- Jefferson's program is CAAHEP accredited and TJU is accredited nationally by Middlestates

Basic Courses Required for Sonography

- Pre-requisites (Bachelor of Science degree)
  - Math (6 credits)
  - English/English Composition (3 credits each)
  - Physics I & II (4 credits each)
  - Chemistry I (3 credits)
  - Anatomy & Physiology (4 credits each, with lab)
  - Medical terminology (3 credits)
  - Statistics (3 credits)
  - Electives (13 credits)

  Total: 50 credits prerequisites

Sonography Courses

- Courses are designed to help students learn principles and instrumentation of ultrasound
  - Physics
  - Lab
  - Principles
  - Patient Care
  - 900 hours of clinical time at more than 40 possible clinical sites

- National Board exams (ARDMS)
  - Physics exam + specialty exam (abdomen, vascular, etc.)

Lab Instruction

The student ultrasound lab at Thomas Jefferson University

Simulation

Medaphor ScanTrainers

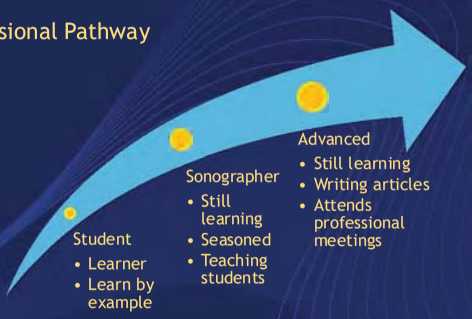
Simulation

Clinical

- Students spend about 900 hours in clinical
- Students usually rotate to 2 or 3 hospitals as part of training

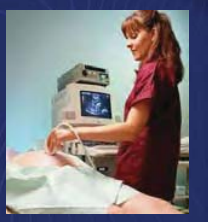
Careers in Sonography

Professional Pathway



Career Pathways

- **The staff sonographer**
  - Working 40 hours per week*
  - May have shift work
  - May have on-call
  - Note: Sonographers in the U.S. provide the first level interpretation (preliminary report), which is officially read by a physician
  - Sonographers do not render a diagnosis or write final reports



Career Pathways

- **The lead sonographer**
  - Working 40 hours per week
  - May have shift work
  - May have on-call
  - Some supervisory responsibilities including training/education of new hires and students

Career Pathways

- **The supervisor**
  - Working 40 hours per week
  - May scan or may be non-scanning
  - May supervise several locations and a large staff
  - Have to appease staff and administration

Career Pathways

- **The Director or Manager**
  - Working 40 hours per week
  - May oversee several non-US departments (e.g., director of Radiology)
  - Budgeting, payroll, hiring/firing

Research Sonographer

- Work with PhDs and MDs
- Sonographers may be staff or may be partially funded
- Learn new and interesting technologies, diagnostic procedures and interventions

Remember that physics you thought you could forget?

Industry as a Career Pathway

- **Sales & Applications**
  - Commission plus salary (variable)
  - Lots of travel
  - Degree may or may not be needed
  - Get to meet a lot of people

Veterinary

- Vet techs currently perform ultrasound but sonographers can also perform this role
- Variety of animals
- Patients don't talk back
- But they may bite you

谢谢

超声波检查在美国

Traci B. Fox, 教育学博士, RDMS, RVT
副教授
托马斯杰斐逊大学
杰斐逊卫生科学学院
医学影像暨放射科学系

托马斯杰斐逊大学

- 医学影像暨放射科学系
  - 新系名截至2018年
- 作为医院项目成立于20世纪80年代
- 于20世纪80年代成为大学项目
- 一年及两年制项目

- 集中课程（选课资料）- 每种课程时间为一年：
  - 通用超声学（28名学生）
  - 血管超声学（14名学生）
  - 心脏超声学（10名学生）

托马斯杰斐逊大学

- 未来：
  - 研究生水平超声教育
  - 临床及非临床超声理学硕士课程

国家认证

- **联合健康教育方案认证委员会(CAAHEP)**
  - 审查及认证超声学课程

- **诊断医学超声课程教育联合审查委员会(JRC-DMS)**
  - 设定认证超声计划的课程及标准

- 杰斐逊开办的课程经CAAHEP认证，TJU由美国中部各州在全国范围内认证。

超声学基础课程要求

- 前提条件 (理学学士学位)
  - 数学 (6 个学分)
  - 英语/英语作文(各3个学分）
  - 物理I 和 II (各4个学分）
  - 化学 I (3个学分)
  - 解剖学及生理学（各4个学分，包括实验操作）
  - 医学术语学（3个学分）
  - 统计学（3个学分）
  - 选修课程（13个学分）

总计：至少获得50个学分

超声学课程

- 课程设置旨在帮助学生了解超声原理及超声仪器
  - 物理
  - 实验室操作
  - 原理
  - 病患护理
  - 40处临床医疗点900小时的临床时间

- 国家考试委员会考试 (ARDMS)
  - 物理考试+ 专业考试(腹部，血管等）

实验室教学

托马斯杰斐逊大学学生超声实验室

模拟

Medaphor ScanTrainers

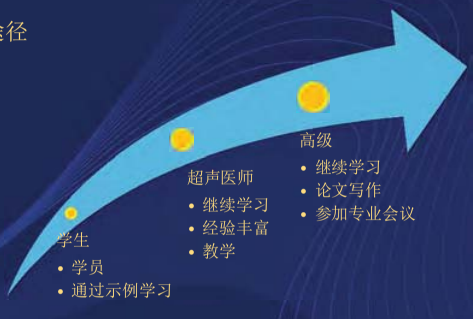
模拟

临床教学

- 大约900小时的临床学习
- 作为培训的部分内容，学生通常在2家或3家医院轮换学习

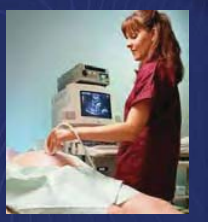
超声波职业

专业途径



职业途径

- **助理超声波医师**
  - 每周工作40小时*
  - 可能轮班工作
  - 可能需要随叫随到
  - 注意：美国的超声医师为第一层次的图像判读（初步报告），通常由医师完成。
  - 超声医师不进行诊断或作出最终报告。



职业途径

- **首席超声医师**
  - 每周工作40小时
  - 可能轮班工作
  - 可能需要随叫随到
  - 负有一定程度的监督职责，包括新聘职员及学生的培训与教育

职业途径

- **主管**
  - 每周工作40小时
  - 可进行扫描或不进行扫描工作
  - 可对数个地点及大量人员进行监督
  - 需要执行员工安抚工作与管理

职业途径

- **总监或经理**
  - 每周工作40小时
  - 可对多个非美国部门（如放射科）进行监督
  - 预算，工资，招聘及解聘

研究型超声医师

- 与博士及硕士一起工作
- 超声波医师可以是员工或受部分资助
- 学习新的有趣的技术，诊断规程及介入疗法

*Sometimes that physics you thought you could forget!

作为职业途径的行业

- **销售与应用**
  - 佣金+薪资(浮动)
  - 大量出差机会
  - 可能需要，也可能不需要学位
  - 结识大量人员

兽医

- 兽医技术人员目前正在进行超声波治疗，但超声波医师也可以执行这一任务
- 各种动物
- 病人不会还嘴
- 但可能会咬你

谢谢

LOGO

中国超声医学继续教育项目概览

四川大学华西医院
超声科 彭玉兰
2018年10月20日成都

www.themegallery.com

Contents

继续教育概念
Continuing Medical Education (CME)

终身教育/非学历教育

针对专业技术人员的知识和技能

更新　补充　提高　完善

继续教育在整个世界范围内，仅用了半个世纪的时间，迅速发展。

一.中国超声医学CME的主要类型

二.住院医师规范化培训管理
The standardized residents training in hospital

1993年，卫生部印发《关于实施临床住院医师规范化培训试行办法的通知》

超声规培基地始于21世纪初，但2017年由中国医师协会超声医师分会首次开展独立的超声学科基地评审

超声培训基地评估

2017年住院医师规范化培训评估指标——超声医学科专业基地

培训基地（医院）名称：						所属省（区、市）：			
评估项目									
一级指标	二级指标	三级指标	★为核心指标	评估内容	现场评估方式	评分标准	分值	得分	简述扣分原因	备注（对核心指标的评判）

4个一级指标，10个二级指标，35个三级指标

1.基本条件（20分）：医院和超声科条件；协同医院条件；政策支持。
2.师资条件（15分）：师资情况；师资建设；
3.过程管理（30分）：培训制度与落实；培训活动；过程考核。
4.质量控制（35分）：带教医师教学质量；学员学习效果。

严格的整改条例15条（红牌，黄牌，整改不合格或将予撤销）

基地整改条例（15条）

- A. 超声科内亚专业个数<4时，将予撤销（红牌）。
- B. 无PACS和His系统，须限期（半年）整改（黄牌）。
- C. <85%时，均须限期（半年）整改（黄牌）。
- D-N……
- O. 总分100分，≥80分为合格，<80~75分为基本合格，<75~60分为限期（半年至一年）整改（黄牌），<60分将予撤销（红牌）；另有材料不真实、或近三年发生相关医疗事故及相关事件等均为一票否决（红牌）
- *其他较突出的需要整改的问题（以下另写明）。

住院医师轮转计划

临床 6m	内科2m，外科2m，妇产科1m，ICU1m
影像 8m	放射科4m，超声科3m，核医学1m
超声 19m	腹部3m，心脏4m，妇产5m，浅表3m，血管3m，介入1m

结业考试

- 第一站 临床思维与决策
- 第二站 基础技能
- 第三站 专科技能

内容及要求如下：

考站名称	考站名称	考核内容	考核形式	考官人数	考核时间	分值	备注
第一站	临床思维与决策	根据所给的病例回答问题	面试	2人	10min	100	根据各学科培训标准及考试大纲中的要求，单独命题并考核，考官根据考核要求评分
第二站	基础技能	心肺复苏术/体格检查	临床/模具操作	2人	[illegible]	100	心肺复苏术和体格检查，两项中抽考一项，考官根据考核要求评分。
第三站	专科技能	各专科要求的技能操作	临床/模具操作	2人	10min	100	根据专科技能操作项目目录，抽考一项，考官根据考核要求评分。

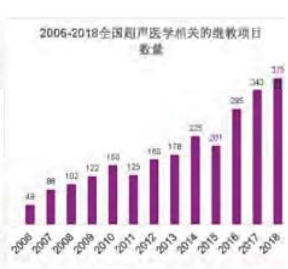
三.进修学习

- 大学、医学院、医院自主招生
- 四川大学继续教育学院
  - 超声专业3月-12月；临床12月

四.中国超声CME

2006-2018全国超声医学继教项目一览表

年份	数量
2006	49
2007	88
2008	102
2009	122
2010	150
2011	125
2012	165
2013	178
2014	225
2015	201
2016	295
2017	343
2018	375
合计	2418



CME：项目类型

形式和内容

形式：专题讲座

院士讲座
超声专业

院士讲座
影像人工智能

CME远程项目

讲座

会诊

支边西藏高原，肝包虫肝移植手术：术后在华西远程会诊，指导医疗。

2007年08月，华西远程继续医学教育项目荣获"亚洲医院管理奖-人力资源发展类卓越奖"

MDT指南/共识讨论

六个MDT之一：华西医院乳腺MDT
(包括:乳腺外科、肿瘤科、病理科、影像科、放疗、基础研究、护理)

交叉学科（医工）专题讨论

名家访谈：主题鲜明（AI）

辩论赛

Work-shop

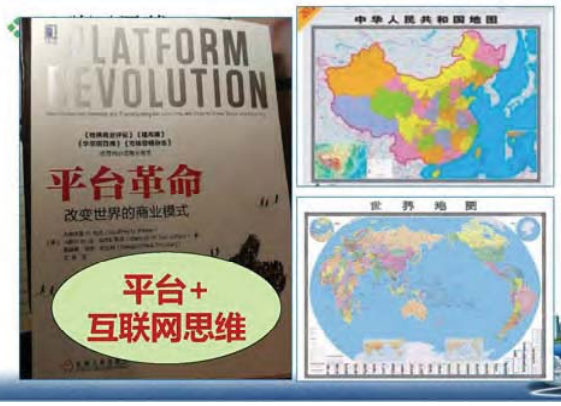
竞猜：为荣誉而战

五.华西超声历史和CME项目

华西超声CME项目数据来源

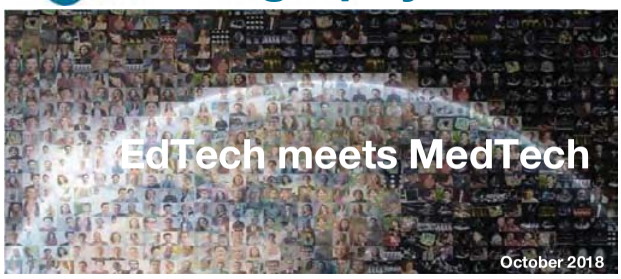
- 四川大学继续教育学院档案：2003-2008（陈文惠提供）
- CME项目网上查询：2007-2018（潘非提供）
- 2003-2018，华西医院超声科36项CME项目

CME遍及世界各地




LOGO
Thank You !
www.themegallery.com

sonography

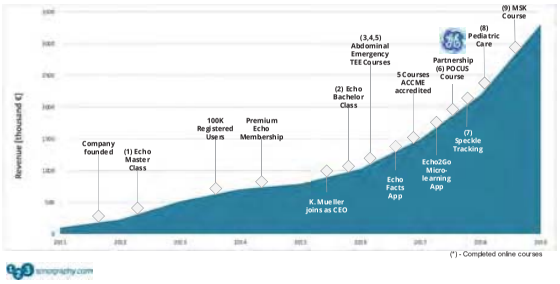


Who we are today

#1 global online medical education platform for ultrasound

Born from Viennese Tradition

Company timeline & growth



Our success so far—

- **Clients** — 27,500+ customers who have bought at least one course
- **User** — 275,000+ registered users in 175+ Countries
- **Facebook** — 125,000+ active community; largest in ultrasound
- **YouTube Vimeo** — 4M+ video views
- **Reach** — 1,000,000+ total reach

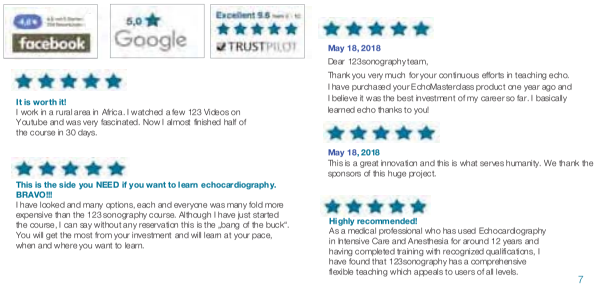
The global ultrasound education market is large and growing—

Global ~$1.0 BN

~10mm+ physicians / health professionals

~4mm new installed units per annum

Customer first focus



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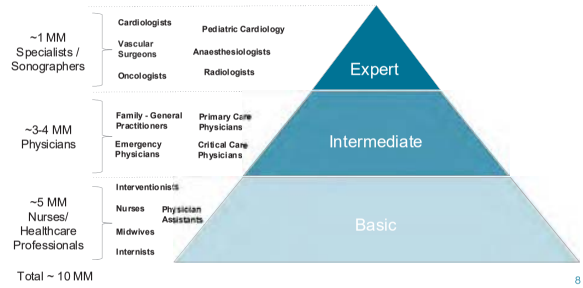
Ultrasound education - customers



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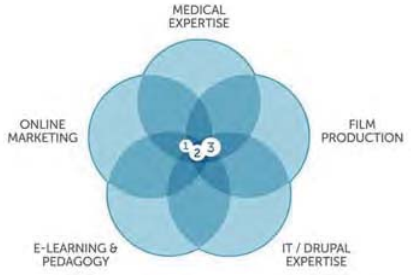
Expanding B2B Partnerships

9

Our Competitive Advantage



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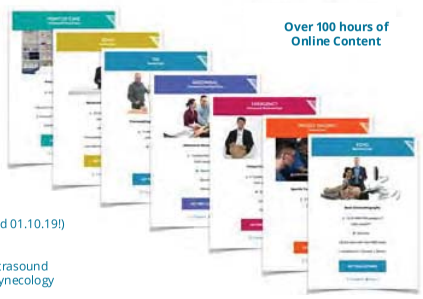
Great Content & *More* of It Drives Growth



Coming Soon:
- MSK (released 01.10.19!)
- Vascular
- Right Heart
- Physics of Ultrasound
- Obstetrics/Gynecology

11

Management & Team

14

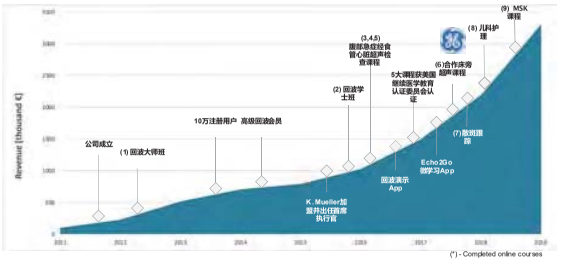
超声波扫描

今天的我们

#1全球第一的在线超声医疗教育平台

来自维也纳的传承

公司成长纪略



辉煌业绩—

- **客户** 27,500多客户，每人至少购买了一种课程
- **用户** 275,000多注册用户，遍及175个以上的国家
- **Facebook** 125,000多活跃社区; 超声领域最大
- **YouTube 视频媒体** 400多万的视频播放量
- **覆盖** 100多万总覆盖量

前景广阔，方兴未艾的全球超声教育市场—

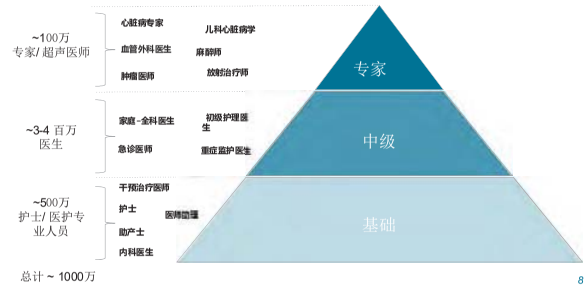
全球约10亿美元

~1000多万的医师/ 保健专业人员

每年新增约400万装机单位

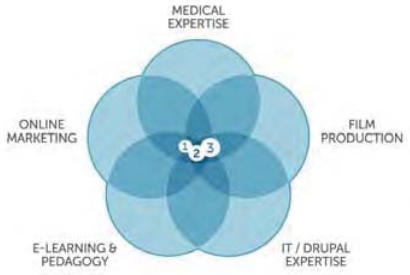
客户至上

超声教育- 客户



拓宽企业对企业电子商务合作关系

竞争优势



驱动增长的精彩内容及更多

即将登场：
- MSK (2019年1月10日发布！)
- 血管
- 右心
- 超声物理学
- 妇产科学

管理及团队

Value of Simulation in Ultrasound Education and Certification

October, 2018

Your worldwide training partner of choice

CAE

OBJECTIVES

- Illustrate the role of CAE Healthcare's Ultrasound Simulation solutions in improving healthcare education and quality of patient care
- Describe key technologies used by CAE Healthcare to enhance simulation solutions
- The increasing role of simulation in healthcare education and its impact on certification

CAE

CAE IS A WORLD LEADER IN TRAINING AND SIMULATION

MORE THAN 100 000 COMMERCIAL FLIGHTS EACH DAY AROUND THE WROLD

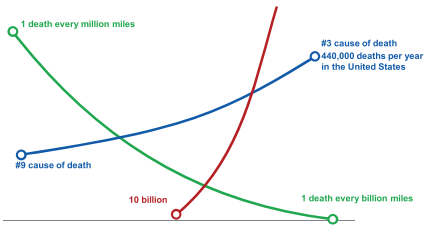
CAE

ADAPTIVE CLOSED LOOP TRAINING:
FLIGHT OPERATIONS QUALITY ASSURANCE (FOQA)
SIMULATOR OPERATIONS QUALITY ASSURANCE (SOQA)

STRIVING FOR AVIATION SAFETY RATES IN HEALTHCARE

Patient safety vs aviation safety
(40 years)

- Aviation accidents per million departures
- Medical errors per 100,000 admissions
- Aviation capacity measured in passenger miles



Source : A guide to Medical Errors Prevention & Reporting. Vantage Professional Education

CAE

LEVEL OF FIDELITY IN AVIATION

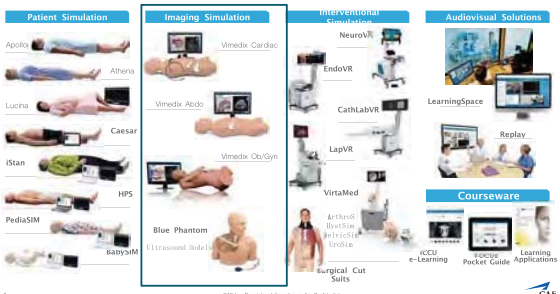
1 hour in a CAE Flight Simulator

=

1 hour of flight time on an actual airplane

This is what we strive for in healthcare simulation!

OUR PRODUCT OFFERING



THOUGHT LEADER AND SOCIETY RELATIONSHIPS

Educational Institutions

University of Cambridge, Harvard Medical School, Columbia University, Duke University, University of Oxford, Stanford University, Yale University, University of Michigan, The University of Chicago, Johns Hopkins University, University of Toronto, McGill

Medical Societies

CHEST American College of Chest Physicians, ESICM, ASE, ESA, Simulation Fellowship, critical care, American Society of Anesthesiologists

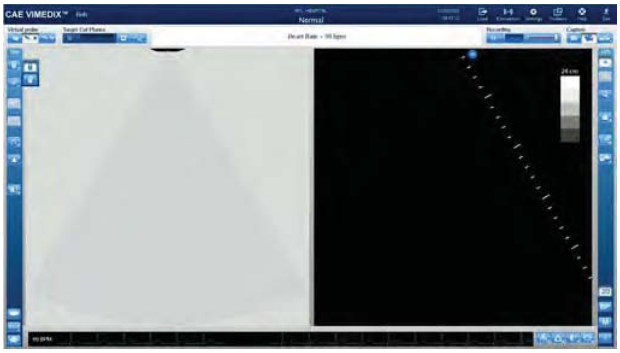
CAE Healthcare collaborates with global experts in healthcare and education

Recent Advances in Technology

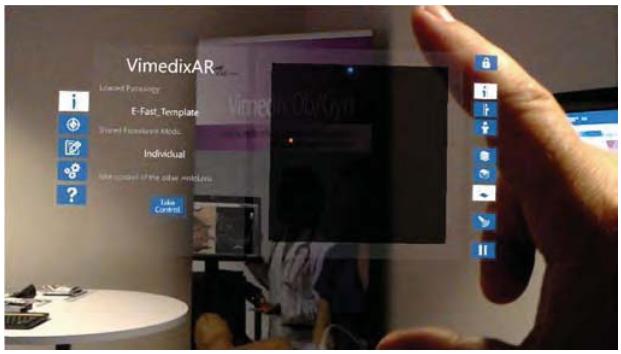
Your worldwide training partner of choice

OBJECTIVE METRICS FOR ASSESSMENT OF PROFICIENCY

Matyal et al. (2014) Anesthesiology, v121, 389-99

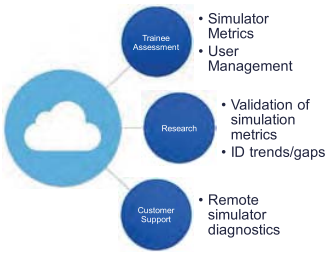


AUGMENTED REALITY: INNOVATION IN EDUCATION



SCREEN-BASED SIMULATION FOR MAINTENANCE OF CERTIFICATION

CLOUD-BASED CONNECTIVITY OF CAE SIMULATORS

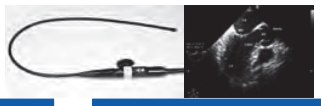


Evidence of Impact on Education and Proficiency

Your worldwide training partner of choice

ACCELERATING PATH TO PROFICIENCY

Transesophageal Echocardiography (TEE)



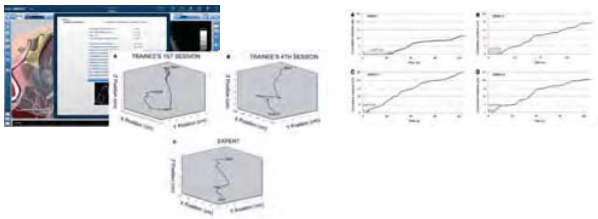
Anesthesia/Cardiology	Emergency Medicine
• 4-week TEE curriculum with E-Learning and Simulation • Demonstrated development of proficiency • Translation into clinical proficiency	• 4-hour TEE Workshop • Most trainees able to obtain basic views after workshop • 95.8% retained ability to obtain views **6 weeks** after workshop

Anesthesiology. 2014 Aug;121(2):389-99. doi: 10.1097/ALN.0000000000000234.
Simulator-based transesophageal echocardiographic training with motion analysis: a curriculum-based approach.

J Cardiothorac Vasc Anesth. 2015 Dec;29(6):1504-10. doi: 10.1053/j.jvca.2015.05.198. Epub 2015 May 27.
Manual Skill Acquisition During Transesophageal Echocardiography Simulator Training of Cardiology Fellows: A Kinematic Assessment.

Crit Ultrasound J. 2015 Dec;7(1):27. doi: 10.1186/s13089-015-0027-3. Epub 2015 Jun 12.
Focused transesophageal echocardiography for emergency physicians-description and results from simulation training of a structured four-view examination.

METRICS TO ASSESS COMPETENCY



Anesthesiology. 2014 Aug;121(2):389-99. doi: 10.1097/ALN.0000000000000234.
Simulator-based transesophageal echocardiographic training with motion analysis: a curriculum-based approach.

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Manual Skill Acquisition During Transesophageal Echocardiography Simulator Training of Cardiology Fellows: A Kinematic Assessment.

SCREEN-BASED SIMULATION FOR MAINTENANCE OF CERTIFICATION

ABA Approval for MOCA credits

CAE SIMULATION USED FOR ASSESSMENT AND CERTIFICATION

- Vimedix used for European Diploma in Echocardiography exam for Transesophageal Echocardiography
- Vimedix used in assessments for Japanese Society of Anesthesia
- ICCU E-Learning a component of Chest (ACCP) ultrasound curriculum

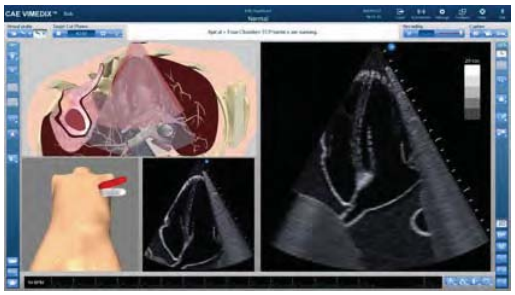
How Simulation Improves Accessibility

Your worldwide training partner of choice

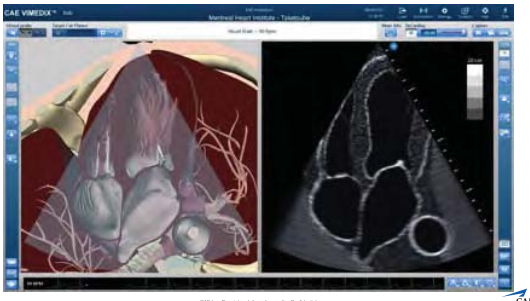
E-LEARNING: FLEXIBLE LEARNING WITH YOUR OWN PACE

SCREEN-BASED SIMULATION: COMPLETELY INTERACTIVE VIRTUAL TOOLS

SELF-DIRECTED MODULES TO SAVE INSTRUCTORS TIME



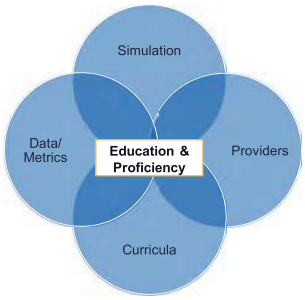
EXPOSURE TO RARE OR URGENT PATHOLOGIES



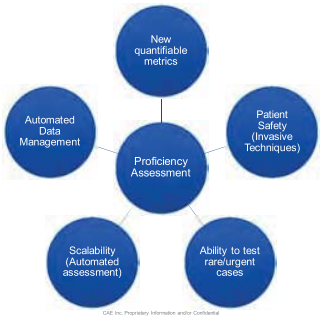
Simulation as a Path to Proficiency

Your worldwide training partner of choice

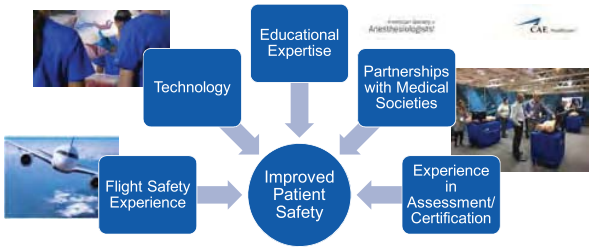
SIMULATION AS A VEHICLE FOR EDUCATION AND PROFICIENCY



ENHANCEMENT OF PROFICIENCY ASSESSMENT WITH SIMULATION



PARTNER OF CHOICE FOR SIMULATION IN EDUCATION/ASSESSMENT



仿真技术在超声教学及认证方面的价值

2018年10月

Your worldwide training partner of choice

CAE

目的

- 说明CAE Healthcare超声仿真解决方案在改善医疗保健教育和患者护理质量方面的作用
- 描述CAE Healthcare用于增强仿真解决方案的关键技术
- 仿真技术在医疗保健教育中日益突出的作用及其对认证的影响

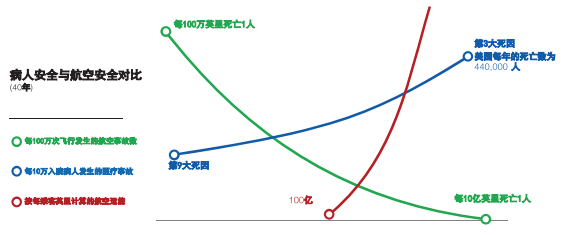
CAE

CAE是培训及仿真技术的世界领袖

全球每天超过100，000架次的商业航班

CAE

力争医疗保健达到航空安全率



来源：医疗事故预防与汇报指南，Vantage专业教育

CAE

航空逼真度

CAE飞行模拟器中1小时

=

在实体飞机中飞行1小时

这就是我们在医疗保健模拟上需要努力的地方！

我们提供的产品

意见领袖与社会关系

CAE Healthcare 与全球医疗保健及教育界的专家精诚合作

最新技术进展

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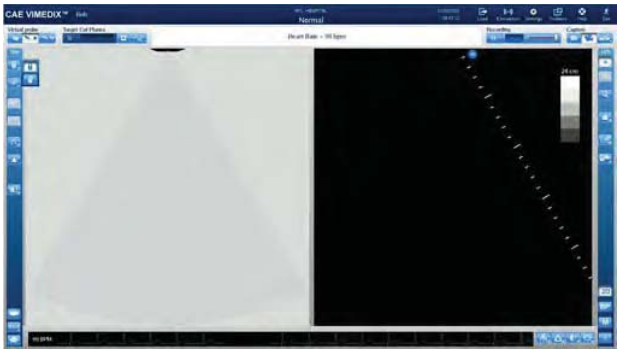
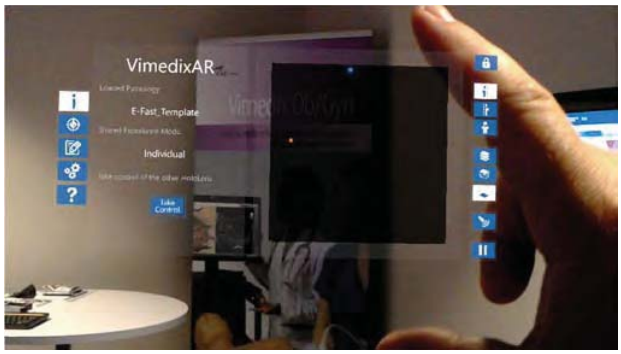
专业程度评估客观标准

Matyal等人 (2014) 麻醉学 第121卷 380-90页

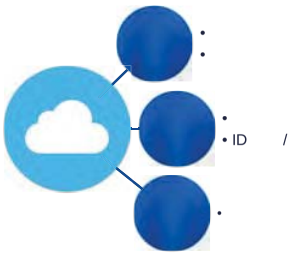


增强现实：教育领域的创新之举



针对认证维护的基于屏幕的模拟

基于云端的CAE模拟器互联



对教育及专业水平影响的证据

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19

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快速提升专业水平

经食管心脏超声检查
(TEE)

麻醉/心脏病学	急诊医学
• 4周TEE课程，包括在线学习及模拟 • 专业水平明显提升 • 临床能力的转化	• 4小时TEE研习课程 • 大多数学员在课程学习后能获得基本视图 • 95.8% 的人在学习后**6周**能够获得视图

麻醉学。2014 年8月;121(2):389-99. doi: 10.1097/ALN.0000000000000234.
基于模拟器的经食管心脏超声检查培训及运动分析：一种基于课程的方法。

J Cardiothorac Vasc Anesth. 2015 年12月;29(6):1504-10. doi: 10.1053/j.jvca.2015.05.198. Epub 2015 May 27.
心脏病学研究人员经食管心脏超声检查模拟器培训期间的手工技能习得：一种动态分析方法

Crit Ultrasound J. 2015 Dec;7(1):27. doi: 10.1186/s13089-015-0027-3. Epub 2015 Jun 12.
急诊医师使用经食管心脏超声检查-结构化四视图考试模拟培训描述与结果

20

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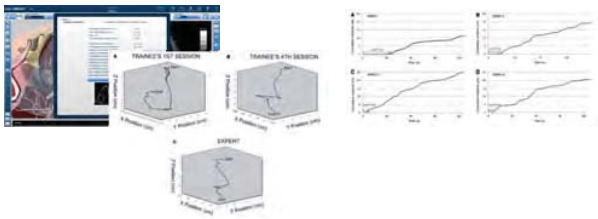
能力评估标准



麻醉学，2014 年8月;121(2):389-99. doi: 10.1097/ALN.0000000000000234.
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21

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针对认证维护的基于屏幕的模拟

ABA认证的MOCA评分

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用于评估及认证的**CAE**模拟

- 经食管心脏超声检查所用的心脏超声考试欧洲文凭 Vimedix
- 日本麻醉学会评估所用的Vimedix
- ICCU在线学习，胸部(ACCP) 超声课程的一种内容

23

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模拟是如何提升访问性的

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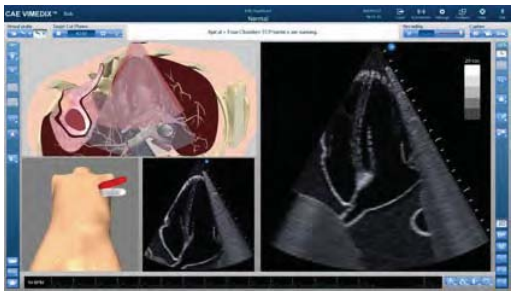
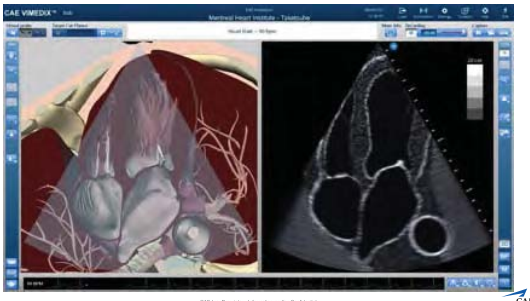
在线学习：按照自己进度安排的灵活学习

基于屏幕的模拟：完全交互式虚拟工具

自主式模块，节省教员的时间



接触罕见或紧急病理的状态



模拟，通向专业水平的必然之路

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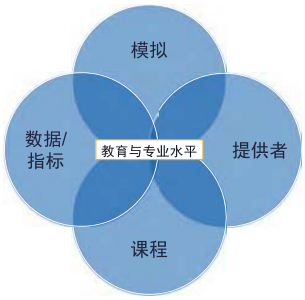
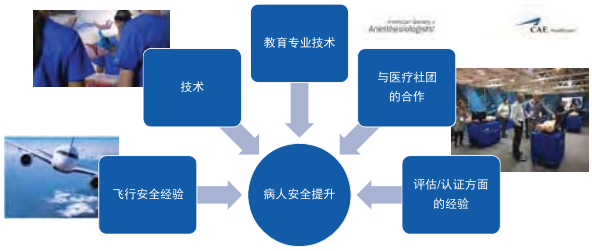
模拟，作为教育及专业水平的一种工具



利用模拟加强专业水平的评估

教育/评估模拟精选合作伙伴



School of Health and Rehabilitation Sciences

Ultrasound simulation and its impact on education and clinical preparedness

Kevin D. Evans, PhD, Principle Investigator
Carolyn M. Sommerich, PhD
Sundus H. Mohammad, BS
Xueling (Jeff) Pan, PhD

The Ohio State University

Serving as the Multi-site PI for this Inteleos funded research study into the impact of simulation.

Researcher/educator at The Ohio State University.

Funded by Federal, State, & Industry for $3.5M

Tenured Professor

Presentation Objectives

- Review the evidence on simulated education
- Describe the progress with Phase I DMS, Med Student pilot, & multi-site recruitment
- Review the design of Phase II
- Stimulate discussion and questions

History of simulation

- McGaghie et al. conducted a review of the published literature from 1990-2010 on the comparative effectiveness of simulation-based medical education with deliberate practice (DP).[1]
- The results of their review were based on only 14 quality studies (out of 3,742) and they included a variety of simulated clinical skills.
- The conclusions of their review were that simulation coupled with DP was superior to clinical medical education.[1]

McGaghie et al recommendations

The five best practices posed from the systematic review were:

1. **Feedback**
2. **Deliberate Practice**
3. **Curriculum integration**
4. **Outcome measurement**
5. **Simulation fidelity.**[2]

Each of these simulation features contains a critical set of factors that would need to be addressed.

Sonography specific educational research

- In sonography, few studies of the use of technology-enhanced simulation exist.
- Gibbs et al. utilized an ultrasound simulator as an educational activity for 25 students who completed both transabdominal and transvaginal scanning on a Medaphor ScanTrainer.[3]
- The author conducted qualitative interviews with the students and found some descriptive information that matches the five best practices posed by McGaghie et al.

Educational Research Objective

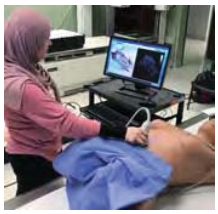
This work will provide evidence to confirm or disconfirm the following hypothesis:

The use of simulation technology will allow participants to augment their learning and execution of basic clinical sonography scanning skills and this will result in a measureable change in clinical skills.

Sim Research Phase I

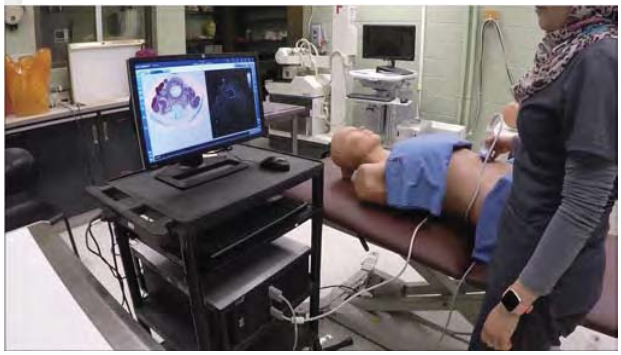
This pilot study will:

1. Validate the fundamental and foundational preliminary standard developed by Inteleos' Innovation Task Force.
2. Develop manuals for uniform instruction across potential educational sites.
3. Confirm the clinical equivalency protocols for Phase Two function, as anticipated.
4. **Integrate micro-ergonomic standards for simulation.**



Best practices: Feedback, Curriculum integration, & Deliberate practice

CAE Vimedix US Simulator video



Phase I- Deliverables

- We developed a standard for students who have no scanning experience in a clinical setting, a fundamental and foundational level, also known as "basic."
- Standards were identified for three content areas: Cardiac, Abdomen, and Gynecology. Partial development was completed for Obstetrical 1st and 2nd Trimesters.
- We have refined, developed, and implemented templates and scoring guides for all the above content areas and have begun doing formative assessments.

Sim Research Phase 2

Research across multiple institutions will:

1. Study clinical equivalency of US simulation to expedite clinical competency, domestically.
   - Sonography education in undergrads (3 sites)
   - PoCUS Physician prep (3 sites)

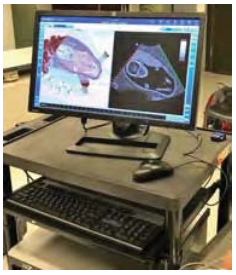
2. Determine clinical equivalency of US simulation internationally, using established protocols and standards
   - China –Beijing
   - China –Zhongshan

Outcomes measurements

Phase 2-Deliverables

- Data will allow for a comparison of students' progression to an established pre-clinical standard using ultrasound simulators compared to real patients and scanning volunteers.
- Comparisons of time and other variables to reach the fundamental and foundational standard will be made between ultrasound simulators and clinical competency with patients and/or fellow students.

Discussion points based on the study



- Inteleos will be able to determine how simulation could fit into its assessments and/or meet some eligibility requirements, to qualify for credential exams.
- The exact percentage of required scans that ultrasound simulation can meet could be determined, once study data are available.
- After all phases of the research are completed, Inteleos can determine whether simulation may be used to formally measure progressive proficiency as part of a psychomotor examination.

Progress to date at OSU: DMS & MD students

IRB approval for data collection [2018B0313] and multi-site approval now is moving through the additional IRB systems.

- Control group of undergraduates have been assessed with no simulation experience (n=10)
- New sonography students are actively learning with a mix of CAE simulator, colleague scanning, and Kyoto phantom/Blue phantom.
- One medical student has completed a CAE pilot PoCUS for Normal aorta & renal cases.
- OSU Medical School will be providing 10 4th year Medical students and 10 1st year Medical students who have completed their cardio block-heart and IVC.

References

1. McGaghie WC, Issenberg SB, Cohen ME, Barsuk JH, Wayne DB. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Academic medicine: Journal of the Association of American Medical Colleges.* 2011 Jun;86(6):706.
2. McGaghie WC, Issenberg SB, Petrusa ER, Scalese RJ. A critical review of simulation-based medical education research: 2003–2009. *Medical education.* 2010 Jan 1;44(1):50-63.
3. Cook DA, Hatala R, Brydges R, Zendejas B, Szostek JH, Wang AT, Erwin PJ, Hamstra SJ. Technology-enhanced simulation for health professions education: a systematic review and meta-analysis. *JAMA.* 2011 Sep 7;306(9):978-88.
4. Gibbs V. The role of ultrasound simulators in education: An investigation into sonography student experiences and clinical mentor perceptions. *Ultasound.* 2015; 23: 204-211.

Questions?

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- This work was supported by a grant from Inteleos and support/equipment provided by CAE Healthcare.

健康与康复学院

超声模拟及其对教育及临床预防的影响

Kevin D. Evans, 博士，课题负责人
Carolyn M. Sommerich, 博士
Sundus H. Mohammad, 理学学士
Xueling (Jeff) Pan, 博士

The Ohio State University

Inteleos资助的模拟影响研究课题多站点负责人

俄亥俄州立大学研究员/教师

获得联邦、州及实业资助350万美元

终身教授

演示目的

- 审查模拟教育的证据
- 说明第一阶段DMS、医学飞行学员及多站点招募进展情况
- 审查第二阶段的设计
- 模拟讨论与问题

模拟的历史

- McGaghie等人对1990 - 2010年出版的有关基于模拟的医学教育与刻意训练（DP）的比较效果的文献进行了审查。[1]
- 他们的审查结果仅基于（3,742项样本中抽取的）14项质量研究，包括各种模拟临床技能。
- 他们审查得出的结论是模拟结合刻意训练优于临床医学教育。[1]

McGaghie等人的建议

系统审查提出的5种最佳做法是：

1. **反馈**
2. **刻意训练**
3. **课程整合**
4. **结果测量**
5. **模拟逼真度.**[2]

这些模拟特征中的每一个都包含需要解决的关键因素。

超声波扫描特定的教育研究

- 在超声波检查中，很少有关于使用技术增强模拟的研究。
- 吉布斯等人利用超声模拟器作为完成了Medaphor ScanTrainer经腹和经阴道扫描学习的25名学生的教学活动。[3]
- 作者对学生进行了定性访谈，发现了一些符合McGaghie等人提出的五种最佳实践的描述性信息。

教育研究的目的

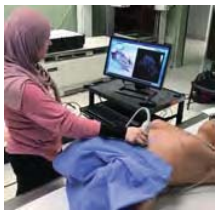
本文将提供证据来证实或否定以下假设:

模拟技术的使用将使参与者能够增强他们对基本临床超声扫描技能的学习和执行，这将导致临床技能的可测量变化。

模拟研究第一阶段

此初始阶段的研究将：

1. 验证Inteleos创新工作组制定的基本和基础性初步标准。
2. 制定所有潜在教育网站统一的教学手册。
3. 如预期的那样，确认第二阶段功能的临床等效方案。
4. **集成微型人体工程学标准以进行模拟。**



最佳实践：反馈，课程整合和刻意训练

CAE Vimedix 美国模拟器视频

第一阶段-研究成果

- 我们为那些在临床环境中没有扫描经验的学生制定了标准，这是一种基础和基本的水平，也被称为“基础”。
- 确定了三个内容领域的标准：心脏，腹部和妇科。 产科第一和第二学期的部分标准已经完成。
- 我们完善、开发并实施了针对上述所有内容领域的模板和评分指南，并开始着手教学评测。

模拟研究第二阶段

多家机构研究将：

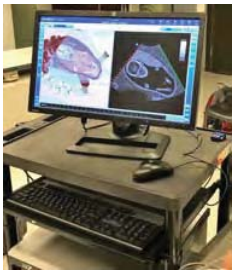
1. 研究美国模拟的临床等效性，以加快国内临床能力的提升。
   - 大学生超生波扫描教学（3处站点）
   - PoCUS 医师预备课程（3处站点）
2. 使用既定的协议和标准确定美国模拟的临床等效性
   - 中国 –北京
   - 中国 –中山

最佳实践：前3位，模拟逼真度，及结果评测

第二阶段-研究成果

- 数据将允许使用超声模拟器与真实患者和扫描志愿者相比，将学生的进展与已建立的临床前标准进行比较。
- 将在超声模拟器与患者和/或同学的临床能力之间进行时间和其他变量的比较，以达到基本和基础标准。

基于研究的讨论点



- Inteleos将能够确定模拟如何适合其评估和/或满足一些资格要求，以获得资格证书考试的资格。
- 一旦获得研究数据，就可以确定超声模拟可以满足的所需扫描的确切百分比。
- 在完成所有的研究阶段后，Inteleos可以确定模拟是否可以作为精神运动检查的一部分用于正式测量专业水平进度情况。

俄亥俄州立大学目前的进展：DMS & MD 学员

- 对没有模拟经验的本科生对照组进行了评估（n = 10）
- 超声学的新学生正在混合积极学习使用CAE模拟器、同事扫描和京都幽灵/蓝色幽灵。
- 一名医科学生已完成正常主动脉和肾脏病例的CAE试验PoCUS学习。
- 俄亥俄州立大学医学院将提供10名四年级医学生和10名完成心肺功能障碍和IVC学习的一年级医学生。

IRB数据收集审批[2018B0313]和多站点审批现在正在通过其他IRB系统。

参考文献

1. McGaghie WC，Issenberg SB，Cohen ME，Barsuk JH，Wayne DB，基于模拟的医学教育配合刻意训练是否比传统临床教育产生更好的结果？证据的元分析比较评论。《学术医学》：《美国医学院协会期刊》。2011年6月;86（6）：706。
2. McGaghie WC，Issenberg SB，Petrusa ER，Scalese RJ，基于模拟的医学教育研究的批判性回顾：2003-2009。医学教育，2010年1月1日;44（1）：50-63。
3. Cook DA，Hatala R，Brydges R，Zendejas B，Szostek JH，Wang AT，Erwin PJ，Hamstra SJ。健康专业教育的技术增强模拟：系统评价和元分析，JAMA，2011年9月7日;306（9）：978-88。
4. Gibbs V.，超声模拟器在教育中的作用：对超声检查学生经历和临床导师认知的调查，超声杂志，2015年;23：204-211。

问题？

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- 这项工作得到了Inteleos的资助和CAE Healthcare提供的支持/设备的支持。

Ultrasound in obstetrics and gynecology

Professor Luo Hong

Sichuan University
West China Second University Hospital
West China Women's and Children's Hospital

History of ultrasonic technology

- Amplitude-mode Ultrasound
- Motion-mode Ultrasound
- Brightness-mode Ultrasound
- Color doppler Ultrasound
- Transvaginal Ultrasound

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- Interventional Ultrasound
- Contrast-enhanced Ultrasound
- Three-dimensional Ultrasound
- Ultrasonic Elastography

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Indications in gynaecology

- Uterine cancer
- Benign and malignant ovarian tumors
- Tubal tumour
- Vaginal tumor
- Endometriosis
- Endometrial lesion
- Congenital dysplasia of uterus and vagina
- Pelvic inflammatory disease
- Monitor reproductive endocrine function

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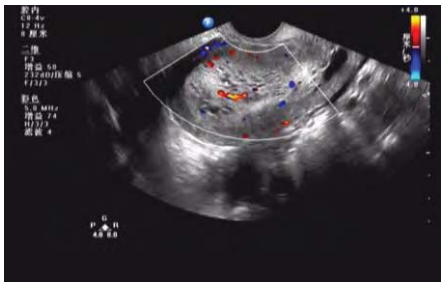

Endometrial hyperplasia

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Indications in obstetrics

- Identify pregnancy
- Assess gestational age
- Monitoring of fetal heart rate
- Abortion
- Ectopic gestation
- Pregnancy complications
- Pregnancy with uterine anomaly
- Gestational trophoblastic neoplasia

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- Fetal congenital malformation
- Placenta\Aminiotic fluid\Umbilical cord
- Amniocentesis
- Multiple pregnancy
- Intrauterine growth retardation
- Huge feteus
- Abnormal fetal position

Intrauterine pregnancy

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Selection of inspection techniques

Two-dimensional ultrasound is the most common and basic approach

Take into account the age, menstrual cycle, disease characteristics, acceptability, and financial status of the patient.

Meanwhile, consider the advantages, limitations, complications and safety of the selected examination methods

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CDFI

- CDFI provides hemodynamic and morphological information for the differential diagnosis of gynecological diseases and the diagnosis of benign and malignant masses

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CDFI

UA
DV — Monitor fetal intrauterine status
UA
UV — Predict fetal pregnancy outcome
MCA

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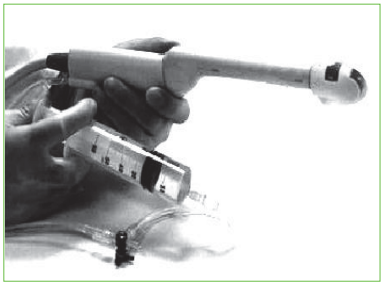
Contrast-enhanced Ultrasound



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Indications

1. Adnexal masses

(1)To identify the presence or absence of blood perfusion and whether it is active tissue

(2) To differentiate benign and malignant masses and determine tissue origin

2. To evaluate the effect of non-surgical treatment of uterine fibroids

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- Preparation before inspection

1.Transabdominal CEUS: proper filling of bladder

2.Transvaginal CEUS: empty bladder

Select proper probes according to the examination requirements. The transabdominal probes were 2.5 ~ 4.0mhz, and the transvaginal probes were 5.0 ~ 9.0mhz

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Methods

- 1.Ultrasonography: transabdominal and vaginal or rectal examination to assess the general situation of the uterus and adnexal area
- 2.Contrast-enhanced Ultrasound

The contrast agent is prepared according to the instructions .The recommended dosage of SonoVue: 1.5-2.4ml（TAS）, 2.4 ~ 4.8ml（TVS）

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Checkout procdeure

1.The ultrasound contrast agent was injected and the timing was started. When the contrast media microbubble reached the target, the entire lesion was scanned slowly and the contrast agent perfusion was observed.

2.Continuous storage of CEUS images within 120s and images within 3 mins if necessary.

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CEUS and Pathological result：endometriotic cyst

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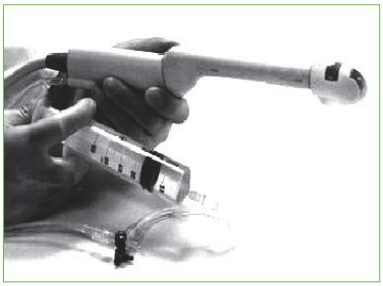
Hysterosalpingocontrast sonography



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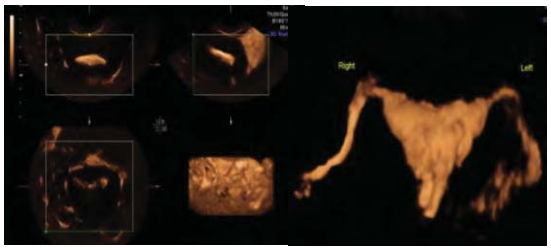
Ultrasonic salpingography procedure

1. intramuscular injection of atropine
2. intrauterine catheterization
3. conventional ultrasound scanning
4. Sonohysterography
5. 3d ultrasound prescanning
6. 4d contrast-enhanced ultrasonography
7. 2D contrast-enhanced ultrasonography
8. 3d contrast-enhanced ultrasonography



Results analysis

MAGIC CUT

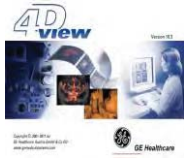
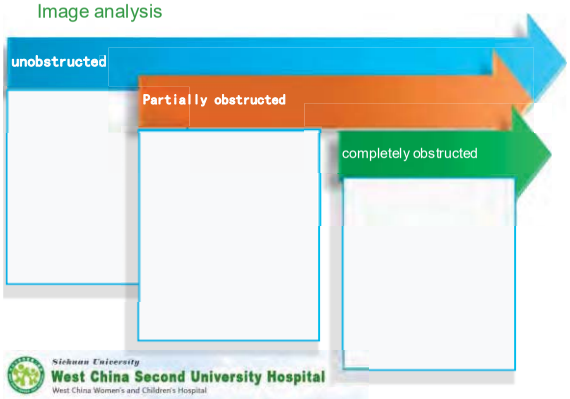
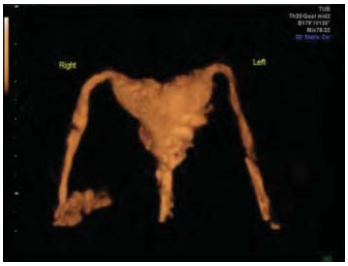


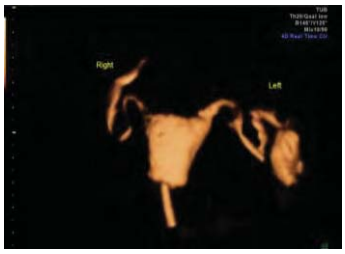
Image analysis



Bilateral fallopian tube unobstructed



Bilateral fallopian tubes partially obstructed， Left hydrosalpinx



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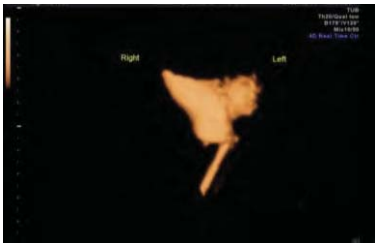
Bilateral fallopian tubes completely obstructed



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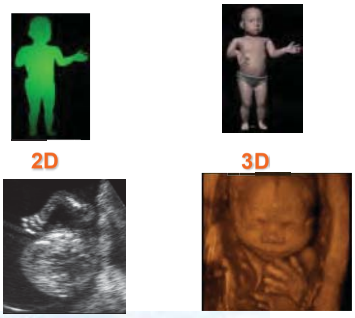
3D ultrasound imaging technology



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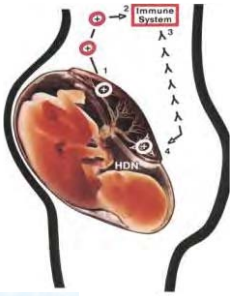
Application of three-dimensional ultrasound in obstetrics

Observation of fetal development and malformation

Observation of umbilical cord

Observation of placenta



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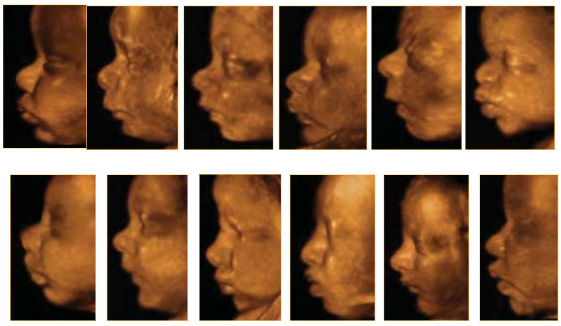

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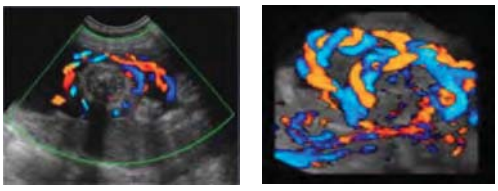
Observation of umbilical cord



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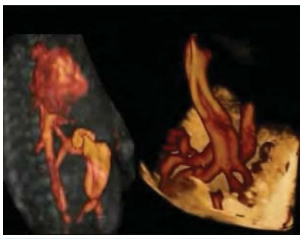
Observation of placenta

Observe the relation between placenta and uterine orifice
Measure the size of the placenta
Display placental blood supply



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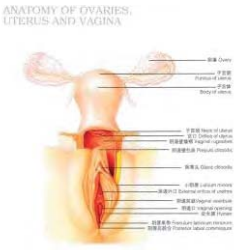
Application of three-dimensional ultrasound in gynecology



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3D ultrasound of normal uterus

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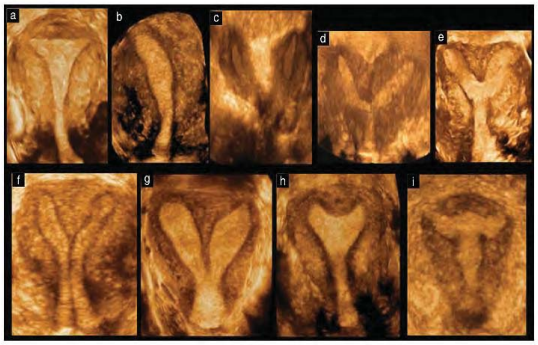
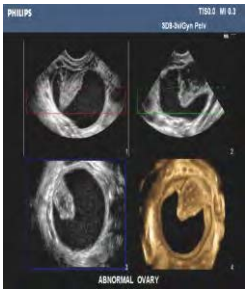


Figure 5 Three-dimensional surface rendered ultrasound images showing different types of uterine malformation using the American Fertility Society[9] classification: (a) normal uterus; (b) unicornuate uterus (Type IId); (c) didelphic uterus (Type III); (d) complete bicornuate uterus (Type IVa); (e) partial bicornuate uterus (Type IVb); (f) septate uterus with two cervices (Type Va); (g) partial septate/subseptate uterus (Type Vb); (h) arcuate uterus (Type VI); and (i) uterus with diethylstilbestrol (DES) drug-related malformations (Type VII).

Overies

Indicate whether there is echo of solid mass in tumor

Indicate the shape and scope of the solid mass



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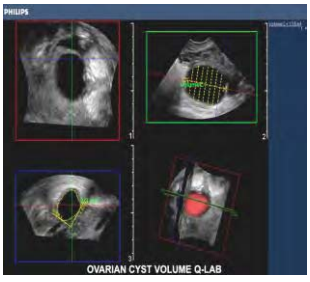
Overies

Measurement of ovarian tumor volume



volume

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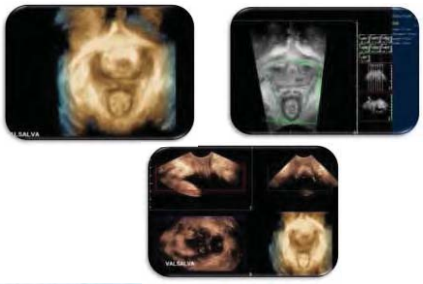
3D ultrasound of the pelvic floor



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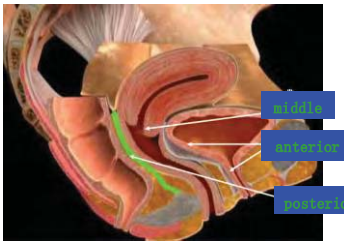
37

Tree chamber observation

anterior chamber

middle chamber

posterior chamber



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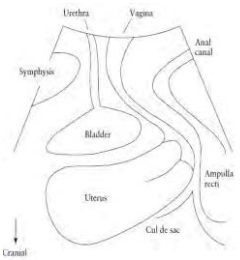

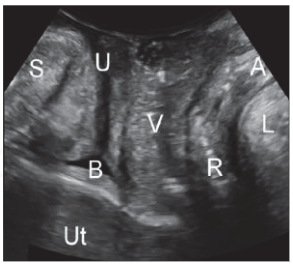

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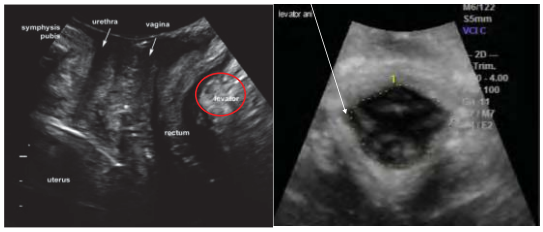
Levator ani



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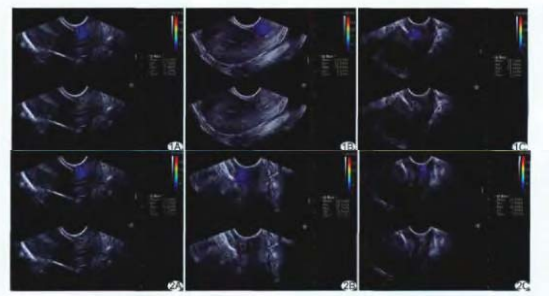
Ultrasonic elastography

Normal cervix



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Interventional Ultrasound in obstetrics

Puncture and injection (MTX) guided by abdominal wall ultrasound after laparoscopic surgery

Umbilical vein puncture (for prenatal diagnosis)

Induced abortion by amniocentesis of malformed fetus

Ultrasound guided drug induction (no amniotic fluid in late pregnancy)

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Interventional Ultrasound in gyenaecology

Place or remove the IUD under ultrasound supervision

Curettage under ultrasound supervision

Ultrasound-guided puncture of follicular cyst

Ultrasound-guided puncture of a pelvic cystic mass

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Ultrasound in the management of vascular disease, an overview.

Michael Lilly, M.D.
University of Maryland School of Medicine
Baltimore, Maryland

Disclosures:

- Practicing Academic Vascular Surgeon
  - School of Medicine
  - Large Academic Medical Center & Inner City Community Hospital
- Medical Director of a hospital-based Vascular Ultrasound Unit
- Medical Director of a Vascular Sonographer Training Program
- Board of Directors of Inteleos – personel certification
- Board of Directors of Intersocietal Accreditation Commission (IAC) – facility accreditation
- No industry relationships

Objectives:

- Review the central role of ultrasound in the modern comprehensive treatment of vascular disease

Plan

- Discuss the 3 phases of care of the vascular patient
- Consider of the role of ultrasound in each phase of care using 3 conditions as examples:
  1. Lower extremity atherosclerosis
  2. Carotid atherosclerosis
  3. Hemodialysis access construction

Role of ultrasound in vascular disease management and treatment.

Ultrasound is valuable in each phase of care of the patient with vascular disease:

1. Initial clinical evaluation
   - Confirm the presence of absence of disease
   - Document disease severity
2. Interventions
   - Procedural guidance
3. After interventions
   Success of the intervention
   Evaluation for recurrence of disease.

Initial clinical evaluation

- Initial clinical evaluation
  - Interview the patient – history
  - Complete physical examination
  - Ultrasound examination
  - Confident diagnosis
  - Treatment plan

Initial clinical evaluation

- Lower extremity atherosclerosis with claudication
  - Segmental pressures and Doppler waveform analysis
    - Confirm physical exam and initial clinical diagnosis
    - Determine the severity of disease
  - Duplex arterial imaging
    - Localize lesion
    - Characterize lesion – stenosis/occlusion, length, calcification
  - Confidently develop treatment plan
    - Medical therapy
    - Exercise
    - Intervention – type: open vs. endovascular.

Initial clinical evaluation

- Carotid Atherosclerosis
  - Carotid duplex imaging
    - Confirm physical exam and initial clinical diagnosis
    - Determine the severity of disease
  - Confidently develop treatment plan
    - Alternative diagnoses
    - Medical therapy – antiplatelet/statin therapy
    - Intervention – endarterectomy vs. stent

Initial clinical evaluation

- Hemodialysis access
  - Duplex Ultrasound examination of upper extremity veins
    - Identify suitable veins for autogenous arteriovenous fistula
  - Arterial physiological exam
    - Identify arterial disease that could lead to access failure or arterial steal
  - Plan appropriate access construction
    - Location – which arm, forearm vs. upper arm
    - Type – native fistula vs. graft
    - Timing of surgical procedure

Interventions

- Procedural guidance – open surgery
  - Venous access for intravenous catheter
  - Placement of surgical incisions
  - Identification of autogenous conduits for bypass or dialysis access
  - Immediate assessment of procedural success

Interventions

- Lower extremity arterial bypass graft
  - Identification/assessment of saphenous vein
  - Placement of surgical incisions
    - Minimize wound complications
    - Shorten procedural time
  - Duplex ultrasound assessment of flow in the bypass graft and in the distal arterial bed

Interventions

- Carotid endarterectomy
  - Placement of surgical incisions
    - Locate the carotid bifurcation accurately
  - Immediate assessment of the endarterectomy
    - Residual plaque
    - Residual stenosis
    - These are associated with periprocedural stroke and should be corrected in the operating room

Interventions

- Hemodialysis access construction
  - Reevaluate the autogenous conduits
    - Dilation with anesthesia or nerve block
    - Identify faulty preoperative assessments or interval changes
  - Placement of surgical incisions
    - Minimize incisional complications
  - Duplex assessment of flow through the access and immediate correction as needed.
    - Stenosis, branches

Interventions

- Procedural guidance – endoluminal surgery
  - Safe arterial (or venous) cannulation
  - Direct guidance of the intervention
    - Angioplasty – artery, vein, arteriovenous fistula
    - Stent/stent graft delivery
    - Ablation – venous therapy
  - Immediate assessment of procedural success
    - Apposition of stents
    - Residual stenosis
    - Dissection

After interventions – follow up

- Most vascular conditions are chronic diseases and will progress or recur over time
  - Extremity atherosclerosis
  - Carotid atherosclerosis
  - Hemodialysis access
- Every vascular intervention has a limited live span
  - Every vascular treatment will eventually fail
  - The goal is to maximize the functional life of each intervention

After interventions – follow up

- Establish the success of the intervention
  - Improved perfusion, normalized flow
- Set a baseline for future evaluations
- Identify correctable lesions that can be treated early before complications ensue

After interventions – follow up

- Lower extremity revascularization, open or endovascular
  - Determine patency of the reconstruction
  - Measure the improvement in distal perfusion
  - Re-intervene if improvement is inadequate
  - Identify early lesions associated with recurrence or graft failure
  - Allow early retreatment to avoid complications

After interventions – follow up

- Carotid intervention – endarterectomy or stent
  - Assess the adequacy of the treatment
  - Monitor for recurrent stenosis
  - Evaluate the contralateral carotid for disease progression.

After interventions – follow up

- Hemodialysis access construction/function
  - Early phase – Monitor "maturation" of the fistula
    - Identify correctable lesions in fistulas
    - Intervene promptly to correct
    - Maximize maturation rate and fistula success
  - Later phase - Evaluate issues with fistula function
    - Poor clearance
    - Low flow – high venous pressures
    - Aneurysmal degeneration

Summary

- Ultrasound is an essential component of a comprehensive practice treating vascular disease
- Important in all phases of care of the vascular patient
- Critical for accurate diagnosis, safe intervention and long-term management

Summary

- We reviewed the central role of ultrasound in:
  - Peripheral atherosclerosis
  - Carotid atherosclerosis, and
  - Management of hemodialysis access
- Equally important in the treatment of:
  - Arterial aneurysm
  - Arterial dissection
  - Venous vascular disease
  - Vascular trauma

Conclusion

- The success of a unit dedicated to the comprehensive evaluation and management of the full spectrum of vascular disease requires:
  - The use of ultrasound in all phases of care, and
  - Trained, competent personnel to use ultrasound technology safely and accurately for the benefit of the patient.

Thank you for the opportunity and the honor of presenting these thoughts to this esteemed group today.

- mlilly@som.umaryland.edu

UNIVERSITY of MARYLAND SCHOOL OF MEDICINE

血管疾病治疗中的超声应用概述

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马里兰大学医学院
马里兰州巴尔的摩市

UNIVERSITY of MARYLAND SCHOOL OF MEDICINE

背景介绍:

- 学术型血管外科执业医生
  - 医学院
  - 大型学术医学中心及市中心社区医院
- 医院血管超声检查室医学总监
- 血管超声培训课程医学总监
- Inteleos董事会成员-人员认证
- 跨社会认证委员会（IAC）董事会成员-设施认证
- 无行业关系

目的:

- 回顾超声在现代血管疾病综合治疗中的核心作用

计划

- 讨论血管病人护理的3个阶段
- 考虑超声在每个护理阶段的作用，以3种情况举例说明：
  1. 下肢动脉粥样硬化
  2. 颈动脉粥样硬化
  3. 血液透析通路构建

超声在血管疾病管理与治疗中的作用

超声在血管疾病患者的每个护理阶段都很有价值：

1. 初步临床评估
   - 确认是否存在疾病
   - 记录疾病严重程度
2. 介入治疗
   - 过程指南
3. 介入治疗后
   介入治疗成功
   评估疾病复发

初步临床评估

- 初步临床评估
  - 与病人进行面谈 - 了解发病历史
  - 完成体检
  - 超声检查
  - 正确诊断
  - 治疗方案

初步临床评估

- 下肢动脉粥样硬化伴跛行
  - 节段性压力和多普勒波形分析
    - 确认体检和初步临床诊断
    - 明确疾病的严重程度
  - 双功能动脉造影
    - 病变定位
    - 病变表征- 狭窄/闭塞，长度，钙化
  - 制订正确的治疗方案
    - 药物治疗
    - 锻炼
    - 介入治疗—类型：开放式或血管内

初步临床评估

- 颈动脉粥样硬化
  - 颈动脉双功能造影
    - 确认体检及初步临床诊断结果
    - 确定疾病的严重程度
  - 制订正确的治疗方案
    - 其它诊断措施
    - 药物治疗 - 抗血小板药物/他汀类药物治疗
    - 介入治疗 - 动脉内膜切除术与支架植入

初步临床评估

- 血液透析通路
  - 上肢静脉双功能超声检查
    - 确定适合自体动静脉瘘的静脉
  - 动脉生理检查
    - 明确可能导致通路失败或动脉窃血的动脉疾病
  - 制订适当的通路构建计划
    - 位置 - 哪只胳膊，前臂还是上臂
    - 类型 - 自身内瘘还是移植物瘘
    - 手术的时机选择

介入治疗

- 过程指导 - 开放式手术
  - 静脉导管的静脉通路
  - 手术切口的位置
  - 明确用于旁路或透析通路的自体导管
  - 手术成功即时评估

介入治疗

- 下肢动脉旁路移植
  - 确定并评估隐静脉
  - 手术切口的位置
    - 最大限度减少伤口并发症
    - 缩短手术时间
  - 双功能超声评估旁路移植物和远端动脉床中的血流

介入治疗

- 颈动脉内膜切除术
  - 手术切口位置
    - 准确定位颈动脉权
  - 动脉内膜切除术即时评估
    - 残留斑块
    - 残余狭窄
    - 这些与围手术期卒中有关，应在手术室进行矫正

介入治疗

- 血液透析通路的构建
  - 重新评估自体导管
    - 使用麻醉或神经阻断术进行扩张
    - 明确错误的术前评估或间隔变化
  - 手术切口的位置
    - 最大限度减少节口并发症
  - 对通路血流进行双功能评估并在需要时立即予以矫正
    - 狭窄，支路

介入治疗

- 手术指导 - 内镜腔内手术
  - 安全动脉（或静脉）插管
  - 直接介入治疗指导
    - 血管成形术 - 动脉，静脉，动静脉瘘
    - 支架/覆膜支架的输送
    - 消融 - 静脉治疗
  - 手术成功即时评估
    - 支架并置
    - 残余狭窄
    - 夹层

介入治疗后- 随访

- 大多数血管疾病是慢性疾病，并且随着时间的推移会进展或复发
  - 肢体动脉粥样硬化
  - 颈动脉粥样硬化
  - 血液透析通路
- 每次血管介入都有其有限的寿命
  - 每次血管治疗最终都会失败
  - 目标是最大化每次介入的功能寿命

介入治疗后-随访

- 确定介入治疗成功
  - 灌注改善，血流正常
- 设定以后评估的一个标准
- 确定可在发生并发症之前及早治疗的可矫正病变

介入治疗后-随访

- 下肢开放式或血管内血运重建
  - 确定重建的通畅性
  - 测量远端灌注的改善
  - 如果改善不明显，重新介入
  - 确定与复发或移植失败相关的早期病变
  - 允许早期再治疗以避免并发症

介入治疗后-随访

- 颈动脉介入 - 动脉内膜切除术或以架
  - 评估治疗的充分性
  - 监测复发性狭窄
  - 评估对侧颈动脉的疾病进展

介入治疗后-随访

- 血液透析通路构建/功能
  - 早期 – 监测瘘管的“成熟度”
    - 确定瘘管中可矫正的病变
    - 立即实施介入矫正
    - 最大化成熟率和瘘管成功率
  - 后期– 评估瘘管功能问题
    - 清除不良
    - 血液低 – 高静脉压
    - 动脉瘤变性

总结

- 超声是血管疾病治疗综合实践的重要组成部分
- 在血管病人护理的所有阶段都很重要
- 对于准确诊断，安全介入和长期管理至关重要

总结

- 我们对超声在如下方面的核心作用进行了回顾：
  - 外周动脉粥样硬化
  - 颈动脉粥样硬化， 以及
  - 血液透析通路的管理
- 治疗中同样重要的还有：
  - 动脉瘤
  - 动脉夹层
  - 静脉血管疾病
  - 血管损伤

结论

- 一个致力于全面评估和管理全方位血管疾病的单位的成功需要：
  - 在护理的各个阶段使用超声，以及
  - 能够安全准确地使用超声技术并为病人着想的经过培训的具有专业能力的人员

感谢您在今天能有这个机会和荣幸向这个受人尊敬的团体介绍您的这些想法。

- mlilly@som.umaryland.edu

UNIVERSITY of MARYLAND SCHOOL OF MEDICINE

Inteleos

Ultrasound Education and Certification in China

David Stolte, MBA, RDCS
Chair, Inteleos Board of Directors

October 2018

Thank you

WEST CHINA HOSPITAL
WEST CHINA SCHOOL OF MEDICINE
SICHUAN UNIVERSITY

HCP
U.S.-CHINA HEALTHCARE COOPERATION PROGRAM

Chinese Medical Doctor Association
Home Of Four Million Medical Doctors In China

中国超声医师网
CHINESE ULTRASOUND DOCTOR ASSOCIATION

Who We Are

Inteleos is a non-profit certification organization that delivers rigorous assessments and cultivates a global community of professionals dedicated to the highest standards in healthcare and patient safety

- Inteleos sets the standards of proficiency in medical imaging, such as ultrasound, nuclear cardiology and cardiac computed tomography
- American Registry for Diagnostic Medical Sonography (ARDMS) sonographer-based examinations and credentials (93,000+ certificants)
- Alliance for Physician Certification and Advancement (APCA) physician certifications in ultrasound and cardiovascular imaging (23,000+ certificants)

Why We Are Here

- History of partnership, friendship and collaboration
- RPVI-China was Inteleos' first ultrasound certification program in China
- Collaboration to share education and help improve patient care

RPVI-China

Inteleos, through ARDMS and APCA, has been working with Chinese physicians to establish standards of proficiency in ultrasound since 2005

- RPVI-China:
  - Delivered in Chinese
  - Formally launched in 2013
  - Developed in close collaboration with Chinese ultrasound doctors
  - In 2016, nearly 400 Chinese ultrasound doctors took the RPVI-China exam
- Partnership with China is essential to Inteleos -- making a worldwide impact on improving patient care and safety through standards

Goals for Meeting

- Share education!
- Help to strengthen the ultrasound community
- Discuss opportunities for collaboration
- Determine how Inteleos can help serve China
- Learn from many experts and leading physicians
- Continue the conversation to improve ultrasound care

Questions?

Inteleos

中国的超声教育与认证

David Stolte, MBA, RDCS
Inteleos 董事会主席

2018年10月

谢谢！

WEST CHINA HOSPITAL
WEST CHINA SCHOOL OF MEDICINE
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中国超声医师网
CHINESE ULTRASOUND DOCTOR ASSOCIATION

监督 管理
自律 维权
服务 协调

我们是谁？

Inteleos是一家非营利性认证机构，提供严格的评估并培养致力于医疗保健和患者安全的最高标准的全球专业人士团体。

- 设定了医学成像的熟练程度标准，如超声，核心脏病学和心脏计算机断层扫描
- **美国注册诊断医疗超声医师协会(ARDMS)** 超声医师考试与证书 (93,000多证书持有人)
- **医师认证与发展联盟(APCA)**
  超声及心血管影像医师认证(23,000多证书持有人)

我们为什么在这里？

- 合作、友谊与协作的历史
- RPVI-中国是 Inteleos在中国的第一个超声认证项目
- 合作分享教育并帮助改善病患护理

RPVI-中国

Inteleos通过ARDMS和APCA，自2005年以来一直与中国医生合作制定超声波熟练程度标准。

- RPVI-中国:
  - 中文内容
  - 2013年正式发布
  - 与中国超声医生密切协作，共同开发
  - 2016年，近400名中国超声医生参与了 RPVI-中国考试
- 与中国的合作对Inteleos 来说至关重要– 通过各种标准对改善病患护理及安全产生全球性的影响

合作目标

- 分享教育!
- 有助于提升超声从业人员的能力
- 探讨合作机会
- 明确Inteleos能够以何种方式服务中国
- 了解更多的专家及一流医师
- 继续对话以改善超声护理

问题？

POINT-OF-CARE ULTRASOUND FUNDAMENTALS CERTIFICATE

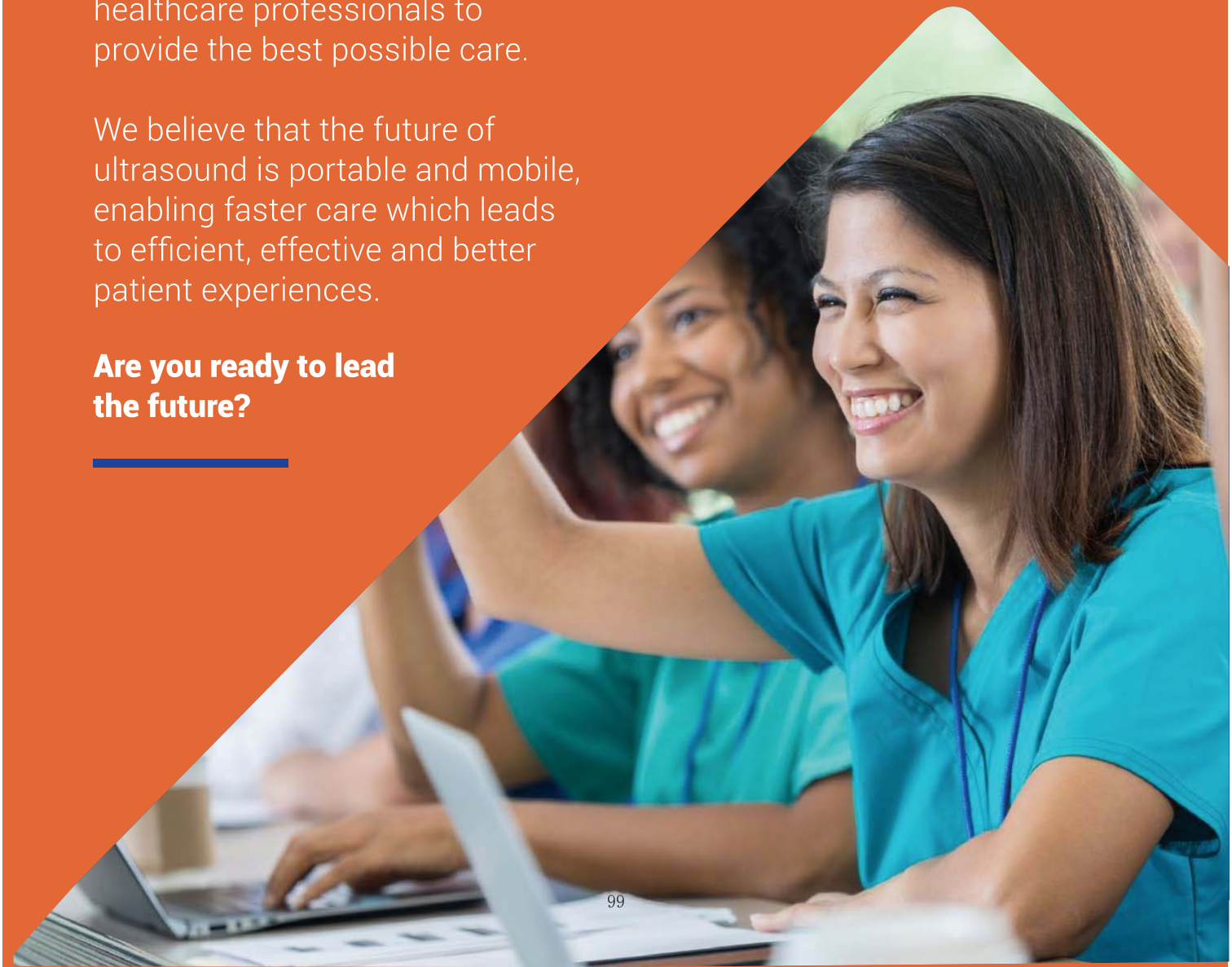
POCUS™
Point-of-Care Ultrasound Certification Academy

JOIN OUR COMMUNITY

The purpose of the POCUS Certification Academy™ is to honor professionals who aim to **improve** their practice and patient experiences by using POCUS. Through our programs, we uphold this purpose and hope to **inspire** healthcare professionals, educators, organizations, and industry leaders to join us in **building a better future**. Ultimately, the POCUS Certification Academy™ seeks to **empower** healthcare professionals to provide the best possible care.

We believe that the future of ultrasound is portable and mobile, enabling faster care which leads to efficient, effective and better patient experiences.

Are you ready to lead the future?



WHAT IS POINT-OF-CARE ULTRASOUND (POCUS)?

POCUS refers to the simultaneous acquisition and interpretation of ultrasound images at the patient's point of need by a healthcare professional to immediately inform diagnosis or treatment, or to aid in the completion of procedures.

WHY IS POCUS IMPORTANT FOR YOU?

- Portable, allowing for real-time imaging and on-the-spot interpretation.
- Less expensive than other imaging modalities.
- Highly accurate in experienced hands.
- No use of ionizing radiation.
- Potentially improved patient experience and satisfaction

WHAT MAKES OUR PROGRAMS UNIQUE?

- Non-profit organization that cares about improving global health.
- Self-paced, on demand, and available online anytime to best fit your schedule.
- Based on real clinical scenarios with engaging and modern educational methods.
- Focused on assessment of the core competencies that matter most.
- Community-driven content developed with experts in the field from multiple specialties and backgrounds.
- Credibility guaranteed by strategic collaboration and support from ARDMS® & APCA™.
- Unique access to exclusive resources and communities of practice for program participants.
- Focused on ongoing learning and development.
- Immediate results and recognition when you earn your certificate.
- Digital badges to help promote your accomplishment.
- A percentage of your fee contributes to scholarship funds.

[The POCUS Program] is a good way to assess your knowledge and makes me proud to be a part of this community."

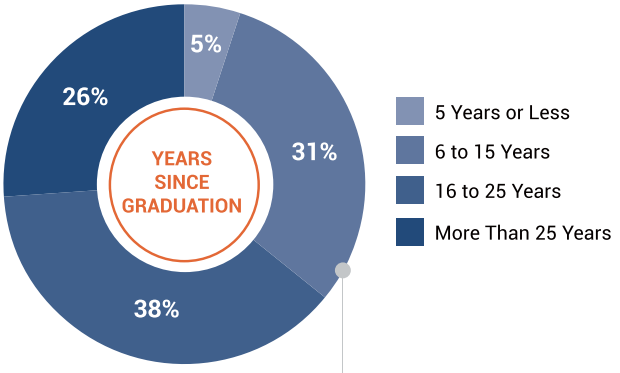
WHO SHOULD PARTICIPATE?

The Point-of-Care Ultrasound Fundamentals certificate is appropriate for physicians, advanced practice providers (e.g., physician assistants, nurse practitioners) and students who want to understand the basic physics and instrumentation of ultrasound when applied in a POCUS clinical evaluation.

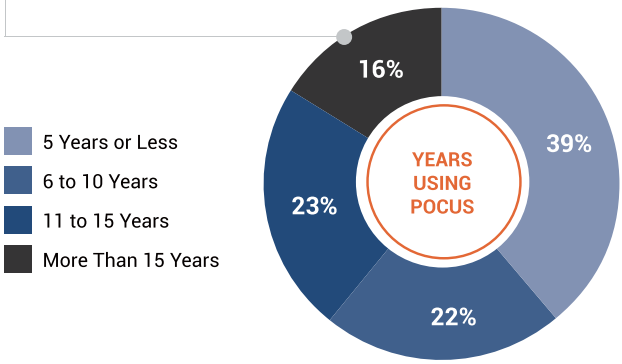
SNAPSHOT OF PARTICIPANTS' PROFILE

AREA OF SPECIALTY

- Cardiology
- Emergency Medicine
- Family Medicine
- Internal Medicine
- Radiology
- Other (Intensivists, Obstetrics & Gynecology, Pediatrics, Orthopedics, Gastroenterology, Neurology, Physical Medicine & Rehabilitation)



"One of the best online learning/ testing modules I have taken part in."



85%*

WOULD RECOMMEND THE POCUS CERTIFICATION ACADEMY™ TO THEIR COLLEAGUES

*Source: 2018 Inteleos Post Exam Survey.

PROGRAM OUTLINE

CORE COMPETENCIES

37%

Instrumentation

- Describe the appropriate use of gain settings
- Understand the factors that determine transducer selection
- Describe the appropriate use of depth settings
- Describe the conventional image orientations

27%

Principles of Ultrasound

- Understand the basic principles & terminology of US physics
- Describe the variables that affect the echogenicity of tissue and structures
- Describe the variables that affect ultrasonic signal attenuation
- Describe the variables that affect ultrasonic signal reflection
- Understand the effect of different media on sound propagation
- Describe the fundamental differences between Doppler US and B-mode US

22%

Ultrasound Artifacts

- Recognize & understand the cause of common US artifacts

14%

Safety & Bioeffects

- Describe precautions used to prevent cross-contamination
- Describe the potential bioeffects of US

ASSESSED BY

- POCUS Fundamentals Examination
- 35 Multiple Choice Questions
- Waived for professionals who have passed the Sonography Principles & Instrumentation (SPI) examination within the last 5 (five) years, or who hold specific credentials offered by ARDMS® or APCA™

PROGRAM DETAILS

Eligibility Requirement

The eligibility criteria for a POCUS Certification Academy POCUS Fundamentals Certificate includes:

- It is recommended that you have education and experience in ultrasound physics prior to enrollment.
- The POCUS Fundamentals is a prerequisite for the clinical certificates and specialty certification.

Preparation

In addition to your practice of POCUS, previous participants have used one of the following methods to prepare for the exams:

- Self-directed learning
- Courses
- Workshops
- Residency or Fellowship
- On the job/Hands-on training

Includes both Learning and Assessment modules when you sign up for the POCUS Fundamentals Certificate.

Pricing

High value for money:

- $125 for the POCUS Fundamentals *(Note: waived for professionals who have passed the Sonography Principles & Instrumentation – SPI – examination within the last 5 years, or who hold specific credentials offered by ARDMS® or APCA™).*
- **Special packages and conditions for students and groups. Scholarships available for those in need. To learn more, write to POCUS@APCA.org**

To apply, go to POCUS.org

For questions, contact POCUS@APCA.org

A good opportunity to demonstrate skills and knowledge.”

In addition to **over 100 Subject Matter Experts from more than 15 countries**, the POCUS Certification Academy™ has an advisory group of subject matter experts who are part of the POCUS Assessment Committee and help build the highest standards for practice of Point-Of-Care Ultrasound. Visit POCUS.org to see full list of participants and their complete bios.

We believe in the power of Point-of-Care Ultrasound (POCUS) to improve global health.

Ernesto Brauer, MD, FACP, FCCP, D, ABSM, graduated from The National University of Mexico City. Trained in Internal Medicine, Pulmonary and Critical Medicine at Mount Sinai Medical Center in Milwaukee, WI. Board-certified in Internal Medicine, Geriatrics, Pulmonary, Critical Care, Sleep and Adult Echocardiography. Associate Professor of Medicine at The University of Wisconsin School of Medicine and Public Health. Dr. Brauer is the Vice Chair of the APCA POCUS Certification Assessment Committee.

Yuriy Bronshteyn, MD, graduated from Vanderbilt University School of Medicine. Board-certified in Anesthesiology, Advanced Perioperative Transesophageal Echocardiography, and Critical Care Medicine. Currently practicing at Duke University Hospital and the Durham Veterans Administration Hospital. Assistant Professor of Medicine at Duke University Medical School and teaches POCUS Ultrasound.

Christopher Davis, PA-C, RT, graduated from A.T. Still University PA program and Weber State University Radiologic Sciences program. Physician Assistant in the Interventional Radiology department at Banner Baywood Medical Center in Mesa, AZ. Adjunct faculty at A.T. Still University Physician Assistant program and guest lecturer at NAU Physician Assistant program.

David L. Dawson, MD, RVT, RPVI, graduated from the University of Southern California and completed his residency in surgery and fellowship in vascular surgery at the University of Washington. He is a decorated Air Force veteran who worked at NASA as Chief of the Medical Sciences Division at the Johnson Space Center in Houston, TX. After 16 years on the University of California, Davis Department of Surgery faculty, he is now with Baylor Scott & White Health in Central Texas. He is a Fellow of the American College of Surgeons, Society for Vascular Ultrasound, and Society for Vascular Medicine, and a distinguished Fellow of the Society for Vascular Surgery. He is the Vice Chair of the APCA Council.

James DellaValle, MD, graduated from Drexel University School of Medicine. Board-certified in Emergency and Family Medicine, focusing on those in rural areas and underserved populations. Served as medical advisor and member of the Board of Trustees of Hands Together. Involved in undergraduate and graduate medical education and is an Associate Professor of Emergency Medicine at The Upstate Medical University in Syracuse, NY. Dr. DellaValle is Chair of the APCA POCUS Certification Assessment Committee.

Amy Morris, MD, graduated from the University of Washington School of Medicine in Seattle, WA. Completed a residency in Internal Medicine and a Fellowship in Pulmonary and Critical Care Medicine at the University of Washington, where she is currently Associate Professor of Medicine in the Division of Pulmonary, Critical Care and Sleep Medicine. Dr. Morris is an Attending in the medical and oncology-bone marrow transplant intensive care units and pulmonary consult services at the University of Washington Medical Center and Harborview Medical Center.

Brian Shian, MD, FHM, graduated from Southwest Medical University in China and was trained in Orthopedic Surgery at Southwest Medical University Hospital. In the United States he worked in Emergency Medicine, then completed his Family Medicine residency at the University of Iowa Hospitals & Clinics. Board-certified in Family Medicine with a Designation of Focused Practice in Hospital Medicine (DFPHM). Associate Professor at The University of Iowa College of Medicine and a Fellow in Hospital Medicine.

Jacqueline Sposito, MD, RDMS, RVT, from Central University of Venezuela. Dr. Sposito completed her internship in obstetrics and gynecology at the Elbano Paredes Military Hospital and her residency in general surgery at the J. Benitez Trauma Hospital in Venezuela. She then became a specialist in Diagnostic Medical Sonography earning another degree from Romulo Gallegos University. Dr. Sposito is currently holding the Program Director position at the Keiser Collegiate system.

Dean Vlahaki, MBBS, RDMS, FRCP, graduated from the University of Queensland Medical School in Brisbane, Australia. Completed Emergency Medicine Residency training and POCUS specialty training at McMaster University in Hamilton, Canada. Assistant Clinical Professor with McMaster University and a major contributor to the Emergency Medicine Point of Care Ultrasound Fellowship program at McMaster University.

R. Eugene Zierler, MD, RPVI, graduated from the Johns Hopkins University. Professor of Surgery in the Division of Vascular Surgery at the University of Washington School of Medicine. Medical Director of the D. E. Strandness, Jr. Vascular Laboratory at the University of Washington Medical Center in Seattle, WA. Research interests focused on the clinical applications of noninvasive diagnostic techniques for vascular disease. Author or Co-author of over 100 journal articles and 50 book chapters. Past-President of the Inter-Societal Commission for the Accreditation of Vascular Laboratories (ICAVL). Served on the Board of Directors of the American Registry for Diagnostic Medical Sonography (ARDMS) and Inteleos.

EMPOWER
IMPROVE
INSPIRE
VALIDATE
LEAD

BETTER CARE.
BETTER FUTURE.

ALLIANCE FOR PHYSICIAN CERTIFICATION & ADVANCEMENT
We are a non-profit mission-driven organization that believes in the power of Point-of-Care Ultrasound (POCUS) to improve global health.

1401 Rockville Pike, Suite 600, Rockville, MD 20852-1402
Phone: (800) 943-1709 | Website: APCA.org

APCA18-000-WEB

床旁检测超声基础证书

POCUS
Point-of-Care Ultrasound
Certification Academy

加盟我们

POCUS 认证学会旨在表彰那些致力于通过使用POCUS改善其实践和患者体验的专业人士。 通过我们的计划，我们坚持这一目标，并希望激励医疗保健专业人士，教育工作者，组织和行业领导者与我们一起共创美好未来。 最终，POCUS 认证学会的终极目标是帮助医疗保健专业人员提供最好的护理。

我们相信超声的未来是便携式和移动式的，可以加快护理速度，从而实现高效，有效和更好的患者体验。

引领未来，您作好准备了吗?

什么是床旁检测超声(POCUS)?

POCUS是指医疗专业人员在患者需要时同时进行超声图像的采集判读，并立即通知进行诊断或治疗，或帮助完成手术。

为什么POCUS对你很重要？

- •便携式，可实现实时成像和现场判读。
- •比其他成像方式便宜。
- •在经验丰富的人手中高度准确。
- •无电离辐射。
- •潜在改善患者体验和满意度

我们项目的独特之处何在?

- 关注改善全球健康的非营利组织。
- 随心所欲，随时随地，随时在线提供最适合您的日程安排。
- 基于真实的临床情景，采用引人入胜的现代教育方法。
- 专注于评估最重要的核心能力。
- 社区驱动的内容由来自多个专业和背景的该领域的专家开发。
- ARDMS®和APCATM的战略合作和支持保证了可信度。
- 为计划参与者提供独特的专属资源和实践社区。
- 专注于持续的学习和发展。
- 获得证书时的即时结果和认可。
- 数字徽章有助于提升您的成就感。
- 您的一定比例的费用被用于奖学基金。

“POCUS项目是对您的知识进行评估的一种好方法，我为成为该社团的一员而感到骄傲。

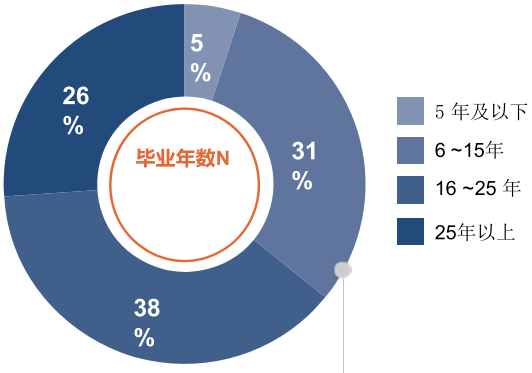
谁应该参与?

床旁检测超声基础证书适用于医生，高级实践提供者（例如，医师助理，执业护士）和想要在POCUS临床评估中应用时理解超声基本物理和仪器的学生。

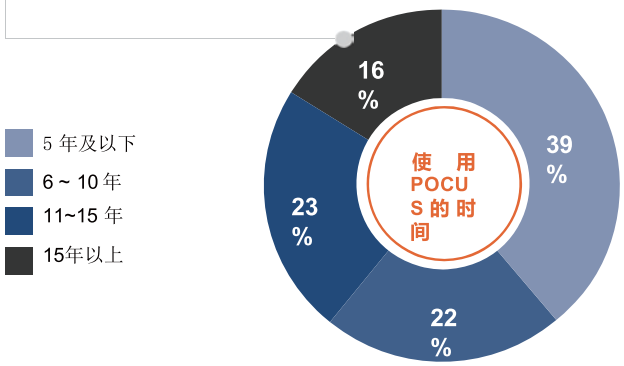
参与者简况

专业领域

- 心脏病学
- 急诊医学
- 家族医学
- 内科医学
- 放射学
- 其它（危重病学，妇产科，儿科学，骨科，消化内科，神经内科，物理医学与康复）



我所参与的最好的在线学习与测试模块已经上线。



85%*

的人会向其同事推荐 POCUS 认证学会。

*资料来源： 2018 Inteleos 考试后调查

课程大纲

核心能力

37%

仪器仪表

- 描述增益设置的适当用法
- 了解决定传感器选择的因素
- 描述深度设置的适当使用
- 描述传统的图像取像

27%

超声基础

- 了解美国物理学的基本原理和术语
- 描述影响组织和结构的回声反射性的变量
- 描述影响超声波信号衰减的变量
- 描述影响超声波信号反射的变量
- 了解不同媒体对声音传播的影响
- 描述多普勒US和B模式之间的根本区别

22%

超声伪像

- 认识并了解美国常见超声伪像的成因

14%

安全及生物效应

- 描述防止交叉的注意事项
- 描述美国的潜在生物效应

评估方式

- POCUS基础考试
- 35道多项选择题
- 最近5年内已通过超声原理及仪表（SPI）考试或持有ARDMS® 或 APCA™颁发的专业证书的专业人员可免于评测

课程内容

资格要求

POCUS认证学会POCUS基础证书资格要求包括：

- 建议在入学登记前具备超声物理学方面的教育与经历
- POCUS 基础课程是获得临床证书及专业证书的前提条件。

准备

除了POCUS实践外，以前学员还采用下述方法准备考试：

- 自主学习
- 课程学习
- 研习班学习
- 住院医师或专科医师实习
- 在职/实践培训

在报名参加POCUS基础证书课程的学习时，包括学习及评测模块。

价格

高性价比：

- POCUS基础课程为125美元 *（注：最近5年内已通过超声波原理及仪表（SPI）考试或持有ARDMS® 或APCATM颁发的专业证书的专业人员除外）*
- **针对学生及团体的特殊套餐与优惠条件。可为有需要者提供奖学金。欲了解更多情况，请致函 POCUS@APCA.org**

申请请登录 POCUS.org

如有问题，请联系POCUS@APCA.org

展示技能与知识的一次绝佳机会。

我们相信床旁检测超声(POCUS)有能力改善全球健康。

除了来自超过15个国家的100多名主题专家外，POCUS认证学会还拥有一个主题专家咨询小组，他们是POCUS评估委员会的成员，帮助建立床旁超声实践的最高标准。欲了解全部参与者及其完整简历，请访问POCUS.org。

Ernesto Brauer, MD, FACP, FCCP, D, ABSM,毕业于墨西哥城国立大学。 在威斯康星州密尔沃基的西奈山医疗中心接受内科，肺和危重医学培训。 具有内科，老年医学，肺科，重症监护，睡眠和成人超声心动图方面的职业资格。 威斯康星大学医学与公共卫生学院医学副教授。 Brauer博士是APCA POCUS认证评估委员会的副主席。.

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