Massive Open Online Courses (MOOCs): a disruptive innovation in Continuing Medical Education?

Presenter: Alvaro Margolis, MD MSc FIAHSI.

Dr. Margolis is an internist with a Master’s degree in biomedical informatics from the University of Utah (USA).

He has held academic positions at the Schools of Medicine and Engineering, Universidad de la República, Uruguay, is Founding Member of the International Academy of Health Sciences Informatics, and Associate Editor of Applied Clinical Informatics.

He is the President of the Global Alliance for Medical Education (GAME), and Director of EviMed, a CME company working across Latin America.

Introduce yourself in the chat
(country/organization/professional profile...)

What is your experience in the topic?

- **Do you have any experience in online courses?** (as Faculty, organizer, participant…).

  Please vote:

  - Yes
  - No

- **Please describe your experience in the chat**.

Agenda

- Definitions (what are we talking about)
  - MOOCs
  - Disruptive innovations
- Are MOOCs a disruptor?
  - What are MOOCs potentially disrupting?
  - Analysis
  - Trends
- Conclusion

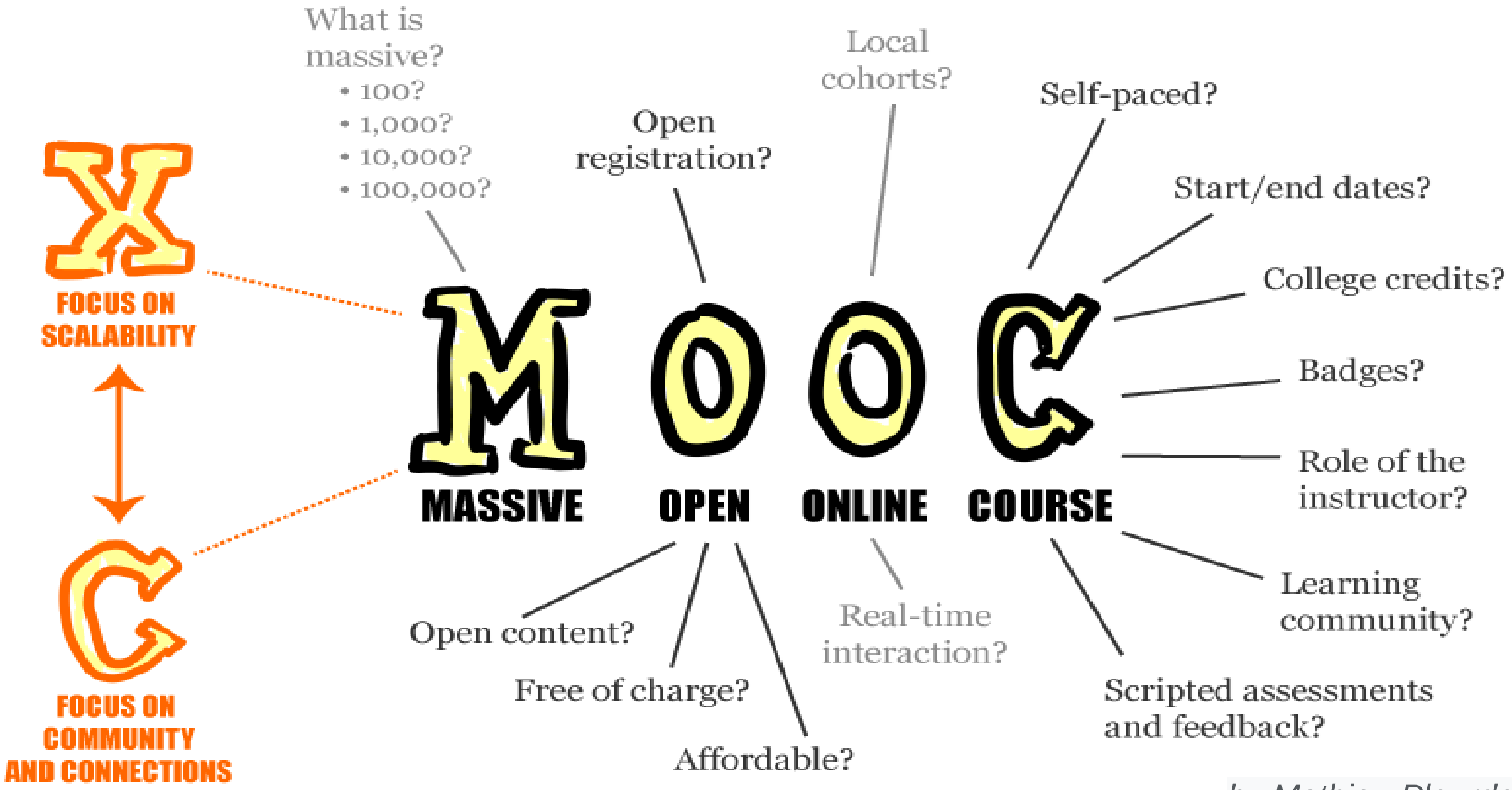
Get ready to challenge or support this conclusion!
(at the end of the Webinar)

MOOCs will change the landscape of formal CME in 3-5 years globally

What are we talking about?

Massive open online courses (**MOOCs**) are open-access courses that allow for **unlimited participation** through the Web (Kaplan and Haenlein, 2016).

(note: according to the theory of disruptive innovations, MOOCs would be the newcomers and disruptors that challenge the existing market of CME, particularly *formal face-to-face events*).



by Mathieu Plourde

Our experience with MOOCs

- Latin America (middle-income region with one million physicians and two languages spoken)
- “Massive” means 500 to 1500 participants.
- “Open” means open registration and affordable, but not free (100-150 dollars).
- “Online” means mostly online asynchronous activities,and sometimes offline team activities.
- “Course” means a sequential educational activity with start and end dates, over 8 weeks, and approximately 30 hours of study, with 3 languages for Faculty and 2 languages for participants.

APRIL TO JUNE 2016

ONLINE COURSE IN SPANISH AND PORTUGUESE

Palliative and Supportive care in Nephrology

TARGET: Latin American nephrologists, nurses, nutritionists, psychiatrists, psychologists, nephrology residents and other health professionals

COORDINATORS: Dr. Carlos Zúñiga (CHI), Dr. Juan Dapueto (UY), Dr. Alze Pereira Dos Santos Tavares (BRA)

CONTACT: cursos@evimed.net
nefro2016.evimed.net

CONTENT:

- Evaluation, epidemiology and symptom management in patients with advanced chronic kidney disease.
- Advanced Care Planning and shared decision making.
- Dialysis start, abstention and withdrawal.
- Conservative treatment.
- Prognosis of patients with advanced chronic kidney disease.

ORGANIZED BY:

SLANH 1970 SOCIEDAD LATINOAMERICANA DE NEFROLOGÍA E HIPERTENSIÓN
SOCIEDADE LATINOAMERICANA DE NEFROLOGIA E HIPERTENSÃO
ENTIDAD EN RELACIONES OFICIALES CON LA ORGANIZACIÓN PANAMERICANA DE LA SALUD (OPS)

KDIGO KIDNEY DISEASE IMPROVING GLOBAL OUTCOMES

ISN INTERNATIONAL SOCIETY OF NEPHROLOGY 1960

SOCIEDAD ARGENTINA DE NEFROLOGIA

INSTRUCTIONAL DESIGN AND IMPLEMENTATION: evimed

ENDORSEMENT:

Sociedad Chilena de Nefrología

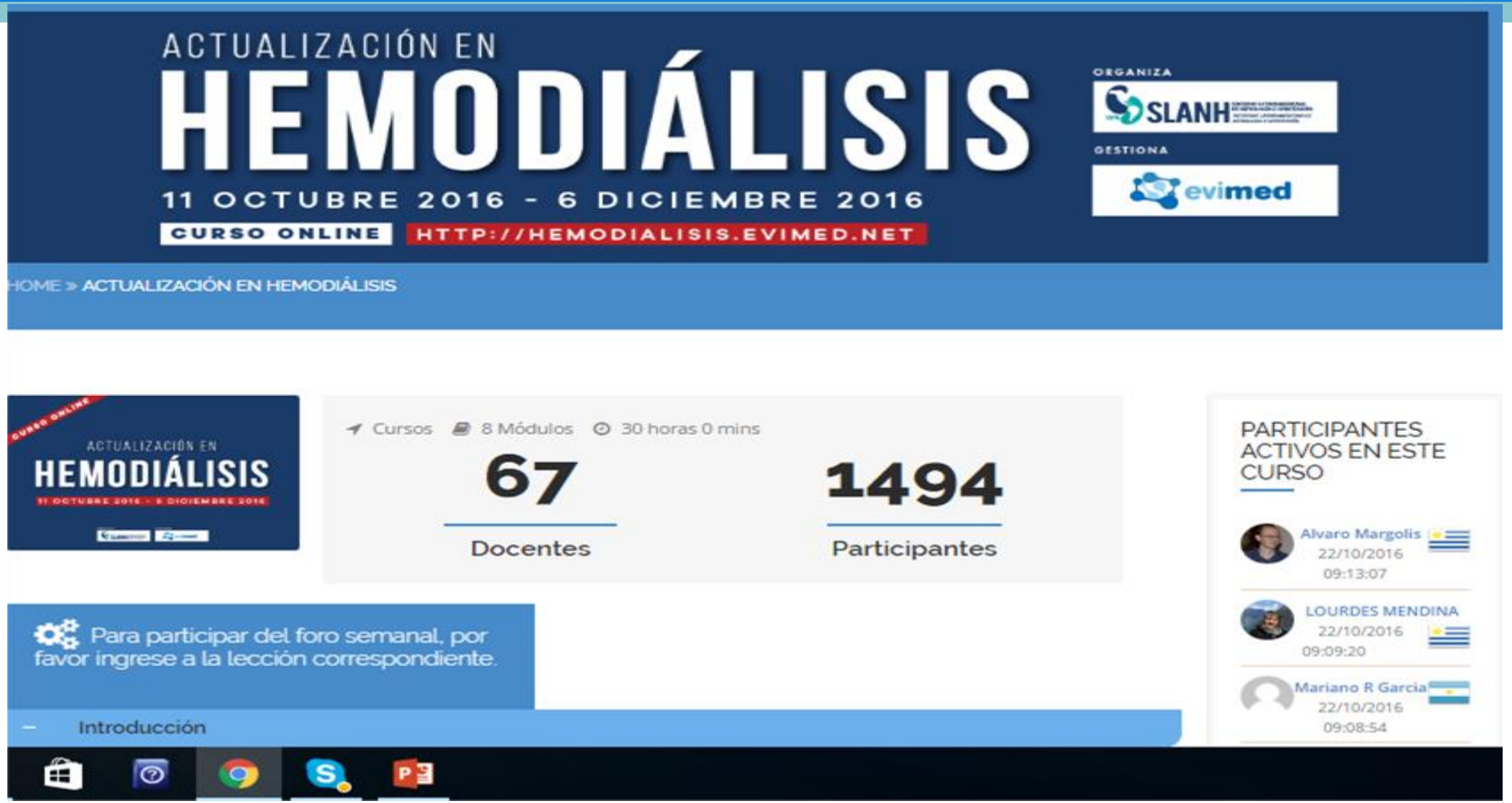
Sociedade Brasileira de Nefrologia

AGN

Sociedad Peruana de Nefrología

UNIFESP

Asociación Colombiana de Nefrología e Hipertensión Arterial


ACTUALIZACIÓN EN
HEMODIÁLISIS
11 OCTUBRE 2016 - 6 DICIEMBRE 2016
CURSO ONLINE
HTTP://HEMODIALISIS.EVIMED.NET
ORGANIZA
SLANH
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HOME » ACTUALIZACIÓN EN HEMODIÁLISIS
CURSO ONLINE
ACTUALIZACIÓN EN
HEMODIÁLISIS
Cursos
8 Módulos
30 horas 0 mins
67
Docentes
1494
Participantes
PARTICIPANTES ACTIVOS EN ESTE CURSO
Alvaro Margolis
22/10/2016
09:13:07
LOURDES MENDINA
22/10/2016
09:09:20
Mariano R Garcia
22/10/2016
09:08:54
Para participar del foro semanal, por favor ingrese a la lección correspondiente.
Introducción

Nefrologia · 8 Módulos · 30 horas 0 mins

73 Docentes

621 Participantes

PARTICIPANTES ACTIVOS EN ESTE CURSO

Alvaro Margolis 03/09/2016 19:26:18

Mario Abbud-Filho 03/09/2016 17:20:56

Situações metabólicas, endócrinas e reprodutivas

4 hours 0 mins · Cuidado do paciente com transplante renal

O fórum desse módulo não admite mais participações.

Diabetes Mellitus pós-transplante

Dr. Alberto Martínez Castelao

Consultor emérito S. Nefrología. Hospital Universitário Bellvitge, Hospitalet, Barcelona. IDIBELL. GEENDIAB. REDinREN. Expresidente da S.E.N.

Baixar apresentação

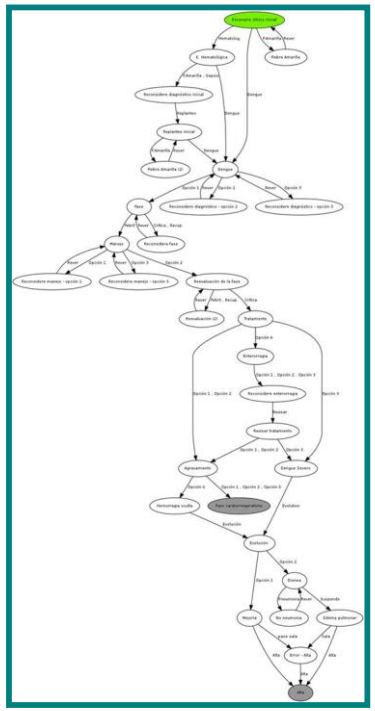
CURRICULUM

- Atividades iniciais — 2 hours 0 mins
- **Situações metabólicas, endócrinas e reprodutivas** — 4 hours 0 mins
- Câncer — 4 hours 0 mins
- A função renal, como estudá-la e preservá-la — 4 hours 0 mins
- O candidato a transplante renal — 4 hours 0 mins
- Patologia cardiovascular — 4 hours 0 mins
- Infecção em comunidade — 4 hours 0 mins
- Atividades finais — 4 hours 0 mins

Clinical simulations

Recorrido

- Situación Inicial
- Leptospirosis
- Cristaloides
- IRA
- **IRA Parenquimatosa**



Correcto

IRA Parenquimatosa

La injuria renal aguda parenquimatosa o intrínseca se puede clasificar, de acuerdo a la localización anatómica de la injuria, en: glomerular, vascular, intersticial, o tubular. Esta última, clásicamente denominada necrosis tubular aguda (NTA), se usa para referirse al síndrome clínico de IRA parenquimatosa secundaria a isquemia y/o nefrotoxicidad.

El examen de orina, estudio sencillo y de fácil acceso, es esencial para la evaluación de la IRA y debe solicitarse en forma sistemática y precoz. La información que se obtiene brinda una rápida aproximación diagnóstica a enfermedades renales. Cuando el mismo es patológico, como en este caso, con presencia de proteinuria, hemoglobinuria y, a nivel del sedimento urinario, leucocituria y cilindros, sugiere fuertemente una causa intrínseca.

Por su parte, la analítica urinaria nos permite evaluar la indemnidad funcional de los túbulos renales. La IRA intrínseca se caracteriza por disfunción tubular y cursa con glucosuria concomitante con glicemia normal, Na^+_u mayor a 20 mEq/l y FeNa mayor a 2–3%, en ausencia de uso de diuréticos. Hay excepciones, como la NTA, en el gran quemado, o en la nefropatía por contraste[9].

La fracción excretada de sodio (FeNa), definida con $[Na_u/Cr_u]/[Na_{pl}/Cr_{pl}]$, en general es más sensible que la concentración de Na^+ urinario, y es el test aislado más significativo, dado que para el cálculo de la FeNa se considera la concentración de Na^+ plasmática, esto hace que esta fracción sea particularmente útil cuando los pacientes se presentan con disnatremia. En estudios prospectivos en pacientes con IRA catalogada como NTA, dado que no revertía la situación luego de la reposición con volumen, la FeNa fue menor a 1% sólo en el 0 al 4%.

El U/P osm es otro test útil para valorar la función tubular; cuando ésta está preservada, la osmolaridad urinaria excede la plasmática, mientras que cuando hay daño tubular con compromiso en la capacidad de concentración, la orina es isoosmolar con respecto al plasma, por lo que el U/P osm ≤ a 1 es sugestivo de NTA, y > de 1, de causa prerrenal[9].

En conjunto, la analítica urinaria y las alteraciones lesionales del examen de orina sustentan el planteo de que el paciente presenta una IRA parenquimatosa. El valor de FeNa indeterminado o en «zona gris» puede ser reflejo de una intensa vasoconstricción.

Para comprender mejor este tema, en el curso contaremos con el texto de los Dres. Gustavo Greloni y Guillermo Rosa-Diez: "**Conceptos básicos de Fisiología Renal aplicada a la Injuria Renal Aguda**".

¿Cuál es el principal mecanismo patogénico de la IRA, en este paciente?

- Nefritis túbulo intersticial aguda
- Necrosis tubular aguda isquémica
- Rabdomiólisis

Siguiente

[redacted]

27

30 may 2018

Hola... Buenas tardes.
Mi nombre es [redacted] y los coordinadores de este curso me han privilegiado al nombrarme tutor en este 2do modulo.
Estaré atento a los comentarios y preguntas del foro y en la medida de mis posibilidades espero contribuir en la resolución de dudas y en ampliar los conocimientos que irán adquiriendo día a día en este curso.

A 27 personas les gusta este comentario

ME GUSTA

[redacted]

1

04 jun 2018

[redacted] buen día.
Respecto a la realización de una segunda biopsia ósea pienso que el tiempo prudente podría ser dado de forma individual para evaluar la respuesta a un tratamiento basado en los resultados de la primera biopsia.
pero tengo las siguientes dudas
* Cual es el tiempo mínimo entre una biopsia y la segunda?
* Hay pacientes que requieran mas de dos biopsias?
* Para evaluar la respuesta de tratamiento basado en una biopsia, siempre se va a requerir una segunda biopsia?
* A un paciente a quien se le realiza una biopsia ósea y semanas o meses después es llevado a trasplante renal, vale la pena someterlo a una segunda biopsia post traspante?
quedo atento a sus comentarios
muchas gracias por su apoyo

Course certificate (sample)

MANEJO DEL PACIENTE ADULTO
CON ASMA EN ATENCIÓN PRIMARIA

CURSO ONLINE

1º AGOSTO - 12 SEPTIEMBRE DE 2018

http://asma.evimed.net

ORGANIZA redEMC Clínica Médica — En asociación con BMJ Learning

CON EL APOYO ACADÉMICO DEL HOSPITAL ITALIANO de Buenos Aires

GESTIÓN EDUCATIVA, INFORMÁTICA Y LOGÍSTICA evimed

Se certifica que:

Aprobó el curso online ***Manejo del Paciente Adulto con Asma en Atención Primaria***, organizado por redEMC Comunidad Médica en asociación con BMJ Learning, con el apoyo académico del Hospital Italiano, desarrollado entre 01 de agosto y 12 de septiembre de 2018, cumpliendo con los requisitos correspondientes, con una carga horaria total estimada de 26 horas.

Dra. Dolores Arceo
Coordinadora académica del curso

Dr. Pablo Tesolín
Coordinador académico del curso

Dra. Yoo Chu Yon
Coordinadora académica del curso

Septiembre de 2018

GESTIÓN EDUCATIVA, INFORMÁTICA Y LOGÍSTICA

evimed

Statistics and diploma for this type of course

Table 1 – Individual number of registrations by country.

Individual registrations by country	Number of respondents
Brazil	264
Argentina	238
Uruguay	229
Mexico	207
Chile	62
Panama	24
Paraguay	24
Colombia	23
Venezuela	22
Ecuador	21
Peru	15
Costa Rica	11
Dominican Republic	7
Salvador	5
Bolivia	3
Spain and Portugal	3
Honduras	3
USA	3
Nicaragua	2
Cuba	1
Guatemala	1
Puerto Rico	1

Source: Medina-Presentado, Julio Cesar, Alvaro Margolis, Lúcia M Teixeira, et al. "**Online continuing interprofessional education on hospital-acquired infections for Latin America**." *The Brazilian journal of infectious diseases.* 21 2 (2017): 140-147.

1169 participants enrolled: 96% of them participated in the course (n = 1126): 46% completed the course requirements.

Notable

Subject

University

Provider

Computer Science
1161 courses / **294.2k followers**

Business
1954 courses / **241.5k followers**

Humanities
1097 courses / **134.8k followers**

Data Science
480 courses / **206.2k followers**

Personal Development
329 courses / **220.8k followers**

Art & Design
634 courses / **148.7k followers**

Engineering
877 courses / **143.3k followers**

Health & Medicine
894 courses / **141.8k followers**

Mathematics
379 courses / **126.2k followers**

Science
1078 courses / **131.7k followers**

Education & Teaching
991 courses / **133.9k followers**

Programming
915 courses / **259.7k followers**

See all Subjects →

1161 courses

Artificial Intelligence Algorithms and Data Structures
Internet of Things Information Technology
Cybersecurity Computer Networking
Machine Learning DevOps Deep Learning
Blockchain and Cryptocurrency

1954 courses

Management & Leadership Finance Entrepreneurship
Professional Development Marketing
Strategic Management Industry Specific
Business Intelligence Accounting Human Resources
Project Management

1097 courses

History Literature Foreign Language
Grammar & Writing Philosophy Religion ESL
Culture Sports

Comments/Questions in the chat

What is a disruptive innovation?

Christensen, Clayton M., Michael Raynor, and Rory McDonald. "What Is Disruptive Innovation?"

Harvard Business Review 93, no. 12 (December 2015): 44–53.

The Journal of Continuing Education in the Health Professions, Volume 18, pp. 69–80. Printed in the U.S.A.

Theoretical Foundations

Disruptive Technologies: A Credible Threat to Leading Programs in Continuing Medical Education?

CLAYTON M. CHRISTENSEN, DBA
Associate Professor
Harvard Business School
Cambridge, MA

ELIZABETH G. ARMSTRONG, PhD
Director of Medical Education
Associate Professor of Pediatrics
Harvard Medical School
Boston, MA

WILEY InterScience
DISCOVER SOMETHING GREAT

Original Research

The Growth, Characteristics, and Future of Online CME

JOHN M. HARRIS, JR., MD, MBA; BERNARD M. SKLAR, MD, MS; ROBERT W. AMEND, MED;
CHERYL NOVALIS-MARINE, MS, MBA

Introduction: *Physician use of online continuing medical education (CME) is growing, but there are conflicting data on the uptake of online CME and few details on this market.*

Methods: *Analyses of 11 years of data from the Accreditation Council for Continuing Medical Education (ACCME) and a survey of 272 publicly available CME Web sites.*

Results: *The data suggest that online CME was 6.9%–8.8% of CME consumed in 2008. If previous exponential growth continues, online CME is likely to be 50% of all CME consumed within 7–10 years. Most (60%) online CME is produced by medical publishing and education companies. The online CME marketplace is consolidating, with 16% of surveyed sites providing 76% of available credits. Currently, 70% of online CME is offered at $10 or less per credit. Most online CME uses low-technology educational approaches, such as pure text and repurposed live lectures.*

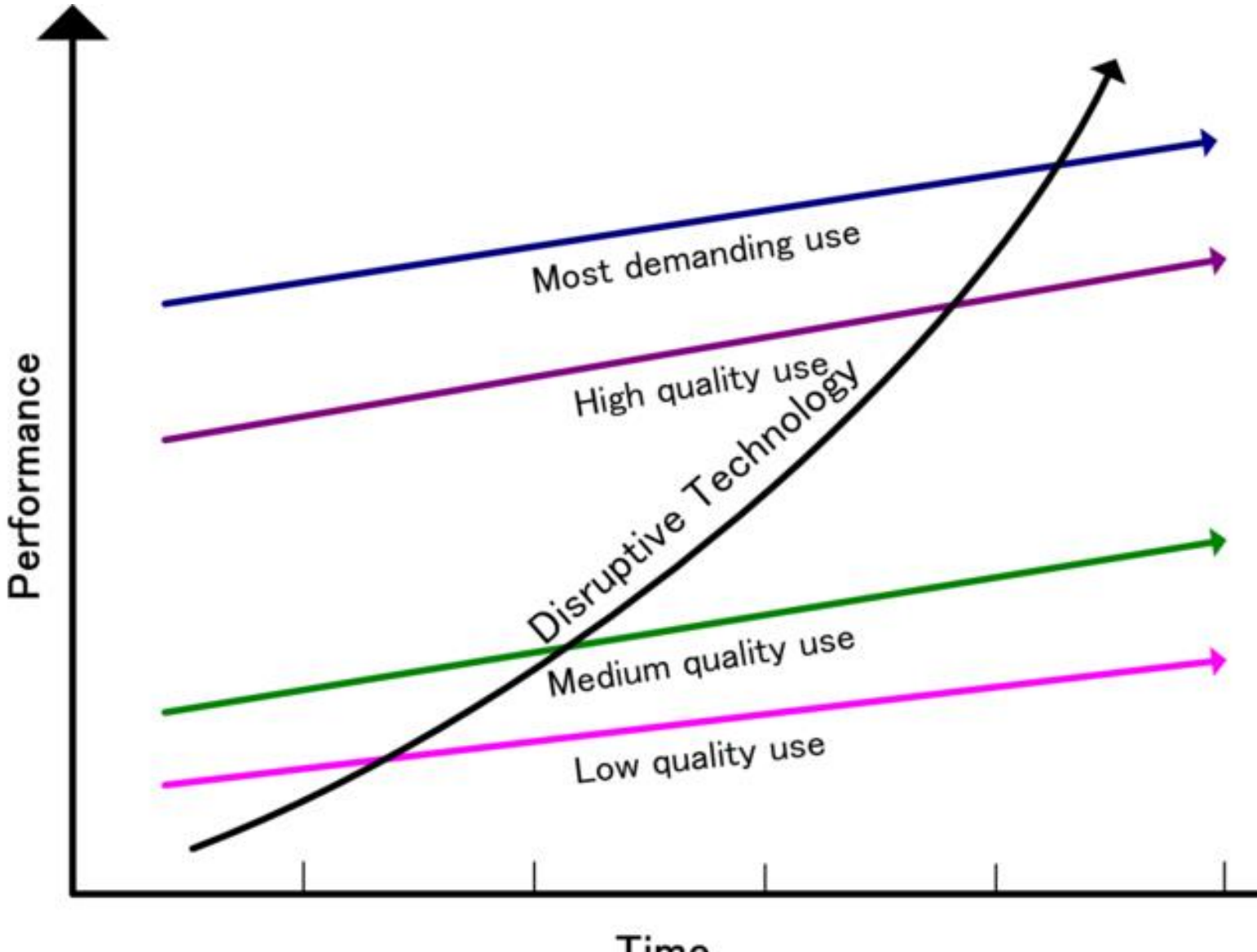
Discussion: *Online CME use is growing rapidly and is likely to be half of all CME consumed by practicing physicians within a few years. The pattern is consistent with Christensen's model of "disruptive innovation," whereby an innovative technology eventually displaces an incumbent technology by first providing a relatively low-quality, low-cost product that meets the needs of unserved customers. The technologies being developed for online CME may facilitate broader changes in medical education as well.*

Key Words: *Internet CME, online continuing education, medical education, disruptive innovation*

Definition

A disruptive innovation is an innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market-leading firms, products, and alliances.

Examples: mass-produced automomobile, digital photography and video streaming.



Characteristics of a disruptive innovation

- It starts with low end or new audiences
- Quality improves over time
- Disruption is a process
- Often based on a different business model

Some attributes related to the disruptive model applied to MOOCs

Quality

Clinically relevant, evidence-based, sequential, multicomponent, interactive education aimed at healthcare professionals and teams.

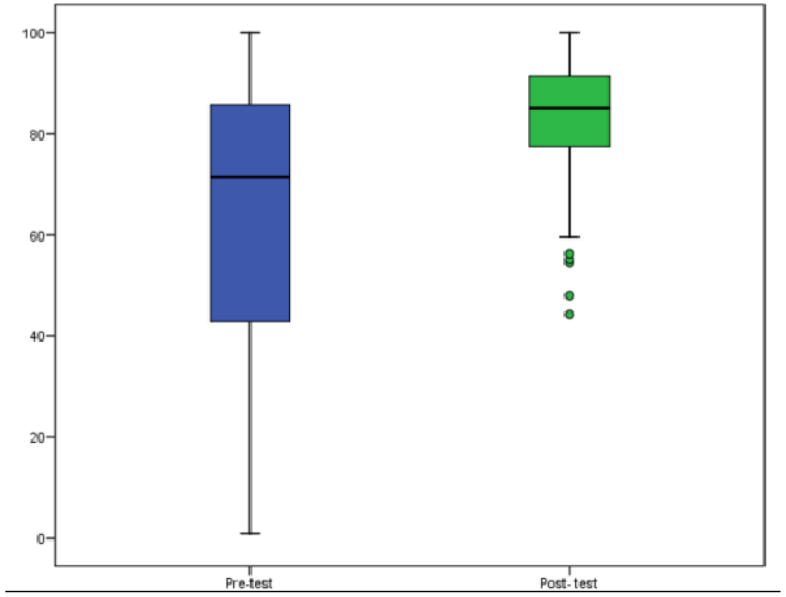


Figure 3 - Knowledge gain.

Source: Margolis A, et al. **Online Continuing Medical Education for the Latin American Nephrology Community**. Stud Health Technol Inform. 2015;216:372-5.

No geographical barriers

Learners, Coordinators, and Faculty

Prof. Dr. Oscar Noboa

(Uruguay)

Director de la Cátedra y del Centro de Nefrología. Hospital de Clínicas. Facultad de Medicina. Universidad de la República. Coordinador del Comité de Patología Renal de SLANH.

Dr. Gustavo Aroca Martínez

(Colombia)

Médico especialista en Medicina Interna y Nefrología. Doctorado en Investigación y Educación. Presidente de la Asociación Colombiana de Nefrología e Hipertensión Arterial.

Dra. María del Carmen A. Casado

(México-Canadá)

Profesora de la Universidad de Toronto. Doctora en Ciencias. Directora de Educación. Nefropatóloga. Coordinadora del Comité de Patología Renal de SLANH.

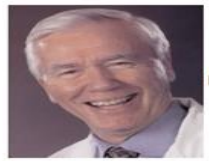
Dr. Osvaldo M. Vieira Neto

(Brasil)

Doctorado en Ciencias Médicas por la Facultad de Medicina de Ribeirão Preto de la Universidad de São Paulo (FMRP-USP). Médico Asistente, Coordinador de Enfermería y Preceptor de la Residencia Médica de Nefrología del Hospital de las

Dr. Rui Toledo Barros – Brasil

Dr. Manuel Praga – España



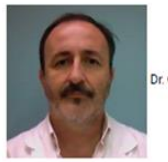
Dr. Daniel Cattran – Canadá

Dr. Charles Jennette – Estados Unidos

Dr. Helmut Rennke – Estados Unidos

Dr. Fernando Fervenza – Estados Unidos

Dra. Heather Reich – Canadá



Dr. Gustavo Greloni – Argentina

Dr. Tommaso Bochicchio – México

Dr. Hernán Trimarchi – Argentina

Dr. Ulrich Specks – Estados Unidos

Dra. Blanca Martínez Chagolla – México

Change of the business model

- **Funding is not primarily based on sponsors/grantors.**
- **It relies heavily on:**
  - **The professionals.**
  - **The institutions where they work.**

References: Steinman MA, Landefeld CS, Baron RB**. Industry support of CME--are we at the tipping point?** N Engl J Med. 2012 Mar 22;366(12):1069-71. doi: 10.1056/NEJMp1114776. PubMed PMID: 22435367.

Maloney S, Haas R, Keating JL, et al. **Cost benefit, cost effectiveness, and willingness to pay for web-based versus face-to-face education delivery for health professionals.** J Med Internet Res 2012;14(2):e47.

Social learning

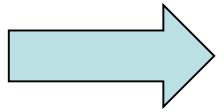
Further reading:

http://www.mededpublish.org/manuscripts/2258

Margolis A, et al. 2019, 'Social learning in large online audiences of health professionals: Improving dialogue with automated tools', MedEdPublish, 8, [1], 55.

Change of paradigm for interaction: from a list of participants to a professional network

Name	E-mail	Country	…
John	Smith	Australia	
Mary	Rodríguez	USA	
Susan	Sarand	Canada	



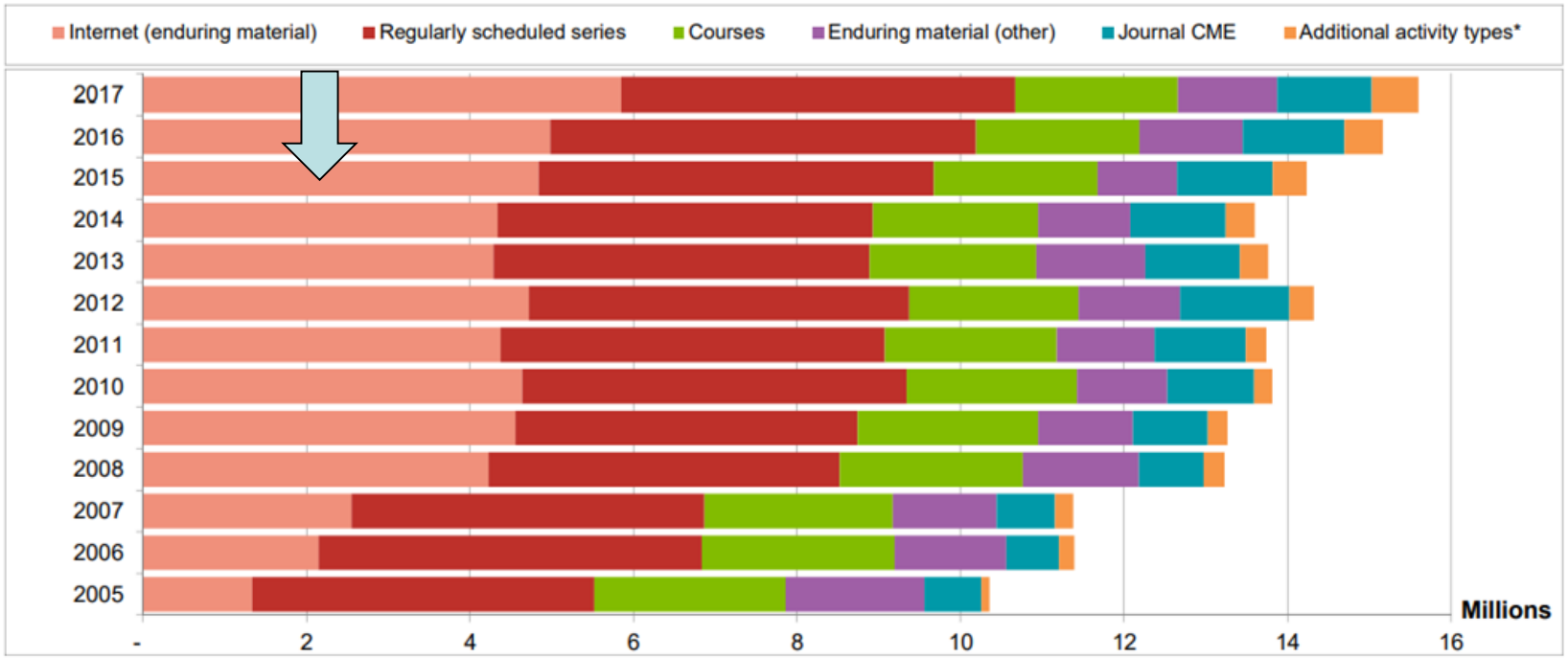
Comments/Questions in the chat

How to address regions with multiple languages? Your opinion is needed!

- A) One language for all course participants (English, most of the times).
- B) Native language for each course participant.
- C) A blend of the above.

Where are we now?

CME Presented by Providers Accredited in the ACCME System
Figure 5. Physician Interactions by Activity Type—2005–2017



Source: ACCME 2017 data report.

CME Presented by Providers Accredited in the ACCME System

Table 1. Size of the CME Enterprise—2017

n= 1,794

		Activities	Hours of instruction	Physician interactions[1]	Other learner interactions[1]
Courses	*6 hours*	76,006	470,512	1,988,077	1,764,767
Regularly scheduled series		23,654	526,082	4,819,388	2,219,581
Internet (live)		4,425	10,740	76,225	273,940
Test-item writing		134	1,042	2,420	297
Committee learning		448	1,477	7,272	4,106
Performance improvement		588	11,027	57,992	7,624
Internet searching and learning		74	1,074	361,724	52,556
Internet (enduring materials)	*2 hours*	43,910	105,354	5,850,971	7,795,141
Enduring materials (other)		8,893	39,518	1,215,513	518,624
Learning from teaching		167	2,359	5,788	2,692
Journal CME		4,419	7,946	1,155,641	241,629
Manuscript review		117	666	57,313	1,400
Other		130	765	3,174	3,982

Our experience

Drop out rates: increases after 2 months.

Coverage of the target audience: 10-30%.

What blend of CME activities do these professionals attend, and why?

Not always good news:

- Small audiences and niche topics
- Generalist physicians

Other challenges:

- Applying what is learned in these courses in different health care systems
- Addressing different accreditation systems

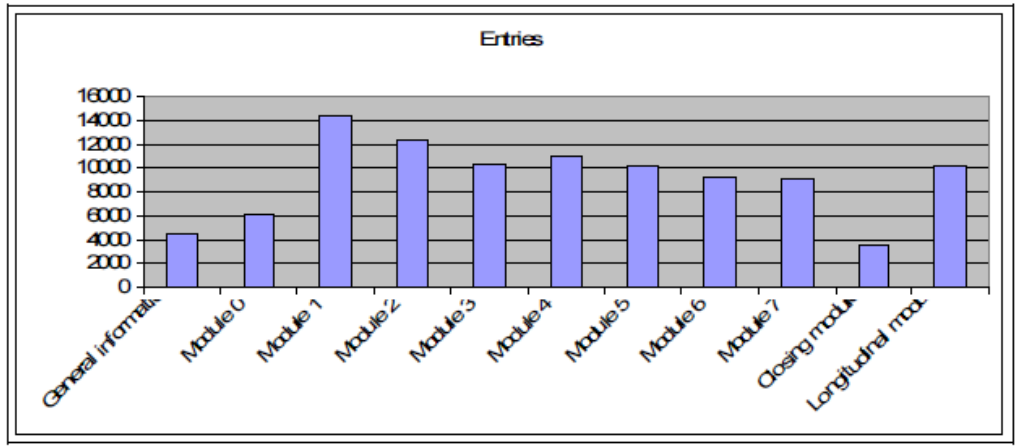


Figure 2 - Number of entries by module.

Source: Margolis A, et al. **Online Continuing Medical Education for the Latin American Nephrology Community**. Stud Health Technol Inform. 2015;216:372-5.

What is likely to happen?

- **MOOCs will change the landscape of formal CME in 3-5 years globally**.
- *Dr. Daphne Koller, co-founder of Coursera: "CME represents a significant market opportunity and we are exploring how we can meaningfully address this space," "We have as many as six partners as part of this launch who are CME accredited, and as we further evolve our health content, it seems like a natural next step for us. "*

See:

Johnson, S. (2019) '**Massive Online Courses Find a New Audience With Continuing Medical Education'**. EdSurge, January 17, 2019.

Available at: https://www.edsurge.com/news/2019-01-17-massive-online-courses-find-a-new-audience-with-continuing-medical-education.

Would you support this conclusion?

- Yes
- No
- Maybe

Please state your reasons in the chat

Want to learn more about the future of CME?

For more information, please see: www.gamecme.org

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