Utilization of Social Media Tools for Student-Driven Medical Education

Philip Kiser, PharmD, PhD
Dept. of Pharmacology, Case Western Reserve University, School of Medicine
Research Service, Louis Stokes Cleveland VA Medical Center

Disclosures

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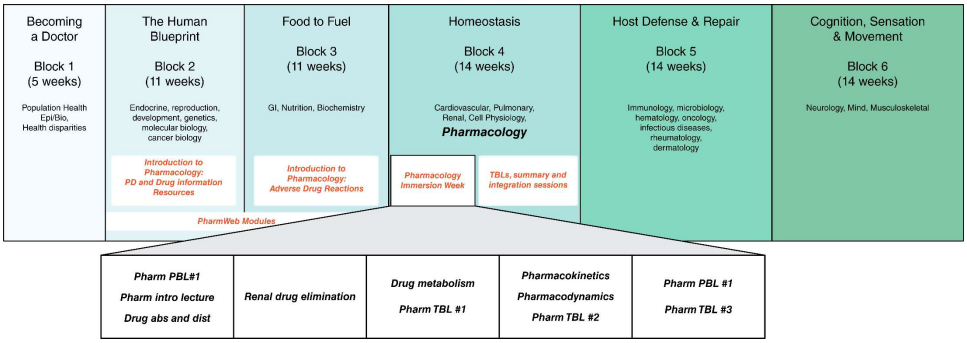
Western Reserve$_2$ (WR2) Curriculum

Foundations of Medicine and Health	Advanced Clinical Experiences and Residency Preparation	
Basic Sciences and Early Clinical Training	Core Clerkships Basic Science Integration Electives and Board Study USMLE Step 1	Acting Internships Transition to Residency Advanced Electives USMLE Step 2 (CK/CS)
Research and Scholarship → MD Thesis		

1st Year → 2nd Year → 3rd Year → 4th Year

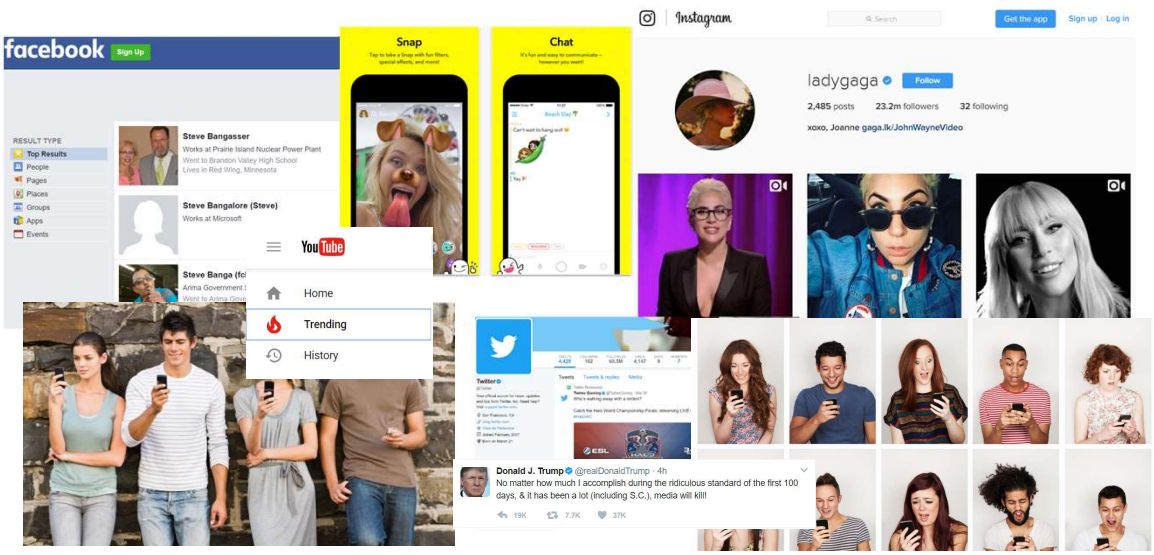
Pre-clerkship curriculum at Case Western

- **Hybrid curriculum**
  - Half lectures/TBLs
  - Half Problem-based learning
- Six sequential Blocks
- Main pharmacology contact time during Block 4



Tight schedule limits student contact time with pharmacology faculty
Yet, students consistently request more pharmacology exposure

How to connect with today's students?



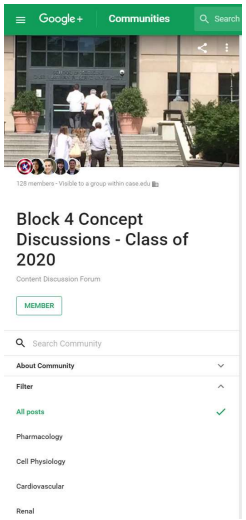
Potential benefits of using social media-based discussion boards for pharmacology education

- Provides a centralized forum for discussion of topics of specific relevance to the curriculum
- Allows students to ask questions after they have had time to digest, reflect on and assimilate information provided in lectures, PBLs or TBLs
- Allows students to efficiently share useful resources
- Allows students to answer each others questions
- All students can follow and contribute to the discussions on their own time
- Forces students (and faculty) to clarify their questions and answers in writing

Cheston CC, Flickinger TE, Chisolm MS. Social media use in medical education: a systematic review. Acad Med. 2013 Jun;88(6):893-901.
Davis WM, Ho K, Last J. Advancing social media in medical education. CMAJ. 2015 May 19;187(8):549-50.

Application of Google+ discussion forums for asynchronous pharmacology education

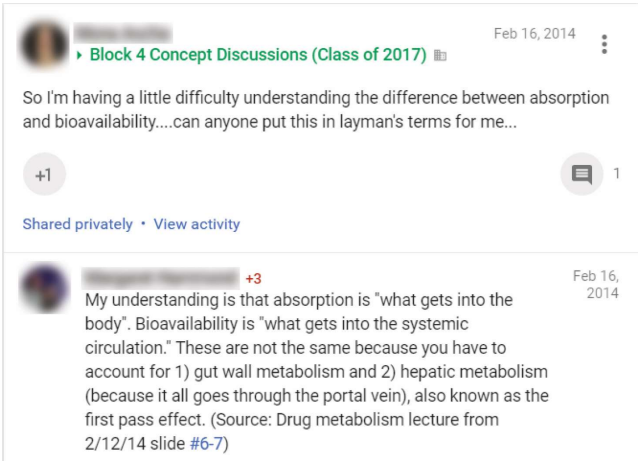
- Professional forum that can be set up for restricted access
- At CWRU, everyone has a Google+ account by default, no need for people to create an account
- Available as an app that runs on smart phones
- Provides helpful functionalities like image and video posting within the discussion box
- Mechanism to reward helpful posts (+1), similar to Facebook “like”, Twitter “favorite” or Instagram “love”
- Can “follow” people like on Twitter
- Community discussions are saved and easy to recall



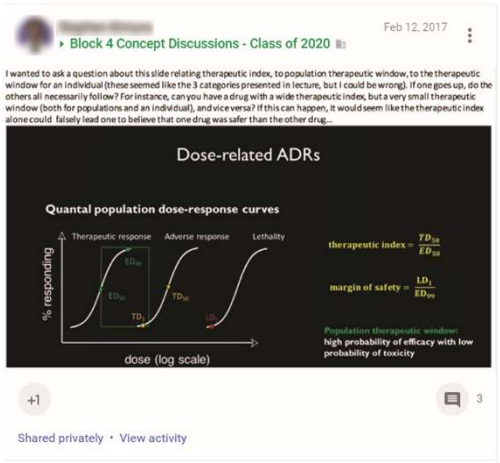
Experience with Google+

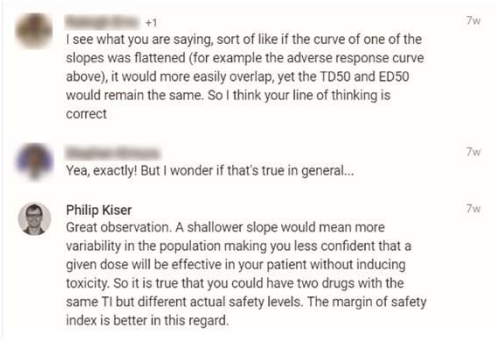
- **Set up**
  - Straightforward except that inviting many people to join a community is cumbersome
- **Participation (initial pharmacology posts)**
  - 13 thus far - 2017
  - 5 – 2016
  - 9 – 2015
  - 11 – 2014
    - In most cases there are multiple follow-up posts
    - Multiple students contribute to the discussion
- **Post topics**
  - Tips on drug information research
  - Clarification of lecture material and assigned reading
  - TBL/PBL ideal answer clarification

Example discussion #1

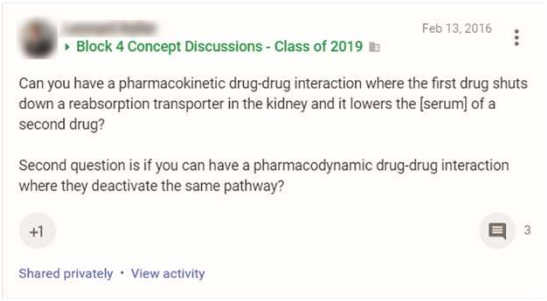


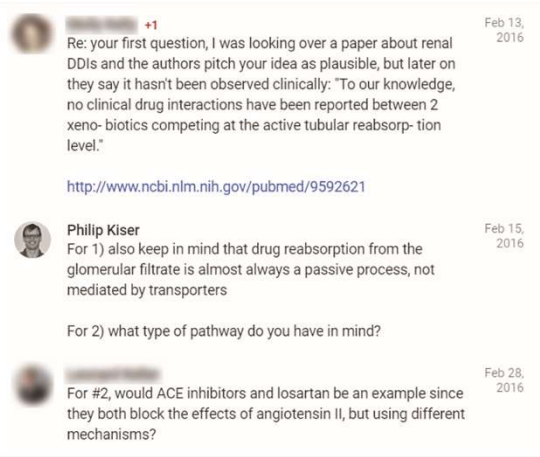
Example discussion #2



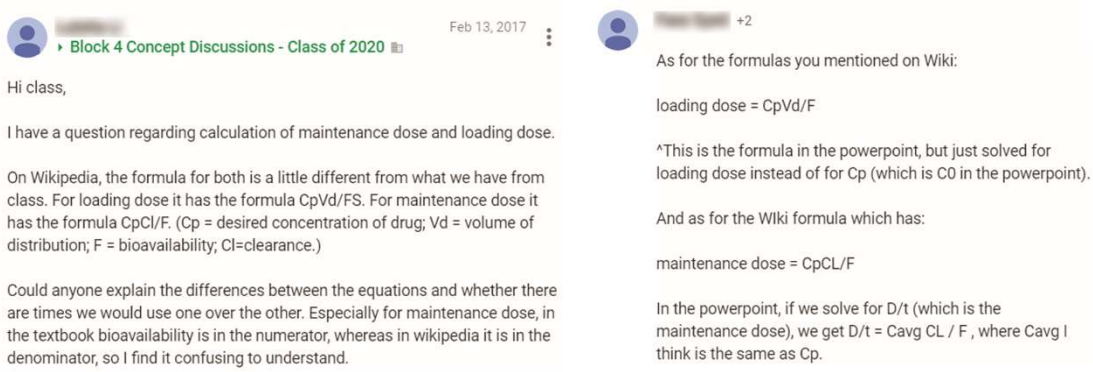


Example discussion #3





Example discussion #4



[redacted]
Block 4 Concept Discussions - Class of 2020
Feb 13, 2017

Hi class,

I have a question regarding calculation of maintenance dose and loading dose.

On Wikipedia, the formula for both is a little different from what we have from class. For loading dose it has the formula CpVd/FS. For maintenance dose it has the formula CpCl/F. (Cp = desired concentration of drug; Vd = volume of distribution; F = bioavailability; Cl=clearance.)

Could anyone explain the differences between the equations and whether there are times we would use one over the other. Especially for maintenance dose, in the textbook bioavailability is in the numerator, whereas in wikipedia it is in the denominator, so I find it confusing to understand.

[redacted] +2

As for the formulas you mentioned on Wiki:

loading dose = CpVd/F

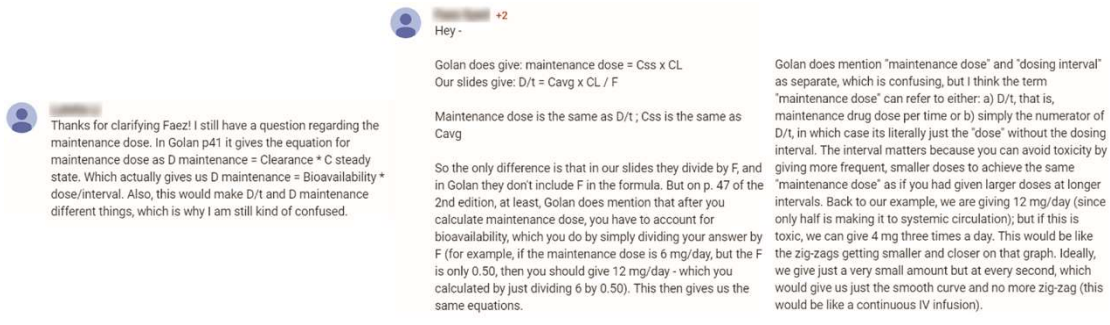
^This is the formula in the powerpoint, but just solved for loading dose instead of for Cp (which is C0 in the powerpoint).

And as for the WIki formula which has:

maintenance dose = CpCL/F

In the powerpoint, if we solve for D/t (which is the maintenance dose), we get D/t = Cavg CL / F , where Cavg I think is the same as Cp.

Example discussion #4, cont.



[redacted]
Thanks for clarifying Faez! I still have a question regarding the maintenance dose. In Golan p41 it gives the equation for maintenance dose as D maintenance = Clearance * C steady state. Which actually gives us D maintenance = Bioavailability * dose/interval. Also, this would make D/t and D maintenance different things, which is why I am still kind of confused.

[redacted] +2
Hey -

Golan does give: maintenance dose = Css x CL
Our slides give: D/t = Cavg x CL / F

Maintenance dose is the same as D/t ; Css is the same as Cavg

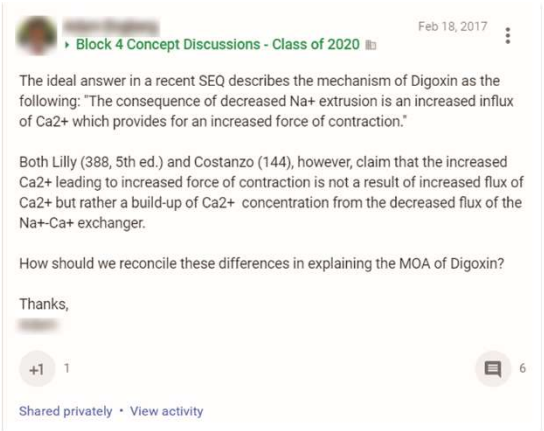
So the only difference is that in our slides they divide by F, and in Golan they don't include F in the formula. But on p. 47 of the 2nd edition, at least, Golan does mention that after you calculate maintenance dose, you have to account for bioavailability, which you do by simply dividing your answer by F (for example, if the maintenance dose is 6 mg/day, but the F is only 0.50, then you should give 12 mg/day - which you calculated by just dividing 6 by 0.50). This then gives us the same equations.

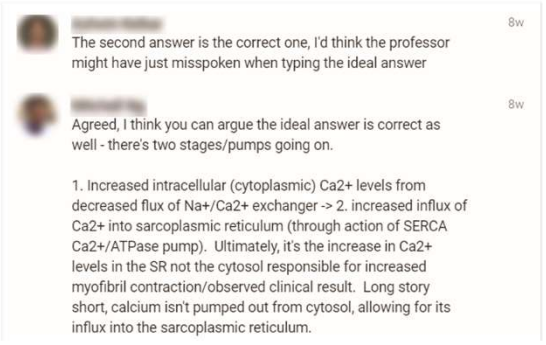
Golan does mention "maintenance dose" and "dosing interval" as separate, which is confusing, but I think the term "maintenance dose" can refer to either: a) D/t, that is, maintenance drug dose per time or b) simply the numerator of D/t, in which case its literally just the "dose" without the dosing interval. The interval matters because you can avoid toxicity by giving more frequent, smaller doses to achieve the same "maintenance dose" as if you had given larger doses at longer intervals. Back to our example, we are giving 12 mg/day (since only half is making it to systemic circulation); but if this is toxic, we can give 4 mg three times a day. This would be like the zig-zags getting smaller and closer on that graph. Ideally, we give just a very small amount but at every second, which would give us just the smooth curve and no more zig-zag (this would be like a continuous IV infusion).

Google+ wishlist

- Anonymous posting (that can be controlled by moderators)
- Easier, more reliable, way to add members *en masse*
- Tracking number of views of a post

Example discussion #5





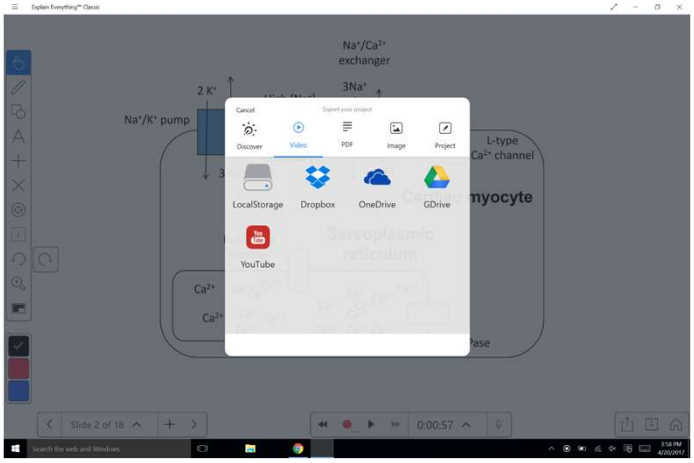
Customized videos to address student questions

Explain Everything™
Explain Everything sp. z o.o.
★★★½☆
Free+
Get
+ Offers in-app purchases

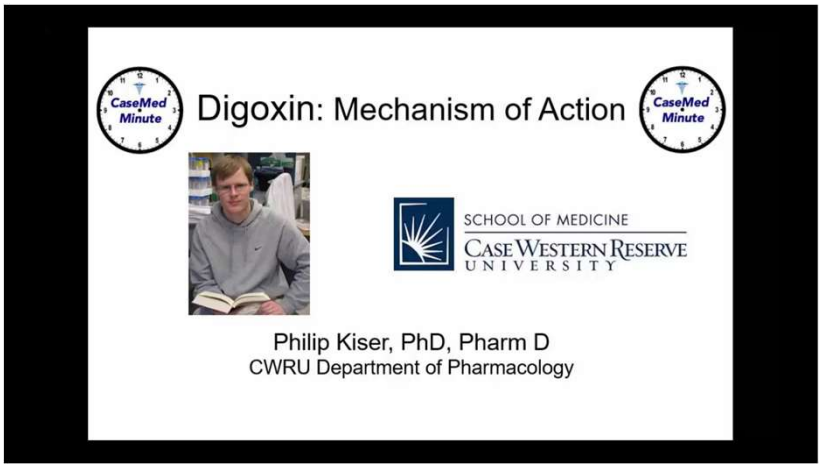
Available for Windows/Mac/Android

Free form or Powerpoint/pdf-based presentation options available

Separate recording for each slide (easy to edit)



Example video



Conclusions, implementation tips and future directions

- Google+ communities are useful for asynchronous pharmacology education
- Faculty promotion and monitoring of the forum is critical for student participation in my experience
- Faculty videos are often helpful supplements to discussions (don't underestimate the amount prep time needed for them!)
- Future efforts will aim to quantify the efficacy of the discussion forum in improving understanding of core pharmacological concepts