# Team 2.0: A collaborative online method for knowledge management in academic medicine

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**MISSION**

To create an interactive forum for team members to manage their knowledge needs related to patient care and for faculty and librarians to embed Information Literacy instruction in clinical care.

LANE KNOWLEDGE MANAGEMENT CENTER

## CONTEXT

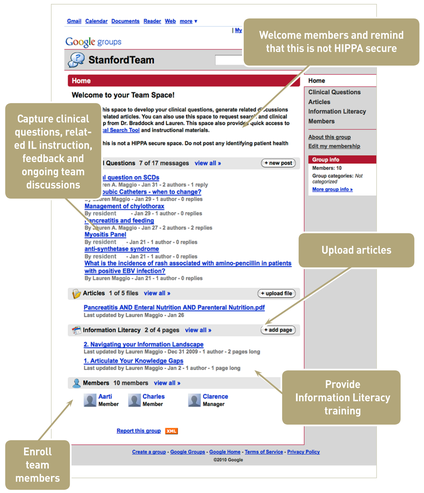
In medical practice clinical questions confronted by individual practitioners often go unasked and unanswered. The structure of an academic inpatient medicine team offers a unique opportunity for collaborative knowledge management around real patients' needs. We developed an online "Team Space" to provide internal medicine teams a mechanism for members, including a clinical librarian, to develop clinical questions generated from patient care, view search and critical appraisal instruction, and upload related articles for discussion and decision making. The Team Space was used as platform for teaching and discussion on rounds. Designed to improve Information Literacy (IL) skills and facilitate collaborative discovery, the Team Space features ongoing question-specific IL instruction.

## METHODS & TARGET AUDIENCE

In 2009 a virtual team space was created using the Google groups platform by an attending and medical librarian (authors KP and LM) who lead Information Literacy at Stanford. Over a four month period (November 2009–February 2010) five internal medicine teams at Stanford Hospital and the Palo Alto Veterans Administration Hospital were provided their own team space. Each team was provided brief oral instruction on the use of the space from KP or LM and were encouraged to use it for collaboration and to facilitate their information needs.

## ANATOMY OF A TEAM SPACE

Each team space includes the following five major areas to:




** Although the original creation of the team space took approximately 2 hours, each additional team space was created in approximately 30 minutes.*

### CONVERSATION

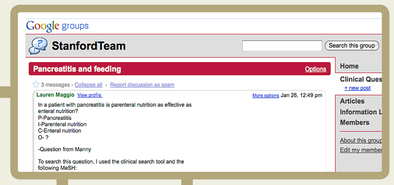
**STUDENT:**
"Hi everyone. I was reading on hemolytic anemia One thought was that a cause of Coomb's negative hemolytic anemia could be G6PD deficiency. Sulfa drugs can cause a G6PD breakout and he was recently started on Bactrim, a sulfa drug. I found case reports of Autoimmune Hemolytic Anemia caused by Carboplatin (which the patient received). http://www.ncbi.nlm.nih.gov.laneproxy.stanford.edu/pubmed/8937414?ito... Also, many other case reports of patients with other Platin related drugs. However, all had a positive Coomb's test (which the patient doesn't). According to UptoDate, the Coomb's test "when accurately and specifically performed, over 99% of patients with warm agglutinin AIHA will exhibit a positive result compared with less than 1% of the normal population" I couldn't access the article it cited because it was from 1973. According to UptoDate, you also see a positive Coomb's test in transfusion hemolytic anemia (as expected)

Other questions to consider: In myelosuppresion anemia caused by chemotherapy do you see an elevated retic count as in our patient and if so by how much would you expect to see? Are there other studies that show the sensitivity of Coomb's test in transfusion hemolytic anemia?"

**ATTENDING:**
"Very interesting idea. This might be worth pursuing, at least by checking his g6pd level. Great detective work!."

**STUDENT:**
"A few things. The main tests for G6PD deficiency are based on detecting the absence of NADPH production. Given that we transfused the patient, his transfused blood will likely show NADPH production. There are 3 studies showing that patients receiving fludarabine develop autoimmune hemolytic anemia. Our patient received gemcitabine, also a nucleoside analog. I have pasted a link to the abstracts below, but in these small studies up to 20 to 70% of patients developed autoimmune hemolytic anemia. They developed them anywhere between the 1st and 6th round of chemotherapy. Our pt. received his round in October and was due for his 5th round this week. I didn't see any mention of the sensitivity of Coombs test in these articles or mention of confirmation with Coombs.

However, looking back at his Hct and Bilirubin, he first started developing a hyperbilirubin that was predominately indirect 10 days after his first blood transfusion. He also reports having a rash on his forehead after his last transfusion. I think his anemia is most likely explained by his new esophageal lesions on top of a hemolytic anemia caused by most likely a delayed transfusion reaction, but possibly hemolytic anemia related to his gemcitabine."




### CONVERSATION

**RESIDENT:**
"Lauren (the librarian), I may need your help with this one.

This question has come up a few times. In particular, we had a few patients that we viewed as having low probability of MRSA infection, but we were a little chicken about cutting back on antibiotics that would cover MRSA. We would sometimes use the MRSA nares test to give us confidence.

Now we have a patient with known, sustained MRSA bacteremia and osteomyelitis, who has been MRSA nares negative a couple of times. I've tried a few searches to find out what the sensitivity of MRSA nares testing is in patients who are known to have MRSA elsewhere, but I haven't been able to find anything remotely helpful."

**LIBRARIAN:**

"For clarification is PCR Assay a viable search term?

Also are we looking for the sensitivity and specificity of the test for patient with a MRSA history OR are looking for just the sensitivity and specificity of the test?"

**ATTENDING:**
"This is a hard question, because the nares screening is more for infection control than diagnosing active infections. This came up in January; I went to our web page from January and was able to pull up an interesting article that our resident shared with the team. I have uploaded it to the article section. What it showed is that when a patient who is known to be colonized with MRSA gets an infection that infection is far more likely to be MRSA than if they are known not to be colonized.

Before reading this paper I didn't pay any attention to the nares screening. Now, in patients who I am treating for Staph Aureus, I think of the nares screen as one more piece of information to use to help with the decision whether to cover MRSA."

### CONVERSATION

**INTERN:**
"How does medical management of unstable angina compare to revascularization in terms of cardiovascular mortality? "

**ATTENDING:**
"I am glad you posted this question. Given the patients we have cared for this week, we definitely should know the answer in some depth.

Notice, this is a great pico question:
**P:** acute coronary syndrome
**I:** medical management
**C:** invasive
**O:** Mortality

If you plug these terms into your search (using the PICO builder, of course) you are taken right to an abundance of resources that will help you manage this decision. This might be a good one to discuss in rounds (hint hint)."

**INTERN:**
"Current AHA guidelines recommend early invasive strategy for UA or NSTEMI partly based on the attached meta-analysis demonstrating benefit in reducing death, MI, and rehospitalization. However, it was noted that the early invasive strategy (cath w/i 72 hrs of presentation) was associated with a higher early mortality hazard compared to more selective revascularization strategy. This led to the suggestion that high risk patients should be selected based on cardiac risk factors for early interventions. This is supported by a recent follow up of the ICTUS trial demonstrating lack of benefit of early intervention strategy re: death/MI in all comers with UA/STEMI. It turns out our patient with ?UA does have significant risk factors (tobacco, HLD, +Fam hx, +stress test) so early invasive strategy may be his best option. We should be aware that although he will derive greater long term benefit from this strategy, his in-hospital mortality may be slightly higher (all cause mortality as well as composite of death/MI)."

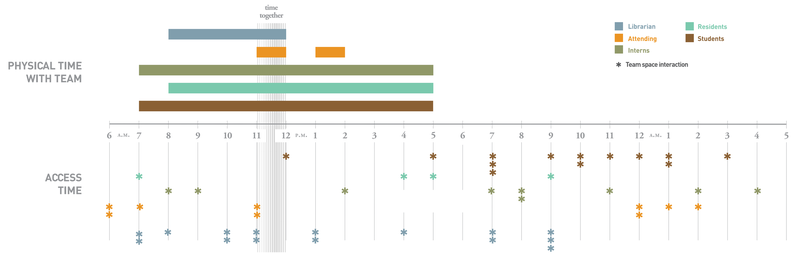
## LESSONS LEARNED

### TECHNOLOGY LESSONS

- Use of the team space is reduced by the fact that the Google Group platform is not in the team's current work flow.
- Each team space takes time to create, maintain and migrate. While it can be made to work for a single team, Google Groups is far from an ideal solution for a program-wide tool.

### CULTURAL LESSONS

- The team space concept was able to temporally extend the concept of team. Team members interacted at times outside of the usual work hours.
- We felt that the team space, when utilized, enhanced the culture of inquiry among the members.
- Questions were often answered iteratively and collaboratively, with the attending and librarian providing feedback along the way.
- Students, who are not always keen to ask questions during the busy work day, were avid users and seemed in some cases to prefer this medium for communicating new knowledge.
- At this point, a champion is needed; the team space was not utilized when a librarian or attending advocate was not on the team.
- Attending/Librarian rotations of one month, rather than two weeks, seem to be associated with more use of the team space.




## FUTURE DIRECTIONS

### DEVELOP PROGRAMS TO INCREASE ACCESS TO AND USE OF THE TEAM SPACE

- Creation of a facilitator guide for attendings who are not "IL experts"
- More broad-based deployment across the inpatient medicine rotation
- Apply the technological lessons learned to build a better team space

### POTENTIAL AREAS OF RESEARCH

- Does the team space enhance/augment the culture of clinical inquiry?
- By fostering collaboration, does the team space increase the likelihood that clinical questions are "answered"?
- Does use of the team space help build IL skills?
- How do team members at different stages of their career respond to and utilize social networking software?

### IL/EBP EDUCATION

The team space clearly documents behaviors in the realm of practice-based learning and improvement. The information in the team space can be harvested to demonstrate competency in this key clinical competency.

## INFORMATION LITERACY

At Stanford University, Information Literacy (IL) is defined by the following competencies:


## CONCLUSION

Team Space provides an interactive and collaborative forum for team members to manage their knowledge needs related to patient care virtually and in the physical team room. However, there are significant cultural and technological barriers to making the team space a consistent component of the inpatient ward experience.

## CONTACTS

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