

Title: Thinking outside the Inbox: Use of Slack in clinical groups as a collaborative team communication platform

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Title: Thinking outside the Inbox: Use of Slack in clinical groups as a collaborative team communication platform

Introduction

Academic faculty commonly collaborate across organizations located in multiple time-zones, rendering in-person communication impractical. Furthermore, local access to content experts may be limited at many institutions, and multiple competing commitments may preclude attendance at relevant networking events.¹ This is especially true during public health crises such as the COVID-19 pandemic which has accelerated the incorporation of digital alternatives into workflow.^{2,3} Therefore, it is important for teams to develop easily accessible, reliable, and cloud-based collaborative tools to facilitate communication.⁴ Although email remains a viable option for short, intermittent communications, the time spent reading and responding to emails among larger teams discussing disparate topics may impair productivity.⁴⁻⁶ Email creates multiple synchronous discussions, making it difficult for individual team members to follow and distinguish topics or projects. At academic medical centers, high volumes of emails risk effective team communication due to important emails being overlooked or inadvertently deleted.^{7,8}

With the advent of Web 2.0, or the social use of the web, there has been an increasing interest in online team platforms, termed “enterprise social networks” (ESNs), which are specifically designed to assist organizations in managing productivity, improving team efficiency,

30 disseminating institutional expertise, and supporting collaboration.^{9,10} While Slack¹¹ is the
31 dominant ESN, several competitors exist, each with its own unique set of features, advantages,
32 and potential limitations. Popular examples include Basecamp,¹² Microsoft Teams,¹³ and Google
33 Hangouts Chat (Table 1).¹⁴ ESNs differ from social network sites, such as Twitter and Facebook,
34 which enable users to create and promote a personal brand while building a network of
35 connections with other individual users.^{15,16} ESNs are team-based platforms, providing
36 streamlined communication channels and creating a richer knowledge-sharing environment
37 focused on a larger series of specific projects or goals.¹⁰
38

39 **What is Slack?**

40 One of the most popular ESNs is Slack, a cloud-based digital workspace and information
41 management system that allows multiple users to collaborate on group projects in real-time.⁴
42 Slack is modeled on the familiar instant messaging structure which allows for a more natural
43 back-and-forth interaction when compared to email.¹⁷ Integrated voice or video calls within
44 Slack also allow users to conference and share screens in real-time. Conversations between
45 members typically occur in channels that can be organized by topic, project, team, or interest.
46 This creates a communal place for storing information and working on projects.⁴ Members can
47 communicate with each other individually via direct messages, or publicly in their respective
48 channels. Real-time and asynchronous communication allows users to participate in active
49 discussions and to catch up on team conversations they may have missed. In addition to
50 messaging, Slack provides the ability to archive, search, and share files amongst team members.
51 A unique feature of Slack is its robust searchability, as all files and messages posted in a group's
52 channels are searchable. Slack offers several levels of service, including a free basic option and
53 upgraded tiers.⁴ Additional information about the different features and pricing is available on
54 the Slack website.

55 Slack has been successfully used by many collaborative groups in a variety of settings, including
56 undergraduate medical education,¹⁷ graduate medical education,¹⁸ course communication,¹⁹
57 conference discussions,²⁰ clinician wellness²¹ and coordination of institutional research.²² In one
58 survey of users conducted by Slack, 32% of respondents agreed that Slack increased team
59 productivity, with a decrease in team meetings by over 25% and intra-network emails by over

60 48%.²³ Nearly 80% of survey respondents felt that Slack enriched their team culture, with 88.6%
61 feeling more connected to their teams.²³ Over 80% of users endorsed improved transparency
62 within their teams, with 62.4% responding that Slack made it easier for them to locate relevant
63 project information.²³ One online collaborative network, Academic Life in Emergency Medicine
64 (ALiEM) has successfully utilized Slack since its debut to significantly augment the team's
65 academic productivity.²⁴⁻²⁷ The authors have experience using Slack for a variety of projects
66 across multiple disciplines. In this manuscript, we focus on integrating this collaborative online
67 team platform for clinical groups.

68

69 **How Slack Might Work within Medicine and Healthcare**

70 Online platforms, such as Slack, can be utilized for academic productivity in research and
71 curriculum development, as well as providing an added level of engagement among educators
72 and learners.^{25,29,30} This can also be valuable for creating virtual communities of practice to
73 promote innovation and development of mentorship and mastermind groups.²⁷ Slack also allows
74 for streamlining of high-stakes communication that is searchable and archivable, including
75 clinical operations communication, such as creating guidelines and protocols. Table 2 provides
76 specific examples of how these ESNs can optimize collaboration among teams working in a
77 broad range of areas including clinical operations, research and medical education.

78

79 **Tips for Successful Slack Utilization**

80 The following section contains tips for engaging in effective Slack communication. These are
81 best practices derived from our experience using multiple Slack channels for carrying out
82 projects^{33,36,37} and running educational programs (e.g. Chief Resident Incubator, Faculty
83 Incubator).^{25,26}

84

85 **Tip 1: Setting up for success - suggestions for onboarding your team to Slack**

86 Onboarding is important in many sectors.^{38,39} When transitioning teams from real-life to digital
87 interactions, it can be helpful to incorporate onboarding, as well. Components to consider when
88 onboarding include:

- 89 a) Assisting individuals with technology - When setting up online spaces, ensuring on-
90 demand assistance for installing apps or asking questions about how to access resources
91 is important. A screencast or in-person session about how to use Slack can help people
92 get set up. For instance, encouraging members to download the apps for their computers
93 and mobile devices with instructions can be important.
- 94 b) Orienting individuals to the online space - Creating and posting a robust set of
95 instructions for describing the online space helps direct members to the features available
96 in Slack. This includes directions for creating a profile, adding a photo, or joining
97 optional channels. See Figure 1 with a screen capture of one possible onboarding channel
98 orientation script.
- 99 c) Socialization - Establishing ground rules is imperative for any work environment, and
100 Slack is no different. The same social rules that exist in real life may not resonate for
101 those who are not used to conducting themselves online via text-based media. Explaining
102 (and role modelling early) the use of niceties or emojis may be highly relevant when
103 interacting in this format.

104

105 **Tip 2: Forming a team of Slack champions**

106 Enlisting the help of individuals with experience using Slack is important for transitioning team
107 members to a new teamwork paradigm. As leadership expert John Kotter points out, change
108 management processes benefit from a guiding coalition that helps foster a successful transition.⁴⁰
109 This group of people acts as the center group of a virtual community of practice for using
110 Slack.^{29,37,41} No one person can be online at all times, so enlisting a team ensures there is
111 adequate coverage by experienced individuals. Members of this group can be deputized to help
112 with the socialization of new members (e.g. greeting them as they arrive and being a friendly
113 ‘host’ to touch base if they have questions) and function more as moderators initially. Granting
114 these individuals Slack administrative powers (i.e. making them an ‘admin’ type of member
115 within the workspace) will allow them to monitor channels to ensure members uphold the
116 principles of inclusivity and respect.

117

118 Having multiple champions can be important because previous literature about online
119 communities suggests that moderators are important for ensuring professionalism.⁴² Gentle

120 nudges and bystander interventions can help prevent miscommunication or to cut tensions that
121 exist in text-based communications.

122

123 **Tip 3: Organizing your workspace**

124 One of the key elements of running an effective Slack workspace is to set it up properly. This is
125 actually the first step for using Slack. Before sending invitations to join the group, set up all the
126 channels required by the team to be successful. This will reduce the likelihood that many
127 channels will be added by individual team members. Consider the organization's most common
128 activities (e.g. shift trades, COVID-19 protocol developments) and create channels for these
129 topics. Then, create a default channel that is titled #1-start-here (as shown in Figure 1); as
130 individuals join, they should be directed to this channel in the invitation email so that they can
131 learn about the code of conduct and expectations. By creating an iterative list of available
132 channels and updating the onboarding message, new members are oriented to available
133 resources.

134

135 **Tip 4: Communicating effectively in Slack requires understanding your options**

136 One of the unique features of Slack is the ability to utilize multiple communication avenues
137 simultaneously. Group members should utilize these to ensure efficient conversation and avoid
138 overwhelming a conversation with multiple disparate thoughts. For example, if there was a group
139 interested in airway management during COVID-19, they could create a dedicated open channel,
140 so that all interested members could join, while avoiding extensive discussion of this in the
141 general education channel. Moreover, if a subset of this group planned to perform a quality
142 improvement or research project on this topic, they could create a closed channel specifically for
143 project planning. A summary of the main communication options is provided in Table 3.

144

145 **Tip 5: Use a continuous quality improvement cycle to improve your workspace**

146 As with all interventions, feedback is essential.^{43,44} Project and education leaders should check in
147 with the team members to assess how the model is working. They should identify whether there
148 is a need for further training, as well as whether there are specific areas that could benefit from
149 refinement. For example, a common error is to create too many channels with significant

150 overlap. While having different channels is beneficial for creating focused content, having
151 multiple similar channels can lead to several redundant conversations.

152

153 **Tip 6: Go beyond Slack to optimize your communication strategy**

154 Remember that although Slack may be known as the ‘email killer’, email or texting still exist and
155 can be used judiciously to enhance Slack-based communications. Some team members may have
156 difficulty adapting to the faster speed and new technology. In these cases, it may be valuable to
157 incorporate more familiar technology (e.g. email, text messages) to highlight time-sensitive or
158 critical questions. If possible, these tools can re-engage group members with Slack as opposed to
159 replacing Slack communication. While the goal of successful adoption of Slack is to alternative
160 means of communication, outlining escalation of communication, e.g. messaging via Slack then
161 text messaging then phone call creates clear expectations. If alternative means of communication
162 is employed that could easily be discussed in Slack, a way to re-direct the group is to respond
163 using Slack. This is key especially at the beginning of the implementation phase to encourage
164 developing of a new habit of communication.

165

166 Similarly, some users may stop utilizing Slack due to other time commitments or difficulty with
167 tracking the conversations if the number of messages gets too large. In these cases, it is important
168 to check in with the user and assess the reason they have stopped using it and work together to
169 identify a solution. This could include developing strategies to build Slack into their daily
170 schedules, adjusting notification features, or allowing them to ignore older messages and start
171 anew with current conversations.

172

173 **Strengths of Slack**

174 As with any tool, Slack has both strengths and limitations. In contrast to other communication
175 platforms such as email and text messaging, new members of a team can join a thread and see
176 the conversation that has taken place prior to their entry. Members can also use a search tool that
177 allows them to quickly find documents or quotes. This facilitates orienting new team members to
178 projects. The ability to create different types of channels in Slack with different privacy settings
179 also adds flexibility to enhance team communication; users can adjust channel settings to create
180 invite-only private or open channels, as needed. Slack users can also easily attach and integrate

181 files such as Word documents, PowerPoint presentations, images, and PDFs into conversations.
182 The use of Slack can reduce the amount of emails received, and naturally organize messages
183 pertaining to a given project or team in a single place.

184
185 Similar to email and text message platforms, users can search and archive Slack conversations
186 for later reference. Downloading the mobile Slack app onto one's device allows it to function
187 similarly to other text message platforms, such as WhatsApp, GroupMe, and iMessage, but with
188 the enhanced functionality and added features of the Slack application. The ability to use Slack
189 in a similar fashion to text messages can reduce the threshold for members of a team to
190 communicate with each other and thereby enhance collaboration. For instance, users may feel
191 more comfortable "direct messaging" another member of the team rather than calling, texting or
192 emailing them. Along these lines, Slack allows for teams to generate a more informal, social
193 experience of working together by promoting more brief, casual conversation and incorporating
194 the use of emojis to increase engagement and levity.

195
196 While Slack is able to provide a platform for multi-institution/large groups to communicate and
197 disseminate archivable information with asynchronous engagements, it also provides an
198 environment that promotes connection and belongingness.²¹ An example was the launch of the
199 first-ever multiple-residency program emergency medicine virtual conference in response to the
200 COVID19 pandemic.³³ Over 1,000 emergency medicine learners and faculty including 64
201 residency programs gathered in a two-hour session and used Slack as a backchannel discussion
202 board. Slack enabled synchronous discussion and brainstorming that augmented the virtual
203 lectures. Within the larger platform, each residency program also had its own channel, which
204 facilitated site-specific discussion relevant to the lectures. Slack provided an innovative way of
205 connecting participants and engaging them using the gamification of medical concepts. Slack
206 provided a platform that allowed for otherwise "quiet" learners in traditional lecture formats to
207 be engaged and contribute.²⁰ During a time when physical distancing was the norm, Slack
208 enabled learners and educators to connect and interact.

209

210 **Limitations of Slack**

211 Users of slack also must maintain awareness of its several pitfalls and strategies to mitigate them.
212 For one, encouraging members of a team to download and begin using Slack can generate
213 frustration and contribute to the perceived burden of staying up-to-date with other existing
214 communication modes, such as email and text message. Defining the role and purpose of the
215 Slack team and delineating expectations for how the team will use Slack can help generate buy-
216 in. Emphasizing that Slack can ultimately reduce the number of emails individuals receive may
217 also encourage its use.

218
219 Variable buy-in among team members also represents a significant potential barrier to integrating
220 Slack. Some will naturally feel intimidated by and uncomfortable with Slack as a relatively novel
221 platform. In order to successfully integrate Slack, all members of the team must be motivated to
222 learn the platform and use it according to the expectations set forth. Providing onboarding to
223 users and enhancing their comfort with the application through efficient, high-yield guidelines
224 and direct peer teaching can address this barrier.

225
226 If buy-in and comfort with slack continues to remain variable across the team, team members
227 may fail to check Slack regularly and may miss critical information. Sending selective
228 supplemental emails to the group with time-sensitive or critical information may address this
229 limitation, as most people tend to check email daily.

230
231 Additionally, as Slack can reduce the threshold for communication and promote more informal
232 and social interactions among team members, unprofessional behavior and miscommunication
233 can occur. Setting ground rules and designating a moderator can help balance community-
234 building with professionalism.

235
236 If a large team uses Slack regularly, users may experience “notification overload” each time they
237 receive messages. Team members can adjust notification settings according to their preferences
238 in order to avoid this.

239
240 The free version of Slack may not meet the needs of a large team. Upgraded plans vary in price
241 and offer enhanced features including unlimited message archive and apps, group calls with

242 screen sharing, guest accounts and shared channels, unlimited workspaces, designated customer
243 service teams, HIPAA-compliant message and file collaboration. The additional cost of upgraded
244 plans may limit use by teams without significant funding.

245
246 Lastly, Slack cannot achieve all of the tasks required of teams collaborating digitally. However,
247 teams can utilize other available applications to fill this void. See Table 4 for details.

248

249 **Conclusions**

250 Digital collaboration afforded by Web 2.0 represents a powerful paradigm within which teams
251 can manage competing responsibilities by faculty, collaborate across institution and geographic
252 location, and reduce in-person meetings during public-health crises such as COVID-19. Slack is
253 a workplace communication tool and instant messaging platform that incorporates many of the
254 benefits of more traditional platforms such as email and text-message, but with several added
255 features that enhance virtual teamwork. Within this framework, teams must anticipate and
256 mitigate limitations in order to optimize use. Although Slack cannot achieve all tasks required of
257 teams within one application, integrating other existing tools can address a broad spectrum of
258 needs for virtual teams.

259

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354

Feature	Slack	Basecamp	Microsoft Teams	Google Hangouts Chat
Messaging	Single-person direct message, group direct message, open channels, closed channels	Single-person direct message, group direct message, open channels, closed channels	Single-person direct message, group direct message, open channels, closed channels	Single-person direct message, group direct message, open channels, closed channels
Message history	10,000 searchable message history on free; unlimited on paid	Unlimited searchable message history for all tiers	Unlimited searchable message history for all tiers	Not specified
Voice/video calls	One-on-one for free, up to 15 participants on paid	Audio and video calls are not supported	Meetings with up to 250 participants on all tiers	Up to 25 on basic tier, up to 50 on highest tiers
Record meetings	No native capability, but available through 3 rd party integrations	No native capability	Available on paid tiers	Available on all tiers
Screen sharing	None on free, only on paid	No native capability	Available on all tiers	Available on all tiers
Integrations	10 integrations on free,	Unlimited integrations on	Unlimited integrations on all	Unlimited integrations on all

	unlimited integrations on paid	all tiers, but less integrations offered compared to competitors	tiers, but less integrations offered compared to competitors	tiers, but less integrations offered compared to competitors
File storage limits	5GB total on free 10GB per user on mid-tier 20GB per user on highest tier	1GB total on free 500GB per team on paid	2GB per user + 10GB shared on free 1TB per user on paid tiers	30GB per user on basic tier Unlimited storage on highest tiers
Guest users	None on free, only on paid	None on free, only on paid	Available on all tiers	No native capability
Exportable messages	Can be exported by admins on most expensive tier	Can be exported by admins	Can be exported by admins	Can be exported by admins
Support	24/7 support and 4hr response	Limited on free, priority support on paid	\$20 per month for 24/7 support	24/7 support for all tiers
Platform availability	Windows, macOS, Linux, iOS, Android, Web client	Windows, macOS, Linux, iOS, Android, Web client	Windows, macOS, iOS, Android, Web client	Windows, macOS, Linux, iOS, Android, Web client

Core Differences	Centered around team communication Significantly more third-party app integrations	Centered around project management, with to-do lists, schedules, and progress reports	More native features, admin control, security compliance, and integrates with Outlook services	Not a full-fledged platform, but integrates with the rest of Google's products
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Table 1. Most common enterprise social network platforms²⁸

Application Domain	Example	Provisos or pitfalls for this application
Clinical/Operations: Process Improvement	The COVID-19 pandemic created unprecedented challenges requiring adaptability and vigilance. Slack streamlines creation and dissemination of protocols and guidelines without inundating members with individual texts, emails, and meetings.	It is important to simplify communication using one platform and minimize alternative modes of communication in order to focus the attention and collaboration.
Clinical/Operations: Physician Group Communication	Given the complex nature of running a department along with various sections, divisions, and team leads, this could be used to develop a system of communication that is recorded, searchable, and reaches the span of the entire physician group without overwhelming traditional email boxes and voicemails. Slack offers synchronous and asynchronous back-and-forth discussion among key stakeholders.	While critical information may be disseminated via Slack, the expansive multiple dialogues may be overwhelming to those who are not in decision-making roles. After every constructive conflict or discussion, team leaders should summarize points and final decisions.
Clinical/Operations: Supply Chain	Departments who are more comfortable with Slack have expanded to inter-departmental collaborations to include supply	While communication on Slack may be comprehensive, translating this into formal memoranda may be needed for

	<p>chain representatives and nursing leadership to communicate needs, updates, and requisitions.</p>	<p>transactions and sales, as well as development of protocols and guidelines easily accessible for many not part of Slack.</p>
Research	<p>Research collaboration, including the creation of this manuscript, has been made possible through communications via Slack. Several others have shown success using this medium.^{22,31}</p>	<p>Differences in routine checking of Slack messages may impede progression of a project. Augmenting the workflow with cloud-based document sharing such as Google Docs may help overcome this pitfall, as well as tagging participants that may lead to a user-directed email announcement.</p>
Education: Curriculum Development	<p>Given the requirement for providing Individualized Interactive Instruction in EM per the Accreditation Council for Graduate Medical Education (ACGME) Residency Review Committee for Emergency Medicine (RRC-EM), Slack offers the opportunity to facilitate virtual small group instructions.^{18,32}</p>	<p>Push notifications from learners may be overwhelming for faculty, and vice-versa. Developing a routine and setting notification preferences may address this challenge.</p>
Education: Program Leadership Communication	<p>In order to minimize emails, text messaging and phone calls, the Stanford emergency medicine residency program director</p>	<p>Appraising the chief residents or other key stakeholders not part of the program leadership channels requires deliberate effort. It is</p>

	<p>leadership team switched to using Slack. Each of the assistant program directors (APDs) have channels for their domains (e.g. recruitment, accreditation, assessment, curriculum, etc.). Updates and issues in each of these domains are now tackled via Slack.</p>	<p>important to hold regular in-person meetings for updates and for hearing other stakeholders' perspectives.</p>
<p>Education: Back Channel for Live Cast Lectures</p>	<p>The ALiEM group launched the first-ever massive online interactive conference in response to the coronavirus pandemic in an effort to provide didactic education to EM residency programs across the country.³ The logistics of creating an engaging and interactive platform challenged the traditional method of using the Zoom platform. Using Slack, individual residency program channels were created to provide site-specific discussions, as well as speaker-channels to allow for direct level of engagement with national experts.³³</p>	<p>Discussions from >1,000 registered participants may be daunting to sift through during the live conference. Creating speaker-specific channels and assigning dedicated back channel moderators allowed for real-time engagement via question and answer format.</p>
<p>Education: Medical Education</p>	<p>Libraries communicate directly with medical students using</p>	<p>Buy-in may be variable, and some students may opt to disengage.</p>

Engagements	Slack. ¹⁷	These students then will be left out from further communications within the institution.
Continuing Professional Development: Creation of Virtual Communities of Practice	The ALiEM Faculty Incubator: provides a novel online approach to faculty development in education scholarship. ²⁵	Variable engagements and individual time-pressures of faculty may affect productivity especially with the integration of online responsibilities to current work and life obligations.
Continuing Professional Development: Mentorship/Mastermind Groups	As with virtual communities of practice, developing mentorship and mastermind groups are easily facilitated by Slack. ^{25,27} Other high performance teams that utilize Slack include Mission Critical Teams Institute ³⁴ and Arena Labs ³⁵	Successful collaborations and mentorship relationships require agreement of goals and responsibilities. Clarifying this at the initiation of the relationship is key.

Table 2. Slack applications in the healthcare sector

Communication Option	Description
Single-person direct message	A direct conversation between two people which is separate from the large group conversations
Group direct message	A direct conversation between several people which is separate from the large group conversations
Open Channels	A dedicated discussion area on a focused topic which any member can join
Closed Channels	A dedicated discussion area on a focused topic which only invited members can join

Table 3. Communication Options in Slack

Tool	Role	Examples
Video Conferencing	Can facilitate synchronous, face-to-face discussions.	Zoom Skype BlueJeans
Writing Collaborative Documents	Can facilitate real-time writing and brainstorming.	GoogleDocs Microsoft 360 Suite Dropbox Paper
File Storage	Can facilitate storage off manuscripts and relevant files	GoogleDrive Microsoft OneDrive Dropbox
Data Entry	Can facilitate data entry and more complex surveys	GoogleForms GoogleSheets AirTable Jot Form Qualtrics
Scheduling	Can facilitate meeting scheduling and project planning	GoogleCalendar Outlook Calendar

Table 4. Tools that can be utilized in conjunction with Slack

Author Manuscript

#1-start-here

November 30th, 2019

PFD Admin says:

Welcome to the Project for Faculty Development Slack channel. This will be an excellent forum for our initiatives. A few tips as you get started:

1. Remember to install the app on your desktop when you phone in. Turn off "notifications" as this will be a great way to stay in touch and collaborate with your PFD team.
2. Head over to [slack.com/news/lets-join-a-private-channel](#) to see some tips.
3. Visit the channels that work for you. All F&D folks follow. Simply click on the "F&D" link below and it'll take you to the relevant channel. Then you can DM, post a message, and begin conversing there.
4. This video introduces you to slack. Check it out!
[https://vimeo.com/147956602/clip3](#)

Vimeo Mega's Data
slack faculty incubator



PFD Admin says:

Find the rest of your team at these channels:

- What's new
- Meetings & events
- Workshops
- Academic support
- Administrative matters

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