



Streamlining the Radiology Consultation Service in the Digital Era

EFFICIENCY THROUGH APPS

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Background

- As Imaging 3.0 comes to the forefront, radiology departments across the country keep looking for ways to add value to the healthcare team.
- Being accessible to the clinical team is critical in the modern healthcare environment as imaging techniques and protocols have become more sophisticated.
- Protocols studies and answering referring clinicians' questions in a timely manner is essential to every radiology department's workflow.

Consultation Service

- In a world driven by productivity, radiologists must integrate into clinical teams without sacrificing their productivity.
- As radiologists, it is our duty to help our clinical colleagues and ensure our patients get the most appropriate imaging, but we must do so efficiently.
- In order to fill this need, the idea of a radiology consultation service was proposed over 20 years ago and many institutions have since implemented such services.

Consult Service Implementation

- In order to better serve our patients and colleagues, our radiology department adopted such a service in March 2014.
- A dedicated pager system was established, making a radiology resident available 24 hours a day, 7 days a week to all in-house radiology techs in order to help protocol studies and answer referring clinician questions.
- The consultation rotation has been incorporated in to the existing GI/fluoroscopy procedural service during work hours.
 - After hours, the resident on call is responsible for the service.

Consultation Service in the Age of Imaging 3.0

- A consultation service is an easy way to bridge the gap between referring providers and radiologists.
- Communication between members of the healthcare team is essential, not only for appropriate image utilisation, but also for optimization of the workflow.
- However, this service may come at the expense of image interpretation and productivity, as each consultation requires diversion of the radiologist's attention away from a study.

Issues with our Service

- While the service has been a valued addition in its 3 years of implementation, many of the junior residents frequently need help from senior residents or attendings for more complex issues.
- Seeking the assistance of these more senior providers often proves difficult; they may be actively engaged in reading studies, performing procedures or working at a different location.
- Given these constraints, how could we improve the efficiency of our consultation service?

Technology to the Rescue!

- Most residents today are “digital natives”; they are used to accessing information quickly and efficiently in an electronic format.
- As smartphones have become more powerful and ubiquitous, portable devices are being utilized more commonly in the practice of medicine.
- Up-to-date, relevant databases of information available electronically have become popular in other specialities and numerous apps have been developed to fill this need.

Our Institutional Solution - RadApp

- We developed an iOS and Android-based application, specifically designed for our departmental needs and made available to all residents and attendings (a total of 43 attendings and 16 residents) through the App Store for iPhone users and through the Game Store for Android users.
- This app provides residents and attendings access to basic ordering information, as well as consult guidelines for contrast administration.
 - Given that not all questions can be answered from static guidelines, we also integrated contact and schedule information into the app which served to streamline communication of radiologists, residents, and techs in the department.

RadApp

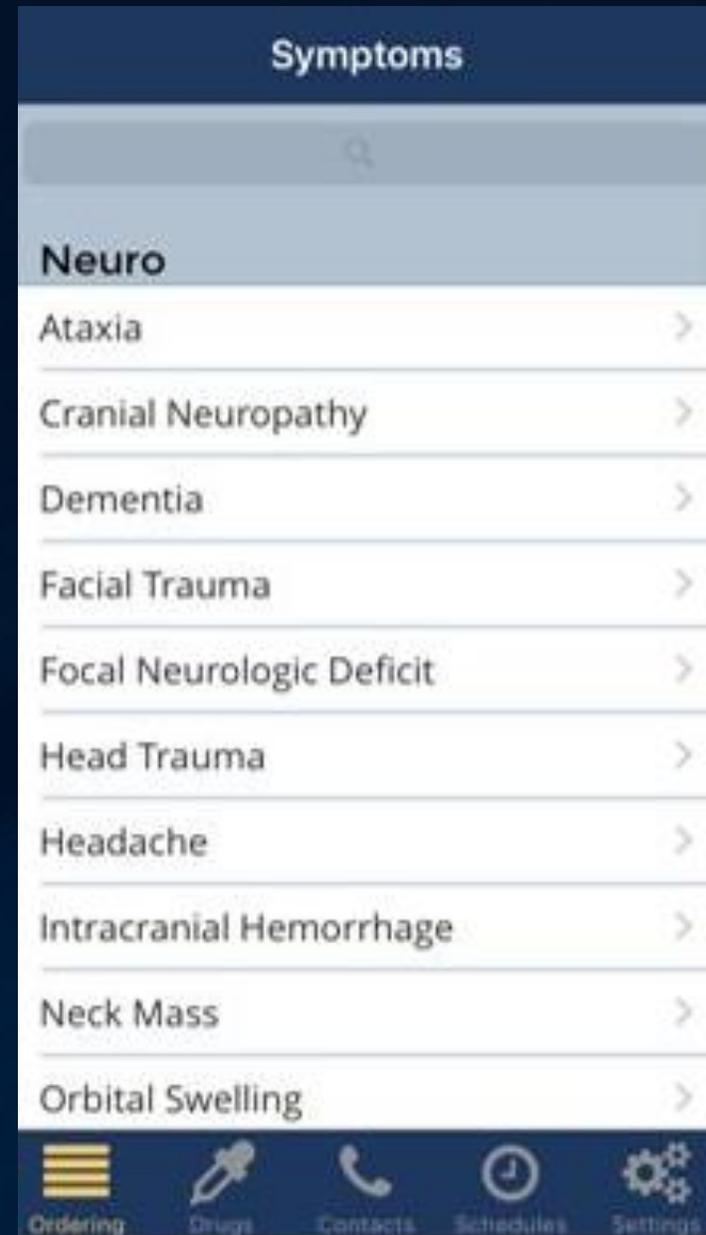
The app was designed with 5 tabs, located at the bottom of the screen.

The last tab is a settings tab, which is also the home tab and includes a user's text-page history and a tab for quick feedback to the app administrator



Orders

- Frequently asked questions that we receive from techs and clinicians related to appropriate ordering of imaging studies.
- It helps the resident ensure the correct test is ordered to address the clinical concerns of the ordering provider, compiled from evidence-based recommendations in the literature.



Drugs

- In this section, there is information regarding:
 - Contrast administration,
 - Contrast reactions,
 - Blood thinners



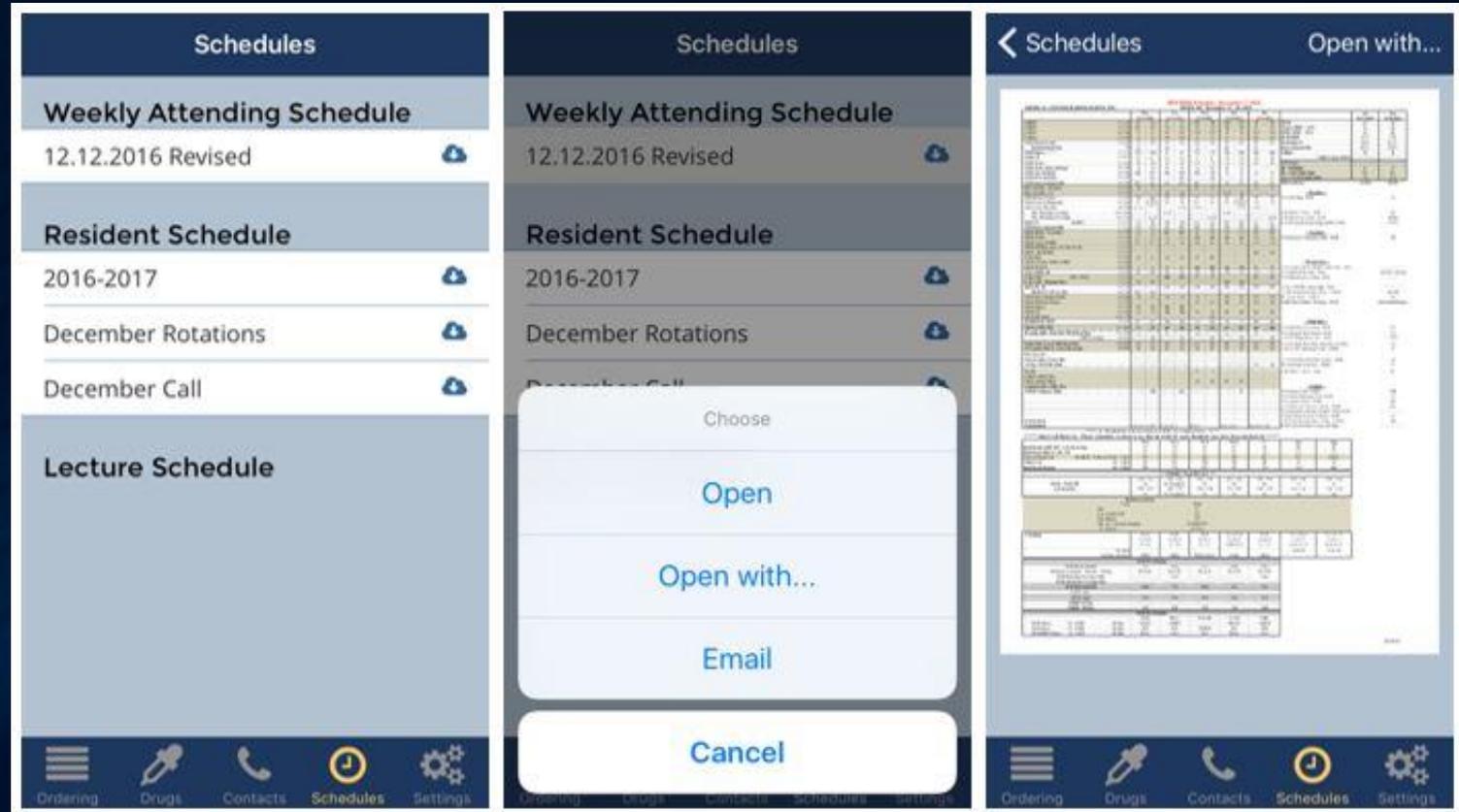
Contacts

- The third tab is divided by clinical site
 - Each hospital has its own sub-category.
- Phone number and pager contacts are available for the entire radiology practice, and dialing, text paging and text messaging options are available directly through the app with the click of a button.
 - The phone service and text-messaging feature simply opens your phone's native telephone or texting function, with the number auto-populated.
 - The text-paging function is built in to the application and utilizes built-in coding for each pager carrier's system.



Schedules

- The fourth tab contains all attending and resident schedules in PDF format.
- These are uploaded manually into the app on a weekly basis for attending schedules, and monthly for resident schedules.
- The didactic lecture schedule is also made available in 6 month blocks



Institution-Specific Information

- In order to secure program specific content, including personal contact information and schedules, a program-specific username and password were developed.
 - Without the login, which was only distributed to our faculty and residents, the application cannot be downloaded and the content cannot be accessed.
- The mobile app is a read-only viewer which pulls content from a password-protected website database, where the content is uploaded and managed by the app administrator.
- Updates are pushed to the end user instantly and on average, the database is updated 2-3 times a week.

Recorded Data

- The website database allows the administrator to monitor overall user activity through this online portal.
- The type of device (Apple vs Android), a user-specific code, and the time and date of access are recorded.
 - Specifics of the visit, including how long the user spent in the app on any given session and what content was accessed is not recorded.

App activity by date Update

Start Date

End Date

Date	Number of pings
19 Apr 2017	11
18 Apr 2017	23
17 Apr 2017	32
16 Apr 2017	28
15 Apr 2017	5
14 Apr 2017	5
13 Apr 2017	6

Devices associated with this app

Total devices: 42 (Android: 7, Apple: 35)
Total with push enabled: 41
Percent using latest snapshot: 23.81%
Number that pinged in the...

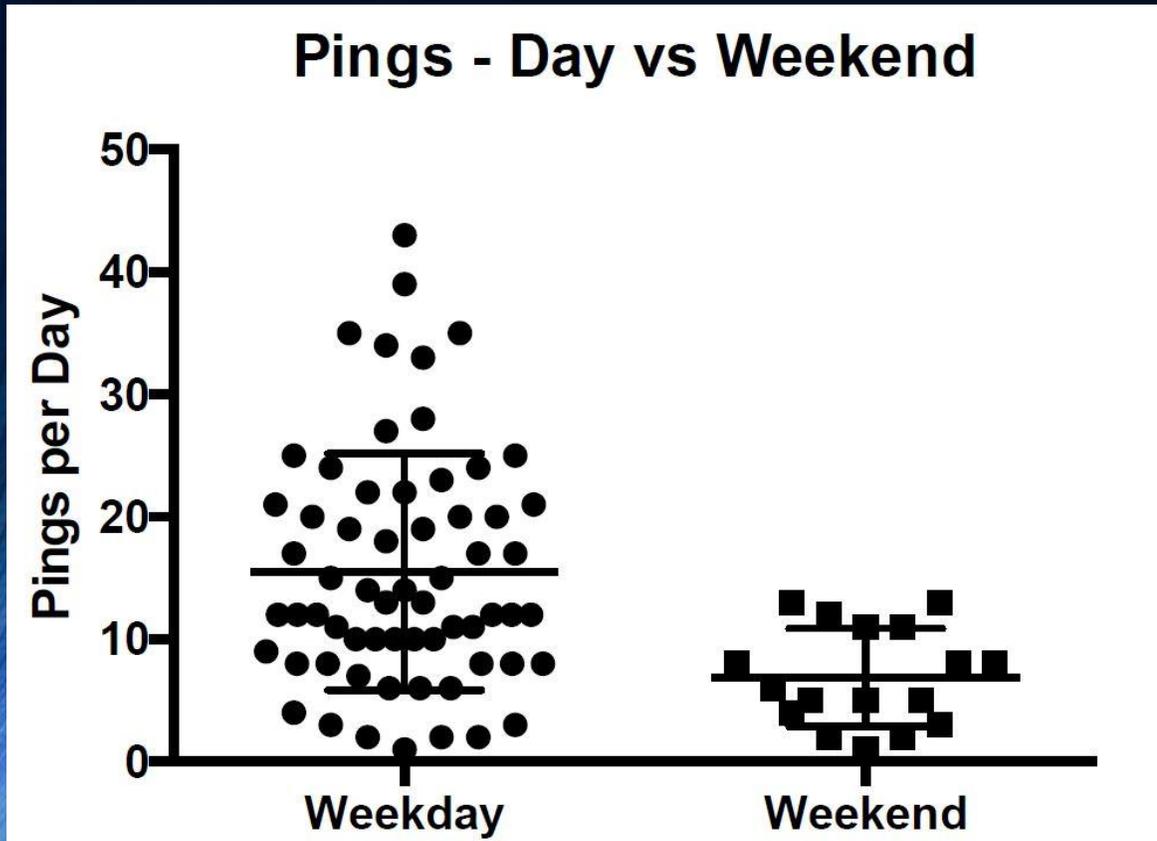
- past day: 13
- past week: 21
- past month: 29

Device type	Last pinged	Snapshot version
apple	19 Apr 2017 at 10:41 AM	1492446526
apple	19 Apr 2017 at 9:55 AM	1492446526
apple	19 Apr 2017 at 8:39 AM	1492341636
apple	19 Apr 2017 at 8:31 AM	1492341636

Outcomes

- Overall, the integration of the app into the consult service was well received at our multi-institution practice.
- Adoption was slow at first, but then snowballed as the department became more aware of the app's features and capabilities.
 - Out of the 59 physicians to whom the app was offered, 42 downloaded it, 35 on the iOS platform and 7 on Android.

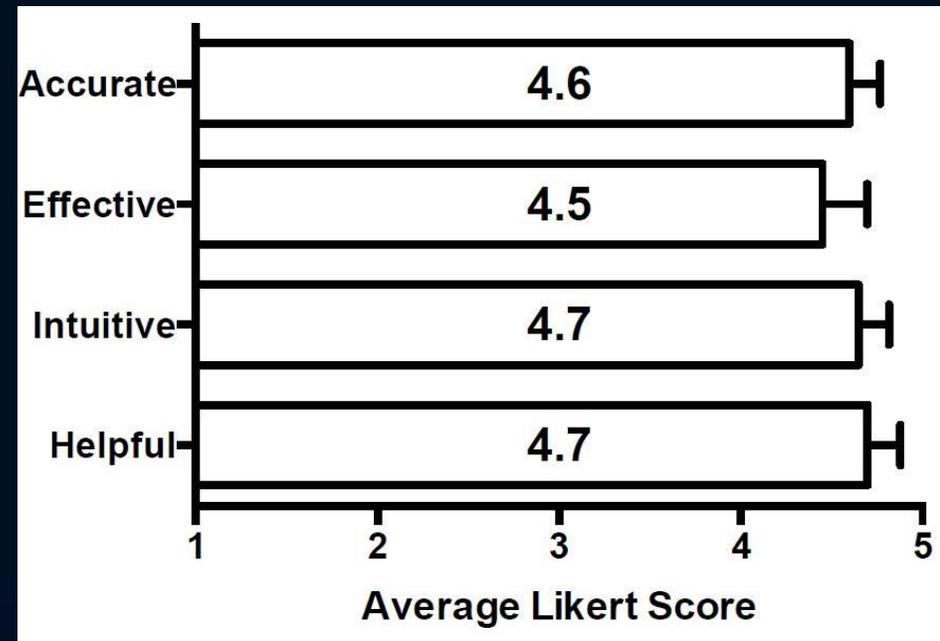
Consultation



- On average, the app has been accessed 15.5 (± 1.2) times/day during weekdays, and 6.9 (± 0.97) times/day during weekends

Satisfaction Survey

- On a follow-up survey (n=21/59) to assess the strengths and weaknesses of the prototype using a 5 point Likert scale, most found it helpful, effective, intuitive, and accurate.
- The most consulted section was schedules, closely followed by contacts.
- Individualized feedback was very positive.
 - Multiple comments were made about how much the app improved work flow and how easy it is to use.



In Conclusion

- In order to maintain high quality reads and provide effective consultation to our referring providers and techs, it is critical to continue to explore and develop new tools that will allow us to be efficient and available.
- This app allows for more seamless communication between our faculty and residents, but also between radiologists, techs, and our referring providers.
- Quick access to relevant information is essential to our continued efficacy, and apps may be an easy solution to successful implementation of Imaging 3.0 and better patient care

Thank you!

PLEASE DIRECT ANY QUESTIONS TO MICHELE.RETROUVEY@GMAIL.COM

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