

NIH CC Enterprise Scheduling System: Design, Challenges and Recommendations

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Conflicts of Interest

Seth Carlson, MSIS

- Has no real or apparent conflicts of interest to report.
- NIH does not endorse or recommend any commercial products, processes, or services.

Objectives

- NIH CC Enterprise Scheduling Current State
- Implementation Challenges and Mitigation Strategies
- What Worked Well
- Outcomes
- Recommendations for a new Enterprise Scheduling Implementation

Vision for Enterprise Scheduling

To reap the benefits of providing real-time access to appointment information for both clinical staff and patients

APPOINTMENTS TAB

Appointment Time	Clinic	Protocol	Task	Type
2017/10/02 12:00	CRC-OP-1H-PED	2015-C-0029	Pediatric Oncology Clinic - Physical Exam ...	ACTIVE
2017/10/02 12:30	Imaging Science-Nuclear Med-CC	2015-C-0029	Imaging - NM - NM PET TORSO 1 DOSE - ...	ACTIVE
2017/10/02 13:00	DPM-CC	2015-C-0029	Pre-Anesthesia Clinic - Evaluation 30 Mi ...	CANCELLED
2017/10/02 13:30	Imaging Science-Nuclear Med-CC	2015-C-0029	Imaging - NM - NM PET BRAIN 1 DOSE - ...	ACTIVE
2017/10/02 14:00	Imaging Science-Nuclear Med-CC	2015-C-0029	Imaging - NM - NM PET TORSO 2 SCAN - ...	ACTIVE
2017/10/02 15:00	RMD-Recreational Therapy-CC	2015-C-0029	Imaging - NM - NM PET BRAIN 2 SCAN - ...	ACTIVE
2017/10/02 15:30	CRC-DH-INW-DH		Recreation Therapy - Treatment 30 min ...	ACTIVE
2017/10/03 08:00	Off-Site Anesthesia		Pediatric Day Hospital - Procedure/Reco...	ACTIVE
2017/10/03 09:00	RMD-Recreational Therapy-CC		Bone Marrow Biopsy & Aspirate * Spinal ...	SCHEDULED
2017/10/04 15:30	Imaging Sciences-MRI-CC	2015-C-0029	Recreation Therapy - Treatment 30 min ...	ACTIVE
2017/10/04 17:00	Imaging Sciences-MRI-CC	2015-C-0029	Imaging - MRI - *Clinical Brain MRI - MRI 1	ACTIVE
2017/10/04 17:45	CRC-OP-1H-PED	2015-C-0029	Imaging - MRI - *Orbits Clinical - MRI 1	ACTIVE
2017/10/05 09:00	TL-CRC-SNE	2015-C-0029	Pediatric Oncology Clinic - Physical Exam ...	ACTIVE
2017/10/05 11:00	RMD-Recreational Therapy-CC	2015-C-0029	Cardiopulmonary Testing SNEN - Echo R...	ACTIVE
2017/10/06 15:30	RMD-Recreational Therapy-CC	2015-C-0029	Recreation Therapy - Treatment 30 min ...	ACTIVE
2017/10/11 15:30	RMD-Recreational Therapy-CC	2015-C-0029	Recreation Therapy - Treatment 30 min ...	ACTIVE
2017/10/13 15:30	RMD-Recreational Therapy-CC	2015-C-0029	Recreation Therapy - Treatment 30 min ...	ACTIVE

Future Appointments

Appointment Date/Time	Location	Protocol	Appointment	Appointment Status	Duration
3/31/2017 10:00 AM	Imaging Sciences-Xray-CC	1999-H-0050	Imaging - DX - Lumbar Puncture Diagnostic	Scheduled	60 Min
Resource (Provider, Room): FLUOROSCOPY ROOM 1					
3/31/2017 8:30 AM	Imaging Sciences-MRI-LCC	1999-H-0050	Imaging - MRI - *Clinical Brain MRI	Scheduled	45 Min
Resource (Provider, Room): MRI 4 (3T)					
Patient Prep Instructions: PLEASE READ: IMPORTANT INFORMATION ABOUT YOUR SCHEDULE: Please arrive at the Clinical Center on the date provided to you by your research team. If you have any questions about your schedule, please contact a member of your research team. Patients who are OVER 60 years old, OR who have Diabetes OR kidney problems AND who are getting MRI with contrast injection need to have kidney function test results available, performed WITHIN 4 weeks of the scan. If your scan appointment time is in the morning BEFORE 10 a.m., please contact your Clinical Center physician or practitioner to arrange getting this blood work done in advance of your appointment so your scan will not be delayed or have to be rescheduled. If your scan is AFTER 10 a.m., please come to phlebotomy at least 2 hours in advance in order to allow time for blood tests to be done. If you are not sure whether you need MRI contrast, please contact MRI reception at (301)496-0026 or your physician or practitioner.					

MYSCHEDULE TAB

NIH CC Enterprise Scheduling Current State

Relevant Background:

- Clinical Center patient appointments are scheduled by research teams, rather than the by patients themselves
- Every patient appointment is tied to a research protocol
- No billing of patient insurance at the Clinical Center
- NIH EHR is not encounter-based
- Complex rollout due to business process transformation of streamlining appointment requesting process for each area along with creating scheduling process
- Challenge in consolidating scheduling mechanisms – patient appointment information is kept in other systems or non-electronic forms
- Challenge to research teams scheduling patients are “shooting in the dark” for available timeslots, and scheduling their “anchor appointment”

NIH CC Enterprise Scheduling Current State

Goals:

- Create a patient itinerary which includes all of the patient's scheduled activities
- Increase system efficiency and user access to appointment resource availability
- Automate updates to the medical order based on any changes to a linked appointment (e.g. cancel order if appointment is canceled)
- Improve the research team appointment management workflow by creating tools to allow them to book and update appointments themselves, but to still limit them to approved workflows
- Improve turnaround times for appointment scheduling and automate notifications to research teams
- Integration with Outlook calendar, to allow providers to see their schedules outside of the EHR, but to protect patient PII

NIH CC Enterprise Scheduling Current State

- 17 distinct institutes who see patients in the Clinical Center
- Over 100 Inpatient and Outpatient research teams scheduling patients for shared resources (e.g. Imaging)
- Over 1500 active research protocols that patients are seen on
- Roughly 100,000 outpatient appointments in the Clinical Center per year
- Roughly 24,000 outpatients who are seen in the Clinical Center per year

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Current Process:

- Require medical order/Electronic Appointment Request to begin the scheduling process
- User selects resources (e.g. Care Provider) and desired date and selects “View Available” functionality
- User selects an available timeslot and submits request.
- If selected resources available, appointment is “autobooked”
- If resources unavailable, or same-day request, then request is placed in scheduler’s queue for processing
- Automatic email notification to requestor once appointment is scheduled

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VARIANT #1 (Verification):

For some areas, the department or service will need to review the request before it can be scheduled by a scheduler. This is true for consultant groups and Rehabilitation Medicine

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VARIANT #2 (Call Center):

For routine Imaging appointments, the patient's care provider will enter the Imaging orders they want performed. Then, someone else will call the call center to schedule the patient for their Imaging appointments. The Call Center schedulers access the Imaging requests in their scheduling queue to link the scheduled appointments back to the orders.

Visibility of Schedule

Unreviewed Allergies

Appointment Availability for C:CG CLIN GEN F/UP 30M OP3

Event: C:CG CLIN GEN F/UP 30M OP3 has 17 open appointment time slots from 10/02/2017 00:00 to 10/03/2017 00:00.

Appt Date/Time	Event	Resource	Location
10/02/2017 08:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 08:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 09:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 09:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 10:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 10:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 11:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 11:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 12:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 12:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 13:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 13:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 14:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 14:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 15:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 15:30	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3
10/02/2017 16:00	Clinical Genetics - Follow-up (30M) OP3		CC-OP-3

Existing appointments are not displayed. Please refer to the Appointments tab for more information.

Previous Day's Availability **OK and Close Window** Check Next Day's Availability

Item Info Repeat OK Cancel

Implementation Challenges and Mitigation Strategies

CHALLENGE #1: Enterprise Scheduling is a Culture Change project

MITIGATION STRATEGIES:

- Stakeholder engagement (surface resistance)
- Executive buy-in
- Business owner role in program – to meet with the impacted groups and to have high visibility
- Process issues must be managed and addressed

Implementation Challenges and Mitigation Strategies

CHALLENGE #2: Stakeholder groups have their preferred ways of managing and storing appointments and don't give them up easily. They value having control of their scheduling tool

MITIGATION STRATEGIES:

- Develop designs which cover the basic requirements of the other system
- Don't create a workflow which incorporates the legacy system
- Offer features which are standard, but bundled into Enterprise Scheduling solution, which other system cannot meet (e.g. Outlook integration)
- Use momentum from assembling a system with most of the patient's itinerary to incentivize remaining areas to join in

Implementation Challenges and Mitigation Strategies

CHALLENGE #3: Organizational demand for Enterprise Scheduling has increased, and team resources are limited

MITIGATION STRATEGIES:

- Established governance process through ESAG (Enterprise Scheduling Advisory Group) and Enterprise Scheduling requests
- Provides transparency around project workload and sets expectations to requesting stakeholders

What Worked Well

- Developing custom tools within the EHR to automate and streamline parts of the appointment requesting and scheduling process (e.g. Autobook, Visibility of Schedule, Outlook Push, Order to Schedule)
- Iterative enhancements to the scheduling processes for areas which schedule a high volume of appointments to reduce the number of steps
- Developing solutions in the EHR which reference scheduling events and resources and update automatically, rather than requiring maintenance each time the events are added or provider resources changed

Outcomes

- Expanded number of departments and services utilizing Enterprise Scheduling for scheduling their patient appointments
- More departments and services are using the same workflows for requesting appointments
- Reduced appointment request turnaround times and improved communication for departments and services
- Scheduling is now seen in the organization as a process improvement tool – for such efforts as improving the patient chemotherapy experience and arranging for language interpreters

Outcomes

- Adding the visibility of schedule and autobook functionality for clinic appointments allowed half of requested clinic appointments to be booked without a scheduler being involved
- Added the ability for users to manage their clinic appointments by rescheduling and canceling them without scheduler involvement, which incentivizes using Enterprise Scheduling
- Added capabilities to visualize linked orders from patient appointments tab, as well as adding “Unscheduled Activities” to more fully define the patient’s itinerary
- Bundled the pre-encounter nursing forms into the clinic appointment requesting process to consolidate and secure the process and allow nursing time to plan for patient visits

Recommendations

RECOMMENDATION #1: Executive buy-in, engage all of the stakeholders early in the process, and document existing process flows; perform gap analysis

- This is particularly important for areas that aren't using electronic scheduling or who don't have a current scheduling process
- Plan ahead for pitfalls, try to make sure users are educated on new process that is supported by the scheduling system
- Partner with clinical champions to ease the pressure on the implementation team at Go Live

Recommendations

RECOMMENDATION #2: Dream big, but dream standard

- Remember that as you develop your solutions, they will also need to be maintained
- Find the right balance between usability and maintenance to give the groups what is needed for their business process, but strive to create robust designs which can be reasonably modified and maintained without a high level of effort

Recommendations

RECOMMENDATION #3: Think creatively when designing and problem solving

- Not every problem can be solved with an electronic solution, particularly process problems
- The solution to the problem may be to add staffing, add an ability for scheduling through a phone call, or another non-electronic solution

Recommendations

RECOMMENDATION #4: Partner with your EHR vendor to implement customizations as part of the supported application

- Creating customizations to support the scheduling workflows will save time during an implementation, but in the long term require more maintenance. Consider creating the customizations, but with a **plan with your vendor to build them into the application roadmap to simplify maintenance**

Recommendations

RECOMMENDATION #5: Regression and performance test at major upgrades

- Make sure to create a robust testing plan, and be prepared to identify and support any performance issues when going live with a new version of your application. Develop automatic monitoring tools to identify bottlenecks in the system if they develop

Recommendations

RECOMMENDATION #6: Think about user training, communication and rollout early in the process

- For implementations which will touch a major business process, communicate early to the impacted users, and schedule outreach sessions before and after the change
- Holding sessions where the user can interact with the new functionality before it is in Production can be helpful
- Busy users may not pay attention until they encounter the change, and may be easily frustrated if the change alters a business process