

USER GROUP MEETING

Mandalay Bay, Las Vegas | November 1-4, 2015



Presenter(s):

Chris Lutz and Srinivas MA

Topic

Technical Review Patient Portal - Advanced

Level

300



Meet our Panelists



Christopher Lutz
Senior Design
Engineer



Srinivas MA
Manager Software
Development



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Agenda

- In this session, we'll review the SQL table schema, how to generate meaningful reports from NextGen Patient Portal, and other useful SQL scripts.
- Goal will be to provide the audience with a deeper understanding of the portal infrastructure and managing the state of your portal implementation.



Agenda

Presentation/Discussion (60 minutes)

- Christopher Lutz
- Srinivas MA

Question and answers (15 minutes)

This presentation is targeted to system administrator or developer level attendees who have TSQL knowledge and currently have the NextGen Patient Portal up and running



Topics we will cover

- Architecture/Topology
- Patient Message Flow
- Table Schema
- Archiving Data
- Copying Prod over test
- Merging/Splitting Practices



Attendee Materials

 All scripts and templates discussed in this presentation are included in the downloadable attendee materials

Caution: Do not insert, update or modify the schemas or attempt to "back end" data.

- Custom Enrollment
- Enrollment Handout
- 👢 Practice Welcome Message
- Reporting
- White Paper
- Read Me



But First...



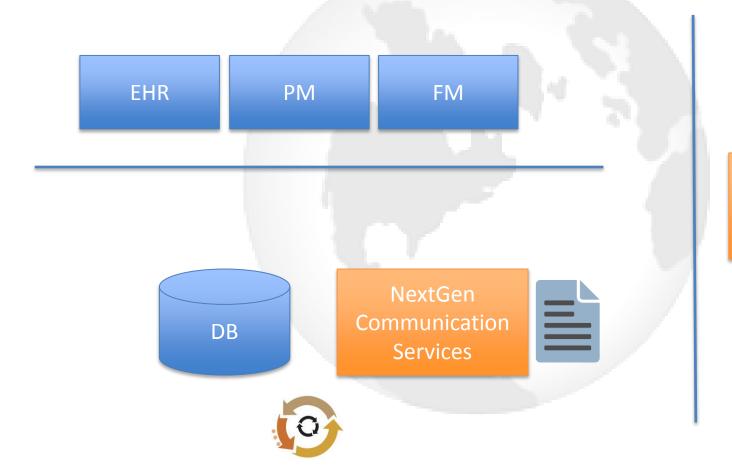




A Quick Overview of the moving parts...



Topology Review



Patient Portal Web Site



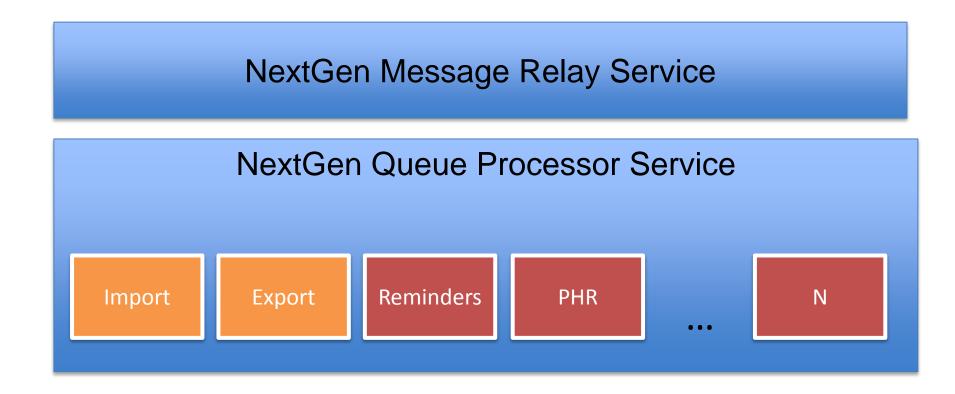


NCS Service Functions

- Synchronization of appointments, medications, recall plans and other clinical data.
- Generating Patient Health Records
- Sending and receiving any patient communication messages
- Sending appointment reminders



NCS is compose of two services







Security on the NCS

- All traffic is encrypted at 2048 bit strength or higher
- Outbound HTTPS 433 and 11001
 - No inbound ports
- Certificate Authentication
- Firewall Rules



Keeping an eye on the message queue



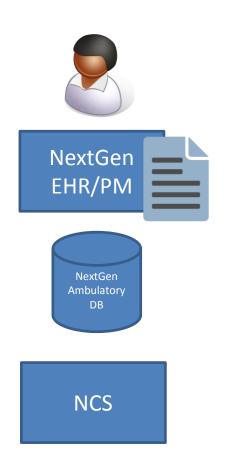
Life Cycle of a Message

The are two message queues, Import and Export

- The Import queue refers to messages coming from the Patient Portal Server
- The Export queue refers to messages outbound from your site to the portal server.



Practice To Patient Message Flow



NextGen Data Interchange Components









Queue Tables

Table Name	Description
Nxmd_import	Incoming message queue
Nxmd_export	Outgoing message queue
Nxmd_fileattachments	Large document payloads

Ideally all of these tables should close to zero records



Message Queue Management

- Messages in the queue are ephemeral
- They are handled first come first served
- They may be gone before a support representative arrive to triage

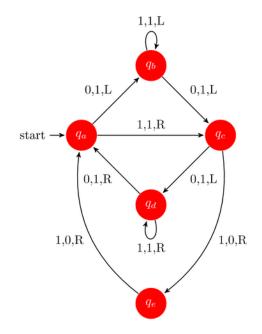


Reporting on the Queue

One technique is to take snap shots of the queue on fixed interfaces to capture state information

Over time the "snap shots" can be pulled Together to build trend data on traffic patterns

High backlogs indicate that adjustments in the NCS settings may be warranted

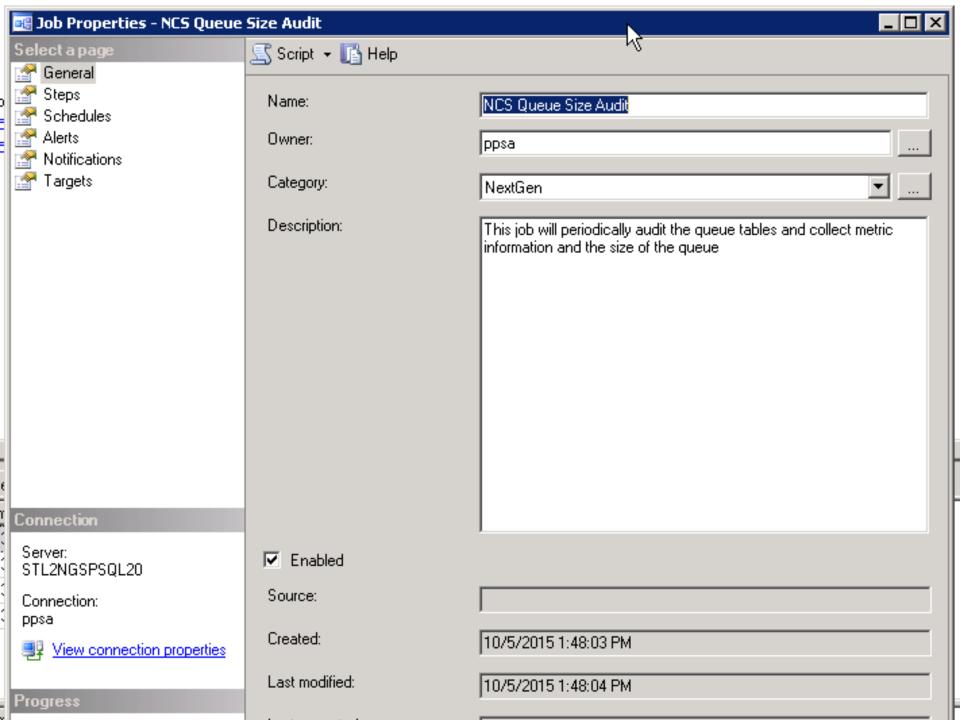




Case Study

- nwgeb_generate_export_audit_log_entry
- Can be set up to inserts a periodic snap shot record into two audit tables
 - NXMD_QUEUE_AUDIT_LOG
 - NXMD_QUEUE_AUDIT_LOG_TOTALS
- Import queue records are identified with an 'I'
- Export queue records are identified with an 'E'

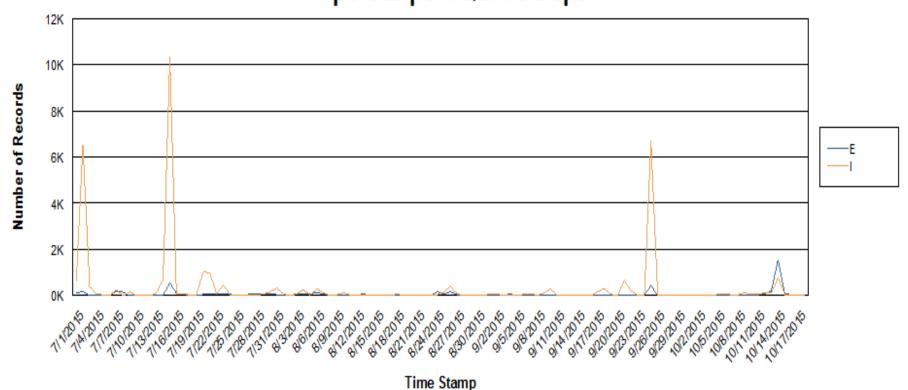




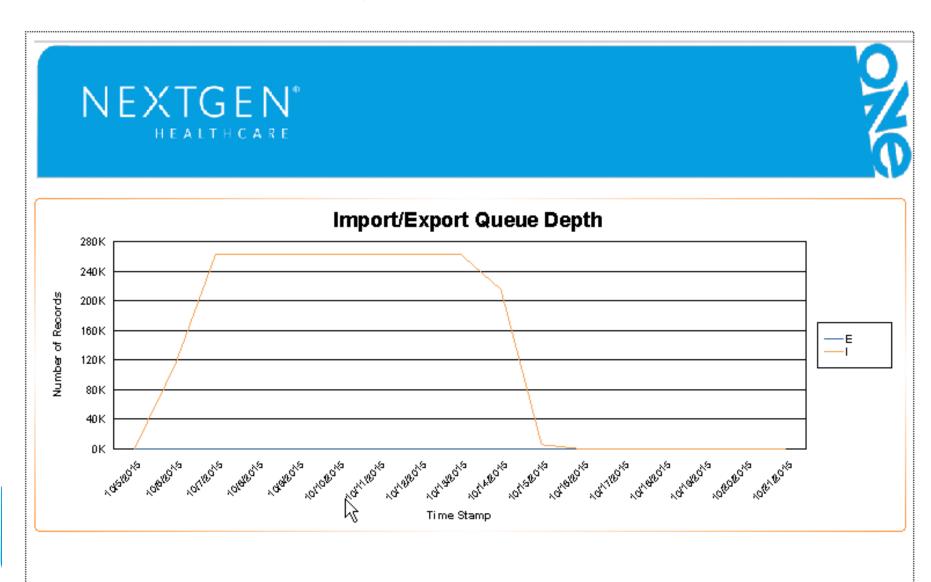




Import/Export Queue Depth



Unhealthy Queue Example



Meta Data Information and General Conventions



General Table Conventions

- Al patient portal tables are named with a prefix of nxmd_ or ngweb_
- All time stamps on any of these tables is in GMT/UTC
- Records are "soft" deleted. The delete_ind field will be set to 'Y'
- Person_id vs Proxy_id



Site and Practice Identifiers

- EHR and EPM use Integer identifiers for practices and enterprises
- In a global topology, there will be collisions with integer identifiers
- In portal, each business unit is assigned a GUID identifier to uniquely identify that entity in the world



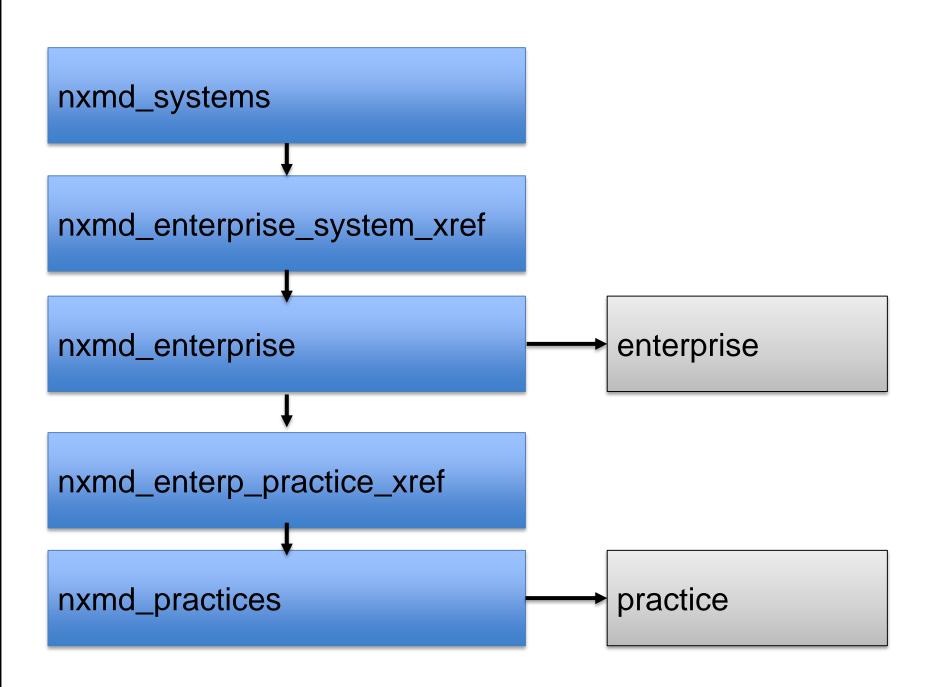


Meta Data Tables

Enterprise/Practice Identifiers

```
nxmd_systems
nxmd_practices
nxmd_enterp_practice_xref
nxmd_enterprise
nxmd_enterprise_system_xref
```





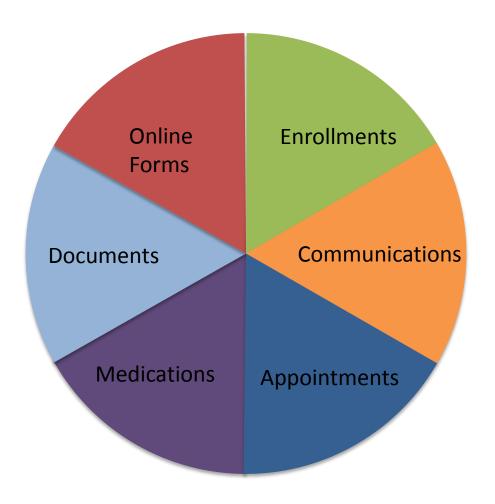
What are my patients doing?



Building a narrative around your patients population

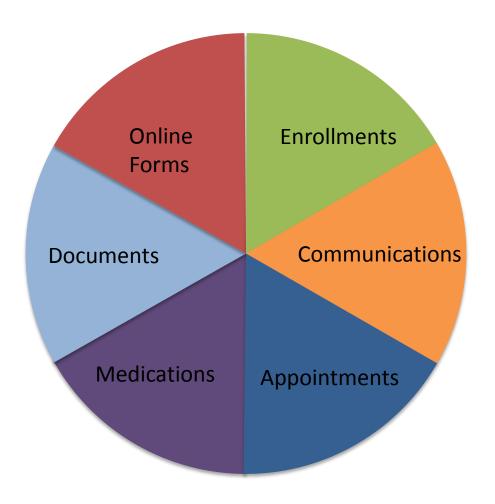
- Who is enrolled?
- Who did not enroll in a timely fashion?
- Who has not logged in within a time period?
- Who has sent a communication message?
- Are my staff responding in a timely fashion?















Enrollment Tables

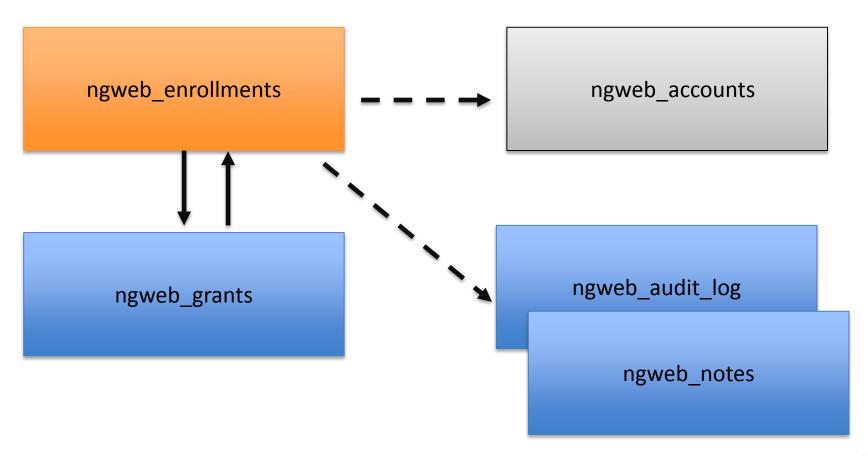






Table	Description
ngweb_enrollments	Current Enrollment Status and audit information
ngweb_grant	Who has access between which accounts?
ngweb_account	Deprecated table, do not use
ngweb_audit_log ngweb_notes	Audit events and notes
Ngweb_securables	User Rights Definitions





Table	Important Fields
ngweb_enrollments	person_id, Nx_practice_id Enrollment_status
ngweb_grant	person_id, entity_id, entity_type, securable_id expiration_date
ngweb_account	Deprecated table, do not use
ngweb_audit_log	person_id, log_type_id
ngweb_notes	object_id,

Note: The nxmd_enroll flag in the patient table is deprecated.





```
select
p.practice_id, p.practice_name, e.person_id, e.enrollment status,
e.enrolled_when, e.account_locked, 'Completed' as 'final_status'
from
nxmd_practices np with (nolock),
practice p with (nolock),
ngweb_enrollments e with (nolock)--Primary patient
where
np.practice id = p.practice id AND e.nx practice id = np.nx practice id
and np.delete_ind = 'N' and e.delete_ind = 'N'
and e.enrollment status in (3) --pending or completed, we do not care about any of the other enrollment statuses.
UNION
select
p.practice id, p.practice name, e.person id, e.enrollment status,
e.enrolled when, e.account locked,
CASE ISNULL( MAX(guardian.enrollment_status), 0)
WHEN 3 THEN 'Guardian Enrolled'
ELSE 'Pending'
END as 'final status'
from
nxmd_practices np with (nolock),
practice p with (nolock),
ngweb enrollments e with (nolock)--Primary patient
LEFT JOIN ngweb_grant g with (nolock)
ON e.person_id = g.person_id AND e.nx_practice_id= g.nx_practice_id and g.delete_ind = 'N'
and g.entity_type = 0 and g.person_id <> g.entity_id and (g.expiration_date < getutcdate() OR g.expiration_date is null)
LEFT JOIN name enrollments quardian with (nolock) ON quardian.person id = q.entity id
where
np.practice id = p.practice id AND e.nx practice id = np.nx practice id
and np.delete_ind = 'N' and e.delete_ind = 'N'
and e.enrollment_status in (1) --pending or completed, we do not care about any of the other enrollment statuses.
GROUP by p.practice_id, p.practice_name, e.person_id, e.enrollment_status,
e.enrolled when, e.account locked
```

Simplifying Enrollments

select * from ngweb_vw_ugm_enrollment_status



Evamples

<u>-</u>	- Aarripies
View/Stored Procedure	Descrip

ngweb vw ugm enrollment status

sp UGMPortal EnrollmentsLastLogin

sp_UGMPortal_EnrollmentsNotes

sp UGMPortal EnrollmentsAll

ngweb vw ugm enrollment status last login

ption

enterprises

Enrollment Status View

patients in a practice

patient

Enrollment Status for all patients for all

Enrollment Status for all patients for a

Enrollment and Last Login Information for

Account History information for a given

given practice **Aggregate Enrollment Status Counts** sp UGMPortal EnrollmentsPractAggr

sp UGMPortal EnrollmentsPract

Determining Patients who have not completed enrollment

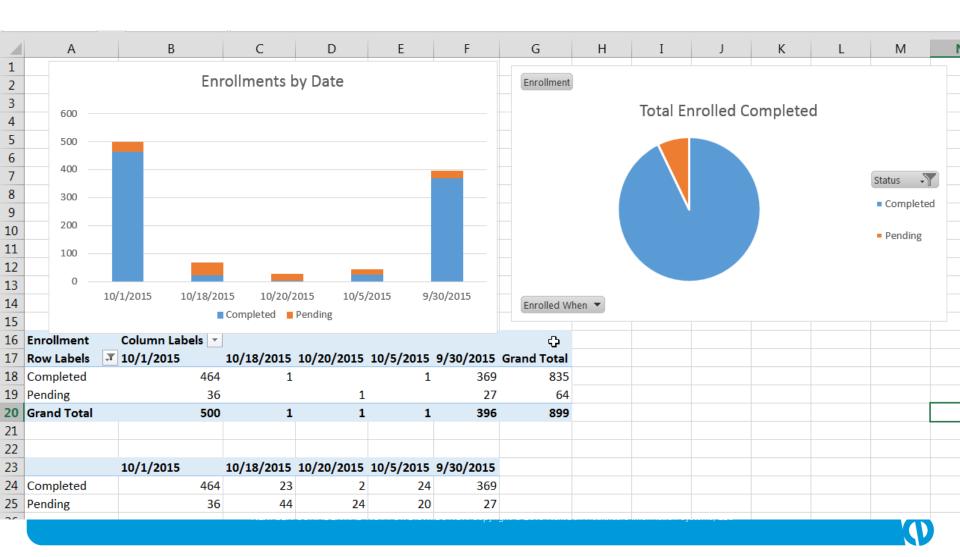
Stored procedure: sp_UGMPortal_EnrollmentsLastLogin

first_name	last_name	final_stat	enrolled_when	last_login
Anup	D	Completed	2014-09-22 03:01:28.163	2014-09-22 07:02:10.800
Care	Manager1	Completed	2014-10-30 01:19:57.103	2014-10-30 05:28:33.517
Child	Dependen1	Completed	2014-10-30 01:25:39.467	2014-10-30 05:25:49.780
Christopher	Lutz	Pending	NULL	2015-09-17 15:24:08.863
David	Burns	Completed	2015-01-08 12:25:40.837	2015-01-09 19:53:59.977
Kevin	Burns	Completed	2015-01-09 14:44:17.010	2015-01-09 19:44:53.383
Kumar	S	Completed	2014-09-22 06:16:52.263	2014-09-22 06:46:58.890
Liz	Burns	Completed	2014-11-17 15:40:13.417	2014-11-18 19:41:26.963
Michelle	Pollard	Completed	2015-01-09 14:42:41.773	2015-01-09 20:03:07.167
Moin	Pasha	Completed	2014-09-05 02:58:23.923	2015-02-24 08:21:36.537
Moin	Pasha1	Completed	2014-08-27 09:38:36.210	2015-02-24 08:11:30.390
Moin	Pasha2	Completed	2014-09-05 02:59:50.913	2015-01-23 05:50:03.080
Moin	Pasha3	Completed	2014-10-10 12:39:41.950	2014-10-16 12:21:20.963
<u> </u>	140		0044 00 00 00 5440 000	

Usage Example: sp_UGMPortal_EnrollmentsLastLogin 0,'0004'



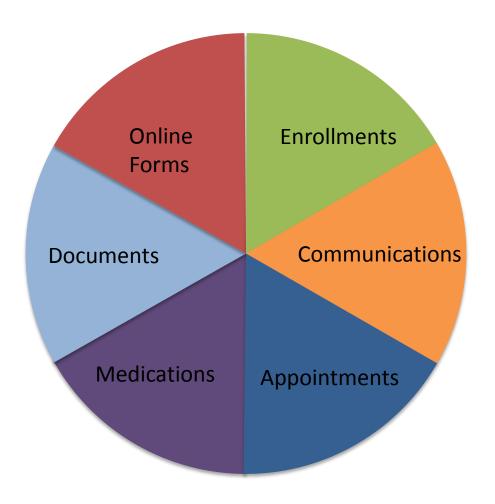
Rendering in Excel



Last Login Time

```
Select
I.person_id, MAX(I.audit_event_timestamp)
from ngweb_audit_log I with (nolock)
where
log_type_id = '3F7F9863-777A-4723-BBB6-5E428B5260DB'
group by I.person_id
```









Communication Schema

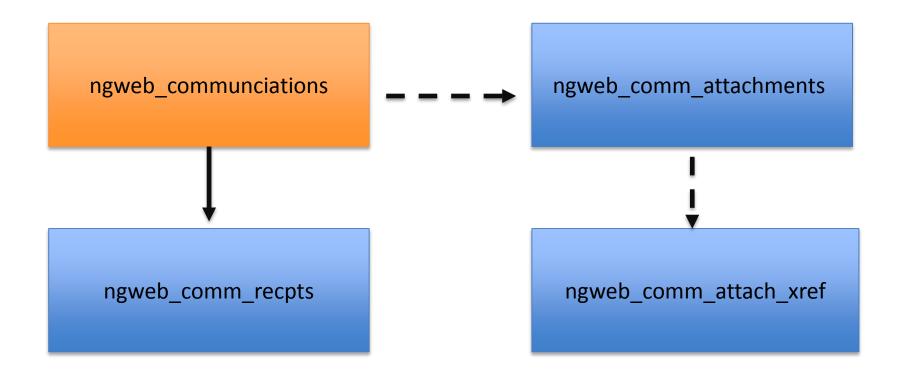




Table	Description
ngweb_communications	The actuall communication message that was send. The subject, the body, etc
ngweb_comm_recpts	To whom the message was sent
ngweb_comm_attachments ngweb_comm_attach_xref	Attachment information that was sent with the message

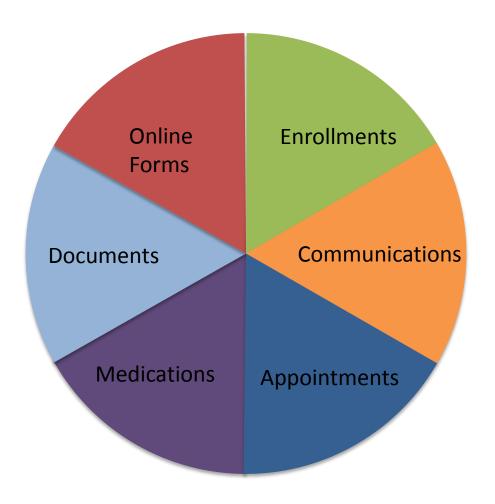




Table	Key Columns
ngweb_communications	comm_id, parent_id sender_id, sender_type, sender_name, receive_when, replied_when, completed_status
ngweb_comm_recpts	comm_id Recipient_id, Recipient_Type (1=user, 2=patient, 5 = rule) Name
ngweb_comm_attachments	comm_id, attachment_type (0 = Online Forms, 1 IMH Form, 2-6= Document, Images) attachment_id, attachment_name
ngweb_comm_attach_xref	parent_id, attachment_id, nx_patient_id, assignment_id

Examples

Stored Procedure Name	Description
ngweb_vw_ugm_communication_status	View to return all communications messages that originated from the patient portal
sp_UGMPortal_CommMsgsAll	All online appointments requested across enterprises
sp_UGMPortal_CommMsgsPract	All online appointments requested at the practice level
sp_UGMPortal_CommNotResponded	All communication message not responded to by a practice staff member







Appointment Requests

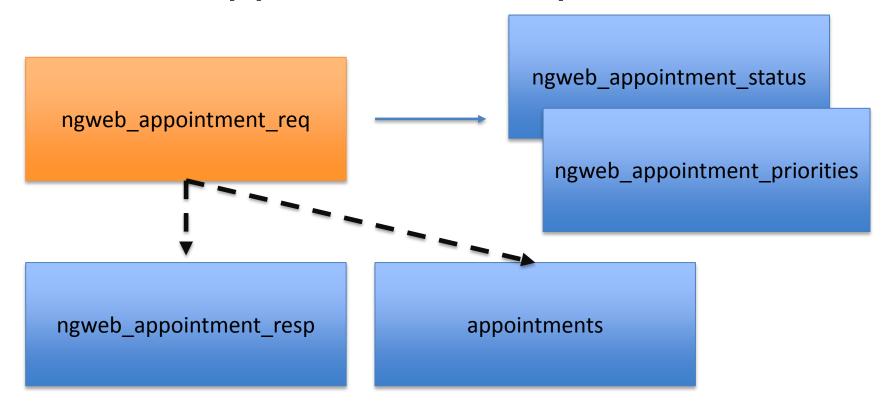






Table	Description
ngweb_appointment_req	Core appointment request table containing the appointment requests informationi
ngweb_appointment_resp	Core table containing practice responses to patient appointment requests.
ngweb_appointment_priorities	Cross reference table containing human readable descriptions of appointment priorities
ngweb_appointment_statuses	Cross reference table containing human readable descriptions of appointment status





Table	Key Columns
ngweb_appointment_req	appointment_id pin_id epm_appt_id requested_when
ngweb_appointment_resp	Appointment_id responded_when
ngweb_appointment_priorities	appointment_priority_id, description
ngweb_appointment_statuses	appointment_status_id, description





Illustrative Example

select * from ngweb_vw_ugm_appointment_status

III Results Messages Messages									
	practice_name	requested_when	priority	status	Provider Name	Appointment Categ	location_na	requested_rea	Responded When
1	Viva Las Vrgas Family Practice	2014-09-10 08:52:14.287	NORMAL	BOOKED	Blood Pressure Check	BP Check	Main Office	Test1	2014-09-10 08:53:54.710
2	Viva Las Vegas Family Practice	2014-09-10 08:53:07.920	NORMAL	BOOKED	Blood Pressure Check	BP Check	Main Office	Test2	2014-09-10 08:54:40.350
3	Viva Las Vegas Family Practice	2014-11-03 07:45:28.230	NORMAL	BOOKED	Blood Pressure Check	BP Check	Main Office	Test	2014-11-03 08:12:11.117
4	Viva Las Vegas Family Practice	2014-09-10 08:55:39.290	NORMAL	BOOKED	Blood Pressure Check	BP Check	Main Office	Test3	2014-09-10 08:57:02.087

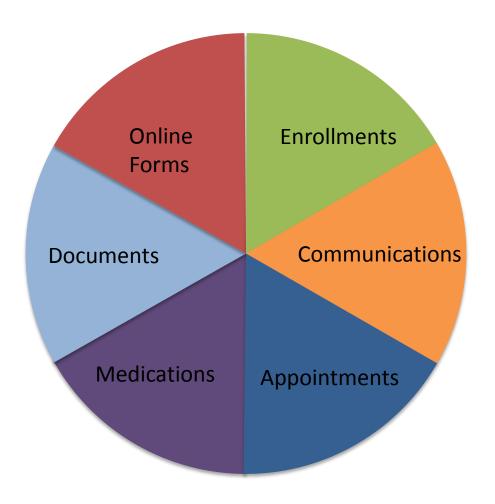


Examples

Stored Procedure Name	Description
ngweb_vw_ugm_appointment_status	View displaying information about appointment requests that originated from the patient portal.
sp_UGMPortal_AptReqsAll	All online appointments requested across enterprises
sp_UGMPortal_AllAptsReqByPractice	All online appointments requested at the practice level
sp_UGMPortal_AllAptsReqByPerson	All online appointments requested by a patient for a given practice











Medication Renewals

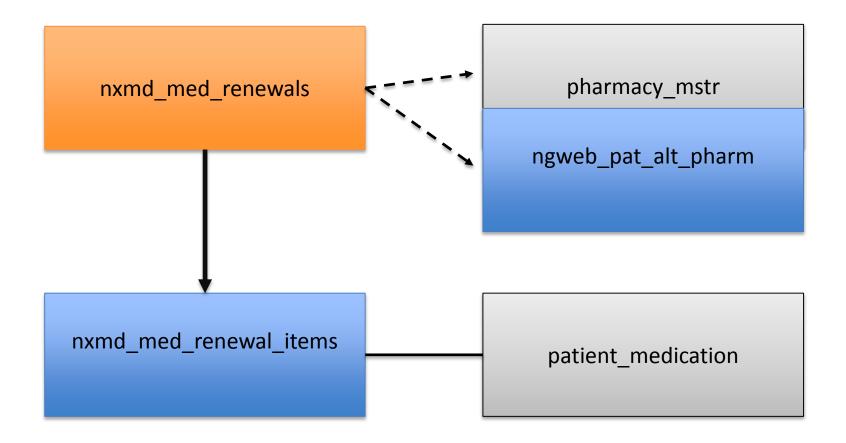




Table	Description
nxmd_med_renewals	Medication renewal transaction record.
nxmd_med_renewal_items	Individual medications that the patient requested to renewal. Has a many to one relationship with the nxmd_med_renewals table
ngweb_pat_alt_pharm	Patient entered pharmacy.





Table	Key Columns
nxmd_med_renewals	Medication renewal transaction record.
nxmd_med_renewal_items	Individual medications that the patient requested to renewal. Has a many to one relationship with the nxmd_med_renewals table
ngweb_pat_alt_pharm	Patient entered pharmacy.





Medication Renewal Core Query

```
select
    p.practice_id, p.practice_name, m.person_id,
    cat.name, o.name, m.request_date, m.response_date
from
    nxmd_med_renewals m with (nolock),
    nxmd_practices np with (nolock),
    practice p with (nolock),
    ngweb_online_identities o with (nolock),
    ngweb_msg_sub_categories cat with (nolock)
WHERE
    m.nx_practice_id = np.nx_practice_id and np.practice_id = p.practice_id
    and o.row_id = m.msg_rcpt_id and cat.row_id = m.msg_sub_cat_id
    order by request_date desc
```



Examples

Procedure/View Name	Description
ngweb_vw_ugm_med_renewal_status	View that will return all medication renewal transactions that originated from the patient portal as well their current status.

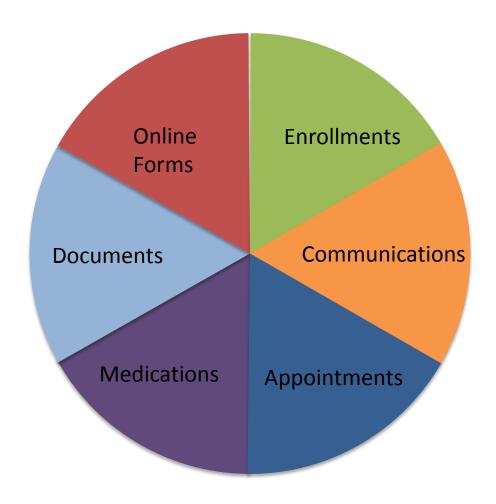
All online medication renewal requests across

sp UGMPortal MedRenwlsAll enterprises

sp_UGMPortal_MedRenwlsPract All online medications renewal requests at the

practice level

sp UGMPortal MedRenwlsPerson All online medication requested by a patient for a given practice







Portal Documents

ngweb_document_history

patient_education

patient_image

patient_ics_image



Portal Documents

ngweb_phr_request → ngweb_phr_documents



Table	Description
ngweb_document_history	Patient Portal Document History record. When a document is sent to the patient and when they read the record.
	Links to the patient document, education and image tables Key Fields: emr_doc_id, person_id
Ngweb_phr_request Ngweb_phr_document	Contains information about PHR record documents that were requested or generated for a patient Key fields
	request_id, person_id, practice_id, create_timestamp





Illustrative Examples

View/Procedure	Description
ngweb_vw_ugm_document_status	This view will return information about all of the documents, ics images, patient images, patient education that was sent to the patient portal and whether the documents were read.
sp_UGMPortal_DocPatHist	This stored procedure will return information about all of the documents, ics images, patient images, patient education that was sent to a specific patient, and whether the patient read the document

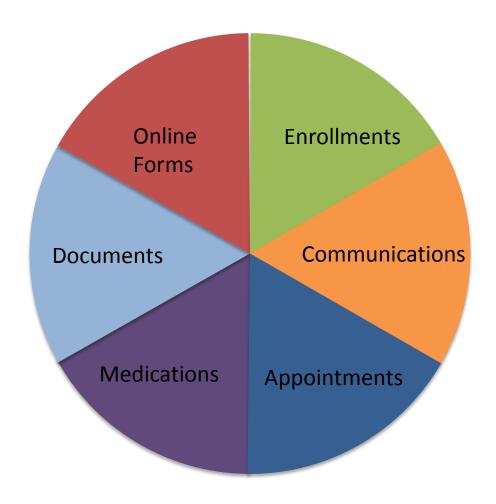


Illustrative Sample

Stored Procedure: sp_UGMPortal_DocPatHist

Ⅲ F	III Results Messages		
	Document Name	Sent When	Read When
1	VIS Influenza	Oct 23 2015 12:00PM	Oct 23 2015 11:57AM
2	Chest Xray	Oct 20 2015 7:12PM	NULL
3	VIS Influenza	Oct 20 2015 7:10PM	NULL
4	Patient Plan	Oct 20 2015 6:58PM	NULL
5	Bone Marrow Transplant: What to Expect	Oct 20 2015 5:50PM	NULL

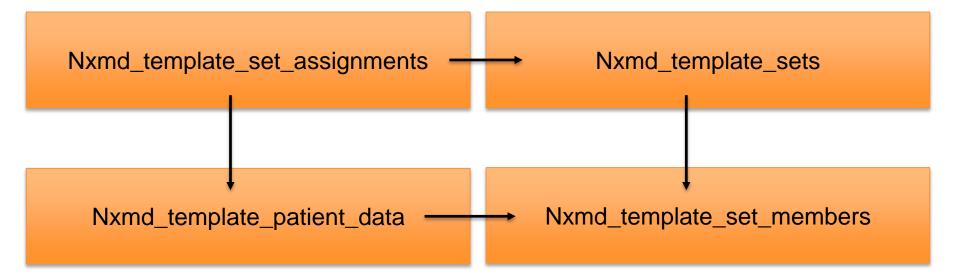








Online Forms





Key Tables

Table	Description
Nxmd_template_set_assignments	Defines which online forms have been sent to which patients
Nxmd_template_sets	The "Grouping" record that combines online forms together for assignment to the patient.
Nxmd_template_set_members	The "compiled" definition an online form. One or more of the records belong to an nxmd_template_set
Nxmd_template_patient_data	The actual data entered by the patient is stored in this table



Key Fields

Table	Key Fields
Nxmd_template_set_assignments	<pre>id, template_set_id, person_id, current_state (0 = pending, 1 = Patient Completed, 2 = Imported), assigned_timetamp, completed_timestamp</pre>
Nxmd_template_sets	id, name, practice_id
Nxmd_template_set_members	id, template_set_id, emr_template_Id
Nxmd_template_patient_data	template_member_set_id, template_assignment_id, current_state, field_data



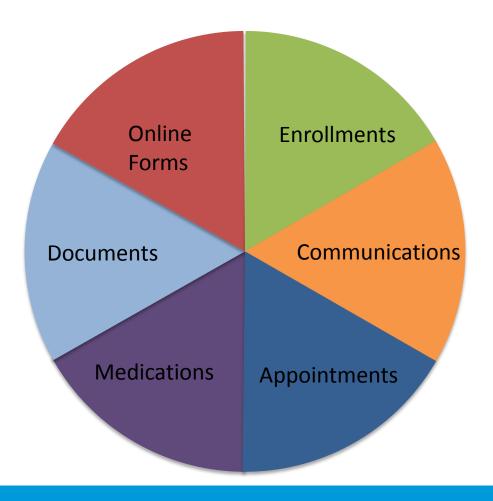
Illustrative Example

View/Stored Procedure	Description
ngweb_vw_ugm_online_form_status	This view will return information about all of the documents, ics images, patient images, patient education that was sent to the patient portal and whether the patient read the document
sp_UGMPortal_OnlineForms	This stored procedure will return information about all of the online



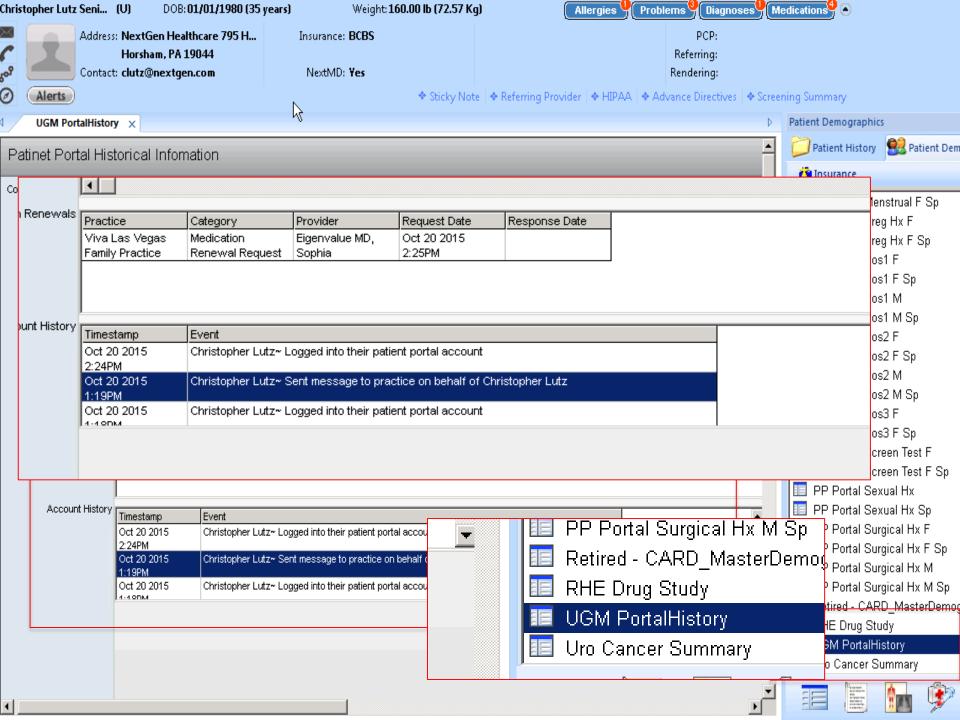


Pulling it all together









Available Crystal Reports

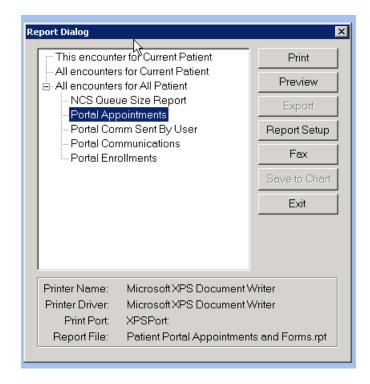


Crystal reports

There are a number of crystal reports that are distributed

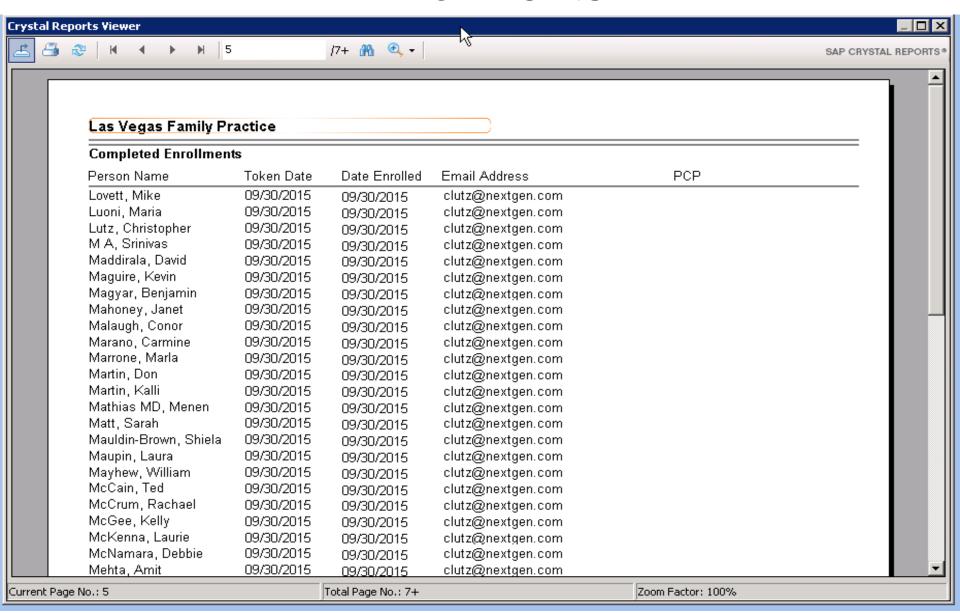
With the patient portal

- Enrollments
- Communications
- Appointments





Enrollments



Appointments

Patient Portal Appointment Request and Forms

Data from 10/21/2011 to 10/21/2015

This report shows the number of appointments requests received and patient forms imported from the patient portal

Las Vegas Family Practice	Count
Number of appointment requests received	13
Number of patient forms imported	0



Communications

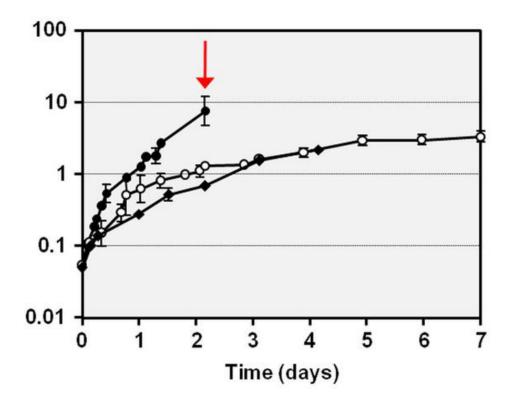
atient Portal Communications Report		Data from 10/19/2006 to 10/21/2015	
his report shows the number of patient portal communcation messages received by provider			
Category	Routing Rule	Messages Received	
⁄a Las Vegas Fa	mily Practice		
Billing Questions			
	Billing Department	2	
Referral Requests			
	Eigenvalue MD, Sophia	12	
Test Results			
	Eigenvalue MD, Sophia	2	
	Hamilton MD, James	20	
Total for Test Results :		22	
otal for Viva Las Vegas Family Practice:		36	

Archiving Data



Archiving Rules

Over time records begin to accumulate in the patient portal inbox





Records Eligible For Archival

- Records flagged as deleted
- Records flagged as "Completed"
- Records from Un-enrolled patients
- Records that reached a particular "age"

 Data still needs to be retained in some fashion for at least 7 years



Tables to Target For Archival

- nxmd_med_renewals
- ngweb_communications
- ngweb_comm_recpts
- ngweb_appointment_req
- ngweb_appointment_resp
- nxmd_template_set_assignments



Archival Stored Procedure

- Sp_UGMPortal_ArchiveData
 - Age in days to archive



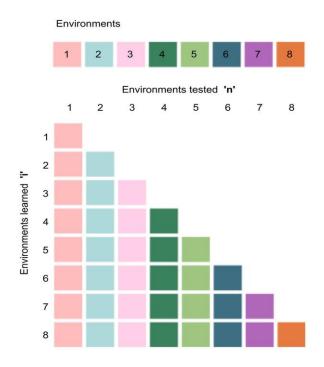


Copying Prod to Test



Test Environment Management

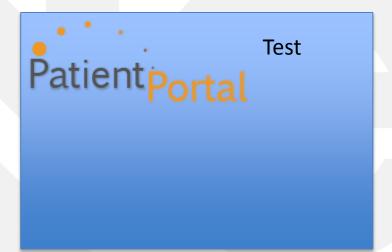
It is possible to run portal in a test environment, but care must be taken when setting up the environment.





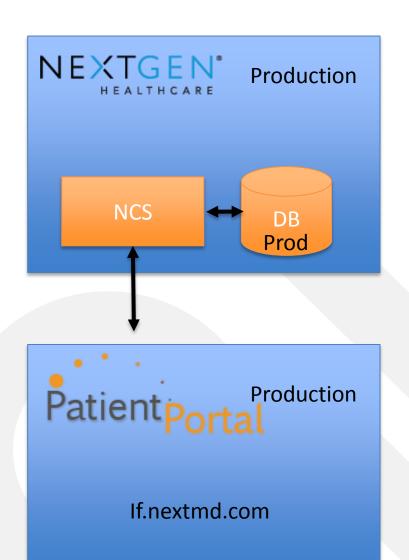


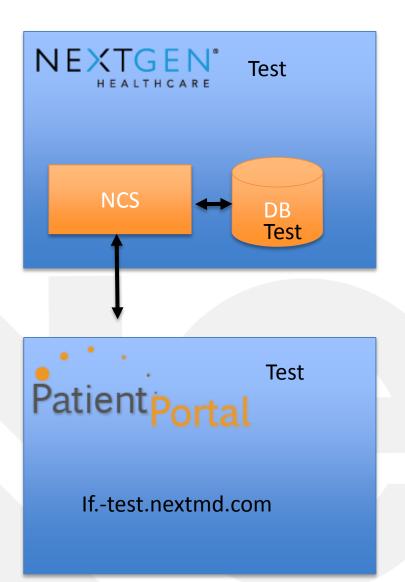






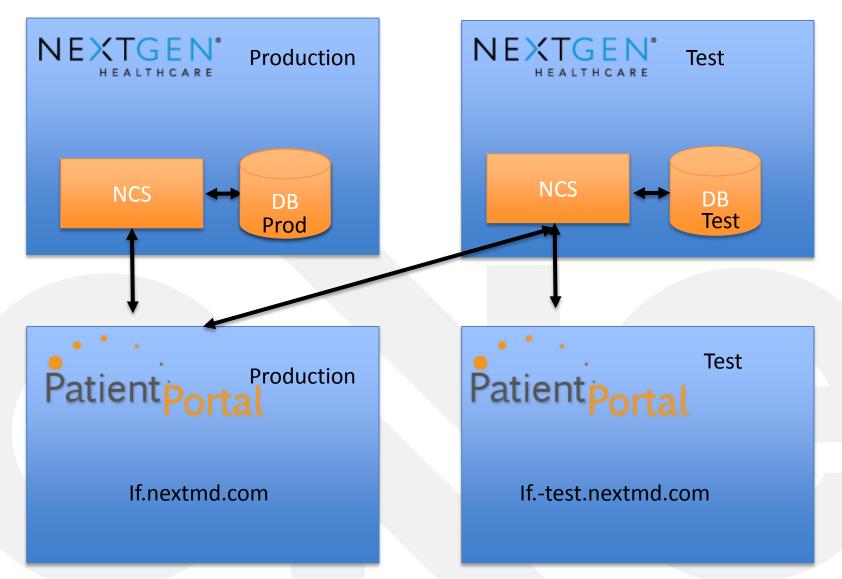






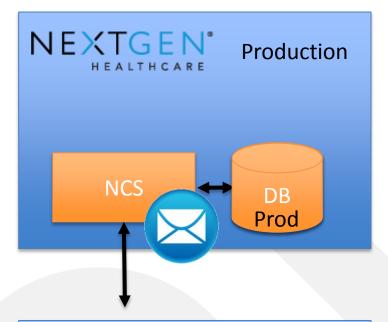




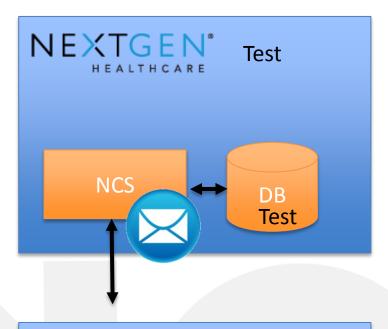














Protocol

- 1) Back up the production database
- 2) Disable any existing NCS instances on TEST
- Restore the database to TEST
- 4) Re-license the test database
- 5) Redact Patient Data
 - Delete all portal enrollment account and meta data for all patients



Protocol

6) Point the NCS to the test environment

```
update configuration_options
set
    option_value = 'if-test.nextmd.com'
where
    key_name = 'EXPORTSERVERADDRESS'
    and option_value = 'if.nextmd.com'
```

7) Bring the test NCS up



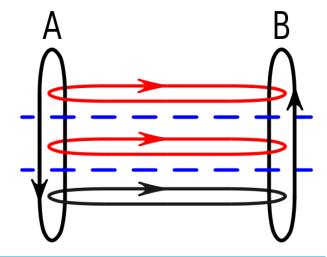
Splitting/Merging Practices



Splitting a Practice Out

On occasion a provider or practice will leave the organization.

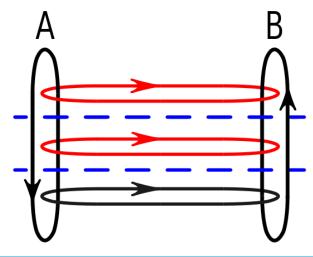
To prevent communication service issues care must be taken properly Partition the portal data out





Merging Practices

Conversely, a provider or practice will be acquired and brought into the fold of an existing practice. In some cases patients are enrolled in both organizations





Preparation

The Preparation Period

- Preliminary steps are performed prior to the actual database merge
- Notification of the patient base

The "Go Live"

The actual execution of the database merge.

The Post Go-Live Monitoring

 Monitoring of the consolidated practices, making adjustments as necessary.



Protocol

The protocol for merging or splitting practices follows this general process

- Stop the communication services except for the NCS export processor
- When all message have cleared, stop the NCS
- Back up the current prod database
- Restore the new database at the new site



Protocol

- Stop the communication services except for the NCS export processor
- When all message have cleared, stop the NCS
- Back up the database
- Restore the new database at the new site



Protocol Continued

- In the source database delete the "leaving" practice and all portal related data
 - In particular the meta data tables nxmd_practice, nxmd_enterprise, nxmd_system
- In the destination database, delete all practice data not related to the moved practice



Protocol Continued

- Rotate the system, enterprise and practice identifoies for new site.
- Run any necessary scripts on the portal server to move or de-duplicate patient enrollments to the new organization
- Bring up the communication services



Protocol Continued

In the case of merging two practices that have patients enrolled in each, you will need to decide which enrollment time stamp to use as it will potentially affect MU2 measures



The more you know!



Portal Sessions - Wednesday

9AM - Using the Patient Portal to Practice Better Medicine Presenters: Shishir Khetan and Cara Allen (Rockville Internal Medicine)

11:15AM - Engaging Patients, Ensuring Outcomes, Raising Social Media Standing - One Stop Solution
Presenters: John A. Hovanesian, MD (Harvard Eye Associates)

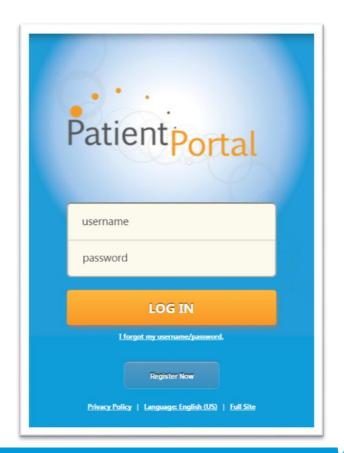


Try it yourself!

Every Attendee has a demo account for patient portal

To Login:

- 1) Goto HTTPS://one.nextmd.com
- 2) Your user name is your email address (in all lower case)
- 3) Password is password1
- 4) Security Answer is **ONE**







Session Survey

Please take a moment to complete a brief survey regarding this session.

- 1. Open your ONE UGM Mobile App (please note: you must have already logged in and accepted the "Terms of Use" to access this feature)
- 2. Click the **Navigation Button** at the top left of the screen
- 3. Select "Sessions"
- 4. **Search** for and select this session
- 5. From the sessions details screen, select "**Survey**" at the bottom right of the screen
- 6. Remember to hit "Save" at the bottom of the survey once you have answered the questions



Any Questions?

