Solution Approach Document

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1 Introduction

The Nightingale Hospital was created in response to the COVID-19 emergency to accommodate large numbers of overflow or recovering patients from surrounding hospitals. The facility was contract in as little as ten days with the plan to serve up to four thousand patients.

A Cerner client, Barts Health NHS Trust (BHT_UK), was chosen to provide the IT systems and workflows. It was therefore decided that the Nightingale Hospital would be configured into the Barts Health Domain. The Nightingale Hospital would inherit existing Barts workflows that are drive by the Cerner Millennium design.

Due to the urgent nature of the project and the timelines that were expected, the design and workflow was kept as simple and linear as possible. Consideration needed to be taken that end users would not be familiar with the system and would not have much time for extensive training. Any design that increased configuration time or resource needs was avoided.

1.1 Purpose

The document is to outline the design of the Nightingale Hospital under the umbrella of the Barts Health. It will describe the considerations taken so that another site can apply a similar thought process to their workflows.

1.2 Scope

The document will review the workflows and design undertaken as part of the Nightingale Hospital project. It will discuss the process of workflow design, configuration considerations and documentation. The process will not holistically fit all similar projects like the Nightingale Hospital however will help to guide the discussions and considerations that need to be worked through.
2 Millennium Functionality

At a high level below is a list of millennium functionality that is needed to deliver this workflow design within the Barts Health domain. Solution knowledge is required for each of these areas, one solution expert can cover more than one solution area.

- Core Security
- Worklist Framework
- Workflow MPage
- Dynamic Documentation
- iView
- PowerForms
- Adhoc Folders
- PM Conversations
- Orders
- Discharge process
- Discern Rules
- Printers/Devices
3 Core Design Approach

3.1 User Access

The design brief was that the users could be coming from any number of locations without much training and need to be given access as soon as possible.

It was decided that clinical users would be given explicit access accounts and not use smartcards, to ensure expediency of access. The existing roles of Clinical Practitioner and Nurse were copied, and a specific Nightingale role was created for each.

Using the specific Nightingale Roles, configuration could then be localized to Nightingale Users without affecting all Barts Health Users.

New Clinician users were not given GMC codes as Personnel aliases, the lead consultant for each encounter would be defaulted to a designated individual. These decisions avoided the concern of creating duplicate personnel aliases for existing users that would cause issues downstream.

3.1.1 PowerChart Position Preferences

Organiser View
The following were removed from the Organiser View for each role
- Outpatient organiser
- Critical care whiteboard
- Scheduling 1, 2 etc
- Care compass
- Hospital at night
- T&O

The key items to be added at the Organiser level are a Worklist MPage (COVID Worklist), which is to be set as the first view in the sequence.
**Table of Contents**

The following were *removed* from the Table of Contents for each role:

- Tasks
- Medication list
- Drug chart
- Drug chart summary
- Newborn summary
- Pregnancy summary
- Historical data view
- Growth chart
- Intake and output

*PowerChart Chart view*
3.1.2 Patient Management Access

Patient conversations in PM Office were limited to the minimum required to allow for easy of training and system use. The Conversation Tasks we revoked from each of the explicit roles.

These conversations were also added to PowerChart Preferences

PM Office Worklists were also restricted to a limited number by revoking tasks on the explicit positions.

3.1.3 Cerner Works Storefront Access

A specific StoreFront was created for the Nightingale users. The storefront was set to bypass Citrix logons so only Explicit Millennium accounts were needed for clinical users. Additionally, only PowerChart is published to this Cerner Works storefront.

The number of Concurrent Users (CCU) has been difficult to determine. There are no existing models to base assumptions on. Cerner Works has determined at minimum we would need 2000 additional CCU capacity for a 4000-bed hospital, with a view that usage/performance would continue to be monitored.
### 3.2 Core Locations

Nightingale hospital was built as its own organisation and facility that has a parent organization of Barts Health NHS Trust. It was given its own NACs Code of R1H0A which was assigned to the organization aliases of NHS Organisation Code and NHS Client Code.

No new Alias Pools were created as existing Barts Health Alias Pools were used for the Nightingale Organisation.

The physical numbers of beds in a ward are very large, in order to keep patient lists manageable and ease of registration, it was decided to suffix ward levels with zones, A, B, C etc. For example, the ward named Florence North became Florence North A, Florence North B, Florence North C and Florence North D. See appendix 7.1 **Physical Layout** for site map.
4 Workflows

4.1 High Level Patient Journey

See Appendix section [Barts Health Workflow Overview](#) for workflow presentation.
4.2 Pre-Admission

4.2.1 Summary

Barts Health are currently deploying a Pre-admission Workflow as part of their current phase of work. The decision was made to utilize this design for the Nightingale Hospital. A conversation call Pending Admission is used to create the pending encounter. Any relevant paper documentation can be attached to patient record using single document capture. At such a point when the patient arrives the Inpatient Non-Elective Admission will flip the encounter to an Inpatient Encounter.

4.2.2 Functionality

- Nightingale Pre-Admission PM Conversation
- Single documentation capture
- Worklist framework
4.3 Triage

4.3.1 Summary

Once the patient arrives at the Nightingale Hospital, the inpatient Non-Elective Admission is completed on the Pending Admission encounter to flip it to an inpatient encounter type.

The wristbands and patient labels will be generated by a generic distribution. However, due to the fast-paced nature of the design on the ground no default printer has been routed.

One lead clinical was chosen to be default into all Nightingale Inpatient Encounters. This lead clinical would drive all results to endorse into Message Centre.

A review on Discern Rules that are triggered by the admission of patients was complete. See Discern Rules in the Technical Considerations section

4.3.2 Functionality

- Non-Elective Admission PM Conversation
- Undo PM Conversation
- Transfer PM Conversation
- Labels & Wristband printing
- Worklist framework
- COVID Transfer Note Type
4.4 Admission

4.4.1 Summary

The workflow for admissions is not task led so as to simply end user training and system use. Therefore, users will utilize the Workflow MPage to manage their tasks.

The following Discern Alerts were suppressed VTE, Dementia & Delirium and EWS, as they are not relevant for the care provided at the facility. See the Discern Rules in Technical Considerations section

4.4.2 Functionality

- Worklist Framework
- Admission Hx PowerForm
- Safeguarding Assessment
- Assessments/Fluid Balance
  - Basic Admission,
  - Safety,
  - SSKIN,
  - Critical Care – Pandemic Documentation
4.5 Doctor’s Workflow / Ward round

4.5.1 Summary

Using the Workflow MPage Doctors can review the patients on the worklist. A PowerForm will be used to set critical daily targets.

One Dynamic Document Template was created for the users in Nightingale, Critical Care Progress Note and Nursing Progress Note types were used for the documentation.

Medications are currently on paper. But Radiology and Laboratory requests will be placed on Millennium and sent via an interface to relevant the Barts Health departments. Results will not be consolidated into pools in message centre but be associated to one lead clinician for all encounters within The Nightingale Hospital.

4.5.2 Functionality

- Nightingale Worklist Framework
- Nightingale Workflow MPage
- Lab / Rad orders
- Daily Targets PowerForm
- Notification Centre (in both Workflow MPage and Worklist Framework)
4.6 Nursing Workflow

4.6.1 Summary

The Workflow MPage will be used to review patients and care.

Nurses will use the Ambulance handover document and the Nursing Progress Notes from the dynamic documents.

Specific iView bands have been created for the nursing workflow.

4.6.2 Functionality

- Worklist Framework
- Workflow MPage
- Intake / Output (Assessments/Fluid Balance)
- Critical Care – Pandemic Documentation
- Critical Care – Pandemic Admission
- Critical Care – Pandemic Transition Documentation
- PowerForms
4.7 Lab Requests / Specimen Collection

4.7.1 Summary

A favourites folder was created call ‘COVID’ and contains an Order Set called ‘Covid/Corona Virus Bundle’. This order set contains the following orders.

<table>
<thead>
<tr>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Blood Count (FBC)</td>
</tr>
<tr>
<td>Urea and Electrolytes (U&amp;E)</td>
</tr>
<tr>
<td>Liver Function (LF)</td>
</tr>
<tr>
<td>Lactate Dehydrogenase Serum (LDH Serum)</td>
</tr>
<tr>
<td>Clotting Screen</td>
</tr>
<tr>
<td>D-Dimer</td>
</tr>
<tr>
<td>C-Reactive Protein Serum</td>
</tr>
<tr>
<td>Creatinine Kinase Serum (CK Serum)</td>
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<tr>
<td>Troponin T Serum</td>
</tr>
<tr>
<td>Ferritin Serum</td>
</tr>
<tr>
<td>HIV 1 and 2 Antibody</td>
</tr>
<tr>
<td>Coronavirus (2019-nCoV) with Flu RSV</td>
</tr>
</tbody>
</table>

Specimen Labels will use the existing Barts Health label program. Label printers will default by patient location and a default label printer that is associated to that location. No requisitions will be automatically printed a default printer.

Requests will be sent, and results will be received from the laboratory via the existing interfaces.

4.7.2 Functionality

- Lab orders
- Label print routing
- Interface
4.8 AHP Documentation

4.8.1 Summary

All AHP documentation will be done within AHP Progress Note (Dynamic Documentation)

4.9 Discharge

4.10 Pre-Admission Clean-up
5 Technical Considerations

5.1 Domain Strategy

Proof of concept configuration and workflow was complete in the CERT domain, current Service Path to Live and promoted to PROD via PECA’s signed by the relevant authorities at Barts Health.

5.2 Discern Rules

Discern Rule design was assessed at the workflow level.

The workflows defined above could potentially trigger Discern Rules from one of the following events:

- Patient Event
- Open Chart
- Add to Scratchpad
- Clinical Event
- Close Chart

To help identify these the Event List report can be run from Discern Dev, this will list all rules categorised by event.

Additionally, any rules that applied encounter location to the logic will need to be reviewed in case the new location needed to be included or excluded.

To help identify these the Modules by Template List can be run from Discern Dev.
5.3 Printers and PC’s

5.3.1 Printers

For each ward there are the following:

- Label Printers - 6
- Wristband Printers – 1
- A4 Printers – 1

An issue was encountered where the wristband printers being deployed were not the same DPI as the wristband printers in Barts Health. This meant the is Wristband Label Program needed to be localised to Nightingale.

5.3.2 PC’s

WTS locations have been provided for the PC’s onsite. These will be used to flex the worklists based on the patient location.

5.4 Interface Considerations

Existing Interfaces were used to support the communication to downstream systems.

5.5 Integrated Technologies

Point of Care analysers were set up to perform blood gas analyse.

5.6 Reporting

5.6.1 CCL Report

This report provides details of Covid test orders & results for admitted patients in the date range.

5.6.2 PI Explorer Reports

‘Std_Covid-19 Report - COVID Report’ displays the information recorded for suspected cases with a Specimen request for a certain orderable, or Diagnosis or problem or coronavirus or an event entered for corona virus specimen between a date range.
‘Std_COVID Report’ - Current Inpatients report displays the information recorded for current admitted patients that are positive for corona virus.

5.6.3 PIEDW Report

Std_COVID Report displays the information recorded for suspected cases with a Specimen request for a certain orderable, or Diagnosis or problem or coronavirus or an event entered for corona virus specimen between a date range.

6 Training Approach

The training approach is primarily designed by the onsite operations. They are looking into utilizing eCoach and existing Barts Quick Reference Guides
7 Appendix

7.1 Physical Location Layout

7.2 Barts Health Workflow Overview

7.3 Nightingale SharePoint (Cerner Internal)

https://cernerprod.sharepoint.com/sites/NightingaleHospital
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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## Revision History

<table>
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<th>Date</th>
<th>Version</th>
<th>Description of Changes to Document (including changed section number(s))</th>
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<td>01-Apr-2020</td>
<td>V0.1</td>
<td>Initial Draft</td>
</tr>
<tr>
<td>02-Apr-2020</td>
<td>V0.2</td>
<td>Reviewed by Nightingale Project Team, some appendments to content for clarity. Add Cerner Works Access Section and Reporting Section.</td>
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<tr>
<td>07-Apr-2020</td>
<td>V0.3</td>
<td>Updated the latest Workflow presentation</td>
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