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Royal Cornwall Hospitals



NHS Trust

NIHR CLAHRC South West Peninsula (PenCLAHRC)

Health Service Modelling Associates 2018: Final Seminar.

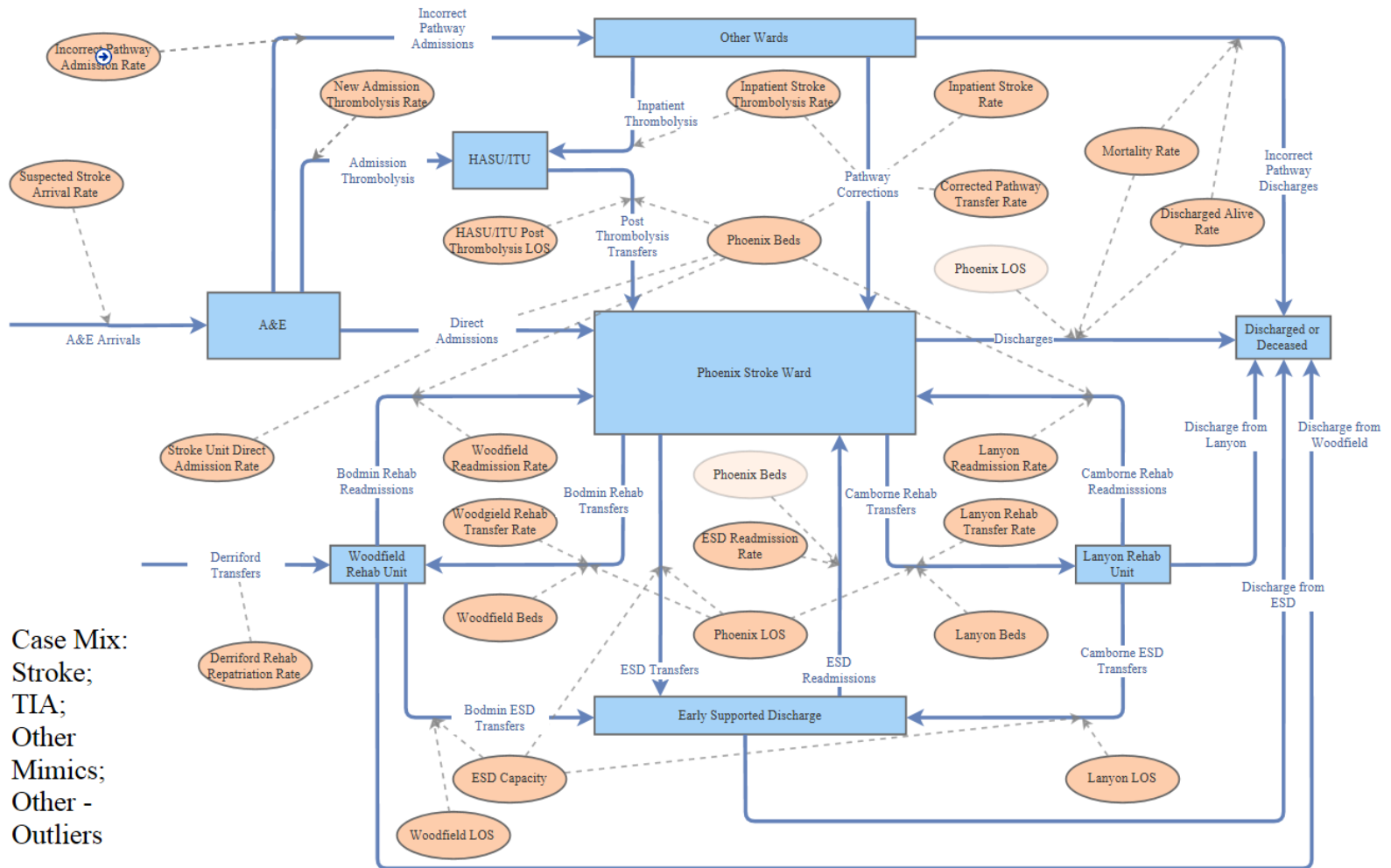
Richard Barrett: Cardiac Information Systems Administrator

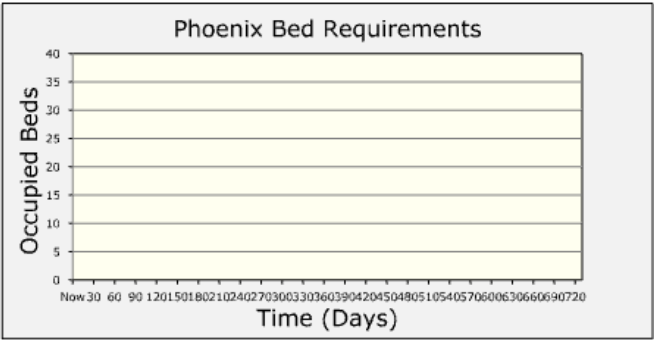
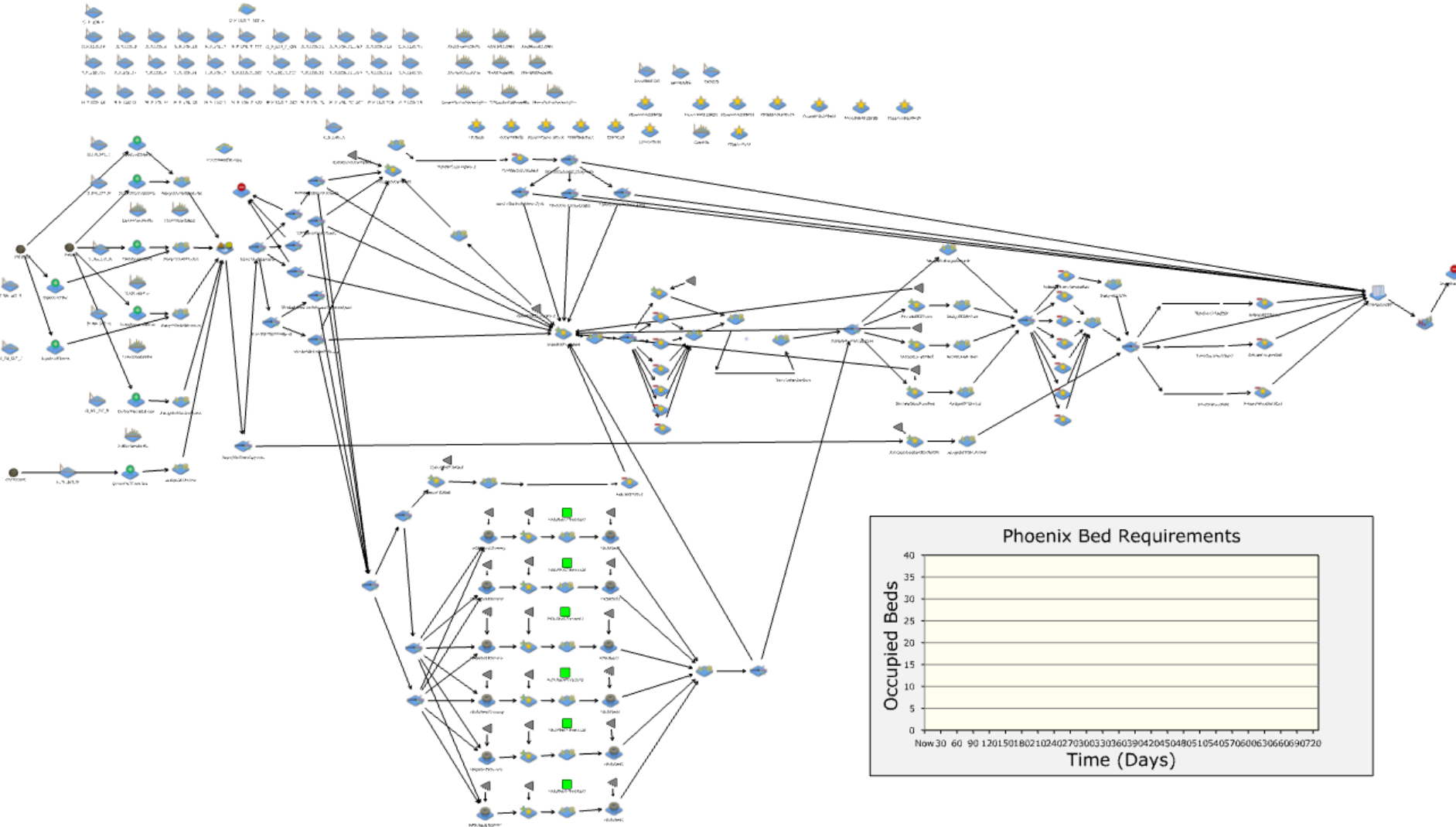
Using modelling to predict stroke bed demand
and optimise catheter lab efficiency at
Royal Cornwall Hospital

Predicting Stroke Bed Demand

- Acute Stroke Care Provision in Cornwall consists of the Phoenix Stroke Unit which currently provides 25 general and 2 Hyper Acute Stroke Unit (HASU) beds.
- Patients requiring inpatient rehabilitation can be transferred to one of two Rehabilitation Units
 - Lanyon Ward at Redruth/Camborne Hospital with 21 beds
 - Woodfield Ward at Bodmin Hospital with 9 beds
- Less acute patients with lesser rehabilitation needs can be discharged to their normal place of residence under the care of an Early Supported Discharge (ESD) team
- Patients on occasion can be transferred back to Phoenix from the Rehab units
- Cornish Rehabilitation patients are also repatriated from Derriford Hospital to the Woodfield Ward.
- In March 2018 there was a peer review of Acute Stroke services two of the recommendations from which were:
 - There are probably too many general Stroke beds – the review recommended a reduction from 25 to 20 general beds.
 - There need to be more (HASU) beds – an increase from 2 to 6 was suggested

RCHT - Stroke Pathway





RCHT - Stroke Ward bed requirements

All Strokes admitted to ASU (1=Yes; 0=No) 0

Phoenix Ward Total Beds 27

Phoenix Ward HASU Beds 2

Unlimited Beds (1=Yes; 0=No) 0

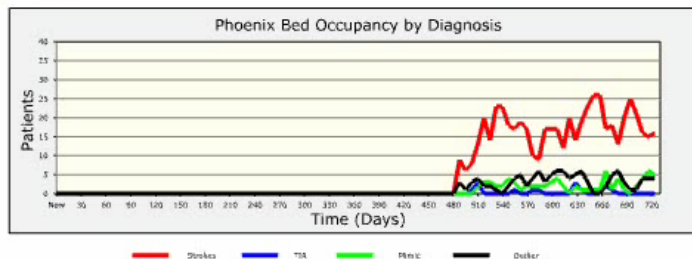
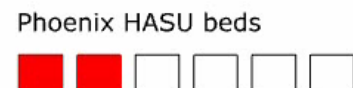
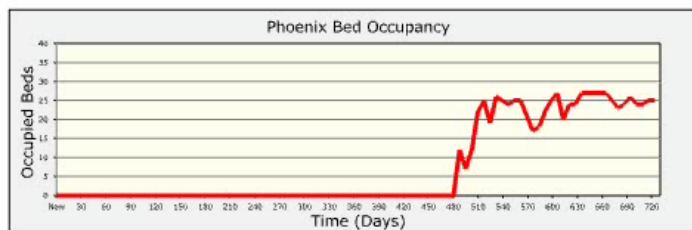
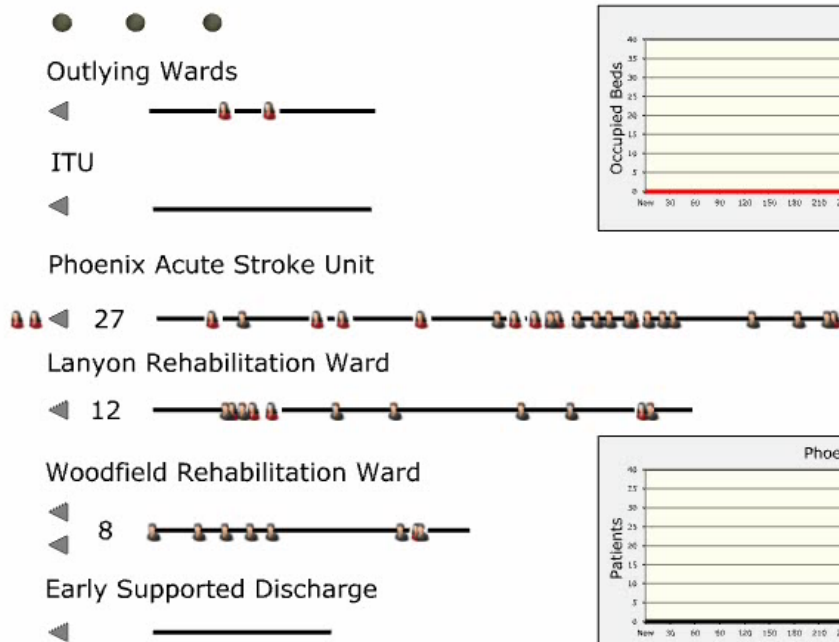
Minimum HASU Length of Stay 12 h

Thrombolysis Percentage 9

TIA Admission Percentage 100

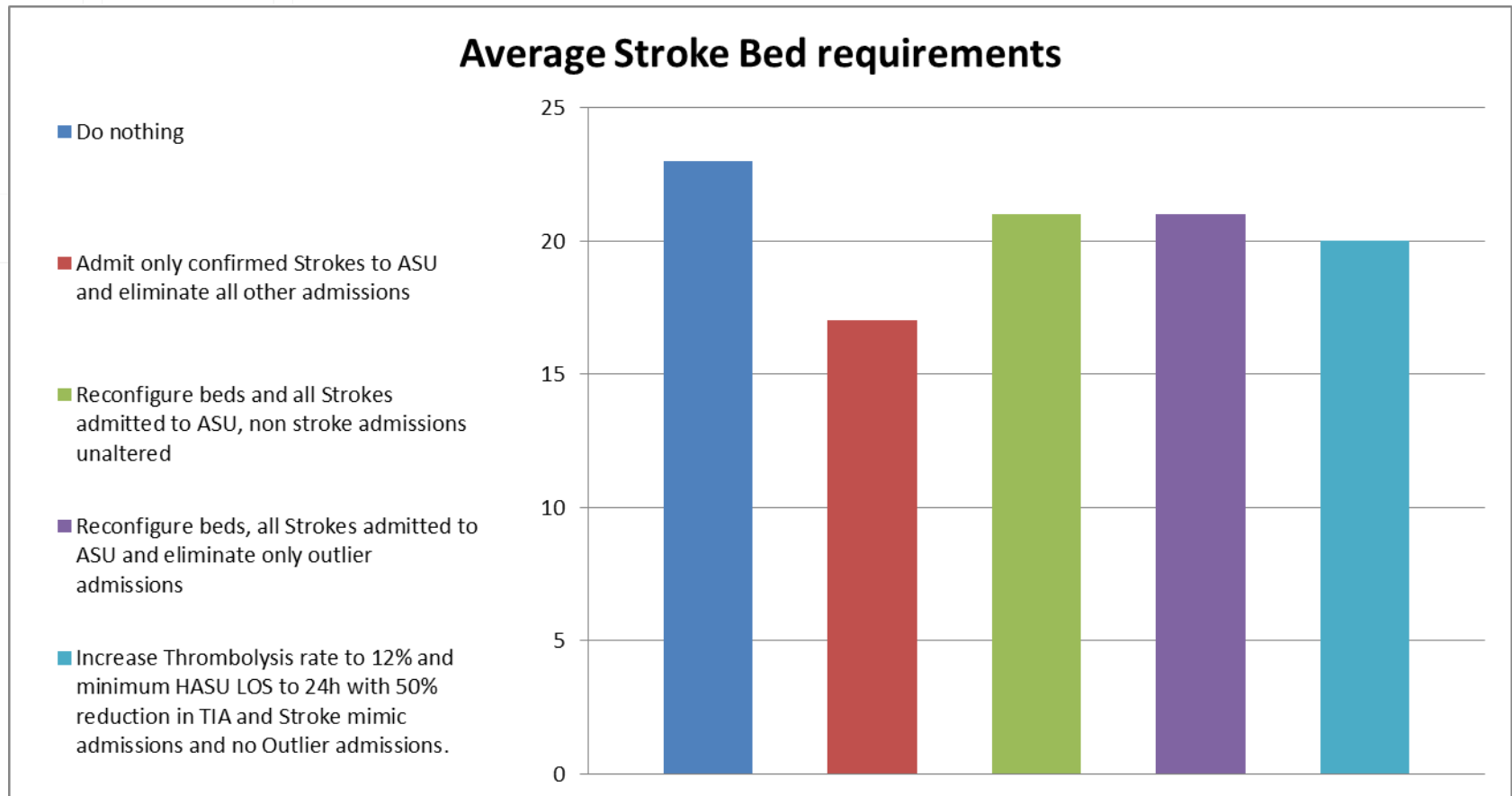
Mimic Admission Percentage 100

Outlier Admission Percentage 100

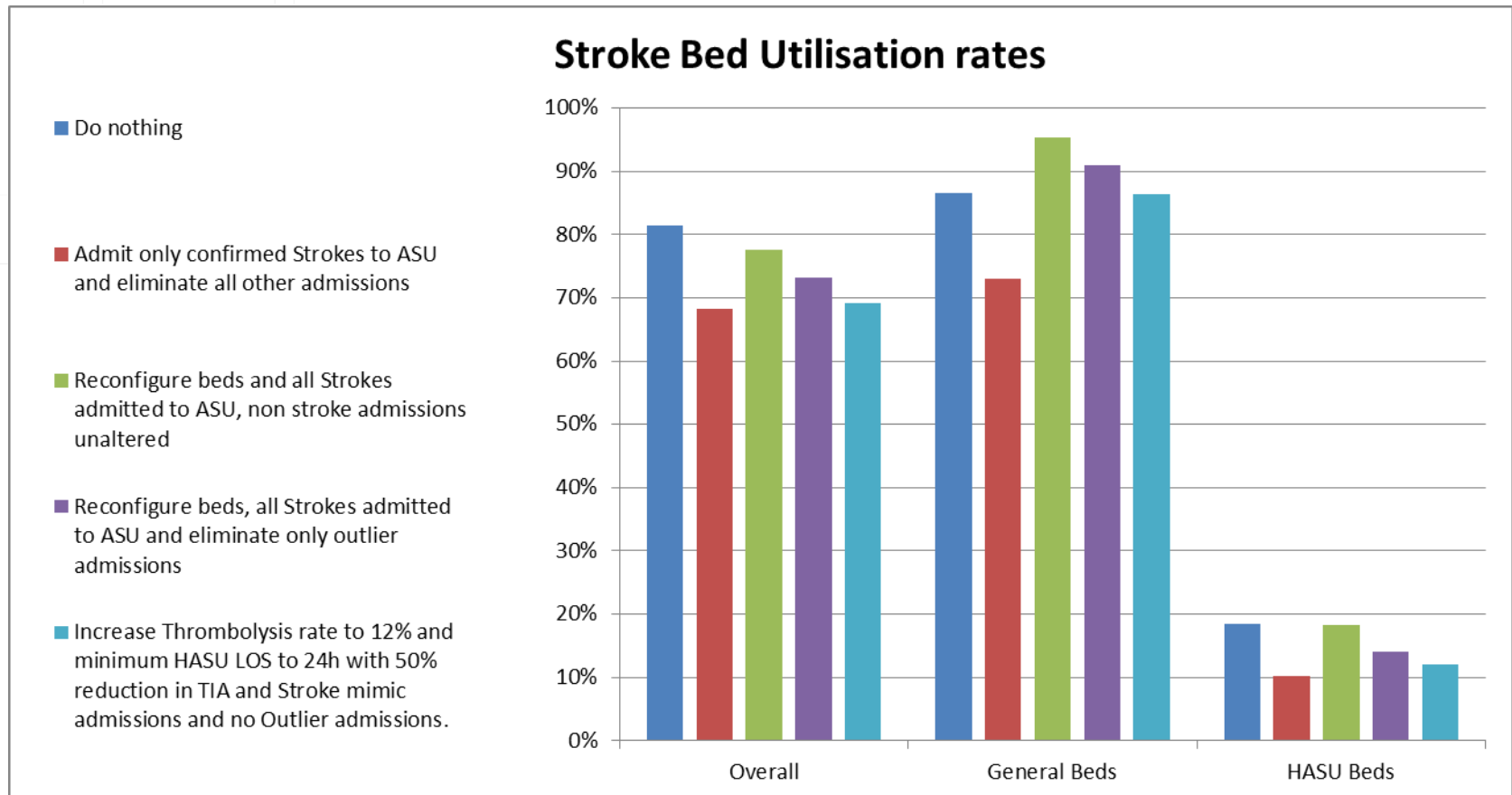


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Predicting Stroke Bed Demand – Model Results



Predicting Stroke Bed Demand – Model Results

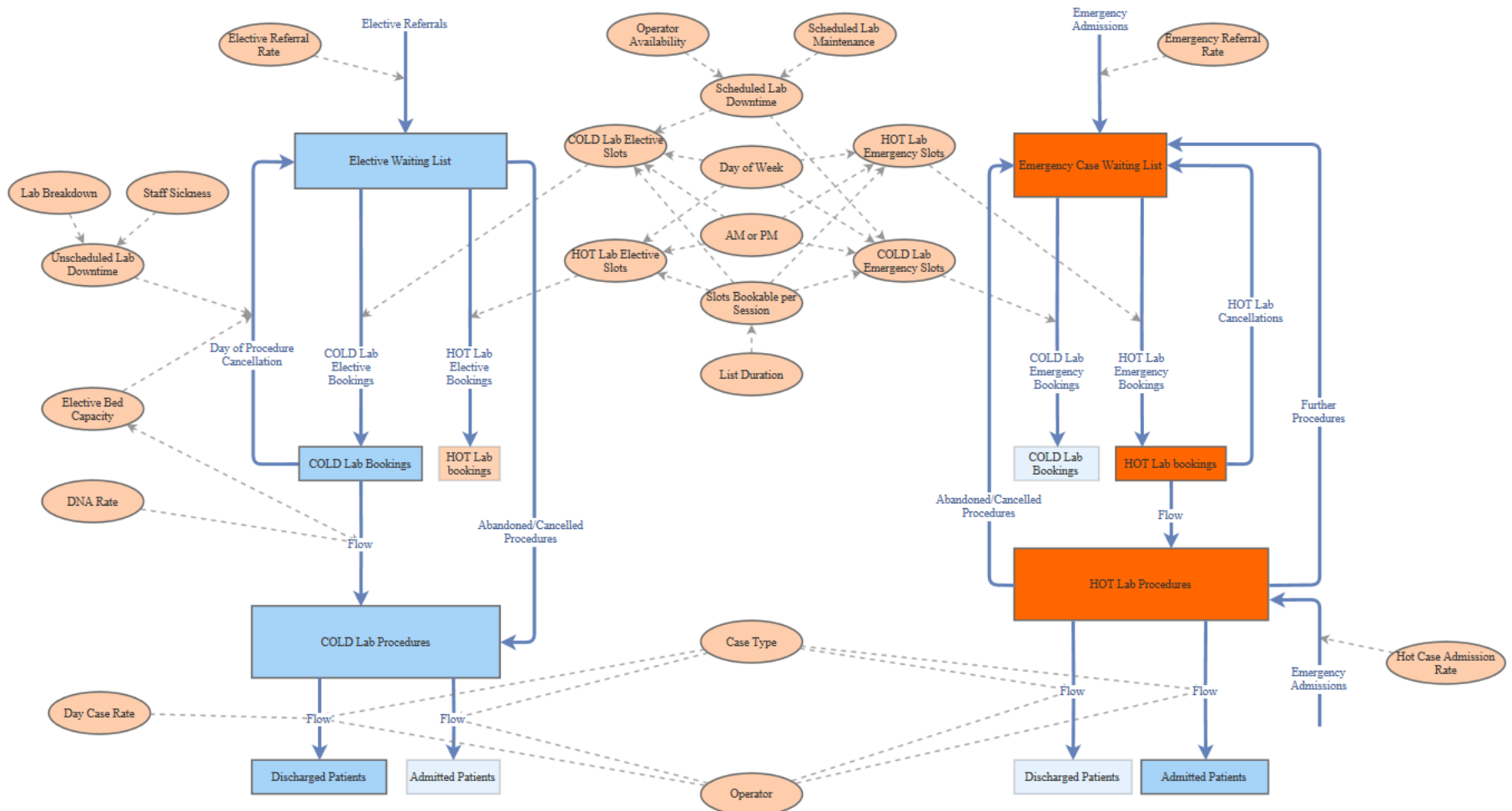


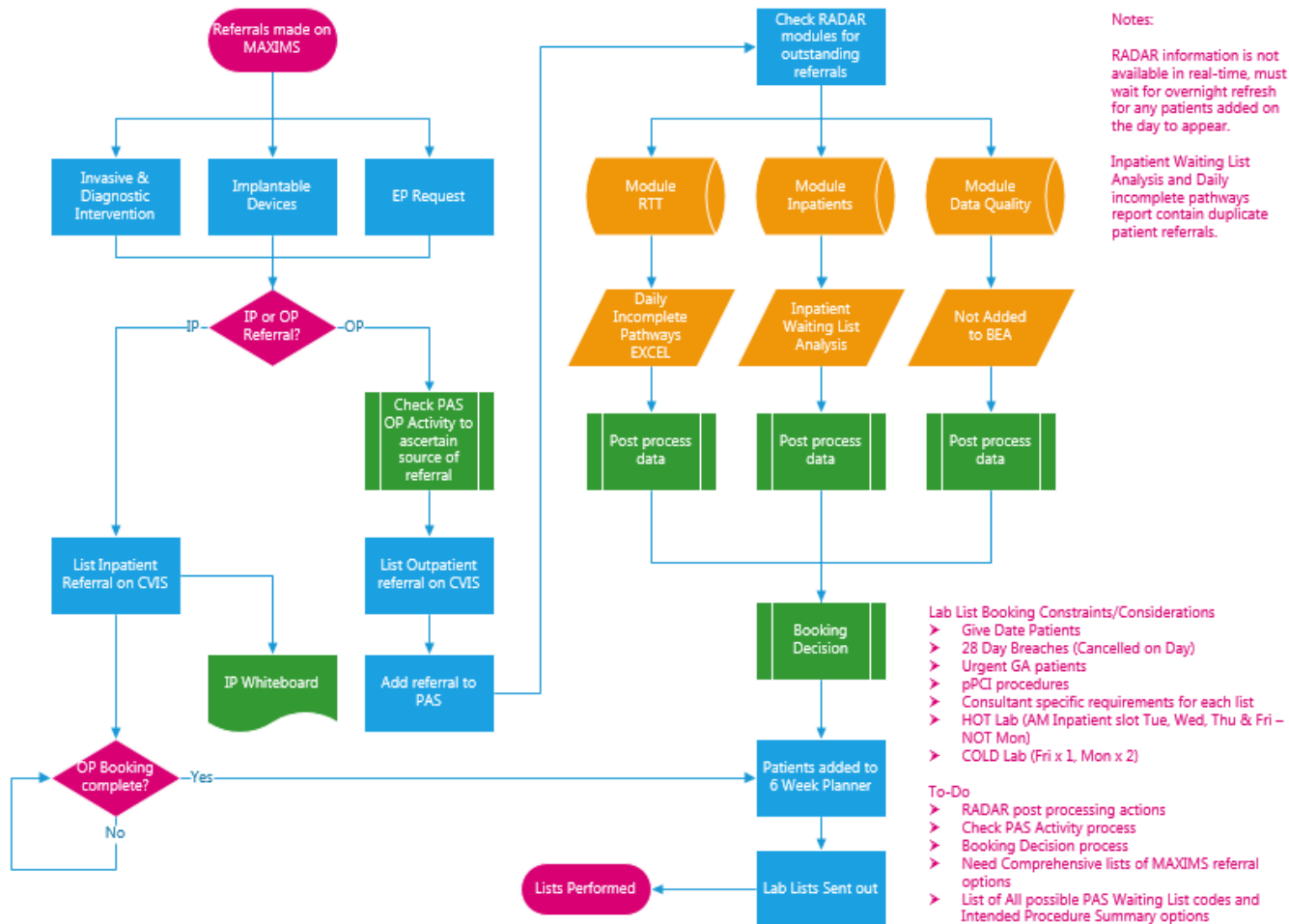
Predicting Stroke Bed Demand – What next

- The model has potentially a lot more predictive scope for the entire Stroke pathway
- Prediction of delayed transfers of care (DTOCs) for all pathways
 - The model separately records the time any patient queues for a Rehab ward bed to calculate DTOC's
 - If Stroke acuity is factored in it will be possible to model the demand for onward packages of care from the ESD and Social Care teams and with an understanding of their resource availability any potential DTOC's quantified.
- Rehab ward Bed reconfiguration
 - Current patient pathways are inevitably influenced to a certain extent by rehab ward bed availability. A geographic modelling exercise coupled with DTOC information could inform any future rehab bed reconfiguration.
- Modelling the effects of introducing point of admission referrals to Derriford for Thrombectomy procedures and subsequent repatriations.

Optimising the efficiency of the Cardiac Catheter Labs

- RCHT has two labs each running 2 scheduled 4 hour lists per day Mon-Fri
- Due to multifactorial reasons the 4 hour Lab lists are not being utilised efficiently with consequential impacts on both inpatient and elective time from referral to procedure.
- During 2017 this resulted in an average list duration of 208 minutes representing a 13% loss of capacity.
- If this lost capacity could be eliminated/reduced this would
 - Reduce overall length of stay for emergency patients waiting for lab procedures which in turn will help with overall hospital flow.
 - Improve patient pathways
 - Tackle patient delay for elective diagnostics/interventions which is in line with core Trust Objectives.
- A modelling approach to the problem will facilitate the compound analysis of multiple simultaneous changes to various aspects of the system whilst also being to ascertain whether individual changes would have a positive (or negative) impact.
- Modelling will also allow us to develop an algorithm to assist the booking teams to plan efficient lists.





Optimising the efficiency of the Cardiac Catheter Labs

- The plan is to create two models
- A mathematical optimisation model to identify the optimal procedure lists to maximise efficient use of the available list time.
- A discrete event simulation model to demonstrate the following scenarios
 - Radiologists available 08:00-18:00 (as opposed to their current availability of 08:30-17:30)
 - Labs available 6 days a week
 - Labs available 7 days a week
 - Removal of breaks between morning and afternoon lists

**Thanks for
listening!**