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#ABUHB_modelling

Examples of Simulation Modelling in ABUHB

Structure of the talk

- The team at ABCi
- Why we are involved in modelling
- Who am I
- Case Studies
  - Patient flow in fracture and orthopaedic
  - ‘111’ in Wales
  - Demand and capacity
- Questions

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Building capability

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- Silver Level **Mathematical Modelling** programme in "Healthcare Analytics and Operational Management" — Taught programme plus intensive mentoring during a project phase
- **6 Fellows** in each cohort, from across the organisation
- **3 projects** in the first cohort used SIMUL8
  - Demand and capacity
  - Reconfiguration of services

Who am I?

- Tracey England
- ABCi
- Mathematical Modeller
  - Discrete Event Simulation
  - Forecasting

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Case Study 1: Trauma and Orthopaedic

Background

80 Fracture Clinics a month

24 consultants, and special wound nurses

207 elective clinics including 31 virtual clinics

Problem / Research Question

Focus of attention is the Trauma and Orthopaedic Department at Royal Gwent Hospital in Newport, Gwent.

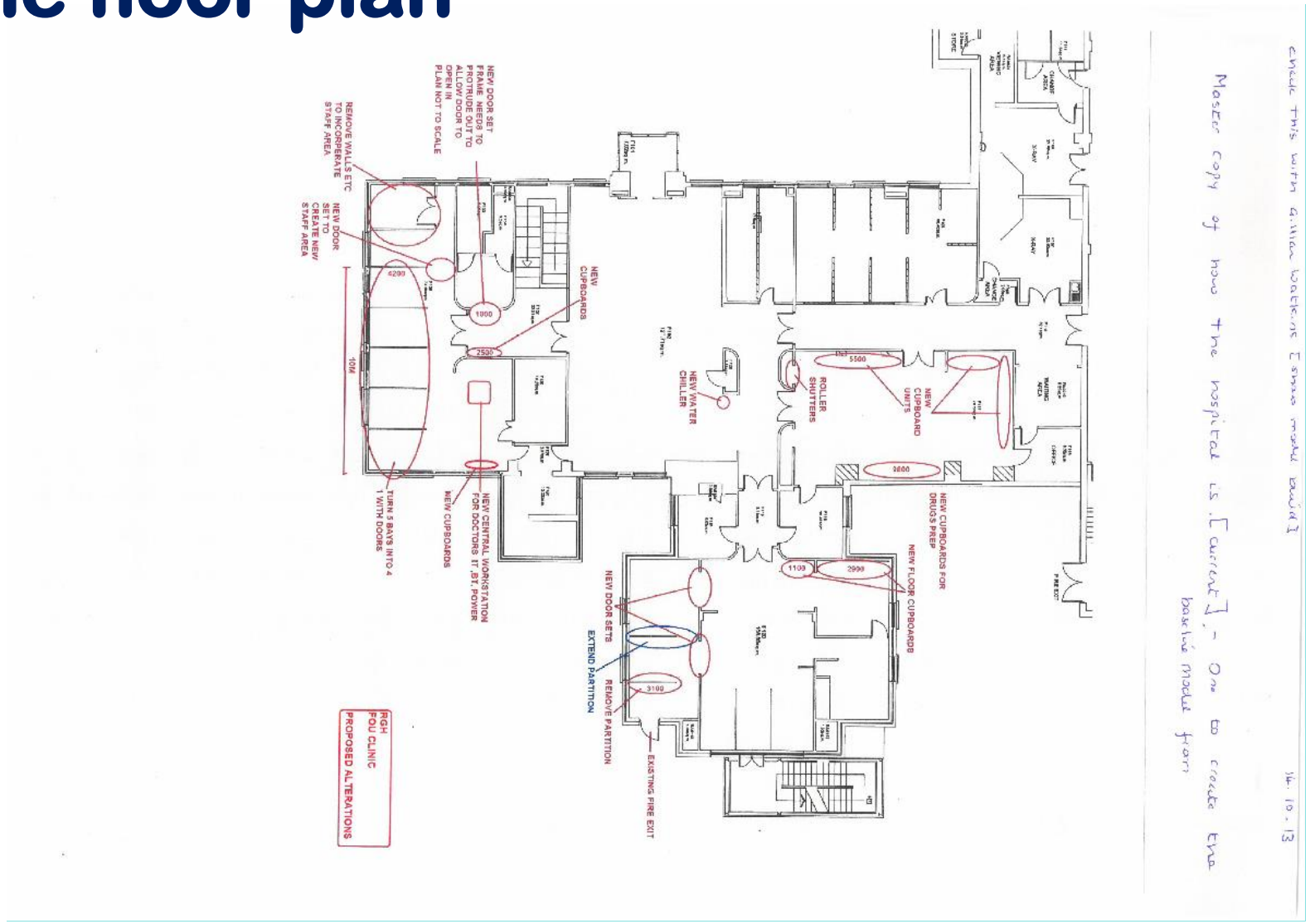
Should the current configuration of rooms in Clinic 1 and 2 be altered?

What effect would reconfiguration have on the flow of patients?

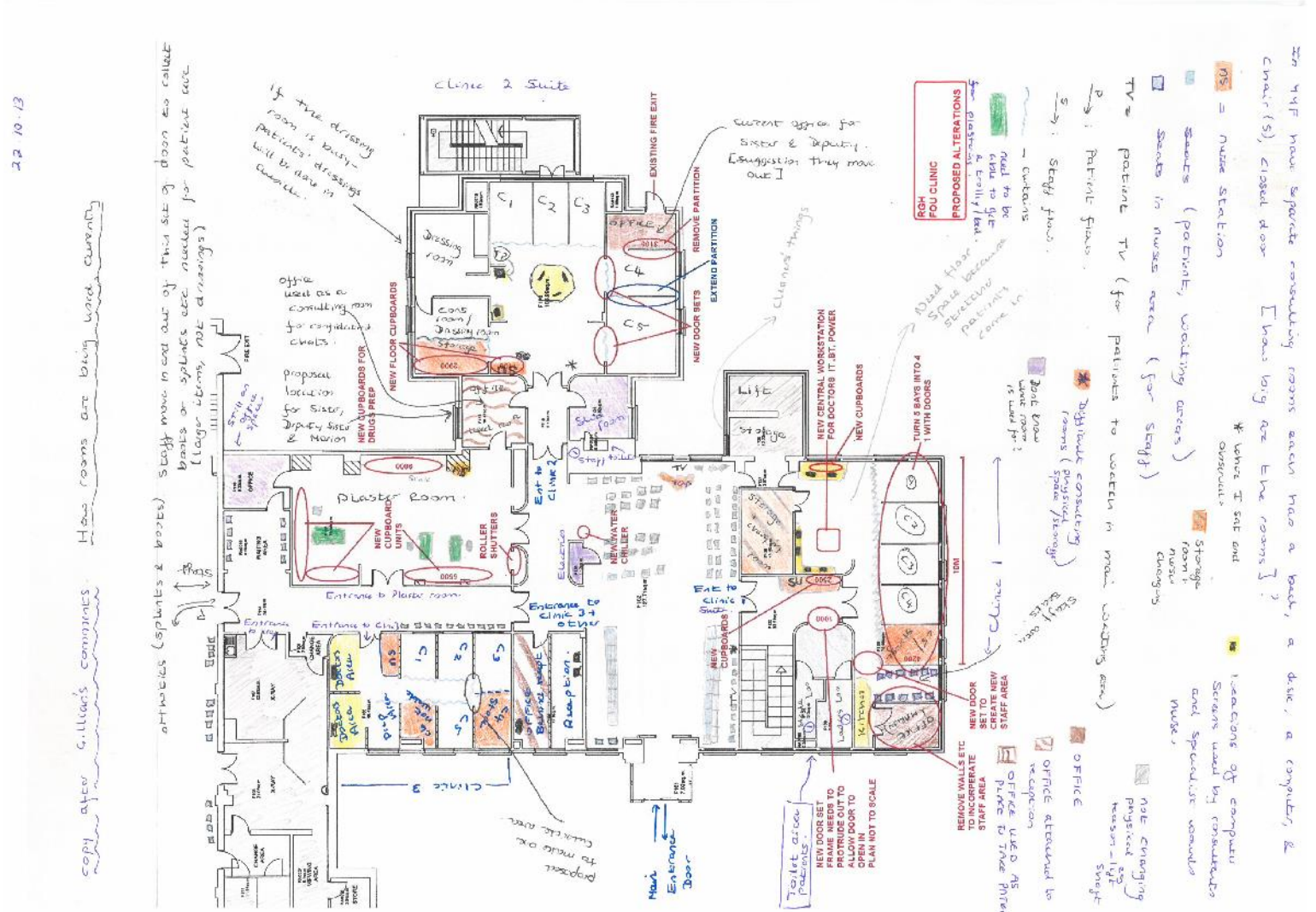
Method

- Obtaining the physical layout of the clinics
- Shadowing the clinics and obtaining expert opinion
- Develop the discrete event simulation to mimic patient flow
- Validate the model
- Run baseline and scenarios

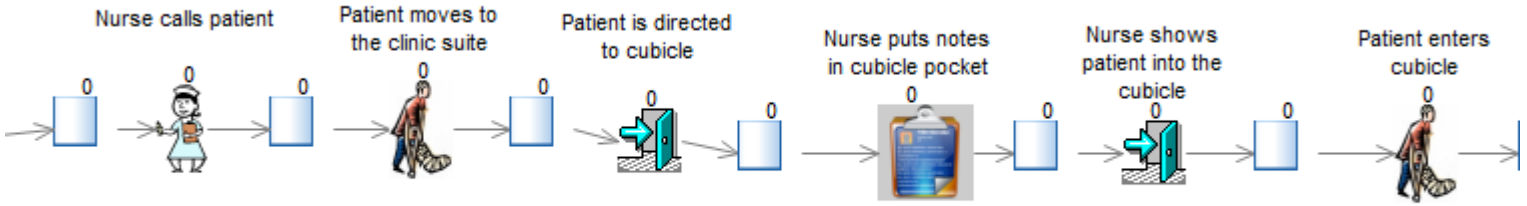
The floor plan

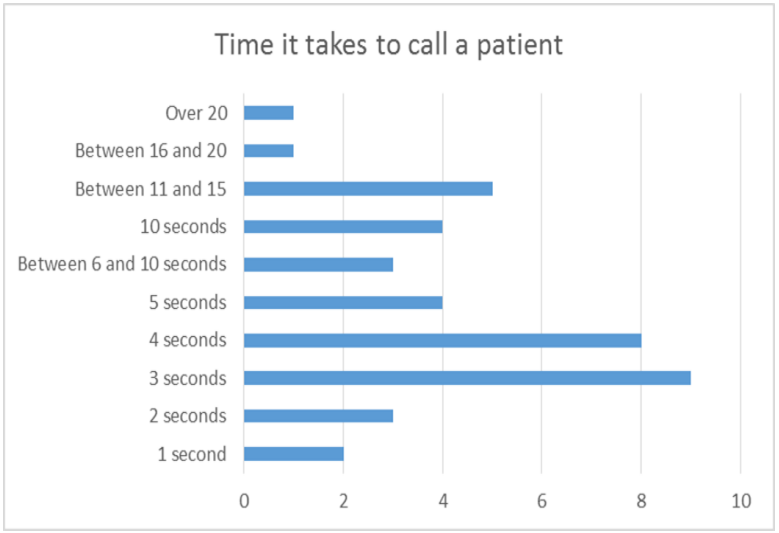


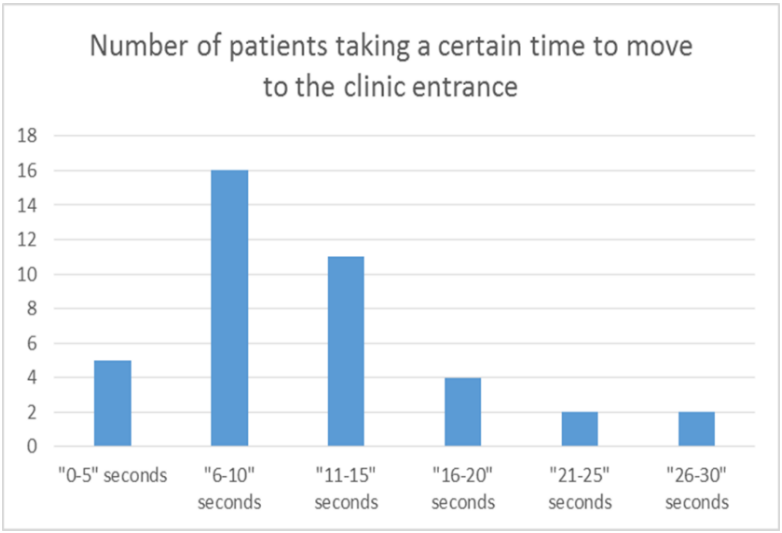
… with added information



Calling the patient

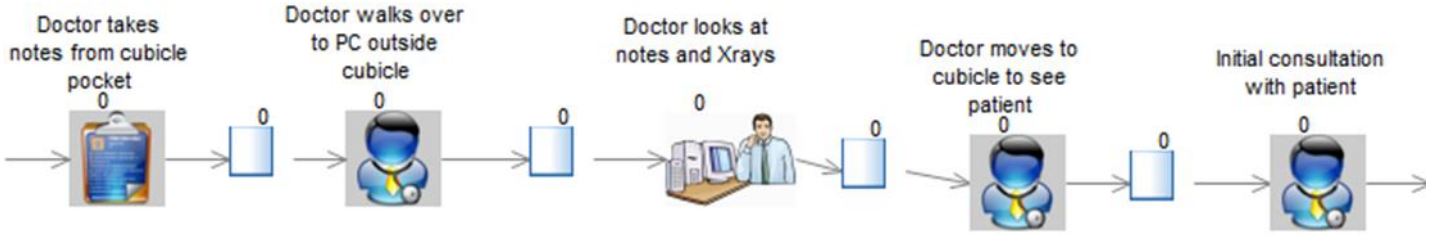




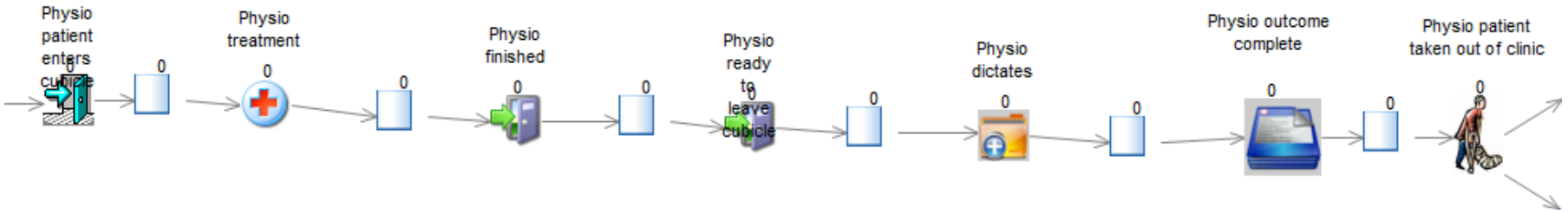


In the clinic

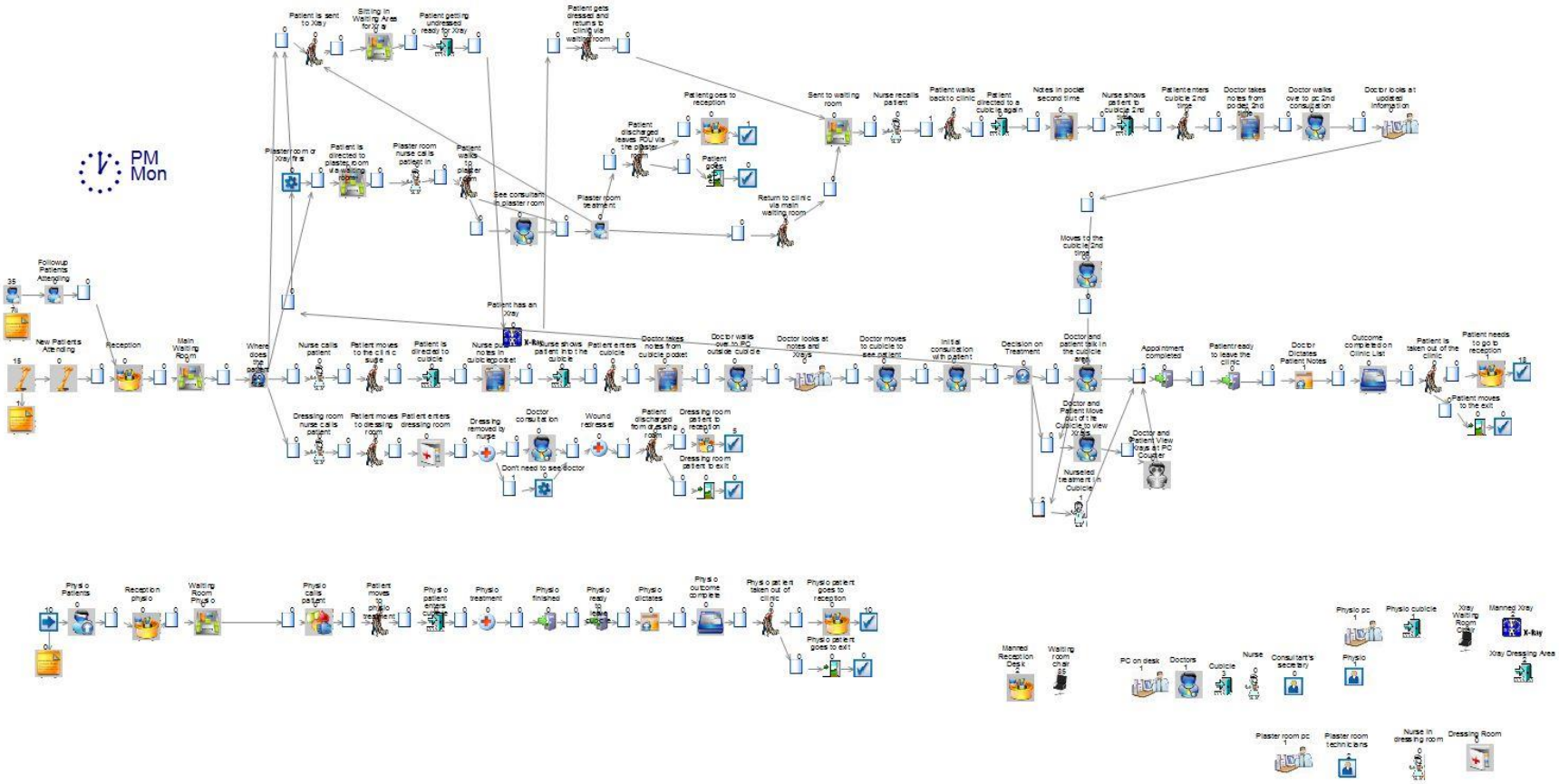
Seeing the consultant or registrar



Seeing the physiotherapist or special wounds nurse



Screenshot of comprehensive model



Data

- **Observation period:** October 2013 – January 2014
- **Shadowing:** October 2013 – January 2014
- **Expert opinion:** Consultant, nurses and physiotherapists

Impact of the model

- **Decided not to alter the clinic**
  - Saved approximately £50,000
- **Importance of clinicians preparing ahead of clinics**
- **Understanding the process and how the clinics work in real life**
  - Shadowing
  - Expert opinion

2 Case Study 2: ‘111’ in Wales

Problem / Research Question

Focus of attention is the proposed introduction of the '111' service to ABMU and subsequent health boards in Wales

How will combining the NHS DW and GP Out of Hours call volume into one service affect workforce planning?

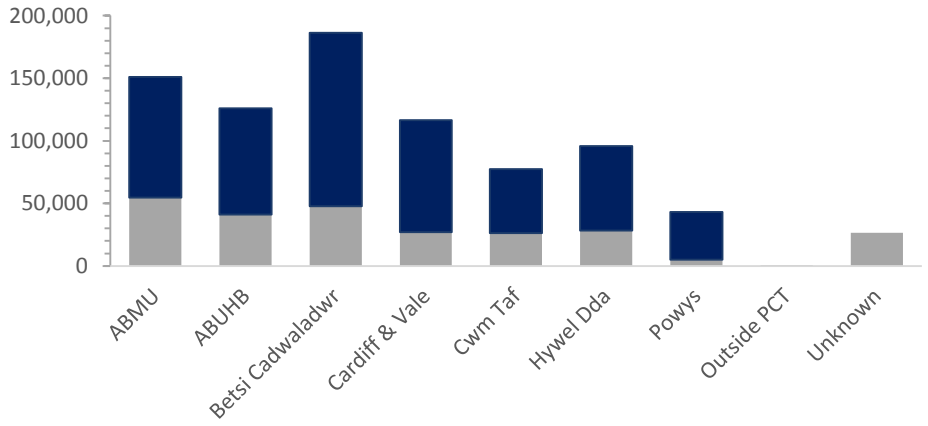
Setting

- **Focus: call volumes to NHS Direct Wales and GP Out of Hours**
  - NHS DW runs 24 hours a day
  - GP Out of Hours runs between 18:30 and 08:00 during the week and all weekend
- **Different staff manning each service**
  - Call handlers
  - Nurse advisors
  - GPs
  - Health advisors
  - Dental advisors

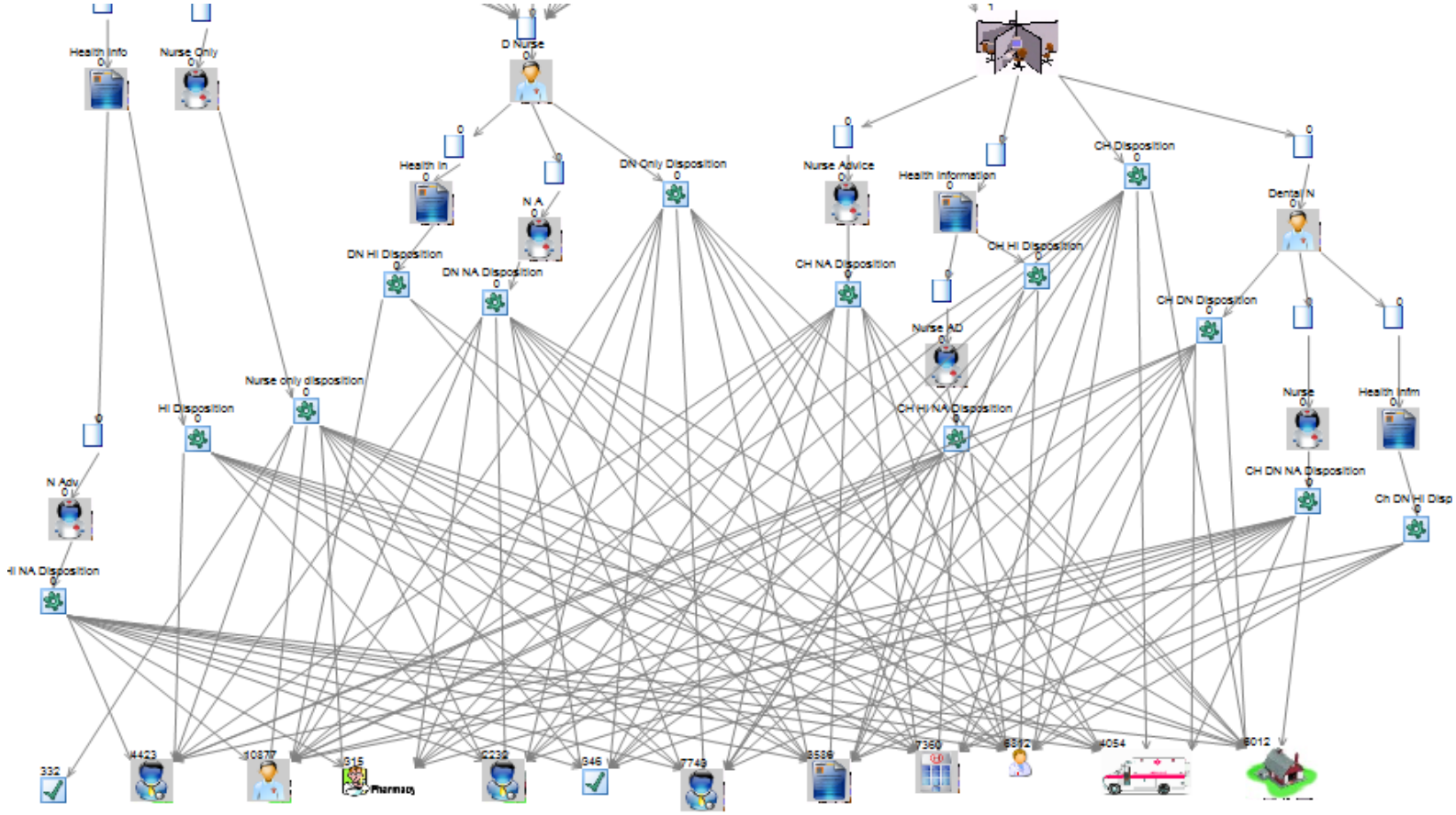
NHS Direct Wales 0845 46 47 Galw IECHYD Cymru + 

Method

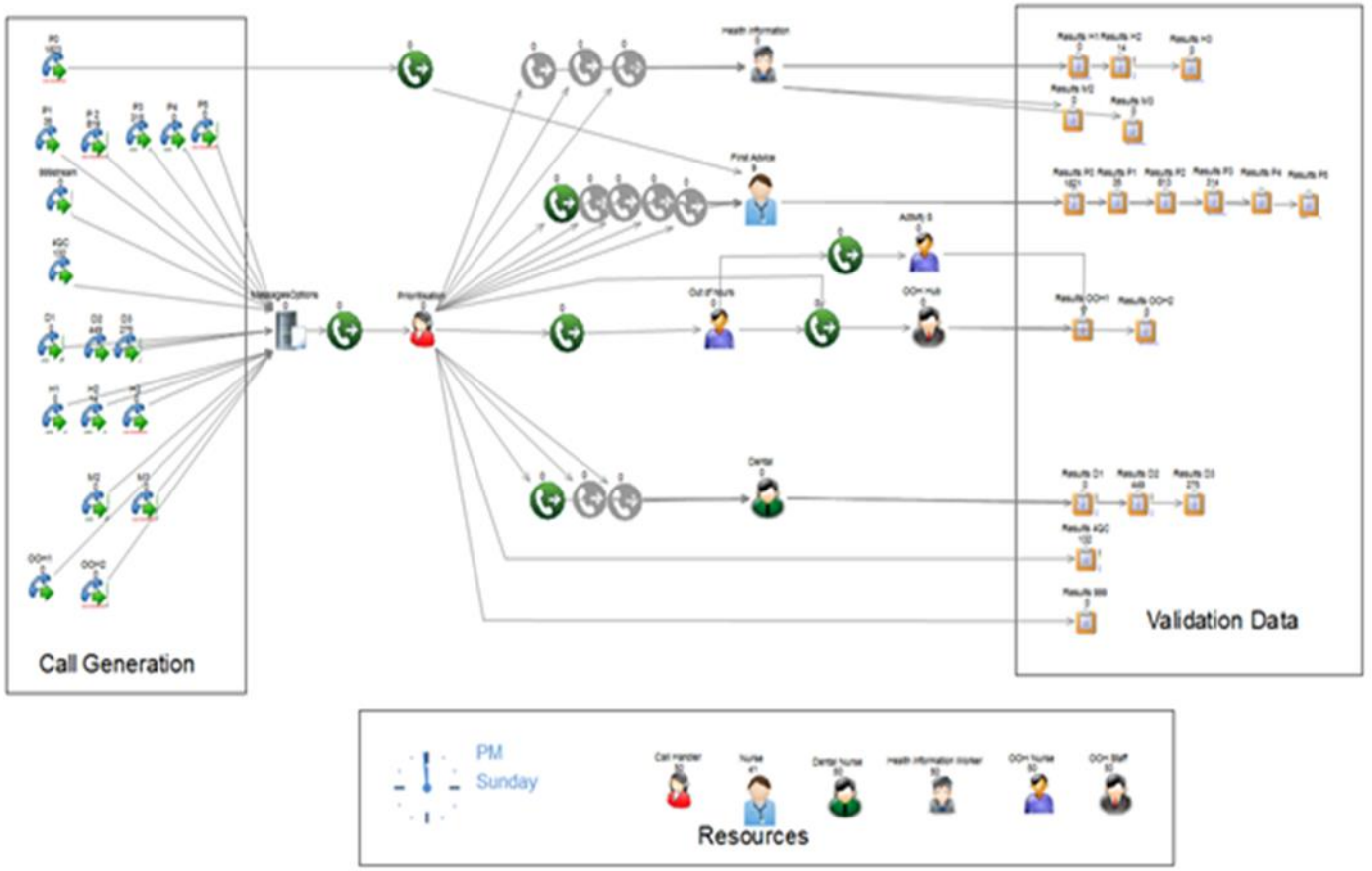
- **Data Analysis:**
  - Approximately 800,000 call records
  - NHS DW
  - GP Out of Hours (one per health board)
    - Approximately double the number of calls
- **Develop separate models for each of the current services**
- **Develop a combined service model**
- **Run baseline model**
- **Scenario testing**
  - Different staff roles



NHS Direct Wales



Combined model



Impact of the model

- **Allowed the '111' team to assess different workforce options**
  - Nurses providing telephone advice
- **An estimate of frontline costs ahead of the service**

- **Communication of the results to Welsh Government**
  - Further continuation of the pathfinder project
  - Introduction of '111' into ABMU and subsequent health boards

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Case Study 3: Demand and Capacity

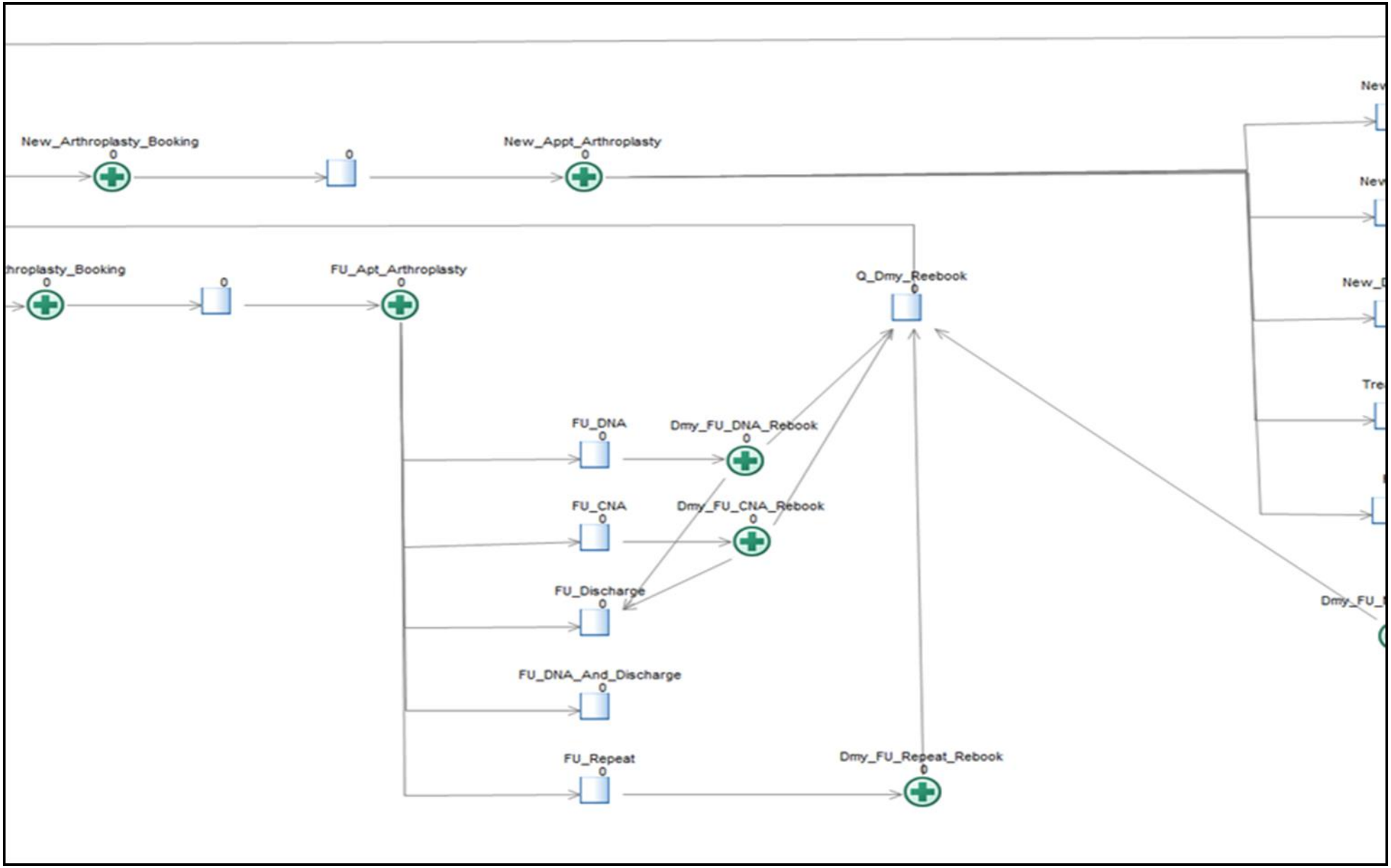
Problem / Research Question

- Is there a better way to understand the demand on the service?
  - Usually the service focuses on activity

- Can we feed the results from the model into the health board's 3-year plan?
  - True referrals
  - Staff capacity
  - Variation

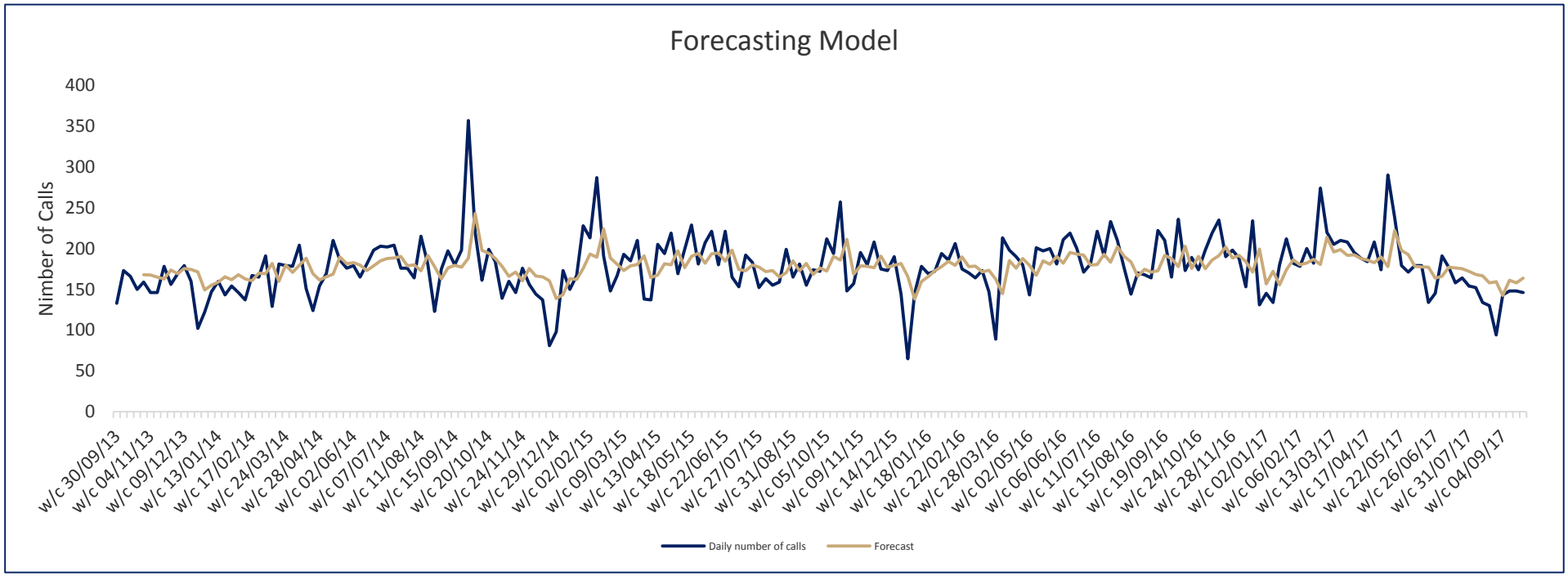
Method

- Modelling fellow project
- Developed following a previous DES model for ophthalmology
- Initial model
- Data analysis
  - Daily,
  - Weekly
- Forecasting model
- Pilot study on one sub-specialty



Impact of the model

- Understand the referral demand from each sub-specialty
- Understand variation
- Feed into the health board's 3-year planning cycle



Final thoughts & future projects

Thoughts

- Based on comprehensive data sets or shadowing exercises
- Allow visualisation to clinicians and managers
- Baseline models and scenarios
- High level reconfiguration and patient flow projects

- **Future work**

- Planning for a new critical care centre
  - Based on 600,000 patient episodes
- Cancer pathway

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Aneurin Bevan Continuous Improvement

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