Intelligent Hospitals

Delivering Standardisation of Hospital Design

July 2021
• Formed in 2017
• Strategic and infrastructure advice to health and social care clients
• Team of more than 60 professionals
• 4 offices:
  • Midlands - Birmingham
  • Southwest - Bristol
  • North - Leeds
  • London
• Multi-faceted:
  • Healthcare Planning
  • Technical Advisory
  • Business Case Authorship
  • Estate strategies
  • Project Management
  • Property Advice

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• Head of healthcare planning - Midlands
• Healthcare Planner
• Architectural Background – Estates focus
• MSc Planning Buildings for Health
• Better Business Case – Practitioner
• HBN Guidance
What is Intelligent Hospitals?

• Standardisation of Design
• Standardisation of Digital Design
• Designing for Sustainability
• Delivering Modern Methods of Construction
Background

• The NHS is embarking on the largest investment in health infrastructure in a generation.
• The NHS has a long history of developing national guidance
  • First HBN published in 1961
• Guidance has been adopted and adapted globally
• Little updating of guidance in recent years
• Recently, a number of high-profile new-build hospitals have fallen short
• Programme of updates to HBNs is underway
• Intelligent Hospitals will take a macro approach to compliment HBNs
• Provide a repeatable approach to support the New Hospitals Programme
Supporting NHP

• 40 new or updated hospitals
• Multi-billion pound investment
• NHS must scale up every aspect of support, including guidance
• Standardisation to ensure quality and value for money
• Things have moved on since the days of Nucleus
• BIM technologies and VR solutions
• ‘Digital Twin’
• Respond to specific needs of each HIP project
• Repeatable but not restrictive
## Arguments for and against

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### Mitigations

- Guidance needs to be flexible and tailored to local circumstances
- Wide consultation across medical and design professions
- Ongoing research and refreshment of guidance
- Guidance to form part of ‘Employer’s Requirements’. Design and build risk taken by contractor
- Engagement with established organisations such as Architects for Health, RIBA, IHEEM and BRE
The Building Blocks

Hospitals vary in type:

- Extensive green or brown field sites that allow a campus development
- Developments on a cleared part of an existing hospital estate where the existing facility will be demolished on completion of the new hospital
- Developments on very tight, very dense inner city sites

Standardised design needs to be adaptable to all hospital site types.
Floorplate

A common floorplate & grid that can accommodate all major services:

Ward Level  
Theatre Level  
Imaging Level

“The flexible building block”

Example of adaptable wing

ICU beds  Outpatients  Inpatients
Standardising the process

Intelligent Hospital is not a ‘one size fits all’ template (ie. Nucleus)

Instead based on a kit of parts approach:

- **Rooms** – to refine and expand the library of repeatable rooms
- **Clusters** – suites of rooms that can be assembled into departments
- **Zones** – master planning and connecting departments
  - Horizontal and vertical adjacencies / stacking
- **Floorplates** – connecting the departments with public spaces, circulation and logistics systems.
Methodology

Considerations to provide opportunities for repeatability in each department:

• **Operational policies**: provide guidance notes where appropriate

• ‘Rules’: A set of ‘rules’ has been set out on which the next stage of the Intelligent Hospital programme can be based.

• **Repeatable rooms** have been identified

• **Issues** have been identified that need to be resolved in greater detail before proceeding further

• **Unit sizes** where appropriate

• **Typologies** where appropriate

• **Clusters**: the size of the suites of rooms which can be standardised
Key departments – Inpatient Wards

- 32 bed wards
- 8-bed clusters
- 100% Single Rooms
- Nested ensuites
- Optimised visibility
- Adaptable to ICU
Key departments – Theatres

- Differing models of care
- Inpatient and daycase flows
- Daylight to theatres
- Clusters of 4/8 theatres
Key departments – Imaging

- Standardised room size
- Design to fit multiple modalities
- Clusters of 2 or 4 imaging rooms
- Separation of Inpatient / OPD flows
- Daylight to waiting areas
Key departments – Emergency

- Standard repeatable room size for Majors/Minors
- Standard repeatable resus rooms
- Cubicles with glazed partitions
- Maximise daylight
- Separate facilities for children
- Separate SDEC facility
Key departments – Outpatients

- Standard repeatable clinic rooms
- Bookable space vs. specialist
- Shift towards virtual consultation
- Accessible and identifiable
- 6 / 8 room generic clusters
Standardising Digital Design

• Development of the ‘Digital Twin’
• Reduce environmental impact of construction
• Improved decision making that enables critical infrastructure to operate effectively
• Scenario planning and predictive analytics
Design for Sustainability

• Off-site manufacture can reduce carbon emissions through more efficient processes
• Reduces city centre emissions and disruption from site works, including particulates;
• Increase design adaptability and potential for disassembly and reuse;
• Increases the efficiency of the design process, reduces bespoke design solutions and products for on-site creation.
Delivering Modern Methods of Construction

• Opportunity to ‘industrialise’ the hospital development and construction process
• Open Source Designs available to architectural, engineering and construction teams
• Standardisation throughout the supply chain • Merging the Digital and the Physical Processes
• Move away from stop-go capital developments to ongoing modernisation of the health estate
Next Steps

• Review of first 8 NHP Projects underway
• Collaboration with NHP Trusts to identify good practice and efficiencies
• Development of the ‘NHP Playbook’
Thank you

Questions?