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INTRODUCTION

Gray Baynes and Shew Architects were commissioned by the Oxford Method Royalties Management Group in 2004 to carry out research on the following topics:

- A review of current published best practice in healthcare design
- A study of Oxford Method Hospitals including a review of how they perform against best practice “benchmarks”
- Interviews with relevant clinicians
- An analysis of how Oxford Method Hospitals can be modified to reflect best practice in healthcare design

A REVIEW OF CURRENT BEST PRACTICE IN HEALTHCARE ACCOMMODATION AND OBSERVATIONS ON FUTURE DIRECTIONS

This part of the study consisted of an information trawl of the following published documents:

- Health Building Note 4 (In Patient Accommodation)
- Health Technical Memoranda
- Infection Control in the Built Environment
- Various publications on:
 - sleep in hospitals
 - space/design of hospitals
 - travel distances
 - environmental psychology
- Medical Architecture Research Unit Publications
- American Institute of Architects Conference Notes
- CABE Publications

(the titles of those publications reviewed and analysed for relevant findings are set out in Appendix 2)

In addition a number of UK clinicians were interviewed ranging from Directors of Medicine through to Senior Nursing Staff.

A REVIEW OF CURRENT BEST PRACTICE IN HEALTHCARE ACCOMMODATION AND OBSERVATIONS ON FUTURE DIRECTIONS - SYNOPSIS

1. WELFARE

- Human needs of patients not to be neglected in the creation of technically efficient facilities.
- Patient empowerment, the desire to retain control and independence.
- Disturbance to rest and sleep. Control of noise (separation).
- Feeling of warmth and welcome - pleasing décor, art shape and appearance of rooms.
- Low cill heights.
- External landscaping.
- Motorised blinds and curtains.
- All beds to receive natural daylight.
- Courtyards with good access.

2. THEORY/PLANNING

- A preference is emerging for a four-bedded room with designated sanitary facilities for each bedroom accessed not from within but from just outside the sleeping area. Each patient has a corner to provide a “home base”, the distance to washing and lavatory facilities is short.
- Each multi bedroom should include or have easy access to a sitting area.
- All single bed and multi bed rooms should have an ensuite WC and shower designated for use by people of one gender at a time.
- All sanitary facilities should be accessible and manageable by people with physical or sensory disabilities, and should be no more than 12m from bed areas or the day room.
- Bidets should be provided.
- If multi bed rooms are used there must be a quiet separate room for consultation.
- Informal social spaces with window seats and low ceilings/alcoves are preferable to large impersonal day rooms.
- Occupancy and lengths of stay are dramatically improved by the introduction of single bed rooms (occupancy grew from 75% to 90% and average length of stay reduced from 10.2 to 7.4 days). Readmission rates are also dramatically improved.

- Single bedrooms has the implication of requiring large bed spaces. The business case will depend therefore on the high utilisation opportunities of single bed rooms.
- Contrary to staff expectations at Poole Hospital most patients said they preferred small ward-based accommodation rather than single bed rooms.
- The Poole Hospital conversion clearly demonstrates that a building designed originally for multi-bed room layouts with an average of 25% circulation is inefficient in design terms for single bed room solutions.
- The larger the area per bed in a room the lower the travel component as more equipment can be brought to and stored at the bedside.
- Increasing the floor area allocated to bed areas increases the percentage of time spent on patient specific activities.
- There are 49 known 'stressors' in hospital. The highest stress level is caused by unfamiliarity of surroundings (having a stranger sleeping in the same room, being woken up in the night etc).
- One of the most taxing problems for patients and staff alike is trying to maintain privacy and dignity. In an open ward of any configuration, any conversation, any clinical intervention and any action on the part of the patient can be overhead.

3. AREAS

- The addition of clinical and family support zones to the bed space will result in an increase in size from previous single bed room of 14m².
- BCIS survey of 75 projects showed average refurbishment costs as 68% of new build.
- Since the 1950's the provision of space in wards has remained fairly constant averaging about 25m² gross area per bed.
- The area per bed space as a proportion of the whole has remained fairly constant at a mean of approximately 60% of the total floor area.

4. THE FUTURE

- The volume of activities that centres on the patient in the bed space is increasing. The level of dependence and disability is high movement around the patient is considerable, and there is likely to be a high use of equipment and aids around the bed. Relatives and visitors are more involved and prepared to assist in patient care and support.

- Single beds provide:
 - Complete flexibility of use for patients of either gender, any age and most clinical conditions including source isolations.
 - Increased opportunity for shortening turnover intervals thus raising annual occupancy.
 - Privacy for treatment and personal activities.
 - Confidentiality of discussion.
 - Quiet for sleep and rest.
 - Staff travel distance reductions.
 - Patient control of environment.
 - The ability to have visitors without causing disturbance (including 'sleep overs')
 - Good control of infections by:
 - min bed pitch of 2.7m
 - smallest possible numbers of beds in each grouping
 - toilet facilities at min 12m distance from beds
 - removal of baths
 - provision of single rooms
 - sufficient sinks and basins
 - dirty and clean utility rooms
 - hard flooring
 - good staff changing facilities

AN ANALYSIS OF OXFORD METHOD WARDS

(3 layouts - Wards 21, 22 and Labour Wards included as illustrations)

ORIGINAL LAYOUTS

Oxford Method wards are predominantly 4 and 6 bed configurations with a number of units having an additional resource of single rooms. In all cases the philosophy was for communal sanitary facilities.

The accommodation is predominantly based on the ground floor. Window to wall ratios are conventional (although cill heights are high) giving adequate levels of natural daylight and ventilation levels of artificial ventilation are poor. Ceilings heights are adequate.

Acoustic absorption levels are good whilst acoustic insulation between units is poor. There is also a considerable problem of noise breakout from the nurses station and sanitary accommodation disturbing sleeping patients.

The sanitary accommodation itself is at some distance from many of the beds and not well overlooked by nursing staff. Conversely, it does have good levels of privacy.

The major concern is the mixed sex nature of the sanitary accommodation although it is true that over the past five years government funded patient dignity initiatives have seen the conversion of many blocks of Oxford Method sanitary accommodation to single sex provision. Where this has been done, it has, if course, exacerbated the problem of travel distances from beds.

The bed spaces themselves are undersized in modern terms. They have a bed to bed pitch of approximately 2.3 metres which does not allow for the large amounts of modern equipment clustered around the patient; it is not good for the suppression of infection; it does not reflect on the rapid growth of bed head TV services (which can invade the privacy of adjacent patients); it also fails to take account of the more intensive nursing requirements of many bed-bound patients today. (These patients require additional space for relatives to spend longer periods of time with patients and larger groups of clinicians attending on the patient).

The configuration of rooms into 4 and 6-bed bays is probably close to the ideal where single rooms are not an option. However, it is clear that single rooms are now becoming more common and it is assumed that over the coming decades we will move to a position where single beds will form the largest proportion of the beds in any given unit.

These configurations are very efficient in terms of space utilisation, capital cost and revenue implications. They are also easy to nurse and result in good staff/patient ratios.

The overall ambience of these units is generally acceptable within the confines of the constraints set out above. Although the long (relatively narrow) corridors and preponderance of stored items along them does lend a rather unkempt and careworn feel to them. The interiors generally cannot be seen as getting close to the best practice in the design of therapeutic, healing environments as expressed in some of the leading edge designs around the UK and in NHS guidance.

Day rooms feature widely in all units. They are somewhat “sterile” and bleak in many cases, being remote from the rooms they serve and having little in the way of architectural modelling and outlook to commend them. Of more concern, they are threatened by various redevelopment/remodelling exercises and have occasionally been lost.

An analysis of an Oxford Method remodelling exercise at Wexham Park Hospital:

3 refurbishment/remodelling projects have been visited and analysed at this hospital. Ward 21, Ward 22 (both general medicine) and a Labour Ward. It was decided that the Labour Ward project was too specialised to hold out any general examples of Oxford Method Bedspace improvement and for that reason has not been included in this study.

General principle of refurbishment:

These wards are disposed in 6-bed bays with grouped sanitary accommodation at some distance from the bed bays.

The brief given to the architects was to incorporate en-suite bathroom accommodation in to each single room and to each group of six beds.

The patients dining room was under-utilised and was therefore sacrificed.

The general concept was to create a small en-suite shower room with toilet and basin in the centre of the window wall for each bay. This layout worked well with existing fenestration and avoided the need for alterations to windows and doors.

Inevitably there was a loss of a single bed space in each 6-bed group because the space remaining (to one side of the en-suite) has proved to be unpopular and difficult to nurse.

Although not specifically mentioned by nursing staff as a problem the proximity of the sanitary facilities to the beds and the arrangement of the door opening does lead to a loss of privacy.

The single rooms were refurbished to incorporate en-suite accommodation by means of either remodelling adjacent store rooms or building small facilities within the volumes of the rooms.

In each case the wards have lost only one bed space.

There were other consequent refurbishments and improvements on a room by room basis such as day rooms and nursing/baby food kitchens.

Floor finishes in the corridors were changed from carpet to vinyl sheet. This has improved hygiene but has resulted in a number of slips and trips and increased noise on the ward.

The overall ambience is now good and the improvements taken as a whole have lifted the qualitative perception of the unit from a rather drab institutional, "legacy" design to something which more closely represents the NHS ideal of modern healthcare design.

Further directions for Oxford Method Hospital Wards:

In an earlier part of the Report we set out a review of the best practice in hospital design and attempted to precisely define those newly emerging elements of a hospital which promise improved healthcare outcomes. They were:

1) Welfare

- 1) Maximise patient and visitor ability to retain control of the environment and independence.
- 2) Control of noise.
- 3) Feeling of warmth and welcome.
- 4) Low cill heights.
- 5) External landscaping.
- 6) Motorised blinds and curtains.
- 7) Good levels of daylight.
- 8) Courtyards with good access.

2) Theory/planning

- 1) Preference for large 4-bedded room with designated single sex, DDA standard sanitary facilities outside of the sleeping area.
- 2) Easy access to a sitting area.
- 3) Separate consulting room.
- 4) Large single bed rooms where possible (15-20m²).

3) The future

- 1) Larger areas around bed for equipment.
- 2) Single sex provision throughout.
- 3) Many beds available for isolation of infection.
- 4) Space for confidential discussion.
- 5) Quiet for sleep and recuperation.
- 6) Reduce staff travel distances.
- 7) Space for relatives to sleep over.
- 8) Increased prefabrication.

Having analysed the optimum configuration of beds and their support spaces we set out as follows a matrix which attempts to predict which of these ambitions could be achieved by remodelling projects within Oxford Method buildings.

Element	Likelihood (H/M/L)	Cost (H/M/L)
1. Patient control over environment	H	L
2. Noise control	L	H
3. Feeling of warmth and welcome	H	L
4. Low cill heights	M	M
5. External landscaping	M	H
6. Motorised blinds/curtains	H	L
7. Good levels of daylight	M	M
8. Courtyards with good access	L	H
9. Preference for 4-bedded rooms	H	H
10. Easy access to sitting room	M	M
11. Separate consulting room	M	H
12. Large single bed rooms	M	H
13. Large spaces around beds	M	H
14. Single sex provision	H	M
15. Isolation beds	H	H
16. Space for confidential discussion	M	H
17. Reduced staff travel distance	L	H
18. Space for relative sleep-overs	M	M
19. Increased prefabrication	M	M

NOTES ON DETAILED ELEMENTS OF FUTURE PLANNING

1. Patient control over environment:

The research indicates that a known patient stressor is their inability to control such things as light levels, pitch and set of window blinds, temperature and ventilation.

Any remodelling exercise should seek to give each patient local control of these elements. This will normally be possible by means of remote control handsets, in-room valving, etc.

2. Noise control:

This is said to be the most important non-clinical criteria governing patient recovery rates.

During refurbishment or remodelling every effort must be made to select products and finishes (eg ceiling tiles, flooring, curtains etc which have the highest levels of acoustic absorbency (particularly in corridors)). There is an obvious conflict here with the requirements of infection control measures which generally seek hard floors etc.

Noise transfer from the nurses station to the ward should be contained at night by physical barriers such as doors or glazing.

3. Feeling of warmth and welcome:

This is relatively easy to achieve even in a rigorous grid building like an Oxford Method Ward. There should be a focus on rich colours, textures, enrichment of edges and changes of direction, good use of textiles and materials of quality. It is also vital to consider small details such as seating, handrails etc which make patients and visitors feel that their needs have been catered for.

4. Low cill heights:

This is of critical importance in that it allows patients and visitors to relax by focussing on vistas beyond the confines of their own rooms. Oxford Method buildings are particularly bad in this respect and seldom have low cill heights where patients may be undressed (for obvious good reasons).

It is technically feasible to reduce cill heights although the exercise would be expensive and may result in a need to re-clad large areas of the exterior of the building.

5. External landscaping:

Self evidently sensible and highly regarded by clinical researchers this is easy to achieve in most ground floor units.

6. Motorised blinds/curtains:

See point 1.

7. Good levels of daylight:

It is not considered feasible to increase the window/wall ratios (save for the lowering of cills described at point 4 - which would not increase the level of daylight within the room).

It is however, perfectly feasible to introduce rooflights into bedded areas although clearly this may occasionally be limited by services.

8. Courtyards with good access:

Courtyards may exist in some Oxford Method Units or they may be created by extension.

In any case they must be easily accessible, well landscaped and be equipped with generous seating.

9. Preference for 4-bedded rooms:

Many Oxford Method Wards already have 4-bed units. Others have six beds and it is sensible to consider removal of two of the beds and their replacement by much needed ancillary accommodation such as assisted shower/toilets (taking care to design the entrance to have good levels of privacy).

The reduction in patient numbers may well reflect the increase in bedded accommodation which is a factor of the current vogue for 23-hour surgery and day case work.

10. Easy access to a sitting room:

The literature cites this as an important method of suppressing anxiety. It is therefore ironic that day spaces are under significant pressure when clinicians seek to increase the number of beds at the expense of other valuable support spaces.

The research points to findings that seated accommodation need not be in formal (and often soulless day rooms) but can in many cases be small areas off corridors, eg bay window seats etc. These latter forms of sitting space should be easy to achieve.

11. Separate consulting room:

Where there are multi-bedded rooms it is essential that there be a comfortable consulting room adjacent, where clinicians can talk openly to patients who are well enough to walk (or be wheeled). This should be possible to achieve in any large scale remodelling exercise.

12. Large single bed rooms:

The single most widespread recommendation in all literature from all over the world is the adoption of single bed rooms.

The benefits are wider ranging and seem to greatly outweigh the disadvantages in nursing efficiency and patient camaraderie.

In the UK it is likely that any refurbishment of a state-run Oxford Method Ward will not seek to attempt 100% single room provision. It will instead seek to improve the ratio of single rooms to multi-bedded rooms from time to time.

13. Large spaces around beds:

This will only be possible if the health economy accepts lower patient numbers in Oxford Method Wards. As discussed at point 9 this may coincide with other trends in healthcare to increase accommodation elsewhere.

14. Single sex provision:

Self evidently important and clearly better facilitated by the move to single rooms.

15. Isolation beds:

The recent rise of hospital acquired infections is likely to turn political attention to this issue and may well speed the move to wider spacing of beds and more importantly to provision of single rooms.

16. Space for confidential discussion see point 11 above:

17. Reduced staff travel distance:

Where possible staff bases and observation points should be clustered as closely as possible around the beds (without causing noise nuisance).

This is more likely to be possible as a result of a large scale remodelling exercise, but should be a target for any redesign of the units.

18. Space for relative "sleep overs":

The research literature shows that this is critical to a patients chances of good recovery (particularly children and adults with partners). Fold down beds may be achieved in single rooms but are not likely to be possible in multi-bed wards.

19. Increased prefabrication:

The literature calls for hospital designers to take account of the need to maximise the chances of utilising prefabricated elements.

This will only be possible under the auspices of the largest of remodelling exercises.

CONCLUSION

Oxford Method Hospitals have provided very high quality clinical space for approximately 30 years in many cases.

The thorough, rational approach to their initial design has given them a very long life in service and allowed many of them to survive remodelling and change of use.

The units are generally in central locations on hospital sites and for that reason are likely candidates for future changes of use.

They are however threatened by:

- lack of commitment/poor maintenance
- new forms of healthcare funding (PFI etc)
- large scale estate rationalisation exercises
- rising standards in building technology (including anxiety over asbestos content)

As can be seen from the study it is possible to fulfil many of the aspirations set out in the literature as exemplars of current and future best practice in healthcare design.

However, Hospital Administrators and Estates Directors should take note that the maximum benefit will be gained from remodelling only if there is a realisation that bed numbers in these particular buildings will be reduced as a result of the project.

This may not be the disadvantage it at first seems if it is conceded that other new buildings on the estate will provide the additional bed capacity lost by Oxford Method improvement projects.

This author feels that the retention of clinical space at the very heart of hospital estates demands that the design be of the highest order to enable the units to have the longest possible future ahead and thus the lowest cost in service.

APPENDIX ONE

NOTES OF SITE VISITS TO:

- MILTON KEYNES GENERAL HOSPITAL

Thursday 15 July at 10am

In attendance: John Marshall (Oxford Method), Nigel Spawton (Gray Baynes & Shew), Kathy Lee (Milton Keynes General Hospital), Ruth Hopkins (for Gray Baynes & Shew).

Ward 4

Phase 1 - "L" shaped ward - 6 Method

6 beds per bay, single sex. At bed head - trunking and gases. Much use of ambulatory equipment (hoists etc.) but space ok.

Use of baths is much less - shower rooms preferred (except for gynae)

Ward 21

Not Oxford Method. Temporary building - now permanent.

Orthopaedics - a very large shower room for each 6 beds as Ward 4.

2 bays and 2 side rooms (with ensuite) - red.

2 bays and 2 side rooms - blue.

Side rooms allocated on a "needs" basis - disabled and carers, HMP Category 1 or Infection.

Side rooms also used for elective physiotherapy.

Where glass has been used it has usually been necessary to obscure it.

Space around beds up to current HTM. 3M bays.

Glass fibre wall covering.

Ward 17

Phase 2 "T" shaped ward. Support on leg of T.

Used for Day surgery and 23 hour admissions.

1.8m "bed" bays used for trolleys and reclining chairs for recovery.

6.6m x 7.2m - poor observation due to curtaining.

Single sided day lighting made ward dark.

Children's Unit - 6 beds at 2.4m spacing.

Ward 19

Major surgery unit. All admissions are pre assessed for suitability in a treatment room adjacent to the ward up to 6 months before admission.

23 hour ambulatory care ward - 24 beds.

A temporary wall has been erected between corridor and bed bays but nursing staff advise doors remain open.

Observation room - nearest to nursing station has 4 bed male and 4 bed female (major surgery etc.)

8 side rooms

6 and 4 bed bays

Fill up male and female beds first

Side rooms last - used for HMP, MRSA, children, adolescents, pregnancies, breast cancer etc.

23 hour surgery admissions are growing at the expense of major long stay surgery. They are soon moving to a 40 bed unit.

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- WEXHAM PARK HOSPITAL

Friday 16 July 2004 - File 5135/11

In attendance: John Marshall (Oxford Method),
 Nigel Spawton (Gray Baynes & Shew)

Maternity Block

Jane Ostler (Clinical Manager)

Now 5 beds in lieu of 6 - Shower and toilet now close by - not at a distance.

Loss of Dining Room - patients now eat by their beds.

Babies are taken into the nursery for bathing as there isn't quite sufficient space. (4 beds would have been better)

Regeneration trolleys are a feature of all units.

Bed Bay width 2100 to 2200.

Quite dark - not enough windows.

Incredibly noisy

Appeared full, even when not.

Hard floors in place of carpets have caused accidents !

Space

Technical equipment won't get any bigger.

Somewhere needed for fathers and birthing companions - particularly during induction.

Side rooms (5 beds) used for : Infection control, Bereavement rooms, Private rooms.

Ultra Modern Units are more labour intensive on staff

Open Rooms are preferred for sociability.

- STOKE MANDEVILLE HOSPITAL

Thursday 29 July 2004 - File 5135/11

In attendance: John Marshall (Oxford Method), Ken Cooper (RNT Director of Estates), Nigel Spawton (Gray Baynes & Shew) and Ruth Hopkins (for Gray Baynes & Shew)

Several changes of use over the years. Possible visits today to : Wards 21 to 23 (2m), Day Surgery Unit, John Hampden (Acute Mentally Ill providing respite for carers - now leased to Buckinghamshire Mental Health Trust), Eye Unit (Designed and built as GP Maternity Unit and Delivery Rooms converted to theatre.

Observations :

Ward 21 to 23 :

Poor legibility (easy to get lost)

Originally a Chest and Orthopaedic unit, then General Surgery.

Now part of Admissions.

Minor alterations have been very problematic. All services for above are in ceilings.

Presence of asbestos. 600 x 600 ceiling tiles - screw holes give burden of asbestos fibre dust. NB: A fire at Battle Hospital caused ceiling tiles to crack across corners and fall out.

Door frames sagged and doors dragged. The frames have been braced with steelwork.

6m unit was designed by David Brown.

Originally obstetrics - some obstetric beds changed to Gynae. It is still a maternity unit.

Brick and Pitched.

HBN now says Bed Bays should be min. 2.9 x 2.9m - for equipment and infection control.

Ward 8 (not Oxford Method) is used as the "cohort" ward for MRSA.

Some patients could be in 5 beds within 2 days !

There is unlikely to be a reduction in bed numbers required - despite shorter stay. It is not good practice to look at reducing bed numbers further.

PFI Hospital :

People tend to ask for 1:1 single rooms.

A 2 bed room is the worst of all - too quiet.

Paradoxically a Nightingale Ward is good because of the noise level. They are also light and airy.

Royal Bucks patients moved into Oxford Method buildings complained of poor air quality.

Visits :

Wards 21 to 23 - Opened 1976.

Derbigum and Erisco Bauder roof

Surgical Ward. Noisy and crowded.

Nurse station with no view of bed bays. Facing into corridor.

Lots of equipment in corridors (patient notes, trolleys etc. etc.)

Medical Emergencies from time to time - 24 hrs only.

Maternity

3m corridor. Feels too wide.

Eye Unit

Brick clad

Very nice feel - good balance of light and ventilation.

Good corridor width.

Incorporating theatres, day rooms, quad, side rooms and bed bays.

APPENDIX 2

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