The bed area represents the focus of a patient’s territory and experience during a short or long stay in hospital. Most people would rather be at home. Comfort and a sense of well-being is a cornerstone of recovery and it follows that ward layout and design are of key importance. Typically the wards account for around 50% of the accommodation in a general hospital.

Many factors impact on the patient’s experience, including:
- Dignity / privacy / personal space
- Opportunity to socialise with others
- Safety / infection control
- Daylight quality
- Views out / landscape / activity
- Bedside space for family and friends
- Natural ventilation / air quality
- Observation of patient by staff and vice versa

It is interesting to reflect on the evolution of bed area design over time from the old institutions in Wales inherited by the NHS when it was formed in 1948 and to trace the approaches to planning which have developed during the years since.

It is an evolution starting with dormitories in ‘Nightingale’ wards and culminating in hospitals under construction which will accommodate all patients in single bedrooms.

The plans shown illustrate the principles which have prevailed during this time and highlight the nature of the spaces within the ward envelope.
The story begins over 200 years ago. When the NHS was instituted in the middle of the twentieth century it inherited a stock of Poor Law Institutions, Infirmaries, Voluntary Hospitals founded by charities and Municipal Hospitals by local authorities from 1930 onwards.

A common thread in all of these inherited hospitals was the Nightingale ward with its beds arranged against the external walls of a large dormitory. Depending on length these could accommodate as many as 36 beds. Nursing staff would generally have a table/desk situated centrally at one end of the dormitory which was the precursor of the nurse base of today.

Access to WC/bathrooms and dayrooms would be at either end of the dormitory which meant that the one space doubled up as the main circulation space. There was a consequent lack of privacy for patients.

As the beds were located end on to the external walls with windows there were issues of draughtiness and glare for patients in beds against the opposite wall.

Generally the Nightingale nursing unit was linear in plan and in some later versions incorporated some smaller multi bedrooms and a couple of single rooms for patients with infectious conditions.
In the frugal post war years waiting lists for NHS inpatient treatment increased and new ward accommodation was built to consolidate the services on existing sites.

More significantly, the Welsh Hospital Board developed the strategy for the provision of District General Hospitals throughout the Principality. Nine of these projects were developed from 1954-1973. These include: Singleton, Royal Gwent, University Hospital of Wales, Ysbyty Glan Clwyd, Prince Charles and Ysbyty Gwynedd.

The ward layout adopted in this generation of hospitals followed the same basic model. It comprised a series of adjacent bays each housing 6 beds (sometimes 4 beds) arranged along a main corridor with the sanitary and ancillary rooms on the other side. Typically each nursing unit would consist of four or five bays with a nurse base/station situated centrally opposite, flanked by four single bedrooms.

Variants on the general theme incorporated some 4 bed or 2 bed bays. Whilst most multi bay plans were linear, some were configured in L or T shapes which reduced the institutional effect of a long straight corridor.

A number of advantages were evident over the dormitory model:

- The main circulation traffic is separate from the bed areas
- The window wall runs parallel with the beds so that patients have light and a view on one side but do not suffer glare.
- The 6 bed bay is less 'regimented' than a Nightingale ward with more privacy and more corner spaces.
Nucleus merits particular mention as it was so widely adopted as the default solution for planning general hospitals from the mid 1970s throughout the UK for the next 25 years. Welsh examples include Morriston, Bridgend, Wrexham, Llanelli, Llandough and the Royal Glamorgan near Llantrisant.

Based on standard cruciform ‘templates’ of 1000m² which could be connected along either side of a ‘street’ the Nucleus package comprised standard plans for almost every conceivable department of a District General Hospital. The standard plans achieved space and therefore cost savings on Building Note norms, and claimed energy efficiency and fire safety amongst other benefits.

Nucleus was conceived as a low rise hospital with the wards at first floor level. Each template accommodated 2 x 28 bed wards configured back to back. Within each ward the 28 beds are housed in 4 x 6 bed bays and 4 single bedrooms clustered around a central nurse base. Some office and ancillary spaces are shared between the two wards in the threshold stem area accessed from the street.

The cruciform geometry of the template achieved much in terms of planning the whole hospital but imposed real constraints on the ward plans which constituted half of the total footprint area:

- 6 bed bays required the bedhead walls to be external window walls
- Dayrooms were small and uninviting
- Most of the ancillary spaces had to be planned in the core of the template requiring artificial light and ventilation

In the eyes of many, these shortfalls represented a backward step from the previous generation of ward plans contributing to the criticism of ‘template tyranny’.

The Nucleus Default

Royal Glamorgan Hospital, 2000, 28 Bed Ward
The echelon ward was conceived and developed in Wales. It originated in the first of what was to become a new generation of purpose built community hospitals. The brief for the new hospital in Mold required 2 x 20 bed wards and specifically rejected the 6 bed bay format. Each ward should have 4 single bedrooms with the remaining 16 beds in Nightingale dormitories. At the time this came as a shock to the design team who felt this form of planning was 50 years beyond its sell-by date. The brief was driven hard by a nursing officer who insisted that all the beds should be readily supervised from a single nurse station without the need for nurses to patrol the corridors. Moreover, he argued, staff numbers could be kept to an economic minimum if Nightingale prevailed.

The echelon ward with its staggered bedhead walls divides the ‘dormitory’ into 2 areas of 8 beds with the nurse base at the pivot. Four single bedrooms are clustered around the nurse base with the dayroom diagonally opposite. Thus all the main patient spaces have optimum sightlines and access from the nurse base.

Each patient is afforded a personal corner space by the echelon geometry of the bedhead walls, which allow a wardrobe area and parking space for the bedside cabinet alongside the bed. The L form of the ward plan facilitates segregation of male and female patients each with adjacent WCs and bathrooms. Ancillary rooms are arranged along external walls to maximise on natural light and ventilation.

The Mold echelon plan was repeated at Aberdare. Variants with a larger number of beds were built into Chirk and Deeside Community Hospitals. A hybrid of Nucleus with a changed template shape incorporating echelon 6 bed bays in an acute hospital context was built at the Princess of Wales Hospital, Bridgend.

AN ECHELEON VARIATION

MOLD COMMUNITY HOSPITAL, 1983, 20 BED WARD
The current shift towards ward planning where single rooms accommodate all or most of the beds is clearly of great significance. It is being pioneered in Wales by Gwent Healthcare NHS Trust in two new hospitals under construction – Ysbyty Ystrad Fawr, Caerphilly (270 beds) and Ysbyty Aneurin Bevan, Ebbw Vale (110 beds).

Rising consumer expectations, gender privacy issues and the escalating problem of superbugs with cross infection are amongst the compelling drivers for change. These now are deemed to outweigh earlier counter arguments of increased floor area / construction costs. The previously held view that supervision of single rooms requires higher levels of staffing is rejected and addressed by the adoption of ‘lean’ working practices supported by decentralised nurse bases.

Professor Roger Ulrich’s expertise and work on evidence-based design in this area has informed and stimulated the debate in Wales. The single room policy in Gwent was chosen for the following stated criteria:

- Improved control of healthcare associated infections
- Minimal patient transfers
- 24 hour admissions without disruption
- Peace and quiet for sleep
- Control of environment
- Privacy for cultural and religious practices
- Confidentiality and openness for patient information
- Privacy and dignity
- More flexibility – gender, age and clinical condition
- Less disruption due to high occupancy levels
- More potential for sustainable development – natural daylight etc.
- Better contact with families and carers

The rationale is compelling and Wales is once more in the vanguard of UK hospital design.