

Hospital Study Tour Report

March/April 2011

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Working as One

Study Objectives

- To inform the New Bendigo Hospital Project through enquiry in key domains of:
 - Design
 - Model of Care
 - Technology
- Focus on approaches to balancing emergency and booked activity, use of enabling technologies to support care and enhance patient safety

Study Constraints

- Scale of visited Hospitals
 - Large
 - Diverse services
- Emphasis of host
 - Constrained by local visit/tours policy
 - Understanding/Interpretation of Study Objectives
 - Key staff availability
- Cultural and Language challenges

Study Constraints

- Researcher Bias
 - Balancing Emergency and Non-emergency demand
 - Maternity Services
 - Surgical Service models

Itinerary

- Norway
 - Oslo – Akershus University Hospital
 - Trondheim – St Olavs University Hospital
- UK -Coventry and Warwickshire NHS Trust
- Italy – Carregi Hospital

Akershus University Hospital Oslo Norway



Design



Main “eave” walkway heading towards main public entrance

The most notable non-visible characteristic of this covered way is the ambient music that is played through the overhead speakers –positive first impressions

Design



Central Street atrium
ceiling

Floor crossovers

The Central Street is the primary pedestrian path with informal eating, internet access and retail space, understated and resonant with the general quiet ambiance of the main hospital.

Design

Expedition, open and welcoming

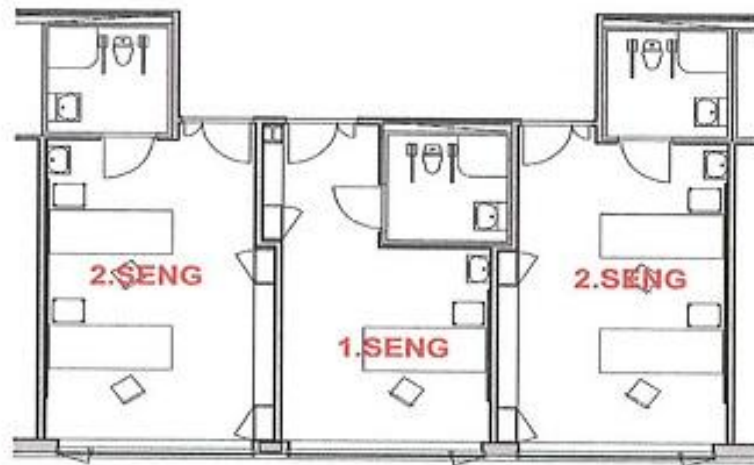
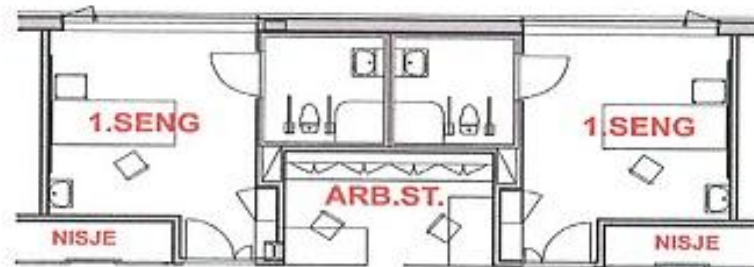


Significant open space areas with light use

Design

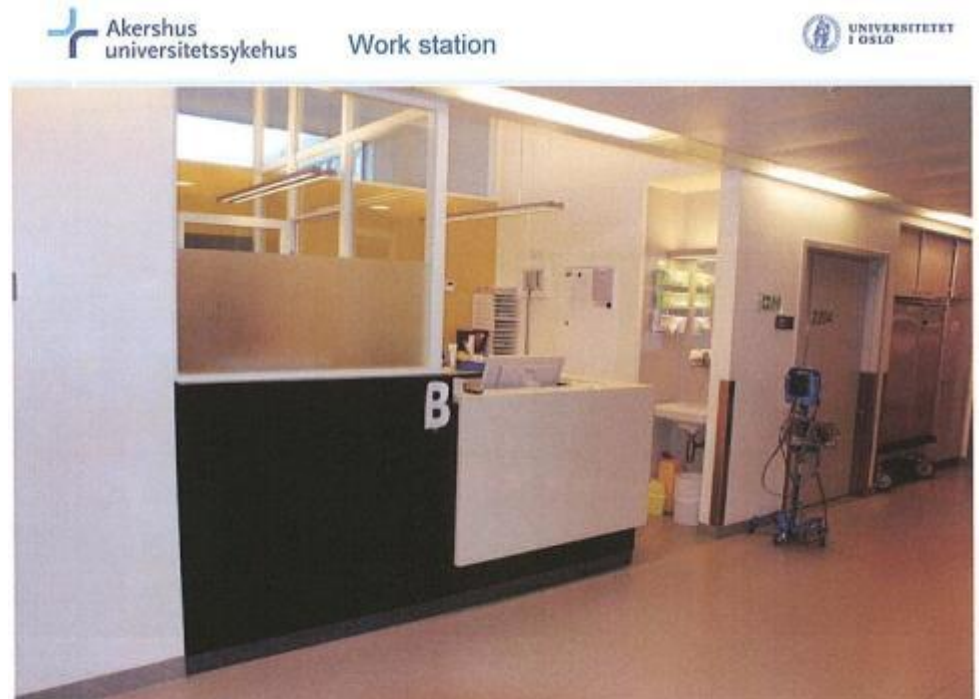
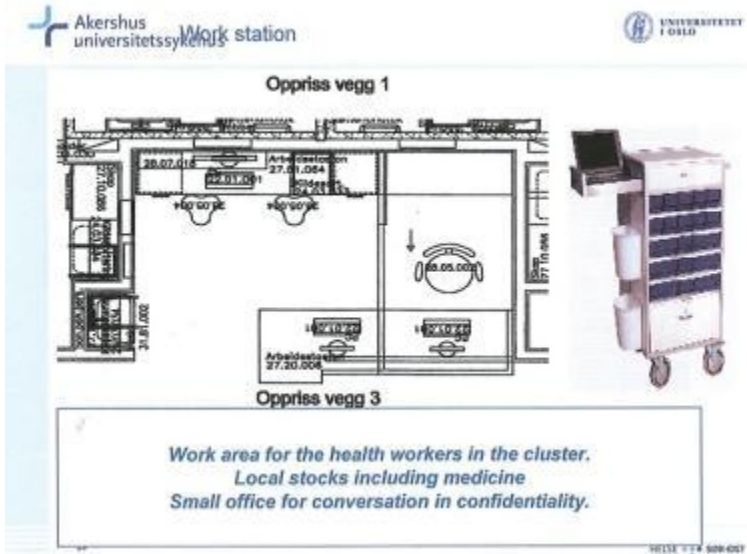
Bed ward

- 28 beds- 2 isolation rooms
- 4 clusters of 7 beds
- 1 and 2 beds room all with bath.
- Patient terminal (PC-TV)
- Work station
- Niche: storages for goods and clothes



Design

Distributed staff pods
High levels of staff dissatisfaction with the space and configuration



Design

- Other Pros and Cons
 - + patient focused
 - + fully enclosed ambulance disembarkation, this space provided mass casualty surge capacity space (gassed)
 - + functional relationship of LDRs and ORs
 - + parents room in neonatology for o/n stays
 - theatre suite design – 14 ORs in a row
 - 70m² theatre underutilised
 - open plan medical staff office – “dysfunctional”
 - inadequate storage space

Models of Care

- Emergency/Planned Demand Balancing
 - ED not a primary care service (Norway wide)
 - GP Referral
 - Ambulance
 - Self presenting time critical emergencies
 - Supported by good 24 hour primary care services in the community
 - Dedicated Trauma (ortho) x 1
 - Emergency Surgery Theatre x 1

Models of Care

- Maternity
 - 8 LDRs supporting 4,500 births (avg 1.5 prpd)
 - Supported by design with LDR comprised of examination room, bathroom and delivery room
- No dedicated obstetric theatre, list vacancy management provides for one of the two closest ORs to be available and these are provisioned for obstetric emergencies
- Patient Hotel plays a key role in LOS
 - Patient remain “admitted” in pt. Hotel and the area has a small nursing/midwifery presence
 - Rooms are also made available for rent to visiting family, subject to availability

Technology



- AGVs
- Services with scheduled delivery requirements e.g. food, stores, linen etc.
- 15 FTE saving

Background for the bed wards

- Patient in focus
- Closeness patient and health workers
- Team
- Right person/ right competence on right place
- Generality - flexibility



Technology



Extensive Pneumatic Tube System
Specimens, blood and
pharmaceuticals

Technology

Work clothes – automated delivery by robot



11

HELIX - SIKRUM

Work cloth robot



11

HELIX - SIKRUM

Uniform Robot

- Staff ID card operated
- Uniform delivery at start of shift for all staff
- RF Chip enabled uniform is delivered to specific staff member/designation
- 30% reduction in recurrent uniform costs
- Time and Attendance Feeder

Technology



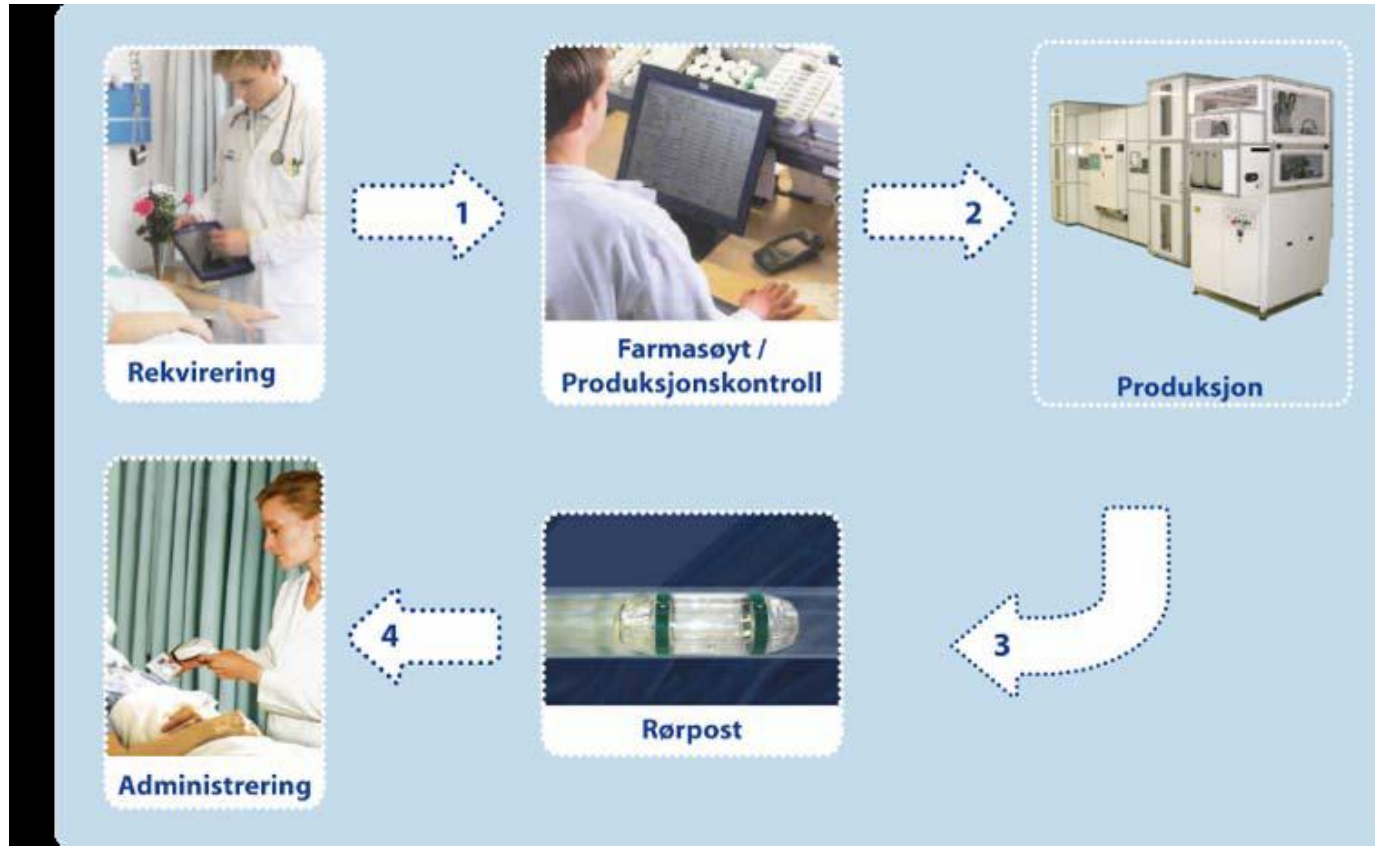
Bedside Computer Terminal

- Patient entertainment and communication

- Clinical Information Terminal

Approach being reviewed as staff interruption of patient use has generated excessive interpersonal friction

Technology



Pharmaceutical Supply Automation remains WIP, while technology elements are in place the “system”, including the change management remain under construction

Technology



IMATIS

Køsystem Innstillinger

Poliklinikk (alle)

Ankommet	Enhet	Pasient	Time	Send To:	Status	Ventetid	Send Message	Utskriv	History	
	Regjster	Ortopedisk Poliklinikk	Patient 42	14:45				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 43	14:55				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 44	15:05				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 45	15:15				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 46	15:25				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 47	15:35				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 48	15:45				Vis		
	Regjster	Ortopedisk Poliklinikk	Patient 49	15:55				Vis		
	Regjster	Hørsentralen	Patient 50	16:05				Vis		
14:42		Hørsentralen	Patient 51	07:55	Audiometrim Rom (N302)	Venter	33 min.	Send melding	Utskriv	Vis
	Regjster	Hørsentralen	Patient 52	08:05				Vis		
14:30		Hørsentralen	Patient 53	08:15	Audiograf	Venter	17 min.	👉	Utskriv	Vis
14:30		Hørsentralen	Patient 54	08:25	Arms Annsen	Venter	17 min.	Send melding	Utskriv	Vis
	Regjster	Hørsentralen	Patient 55	08:35				Vis		
	Regjster	Hørsentralen	Patient 56	08:45				Vis		
	Regjster	Hørsentralen	Patient 57	08:55				Vis		
	Regjster	Hørsentralen	Patient 58	09:05				Vis		
	Regjster	Hørsentralen	Patient 59	09:15				Vis		

Hva synes du om programmet?

Check in Kiosks
Queuing
SMS Alerts

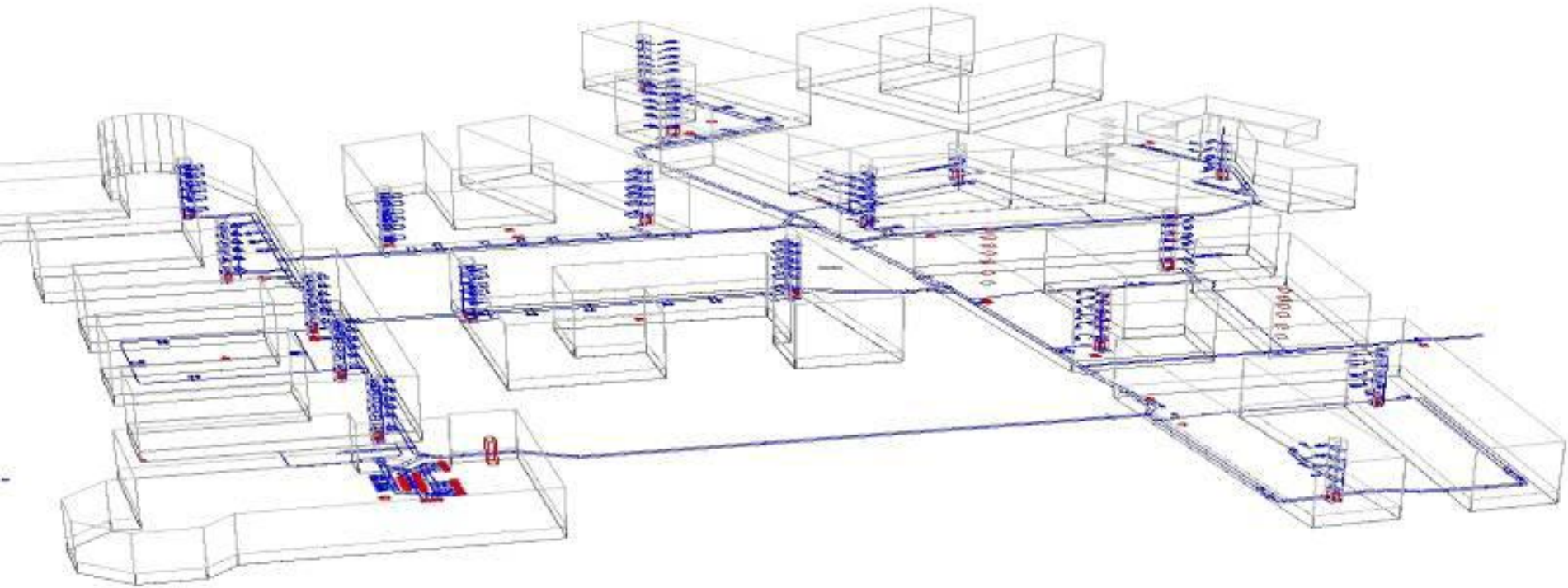
Technology

- Integrated EMR and Order/Results
- Integrated IP Communications
- Smart Cards
 - Swipe Logins to all data terminals
 - Access to facilities and devices including parking lots, retail stores, robots, workstations etc.
- Voice Recognition
- Point of Use Consumables System

St Olavs Hospital Trondheim Norway





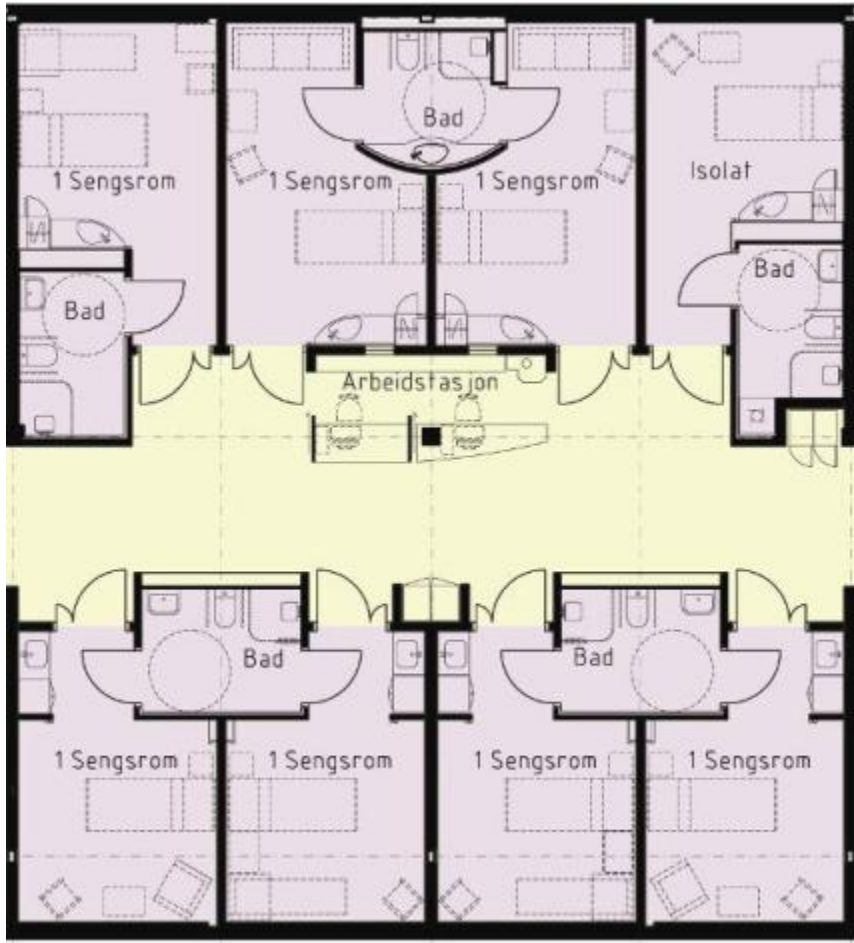








Design



Bed Clusters – 8 beds
Mix of Shared and Dedicated Ensuites
Staff Station for each cluster

Design



Staff Station

Consistent message of serious dissatisfaction with staff station design, centred around issues of clinical communication, confidentiality and clinical functionality
Some patient rooms have been converted into collaboration and handover rooms

Design

- Other Issues
 - Open Planned Clinician Offices were being retrofitted as offices
 - Inadequate storage space
 - Impressive vestibule spaces, but inadequate clinical communication, planning and management space
 - University vs Hospital
 - Imbalance between Patient Centred and Clinical Functionality considerations

Design



Retrofit Offices in
Open Plan space

Design



On Ward patient meals and visitor area
Food Service model is predicated on patients dressing for meals served in the dining room. Only those clinically unable to attend have meals in room

Models of Care

- Emergency/Planned Demand Balancing
 - ED – same entry ticket rules as Akershus
- 3 Dedicated Emergency/Trauma Theatres
 - Developed system of Triage Categorisation of emergency/trauma surgical cases, with expected to treatment times from 0 to 72 hours
 - Defined low urgency cases wait for surgery at home
 - Well supported by dedicated ICT

Peri-operative Coordination and Communication System

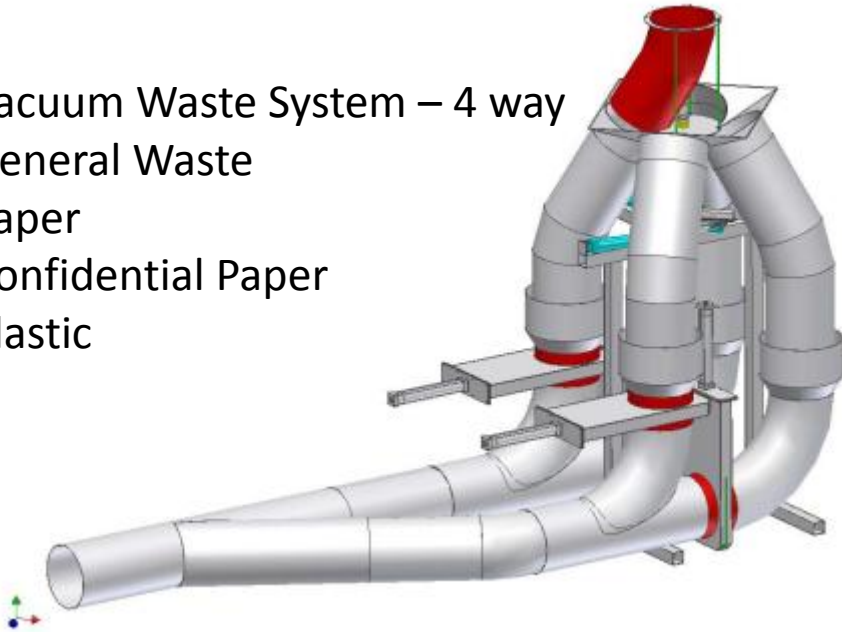


Models of Care

- The overall Hospital design and construction reflects the “organ based” organisation of service and care models
- Maternity
 - One of the 5 Women’s ORs is a dedicated obstetric emergency theatre
 - Every examination room in unit and in OPD has ultrasound
 - All midwives and obstetricians are sonographer trained

Technology - Advanced Logistics

Vacuum Waste System – 4 way
General Waste
Paper
Confidential Paper
Plastic



AGVs



Pneumatic Tube and
Robot



Uniform
Robot

Technology

- Automated Drug Supply – also WIP
- Check-in and Queuing
- Patient Terminal
- EMR
- Voice Recognition
- Integrated IP Phones and Nurse call
- Visualisation (AV) in ORs



University Hospitals Coventry and Warwickshire NHS Trust



Design

- Main Street Design
- Separation of Public and Service Traffic
- Corridors 1/3 of a mile in length



Design



Entrance Foyer
Busy and noisy area

Real Time Public
Transport Information

Health Information

Retail and Cafe Precinct

Design



Outpatient Department
Central waiting room
Innovative roof

Design



Helipad

Models of Care

- Surgical Services
 - Emergency Surgery Theatre - 24/7
 - Trauma Theatre 8.30am – 9.00pm daily
 - Obstetric Theatres – Emergencies and Booked
 - Theatres and Anaesthetic Services operate as a “Service and Supply Department” Lists are populated by surgical specialties and resource inputs provided by the Theatre Service
 - Theatre Sessions types – 4hr, 8,hr and 10hr (neurosurgery)
 - The business process is supported by dedicated software application OPERA

Models of Care

OPERA - Canadian product interfaced to PAS (iPM)

- Feeds the Clinical Reporting System, a presentation layer which is being grown as EHR
- Sterile Supplies and theatre consumables catalogues are being interfaced
- Prosthetic and Tray Level Instrument Tracking interfaced
- The software supports RFID feeds for up to 55 time points

Models of Care

- ICU
 - 19 beds
 - 66% Emergency
 - 34% Booked
 - Downstream bed block a key constraint
 - Full Vital Signs Capture with set MET criteria monitored by Critical Care Outreach Team
 - Design provides for separate entrance to isolation beds

New Bendigo Hospital Considerations

- What is enabling technology and is it defined beyond ICT and how might the cost benefits of opportunities like Uniform Robot or AGVs be examined?
- Have we got the balance right between patient centred and staff effective?
- How can we derive clinical efficiencies in the emergency and booked space with part time Senior Medical Staff?

Models of Care

- Same day and multiday surgery is separated
- Dual streams of Maternity care
 - Obstetric
 - Birth Centre (modelled on Australian services)
 - Protocol driven midwifery care
 - 30-35 births per month
 - Pregnancy attended by Community Midwife
 - Defined Obstetric (Hospital or Community) participation

Design

Birth Centre



Common Challenges

- All Hospitals described the following as key challenges:
 - Better patient flow
 - More day treatment
 - Reduced length of stay
 - Budgetary control
 - Reduced sickness absence among staff
 - Health Workforce Supply
 - Emergency/Booked demand management

Common Elements

- Senior Medical Staff
 - All hospitals have salaried medical staff
 - Very low, if any, Visiting Medical Officers
 - Senior Medical Staff working for the single employer
- This appeared to offer benefits in areas such as engagement and work scheduling, however, placed different demands in relation to office policy

Common Themes

- Balance of Staff and Patient needs and interests through the design process
- Integrated IP communications make a positive difference
- Electronic Medical Record with automated clinical data capture
- Smart logistics are providing recurrent savings
- Dedicated Theatre Management Systems are improving throughput and patient safety

New Bendigo Hospital Considerations

- Does our ICT and Technology Planning have a throughput and patient safety focus?
- We need to ensure the appropriate clinical input into such planning?
- What models of food service and pharmaceutical management do we want?

Acknowledgements

Gratitude is Extended to Bendigo Health, the Department of Health and the New Bendigo Hospital Project for the opportunity to conduct the tour and to present feedback.