ACUTE SERVICES REDEVELOPMENT PROJECT

SERVICE/DEPARTMENT

Out-put Based Specification

Critical Care

Planning Group Lead: A McCullough

<table>
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<tr>
<th>Version</th>
<th>Date</th>
<th>Author</th>
<th>Comments</th>
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<td>2</td>
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<td>P Tate</td>
<td>Review of document and request for further information</td>
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<td>3</td>
<td>28.05.13</td>
<td>J Laurie</td>
<td>Review of document and additional information added</td>
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<td>4</td>
<td>14.07.13</td>
<td>P Tate</td>
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<td>24.07.13</td>
<td>P Tate</td>
<td>Removal of outside space</td>
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INTRODUCTION AND OUTLINE OF SERVICES

1.1 Departmental Function

Critical Care is where specialised care is provided to patients whose conditions are life-threatening and who require comprehensive care and constant monitoring. This is normally provided in an Intensive Care Unit (ICU – Level 3 Care) and/or High Dependency Unit (HDU – Level 2 Care).

Critical care services for the region are provided currently from Dumfries & Galloway Royal Infirmary.

The development of intensive care and high dependency care has been driven by the evidence that severely ill patients will benefit from a greater intensity of medical and nursing care than is available in general wards. The weight of clinical opinion supports the view that intensive care improves the survival of these patients.

ICUs (Level 3 care) are staffed to a minimum ratio of 1 patient to 1 nurse and are managed by a Consultant with special interest in Intensive Care (currently all anaesthetists). Currently the ICU operates a “closed unit model” where the anaesthetic team control admission and discharge.

High Dependency Units (Level 2) are staffed to a minimum ratio of 2 patients to 1 nurse. The patients within a high dependency unit remain under the care of their Consultant Surgeon or Physician. The units are supported by the anaesthetic department as and when required. Currently all consultants admit to HDU this is often referred to as an “open unit model”.

Further information about critical care levels of care can be found in the intensive care society guidance published in 2009.

1.2 Specialist/Tertiary Services

None of the 3 ICU/HDU’s units currently deliver any tertiary services. There are various categories of patients who require to be transferred to tertiary centres, such as those requiring specialist Neurosurgical, Cardiothoracic, and Paediatric care.

Between Jan 2011 – December 2011 at least 19 patients were transferred to other ICUs out with NHS Dumfries & Galloway.

1.3 Current Service Configuration

1.3.1 Bed/Treatment Area Numbers

<table>
<thead>
<tr>
<th>Area</th>
<th>Bed Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU</td>
<td>4</td>
</tr>
<tr>
<td>Surgical HDU</td>
<td>4</td>
</tr>
<tr>
<td>Medical HDU</td>
<td>8</td>
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</table>

1.3.2 Access to Imaging & Laboratories

Diagnostic imaging is provided by the imaging department using dedicated mobile x-ray machines and image intensifiers which are kept within close proximity of the units.
Access to imaging is available 24 hours a day, 7 days a week.

ICU and HDU units rely heavily on laboratory support in the diagnosis; assessment, treatment and monitoring of critical care patients. Local laboratory testing (blood gas and glucose monitoring) is available within the ICU and medical HDU. The Operating Theatre department also make use of these facilities.

Critical care staff has ready access to laboratory investigations and results using the vacuum tube system.

Blood and blood products are currently located within a single fridge that is located within (and monitored/managed by) the laboratory area. This arrangement continues to be the preferred model for future blood and blood product management.

Access to laboratory services at DGRI is 24 hours a day, 7 days a week.

The ICU is located in close proximity to imaging, laboratory, theatre and recovery facilities (on the same level). Medical and surgical high dependency units are currently situated on a floor above and access to these services is via lift.

1.3.3 Specialist Technical Infrastructure Requirements

Critical Care facilities are, by their nature, complex and technically demanding environments, within any acute facilities, where the acuity of the patients being cared for places much higher than normal demands on facilities, services and technology. These requirements are highlighted in more detail in later sections of this brief relating to proposed facilities/services.

1.4 Capacity For Investigation/Treatment Of Current Referrals

Dumfries & Galloway Royal Infirmary does not have staffed 24-hour recovery areas that support theatres. Patients who require prolonged recovery and those operated on “out-of-hours” are frequently accommodated in critical care beds, however, this process is not anticipated in future.

Intensive Care Unit

In the year Jan 2011 – December 2011 there were 293 patients admitted to ICU with bed occupancy of 80.8%. Throughout the year there are peaks and troughs in number of patients requiring intensive care support.
Surgical HDU

Surgical HDU activity data confirms that the daily dependency scoring attributes 63% of patient days to Level 2 care at 81.3% occupancy. This equates to 2.0 level 2 beds and 1.2 level 1 beds.

Medical HDU

Data from the medical HDU shows that the daily dependency scoring gives 65.2% of patient days at level 2 with 62.9% occupancy. This would equate to 3.3 level 2 beds and 1.8 level 1 beds.
1.5 Patient Activity (by function)

Activity is as follows:

Table 1 – Number of annual admissions to ICU (source: SICS Audit Group)

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tr>
<td>DGRI</td>
<td>273</td>
<td>276</td>
<td>334</td>
<td>331</td>
<td>304</td>
<td>324</td>
<td>316</td>
<td>285</td>
<td>298</td>
<td>293</td>
</tr>
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</table>

Table 2: Number of annual admissions to HDU (Source: SICS Audit Group)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical</td>
<td>313</td>
<td>336</td>
<td>360</td>
<td>393</td>
<td>392</td>
<td>431</td>
<td>418</td>
</tr>
<tr>
<td>Medical</td>
<td>841</td>
<td>783</td>
<td>793</td>
<td>823</td>
<td>804</td>
<td>854</td>
<td>731</td>
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</table>

In 2011 the average ICU bed occupancy was 80.8% meaning that for 7% of the time the unit was over the ICS recommended bed occupancy rate. The total number of bed days was 1180 (1460 capacity) with an average length of stay (LOS) 4.0 days with a median of 2.0 days. This reflects the impact of long stay patients on bed usage and the pressure exerted on Level 3 beds when certain patients have a protracted stay.

1.6 Effect Of System Redesign/Balance of Care/National Strategy

Whilst demographics show greater numbers of older patients with multiple co-morbidities within Dumfries & Galloway, it is anticipated that new models of care and care pathways will be developed.

More advance therapies, repatriation of patients and centralisation of specialist services may have a varied impact on demand for high dependency beds.

Co-location of ICU, medical HDU and surgical HDU will support some of the anticipated increased needs. The developing concept of flexibility between Level 3 and Level 2 beds, through the creation of a co-located “Critical Care Unit”, will create facilities that will be better able to manage “activity peaks” at any given care level.

1.6.1 Current Links with Other Centres
Specialist tertiary services such as cardiac, paediatrics and neuro are provided centrally. Patients requiring coronary stents are transferred to the Golden Jubilee Hospital.

Vascular services are currently shared between Carlisle and Dumfries. However, the bed modelling for Critical Care assumes that this elective activity will take place elsewhere (West of Scotland/Carlisle) in future.

1.7 Impact Of Current Location/Configuration On The Running Of The Service

1.7.1 Positive

- Adjacencies of Imaging and Theatres to ICU
- Identity of individual units

1.7.2 Negative

- Layout of units
- Lack of space
- Non compliance with SHPN standards
- Different equipment, processes and protocols in each unit
- Medical cover
- Inefficient and inappropriate use of beds
- Separation of the three critical care areas

1.8 Current Service Risks

The main challenge facing the delivery of safe patient care is the effect of Modernising Medical Careers (MMC) and the European Working Time Directive (EWTD) on medical staffing and in particular the implications of this - in combination with increasingly stringent training and delivery standards - on short-medium term service sustainability.

Recruitment and retention of specialist critical care staff is challenging.

The significance of this risk cannot be underestimated, as failure to address it will result in critical care services becoming unsustainable.

2 SERVICE TRENDS

2.1 Demand on Specialty/Service

2.1.1 Anticipated Future Activity

Extensive work has been undertaken by the critical care work group about future activity that includes an assessment of the impact of a wide range of planning assumptions on critical care services and capacity requirements.

Factors that have been considered in relation to future capacity planning for critical care services include:
• Current bed numbers
• Occupancy and length of stay
• Level 1 care in ward with support from critical care and pain team
• Managing existing unmet need
• The impact of co-location/redesign (The Critical Care concept)
• Historical and future growth/trends
• The impact of staffing changes/redesign
• The impact of technology/new treatment regimes
• Vascular service change

Results of analysis of ICU/HDU data from Scottish Intensive Care Society Audit Group (SICSAG) and a needs assessment are included below:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Ward</th>
<th>Current</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>ICU/SHDU</td>
<td>8</td>
<td>10.0</td>
<td>10.3</td>
<td>10.7</td>
<td>11.0</td>
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<tr>
<td></td>
<td>Medical HDU</td>
<td>8</td>
<td>8.0</td>
<td>8.5</td>
<td>8.9</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
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<td>18.0</td>
<td>18.8</td>
<td>19.6</td>
<td>20.2</td>
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<tr>
<td>Scenario 2</td>
<td>ICU/SHDU</td>
<td>8</td>
<td>9.0</td>
<td>9.3</td>
<td>9.7</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>Medical HDU</td>
<td>8</td>
<td>7.9</td>
<td>8.4</td>
<td>8.9</td>
<td>9.1</td>
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<tr>
<td></td>
<td>Total</td>
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<td>16.9</td>
<td>17.7</td>
<td>18.6</td>
<td>18.9</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>ICU/SHDU</td>
<td>8</td>
<td>8.3</td>
<td>8.6</td>
<td>8.9</td>
<td>9.1</td>
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<tr>
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<td>6.4</td>
<td>6.8</td>
<td>7.2</td>
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<tr>
<td></td>
<td>Total</td>
<td>16</td>
<td>14.7</td>
<td>15.4</td>
<td>16.1</td>
<td>16.5</td>
</tr>
</tbody>
</table>

• Scenario 1 (no change) would require 2 – 4 additional critical care beds
• Scenario 2 (Vascular removed) would require 1 - 3 additional critical care beds
• Scenario 3 (Level 1 care provided in general wards) shows projected bed numbers within current capacity

It has been recognised that the present arrangements for the management of level 1 patient’s will need to change. Proposals to support this will be agreed and implemented well in advance of the new facility opening.

2.2 Technology / Developmental Technology

Developing technology may require the transfer of more patients to tertiary care for specialist treatment and earlier repatriation for continuing high dependency care.

2.3 Assessment & Admission Criteria

The decision to admit or refer any patient to the Critical Care Facility ICU/HDU is the responsibility of the appropriate consultants i.e. the referring consultant and the Consultant on call for the Critical Care.

The ‘Gatekeeper’ role is key to the efficient running of Critical care. The referring (speciality) Consultant cannot always fulfil this role. However, in the interim period it will be important to establish the principal of a “closed” unit.

With regard to elective admissions any anaesthetist or surgeon may pre-book a bed. This does not guarantee a bed but helps in planning.
2.4 Nurse Practitioner/AHP Role Enhancement

The critical care advanced nurse practitioner role will become increasingly more important with the anticipated reduction in medical staff resource. This will create more opportunities for a stable workforce with local knowledge.

2.5 Multi-Disciplinary & Multi-Agency Working

A wide range of AHPs are involved in the delivery of critical care e.g. Physiotherapists, Pharmacists, Dieticians and Speech Therapists.

2.6 Other Factors Affecting Activity And Treatment By 2015 / 2020

Issues such as EWTD and training and recruitment and retention, as identified previously, need to be considered for future years. Co-location of ICU and HDU facilities may alleviate some of the pressures that will face the organisation in trying to provide a service to all areas. Co-location of the units will allow much better use of staff available.

2.7 Treatment Trends

Increasing centralisation of services will mean vascular surgery and oesophagectomies will be performed elsewhere. Increasingly, patients will be repatriated from tertiary centres for continued care at D&GRI.

2.8 Likely Technical Advances

The implementation of “Enhanced Recovery Programmes” in combination with less invasive surgery will reduce activity levels associated with, for example, bowel cancer cases/level 1 epidural care in inpatient wards.

2.9 Service Delivery Transitional Risks

A number of development activities require to be implemented to mitigate risk and prepare for future model of care. These include:

- Level 1 care on wards
- Workforce Planning
  - Change in the medical staffing of current units
  - Development of ANP roles
- Aligning policies and procedures
- Dedicated educational time
- IT development
- Planning the move

3 CLINICAL/SERVICE MODEL & PHILOSOPHY OF CARE

3.1 Philosophy of Care

By using a team approach we aim:

- To meet the physical, psychological and social well being of patient and carer/ relatives by assessing, planning, implementing and evaluating care.
To care for the critically ill patient by the most able staff, under the best possible conditions with the best of modern equipment.

Deliver safe holistic care in accordance with professional codes, standards and charters.

To preserve the dignity and confidentiality of each patient as an individual.

To provide a platform for the education and training of all staff and students.

3.2 Model of Care Delivery

The `Gatekeeper` role is key to the efficient running of Critical care. The referring (speciality) Consultant cannot always fulfil this role.

- Closed model of care whereby a nominated clinician acts as gatekeeper controlling admission and discharge from CCU
- Care shared with referring clinician but responsibility with critical care team.
- Consultant led.
- Multidisciplinary working and optimised skill mix
- Dedicated to critical care and resuscitation.
- Extra support from Anaesthesia / Medicine on call if required.
- Transfers by Consultant in Critical care / Anaesthesia or retrieval Teams.

3.3 Future Service Scope

Critical care beds will be required for the management of level 2 and 3 patients only.

3.4 Patient/Process Flow & Service Delivery

The majority of patients will be admitted to the Critical Care unit via the Emergency Department, Combined Assessment Unit or theatre.

The majority of patients and their ongoing care will be transferred to a ward.

Clear admission, transfer and discharge criteria, along with the implementation of the “closed” unit will be essential for bed management.

Patient movement will be minimised within the unit.

3.5 Future Service Delivery Risks

Recruitment and retention of specialist critical care staff.

New speciality, in Intensive Care Medicine and Faculty (FICM) with single CCST.

4 FUNCTIONAL CONTENT

4.1 The Proposed Facilities/Accommodation Overview

The additional information provided in this section is intended to provide a brief description of key functional areas.

Patient Bedroom
- Space for bed, reclining chair and resuscitation equipment
• Visual and accoustic privacy
• Maximise outside views from window.
• Adequate lighting and ventilation
• IT pendant at foot of bed
• Reverse Osmosis water source in all rooms
• Hand wash basin
• Alert system for contacting staff in emergency and patient call system
• Ceiling mounted hoists
• Minimum 28 power sockets (Uninterrupted Power Supply provision)
• 100% single rooms
• Light over bed must be controllable and bright
• Glass panels must maximise visibility and observation into bed spaces. However, privacy and dignity must be able to be achieved at all times.
• Cabinet for storage with locked pharmacy cupboard with workspace on top
• Electronic whiteboard screen at each bed space [clarify requirement]

En-Suite
• Wet room with shower
• Hoist
• Oxygen and suction points
• Waterproof power points

Communications Base
• Open
• Resuscitation/ airway trolleys readily accessible for checks with power points
• Central station for monitors and alarms
• Telemetry capability across Critical Care
• Minimal book/folder storage in cabinets
• Close access to pneumatic tube system

Seminar Room
• Screen and projector
• Teaching board
• Teleconferencing facilities (GCH)
• No bench space

Relative Waiting area
• Several groups / movable partitions
• Comfortable chairs
• Beverage facilities
• TV and computer access (Wi-Fi)
• Notice board
• Rails to mount art work
• Disabled pay phone
• Video camera for access & security

Interview Room
• 8 seats
• 1 sofa bed
• Close proximity to WC
• Panic/ alarm system
Entrance
- Separate entrances for patient/staff and relatives
- North and South Wings? Own buttons – Bespoke call entry system
- 2 level of security access for relatives and visitors
- Zoning and lockdown for staff and visitor areas
- Streaming of access requests with names for Wings??

Pantry
- Ice maker
- For patients and relatives (too dangerous in relatives area) [Only o Relevant
Healthcare Issues / Examples ne Pantry in SOA]
- Storage of enteral feed - ? additional fridge

Clean Utility
- Preparing trolleys for sterile procedures (central and arterial lines, Tracheostomy, epidurals, chest drains)
- Checking and preparing drugs
- Storage of sterile supplies and packs
- Security for drugs with swipe access
- Division of room into 2
- Sink for hand washing
- IV fluids
- Medication fridge
- Controlled Drug cupboard and additional locked cupboard for K+
- All drug cupboards have locks
- Internal/ external drug separation

Bulk Supplies Store
- Surgical supplies and IV fluids
- Bed pans and bottles
- Respiratory supplies

Imaging Bay
- Storage of mobile digital x-ray machine
- Ultrasound machines x2
- Lead coats with hangers
- Power sockets x4

Resus Trolley Bay
- Power sockets x 4 for charging equipment
- Shelves for storage of disposables
- Checking book and audit forms stand

Transfer Trolley
- 2 trolleys
- Power points
- Shelves for kit bags and monitor spares
- Oxygen storage (?in medical gas room)

Medical Gas Store
- Fire resistant
- External wall
Furniture Store
- Beds, chairs, hoists, mattresses

Equipment store
- Ventilator and circuit store
- Lockers for staff and patient belongings

Clinical Equipment store
- All other electrical equipment including infusion pumps, IV poles, monitors such as Doppler

Medical Physics Test area – [? in Equipment store]
- Gas points
- Service manuals
- Shelves for circuit storage

Laboratory
- Blood gas machine
- Fridge for storage of samples?
- Sink for hand washing
- Bench space

Handover Room
- Table and chairs to seat 8
- Glass walls for visibility (above bench height)
- Projector screen and computer
- Bench space and power points on one side

Senior Charge Nurse Office
- Cellular office. Bench height glass to ceiling for other walls.
- Multiple IT Network points
- Filing cabinet x 1

4.2 Clinical Facility Requirements (How will it work)

4.2.1 Configuration

The Critical Care Unit should be located on a single floor.

There should be well defined routes within the department and to other areas for staff, patients and FM services. It should also be capable of maintaining appropriate flow separations including:

- Clinical/FM transport route separation
- IT access in all clinical and staff areas, with access to administration systems and VC equipment.

- All staff carry portable communication systems that will enable immediate contact and alert to colleagues within Critical Care and adjoining areas e.g. Operating Theatre.

The unit will maximise access to natural light wherever possible.
The anaesthetic department will be adjacent to and on the same floor as Critical Care and Operating Theatres. This area should provide a single block of rooms with associated support accommodation. It is important that all rooms are serviced by a single reception and appropriate supporting utilities.

4.2.2 Reference to internal relationships/adjacencies

Close proximity to anaesthetic departmental facilities, training space and workstations and to theatres.

4.2.3 Access Requirements

The administrative accommodation component should also be accessible through a non-clinical route, although entry to clinical areas through admin space should also be strictly controlled.

Have strictly controlled access at all times that is consistent with the whole hospital security strategy.

4.3 Opening Times (When will it work)

Open to relatives 24/7 under the direction of a Senior Charge Nurse.

4.4 Specific Design Considerations

Maximise daylight
Good visibility of patient rooms
Alarm and communication systems to facilitate safety of patients and staff
Direct access to seminar room from hospital corridor

4.5 Design Guidance

SHPN 17
To comply with all relevant SHTMs and building guidance

4.6 Environmental and Services Requirements

There must be separate lifts and routes for visitors and relatives; these lifts should also be accessible to staff. There must also be separate well-defined routes for patients with no crossover.

Direct access from the main loading bay should be possible to facilitate the transfer of supplies.

Natural light in patient areas and staff office and training accommodation is essential.

Each light in the single rooms should be dimmable from the patient’s bedside. Additionally adequate arrangements should be made for the illumination of anaesthetic machines and monitors.
All areas in which anaesthetic gases are inhaled or exhaled must be provided with active gas scavenging systems. Air management systems must conform to relevant HBN, HTM and Infection Control guidance and standards.

All floor, wall and ceiling surfaces must be washable and seamless and able to withstand frequent deep cleaning processes and chlorine based decontamination.