TECHNICAL GUIDANCE TO SUPPORT UNSCHEDULED CARE PERFORMANCE IMPROVEMENT

Special Delivery Unit (SDU)

OCTOBER 2011 – MARCH 2012
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1. Introduction

Patients are waiting too long, too often for admission to hospital following attendance at Emergency Departments (E.D's) in Ireland. This is leading to an unacceptable level of experience for patients, and compromising the levels of privacy and dignity we can achieve. Further to the experience issue, there is evidence to suggest that overcrowding in Emergency Departments can lead to higher mortality amongst the patients affected. We do not have specific evidence demonstrating that this is the case in Ireland at present, but if there is any risk that this is the case, there is a first-order collective professional duty to act to resolve the situation.

Overcrowding also has a detrimental impact on the proper functioning of Emergency Departments. Used appropriately, Ireland has an effective network of access to unscheduled care. But overcrowding downgrades our ability to offer rapid diagnosis, treatment or discharge for the majority of ED attendances with minor medical conditions and accidents, whilst ensuring resources are continually available for the receipt of undifferentiated medical and trauma presentations.

The solution to the ‘trolley wait’ problem will not be found within Emergency Departments. Unacceptable waiting in emergency departments is symptomatic of one of a number of other issues that need to be addressed. This means we must take an approach that considers each element of what we might define as the ‘unscheduled care system’. Its components are as follows:

GPs, community services, ED, MAU/AMU, medical wards, emergency and urgent surgical capacity, Hospital Consultants, Nursing, Health and Social care professionals, diagnostic capacity, discharge planning, home support packages, Fair Deal.

Of course, these are only the components that are funded statutorily. There are also many interacting elements from family relationships to the voluntary and private sectors that also have an impact on the ability of the system to provide high-quality, responsive care.

This document is designed as a reference resource and guidance document for the improvement of unscheduled care and the start of a systematic approach to eliminate excessive waiting in emergency departments. Each element has been discussed with the clinical and managerial leadership from every hospital at regional level in a series of 12 meetings over three weeks in September. These meetings, approved by ISD nationally and sponsored by the RDOs in each region, have shaped the scope and content of this guidance.

The document should be understood as a framework for co-ordinating the resources offering unscheduled care in Ireland to achieve the highest quality service possible for the period October 2011 – March 2012 and maximise the preparations for December and January when bed days are likely to experience their peak demand.

The contents of this document represent guidance in advance to support the introduction of hard targets for emergency department waiting that we anticipate being introduced from January 2012.
2. Clinical programmes

The SDU has a general policy that the clinical programmes represent the strategy for the development of healthcare services in Ireland.

The clinical programmes most involved in the short-term performance improvement agenda for unscheduled care are the Acute Medicine Programme (AMP) and the Emergency Medicine Programme. (EMP) In the future, the management of primary care, chronic disease and surgery will all be required to make a major contribution. The initial focus, however, is on the management of patient flow leading up to, including and immediately following the process of acute medical admission. The documentation for both these programmes has been considered in the light of the establishment of the SDU (the AMP in its published form, the EMP in its unpublished but finalised documentation). The SDU is in full support of all aspects of the designs proposed in the clinical programmes, and will support their implementation through the inclusion of key agreed metrics in the infrastructure we are developing.

The leadership of the EMP programme has been closely involved in the development of the nine time points in phase one of the ED ICT programme and in the plan to provide EDs in Ireland with an effective electronic patient management system. They have also been involved in the production of the patient-level web system developed to share the outputs of the time monitoring. Finally, the SDU is developing its performance improvement strategy in strict co-ordination with the EMP development plan.

With respect to the AMP, the SDU is co-sponsoring the project to review and upgrade the capability to track patients in AMU and MAU and exploring the possibility of integrated electronic records to improve workflow and risk management for patients who require shorter lengths of stay. The programme and the SDU is also jointly sponsoring work to examine ways to introduce effective professional accountability arrangements to ensure that the minimum agreed levels of support to the new system are reliably provided.

Both programmes participate in the weekly meetings with the SDU and the HSE in the active process to co-ordinate unscheduled care management and development within Ireland.

3. The Irish Nurses and Midwives Organisation (INMO) trolley wait indicator

On the way to the goal of eliminating trolley waits, we need to have reliable systems of measurement to demonstrate progress and indicate where sites are not making sufficient progress.

For the 6 month period of this guidance, the INMO trolley wait indicator will remain the core currency of evaluating trolley wait performance. Since we wish to achieve some level of progress over last year’s performance, we need to establish some threshold of improvement that we will aspire to this year.

Since we have not yet developed and launched each site’s improvement plan to eliminate trolley waits, and we do not have a reliable measure in place for patient journey times (though we hope to have remedied this in time for January 2012) it is difficult to establish a trajectory for improvements in the percentage of patients waiting less than 6 hrs.
An alternative approach to target-setting for the next 6 months period would be to use the INMO indicator to trigger responses at an appropriate level to ensure systems are in place to improve performance. It is clear from both the anecdotal and statistical evidence that the period following Christmas and into the first few weeks of January is the moment of greatest risk for the system not being able to respond to the community’s need for attention at EDs. It follows that this period should be where we focus our greatest attention.

On January 5th this year, there was a day when the trolley waits 'spiked' to a national level of 569. It is reasonable for us to set this as the ‘high tide’ mark and undertake the process changes, planning and reorganisation necessary to ensure that the situation in the coming December and January does not get this bad again.

We have undertaken an analysis of each site’s performance on the day of that peak, The trigger for each individual hospital should be set at 30% of the maximum trolley wait reported by the individual hospital during the November – February timeframe, and their current performance relative to this peak. We will interact with all hospitals during this period on an individual basis where appropriate.

We will leave the details of how each site should adjust their escalation plans to become sensitive to this threshold to the sites themselves, and with colleagues in the HSE will review any changes to escalation plans in early November.

It is clear from our analysis that a measurement system which accurately tracks patient level journey times in each hospital ED hour by hour, and a target journey time, is the most effective way of measuring and managing performance in the EDs. Our aim is to move to a system based on patient journey times with a maximum 9 hour wait. If we succeed in this shift, and succeed in delivering the 9 hour maximum, the present INMO trolley count figures should decline to acceptable levels as the improvement programme has its impact. We will maintain monitoring of the trolley count as a further validation of progress.

4. Proposals to revise the national ED access target

The SDU will be publishing separate to this document a consultation paper on the performance regime 2012 -14. This will propose the introduction of scorecards at hospital level containing hard outcome targets within three domains: quality, access and financial management. Every effort will be made to combine all of the performance information already being collated and where appropriate to discontinue any element no longer relevant.

The unscheduled care targets will form part of the access scorecard and will focus on the ability to respond promptly to unscheduled care demand in emergency departments. The rationale for this focus is:

- That this area is where at present patients are experience the worst delays
- There is evidence that overcrowding in EDs increases mortality risk

The present HSE target is to have 100% of patients waiting less than 6 hours from arrival at ED to admission, treatment or discharge. This was first proposed in the task force report in 2007, established to be achieved in January 2009- and remains in force for December 2011. However, to date this target has not been achieved. We will discuss the information
collection issue further in the section on ED ICT below but for now it is worth outlining a brief discussion of how we should consider recasting the target.

Target setting is not a science, but following a detailed discussion with the Emergency Medical Programme and discussion with the clinical and managerial leadership of each hospital during the recent weekly meetings, it seems that there is a reasonable consensus that **setting a standard that 95% of patients should be resolved within 6 hours from presentation at ED to admission, treatment or discharge is appropriate and reasonable.** Some sites are already achieving this standard regularly but for others this will represent a major leadership, organisational and (in some cases) hospital network challenge.

There is some evidence to suggest that establishing the requirement to provide definitive management for **all** patients in 6 hours may lead to distortions in clinical decision-making and possibly result in an artificial rise in zero-day length of stay admissions which would make the implementation of the AMP more challenging.

Other jurisdictions have experimented with near to 100% targets. England notably achieved national average performance of 98% of patients through A&E departments in 4 hours but this has now been brought back to 95% on the basis that this gives increased local flexibility for clinicians to do the right thing more often.

**Because of the scale of the challenge involved, we need to set out a reasonable timescale.** The original proposal was to allow the system until December 2014 to achieve this standard, but there is a broad body of opinion of the view that this is too long and that we should aim to deliver this as a national standard by December 2013. We are planning to invite sites to describe their own reasonable rate of improvement towards this target.

It is of course possible that we could deliver on a 95% 6 hour target and still have trolley waits. If 5% of our attendances wait 24 hours for admission we will still not have the conditions in place to make the Emergency Departments functional.

In order to address the issue of arranging services so that patients never have to wait unduly on trolleys, we also need to introduce a 'back stop' target so that no patient waits more than 9 hours in the emergency department, and we should work to achieve this standard by September 2012 at the latest. This will require the issue to become one of the major focuses of improvement work by the service at every level across acute, community and primary care.

The proposed target regime, then, is for each site to agree an improvement trajectory towards managing 95% of ED presentations definitively within 6hrs, and that no patient should wait more than 9 hours by September 2012. We would welcome representations and thoughts on this proposal in the coming weeks, since these thresholds need to be established by the start of December 2011 for inclusion in the HSE service plan.

5. **HSE daily monitoring**

In previous years, the HSE has initiated a process of daily monitoring of the system to identify where pressure is emerging and to facilitate the co-ordination of the system at national level. We will maintain this process this year, and the SDU and HSE team have agreed a process to ensure that roles are clear and unambiguous.
The reporting requirements for hospitals and a description of the process and relationships that will be in place from October 2011 – March 2012 will be issued shortly.

6. Statistical Process Control (SPC) and situation reporting

The SDU has produced and shared with each site an analysis of the key areas of clinical demand that have an impact on the performance of the unscheduled care system and the ability to deliver responsive services in EDs. Of necessity, these are restricted to the information that is available consistently over the last 2 years which in practice means data related to acute sites. Each site has been shown and had circulated SPC charts showing the variation in: ED attendances, Emergency admissions through ED, Elective Overnight Admissions and Daycase admissions. Taken together, these measures offer a guide to the level of variation the unscheduled care system can reasonably expect. Some sample charts are included with a brief overview paper on statistical process control as Appendix A.

Since the available data at the time of the analysis was weekly, these charts represent a useful validation of the approach of using statistical process control to analyse the behaviour of the unscheduled care system. The calculations of upper control limit variations in demand can also be useful in making high-level judgments about capacity requirements. How this work might be initiated is described below in the section on capacity planning.

In order for the system to get the most operational benefits out of using SPC, it would be much stronger if we could organise a daily data collection of the key variables. Following discussions across the system during the weekly meetings, we are proposing that each site makes arrangements from the end of October to begin submitting a daily web-form report containing activity reports for the previous day around the following areas: ED /admissions /mau/ amau/amu targets /beds/discharges/ cancellations/ medically discharged patients.

For the 18 sites who are implementing the AMU/MAU designs from the AMP, there is a requirement from the date of commencement of operation to submit 5 time points daily representing the following core stages of the AMU/MAU journey:

- Arrival in AMU/AMAU/MAU
- Time admitted to AMU
- Time seen by Senior Doctor
- Time to disposition decision
- Time to bed request on PAS
- Time departed

Using these data, the SDU will design an automated web system to begin developing daily SPC charts for each site that will be automatically updated and provide indications of higher or lower pressure. Every system is unique, and it will take some time to develop the appropriate interpretations of the information we generate in this way, and also some time to become adept at the tactical and strategic adjustments we may need to make to existing
capacity and ways of working. But the development of this reporting system will enable us to generate an objectively verifiable measure of pressure in the unscheduled care system and will provide a stronger scientific foundation for our decision making than is available at present.

It has been expressed very clearly at the weekly meetings that hospitals are at very different levels of capability to capture and manage data in a timely way, and that in some places the impact of the moratorium has made this area problematic for some hospitals, however the daily reporting of these numbers needs to be treated as mandatory. There will be value for each site in the exercise, as well as for the more effective management of the network.

The contact within the BIU for the provision of information for the SPC charts is Jackie Ebbs, Business Intelligence Unit, CPCP.

7. Capacity planning

Ireland does not have a commonly accepted process for undertaking capacity planning with respect to unscheduled care. This makes it difficult to correctly diagnose the type of management action that might be most effective to tackle trolley waits.

At the meetings in recent weeks, the idea has developed that we should initiate a process to develop a logic and a data collection system to address this issue. The SDU has produced a ‘first cut’ capacity planning model that brings together capacity (expressed as bed days and combining overnight and daycase surgical and medical capacity using available data on lengths of stay) and demand (including the variation in demand shown in the SPC analysis).

This is not intended to be a complete or final logic – it represents a starting point (as one example, it does not at present incorporate delayed discharges). We have requested that each region should identify appropriate representatives to contribute to the debate about how to develop such a capacity model and to work with the service on its implementation and interpretation.

On a local basis, there is a strong imperative to ensure that resource that is presently available is aligned and co-ordinated to maximise its benefit for patients. This is particularly important for the period across December and January when we are likely to experience peak demand for bed days.

One way to achieve this is to undertake a brief overview of the relevant resources and whether or not there is a risk to capacity being lost at key stages over the December and January period. As a second dimension to this, we should also ensure that key personnel with decision making authority are contactable and that on-call arrangements for senior managers and team supervisors are clear. This will help at the times when escalation may be necessary to ensure that the whole system can respond to support patient flow and we do not experience a situation where demand is rising and the system is not responding.

The format for this local capacity planning exercise is included as Appendix B. Different areas and regions may take distinct approaches to this exercises and since this process will be co-ordinated at regional level, RDOs have discretion on issues of emphasis or interpretation. Some further guidance can be provided if so wished.
This will be an organic process, and in some areas the managerial capacity to deliver this level of planning may present a challenge (although this fact would itself highlight a risk). Recognising that they will be a work in progress, we would ask for latest versions of area capacity plans to be sent to the SDU on Monday 24th October to pauline_clifford@health.gov.ie.

8. Approach to performance improvement

The trolley wait problem is not evenly distributed across Ireland. Of the 33 hospitals currently with some level of Emergency Department, the majority of patients waiting is concentrated in a small number of sites.

This is in part simply a function of size and volumes and has different causes. Some hospitals are experiencing very high levels of delayed discharges, others have problems with resource management or processes that require improvements and in some areas there are capacity imbalances that will need to be addressed.

There is also some evidence suggesting that on year-on-year basis, the trolley wait indicator is higher in 2011 than over the same period in 2010. Whilst we must acknowledge the major service impact of the financial constraints, we cannot afford to use this as an excuse to disregard any avenue that may secure improvements for patients. The fact is that some sites – and some hospital networks – need to take urgent remedial action to make them better prepared for December and January than last year.

Using statistical analysis alone, the SDU has developed a list of sites that are at the greatest risk of performance problems in December and January. This list is included as Appendix C.

In all likelihood, this list will surprise no-one, and we will use this list to prioritise the improvement programme in each region.

a. Performance diagnostics

NB We intend to establish the improvement programme on a site-by-site basis by developing a diagnostic tool co-designed with the Acute and Emergency Medicine Programmes. We will then develop the resources to undertake a diagnostic review in each of the at-risk sites, in partnership with their local clinical and managerial leadership. This process will result in a number of outputs:

- Agreement on the key priorities and action plans associated with the implementation of the AMP and EMP
- Agreement on where the key areas are that require focus within the hospital
- Agreement on changes to capacity that may be required to most effectively manage demand, including at hospital network level
- Agreement on where linkages or process between the hospital and its associated primary and community services, and the ambulance service need to be further developed
- Consideration of areas where external support may be valuable

Taken together, this will result in the development of hospital and network improvement plans that will outline the key milestones that need to be achieved to bring the unscheduled care system into balance and ensure that process-related delays are minimised.
The improvement resource and support planned through the AMP and EMP will be coordinated with this process to ensure that each hospital has a single arrangement through which both the planned investments and process changes are delivered.

The SDU is in the process of adapting a tool used by the Intensive Support Team at the English DH and this will be forwarded shortly as a draft to the system for comment, following which we will distribute a final version that will be used in the proposed site visits.

As well as this hospital- and community-based work, the SDU is also undertaking the following work to support performance improvement across unscheduled care.

b. Discharge planning and bed management networks

The initial SDU letter in June requested leads from each hospital for the key areas of the patient flow process, notably those involved in discharge planning and bed management.

Mary Boyd and Anne Keating have joined the SDU to lead the national improvement networks in these two areas. They have worked with hospitals to validate the original nominations and have incorporated the responses into directories of named staff members in each network. The draft directory is included as Appendix D. Please send all corrections/additions to Pauline_Clifford@health.gov.ie by Monday October 24th.

The initial meeting of this network was held on October 12th and they will begin a programme with the following goals:

- To identify best practice in Ireland and beyond and ensure the resources are shared throughout the system.
- To produce materials to support performance improvement: good practice guides, training programmes and professional development programmes.
- To assist in the development of measures to allow information systems to better track pressure.
- To specify specific patient flow measures within the patient journey.
- To standardise processes within Bed Management and Discharge Planning.
- To help organisations identify bottlenecks by setting measures such as compliance with key standards within the Code of Practice for Integrated Discharge Planning IDP.
- To support under-performing hospitals to improve.
- To develop specific policies and procedures in conversation with the service to improve the bed management and discharge processes.

c. Appointment of a Director for Performance Improvement

A process is underway for the appointment of a Director of Performance Improvement for Unscheduled Care.

d. Identification of resources to provide intensive support

The delivery of sustainable improvements in unscheduled care is a complex and technically demanding exercise. In conjunction with the HSE, we are in the process of attempting to source senior external support that will bring the experience of a successful track record in
this area. If this plan succeeds, we will be able to allocate specific improvement resource each week to each region to work with their most challenged sites.

   e. ED Information Technology upgrade programme

Since June, and in conjunction with the Emergency Medicine Programme and Acute Medicine Programme a programme has been put in place to upgrade the IT capability of Emergency Departments. This programme is designed in two stages. First, to enable the reliable capture of patient journey time data and second to organise the roll-out of an electronic clinical system to be implemented in EDs.

The details of the first stage, including which hospitals are participating, and some sample screen shots showing the web system are included in Appendix E.

Further details on the second stage will be released by the end of November.

   f. Fair Deal

The SDU, with the HSE, have commenced a discussion with the managers of the Fair Deal scheme to explore ways in which the national process can link more effectively with the leaders in hospitals to better support improved patient flow.

Work has commenced to connect the list of patients that are entitled to the scheme nationally to each hospital to improve the co-ordination of care packages between hospitals and long term care providers, and support improved communication with patients and families.

We will also examine ways in which the interaction between hospitals and the local health offices that administer the scheme can be improved.
Conclusion

Systematic work to improve the responsiveness and performance of the whole unscheduled care system is the key to eliminating trolley waits.

This paper highlights the range of approaches the SDU will be taking to support the national hospital network, and its partner clinical and social services in delivering this change.

- It emphasises that the Clinical Programmes represent the services strategy and undertakes to work in strict co-ordination with the programmes
- In terms of targets and standards, it supports that use for the next 6 months of the INMO measure of trolley waits as the best view of pressure in the system presently available
- It proposes adjustments to the national target system to move to eliminate trolley waits by September 2012 and agree with each hospital site their trajectory to delivering a 95% standard for management of patients within 6 hours in EDs
- It then describes the process that will operate this year for HSE co-ordination of the system, and the national weekly communication process that will include the HSE, SDU and clinical programmes
- It describes a proposal – discussed with the service leadership - to initiate an exercise in developing a statistically valid pressure monitoring system at hospital level using statistical process control (SPC)
- It provides a framework for work to commence on national capacity planning, and initiates a local capacity planning process to ensure that the hospitals, primary care and community care services are co-ordinated for the coming December and January period
- It described the SDU's present approach to supporting performance improvement, including:
  - The development of a performance diagnostic tool for sites at risk of poor performance
  - The establishment of formal improvement networks for delayed discharge and bed management with representation from each hospital
  - The appointment of a director for performance improvement
  - The identification of external intensive support where required
  - The delivery of the ED IT upgrade in two stages
  - The use of SPC
  - The use of hospital scorecards as a performance tool;
  - Work with Fair Deal to improve information flows with hospitals
  - Clear lines of accountability

Taken together, these measures represent the framework to co-ordinate the range of responses that will be necessary to improve trolley waits. It balances a strong focus on short-term measures to attempt to improve performance this winter with the beginning of the development of the capabilities that will be needed in the medium term to work towards the sustainable elimination of trolley waits from the Irish healthcare system by September 2012.
Appendix A

Statistical Process Control (SPC) – made simple

The Normal Curve.

Consider waiting for a bus that is scheduled to arrive at your bus-stop at 10 minutes past the hour. Experience will tell you that on some occasions the bus arrives a few minutes early, sometimes it arrives at exactly on time, and every so often it arrives a few minutes late. Small variations in the arrival time of the bus are to be expected and to the extent that they are small, are reasonable and natural.

If you were to record the time the bus arrived every day you would hopefully find that most of the arrival times were clustered around 10 minutes past the hour. With a reliable bus service, you would expect to find fewer and fewer occasions for the bus arrival the further away from 10 past the hour you go.

If you collect enough data points to plot how frequently the bus arrives at each point in time, the result will be a curve somewhat like:

This is a classic shape in nature, and is known as the Normal Distribution Curve. Provided your sample size is large enough, you get the same shape regardless of whether you are plotting bus arrival times, adult heights in the population or percentage scores in an examination.

In the context of the bus service, the chart gives an immediate and an intuitive impression about how reliable the service is from the perspective of the bus’ arrival time. The more “spread out” the chart is the greater is the variation in arrival time. Conversely, if the chart was very “narrow” and centred on the “10” – it would be clear that the arrival time was very predictable and with little variation.
In statistics, the measure of the degree to which the chart is “spread out” or not is called the standard deviation. The standard deviation is simply a number, calculated by formula, which provides a measure of the degree of variation.

In the bus arrival time example, the average time the bus arrived at was at 10 minutes past the hour. The average is also known as the mean. One of the most powerful aspects of the Normal Distribution, the Standard Deviation and the Mean is that it is possible to say what percentage of the items that are being measured occur one, two or three standard deviation either side of the mean.

As illustrated above, we can say:

- 68.2% of all arrival times measured will occur between one standard deviation below the mean and one standard deviation above it.
- 95.4% will occur between two standard deviations below the mean and two standard deviations above it.
- 99.7% will occur between 3 standard deviations below and three standard deviations above the mean.
Process Control Charts

Process Control charts are another way of looking at exactly the same information. Instead of plotting how frequently a particular arrival time occurs, if we plot the actual arrival time, we can construct a chart as follows.

![Arrival Time Chart]

It is a simple mathematical exercise to calculate and plot the Mean as the average of all the times recorded.

Equally easily, if we define the Upper Control Limit (UCL) as the “Mean + Two Standard Deviations” and the Lower Control Limit (LCL) as the “Mean – Two Standard Deviations”, we can calculate and plot the UCL and the LCL as per below:

![SPC Chart for "Arrival Time"]
This is now the Statistical Process Control Chart for the Bus Arrival Time.

With reference back to the discussion on the Normal Distribution, the significance of defining the Upper Control Limit (UCL) and the Lower Control Limit (LCL) as the Mean plus or minus two Standard Deviations means we can be confident that 95% of the time, all arrival times will fall between these two limits, UCL and LCL.

The SPC charts for the hospitals have been built in exactly the same way, generally using data collected over two years.

Regardless of whether the chart refers to weekly ED Attendances or weekly Admissions to the Hospital from the ED, the interpretation is the same. In the case of ED Attendances, that interpretation is that 95 times out of 100, the number of attendance at the ED on a weekly basis will be between the two limits defined by the UCL and LCL.

SPC Chart
Admissions via ED
### APPENDIX B

**CAPACITY PLANNING DOCUMENT**

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- Medical Beds
- Clinician Roster
- Discharge Team
- Bed Managers
- Diagnostic support
- Home Help
- Community Services
- Step down/Intermediate care beds
- Outpatient Slots
- Elective activity profile
- Transport

#### Hospital B
- Medical Beds
- Clinician Roster
- Discharge Team
- Bed Managers
- Diagnostic support
- Home Help
- Community Services
- Step down/Intermediate care beds
- Outpatient Slots
- Elective activity profile
- Transport

#### Hospital C
- Medical Beds
- Clinician Roster
- Discharge Team
- Bed Managers
- Diagnostic support
- Home Help
- Community Services
- Step down/Intermediate care beds
- Outpatient Slots
- Elective activity profile
- Transport

*Red - Capability/L'Ship gap identified | Amber - Capability/L'Ship not yet | Green - Capability/L'Ship in place and guaranteed*
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Appendix C

List of hospitals - Alphabetical order

Adelaide, Meath and National Children’s Hospital (Tallaght)
Beaumont Hospital
Cavan General Hospital
Connolly Memorial Hospital
Cork University Hospital
Drogheda - Our Lady of Lourdes Hospital
Galway - University College Hospital
Limerick - Mid Western Regional Hospital Dooradoyle
Mater Misericordiae Hospital
Mullingar - Midland Regional Hospital
Naas General Hospital
Portinuncula Hospital, Ballinasloe
South Tipperary General Hospital
St Vincents University Hospital and St Columcilles
Wexford General Hospital
## Appendix D

### Bed Managers Directory

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<tr>
<th>HOSPITAL</th>
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<th>Bed Mgt Office</th>
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<td>Mairead Cowan</td>
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Appendix E  

ED Data Project Screenshots

As of the time of writing, six hospitals are “live” on the ED Data System. These are:

- Adelaide Meath and National Children’s Hospital Tallaght
- St. Vincents University Hospital
- Cork University Hospital
- Midland Regional Hospital Tullamore
- Waterford Regional Hospital
- University College Hospital Galway

Sample screen shots from the system are shown below: