Guidance on the built environment of a haematology/oncology day ward

Version	Date published	Amendment	Approved By
1	April 2020		Working Group
1.1	May 2025	Addendum May 2025 added to page 2	NCCP

All comments and feedback are welcome at oncologydrugs@cancercontrol.ie
This information is valid only on the day of printing, for any updates please check https://www.hse.ie/eng/services/list/5/cancer/profinfo/medonc/safetyreview/guidance-on-the-built-environment-of-a-haematology-and-oncology-day-ward.html

Addendum May 2025:

This document was developed by a Working Group in April 2020. Sites using this document after this date are encouraged to check the most up to date references online, including HTNs and HBMs, and latest Infection, Prevention and Control advice (IPC).

The follow links may be useful:

NHS England Health Building Notes linked here

NHS England Health Technical Memoranda linked here

Infection Control Guiding Principles for Buildings Acute Hospitals and Community Health and Social Care Settings linked here

To note, CPE guidelines are heavily referenced in this document and were updated in 2022 and can be found on the HSPC webage specific to CPE linked here

As referenced in the document, local IPC teams should be involved from the outset in any plans for day oncology refresh / refurbishment / new builds, as local surveillance data may influence final decisions at site.

Addendum re COVID-19 pandemic:

This guidance document was completed before the occurrence of the COVID-19 pandemic.

Recommendations in relation to increased availability of single rooms en-suite and minimum spacing per recliner/patient treatment space are in keeping with the appropriate delivery of care during the pandemic.

Advice in relation to the location of the dayward in close proximity to inpatient facilities requires revision. Priority must be given to the delivery of daycase systemic anticancer treatment in a location in which the risk of COVID19 infection is minimised.

To assist the maintenance of a COVID-free environment, the preferred location of a SACT day ward is either separate from the acute hospital campus or with an entrance for patients that is not shared with patients attending other areas of the hospital. In addition, a triage point should be identified for incoming patients to the day service, at a location which facilitates early identification of possible COVID-19 and diversion from the SACT treatment delivery area.

Terms used in this document:

'Day unit' is used to describe a day unit or day ward for the delivery of systemic anti-cancer treatment/preventative treatment to patients with either a medical oncology or haemato-oncology diagnosis.

'*Systemic anti-cancer treatment'* is used to describe medicines administered for the treatment of a cancer diagnosis, typically at recurring intervals over a period of time. This includes drugs described as chemotherapy, hormonal treatments and immunotherapy.

Abbreviations:

AMR	Antimicrobial Resistance
ACH	Air changes per hour
BSRIA	Building Services Research and Information Association
CPE	Carbapenemase producing Enterobacterales
CIBSE	Chartered Institute of Building Services Engineers
HBN	Health Building Note
HCAI	Healthcare Associated Infection
HIQA	Health Information and Quality Authority
HPSC	Health Protection Surveillance Centre
HTM	Health Technical Memorandum
HSE	Health Service Executive
NCCP	National Cancer Control Programme
SACT	Systemic Anti Cancer Therapy

Contents

Addendum re COVID-19 pandemic 2
1. Executive Summary 5
2. NCCP Built Environment Summary of Recommendations 11
3. Background 17
4. Guidance 22
    4.1 Location 23
    4.2 Accommodation requirements 24
    4.3 Layout & design 33
    4.4 Engineering considerations 39
    4.5 Infection prevention and control 45
    4.6 Waste Management 47
5. Appendices 49
    5.1 Sample schedule of accommodation for an oncology unit serving a population of 400,000 50
    5.2 Drug storage additional advice 54
    5.3 Considerations for administration of Pentamidine 64
    5.4 Self Assessment Toolkit 65
    5.5 CDC Tool 77
    5.6 Group Membership 78
    5.7 Methodology 78
References 79

1. Executive Summary

Background

The 2014 National Cancer Control Programme (NCCP) Medication Safety Review recommended that national guidance be developed on the optimum built environment of a haematology/oncology day ward. This guidance will be relevant to frontline staff in medical oncology and haemato-oncology day units, infection prevention and control services, clinical directors, service managers, estates/technical services departments and risk management personnel.

A multidisciplinary group arrived at this guidance on behalf of the NCCP, following consideration of available guidance elsewhere, expert opinion, site visits and consultation. Specific issues considered included:

- minimising the risks to patients and staff due to the use of cytotoxic drugs
- minimising risk of infection in a vulnerable population
- respecting the dignity and comfort needs of patients
- providing care in a safe and secure environment
- facilitating efficient processes and optimising use of staff time
- adherence to relevant legislative requirements and national policies

Location

The location of an oncology day unit within the hospital premises should be accessible to patients, consider staff and patient flow to/from inpatient and other outpatient services and facilitate close engagement with the pharmacy. These needs must be balanced against other requirements, such as the advantage of separate waiting facilities for a population vulnerable to infection.

Accommodation requirements

The unit should include appropriate space for a public waiting area and reception; clinical areas for delivery of Systemic Anti Cancer Therapy (SACT) but also for review or procedures required; staff areas; storage; ancillary/sanitary spaces and support services. The recommended space allocated to each area is based on the intended functions, plus the need for adequate separation from an infection control perspective.

The built environment can minimise the spread of infectious agents and anti-microbial resistance through the provision of adequate space and physical barriers between patients. Screening policies in this patient population – who are an "at risk" group for both Carbepenemase producing Enterobacterales (CPE) acquisition and infection (Health Protection Surveillance Centre, 2018b) – will result in an increased demand for single rooms or cohorting where single room numbers are insufficient. Preventing the spread of CPE in particular is dependent on adequate, and ideally individual, toilet facilities. Single rooms should therefore be ensuite. Multi-patient bays should be arranged in groups of up to a maximum of four recliner spaces (Health Protection Surveillance Centre, 2018b), which will comply with current cohorting recommendations, and with a minimum designated space of 10m^2 per patient. A minimum of one semi-ambulant WC should be designated for each multi-patient bay. At least one accessible WC should be provided, at a minimum of one per 10 recliners.

Units require access to an airborne isolation suite, for the appropriate management of a scheduled or unscheduled patient who presents unwell with a possible airborne infection.

A dedicated chemotherapy preparation area is required for the temporary storage of chemotherapy agents which have been dispensed from pharmacy and for additional tasks involved in preparation and delivery of treatment. The storage available for cytotoxic, and other drugs, required in the haematology/oncology

day ward must meet legislative, environmental, patient safety and security requirements.

Those units providing intrathecal treatment should follow current NCCP intrathecal policy, such as designation of a room for intrathecal treatment delivery and a dedicated locked facility for the temporary storage of intrathecal drugs between time of issue and administration.

The space provision for staff areas should consider the needs of the wider multidisciplinary team, including nursing, doctors, clinical pharmacists and other allied health professionals.

Layout and design

The environment should be welcoming and help patients feel at ease, without compromising patient safety and while respecting the need for good infection control practices and efficient working. Service users' views should be sought at the onset of planning. Patient comfort and patient choice should be respected in the design of the environment, including consideration of the needs of teenage/young adult patients.

The space available for treatment delivery can be divided between multi patient bays and single rooms. In shared areas, appropriately placed partitions should be provided for privacy. A balance should be struck between patient privacy; patient/patient social interaction; need for infection prevention and control; and the need for staff and patients to be able to observe one another.

Speech privacy is essential in areas where personal and confidential discussions may be held. Design features should also be employed to minimise noise levels overall.

Finishes should be durable, easily cleaned and disinfected and designed to minimise the risk of transmission of infection.

The design of the unit should aim to minimise its environmental impact through efficient energy use and designing for flexibility of use over time.

Engineering considerations

All engineering systems within new facilities should comply with the Irish Building Regulations and all relevant Irish and European Standards. They should also comply with relevant best practice guidelines including the NHS HBN's, HTM's, HPSC, HSE, BSRIA and CIBSE guidance documents.

In refurbishment projects, existing engineering systems should be upgraded to comply with current standards where this is reasonable and practical.

Ventilation is an important consideration in oncology day wards. In particular, the requirements for infection prevention and control should inform the nature of ventilation system required to meet the specific clinical needs of the facility. In some cases, this may necessitate the need for conditioned air.

Where an airborne isolation room is required, this should be of the Positive Pressurised Ventilated Lobby type and designed to meet the requirements of HBN 04-01 Supplement 1(2013d). It is essential that the following requirements are achieved in order to ensure that the infection prevention and control measures are fulfilled:

- Air Leakage shall be tested to a maximum permeability of 2.5 m3/h.m^2 at a reference pressure of 50 Pascals; and be carried out in accordance with BSRIA Standard: BTS 3/2018 – *Air Permeability Testing of Isolation Facilities.* This is required to prevent the ingress of air and spores from the environment outside.

- The design of the lobby is such that it prevents air movement from the patient's room to the corridor and from the corridor to the patient's room.

The function of an airborne isolation room in the day ward setting is discussed further in section 4.2.3 of this document.

All new ventilation systems should be installed with the facility for fitting HEPA filtration as per the HSE Estates Directorate Guidance on Air Handling Unit Specifications (2015).

National guidance should be followed in the design and maintenance of water services and ventilation systems.

In the interests of infection prevention and control, bedhead services should be designed to accommodate the mounting of medical equipment.

ICT Infrastructure

Early consideration should be given to ICT infrastructure to ensure that this meets the needs of the service including those of staff, patients and visitors. ICT solutions should be developed with a strong focus on information management requirements.

Infection prevention and control

Managing transmission of antimicrobial resistance bacteria in an acute hospital setting is increasingly challenging. In response to the rising prevalence of CPE in Ireland, in October 2017, the Minister for Health activated the Public Health Emergency Plan to address CPE in our health system. This requires that all efforts should be made to design an environment which will limit its spread within such a vulnerable population. CPE are mostly carried asymptomatically in the bowel, so it may not be known that a person is a carrier unless they are screened, making detection and containment difficult. CPE and VRE are faecally carried organisms and spread from patient to patient for example by shared toilet facilities (Health Protection Surveillance Center, 2018). The aforementioned recommendations on the minimum space provided per patient bay, the provision of single rooms en-suite and adequacy of toilet facilities are critical to minimise the risk of patient to patient transmission of infectious agents, including multi-drug-resistant organisms such as CPE.

Sufficient hand hygiene facilities must be made available in patient care areas and the design of treatment areas should facilitate easy cleaning and decontamination. Water features that generate aerosols can pose a risk to immunocompromised patients. Other planned aesthetic features should undergo an assessment to ensure they do not pose an infection risk.

Infection prevention and control teams must be involved in all stages of hospital building or refurbishment programmes to advise on these issues.

Hazardous waste

Segregation at the point of origin, aided by suitable disposal containment is vital to ensure safe handling, storage, transport and disposal of waste. The access to hazardous waste storage areas should be controlled and a separate exit should be provided for waste to minimise risk of contamination.

Implementation

The purpose of this guidance document is to describe the necessary facilities and layout of a day unit which will facilitate the delivery of high quality, safe patient care and enhance the patient experience. A well designed unit can also facilitate efficient patient flow.

The guidance should be used in planning new developments and major refurbishments. It should also be used to audit existing facilities and identify possible short term improvements that can be made with appropriate funding.

The services offered and population served varies between facilities. Local service providers should prioritise recommendations for action in line with the current and proposed services provided by the facility.

This guidance is current at this point in time and may need to be updated in line with evidence base, legislative requirements and guidance update.

2. NCCP Built Environment Summary of Recommendations

Section 4.1 Location	
Rec No	**Recommendation**
1	The unit location and design should ensure safe and independent access by people with disabilities.
2	Location should allow for transfer of an unwell patient to an inpatient bed via a discreet route.
3	Where an inpatient medical oncology/haematology service is available, the day ward should be in reasonable proximity to facilitate staff and patients.
4	The unit should be located in proximity to the out-patient services. It is not recommended that waiting areas and facilities are shared with other out-patient clinics.
5	Where possible, the unit should be located adjacent to the aseptic compounding unit or pharmacy dispensary.

Section 4.2 Accommodation Requirements	
Rec No	**Recommendation**
6	The reception office should facilitate ease of communication, while respecting privacy and accessibility requirements.
7	The waiting area should be subdivided into smaller waiting areas and/or broken into modular waiting areas within the unit.
8	Consultation rooms, examination/procedure rooms and interview rooms should be provided.
9	Multi-patient bays should be arranged in groups of up to a maximum of

	four recliner spaces, with a minimum designated space of $10m^2$ per patient. Local surveillance data and risk assessment may require a reduced number of recliner spaces per bay.
10	A minimum of one single room should be provided for every four recliner spaces, either as a single room en-suite or specialised ventilation isolation suite, and at a ratio of one/100,000 population served. Each unit requires access to an airborne isolation suite with specialised ventilation
11	A minimum of one semi-ambulant WC should be available for every four recliners. At least one accessible WC should be provided, at a minimum of one per 10 recliners.
12	If the unit provides intrathecal treatment, then a room should be designated for this purpose, as per NCCP Intrathecal Policy.
13	The required staff areas are: • Staff base(s) within the treatment delivery area and chemotherapy preparation room • Ensuring space for doctors, clinical pharmacists and other allied health professionals • Staff office spaces • Multi-disciplinary team meeting room • Shower, toilets, locker room and rest areas
14	The storage available for cytotoxic, and other drugs, required in the haematology/oncology day ward must meet legislative, environmental, patient safety and security requirements.
15	Units providing intrathecal therapy must provide a dedicated locked facility for the temporary storage of intrathecal drugs between time of issue and administration.
16	Storage areas are required for: • Drugs and fluids • Equipment including wheelchairs • Chart storage in a locked/supervised area • Cleaner's store

	• Linen store
17	Separate ancillary areas/sanitary spaces are required: • Sluice • Dirty utility • Disposal room/hold with entrance not directly onto the unit • Clean Utility

Section 4.3 Layout & Design	
Rec No	**Recommendation**
18	Local planners should seek the views of service users at the onset of the planning process.
19	Patient comfort and patient choice should be respected in the design of the environment, including consideration of the needs of adolescents/young adult patients.
20	The overall shape and layout should aim to optimise staff workflow, patient comfort and safety and allow for optimal delivery of healthcare.
21	In shared areas, appropriately placed partitions should be provided for visual and auditory privacy and infection prevention and control.
22	In single rooms, options to maintain line of vision should be considered e.g. viewing panels, sliding glass doors.
23	Each staff base should facilitate a clear view of patients under their care.
24	All spaces used by patients for prolonged periods of time should have access to natural light, where possible. If not, artificial lighting should be of good quality.
25	Consultation and examination rooms should be sound-attenuated so that conversations cannot be heard outside and sound from external areas is limited.
26	Finishes should be durable, easily cleaned and disinfected and designed to minimise the risk of transmission of infection in line with

	appropriate national and international guidance documents.
27	The design of the unit should aim to minimise its environmental impact by ensuring that energy is used efficiently and only where necessary.
28	Design should allow for flexibility of use over time.

Section 4.4 Engineering Considerations	
Rec No	**Recommendation**
29	The requirements for infection prevention and control should inform the nature of ventilation system required to meet the specific clinical needs of the facility. In some cases, this may necessitate the need for conditioned air.
30	Where an airborne isolation room is required, this should be designed to meet the requirements of HBN 04-01 Supplement 1 (2013). Particular attention should be paid to the airtightness requirements of this type of isolation room.
31	All new air handling and ventilation units should be designed, installed and maintained in compliance with European Standards, HTM 03-01 and the HSE Estates Directorate Guidelines on Air Handling Unit Specification.
32	All new ventilation systems should be installed with the facility to fit HEPA filters on the supply air stream.
33	National guidelines, HTM 03-01 and HTM 04-01(2017) should be followed in the design of water services and ventilation systems, with respect to the risk of organisms such as Legionella**.**
34	Consideration should be given to the transportation of blood and other samples to the laboratory. Pneumatic Tube systems should be extended into the facility where reasonable and practical.
35	Early consideration should be given to ICT infrastructure to ensure that this meets the needs of the service including those of staff, patients and visitors.

36	Fridge alarms should be remotely monitored at a central location which is staffed 24 hours, to ensure action is taken when the day ward is closed.
37	Controlled access (e.g. remote swipe card access) is required to all restricted areas - medical records area, drug preparation and storage areas, sluice, hazardous waste storage, cleaner's cupboard.
38	Subject to local risk assessment and contingency planning, the facility design should have a resilient power supply capable of providing full back up to relevant services systems, including specialist ventilation systems.
39	In the interests of infection prevention and control, early consideration should be given to the planning of bedhead services and should be designed to accommodate the mounting of medical equipment.

Section 4.5 Infection Prevention and Control	
Rec No	**Recommendation**
40	Infection prevention and control teams are required to be consulted in all stages of hospital building or refurbishment programmes. In compliance with the National Guidelines for the Prevention of Nosocomial Aspergillosis, HPSC, 2016, construction work cannot commence until the construction permit is issued.
41	Specific safeguards must be in place to minimise the risk of infection during the construction period. The HPSC National Guidelines on the Prevention of Nosocomial Aspergillosis should be followed where construction activity is taking place in or near existing clinical facilities.
42	Hand hygiene facilities in patient care areas should be made available according to national recommendations.

Section 4.6 Hazardous Waste	
Rec No	**Recommendation**
43	Sufficient space must be provided for the segregation of household, clinical, cytotoxic and sharps waste.
44	The flow of goods, services and waste materials should be designed to minimise the risk of contamination. Specific consideration should be given to the location of the dirty utility and provision of a separate exit for waste.

3. Background

3.1 The NCCP Review

The use of systemic anti-cancer therapy has risen significantly in recent years, with a 6% year-on-year growth in admissions for chemotherapy (HIPE, 2016). While greater treatment availability brings undoubted benefits to patients, it also presents a challenge to patient safety as the number of cytotoxic drugs expands and the use of oral chemotherapy drugs increases. In addition, the increasing complexity and usage of systemic anti-cancer therapy has raised concerns about the risks to health care workers involved in the preparation and administration of systemic anti-cancer therapy.

The NCCP and HSE Patient Safety Directorate co-sponsored a review across all 26 hospitals in Ireland involved in the administration of systemic cancer treatments in adults and children, including both oncology and haematology services. The scope included the following steps of the oncology medication pathway: pre-treatment assessment, documentation in patient records, chemotherapy ordering and prescribing, dispensing and supply, administration checks and management of risks.

The NCCP is developing national safety policies in collaboration with stakeholders based on the learnings from the review. A specific recommendation had been made in the review report (Heckmann et al., 2014) in relation to the absence of national guidelines on the optimum built environment of a day unit:

'Recommendation 9 - Guidelines should be agreed nationally on the optimum requirements of the built environment of a haematology / oncology day ward.
Day ward design must consider:

- *Current and future needs/demands*
- *Infection control recommendations*
- *Health and safety considerations*

- *Patient comfort*
- *An efficient and safe work environment*

The NCCP convened a multi-disciplinary working group to establish this guidance, as informed by available evidence and expert opinion. The membership of the group and their methods are outlined in the appendix 1. Certain national initiatives have taken place, since the publication of the NCCP review, which further inform best practice and priorities in the oncology day ward design. These include the recommendations of HIQA inspections of oncology and haematology day wards (HIQA, 2016), the National Taskforce for HCAI/AMR in relation to the threat of CPE (Carbapenemase producing Enterobacteriaceae) in Irish hospitals (National Taskforce for HCAI/AMR, 2017a) and Irelands national action plan for antimicrobial resistance (iNAP, 2017). These have been given close consideration in the development of the group's recommendations.

3.2 Purpose

The purpose of this guidance document is to describe the necessary facilities and layout of a day unit which will facilitate the delivery of high quality, safe patient care and enhance the patient experience. A well designed unit can also facilitate efficient patient flow.

3.3 Implementation

The guidance should be used in planning new developments and major refurbishments. It should also be used to audit existing facilities and identify possible short term improvements that can be made with appropriate funding.

The services offered and population served varies between facilities, as outlined below (see *specific considerations*). Local service providers should prioritise recommendations for action in line with the current and proposed services provided by the facility.

The relative importance of recommendations should be interpreted by local service providers in the context of current/proposed services. This will aid prioritisation of recommendations for implementation which are subject to the wider service context, feasibility, funding availability and value for money considerations.

3.4 Intended audience

This guidance is relevant to frontline staff in medical oncology and haemato-oncology day units, infection prevention and control services, clinical directors, service managers, estates/technical services departments and risk management personnel.

3.5 Organisation and patient flow

An understanding of the patient flow and the type of care given in an oncology day unit setting is essential to provide context for non-oncology staff reading this guidance.

Patients undergoing systemic therapy in a day ward setting typically attend for multiple visits at scheduled intervals over a number of weeks or months. The number, spacing and length of visits vary according to their particular treatment protocol. The decision to proceed with treatment at each visit will depend on blood test results and on a clinical assessment. In a two-day model, the patient attends for bloods and/or assessment on the day prior to treatment and is therefore ‘treatment ready’ when they come to the day unit.

Depending on the treatment protocol, a patient may require intravenous fluids and medication for prevention of side effects, in addition to their systemic anti-cancer therapy. The time spent by a patient in a treatment space can typically range from thirty minutes to six hours, after which patients are discharged home with relevant advice.

The day ward may also be used for patient education and counselling prior to starting treatment; for tests they require during treatment (e.g. bone marrow biopsy); for consultant review of those on treatment, including preventive treatments/prophylaxis; and for assessment of patients who contact the day ward between treatments due to feeling unwell.

3.6 Specific considerations

This guidance is applicable to all units delivering systemic anti-cancer therapy.
All units:

- require the appropriate facilities for the safe preparation and administration of treatments
- need to consider the potential for patients to be immunocompromised as a result of their treatment and the important role of infection prevention and control in this regard
- Need to consider the accessibility needs and privacy preferences of their patients, including those who may be receiving palliative treatment.

There are, however, key variations in the services provided in individual units, as outlined below. These should be taken into consideration by local service providers when considering recommendations and prioritising issues for implementation.

- A large proportion of day units in Ireland cater for patients with medical oncology, haemato-oncology and benign haematological conditions. Some have separate medical oncology and haematology day units; some have just one or the other.
- Of the current 26 hospitals in Ireland with day units, only 15 have a medical oncology/haematology inpatient service onsite. Inpatient beds are occasionally used for clinical assessment, minor procedures or when

isolation rooms are required. Existing units also vary considerably in scale, ranging from 6 to 35 treatment spaces.

- Both paediatric and adult day units need to consider how they can meet the needs of teenage/young adult groups (Teenage Cancer Trust, 2010). Paediatric Systemic Anti-Cancer Therapy is delivered primarily in Children's Health Ireland (CHI) at Crumlin with a paediatric haematology service also in Mercy Hospital, Cork.
- There is variation in the level of complexity of treatments provided in different units. For example, intrathecal therapy is only delivered in a subset of units.
- A unit which delivers clinical trials has additional requirements such as space for additional clinical review, record keeping, storage of trial equipment etc.

4. Guidance

The group considered the following in recommending the optimum design of an oncology day ward facility:

- minimising the risks to patients and staff due to the use of cytotoxic drugs
- minimising risk of infection in a vulnerable population
- respecting the dignity and comfort needs of patients
- providing care in a safe and secure environment
- facilitating efficient processes and optimising use of staff time
- adherence to relevant legislative requirements and national policies

The recommendations are grouped under specific themes, for ease of reference:

- Location
- Accommodation requirements
- Layout and design
- Engineering considerations
- Infection prevention and control
- Waste management

Implementation of these recommendations will be assisted by use of the resources detailed in the appendices of this document.

4.1 Location

The location of an oncology day unit within the hospital premises should be accessible to patients, consider staff and patient flow to/from inpatient and other outpatient services and facilitate close engagement with the pharmacy. These needs must be balanced against other requirements, such as the advantage of separate waiting facilities for a population vulnerable to infection.

Recommendation 10 of the national review (Heckmann et al., 2014) stated *'If restructuring of the hospital built environment is planned, consideration should be given to co-locating the oncology day ward and the preparation area for oncology drugs/pharmacy aseptic units, particularly where the pharmacist(s) involved in the service are shared between the clinical oncology service and drug compounding.'* This would be considered the ideal. In one existing unit, a hatch system allows direct movement of prescriptions and medication between the pharmacy and day unit. Feasibility does depend on the scale of the on-site pharmacy service.

Recommendations	
1	The unit location and design should ensure safe and independent access by people with disabilities.
2	Location should allow for transfer of an unwell patient to an inpatient bed via a discreet route.
3	Where an inpatient medical oncology/haematology service is available, the day ward should be in reasonable proximity to facilitate staff and patients.
4	The unit should be located in proximity to the out-patient services. It is not recommended that waiting areas and facilities are shared with other out-patient clinics.
5	Where possible, the unit should be located adjacent to the aseptic compounding unit or pharmacy dispensary.

4.2 Accommodation requirements

A sample schedule of accommodation is included in Chapter 5, which outlines typical space requirements for a unit serving a population of 400,000. (Department of Health (UK), 2013c). This is intended as a guide only and is expected to vary from one unit to another, according to the variables outlined in chapter three.

The rationale for the accommodation components is outlined in this section, under a number of broad categories:

- Public spaces
- Clinical spaces for reviews
- Clinical space for delivery of systemic anti-cancer treatment
- Staff areas
- Storage areas
- Ancillary and sanitary spaces

4.2.1 Public Spaces

A **reception office** is required at the entrance to the unit and adjacent to the waiting area for receiving and registering patients upon arrival. It must be possible for patients, escorts and staff to communicate easily but with adequate privacy.

The **waiting area** should offer a comfortable and welcoming environment. It should be subdivided into smaller areas to allow segregation of patients who are immunocompromised and to minimise the risk of transmission of infectious disease, e.g. viral respiratory tract infections. A minimum distance of one metre is required to reduce the spread of infectious agents carried in respiratory droplets. An infocaster information system should be provided, to communicate infection control messages to patients and the public e.g. during respiratory season.

Where unit layout and patient flow permits, sub-wait areas could be provided within the unit.

Separate male and female **sanitary facilities**, including an accessible toilet, should be located adjacent to the waiting area. Hand sanitisers should be widely available and respiratory masks should be readily available during respiratory and influenza season. Consideration should be given to **accessibility** requirements throughout all public spaces.

Recommendations	
6	The reception office should facilitate ease of communication, while respecting privacy and accessibility requirements.
7	The waiting area should be subdivided into smaller waiting areas and/or broken into modular waiting areas within the unit.

4.2.2 Clinical space for reviews

Patients who are currently on treatment may require a clinical review or may attend the day unit for other reasons such as a consultation, procedure, examination or patient support. A number of dedicated rooms should be provided in preference to carrying out these activities in the treatment bays designated for delivery of systemic treatment. The rooms may, for example, be used to assess fitness for treatment, for scheduled outpatient visits, patient education, oral chemotherapy clinics and unscheduled assessment of unwell patients. In smaller facilities a local risk assessment should be done to inform which of these functions may be accommodated.

A **consultation room** has similar requirements to an outpatient clinic room, to facilitate a comfortable space for discussion with the patient plus an examination couch. Sufficient space is required for clinical hand washing facilities, waste receptacles and a desk/IT point.

An **examination/procedure room** should have a couch or trolley to facilitate procedures such as bone marrow biopsy, phlebotomy, etc. Again, sufficient space is required for clinical hand washing facilities, waste receptacles and desk/IT point.

A number of **interview rooms** are required, in which to conduct patient education sessions, family meetings, counselling etc. These rooms should have a less clinical feel and offer privacy to patients and families. While these rooms are intended for those who are receiving or about to commence treatment, there is also an advantage to locating such a room closer to the main entrance of the unit.

Recommendations	
8	Consultation rooms, examination/procedure rooms and interview rooms should be provided.

4.2.3 Clinical space for delivery of systemic cancer treatment

Consideration should be given to the optimum use of space, patient privacy and personal choice, and infection prevention and control when designing this space. A risk assessment should be carried out locally taking into consideration the types of service provided and the prevalence of antimicrobial resistance.

The space provided for treatment delivery should be divided between single rooms en-suite and multi patient bays. Treatment should primarily be delivered in adjustable recliners. The option of a bed should ideally be available to patients, e.g. in a subset of single rooms.

The built environment can minimise the spread of anti-microbial resistance through the provision of adequate space and physical barriers between patients. Screening policies in this patient population – who are an at risk group for both

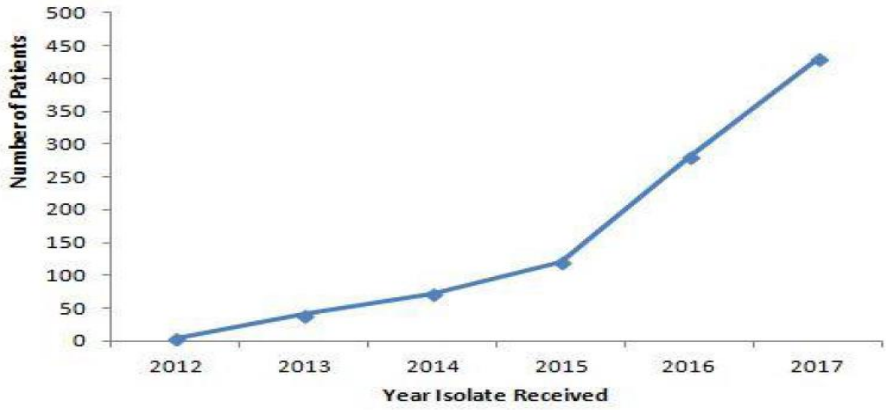
CPE acquisition and infection – will result in an increased demand for single rooms or cohorting where single room numbers are insufficient.

UK guidance recommends a maximum of six recliners per **multi patient bay** (Department of Health (UK), 2013c). Ireland has an increasing prevalence of multi-drug resistant organisms (see EARS-NET data available on the HPSC website) and in response to the rising prevalence of CPE, the Minister for Health activated the Public Health Emergency Plan to address CPE in our health system. – see Figure 1 (Health Service Executive, 2018)

Preventing the spread of CPE is dependent on adequate, and ideally individual, toilet facilities. Single rooms provided should therefore be en-suite. We recommend limiting multi-patient bays to no more than four patient spaces. Local surveillance data and risk assessment may require less than four patient spaces (National Health Service, 2005a). This will also have the benefit of enhanced infection prevention and control through segregation but will also meet the requirements of current guidelines on CPE cohorting when there are insufficient single rooms (National Taskforce for HCAI/AMR, 2017b). Options for physical separation of patients is detailed in section 4.3.1.

Smaller multi-patient bays will also facilitate segregation of teenage patients from older adults. Within such a shared area, design considerations should be employed to ensure both visual and auditory privacy (Macmillan, 2010). The space per patient must accommodate the recliner, clinical hand washing facilities and waste receptacles and allow sufficient space for staff to work safely in the administration of drugs. A minimum space of $10m^2$ is recommended.

Figure 1. Shows the annual number of patients with newly confirmed CPE from 2012-2017



Guidance From the UK (Department of Health (UK), 2013c) recommends the provision of one treatment chair (recliner) per 20,000 population and one single room en-suite/isolation room per 100,000 population. Again, given the risk of multi-drug resistant organisms identified in Ireland recently (National Taskforce for HCAI/AMR, 2017b) (National Taskforce for HCAI/AMR, 2017a) (Department of Health) (Health Protection Surveillance Centre, 2018a) and the indication for CPE screening in many haematology/oncology patients, we anticipate the need to deliver a greater proportion of care in single rooms en-suite. (Health Protection Surveillance Centre, 2018b).

The overall treatment spaces per catchment population required will vary depending on efficiencies such as opening hours of the unit and the availability of other clinical spaces, in addition to the complexity of the treatments provided.(Health Protection Surveillance Centre, 2018a).

CPE and VRE are faecally carried organisms and spread from patient to patient by shared **toilet facilities.** A minimum of one semi-ambulant WC should be

available for every four recliners and at least one accessible WC should be provided per ten recliners (Department of Health (UK), 2013c).

En-suite single rooms should be provided for privacy or clinical reasons – for example, for those posing a non-airborne infectious risk such as CPE, for elderly frail patients, for those using scalp cooling treatments, or as a personal preference. The inclusion of an en-suite is recommended, given the epidemic spread of CPE in Ireland, for which sharing of toilet facilities is a significant risk factor (National Taskforce for HCAI/AMR, 2017b). Note that the space required for a day unit single room en-suite is less than that for an inpatient single room en-suite (Appendix 5.1)

Unwell patients may present to the day unit with a possible airborne infection and not be fit for their planned systemic therapy but require a space in which to be assessed, which minimises the exposure risk to themselves and others. Access to an **airborne isolation room** is therefore required and is indicated where a patient is considered to pose an airborne infectious risk. Whether it is located on the day ward itself, or for example on a nearby in-patient ward, if located in the day ward, it could be vacated at shorter notice, compared to an inpatient room. Airborne isolation rooms require an anteroom and an en-suite and require specialised ventilation (see Section 4.4).

A vacant single room has the potential to be used for other purposes. See appendix 5.3 Considerations for Administration of Pentamidine.

If the unit provides **intrathecal treatment**, then one room should be designated for this purpose. As per NCCP Intrathecal Policy (National Cancer Control Programme, 2016), this does not preclude its use for other activities when not required for ITC administration. A consultation room or procedure room from the on-treatment suite could be suitably designated.

A dedicated space should be assigned for storage of a **resuscitation cart**.

Recommendations	
9	Multi-patient bays should be arranged in groups of up to a maximum of four recliner spaces, with a minimum designated space of 10m^2 per patient. Local surveillance data and risk assessment may require a reduced number of recliner spaces per bay.
10	A minimum of one single room should be provided for every four recliner spaces, either as a single room en-suite or specialised ventilation isolation suite, and at a ratio of one/100,000 population served. Each unit requires access to an airborne isolation suite with specialised ventilation.
11	A minimum of one semi-ambulant WC should be available for every four recliners. At least one accessible WC should be provided, at a minimum of one per 10 recliners.
12	If the unit provides intrathecal treatment, then a room should be designated for this purpose, as per NCCP Intrathecal Policy.

4.2.4 Staff areas

The staff base/nurses' station, office space and seminar/MDT rooms provided on-site should facilitate all the members of the multi-disciplinary team, including doctors, clinical pharmacists and allied health professionals and should ensure ICT to facilitate video linkage with remote sites. Layout should reflect optimisation of space usage and offer flexibility in use. The exit should be positioned away from the clinical area.

Staff facilities required includes a changing/locker room, shower rooms, WCs and rest room/pantry. The requirements will vary depending on the ease of access to other staff facilities nearby. However, a minimum of one **staff shower** should be provided for staff on site, in case of spillages.

Recommendations	
13	The required staff areas are: • Staff base(s) within the treatment delivery area and chemotherapy preparation room • Ensuring space for doctors, clinical pharmacists and other allied health professionals • Staff office spaces • Multi-disciplinary team meeting room • Shower, toilets, locker room and rest areas

4.2.5 Storage areas

Drug storage should be located in the chemotherapy preparation area described in section 4.2.3. Supplies required for the preparation and use of drugs should be stored in the same room. A resource containing additional detail on drug storage is provided in appendix 5.2.

For units administering intrathecal therapy, there should be a facility available on the day unit for the **storage of intrathecal drugs** if administration has to be delayed, as per NCCP Intrathecal Policy (National Cancer Control Programme, 2016). Current policy recommends that this could be a clearly marked locked box within the main drug storage area, noting need for refrigeration if required.

Other storage requirements are for a secure chart storage area, wheelchair/ equipment store, clean linen store and a locked cleaner's cupboard, which does not open into the patient area. Equipment storage room(s) should facilitate clear separation of clean equipment from that awaiting cleaning.

Recommendations	
14	The storage available for cytotoxic, and other drugs, required in the haematology/oncology day ward must meet legislative, environmental, patient safety and security requirements.
15	Units providing intrathecal therapy must provide a dedicated locked facility for the temporary storage of intrathecal drugs between time of issue and administration.
16	Storage areas are required for: • Drugs and fluids • Equipment including wheelchairs • Chart storage in a locked/supervised area • Cleaner's store • Linen store

4.2.6 Ancillary and sanitary areas

Clean and dirty utility rooms are required for both the clinical review suite of rooms and the treatment delivery area. Certain unit designs may facilitate sharing of these areas, provided location is convenient and minimises movement of soiled material throughout the unit.

A **secure disposal room** is required for the temporary storage of segregated waste, which does not open into the patient treatment area.

Recommendations	
17	Separate ancillary areas/sanitary spaces are required: • Sluice • Dirty utility • Disposal room/hold with entrance not directly onto the unit • Clean Utility

4.3 Layout & design

Designers should create an environment which is welcoming and will help patients feel at ease, particularly given the recurring nature of visits for systemic treatment. This can be done without compromising patient safety and while respecting the need for good infection control practices and efficient working. It can also have a positive effect on staff morale.

Patients should be consulted on the aesthetic aspects of the unit design. For example, a carefully chosen work of art can significantly improve the patient experience. Useful resources which outline features which can improve the patient experience include:

- Improving the patient experience – evaluation of the King's Fund's Enhancing the Healing Environment programme
- Better by design
- Macmillan Quality Environment Mark

The most recent Cancer Strategy (Department of Health, 2017) has a focus on children, adolescent and young adults with cancer and the development of an equitable, accessible and appropriate service, specifically for this cohort of patients is recommended. Consideration should be given to an age-appropriate environment. Both adult and paediatric units must consider the specific needs of adolescents/young adult patients attending the unit (Teenage Cancer Trust, 2010).

Internal rooms may appear to contribute to economy in planning but costs for additional artificial lighting and ventilation should be carefully assessed. They are only suitable for activities which need a controlled environment or are carried out intermittently by different individuals – for example in circulation areas and some storage areas.

Recommendations	
18	Local planners should seek the views of service users at the onset of the planning process.
19	Patient comfort and patient choice should be respected in the design of the environment, including consideration of the needs of adolescents/young adult patients.

4.3.1 Spatial arrangement within the treatment area

As outlined in section 4.2.3, the space available for treatment delivery can be divided between multi patient bays and single rooms. Project teams should be aware that patient privacy can be compromised by an open-plan design within the treatment delivery area. A balance should be struck between patient privacy; patient/patient social interaction; need for infection prevention and control; and the need for staff and patients to be able to observe one another.

Shared treatment areas should be large enough that people do not feel overlooked, even on busy days and for ease of cleaning and decontamination. Those receiving treatment should have access to screens or private space:

- Non-fixed partitions are preferable and can offer flexibility.
- Partitions can give patients a greater sense of personal space.
- Partitions need to be of a height or design to allow direct vision from a staff base.
- Part glass partitions with integrated blinds may facilitate privacy and visibility.
- Partitions should be designed to allow effective cleaning and facilitate infection prevention and control (National Health Service, 2005a).
- If curtains are used, they should be disposable.

Staff base(s) should be located so that staff sitting at the base can observe the patients in the treatment area. Staff bases should be designed to minimise the disturbance to patients.

Recommendations	
20	The overall shape and layout should aim to optimise staff workflow, patient comfort and safety and allow for optimal delivery of healthcare.
21	In shared areas, appropriately placed partitions should be provided for visual and auditory privacy and infection prevention and control.
22	In single rooms, options to maintain line of vision should be considered e.g. viewing panels, sliding glass doors.
23	Each staff base should facilitate a clear view of patients under their care.

4.3.2 Lighting

Wherever possible, spaces to be occupied by patients or staff should have natural daylight with an outside view. Natural lighting is important to human well-being. Glare can be dealt with by installation of blinds or through architectural detailing of window shape and depth of reveals. If a unit is on the ground floor, consideration must be given to patient privacy.

Artificial lighting should provide sufficient illumination for clinical activities and allow changes in patient skin tone and colour to be easily identified. Good artificial lighting design includes well designed light fittings, e.g. up-lighting to create a softer less clinical environment, colour rendering luminaires and the provision of dimmable lighting control for patient lights where appropriate.

Courtyards enable more rooms to receive natural daylight and ventilation, and provide an outlook which can compensate patients for the lack of a longer view.

Recommendations	
24	All spaces used by patients for prolonged periods of time should have access to natural light, where possible. If not, artificial lighting should be of good quality.

4.3.3 Acoustics and noise attenuation

Speech privacy is essential in spaces where personal and confidential discussions are held, such as interview rooms and consulting/examination spaces.

Excessive noise anywhere in the unit can cause discomfort to both patients and staff. Noise levels can be reduced by the correct installation of appropriately specified ceiling tiles and partitions. Noise-sensitive areas should be located as remotely as possible from internal and external sources of unavoidable noise.

Recommendations	
25	Consultation and examination rooms should be sound-attenuated so that conversations cannot be heard outside and sound from external areas is limited.

4.3.4 Finishes

Finishes should be chosen which are durable and easily maintained. They will need to withstand accidental impact and constant cleaning, including the occasional use of chlorine-releasing agents (for body fluid spillages).

Consideration should be given to options which contribute to a softer clinical environment for patients, without compromising on safety. Flooring should not be or appear to be slippery. Floor patterning which could induce disorientation

should be avoided. Slip resistant, static electricity, flammability, infection hazards and impermeability to fluids should also be considered.

Special design consideration should be given to corners, partitions, counters and other elements which may be subjected to heavy use. Wall coverings should be chosen with cleaning in mind (National Health Service, 2005b).

Recommendations	
26	Finishes should be durable, easily cleaned and disinfected and designed to minimise the risk of transmission of infection in line with appropriate national and international guidance documents.

4.3.5 Sustainability

The design of the unit should aim to minimise its environmental impact, by ensuring that energy is used efficiently and only where necessary. The design should aim to exceed statutory requirements in all aspects of sustainability and aim to achieve the highest levels of environmental effectiveness. For new build projects, the design process should comply with the requirement of IS 399 and include an energy efficiency design review. (Sustainable Energy Authority of Ireland)

For example, treatment areas and offices should be located where they can benefit from natural daylight, while areas such as stores, WCs and utility rooms can be located towards the core of the unit. Energy recovery systems should be employed where possible, and particularly on ventilation systems, with the exception of those serving airborne isolation rooms.

Consideration should be given to flexibility of use over time and ease of adaptation for future service needs. For example, a move towards oral chemotherapy review and dispensing from the day ward could impact on the requirements for clinical review spaces as outlined in 4.2.2.

The layout should be designed in such a way that if required, it can easily be converted into single patient delivery units rather than shared 4-5 bed unit spaces (Department of Health (UK), 2013c)

Recommendations	
27	The design of the unit should aim to minimise its environmental impact by ensuring that energy is used efficiently and only where necessary.
28	Design should allow for flexibility of use over time.

4.4 Engineering considerations

All engineering systems within new facilities should comply with the Irish Building Regulations and all relevant Irish and European Standards. They should also comply with relevant best practice guidelines including the NHS HBN's, HTM's, HPSC, HSE, BSRIA and CIBSE guidance documents.

In refurbishment projects, existing engineering systems should be upgraded to comply with current standards where this is reasonable and practical.

4.4.1 Space requirements for services and plant

The building design should include sufficient space for the full range of building services and distribution systems. Reference may be made to the NHS Health Technical Memoranda for guidance on spatial requirements (Department of Health (UK), 2014b) (The Building Services Research & Information Association, 1992). Service distribution should be contained within service spaces on the floor. Consideration should be given to the minimisation of noise and vibrations from plant rooms. (Department of Health (UK), 2013f).

4.4.2 Heating, Ventilation and Cooling Systems

Ventilation is an important consideration in oncology day wards. In particular, the requirements for infection prevention and control should inform the nature of ventilation system required to meet the specific clinical needs of the facility.

Ventilation systems should be designed to meet the requirements of HTM 03-01 (Specialised Ventilation for Healthcare Premises). In addition, the specific requirements of HBN 02-01 (Cancer Treatment Facilities) relevant to the nature of the clinical activity should be adhered to where required.

Where an airborne isolation room is required, this should be of the Positive Pressurised Ventilated Lobby type and designed to meet the requirements of HBN 04-01 Supplement 1(2013d). It is essential that the following requirements

are achieved in order to ensure that the infection prevention and control measures are fulfilled:

- Air Leakage shall be tested to a maximum permeability of 2.5 m3/h.m2 at a reference pressure of 50 Pascals; and be carried out in accordance with BSRIA Standard: BTS 3/2018 – Air Permeability Testing of Isolation Facilities. This is required to prevent the ingress of air and spores from the environment outside.
- The design of the lobby is such that it prevents air movement from the patient's room to the corridor and from the corridor to the patient's room.

The room should be monitored regularly to ensure that the pressure differentials continue to meet the design specifications. If there are any concerns, the local Technical Services Department should be contacted in the first instance. Further advice can be obtained from HSE Estates.

Isolation rooms which are designed to 'switch' between negative and positive pressure states should be avoided. These rooms introduce risk if they are not in the correct operating mode for the patient type.

Construction activity in and nearby clinical facilities poses a risk to infection prevention and control with particular regard to Nosocomial Aspergillosis. All new ventilation systems should be installed with the facility for fitting HEPA filtration as per the HSE Estates Directorate Guidance on Air Handling Unit Specifications (2015). This approach facilitates minimal intervention in order to meet the recommendations of the HPSC National Guidelines on the Prevention of Nosocomial Aspergillosis.

As described further in section 4.4.4, attention should be paid to national guidelines on the control of Legionella in ventilation and water distribution systems.

Recommendations	
29	The requirements for infection prevention and control should inform the nature of ventilation system required to meet the specific clinical needs of the facility. In some cases, this may necessitate the need for conditioned air.
30	Where an airborne isolation room is required, this should be designed to meet the requirements of HBN 04-01 Supplement 1 (2013). Particular attention should be paid to the airtightness requirements of this type of isolation room.
31	All new air handling and ventilation units should be designed, installed and maintained in compliance with European Standards, HTM 03-01 and the HSE Estates Directorate Guidelines on Air Handling Unit Specification.
32	All new ventilation systems should be installed with the facility to fit HEPA filters on the supply air stream.

4.4.3 Hot and cold water systems

Hot and cold water storage and distribution systems should be designed to minimise or prevent conditions which permit the growth of waterborne microorganisms and biofilm and also to allow easy cleaning and disinfection. This is essential in any healthcare facility but particularly given the susceptibility of an immunocompromised patient to organisms such as Legionella. These systems should be designed in accordance with HTM 04-01(Department of Health (UK), 2017a) . However, the HPSC ‘Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facilities’ (Health Protection Surveillance Centre, 2015), ‘National Guidelines for the Control of Legionellosis in Ireland’ (Health Protection Surveillance Centre, 2009) and any superseding guidance takes precedence where these offer differing recommendations.

Recommendations	
33	National guidelines, HTM 03-01 and HTM 04-01(2017) should be followed in the design of water services and ventilation systems, with respect to the risk of organisms such as Legionella.

4.4.4 Piped medical gases

Piped medical gases should be designed in accordance with the requirements of Health Technical Memorandum 02-01 – 'Medical gas pipeline systems' (Department of Health (UK), 2006). As a minimum medical Oxygen and suction must be available in treatment areas and must be clearly labelled.

4.4.5 Pneumatic tube transport systems

Consideration should be given to the transportation of blood and other samples to the laboratory. Pneumatic Tube systems should be extended into the facility where reasonable and practical.

Where pneumatic tube systems are installed, these should comply with Scottish HTM 08-04 (National Health Service, 2015).

Recommendations	
34	Consideration should be given to the transportation of blood and other samples to the laboratory. Pneumatic Tube systems should be extended into the facility where reasonable and practical.

4.4.6 ICT requirements

Early consideration should be given to ICT infrastructure to ensure that this meets the needs of the service including those of staff, patients and visitors. ICT solutions should be developed with a strong focus on information management requirements.

The pace of ICT developments is such that access to electronic records, protocols and guidance is essential in all patient care areas, including where treatments are being prepared or checked. ICT access should be provided at the patient bedside, to facilitate use of electronic clinical information systems once available.

Some drugs have a requirement to be stored within a specific temperature range. As such, refrigerators used for the storage of such drugs must be installed with monitored alarms which will alert staff if the temperature goes outside of a pre-set range. For day facilities which do not operate 24/7 these alarms should be remotely monitored at a central location which is staffed 24 hours.

Recommendations	
35	Early consideration should be given to ICT infrastructure to ensure that this meets the needs of the service including those of staff, patients and visitors.
36	Fridge alarms should be remotely monitored at a central location which is staffed 24 hours, to ensure action is taken when the day ward is closed.

4.4.7 Controlled access

For security reasons and patient/visitor safety, access should be controlled to areas containing patient sensitive information or potentially hazardous materials. Controlled access using individual staff cards or fobs is preferable to keypad access.

Recommendations	
37	Controlled access (e.g. remote swipe card access) is required to all restricted areas - medical records area, drug preparation and storage areas, sluice, hazardous waste storage, cleaner's cupboard.

4.4.8 Electrical Resilience

In the interests of patient safety, it is important that oncology treatment facilities can continue to operate in a safe manner in the event of a global or local electrical failure. Consideration should extend beyond essential electrical systems, such as light and power for medical equipment, and should also consider specialist ventilation systems, where this is reasonable and practical.

In new facilities, electrical systems should be designed and installed to meet the requirements of HTM 03-01 on electrical services supply and distribution (Department of Health (UK), 2017b).

Recommendations	
38	Subject to local risk assessment and contingency planning, the facility design should have a resilient power supply capable of providing full back up to relevant services systems, including specialist ventilation systems.

4.4.9 Bedhead Services

At each patient location within a bedhead trunking system, oxygen and suction services will normally be required. Bedhead trunking and fixture/fitting should be such that minimise infection risk and allow for appropriate cleaning and decontamination. The provision of dedicated wall space or chair mounted equipment discourages excessive movement or sharing of equipment between patients and frees up floor space. Consideration should be given to the patient's need for charging of communication or entertainment devices.

Bedhead Services should meet the requirements of HTM 08-03 (Department of Health (UK), 2013e).

Recommendations	
39	In the interests of infection prevention and control, early consideration

	should be given to the planning of bedhead services and should be designed to accommodate the mounting of medical equipment.

4.4.10 Soils and Waste installations

Soils and Waste installations in clinical areas should be designed and installed such that they are fully accessible for rodding and maintenance.

4.4.11 Commissioning & Handover of Engineering Systems (DC)

Engineering systems should be commissioned and handed over as per the recommendations of “HSE Estates – Guidance on Handover & Completion Procedures for Building Systems in Capital Works Projects”
In particular, the commissioning and handover process should meet the requirements and adhere to the standards of the following documents:

- ‘Model Commissioning Plan’ (BG 8/2009), published by BSRIA Ltd., ISBN: 9780860226871;
- ‘Handover, O&M Manuals, and Project Feedback: A toolkit for designers and contractors’ (BG 1/2007), published by BSRIA Ltd., ISBN: 9780860226673; and
- ‘Soft Landings Framework’ (BG 54/2014), published by BSRIA Ltd., ISBN: 9780860226857.

A certificate of compliance should be provided.

4.5 Infection prevention and control

Managing transmission of antimicrobial resistant bacteria in an acute hospital setting is increasingly challenging. The importance of effective infection prevention and control is ever more apparent due to difficulties in containing the transmission of CPE. CPE are mostly carried asymptomatically in the bowel, so it

may not be known that a person is a carrier unless they are screened, making detection and containment difficult (Health Protection Surveillance Centre, 2018a).

Patients receiving SACT are already a particularly susceptible to infection. They are more likely to carry multi-drug resistant organisms due to previous hospital stays and antibiotic treatments and are more at risk of developing an infection due to such an organism.

The aforementioned recommendations on the minimum space provided per patient bay, the provision of single/isolation rooms and adequacy of toilet facilities are critical to minimise the risk of patient to patient transmission of infectious organisms. If adequate toilet facilities are lacking, the provision of additional toilet facilities should be addressed as a matter of urgency. (Health Protection Surveillance Center, 2018)

Sufficient hand hygiene facilities must be made available in patient care areas, to meet national recommendations as outlined in *Guidelines for Hand Hygiene in Irish HealthCare Settings. (Royal College of Physicians of Ireland, 2015)*

Emphasis should be placed on designs and finishes that enable staff to keep the treatment unit clean and as free from infection as is reasonably possible while providing a comfortable environment. While works of art can improve the patient experience, assessment should be carried out to ensure there is no infection control risk. In addition, decorative fountains or other water features that generate aerosols are not recommended due to the infection control risks to immunocompromised patients. (Health Protection Surveillance Centre, 2015) (Health Protection Surveillance Centre, 2009)

Infection prevention and control teams must be involved in all stages of hospital building or refurbishment programmes to advise on these issues. Consideration

should also be given to safeguards which should be put in place to protect patients during the construction period (Health Protection Surveillance Centre, 2016). The HPSC National Guidelines on the Prevention of Nosocomial Aspergillosis should be followed where construction activity is taking place in or near existing clinical facilities.

Infection control risk assessment should be carried out annually by each unit.
A tool such as the CDC infection control tool can be utilised to assist in the assessment of infection control programmes and practices in acute hospital. The CDC tool and is available via the following link https://www.cdc.gov/infectioncontrol/pdf/icar/hospital.pdf

Recommendations	
40	Infection prevention and control teams are required to be consulted in all stages of hospital building or refurbishment programmes. In compliance with the National Guidelines for the Prevention of Nosocomial Aspergillosis, HPSC, 2016, construction work cannot commence until the construction permit is issued.
41	Specific safeguards must be in place to minimise the risk of infection during the construction period. The HPSC National Guidelines on the Prevention of Nosocomial Aspergillosis should be followed where construction activity is taking place in or near existing clinical facilities.
42	Hand hygiene facilities in patient care areas should be made available according to national recommendations.

4.6 Waste Management

The management of hazardous healthcare waste is central to safe and responsible hazardous healthcare waste management. Segregation at the point of origin, aided by suitable disposal containment is vital in ensuring safe handling, storage, transport and disposal of waste. The risk of waste becoming an infection

control issue is lower when handled in an appropriate manner. (Health Service Executive,2010)

Recommendations	
43	Sufficient space must be provided for the segregation of household, clinical, cytotoxic and sharps waste.
44	The flow of goods, services and waste materials should be designed to minimise the risk of contamination. Specific consideration should be given to the location of the dirty utility and provision of a separate exit for waste.

5. Appendices

The following appendices are samples of the resources available which may be helpful in assisting in the implementation and monitoring of the recommendations with this guidance document.

5.1 Sample schedule of accommodation
5.2 Drug storage additional advice
5.3 Considerations for administration of Pentamidine
5.4 Self assessment toolkit
5.5 CDC tool link
5.6 Group membership
5.7 Methodology

5.1 Sample schedule of accommodation for an oncology unit serving a population of 400,000

Areas are estimated and for guidance only, based on a population of 400,000 and adapted from a UK sample schedule (ref). UK circulation and engineering allowances[1] have been used to estimate the gross area requirements.

Section	Room Name/ Function	Notes	Unit area allowance m^2	*No of units*	Net area m^2	Gross Area m^2
	Public spaces - Entrance, reception and visitors facilities					
	Reception desk (size based on the number of places)	Division required between counters for privacy	5.5	*2*	11	17.6
	Waiting area (25 places)	Some physical separators among seating for infection control reasons. Include infocaster/ wall mounted notice board 1 per treatment place	2.25	*25*	56.3	90
	Interview room (7 places)	For patient education or as an additional counselling space	12	*1*	12	19.2
	WC semi ambulant	1 per 12 waiting spaces; male and female required	2.5	*2*	5	8.0
	WC independent wheelchair	Unisex 1 per unit	4.5	*1*	4.5	7.2
	Clinical spaces for reviews					
	Sub wait (6 places)	If facilitated by the unit design and patient flow, there is benefit in a smaller waiting area within this unit. The space required may be a portion of that allocated above	2.25	*6*	13.5	23.4
	Examination /procedure room	1/100,000 population. For interventions, such as bone marrow biopsy, lumbar puncture, phlebotomy. Could also serve as the room dedicated for intrathecal chemotherapy administration.	12	*4*	48	83.0
	Consulting/	1/100,000 population	16	*4*	64	110.7

[1] Circulation & communication allowance (all areas): 35%

Engineering allowance (public area): 25%

Engineering allowance (clinical area): 28%

Engineering allowance (staff area): 23%

	Examination room (double sided couch)	Consultation area, to include sit down area with patient and examination couch. Number required will vary depending on use of outpatient department rooms.				
	Clean Utility Room	Required	16	*1*	16	27.7
	Dirty Utility Room	Required	8	*1*	8	13.8
	Staff Communication Base (size based on number of places)	Space required for staff base and to encourage patient flow through unit	5.5	*2*	11	19
	Interview room (7 places)	A non-clinical space, for counselling, family meetings	12	*1*	12	20.8
	Store, linen	Design may allow this to serve the SACT delivery area also	3	*1*	3	5.2
	Store equipment and consumables	Design may allow this to serve the SACT delivery area also. Must facilitate identification of cleaned equipment vs. that awaiting cleaning, e.g.as two separate storage areas	8	*1*	8	13.8
	Clinical Spaces for delivery of SACT					
	Chemotherapy Treatment, Multi chair bay	1 space per 20,000 population. Space to accommodate recliner, sink, waste receptacles etc.	10	*20*	200	346
	Chemotherapy Treatment, single rooms	1 single room per 100,000 population. We recommend all single rooms to be ensuite (*note UK guidance says single room*), requiring an additional 4m^2 per 12m^2 room A patient shower room should be provided in one en-suite (Department of Health (UK), 2013a) We recommend one of the four single rooms to be an airborne isolation suite with lobby and en-suite	16 2.5 20	*3* *1* *1*	48 2.5 20	83 4.3 34.6
	Chemotherapy preparation and drug storage	Required	16	*1*	16	27.7
	Clean Utility Room	Required	16	*1*	16	27.7
	Dirty Utility Room	Required	8	*1*	8	13.8
	Staff base	E.g. arranged as one staff base of 2 places provided per multi-chair bay plus single room.	5.5	*8-10*	44	76.1

	WC semi ambulant	Required (1 per 6 bays)	2.5	*4*	10	17.3
	WC Independent wheelchair	Required (1 per 12 bays) Two WCs allows gender segregation	4.5	*2*	9	15.6
	Store: linen	Note design may allow this to be shared with clinical review area	3	*1*	3	5.2
	Store: equipment and consumables	Note design may allow this to be shared with clinical review area	12	*1*	12	20.8
	Store: fluids		12 m2	*1*	12 m2	20.8
	Staff spaces: shared support					
	Admin area shared use	Size based on number of workstations required. [we recommend 4, rather than the 6 in HBN]	6.6	*4*	26.4	41.7
	Office: 1 person	Where shared office space inappropriate, e.g. unit manager, telephone triage office.	8 m2	*3*	24	37.9
	Office: 2 person	As above	12 m2	*1*	12	19.0
	Seminar/MDT room	Required – 19m^2/20 person room. Ensure ICT for linkage with other sites	38	*1*	38	60
	Staff restroom	For staff breaks plus kitchenette. Allow 1.9m2/seat, e.g. 10/unit	1.9	*10*	19	30
	Disposal hold 3000 litres	Secure area for waste storage	12	*1*	12	19
	Parking bay: Resuscitation trolley	One per unit	2	*1*	2	3.2
	Staff wc ambulant	Required	2	*1*	2	3.2
	Shower room ambulant	In case of spillage, even if changing facilities elsewhere.	2.5	*1*	2.5	4.3
	Staff changing facilities					
	Staff changing area (size based on number of lockers)	Includes uniform exchange area, showers and a number of individual changing rooms. Based on 30 staff who need a locker plus a 10% contingency for Male/Female split. Suggested apportionment 2/3 female 1/3 male. Lockers do not need to be assigned per individual but allow sufficient numbers for changeover times.	1.4	*33*	46.2	73
	Changing room semi ambulant	Additional area to allow for gender segregation.	2.0	*1*	2.0	3.2

	Shower room ambulant	Additional area to allow for gender segregation.	2.5	*1*	2.5	3.9
	WC ambulant	Additional area to allow for gender segregation.	2.0	*1*	2.0	3.2
	Other considerations					
	Oral Chemotherapy consultation room	Consider as a future need, particularly if oral chemotherapy to be dispensed by hospital	8	*1*	8	13.8
	Total accommodation allowance				**872 m^2**	**1,468 m^2**

5.2 Drug storage additional advice

Introduction

The purpose of these guidelines is to provide recommendations for the storage of drugs in a haematology/oncology day ward which consider legislative requirements, security and patient safety recommendations. Drug storage is an essential component of the total drug control system within a hospital. The Drug Store/Preparation Room is required for the storage and preparation of all drugs to be used on the Ward/Department. Well-designed storage can minimise overcrowding, incorrect selection and missed doses of medications (Department of Health (UK), 2014a)

Planning Drug Storage

- The lead or nominated pharmacist and lead or nominated nurse must be included at an early stage in any plans to upgrade or build new drug storage facilities (Department of Health (UK), 2014a).
- Haematology/oncology day ward drug storage facilities may be provided as a central facility (16 m^2 would serve 24 patients) or as smaller devolved rooms (9 m^2 per 6 chair bay). However where possible, store drugs in one drug storage room per ward/department. (Department of Health (UK), 2013c) The use of more than one drug storage room will replicate stock and increase costs to the hospital, and will necessitate distribution of drugs by ward/department staff after delivery.
- Calculate the amount of drug storage for any clinical area by inspection of the drug stock list for the specific area and consideration of department specific requirements.
- The room should be located adjacent to treatment areas. (Department of Health (UK), 2013b)

Functions of Drug Storage Rooms

The **only** functions of drug storage rooms are:

- The storage of drugs
- The preparation of drugs
- The storage of supplies required for the preparation and use of drugs

Environmental Conditions

Environmental control is required to maintain drug integrity throughout all stages of drug use.

Light

- Do not store drugs in direct sunlight.
- Do not store drugs in close proximity of artificial lighting.
- Drug storage and preparation areas require a lighting level of 1460 Lux as this has been shown to reduce the incidence of errors when selecting and preparing drugs.(Department of Health (UK), 2014a)

Temperature

- Store drugs at temperatures outlined in their marketing authorisations.
- Excursions from temperature recommendations may affect the integrity and/or shelf life of drugs.
- Most drugs require storage at a temperature below 25ºC. Drug storage areas must be mechanically temperature controlled to ensure this is provided. Equip drug storage areas with temperature recorders or other devices that will indicate when the specific temperature range has not been maintained (Department of Health (UK), 2014a)
- Within drug storage rooms, do not store drugs adjacent to areas of extreme temperature variation, i.e. heaters, windows, high heat output bulbs.
- Store refrigerated drugs at a temperature of 2 to 8ºC in a lockable pharmaceutical grade refrigerator. Refrigerators must have an integrated

digital thermometer with maximum and minimum recording and audible alarm. Consideration inclusion of temperature logging capability, especially where high-value stocks are held.(Department of Health (UK), 2014a)

Humidity

- Steam can adversely affect drugs. Avoid locating drug storage rooms adjacent to areas that may generate steam, for example bathrooms and kitchens.

Hygiene

- Ensure drug storage rooms comply with Infection Control Policies and Hygiene Standards.
- Drug storage rooms and storage systems should be easily cleaned and disinfected.
- Include appropriate waste disposal facilities. The discharge of cytotoxic materials into the environment is regulated thus specific routes for disposal must be agreed and described in local rules and protocols. (Department of Health (UK), 2013b) (Health Service Executive, 2010)

Water

- Site hand washing facilities appropriately in Drug Storage Rooms to ensure that water does not come into contact with drugs.

Ventilation

- Drug storage rooms should be adequately ventilated.

Drug Storage Security

- Drug storage rooms must be secure and locked by lock and key, or keypad locks with limited staff swipe access.
- Do not place storage rooms at the extremes of a ward/department, but in a central area.
- Position drugs storage/preparation should be out of open view of patients, visitors and other staff.
- Patients do not have access to, or are treated in, drug storage rooms.
- Fixtures and equipment used to store drugs is constructed so that drugs are accessible only to designated, authorised personnel.
- No other areas of a ward are appropriate for drug storage, including nurse's stations. Drugs excluded from storage in a Drug Storage Room include:
    - Emergency use/access to resuscitation trolleys
    - Patient's own drugs
    - Drugs stored in lockable drug presses in individual patient rooms/cubicles.
- Windows from drug storage rooms to internal areas have security screens, for example be mirrored or tinted.
- Windows accessible externally (ground level, or access from, for example, a roof) have a stainless steel security mesh.
- Lock all drug storage rooms, drug trolleys presses and refrigerators at all times to prevent unauthorised access to drugs.
- Secure drug trolleys to a wall when not in use. Lock all sections of the drug trolley.

Health & Safety

- Drug Storage Rooms must comply with the correct Health and Safety Standards.
- Do not store drugs on the floor.

- Do not pile drugs dangerously on top of each other, or overloaded onto shelves.
- Store drugs in areas that are easily accessible for all service users.
- Appropriate storage locations for glass bottles, heavy items, volatile, flammable or explosive items should be allocated.

Capacity

Capacity of the proposed storage systems, within drug storage rooms, should be sufficient to hold quantities of drugs required to meet department needs. Capacity requirements may need to be revised when:

- There are increases in patient bed numbers
- There are increases in procedures being undertaken in an area
- There are new procedures being undertaken in an area that result in an increased consumption or new requirement for drugs, and thus drug storage requirements.

Storage System Requirements

- Storage systems should enable storage of all drugs in an orderly, systematic, standardised manner to avoid risk of confusion between drugs and to avoid cross-contamination.
- Store drugs in an organised uniformed manor with reference to product type / volume / quantity.
- Implement stock rotation as new stock is delivered. This is necessary to eliminate unnecessary wastage / disposal and to prevent overstocking.
- Store all drugs in the container/packaging in which they are supplied.
- Never remove drugs from the container and never leave drugs loose in trays or on shelves.
- Never combine the contents of amber tablet containers, white cardboard boxes, plastic bags or original packs such as bottles to the contents of another container or package.
- Do not place drugs into unmarked containers.

- Drug presses should be locked, constructed of steel or other impenetrable material, and firmly anchored in place in drug storage rooms.
- It is recommended that each category of drug is stored together in a dedicated or designated press (Department of Health (UK), 2014a) Storage for specific categories of drugs needs to be considered:
    - Controlled Drugs
    - Epidural and intrathecal infusions
    - Concentrated electrolytes
    - Cytotoxic drugs
    - Oral solid drugs
    - Injectable drugs
    - Oral liquid and rectal drugs
    - External drugs and dressings
    - Inhaled drugs
    - Refrigerated drugs
    - Bulk drugs, for example IV fluids
    - Patient's own drugs
    - Drugs to take home

Cytotoxic Drugs

- Store cytotoxic drugs in locked and alarmed facilities. (Department of Health (UK), 2013c)
- Segregate cytotoxic drugs from other drug categories including cytotoxic drugs requiring refrigeration.
- Bring compounded cytotoxic drugs to room temperature prior to administration. Shelves/drawers to facilitate this process should be available in the drug storage room.
- Deliver cytotoxic drugs in a safe, secure and traceable manner. It is not appropriate to deliver cytotoxic drugs by pneumatic tube owing to the risks involved.(Department of Health (UK), 2013c)

Intrathecal Chemotherapy

It is not desirable to store intrathecal chemotherapy drugs outside the pharmacy between issuing and administration and emergency stocks should never be held on the unit. However, if the drugs have to be issued and there will be a short delay before administration, store them in a dedicated container/refrigerator reserved for this purpose alone. (National Cancer Control Programme, 2016)

Clinical Trials Drugs

Clinical trial drugs have no specific storage requirements once dispensed for patients. Clinical trial drugs do not routinely require storage at ward level. If storage is required clinical trial drugs should be stored in accordance with the storage conditions on the label e.g. at room temperature or 2 to 8°C.

Drug Presses

- Order storage presses to meet current, and to consider potential future, needs.
- Do not obstruct the front of drug presses. Where worktops or other obstructions project more than 500mm, reach dimensions into presses will be compromised.
- Consider storage heights for all drugs, to minimise the risk from lifting and handling. If storage heights exceed 1700mm, a portable, non slip step or sturdy two rung ladder will be required to be kept in the Drug Storage Room.
- There are no Irish guidelines for drug presses standards in hospitals. The Royal Pharmaceutical Society of Great Britain National Health Service (NHS) in England recommends the use of drug presses that meet British Standards BS2881 (1989).(Department of Health (UK), 2014a)

Shelving

- Consider inclusion of appropriate shelving in the design and layout of drug presses.
- Shelving in presses allows users to see at a glance what is stored in the press.
- Ensure there is adequate shelving with suitable divisions, potentially tilted to allow easier identification, accessibility and replenishment. It should be possible to adjust the position of the shelves within presses to allow for the wide range of product sizes.
- Ensure shelving is capable of holding the weight of the stock. Pull out shelving can have weight limits to the amount of stock held.
- Trays and baskets are considered unsuitable for storing drugs (except external drugs and dressings) because they do not allow drugs to be adequately segregated and clearly displayed and hence increase the risk of incorrect drug selection.(Department of Health (UK), 2014a)

MDA Presses

- MDA presses must be constructed of welded steel or steel mesh.
- Each door is fitted with an effective lock. Ward MDA presses should conform to the British Standard reference BS2881 or be otherwise approved by the pharmacy department. In some instances, this lock is the lock on the outer drug press.
- To ensure staff security, fit MDA presses within wards or clinical areas with a red lamp indicating when the cupboard is unlocked. Site a repeater lamp outside the doorway of the room in which the press is located. Stand alone/separate MDA presses must be fitted with an alarm connected to the hospital alarm monitoring centre.
- Rigidly and securely fixed the MDA press to a wall or floor which is soundly constructed by means of at least two rag-bolts each passing through an internal anchor plate of mild steel. "Soundly constructed", in respect of a wall or floor, means constructed of solid brick, concrete block

or mass concrete, of sufficient thickness, depth and strength to provide a firm and secure anchor(Misuse of Drugs (safe custody) regulations, 1982).

- Do not display items outside a safe or cabinet to indicate that drugs are kept in it.

Bulk Storage

Bulk storage comprises stock intravenous and dialysis fluids, enteral and sip feeds, alcohol gels and antiseptics. Capacity of the bulk storage area should be sufficient to hold quantities of drugs required to meet ward/department needs. Recommendations for bulk storage include:

- A large lockable storage area with shelving for intravenous fluids, sterile irrigation fluids, dialysis fluids (where applicable) and enteral feeds.
- Store bulk items in their original boxes. This is essential from the perspectives of risk management, batch recall and stock management. Do not decant bulk items into drawers.
- Storage area (press or shelving) for disinfectants and antiseptics.
- Separate storage area with a metal press for flammable pharmaceutical products, such as alcohol hand gel where the volume exceeds 50 litres.
- Locate the bulk storage areas in close proximity to patients as nursing and other ward staff have to transfer bulk items to patient care areas.
- Bulk materials may be delivered and stored on pallets in some wards/ departments, e.g. ICU, dialysis units. Pallets are stored at low level, this may impact on the area required for storage.
- Open and use bulk items 1 box at any time, i.e. do not open multiple boxes of the same product as this contributes to un-necessary wastage/ disposal of bulk stock items.

Communications

Drug storage rooms should have:

- Telephone for receiving/making internal calls
- Bulletin/Notice Board

- Internet and intranet access (physical or Wi-Fi) for access to internal and external electronic references

Preparation/Manipulation of Drugs for Administration

Preparation/manipulation of drugs for administration relates to the processes associated with preparing the drug for patient use. The storage room should be a quiet, secure area so drugs can be prepared without interruption, minimising the risk of calculation and preparation errors. To facilitate drug storage rooms must have:

- sufficient, specifically allocated counter space available for the preparation of drugs for administration. At least 2 metres of worktop is required for drug preparation in each 24-bed ward. (Department of Health (UK), 2014a)
- easily cleaned work surfaces which are not cluttered.
- counter space height that allows drug preparation by all users while standing, and constructed from an impervious material.
- storage space for the additional items required for drug administration, syringes, needles, giving sets etc.
- appropriate hand washing facilities.

5.3 Considerations for administration of Pentamidine

- A single room with adequate air exchanges (e.g. 12 ACH) and external ventilation is the preferred environment for the administration of nebulised pentamidine. (ANSI/ASHRAE/ASHE, 2013)
- In the absence of external ventilation, the room would need to be left vacant for an extended period as pentamidine poses a hazard to other patients and staff (Pentacarinat Summaries of Product Characteristics).

5.4 Self Assessment Toolkit

Guidance on the built environment of a haematology/oncology day ward:

Assessment tool

This self- assessment tool is based on the recommendations contained within the national guidance on the built environment of a haematology/oncology day ward. Please assign a rating as follows:

Met:	Unit complies fully with the recommendation
Partially:	Elements of the recommendation are in place, but not all – provide detail in comments box
Not met:	Unit does not comply with the recommendation
N/A:	The recommendation is not relevant to the unit (e.g. does not provide intra-thecal therapy) – please provide detail in comments box.

Location	Recommendation	Met	Partially	Not met	N/A	Comment
1	The unit location and design should ensure safe and independent access by people with disabilities.					
2	Location should allow for transfer of an unwell patient to an inpatient bed via a discreet route.					
3	Where an inpatient medical oncology/haematology service is available, the day ward should be in reasonable proximity to facilitate staff and patients.					
4	The unit should be located in proximity to the out-patient services. It is not recommended that waiting areas and facilities are shared with other out-patient clinics.					
5	Where possible, the unit should be located adjacent to the aseptic compounding unit or pharmacy dispensary.					

Accommodation requirements	**Recommendation**	**Met**	**Partially**	**Not met**	**N/A**	**Comment**
6	The reception office should facilitate ease of communication, while respecting privacy and accessibility requirements.					
7	The waiting area should be subdivided into smaller waiting areas and/or broken into modular waiting areas within the unit.					
8	Consultation rooms, examination/procedure rooms and interview rooms should be provided.					
9	Multi-patient bays should be arranged in groups of up to a maximum of four recliner spaces, with a minimum designated space of $10m^2$ per patient. Local surveillance data and risk assessment may require a reduced number of recliner spaces per bay.					
10	A minimum of one single room should be provided for every four recliner spaces, either as a single room en-suite or specialised ventilation isolation suite, and at a ratio of one/100,000					

	population served. Each unit requires access to an airborne isolation suite with specialised ventilation					
11	A minimum of one semi-ambulant WC should be available for every four recliners. At least one accessible WC should be provided, at a minimum of one per 10 recliners.					
12	If the unit provides intrathecal treatment, then a room should be designated for this purpose, as per NCCP Intrathecal Policy.					
13	The required staff areas are: • Staff base(s) within the treatment delivery area and chemotherapy preparation room • Ensuring space for doctors, clinical pharmacists and other allied health professionals • Staff office spaces • Multi-disciplinary team meeting room • Shower, toilets, locker room and rest areas					
14	The storage available for cytotoxic, and other					

	drugs, required in the haematology/oncology day ward must meet legislative, environmental, patient safety and security requirements.					
15	Units providing intrathecal therapy must provide a dedicated locked facility for the temporary storage of intrathecal drugs between time of issue and administration.					
16	Storage areas are required for: • Drugs and fluids • Equipment including wheelchairs • Chart storage in a locked/supervised area • Cleaner's store • Linen store					
17	Separate ancillary areas/sanitary spaces are required: • Sluice • Dirty utility • Disposal room/hold with entrance not directly onto the unit • Clean Utility					

Layout & design	**Recommendation**	**Met**	**Partially**	**Not met**	**N/A**	**Comment**
18	Local planners should seek the views of service users at the onset of the planning process.					
19	Patient comfort and patient choice should be respected in the design of the environment, including consideration of the needs of adolescents/young adult patients.					
20	The overall shape and layout should aim to optimise staff workflow, patient comfort and safety and allow for optimal delivery of healthcare.					
21	In shared areas, appropriately placed partitions should be provided for visual and auditory privacy and infection prevention and control.					
22	In single rooms, options to maintain line of vision should be considered e.g. viewing panels, sliding glass doors.					

23	Each staff base should facilitate a clear view of patients under their care.					
24	All spaces used by patients for prolonged periods of time should have access to natural light, where possible. If not, artificial lighting should be of good quality.					
25	Consultation and examination rooms should be sound-attenuated so that conversations cannot be heard outside and sound from external areas is limited.					
26	Finishes should be durable, easily cleaned and disinfected and designed to minimise the risk of transmission of infection in line with appropriate national and international guidance documents.					
27	The design of the unit should aim to minimise its environmental impact by ensuring that energy is used efficiently and only where necessary.					
28	Design should allow for flexibility of use over					

	time.					

Engineering	Recommendation	Met	Partially	Not met	N/A	Comment
29	The requirements for infection prevention and control should inform the nature of ventilation system required to meet the specific clinical needs of the facility. In some cases, this may necessitate the need for conditioned air.					
30	Where an airborne isolation room is required, this should be designed to meet the requirements of HBN 04-01 Supplement 1 (2013). Particular attention should be paid to the airtightness requirements of this type of isolation room.					
31	All new air handling and ventilation units should be designed, installed and maintained in compliance with European Standards, HTM 03-01 and the HSE Estates Directorate					

	Guidelines on Air Handling Unit Specification.					
32	All new ventilation systems should be installed with the facility to fit HEPA filters on the supply air stream.					
33	National guidelines, HTM 03-01 and HTM 04-01(2017) should be followed in the design of water services and ventilation systems, with respect to the risk of organisms such as Legionella					
34	Consideration should be given to the transportation of blood and other samples to the laboratory. Pneumatic Tube systems should be extended into the facility where reasonable and practical.					
35	Early consideration should be given to ICT infrastructure to ensure that this meets the needs of the service including those of staff, patients and visitors.					
36	Fridge alarms should be remotely monitored at a central location which is staffed 24 hours,					

	to ensure action is taken when the day ward is closed.					
37	Controlled access (e.g. remote swipe card access) is required to all restricted areas - medical records area, drug preparation and storage areas, sluice, hazardous waste storage, cleaner's cupboard.					
38	Subject to local risk assessment and contingency planning, the facility design should have a resilient power supply capable of providing full back up to relevant services systems, including specialist ventilation systems.					
39	In the interests of infection prevention and control, early consideration should be given to the planning of bedhead services and should be designed to accommodate the mounting of medical equipment.					

Infection prevention and control	Recommendation	Met	Partially	Not met	N/A	Comment
40	Infection prevention and control teams are required to be consulted in all stages of hospital building or refurbishment programmes. In compliance with the National Guidelines for the Prevention of Nosocomial Aspergillosis, HPSC, 2016, construction work cannot commence until the construction permit is issued.					
41	Specific safeguards must be in place to minimise the risk of infection during the construction period. The HPSC National Guidelines on the Prevention of Nosocomial Aspergillosis should be followed where construction activity is taking place in or near existing clinical facilities.					
42	Hand hygiene facilities in patient care areas					

	should be made available according to national recommendations.					

Hazardous waste	Recommendation	Met	Partially	Not met	N/A	Comment
43	Sufficient space must be provided for the segregation of household, clinical, cytotoxic and sharps waste.					
44	The flow of goods, services and waste materials should be designed to minimise the risk of contamination. Specific consideration should be given to the location of the dirty utility and provision of a separate exit for waste.					

5.5 CDC Tool

The CDC tool is intended to assist in the assessment of infection control programs and practices in acute care hospitals. If feasible, direct observations of infection control practices are encouraged. The CDC website can be found at the following https://www.cdc.gov/hai/settings/outpatient/outpatient-care-guidelines.html

The CDC tool which has been modified for use within Irish hospitals environment can be found on the NCCP website (website link to tool to follow on publication)

5.6 Group Membership

Name	Title	Organisation
Dr. Breida Boyle	Microbiology Consultant	St James's Hospital
Ms. Fionna Brennan	Assistant Director Of Nursing	Our Lady's Children's Hospital, Crumlin
Ms. Sinead Brennan	Assistant Director of Nursing	St Vincent's University Hospital
Ms. Jennifer Brown	Pharmacy Head of Operations	Mater Misericordiae University Hospital
Mr. Damien Clarke	Engineering Adviser	HSE Estates
Ms. AnneMarie DeFrein	Chief II Pharmacist	National Cancer Control Programme
Ms. Keira Doherty	Project Manager	National Cancer Control Programme
Mr. Charlie Dolan	Architectural Adviser	HSE Estates
Dr. Maeve Doyle	Microbiology Consultant	University Hospital Waterford
Dr. Triona McCarthy	Public Health Consultant	National Cancer Control Programme
Ms. Cathleen Osborne	Clinical Nurse Manager III Cancer Services	University Hospital Limerick
Ms. Patricia Ryan	Patient representative	Patient representative

5.7 Methodology

This document was developed as a result of a recommendation made within the NCCP Oncology Medication Safety Review Report (Heckmann et al., 2014) in relation to the absence of national guidelines on the optimum built environment of a day unit.

The NCCP carried out site visits to a number of hospital oncology and haematology units that provided publically funded SACT services across Ireland. This gave the NCCP an insight into the variation in location, layout and type and number of facilities available within day wards nationwide. Based on the initial information gather during site visits, this document was developed considering the Irish context using a mixture of national and international best evidence, in addition to the expert opinion of the working group members. Feedback as a result of a consultation process was also reviewed and considered by the working group for inclusion in this document.

References

ANSI/ASHRAE/ASHE 2013. Standards 107-2013 Ventilation of Health Care Facilities.

DEPARTMENT OF HEALTH. *Public Health Emergency Plan to tackle CPE* [Online]. Department of Health. Available: http://health.gov.ie/national-patient-safety-office/patient-safety-surveillance/antimicrobial-resistance-amr-2/public-health-emergency-plan-to-tackle-cpe/ [Accessed 05/04/2018 2018].

DEPARTMENT OF HEALTH 2017. National Cancer Strategy 2017-2026.

DEPARTMENT OF HEALTH (UK) 2006. Medical gases, Health Technical Memorandum 02-01: Medical gas pipeline systems. Part A: Design, installation, validation and verification.

DEPARTMENT OF HEALTH (UK) 2013a. Health Building Note 00-03: Clinical and Clinical Support spaces.

DEPARTMENT OF HEALTH (UK) 2013b. Health Building Note 00-09: Infection control in the built environment. *In:* DH, E. F. (ed.).

DEPARTMENT OF HEALTH (UK) 2013c. Health Building Note 02-01 Cancer Treatment facillities.

DEPARTMENT OF HEALTH (UK) 2013d. Health Building Note 04-01 Supplement 1 Isolation facilities for infectious patients in acute settings.

DEPARTMENT OF HEALTH (UK) 2013e. Health Technical Memorandum 08-03: Bedhead Services.

DEPARTMENT OF HEALTH (UK) 2013f. Specialist service. Health Technical Memorandum 08-01: Acoustics.

DEPARTMENT OF HEALTH (UK) 2014a. Health Building Note 00-01 General design guidance for healthcare buildings.

DEPARTMENT OF HEALTH (UK) 2014b. Health Technical Memorandum 00, Policies and Principles of Heathcare Engineering. NHS.

DEPARTMENT OF HEALTH (UK) 2017a. Health Technical Memorandum 04-01: Safe water in healthcare premises. Part A: Design, installation and commissioning.

DEPARTMENT OF HEALTH (UK) 2017b. Health Technical memorandum 06-01: Electrical services supply and distribution.

HEALTH PROTECTION SURVEILLANCE CENTER 2018. Guidance Relating to Carbapenemase Producting Enterobacterales (CPE): Interventions for Control of Transmission of CPE in the Acute Hospital Section. CPE Expert Group.

HEALTH PROTECTION SURVEILLANCE CENTRE 2009. National Guidelines for the Control of Legionellosis in Ireland. Report of Legionnaires Disease Subcommittee of the Scientific Advisory Committee.

HEALTH PROTECTION SURVEILLANCE CENTRE 2015. Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facillities.

HEALTH PROTECTION SURVEILLANCE CENTRE 2016. National Guidelines for the Prevention of Nosocomial Aspergillosis . A report of the Aspergillosis Subcommitee of the Health Protection Surveillance Centre Scientific Advisory Commitee.

HEALTH PROTECTION SURVEILLANCE CENTRE 2018a. Assessing Evidence of Transmission and End of Transmission of Carbapenemase Producing

Enterobacterales (CPE). CPE Expert Group National Guidance Document, Version 1.
HEALTH PROTECTION SURVEILLANCE CENTRE 2018b. Requirements for Screening of Patients for Carbepenemase- Producing Enterobacterales (CPE) in the Acute Hospital Sector, CPE Expert Group.
HEALTH SERVICE EXECUTIVE 2010. Healthcare Risk Waste Management Segregation, Packaging and Storage Guidelines for Healthcare Risk Waste. *In:* CHILDREN, D. O. H. A. (ed.) 4th Edition ed.
HEALTH SERVICE EXECUTIVE 2015. HSE Estates Sustainable Healthcare Building Guidelines. Specification, design, construction and refurbishment of Healthcare Buildings.
HEALTH SERVICE EXECUTIVE 2018. Carbepenemase producing Enterobacteraise (CPE) in HSE acute hospitals. Monthly report for the National Public Health Emergency Team (NPHET).
HECKMANN, P., MCCARTHY, T., HANAN, T. & WALSH 2014. NCCP Oncology Medication Safety Review Report. HSE.
HIPE 2016. Systemic Anti-Cancer Therapy Activity in Ireland, HIPE Data 2014-2016
HIQA 2016. Overview of HIQA unannounced infection prevention and control inspections in 2015. Inspections conducted in public acute hospitals against the National standards for the prevention and control of healthcare associated Infections.
INAP 2017. Ireland's National Action Plan on Antimicrobial Resistance 2017-2020. Hawkins House: Department of Health.
MACMILLAN 2010. Macmillan Quality Environment Mark, Self Assessment Tool Version 2.
MISUSE OF DRUGS (SAFE CUSTODY) REGULATIONS 1982. Misuse of Drugs (safe custody) regulations. Statutory Instrument No. 321.1982.
NATIONAL CANCER CONTROL PROGRAMME 2016. Guidance on the Safe Use of Intrathecal Chemotherapy In the Treatment of Cancer. Oncology Medication Safety Review Implementation Resources.
NATIONAL HEALTH SERVICE 2005a. Health Technical Memorandum 56, Building Components Series Partitions.
NATIONAL HEALTH SERVICE 2005b. HEALTH TECHNICAL MEMORANDUM 69, Building Component Series
Protection.
NATIONAL HEALTH SERVICE 2015. Scottish Health Technical Memorandum 08-04: Specialist service. Pneumatic tube transport systems. Part B: Design considerations and good practice guide.
NATIONAL TASKFORCE FOR HCAI/AMR 2017a. Briefing note for leadership team re: CPE outbreak and management response on behalf of National Taskforce for HCAI/AMR. Requirement for urgent action to contain epidemic spread of Carbapenemase producing Enterobacteriaceae in the Irish Healthcare System.
NATIONAL TASKFORCE FOR HCAI/AMR 2017b. Requirement for urgent action to contain epidemic spread of Carbapenemase Producing Enterobacteriaceae in the Irish Healthcare system in Ireland. A clear and immediate threat to public health and sustainability of health service delivery systems.

PENTACARINAT SUMMARIES OF PRODUCT CHARACTERISTICS. Available: https://www.medicines.org.uk/emc/product/977 [Accessed 06/05/2018 2018].

ROYAL COLLEGE OF PHYSICIANS OF IRELAND 2015. Guidelines for hand hygiene in Irish healthcare settings. Update of 2005 guidelines, January 2015.

SUSTAINABLE ENERGY AUTHORITY OF IRELAND. *IS 399 Energy Efficient Design Managment* [Online]. https://www.seai.ie/energy-in-business/training-and-standards/is-399-energy-efficient-design-management/. [Accessed 15/03/2018 2018].

TEENAGE CANCER TRUST 2010. Exploring the impact of the built enviroment. The Futures Company report for Teenage Cancer Trust.

THE BUILDING SERVICES RESEARCH & INFORMATION ASSOCIATION 1992. TN 10/92 Space Allowances for Building Services Distribution Systems-Detail Design stage.

THE BUIDLING SERVICES RESEARH & INFORMATION ASSOCIATION 2018. BTS 3/2018 Air Permeability Testing of Isolation Facilities