

Use of Intensive Care Units in NL

Objective

To determine the utilization, level of complexity, and work force level in the Intensive Care Units (ICUs) of the acute care hospitals in NL.

Practice Points

1. The Tasmania Role Delineation Framework has provided a criteria-based classification system for the level of complexity of individual services in a hospital and the Work Force Level needed to provide this level of complexity.
 - a. For ICU, the major problems revolve around trained personnel, access to specialists, and specifically trained allied health professionals and physicians.
2. Objective admission criteria to ICU as recommended by the Society of Critical Medicine include criteria for vital signs and laboratory values (the 'priority model').

Data

The utilization data were obtained from the Canadian Institute for Health Information (CIHI) and the Regional Health Authorities (RHAs), level of complexity and work force level was reported by the RHAs using criteria outlined in the Tasmania Role Delineation Framework, and evaluation of the three rural hospitals of Eastern Health (EH) was provided by Dr. S. Peters.

The data for the evaluation were obtained from Meditech, and included fulfilment of the admission criteria (the priority model) recommended by the Society of Critical Medicine, and interventions undertaken in the first 24 hours of admission to ICU.

Levels of complexity and of work force level range from 2–6, with 6 being the highest.

Results

Table 1. Workforce Level Criteria

Level#	Workforce Description
2	<ul style="list-style-type: none"> • Medical Director with suitable experience and qualifications in an acute care specialty (ICU, ED, Anesthesia) • Access to specialists from relevant disciplines to provide support and consultation as required • Nurse Manager with experience and post registration qualification in either intensive care, high dependency or emergency medicine nursing (or equivalent) • RNs with post registration experience in a critical care environment and minimum requirement of electrocardiography (ECG) interpretation and advanced life support (ALS) competence • A minimum nurse-patient ratio of 1:3 present in the unit • Educational program for nursing staff which may include links with higher level referral centres and tertiary education institutions • Access to technical support staff as required • Access to clinical pharmacist, physiotherapist, pastoral care, social worker, dietician and any other allied health services
3	<ul style="list-style-type: none"> • Medical director who is either a FRCPC, Critical Care Medicine or has another relevant Specialist Qualification and suitable recent experience in modern intensive care practice • Access to Intensive Care Specialist to ensure patient safety and appropriateness of admission • Physician or Family Physician with appropriate ALS and airway experience • Nurse Manager with post registration qualification in intensive care • RNs with post registration qualification in intensive care or high dependency nursing and have ECG interpretation and ALS competence • A minimum nurse-patient ratio of 1:2.25 or 1:3 (24 hours) (Nursing Hours per Patient Day (NHPPD) HDU model (standalone)

Work force criteria for each level of complexity in ICU services defined by the Tasmania Role Delineation Framework.

Table 1 continued

Level#	Workforce Description
4	<ul style="list-style-type: none"> Medical Director with a full-time commitment to the operation of the unit and who is a FRCPC, Critical Care Medicine Sufficient registered specialists from relevant disciplines on-call 24 hours, with rostering and call arrangements determined by the Medical Director In addition to the attending Specialist, at least one on-site physician with appropriate level of experience, airway and ALS skills, rostered for the unit and immediately available at all times to attend the unit A nurse in charge of the unit who has a post registration qualification in intensive care All nursing staff in the unit responsible for direct patient care being RNs with the majority of all nurses having a post registration qualification in intensive care All nurses working in unit must have ECG interpretation, ventilation, invasive line management, and ALS competence at a minimum A minimum of two RNs present in the unit at all times when there is a patient present in the unit, and this number should be maintained irrespective of Rapid Response Team involvement Educational programs for both medical and nursing staff which may include links with higher level referral centres and tertiary education institutions Access to a dedicated unit nursing educator An orientation program for new staff A minimum nurse–patient ratio of 1:1 for ventilated and similarly critically ill patients, as per accepted clinical standards for ICUs A minimum 1:2 nursing ratio for high dependency patients
5	<ul style="list-style-type: none"> Minimum 50% of all nursing staff to have post registration qualification in ICU Each nursing shift requires a designated Clinical Nursing Coordinator and critical care nurse supervisors/educators. The number of critical care nurse supervisors/educators required per shift will vary depending on percentage of qualified staff Capacity and staffing models adequate to cope with surges in demand for unexpected peaks in emergency referrals, both from within the institution and from referring regional centres Allied health support, including dedicated, specialized ICU physiotherapists. Recommend 1.0 FTE Senior Physiotherapist per 7 ICU beds OR 1.0 FTE Senior Physiotherapist per 5 HDU beds A dedicated ICU Specialist Pharmacist. Other pharmacy services including compounding, sterile room services, therapeutic drug monitoring, clinical drug guidelines and protocols Equipment manager
6	<ul style="list-style-type: none"> FRCPC, Critical Care Medicine qualified ICU specialists on-call 24 hours ICU resident on-site and exclusively rostered to the Unit 24 hours

Work force criteria for each level of complexity in ICU services defined by the Tasmania Role Delineation Framework.

Table 2. Number of ICU Stays and Length of Stay with the Level of Complexity and Work Force Level, 2019/20

Large Hospitals	Stays (N)	Length of Stay (days)	Level of Complexity	Work Force Level	Small Hospitals	Stays (N)	Length of Stay (days)	Level of Complexity	Work Force Level
HSC	2,680	5.9	6	3–6#	Carbonear	222	4.2	4	<2
St. Clare's	1,675	3.1	6	<2–6#	Clareville	200	4.0	4	<2
Janeway PICU	158	4.0	5	6	Burin	194	2.3	4	<2
Neonatal ICU	338	19.0	5	6	Stephenville	155	3.1	4	<2
Gander	523	4.4	5	4–6#	St. Anthony	330	2.7	4	2
GFW	474	6.2	5	4–6#	HVGB	162	2.5	4	2
Corner Brook	585	4.0	5	4	Labrador City	85	3.1	4	2

If workforce components (i.e., medical/nursing/allied health) were discrepant from each other such that an overall workforce level could not be assigned for that site, a range was assigned identifying the levels of the lowest to highest workforce components at that site.

- For the small hospitals, work force level is not commensurate with the level of complexity reported. Relative to the catchment population, the number of admissions to ICU in St. Anthony is high.
- Length of stay varies by hospital. It is 19.0 days at the NICU in the Janeway, which is high in comparison to the national average of 9.9 days.

Table 3. Review of Non-Cardiology ICU Use in the Three Rural Hospitals of EH, 2019/20

	Carbonear	Clarenville	Burin
N evaluated	61	110	42
% admitted from ED	85	38	79
% admitted from OR	5	54	14
% discharged directly home	69	93	81
% with no admission criterion [#]	62	91	74
% intervention with vasopressors/ventilation/transfusion	23	34	38

[#] No admission criterion as defined by Society of Critical Medicine

- In Clarenville, over half the admissions to ICU were direct from the OR.
- The vast majority in the three hospitals were discharged from ICU to home.
- The majority, particularly in Clarenville, did not fulfill any admission criterion to ICU.
- The majority in the three hospitals had no intervention with vasopressors, ventilation, or transfusion in the first 24 hours of admission to ICU.

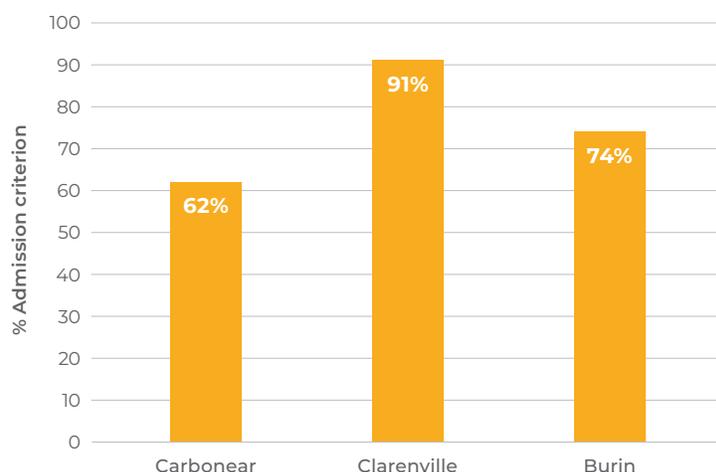


Figure 1. Per Cent With No Admission Criterion to ICU as Defined by the Society of Critical Medicine

Conclusions

1. In the rural hospitals, the number of admissions to ICU reported was small, and the work force level was not commensurate with the level of ICU complexity reported.
2. In the three rural hospitals of Eastern Health, the majority had no criterion consistent with the need for an ICU admission, a minority had an intervention with vasopressors or ventilation or transfusions, and the majority were well enough to be discharged directly home.
3. In Central Health, the total annual number of stays in both Gander and Grand Falls-Windsor was 997, <three/day. Consideration should be given to having one ICU in the region with a Special Care Unit in the other hospital.
4. ICU care is very specialized and should be undertaken in three centres in the province (St. John’s, one site in Central, and Corner Brook). Outside St. John’s, upgrading of personnel will be necessary.
5. Special care designation should replace ICU in the small hospitals because the work force level is not commensurate with ICU complexity.