



ADULT CRITICAL CARE LEVELS OF CARE

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For more information, please contact:

Email: info@ccso.ca

Website: www.criticalcareontario.ca

Acknowledgements

Reference Committee Members

Dr. Mark Bailey (Critical Care Clinical Lead, North Simcoe Muskoka LHIN area)

Dr. Niall Ferguson (Critical Care Clinical Lead, Toronto Central LHIN area)

Dr. Frank Reinders (Critical Care Clinical Lead, Waterloo Wellington LHIN area)

Dr. David Neilpovitz (Critical Care Clinical Lead, Champlain LHIN area)

Dr. Randy Wax (Critical Care Clinical Lead, Central East LHIN area)

Francois Lemaire (VP & CNE, Pembroke Regional Hospital)

Teresa Smith (Former EVP, Hamilton Health Sciences)

Erin Kelleher and **Paul Sandor** (Hamilton Health Sciences on behalf of Teresa Smith)

Enhancing Adult Critical Care Levels of Care in Ontario

I. Introduction

The purpose of this guide is to document the key details pertaining to the Levels of Care enhancements that were implemented for all adult Intensive Care Units (ICUs) in Ontario in 2020. The goal of this initiative was to update the Levels of Care definitions for adult critical care to reflect a consistent standard of unit capabilities and expectations, and to operationalize the revised levels to support the following objectives:

- Establish a common standard/understanding regarding unit level capacity and capability;
- Provide a mechanism to ensure units are accountable for providing the Level of Care based on the updated defining criteria; and,
- Facilitate efficient patient flow across levels of critical care.

The defined Levels of Care criteria, developed based on the Critical Care Information System (CCIS) data and local clinical input, supported the revisions implemented. The Life Support Interventions (LSI) that each unit entered during the 2019 calendar year were reviewed to arrive at the unit designations, which were subsequently reviewed with local input led by the local Critical Care Clinical Leads.

Critical Care Services Ontario (CCSO) plans to ensure the continuing relevance of the Level of Care definitions and assigned designations by periodically monitoring the LSI data in CCIS, as well as considerations of local clinical input. Therefore, the need for ensuring ongoing and accurate unit-based CCIS data entry remains paramount.

The data analyzed and used to inform the refinements to adult critical care Levels of Care expectations has specific limitations that need to be considered when reviewing the outputs and directions of this work:

- The clinical capabilities identified in the stated Life Support Intervention (LSI) expectations are not intended to be an exhaustive list of unit clinical capabilities. The clinical capabilities believed to be common within an adult Level of Care assignment (e.g. Level 3 Advanced, Level 3 Basic, etc.) will continue to evolve based on data review and clinical input.
- The LSI measures are being used as a proxy for the capabilities within a unit. It is recognized that there may be additional capabilities within a unit, for example, with non-invasive monitoring, that are not reflected in the capture of LSI data.
- The LSI data (as captured through CCIS) may not be a complete representation of patient acuity. Monitoring data quality over time, at a unit level, may be required to ensure data accurately reflects the care being delivered within a unit.

II. The Six Levels of Care Categories for Adult ICUs

Prior to the implementation of the enhanced Levels of Care designations in August 2020, adult ICUs were designated as either Level 2 or Level 3 across Ontario. Moving forward, the new adult ICU level designations are broken down into six categories: *Level 2 Basic*, *Level 2 Advanced*, *Level 2 Coronary*, *Level 3 Basic*, *Level 3 Advanced*, and *Level 3 Coronary*.

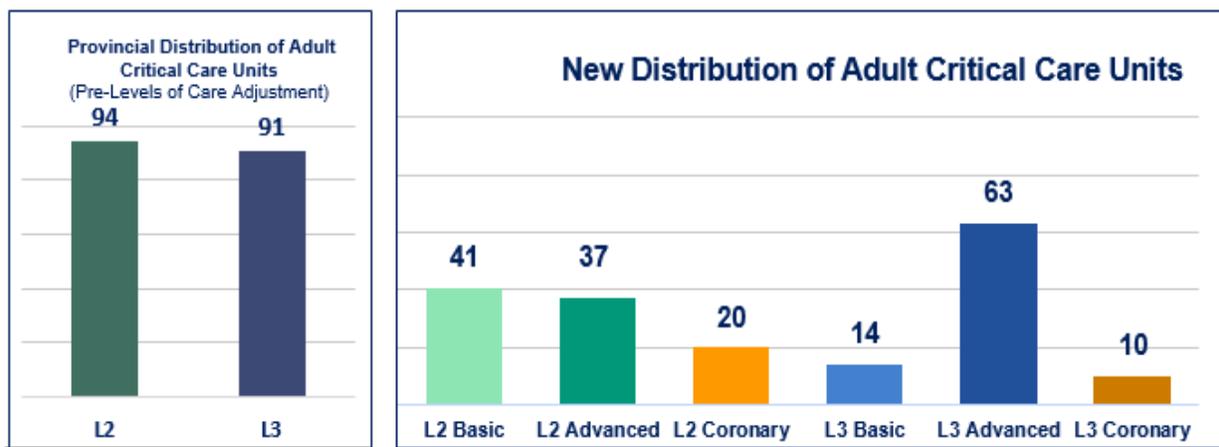


Figure 1. Distribution of adult ICUs across Ontario, pre and post Levels of Care implementation.

Post-implementation, CCSO will undertake the following next steps:

- CCSO will monitor the impact of refined adult Levels of Care over time;
- Criteria for coronary care units (Level 2 Coronary and Level 3 Coronary) will be developed in future work; and,
- The designations for each ICU will be reviewed and re-assessed periodically.

III. General Expectations for Sustaining the New Levels of Care Designation

The level-specific criteria, presented in section IV need to be reviewed in consideration of the following general expectations:

- It is highly recommended that medical oversight of ventilated patients be provided by an intensivist. Due to the complex nature of caring for patients in critical care units, it is important for hospitals to structure their critical care teams to match the acuity and care needs of patients (CIHI, 2016). There is evidence in the medical literature on the benefits of having an intensivist managing such units, especially units that provide invasive mechanical ventilation. Multiple studies have shown that intensive care units managed by intensivists achieve superior clinical and quality outcomes, including reduced length of stay and associated costs, lower number of

mechanically ventilated days, and reduced morbidity and mortality (*Morrow et al., 2012; Wise et al., 2012; Gutsche and Raiten (2013); Masud et al., 2018*).

- Within a critical care unit, 70% of the ICU nursing staff are trained to the [Practice Standards for Critical Care Nursing](#), by way of formal training or substantial critical care experience (e.g. > 10 years).
- Level 2 Basic and Level 2 Advanced units would not routinely be expected to take CritiCall calls for patient transfers requiring critical care support.
- Level 3 Basic and Level 3 Advanced units would be expected to accept CritiCall calls for patient transfers requiring critical care support.

IV. Level-specific Criteria and Thresholds for the new Level of Care designations

The adult Levels of Care criteria, refined by the [Adult Levels of Care Reference Group](#), were supported through the analysis of the Critical Care Information System (CCIS) data, as well as province-wide clinical consultations. Each ICU and its capabilities were then matched to the appropriate Levels of Care criteria. The criteria for Level 2 Basic and Advanced and Level 3 Basic and Advanced designations are described in the tables below. Units must fully meet all the criteria to be assessed at that Level of Care.

Criteria for Level 2 Coronary and Level 3 Coronary care units will be developed in future work.

Level 2 Basic

Unit Governance	<ul style="list-style-type: none"> • Expectation that there is a single clinical point of contact for admissions / flow for the unit during times of pressure or surge (e.g. on-call physician, medical director) • There may be multiple MRPs within the unit, but there should be a single gatekeeper for the unit during times of capacity pressure
Ventilation	<p>Units can support:</p> <ul style="list-style-type: none"> • Non-invasive oxygen supplementation therapy for non-acute issues (e.g. high flow, chronic at-home BiPAP / CPAP) • Total Overall Ventilation Support (invasive, non-invasive supplementary): >10% of patient days • <1% patient days with invasive mechanical ventilation support <p>Units with a focus on supporting stable Long Term Ventilated (LTV) patients are included in Level 2 Basic ICUs</p>
Unit Occupancy	<ul style="list-style-type: none"> • Average annual occupancy of 40% or more

Level 2 Advanced: All of the Level 2 Basic criteria plus:

Ventilation	<ul style="list-style-type: none"> • Some capability for invasive ventilation. <ul style="list-style-type: none"> ○ Units may provide transition care for acute invasive respiratory support where no other capacity for this care is available within the site ○ Units may provide chronic invasive ventilation support or support for ventilator weaning ○ Units may not typically have patients requiring invasive ventilation support, but with the availability of an intensivist and multi-disciplinary care team are able to do so. • Units able to support mechanically ventilated patients for a short period • Other ventilation support (non-invasive CPAP / BiPAP, OptiFlow at a level greater than 50 L/minute) • Up to 10% patient days with Invasive mechanical ventilation (IMV) support • Total Overall Ventilation Support: >15% of patient days • 10-35% beds are IMV capable
Arterial Line Monitoring	<ul style="list-style-type: none"> • Units should have some patient days with arterial line monitoring
Vasoactive/Inotropic IV Medications	<ul style="list-style-type: none"> • Units should have some patient day with vasoactive / inotropic IV medications
Unit Occupancy	<ul style="list-style-type: none"> • Average annual occupancy of 50% or more

Level 3 Basic: All of the Level 2 Advanced criteria plus:

Unit Governance	<ul style="list-style-type: none"> • Recommended leading practice: single clinical point of contact for admissions / flow for the unit on a day-to-day basis would be an intensivist <ul style="list-style-type: none"> ○ There is a recognition that due to the size or specialty within a unit this may not be feasible ○ Patients in these units should be managed by physicians with a Special Interest (SI) in respiratory care
Ventilation	<ul style="list-style-type: none"> • Invasive ventilation support; must have 24/7 RT support • At least 35% of beds are capable of invasive ventilation • At least 10% of patient days with invasive ventilation support provided
Vasoactive / Inotropic IV Medications	<ul style="list-style-type: none"> • At least 5% of patient days with single or multiple vasoactive / inotropic IVs provided
Arterial Line Monitoring	<ul style="list-style-type: none"> • At least 10% of patient days with arterial line monitoring provided
Unit Occupancy	<ul style="list-style-type: none"> • Average annual occupancy of 60% or more

L3 Advanced: All of the Level 3 Basic criteria plus:

Unit Governance	<ul style="list-style-type: none">• Expectation that the single clinical point of contact for admissions / flow for the unit on a day-to-day basis is an intensivist
Ventilation	<ul style="list-style-type: none">• At least 50% of beds are capable of invasive ventilation• At least 30% of patient days with invasive ventilation support provided
Vasoactive/Inotropic IV Medications	<ul style="list-style-type: none">• At least 1% of patient days with <u>multiple</u> vasoactive / inotropic IVs provided
Arterial Line Monitoring	<ul style="list-style-type: none">• At least 15% of patient days with arterial line monitoring provided
Unit Occupancy	<ul style="list-style-type: none">• Average annual occupancy of 75% or more

If you have additional questions related to the enhanced Adult Level of Care designations and the associated definitions, please contact info@ccso.ca