

# Continuous Lateral Rotation Therapy

## Union Hospital, Union NJ

### STUDY RESULTS

#### INTRODUCTION

Continuous Lateral Rotation Therapy (CLRT) has been used for years to keep immobilized patients in motion. Prolonged inactivity for any age group produces sequelae in many body systems. Research has indicated that CLRT may result in fewer days of bed confinement, decreased incidence of pneumonia, decreased atelectasis or respiratory complications, decreased Critical Care Unit (CCU) and hospital lengths of stay (LOS); and fewer days of mechanical ventilation. *See Appendix 1: The Bibliography.*

For years, Union Hospital has used the Efica CC® Dynamic Air Therapy® Unit with select patients in the CCU. A policy was in place for its use, however, there was no consistency in its use nor adherence to the policy. The staff did not feel comfortable ordering the bed without approval of the physician and Critical Care Educator. There were long lag times in implementation of the therapy and patient selection depended upon the physician or nurse responsible for a specific patient. Also, incremental costs of caring for a patient with pneumonia had risen over the past few years at Union Hospital. The Critical Care Educator believed the hospital could reduce those incremental costs and improve patient outcomes through the use of a standardized protocol that included CLRT.

However, before beginning, the Critical Care Educator needed to address the many misconceptions about the use of Continuous Lateral Rotation Therapy. Many nurses did not believe in the science of turning. The belief was that such positioning is for prevention of pressure ulcers, not to improve pulmonary outcomes.

Misconceptions of families were that the discontinued use of CLRT therapy for a family member signaled a decline in condition and that medical staff was giving up on them.

The Purchasing Department had misconceptions as well. This department looked at bed usage as a line item in the budget rather than spending versus cost savings per patient. Purchasing's concern was that the bed had been used for almost two years with no appreciable savings noted. In part this concern was a valid one, as such data were not consistently being monitored.

Based on these issues and concerns, the Critical Care Educator at Union Hospital initiated a data collection process with the intent to identify the types of patients that would most benefit from CLRT. Data was collected for a one-month period in the Critical Care Unit. From this data collection effort, clinical and financial data were summarized and presented to both the Nursing and Finance Committees at the institution.

#### PLAN

From this baseline information, the staff and administration at Union Hospital agreed that action needed to occur.

In 1999, the current Critical Care Educator attended a Pulmonary Process Improvement program presented by Hill-Rom. Based upon the data and the pulmonary program information presented, the Critical Care Educator began the Pulmonary Process Improvement program with a core group of people who were committed to the project. The facility's key clinical and financial decision-makers were included during the initial program definition. This step facilitated an understanding for all involved of the purpose, goals, outcomes and standards of care to be derived from this program.

The Critical Care Educator worked with the Medical Director of Pulmonary Medicine, the Critical Care Committee, Process Improvement Committee, Nurse Executive Committee, Medical Executive Committee, the Vice- President of Continuous Quality Improvement, and the Vice-President of Patient Care Services. Members of the purchasing

department and Emergency Room were included. Key staff members who would be involved in direct patient care were involved in the process as well. Hill-Rom consultants were also part of the core team.

The “Efica CC® Unit” project became the process improvement project for the Critical Care Unit. The goal for this process improvement was to improve the clinical outcomes for those identified patients who could benefit from CLRT in the ICU. Success was measured by a decrease in ICU LOS, a decrease in Hospital LOS, a decrease in ventilator days, and a decrease in total costs for these patients.

## **DO**

Upon Administrative approval of the Pulmonary Process Improvement goals, work began on developing a competency-based instrument for the staff to use after the educational sessions were completed. The Critical Care Educator redesigned the protocol for bed usage and developed an algorithm to direct the staff in appropriate patient usage. The policy and procedure for CLRT was retooled. The Critical Care Educator also developed a sample doctor’s order form, and initiated use of the Predicus™ Pneumonia Risk Evaluation tool for determining patients at risk for developing pulmonary complications.

Upon completion of the first draft the core team was asked for their input and suggestions on the changes made to the recommended protocol, policy, procedure, algorithm, and other related materials. Once the revisions were completed, the study was under way. *See Appendix 2: Protocol Algorithm, Competency Checklist, CLRT Tracking Sheet, Doctor’s Order, Predicus™ Tool and Data Collection Tool.*

Together with Hill-Rom representatives, the Critical Care Educator inserviced the entire nursing staff on both the process and correct usage of the Efica CC® Therapy Unit. From a preventive standpoint, process improvement training of emergency room personnel was key, in that, if there was to be an impact on decreasing pulmonary complications, it would begin there. By identifying the patients at risk and initiating the order for CLRT, it would reduce the lag time for getting the patient started on the therapy. Written information describing the process was also placed in each patient room for the duration of the therapy.

Education was the key to success in the implementation of this process improvement

initiative. Hill-Rom worked closely with the Critical Care Educator to provide both CLRT product and concept education. Background information taken from clinical research studies was provided to the staff. The Medical Director of Pulmonary Medicine in the CCU helped his staff understand that if the nurses felt CLRT needed to be ordered they should write the order. Education for the nursing staff focused on the new CLRT protocol and the supporting documentation. The data collectors were trained and oriented to the process. The CCU staff was also educated on how to maintain proper rotation and collect therapy statistics summary information.

Hill-Rom worked to develop in-house CLRT experts; staff members on all shifts who could be internal resources. An educational program was developed and provided for the CCU staff. The competency checklist was used to determine the staff’s readiness and ability to use CLRT.

Upon completion of the staff education, prospective data collection began. All patients admitted to the CCU were assessed for the study. Bi-weekly rounds were initiated. The Critical Care Educator, Hill-Rom and key staff members completed rounds on all CCU patients. These rounds facilitated bedside staff education and assessment of protocol compliance.

The methodology used for the Pulmonary Process Improvement initiative was a two-group, comparative design. Quality outcome data on patients receiving CLRT (Efica CC® Dynamic Air Therapy®) was compared to baseline outcome data collected on a similar control group of manually rotated patients. The main purpose of this Process Improvement project was to collect evidence to support improved patient outcomes in a select group of patients in the Critical Care Units at Union Hospital using a standardized process that included Continuous Lateral Rotation Therapy. These outcomes were:

- Decreased LOS in the CCU
- Decreased LOS in the hospital
- Decreased number of ventilator days
- Decreased total cost per patient

A total of 46 subjects, with 23 in each group, were enrolled in this descriptive, outcome study from November, 1999 to March, 2000.

## CHECK

The data collected for both groups was organized and compiled by the Critical Care Educator. The Critical Care Educator then compared outcomes for each group and presented this information to key clinical and financial decision-makers, as well as the core team.

The Pulmonary Process Improvement Initiative wielded these results:

- A decrease in the number of days on a ventilator in the CLRT group (86 days)
- A decrease in the CCU LOS in the CLRT group (79 days)
- A decrease in the Hospital LOS in the CLRT group (80 days)
- A decrease in Total Charges for CLRT (\$2,288,529)  
Efica CC® Unit vs. Total Charges contributed only 1.1% of the total charges applied

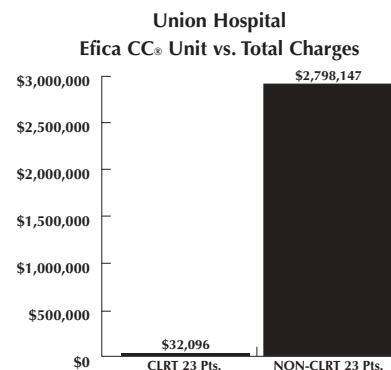
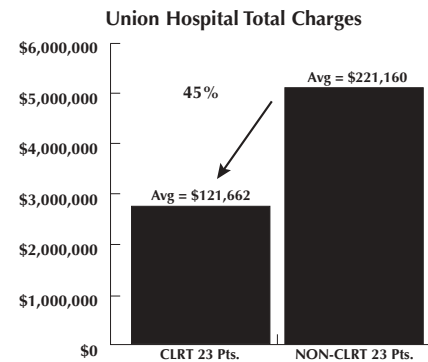
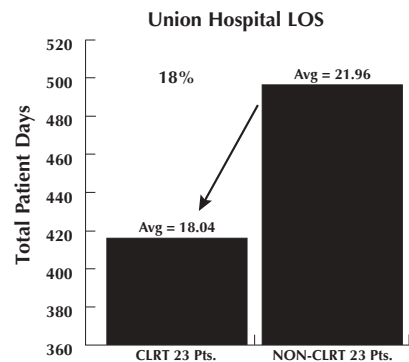
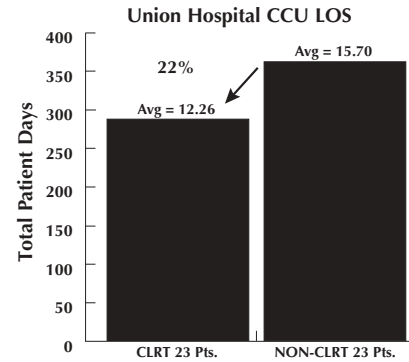
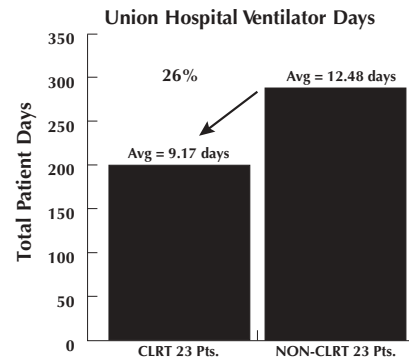
Based on these findings it was concluded that a standardized process, coupled with the use of CLRT, demonstrated improved clinical outcomes for these patients. The Critical Care Educator will continue to work with the staff to ensure protocol compliance and monitor patient outcomes to assure the right patient is using the right product at the right time.

## ACT

In an effort to continue the gains made with this process improvement initiative, it was decided that bi-weekly rounds should continue and that staff education concerning CLRT will be repeated as necessary.

Continuous Lateral Rotation Therapy (CLRT) will continue to be a standard of care for select patient populations (based upon protocol criteria) at Union Hospital. This standard of care is supported by the improved patient outcomes documented during the process improvement process.

The next process improvement initiative of the Critical Care Educator will be on the use of proning in those select patients within the Critical Care Unit. The same process will be applied in measuring patient outcomes with Hill-Rom personnel to assist in the process.



# APPENDICES

## APPENDIX 1

### BIBLIOGRAPHY

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## APPENDIX 2, #2

### COMPETENCY FOR EFICA CC® DYNAMIC AIR THERAPY® UNIT

CRITICAL ELEMENTS	MET	NOT MET	COMMENTS
1) States that a MD order and a renewal $\bar{q}$ 4 days are required.			
2) States both of the following acceptable written orders: <ul style="list-style-type: none"> <li>• “Continuous Lateral Rotation (CLRT) via Efica CC bed.”</li> <li>• “Continuous Lateral Rotation (CLRT) and chest PT <math>\bar{q}</math> via Efica CC bed.”</li> </ul>			
3) States how to utilize the CLRT Percussion/Vibration Decision Tree as evidenced by the following case studies: <ul style="list-style-type: none"> <li>• Patient who meets placement criteria</li> <li>• Patient who does not meet placement criteria</li> <li>• Patient met placement criteria but no longer meets criteria</li> </ul>			
4) Demonstrates how to set the Efica CC bed for: <ul style="list-style-type: none"> <li>• Percussion</li> <li>• Vibration</li> <li>• Rotation</li> </ul>			
5) Demonstrates how to use the scale.			
6) Demonstrates how to set Efica CC bed into a Trendelenburg position.			
7) Demonstrates how to set Efica CC bed for CPR.			
8) Demonstrates appropriate documentation in the following situations: <ul style="list-style-type: none"> <li>• On-going therapy</li> <li>• Response to CLRT</li> <li>• Response to Percussion/Vibration</li> </ul>			

Validated by: \_\_\_\_\_

Date: \_\_\_\_\_

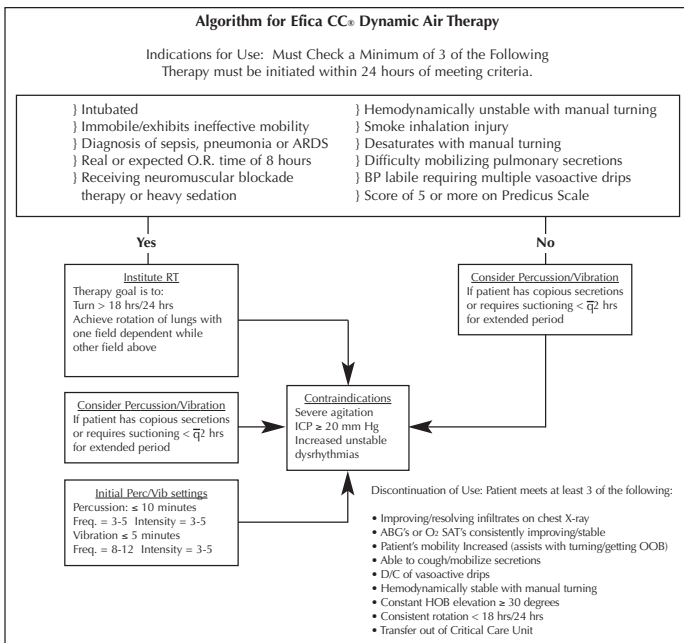
Name: \_\_\_\_\_

Unit: \_\_\_\_\_

Social Security Number: \_\_\_\_\_

Shift: \_\_\_\_\_

## APPENDIX 2, #1



### CLRT THERAPY TRACKING SHEET

Patient Name				
Medical Record #				
Hosp Adm Date	Age	DC Date		
Specialty Unit/Adm Date	ICU D/C Date			
Efica CC Bed On Date	Efica CC Bed Off Date			
Vent On Date	Vent Off Date			

Intubated	Y/N	Desaturates with Manual Turning	Y/N
Immobile/Exhibits Ineffective Mobility	Y/N	Receiving Neuromuscular Blockade Therapy or Heavy Sedation	Y/N
Difficulty Mobilizing Pulmonary Secretions	Y/N	Diagnosis of Sepsis	Y/N
BP Labile Requiring Multiple Vasoactive Drips	Y/N	Diagnosis of ARDS	Y/N
Real or Expected OR Time of > 8 hours	Y/N	Hemodynamically Unstable with Manual Turning	Y/N
IABP	Y/N	Smoke Inhalation Injury	Y/N


Reason for Efica CC Bed	Treat	Nosocomial	Yes	N/A
	Prevent	Pneumonia	No	

Outcome of Therapy	Resolution	Death
	Prevented	No Progress

Date	Rotated Since Placement	Hrs w/o Rotation Last 24
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## APPENDIX 2, #4

<b>PULMONARY PREDICUS™ RISK TOOL</b>	
<b>Instructions:</b> Answer the questions below as they pertain to your patient today. Place an X in the corresponding box for each YES answer.	
1) Is your patient over the age of 65?	<input type="checkbox"/>
2) Was your patient admitted through the emergency room?	<input type="checkbox"/>
3) Did your patient have prior hospital admissions within the last 30 days?	<input type="checkbox"/>
4) Prior to the current critical care admission was your patient in the hospital longer than 4 days?	<input type="checkbox"/>
5) Does your patient have a history of COPD?	<input type="checkbox"/>
6) Is your patient currently intubated?	<input type="checkbox"/>
7) Is your patient on a ventilator?	<input type="checkbox"/>
8) Is your patient being weaned from the ventilator?	<input type="checkbox"/>
9) Does your patient have an indwelling urinary catheter?	<input type="checkbox"/>
10) Is your patient's most recent albumin level < 2.4?	<input type="checkbox"/>
11) Did your patient have emergency surgery during this hospitalization?	<input type="checkbox"/>
12) Did your patient have cardiac, pulmonary or abdominal/thoracic surgery during this hospitalization?	<input type="checkbox"/>
Total number of YES answers:	_____
<b>Scoring Instructions:</b> Give one point for each X. If the score totals 5 or higher your patient is at risk for the development of a Nosocomial Pneumonia.	
* Indicates terms defined on back of page.	

<b>Tool Definitions:</b>
1. <b>Admitted through the emergency room</b> - this indicates any patient that due to an emergency situation was admitted to the hospital from the ER, this does not include a direct admit from a doctor's office.
2. <b>Prior hospital admissions</b> - this indicates any acute care stay, at any acute care facility during the past thirty days. This does not include a skilled nursing stay.
3. <b>COPD</b> - chronic obstructive pulmonary disease.
4. <b>Intubated</b> - Insertion of a tube through the glottis to allow the entrance of air. The tube can be inserted orally, nasally or via the trachea.
5. <b>On a Ventilator</b> - The act of breathing through the support of a mechanical device.
6. <b>Weaning</b> - The process of assisting patients to breath spontaneously without mechanical support.
7. <b>Emergency Surgery</b> - Surgery that is scheduled immediately, supersedes any other type of surgery or operating room scheduling.
8. <b>Cardiac, pulmonary, abdominal/thoracic surgery</b> - this indicates any type of surgery that creates an incision to the chest cavity or abdominal area.
<b>Note:</b> If the patient has an existing pneumonia at the time of admission, this assessment is not needed.
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## APPENDIX 2, #5

### DATA COLLECTION TOOL

Hill-Rom Guideline Model

Patient Name: \_\_\_\_\_

Daily Clinical Assessment for CLRT (Continuous Lateral Rotation Therapy)

(Fill in date and circle "Yes" or "No")

GUIDELINES FOR EVALUATING CONTINUATION OF CLRT	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
1. "Time in Rotation" in last 24 hours (consider D/C therapy if < 18 hours)	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours	# Hours
2. ABG's or oxygen saturation's consistently improving or stable	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
3. Increasing mobility of patient as evidenced by: A. Assists with turning B. Getting OOB	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
4. Transfer out of Critical Care Unit	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
5. Increased ability of patient to cough/mobilize secretions	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
6. D/C vasoactive drips	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
7. Improving/resolving infiltrates on CXR	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
8. Hemodynamically stable with manual turning	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
9. Constant HOB elevation ≥ 30 degrees	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No

## APPENDIX 2, #6

### PHYSICIAN'S ORDER FOR EFICA CC® BED FOR CONTINUOUS LATERAL ROTATION THERAPY (CLRT) SHOULD READ:

CLRT via Efica CC® therapy bed ≥ 18 hrs/24 hrs

and/or

CPT q \_\_\_\_\_ hours via Efica CC® therapy bed

# SUMMARY

## PLAN

Design and implement methodology to utilize the EFICA CC® Dynamic Air Therapy® Unit more effectively with favorable clinical and financial outcomes

Task Force to Head Project included: Critical Care Educator, the Medical Director of Pulmonology, and a Hill-Rom Clinical Therapy Specialist

Critical Care Nurse Manager and a Hill-Rom Clinical Therapy Specialist presented project to:

- Critical Care Committee
- Project Improvement Committee
- Nurse Executive Committee
- Medical Executive Committee
- Vice-President of Continuous Quality Improvement
- Vice-President of Patient Care Services

The Task Force met to establish goals, perform root cause analysis and plan solutions

- Selection criteria policy for the EFICA CC® Dynamic Air Therapy® Unit
- Conducted staff education to RNs, RTs, and Residents

## DO

- Establish a reading list on the benefits of rotation therapy and prone positioning
- Place posters in conference room and have video available on positioning
- Track use of beds and patient progress
- Educate staff regarding positioning, criteria for enrollment, and protocol
- Redesign protocol
- Change in the ordering of EFICA CC® Dynamic Air Therapy® Unit
- Redesign St. Barnabas Medical Center Pulmonary Protocol to fit Union Hospital's Population group in Critical Care
- Add the Predicus™ Tool as one indicator for CLRT
- Post algorithm for use of EFICA CC® Unit in every patient room

- Complete competency for EFICA CC® Unit
- Implement use of St. Barnabas Medical Center CLRT Tracking Tool
- Kickoff Educational Program November 4, 1999
- Empower CCU nurses, by the Medical Director of Pulmonary, to write orders for CLRT using the EFICA CC® Unit
- Enlist designated critical care nurse and Hill-Rom Therapy Specialist to conduct bi-weekly rounds to monitor selection and usage of EFICA CC® Dynamic Air Therapy® Unit
- Conduct mandatory competency
- Proactively include respiratory therapists in the emergency room in the process to prevent complications early on

## CHECK

- Sample: 23 CLRT patients vs. 23 Non-CLRT patients were compared
- Outcomes pre- and post-process improvement program revealed
- ↓ number of ventilator days in patients who received EFICA CC® Unit by 86 days
- ↓ CCU LOS by 79 days
- ↓ Hospital LOS by 80 days
- A \$2,288,529 savings in EFICA CC® Unit charges
- EFICA CC® Unit Charge vs. Total Charge \$32,096 vs. \$2,798,157 (1.1% of total charge)

## ACT

- Continue bi-weekly rounds
- Repeat CLRT related education as necessary
- CLRT adopted as the standard of care for select patient populations meeting the protocol criteria

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