

Cardiac Arrhythmia Management Redesign Project

Using a Lean Approach to Deliver Quality Patient Care

Glyn Boatswain, Rohan Gonsalves, Dr. Amir Janmohamed, Dr. Bhavanesh Makanjee,

Dr. Amelia McCutcheon, Dr. Joe Ricci

Rouge Valley Health System, Toronto, Ontario, Canada

gboatswain@rougevalley.ca

rgonsalves@rougevalley.ca

ajanmohamed@rougevalley.ca

bmakanjee@rougevalley.ca

amccutcheon@rougevalley.ca

jricci@rougevalley.ca

Abstract

The presenters will walk the participants through the Cardiac Arrhythmia Redesign Project. The purpose of the project was to enhance the quality of the Regional Cardiac Arrhythmia program. The objectives include the following dimensions of quality: patient satisfaction, clinical excellence, safety, effectiveness and efficiency (the attached project plan outlines the objectives in more details - see Table II). The project used Lean approach as its framework. Lean is a management system, a toolset, and a philosophy that focuses on delivering quality care to the customer in a structured and meaningful method. It allows hospitals to improve the quality of care for patients by removing “waste” in their system. The diagrammatic depiction of the Arrhythmia Management Redesign Project is shown in Figure I.

Introduction

Lean Management principles have been used effectively in manufacturing companies such as Toyota Motor Corporations for many years. In 1945, Toyota Motor Corporation developed the “Toyota Production System (TPS)” [1, 2]. TPS was set out to advance quality while improving productivity and reducing costs [1, 2]. Although the concepts were derived from TPS, the term *Lean* was credited to Jon Krafcik [1], who sought out for practices that led to the success of Japanese automakers such as Toyota. Toyota popularized Lean as their management system that focuses on delivering quality to their customer. Within hospitals, Lean is utilized as a methodology that allows hospitals to improve the quality of care for their customers, the patients, by reducing *waste* in their systems. Waste within hospitals means any motion or effort that does not provide any *value* for the patient [1, 3]. Once value is defined and understood for the patient, wastes or non-value added steps are eliminated. The elimination of waste also supports employees and physicians by removing roadblocks, allowing them to focus on providing the best health care experience for their patients.

Initial State, Objectives and Methodology

In 2008, Lean was adopted at Rouge Valley Health System (RVHS) as a management philosophy. The philosophy focuses on *Lean Thinking*, which relies on sustaining two pillars while being guided by five principles [1, 4]. The two pillars are eliminating waste and showing respect for people [1, 4]. The five principles are:

1. Specify *value* from the standpoint of the end customer
2. Identify all the steps in the *value stream*, eliminating every step that does not create value.
3. Make the value-added step occur in a tightly integrated sequence so work *flow* smoothly.
4. Let customers *pull* value.
5. Pursue *perfection* through continuous improvement.

The team within the Regional Arrhythmia Management Program, which consists of Pacemaker and Implantable Cardioverter-Defibrillator (ICD) implants, Electrophysiology Studies & Ablations (EP), and follow-up management, sought to establish what value means from the patients perspective and determine how quality can be delivered within its services. In order to achieve this, it was essential to thoroughly understand its initial (current) state. This was achieved through conducting a Value Stream Analysis (VSA) exercise. A VSA is a planning tool that creates a system creating path which provides a vision of the future ideal state by optimizing results of waste elimination within its current state [1, 4]. The objectives of the VSA were to enable the medical, clinical and administrative team to:

1. Identify current process steps of the patient's journey.
2. Identify wastes or non-valued added steps within the current state.
3. Create the future ideal state ensuring quality at the forefront.
4. Develop a project plan with timelines, leads and outcomes.
5. Determine key measures of success to validate project initiatives outcomes.
6. Outline metrics for sustainability and evaluation.
7. Determine follow-up structure for measurement tracking and reflection.

It was understood and agreed upon that by completing the objectives of the VSA, as a system-creating path, it would effectively allow for the purpose of the project to be met that is to enhance the quality of the Regional Cardiac Arrhythmia Services.

Results & Discussion

There are two interdependent paths for successful implementation of using the Lean approach: a system-creating path and culture-creating path. Prior to full immersion of the system-creating path, this is established through the VSA exercise, it was essential to establish the culture-creating path supporting the "respect for people" pillar of Lean Thinking. As a result, a Lean education and training session was held to generate empowerment among the medical, clinical and administrative teams. The result of this event propagated a Lean culture instilling learning and action oriented mindsets, where identifying and eliminating wastes and continuous improvement become daily standard operating practice.

The VSA exercise began with a full analysis of patient satisfaction surveys. The review of patient satisfaction survey aided in understanding value and indicated preliminary opportunities for improvement such as enhance communication throughout the patient’s journey, and reduce wait times. However, the surveys were completed in a retrospective manner, and as a result, real-time corrective actions were not completed. Therefore having a real-time patient satisfaction survey was the first gap identified prior to mapping the patient journey.

The result of mapping the current process steps of the patient’s journey within the current state identified four parts: (1) Booking/pre-assessment visits, (2) Pre-procedure/procedure, (3) Post-Procedure and (4) Overall. During the mapping session, the medical, clinical, and administrative team identified wastes or non-valued added steps. Table I summarizes wastes and gaps identified within each phase of the patient journey including pre-mapping analysis.

Table I. Summary of VSA gap analysis

VSA Parts	Waste and Gap
Pre-mapping	No real-time measure of patient satisfaction for delivery of services
Booking/pre-assessment visits	Lack of standardized referral form Need to update Medical Care Plan Lack of standard patient educational material for pre-procedure consultation
Pre-procedure/procedure	Front loading and batching of patient appointments for procedures and clinic follow-up appointments Documentation of patient information not streamlined Lack of frequent formalized training for technicians
Post-Procedure	Lack of standard work for Arrhythmia Specialist for follow-up appointments No consistent process for complication tracking
Overall	Fragmentation of the patient journey throughout the continuum Lack of planning to manage projected growth and resource management required Lack of quality control measures to meet best practice guidelines Lack of branding or Arrhythmia Services across the Region

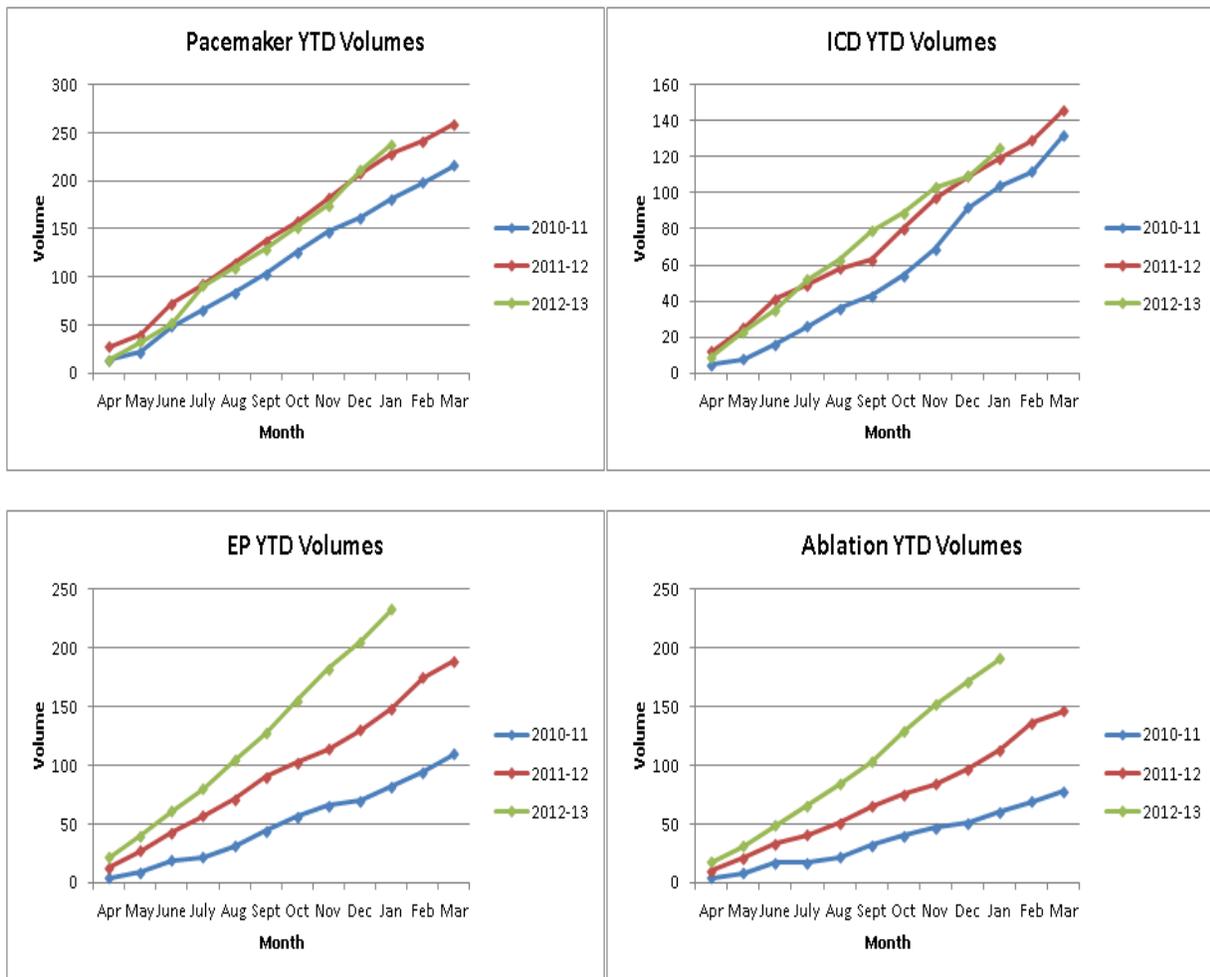
Once the wastes and gaps were identified, a future ideal state was created ensuring wastes elimination and quality at the forefront. See Appendix A for future state map (Figure I). The future state map took into consideration delivering on quality outcomes such as patient satisfaction, clinical excellence, safety, effectiveness and efficiency. As such, a project plan was

created that identifies these areas while identifying deliverables to eliminate waste. See Appendix B for the Arrhythmia Management Redesign Project (Table II). An action priority and effort matrix was used to prioritize project deliverables while a follow-up structure was created to ensure an effective cadence for measurement tracking and to force reflection. The key metrics includes patient satisfaction, wait times, complication rate, staff satisfaction, procedure room turn-around time, cancellation rate, and variance to budget.

Conclusion

The Arrhythmia Management Redesign Project goal for completion is April 2013, and as a result, full details of deliverables against the measures of success will be updated. In conclusion, it becomes essential to sustain Lean practices as the Regional Cardiac Arrhythmia program continues its growth. Figure II summarizes the volume growth trends within this fiscal year and further demonstrates the growth within the last three years.

Figure II. Arrhythmia Management Program volume growth from 2010 to 2013.



The increase in patient volumes heightens the importance in creating and sustaining the Lean initiatives that are established through the redesign process, as with using the Lean approach, patients will receive the quality of care they expect and deserve.

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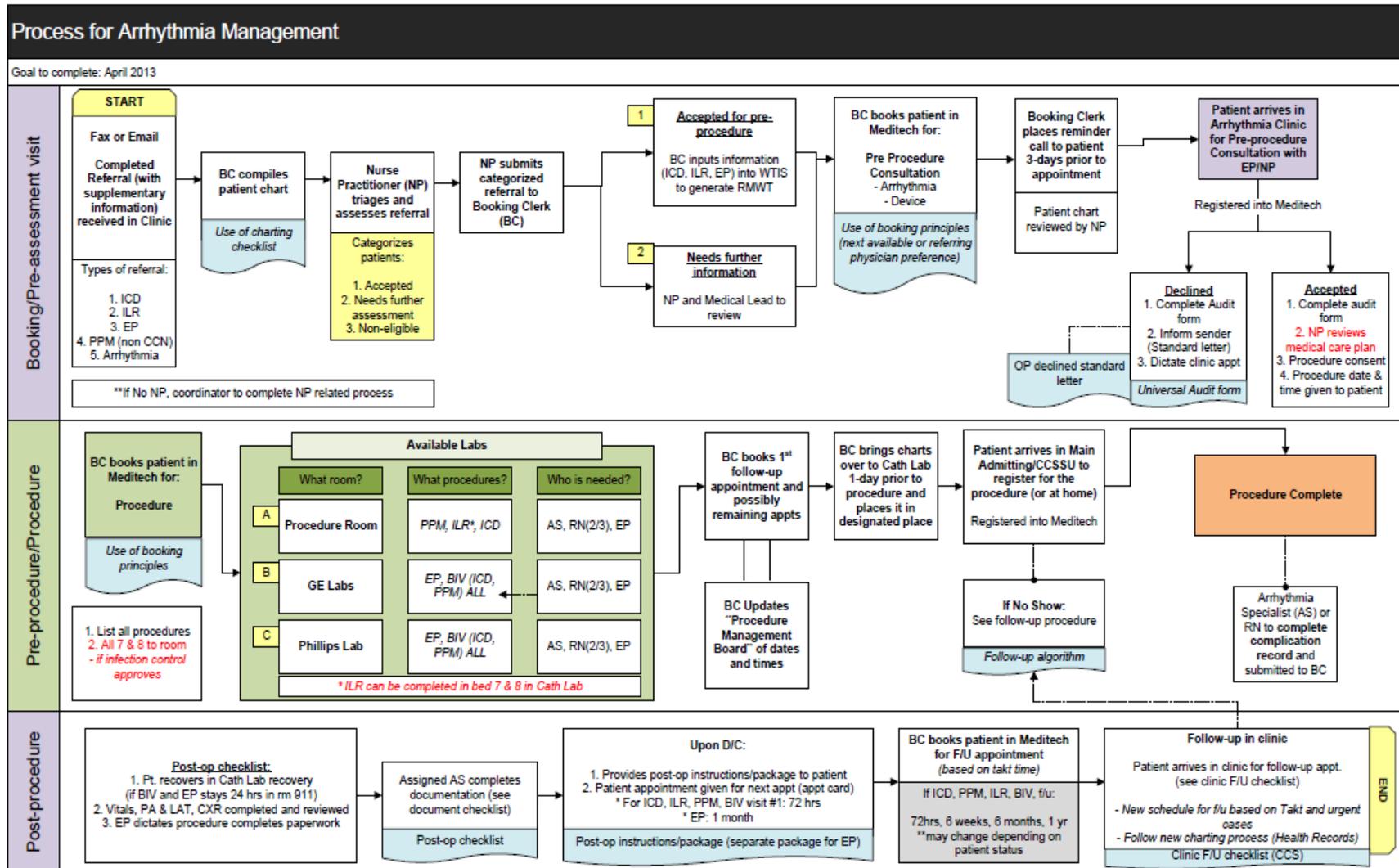
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Acknowledgment

The authors gratefully acknowledge the hard work and dedication of the medical, clinical and administrative teams in the Regional Arrhythmia Management Program for their efforts in ensuring the best care for the patients and their families.

Appendix A

Figure I. Future Ideal State of the Regional Cardiac Arrhythmia program.



Appendix B

Table II. Arrhythmia Management Redesign project plan.

ARRHYTHMIA MANAGEMENT REDESIGN- PROJECT PLAN							
Project Plan to be completed by April 2013							
#		What are the objectives and/or deliverables?	Who is responsible?	How will it be achieved? (action required)	Target Date	Actual Date	Comments/Status
1	Clinical excellence	1a) Create/review “Medical care plan” and patient educational material for pre-procedure consultation	Rohan	Quick Win			
		1b) Create/review post-op patient instruction package (with appointment time)	Glyn to f/u with Gracy	Project			Can be printed in Cath lab recovery for patient
		1c) Education training with technicians by EPs	Dr. Janmohamed	Project			Continued Education – Monthly sessions.
2	Safety	2a) Build Cardiac Catheterization Lab complication record to incorporate Arrhythmia Services	Rohan	Quick Win	Nov 26 th <i>implem ented</i>		Nov 12 th for review
		2b) Determine process & accountability for complication tracker: excel, approach, main responsible pers on (MRP)	Rohan	Quick Win	TBD		
3	Effectiveness	3a) Hire Nurse Practitioner (NP) - review & post job description	Glyn	Quick Win	July 2013		To be posted by Nov 29 th .
		3b) Review Human Resources & projected volume growth and identify areas of specialty	Glyn	Short term: connect with 2 newly hired nurses in Cath Lab	TBD		
		3c) Create standard work for Arrhythmia Specialist for follow-up appointments	Glyn	Standard Work Kaizen Event			See email from Dr. Janmohamed for structure
4	Efficiency	4a) Ensure all “all-in-one” standardized referral form is created (ICD,PPM, ILR, EP) that captures supplementary information; including CCN data capture	Rohan/Ahilia	Circulating – documenting	Nov 19th		Add Ted Davies name
		4b) Redesign patient charting process to include storing in Health Records	Glyn/Rohan/Ahilia	Project/Kaizen Event	TBD		A3 in progress.
		4c) Redesign follow-up clinic structure (based on takt time, room availability, standard times).	Rohan/Glyn	TAKT time analysis	Nov 22nd		Have staggered starts for Emergencies & admin work

		4d) Create/review standard Letter to referring MD if a) patient (Outpatient) is not accepted, or b) if accepted for procedure (full information sheet)	Rohan/Dr. Janmohamed	Quick Win			
		4e) Create/review patient chart checklist	Rohan	Quick Win			
		4f) Create/review “universal” audit form to incorporate all types for pre-procedure clinic visit	Glyn	Quick Win			
		4g) Review utilization of EP lab & Procedure room – current state analysis - Implants RVC vs. RVAP - TSH vs. LHO vs. RVHS	Glyn/Dr. Janmohamed	Level Loading and Standard Work Kaizen			
5	Patient Satisfaction	Develop a patient satisfaction survey process that includes real time analysis & reporting of results	Rohan	Project			
6	Partnership	Networking & Marketing Strategy - Review of all referring physicians (volume log – quarterly measures)	All	Project			Jan 2013 to f/u with physicians who attended Dr. Ricci’s event.
GO-LIVE with new process – April 2013							