THE UNIVERSITY OF CHICAGO MEDICINE

Prevention of Venous Thromboembolism in an Urban Academic Medical Center

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- 568-bed academic medical center
- Located in Hyde Park neighborhood on Chicago's south side
- 25,000 patients admitted per year
- 78,000 visits per year to adult and pediatric emergency departments.
- Center for Care and Discovery opened in 2013, a state-of-the-art hospital with focus on cancer, digestive diseases, neuroscience and advanced surgery.
- Other notable specialty programs include endocrinology, cardiology, kidney diseases, orthopedics, transplantation, pediatrics and women's services.

Why?

- Hospitalization is major risk factor for developing Venous Thromboembolism (VTE)
- VTE is the most common preventable cause of hospital death.
- Approximately 348,558 hospitalized patients in the United States are diagnosed with Deep Vein Thrombosis (DVT) each year.
- 277,549 are diagnosed with Pulmonary Embolism (PE)
- 78,511 are diagnosed with both DVT and PE.
- 13,164 of patients with DVT, 19,297 with PE, and 3,735 with both DVT and PE diagnoses will die.
- One-half of patients diagnosed with DVT will have long term complications such as swelling or pain in affected limb
- One-third of patients with DVT will have another DVT or PE within 10 years

Centers for Disease Control. Morbidity and Mortality Weekly Report. Venous Thromboembolism in Adult Hospitalizations, 2007-2009. June 8, 2012
www.cdc.gov Venous Thromboembolism Data and Statistics

Why?

Why?

Background

- Prophylaxis rates well below national average and an increase in VTE events in our hospital indicated a need for improvement in prevention practices.
- In 2013, approximately 73% of inpatients in our hospital received VTE prophylaxis.
- 15% of patients who developed a VTE during the hospitalization had not received prophylaxis.
- Organization VTE prevention interventions had been focused on surgical services.
- Patients across all services were developing DVTs or PEs while hospitalized
- Focus on fall prevention had unintentional consequence of discouraging nurses from ambulating patients when appropriate

Aims

- Address inconsistent practice around venous thromboembolism prevention for medical and surgical inpatients within the medical center.

- Lean methodologies were used to increase appropriate utilization of prophylaxis, decrease variability of practice, and reduce venous thromboembolism events.

Lean Kaizen

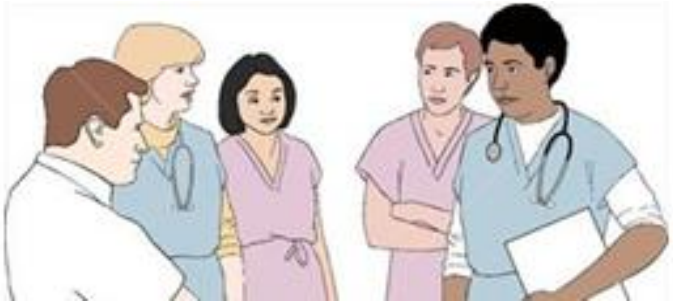
改善

Kai = Change Zen = Good

Kaizen Event –Getting to the root cause

Kaizen Event – Multidisciplinary Team

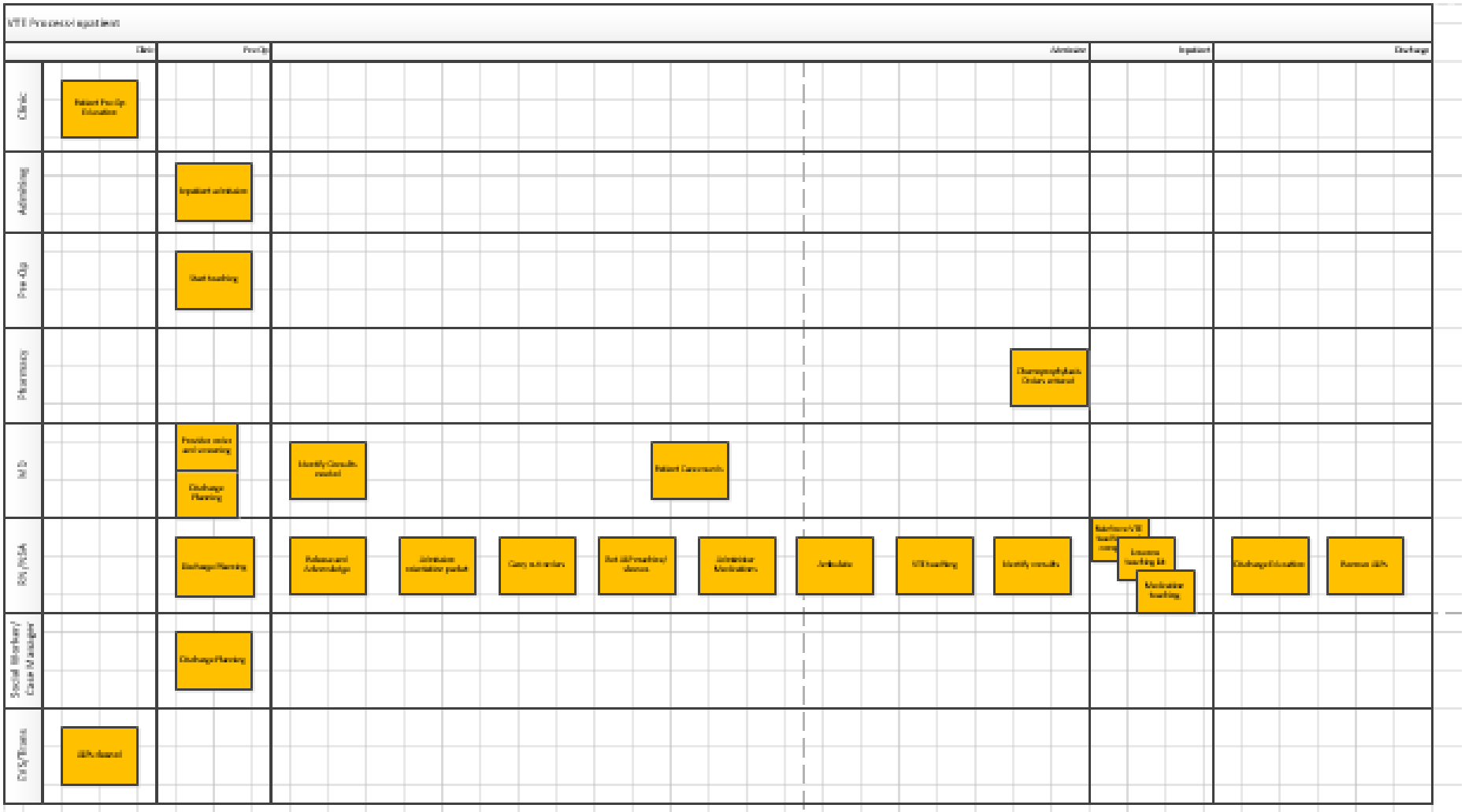
- Nursing-Leadership
- Medical and Surgical Registered Nurses
- Nursing Assistants
- Healthcare providers- MD and APN
- Nursing educators
- Support services-Transportation, Supply Chain
- Nursing informatics, Quality, Risk Management and Operational Excellence



Kaizen Event – 3 day "JDI" Activities

- No standard prevention practices for VTE
- Current state of VTE prevention
- Future state of VTE prevention
- Brainstorm of barriers to VTE prevention
- Developed standard roles for nurses, nursing assistants, and providers
- Developed action plan for rolling out interventions
- Transportation inventory of pumps
- Changed nursing documentation workflow to main assessment flowsheet

Swim Lane Map

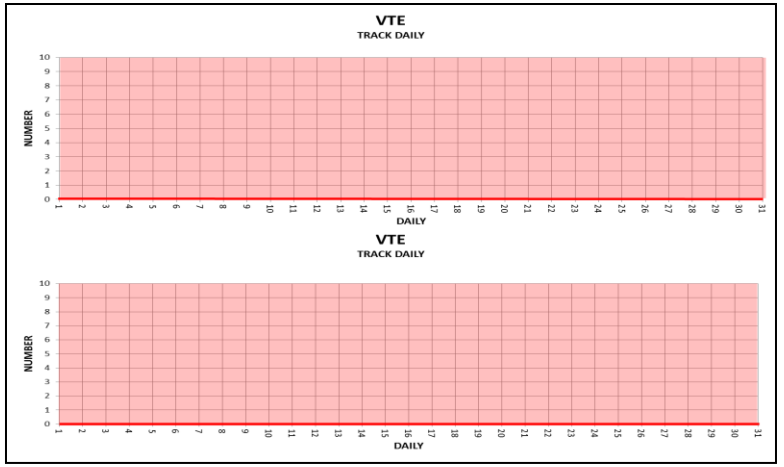


Standard work

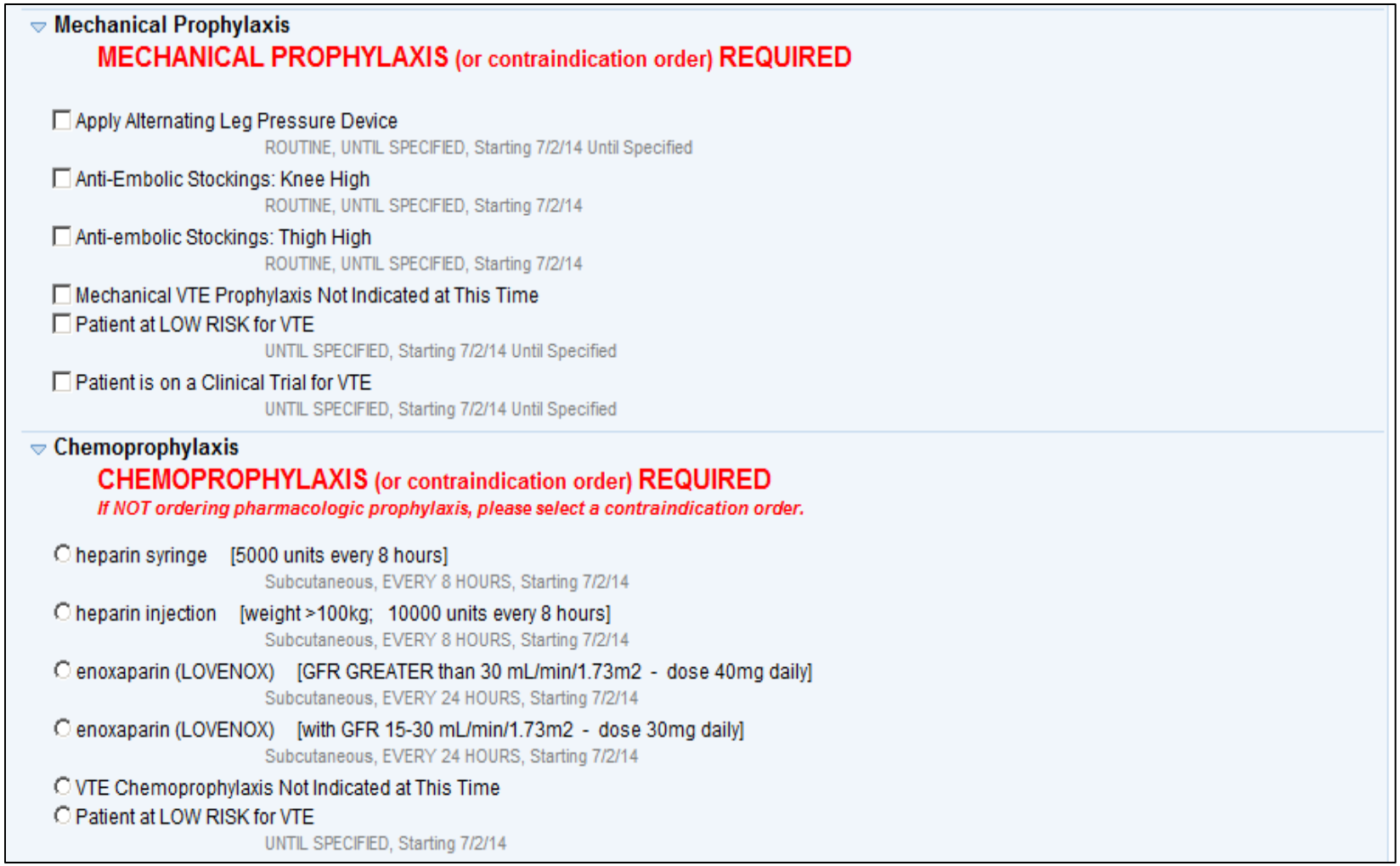
Standard Work			
Title: Registered Nurse		**Revision Date:** 1/23/2014	
Department: Nursing		**Process Owner:** Manager	
Cycle Time: 99		**Inventory:** ALPs, EPIC, ALP sleeve	
Instructions and Special Considerations: VTE= ALPS/anticoagulation/ambulation. **ALPS at all times except when ambulating**			
	RN Assessment + High Risk - VTE Orders= Call Provider		
#	Work Step Description	Keypoint	Time (min)
1	Report taken/ED SBAR		3
2	Give NSA report		2
3			
4			
	Admit patient		20
1	Orders received/released		1
2	Update NSA		2
3	POC initiated		25
4	Reinforce education about VTE interventions (pamphlet)		
	Administer Medications		
1	Check orders		
2	Omnicell to retrieve medications		
3	Get supplies/syringe/alcohol		
4	Educate/Administer/ Document Medications		5
5	If interruption in anticoagulant admins due to testing/procedures; give prior to departure (if in Omnicell timeframe)		
	Early Ambulation		
1	Educate patient and document education		1
2	Prepare patient		10
3	Walk		10
4			
5			
	Return to room		
1	Patient to bed/chair		5
2	Reconnect devices/drains		5
3	Give patient the call light		1
4	Documentation VTE interventions every 4 hours and prn		9
5		Cycle Time	99

Kaizen Event- Follow Up Activities

- VTE bundle inclusion in MD Order Sets - February 2014
- Quality audits led by nursing leadership - February 2014
- Education roll out- Interactive unit based in-services - February-April 2014
- VTE prophylaxis education added to orientation for Registered Nurses and Nursing Assistants - April 2014
- New ALPs machine at every bedside rolled out - April 2014
- VTE prophylaxis measures added to unit MDI boards - July 2014
- VTE prophylaxis education added to annual comps for RNs – August 2014
- VTE prophylaxis education added to annual comps for Nursing Assistants - October 2014



Order Set



Mechanical Prophylaxis

MECHANICAL PROPHYLAXIS (or contraindication order) REQUIRED

- ☐ Apply Alternating Leg Pressure Device
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14 Until Specified
- ☐ Anti-Embolic Stockings: Knee High
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14
- ☐ Anti-embolic Stockings: Thigh High
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14
- ☐ Mechanical VTE Prophylaxis Not Indicated at This Time
- ☐ Patient at LOW RISK for VTE
  UNTIL SPECIFIED, Starting 7/2/14 Until Specified
- ☐ Patient is on a Clinical Trial for VTE
  UNTIL SPECIFIED, Starting 7/2/14 Until Specified

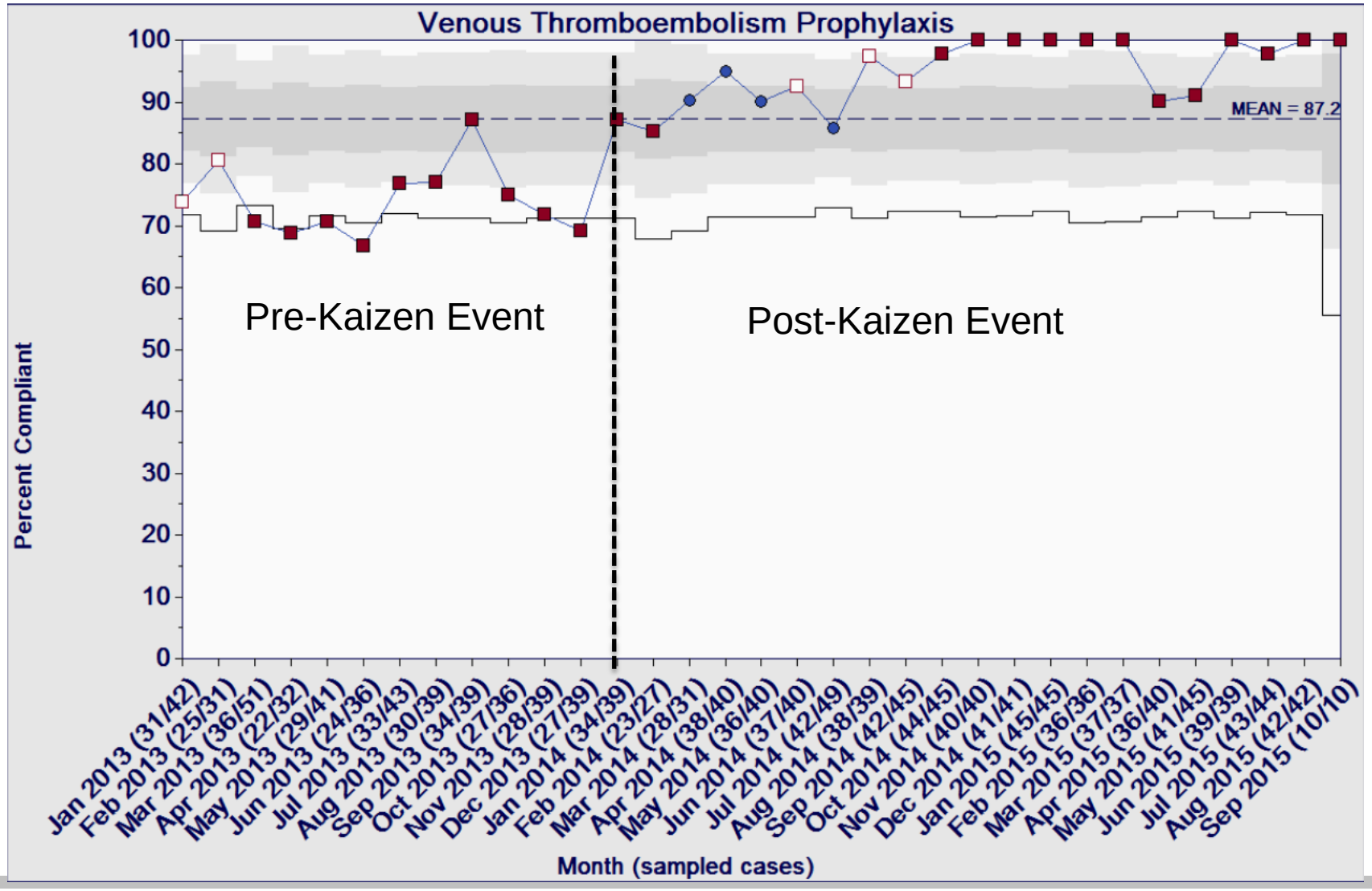
Chemoprophylaxis

CHEMOPROPHYLAXIS (or contraindication order) REQUIRED

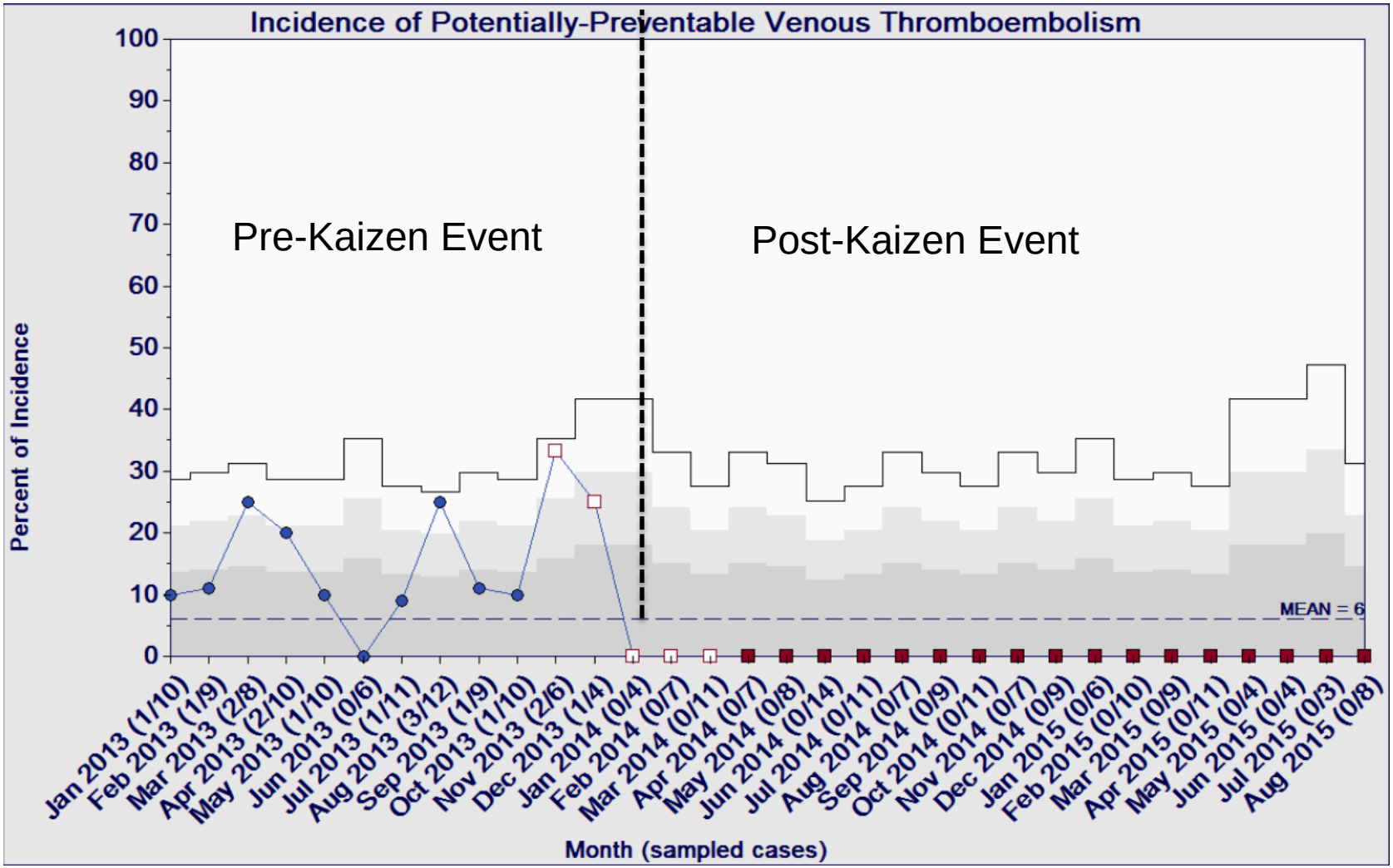
If NOT ordering pharmacologic prophylaxis, please select a contraindication order.

- ○ heparin syringe [5000 units every 8 hours]
  Subcutaneous, EVERY 8 HOURS, Starting 7/2/14
- ○ heparin injection [weight >100kg; 10000 units every 8 hours]
  Subcutaneous, EVERY 8 HOURS, Starting 7/2/14
- ○ enoxaparin (LOVENOX) [GFR GREATER than 30 mL/min/1.73m2 - dose 40mg daily]
  Subcutaneous, EVERY 24 HOURS, Starting 7/2/14
- ○ enoxaparin (LOVENOX) [with GFR 15-30 mL/min/1.73m2 - dose 30mg daily]
  Subcutaneous, EVERY 24 HOURS, Starting 7/2/14
- ○ VTE Chemoprophylaxis Not Indicated at This Time
- ○ Patient at LOW RISK for VTE
  UNTIL SPECIFIED, Starting 7/2/14

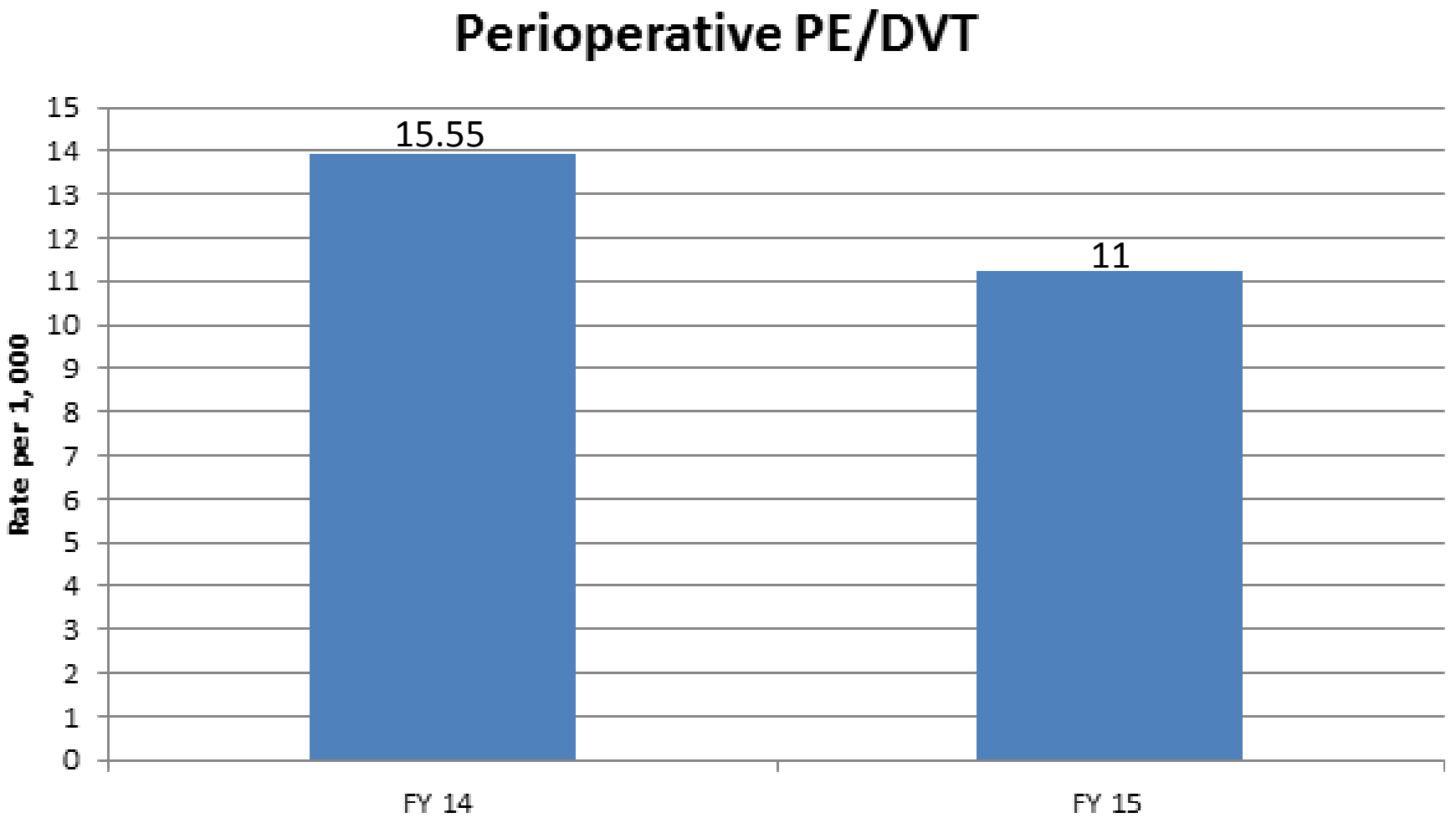
Outcomes


Venous Thromboembolism Prophylaxis
MEAN = 87.2
Pre-Kaizen Event
Post-Kaizen Event
Percent Compliant
Month (sampled cases)
100
90
80
70
60
50
40
30
20
10
0
Jan 2013 (31/42)
Feb 2013 (25/31)
Mar 2013 (36/51)
Apr 2013 (22/32)
May 2013 (29/41)
Jun 2013 (24/36)
Jul 2013 (33/43)
Aug 2013 (30/39)
Sep 2013 (34/39)
Oct 2013 (27/36)
Nov 2013 (28/39)
Dec 2013 (27/39)
Jan 2014 (34/39)
Feb 2014 (23/27)
Mar 2014 (28/31)
Apr 2014 (38/40)
May 2014 (36/40)
Jun 2014 (37/40)
Jul 2014 (42/49)
Aug 2014 (38/39)
Sep 2014 (42/45)
Oct 2014 (44/45)
Nov 2014 (40/40)
Dec 2014 (41/41)
Jan 2015 (45/45)
Feb 2015 (36/36)
Mar 2015 (37/37)
Apr 2015 (36/40)
May 2015 (41/45)
Jun 2015 (39/39)
Jul 2015 (43/44)
Aug 2015 (42/42)
Sep 2015 (10/10)

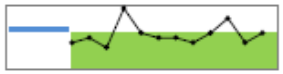
Outcomes


Incidence of Potentially-Preventable Venous Thromboembolism
Pre-Kaizen Event
Post-Kaizen Event
Percent of Incidence
100
90
80
70
60
50
40
30
20
10
0
MEAN = 6
Jan 2013 (1/10)
Feb 2013 (1/9)
Mar 2013 (2/8)
Apr 2013 (2/10)
May 2013 (1/10)
Jun 2013 (0/6)
Jul 2013 (1/11)
Aug 2013 (3/12)
Sep 2013 (1/9)
Oct 2013 (1/10)
Nov 2013 (2/6)
Dec 2013 (1/4)
Jan 2014 (0/4)
Feb 2014 (0/7)
Mar 2014 (0/11)
Apr 2014 (0/7)
May 2014 (0/8)
Jun 2014 (0/14)
Jul 2014 (0/11)
Aug 2014 (0/7)
Sep 2014 (0/9)
Oct 2014 (0/11)
Nov 2014 (0/7)
Dec 2014 (0/9)
Jan 2015 (0/6)
Feb 2015 (0/10)
Mar 2015 (0/9)
Apr 2015 (0/11)
May 2015 (0/4)
Jun 2015 (0/4)
Jul 2015 (0/3)
Aug 2015 (0/8)
Month (sampled cases)

Outcomes


Perioperative PE/DVT
Rate per 1,000
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
15.55
11
FY 14
FY 15

Outcomes

What are we measuring?	How are we measuring it?	Desired Direction	Baseline and Rolling 12 Months	Our Performance				
				Baseline	Results Through	Current Month	FY15 Target	Current Status (FYTD)
Perioperative pulmonary embolism or deep vein thrombosis - PSI 12***	Count (Rate per 1,000 patients)	⇩		94	Jun	7 (11.6)	85	80

Next Steps

- Project Walk is being rolled out to identify patients with high risk mobility problems and promote early ambulation
- Monthly VTE event report distributed and reviewed by Nursing leadership for compliance with VTE prevention measures in patients who developed VTE
- Development of data metrics and reports that examine VTE prevention measures in greater depth

Lessons Learned

- Interdisciplinary team and key stakeholders at the table are crucial for success
- “Kaizen” Lean methodology process improvement guided the development, implementation and integration of best practice initiatives
- VTE prevention orders integrated into routine provider workflow improved ease of ordering and improved interdisciplinary communication of patient’s needs.
- Organizational support for dedicated resources, creating awareness and providing a standard process was essential
- Culture change is always a challenge but was necessary to achieve success