

Medtronic

Engineering the extraordinary

TAVR Staff and Clinic Optimization

January 20, 2023

Moderator: Lucy Schlueter, Global Market Development Consultant, Medtronic

Faculty:

Michael Querijero MSPA-C, Health System Director NYU Langone Heart

Nicole Dellise, DNP, FNP-BC, CHFN Director, Structural Heart Program

January 2023 #UC202311259EN

© 2022 Medtronic. All rights reserved.

Staff and Clinic Optimization

Agenda

- Introductions to our Speakers
 - Mike Querijero, MSPA-C, Health Systems Director at NYU
 - Nicole Dellise, DNP, FNP-BC, CHFN, Structural Heart Director at HCA TriStar Centennial Heart & Vascular
- Polling Question
- Q&A/Survey

STRUCTURAL HEART LANDSCAPE AND BEYOND: SUSTAINING GROWTH FOR THE FUTURE

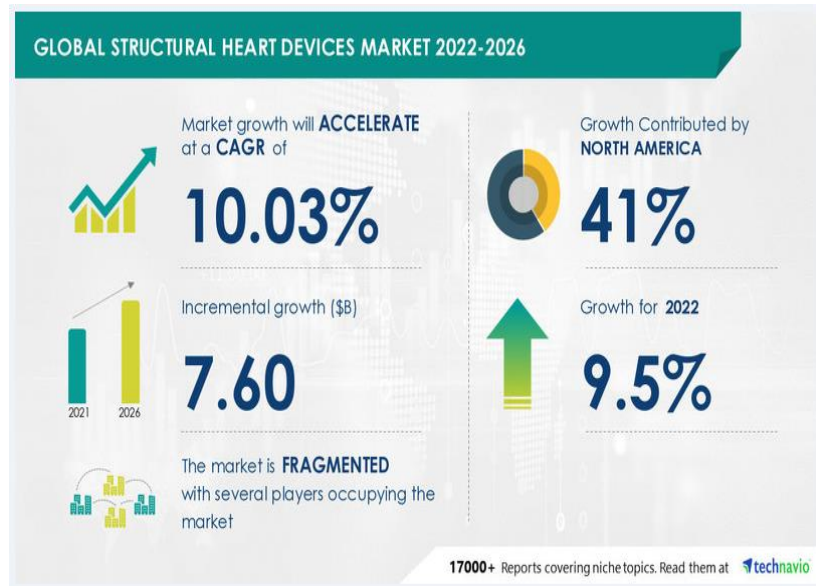
Michael Querijero MSPA-C
Health System Director
NYU Langone Heart



Agenda

- Current State
- TAVR program from the beginning: Lessons learned
- Healthcare: Lean Model
- New Challenges and Basic Finances
- Outpatient Staffing

Current State Structural Heart Programs



- Valvular heart disease is one of the most frequent causes for heart failure
- Indication for TAVR includes low risk
- Clinical outcomes for TAVR have been successful
- TEER for mitral
- Tricuspid Studies on going
- LAAO Closures
- ASD/PFO, VSD, PDA, Coarct and paravalvular leak closures

Local Current State

NYU Langone Health System



Tisch Hospital

- > 300 Bed Acute Care Tertiary Hospital

Kimmel Pavilion

- 374 Bed Hospital

Hassenfeld Children's Hospital

- 102 Beds

NYU Brooklyn

- 450 Beds

NYU Long Island

- 591 Beds

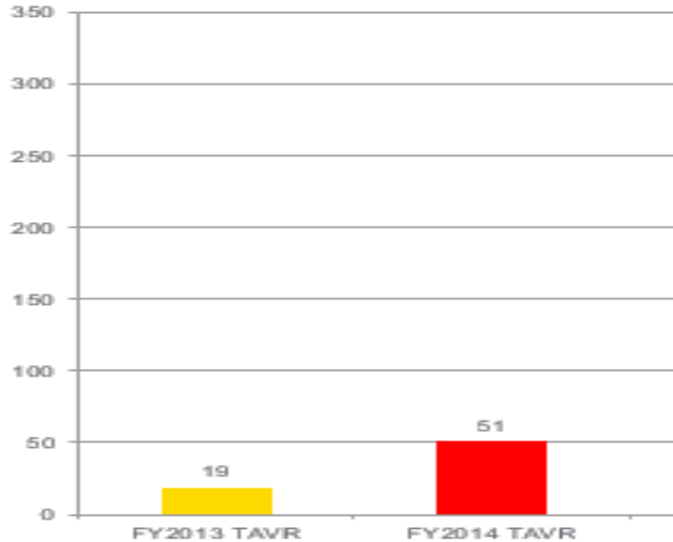
Long Island Community Hospital

- 508 Beds

- 20 TAVR programs within a 25 mile radius of NYU KP/TH
- DRG 266 reimbursement reduction 2.6%
- DRG 267 reimbursement reduction 4.1%
- Bed Surge
- Lack of ICU beds

NYU Langone Medical Center

TAVR Program Relaunches 9/2014



Initial Impression of TAVR

TAVR Early loss Leader

- Both Cardiology and Cardiac Surgery expected to cover losses – “Investment”
- Largely Negative Contributions Margins
- Despite lower research pricing
- Long Wait Times

TAVR PROGRAM Circa 2012-2014

- No Dedicated Heart Valve Team
- Care not Structured
- No Valve Clinic
- Poor Surgical Buy In
- Lack of Designated Hybrid Cath/ Hybrid OR Time
- No Dedicated Valve Coordinator
- Missing Administration Support

Historical Data

State of the Program 2014

- No Dedicated Heart Valve Team
- Care not Structured
- No Valve Clinic
- Poor Surgical Buy In
- Lack of Designated Hybrid Cath/ Hybrid OR Time
- No Dedicated Valve Coordinator
- Missing Administration Support

Results

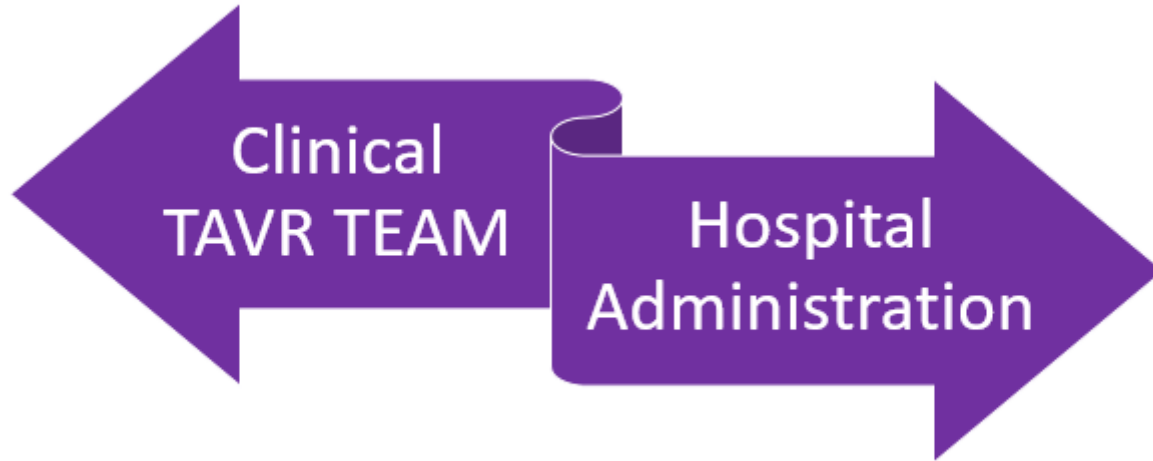
	Pre Sedation Protocol 1 Year	STS/TVT Registry 2014
N	55	12,558
Sedation Cases	0 (0%)	629 (5%)
LOS Days: Average (Median)	5.4 (5)	6.1 (5)
ICU LOS Hours: Average (Median)	42.3 (25)	64.1 (33)
Procedure Time: Average (Median)	2:37 (2:13)	144 (119)
Dispo Home (excludes VA pts)	74%	68%
In Hospital Mortality	5.5%	4.0%

Goals

- Increase Volume
- Increase Program Visibility
- Improve Outcomes
- Improve Patient Experience
- Build and Strengthen Referral Base

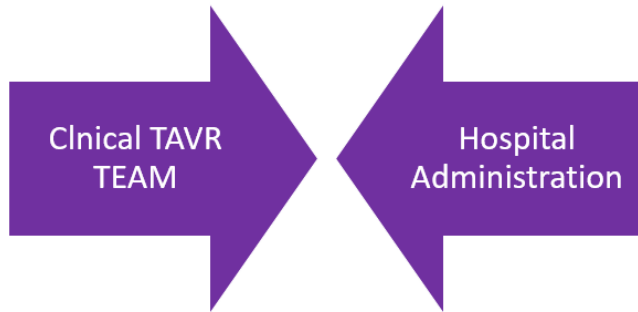


DIRECTION



Administrative and Clinical Collaborative Effort

Path less taken



Joint Program Building

- Promote the Growth of the Program
- Improve Efficiencies/ Standardized Key Areas (Stream line Care)
- Achieve Favorable (+) Contribution Margins
- ID areas of loss
- Improve Outcomes

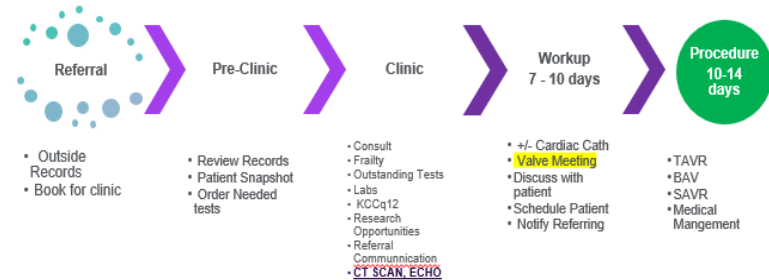
Steps to Success

Measurement of Success



1st step: Streamline screening

Screening



2nd Step: Intraoperative optimization

Identified issues prior to optimization

- Maximize Hybrid OR Utilization (2 cases) – Decrease procedure time (2.4 hours), Reduce turnover time (2 hours),
- Staffing (staffed by cardiac surgery and cath lab staff)
- Equipment Utilization
- Decrease ICU/CVSCU Time (> 40 hours)
- Reduce Complications – avoid ambiguity, protocols
- Transition of Care (high readmissions rates)
- Costs of increased wait time for patients

2nd Step: Intraprocedure optimization

Identified issues prior to optimization

- Maximize Hybrid OR Utilization (2 cases) – Decrease procedure time (2.4 hours), Reduce turnover time (2 hours),
- Staffing (staffed by cardiac surgery and cath)
- Equipment Utilization
- Decrease ICU/CVSCU Time (> 40 hours)
- Reduce Complications – avoid ambiguity, p
- Transition of Care (high readmissions rates)
- Costs of increased wait time for patients



INTRAPROCEDURE INFRASTRUCTURE TAVR EFFICIENCY: Strategy

- **MIME (Minimal Invasiveness and Maximal Effectiveness)**
 - Limit number of encounters before implant
 - Movement away from general anesthesia
 - TTE instead of TEE
- Structure All Facets of Care: Educate Staff
- Shrink Team

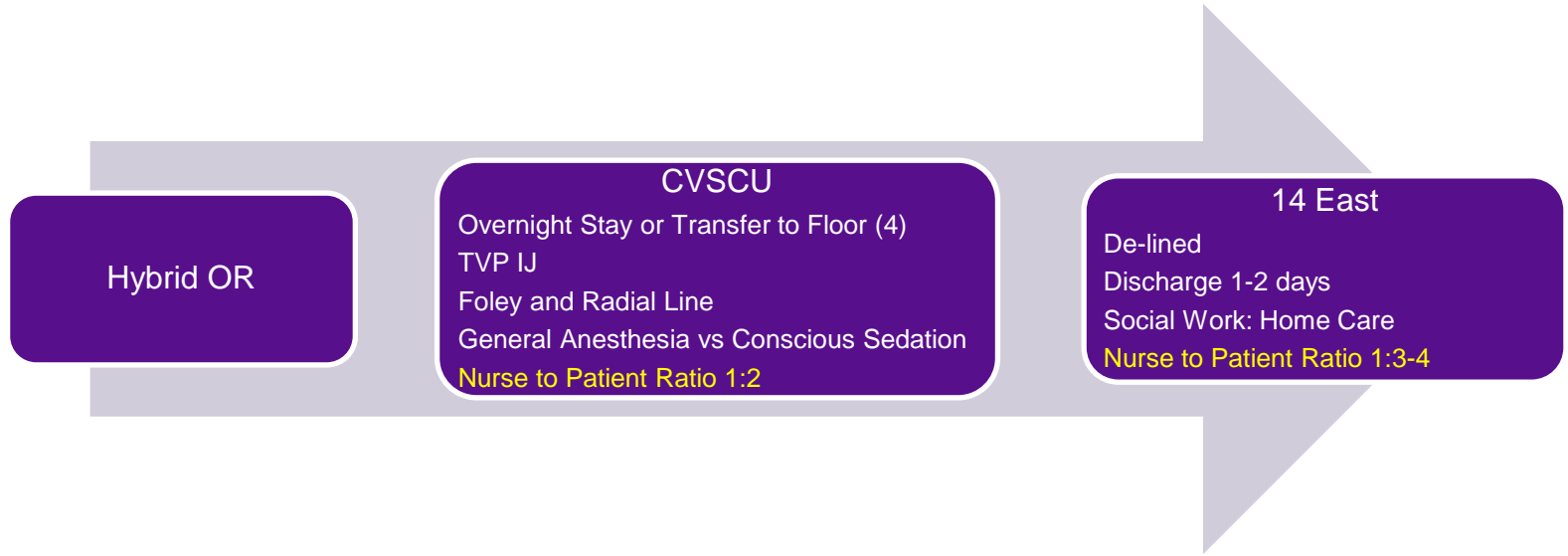
Optimal Imaging for Guiding TAVR: Transesophageal or Transthoracic Echocardiography, or Just Fluoroscopy?



Itzhak Kronzon, MD, Vladimir Jelnin, MD, Carlos E. Ruiz, MD, PhD, Muhamed Saric, MD, PhD, Mathew Russell Williams, MD, Albert M. Kasel, MD, Anupama Shivaraju, MD, Antonio Colombo, MD, Adnan Kastrati, MD
Section Editor: Partho P. Sengupta, MD

THE FOLLOWING iFORUM DEBATE FEATURES 3 VIEWPOINTS related to the most practical and effective imaging strategy for guiding transcatheter aortic valve replacement (TAVR). Kronzon, et al. provide evidence that enhanced analysis of aortic valve anatomy and improved appreciation of complications mandate the use of transesophageal echocardiography as front-line imaging modality for ALL patients undergoing TAVR. On the other hand, Saric and colleagues compare and contrast the approach of performing TAVR under transthoracic guidance. Lastly, Kasel and co-workers provide preliminary evidence that TAVR could be performed under fluoroscopic guidance without the need for additional imaging technique. Although the use of less-intensive sedation or anesthesia might reduce the procedural time, we need more randomized data to establish the most cost-effective approach in guiding TAVR.

Step 3: Optimize post procedure recovery (CVSCU Model)



Handoff/ Flowsheet

- Cardiac Anesthesiologist, nurse and fellow transport patient from Hybrid OR to CVSCU (PACU)
- Signout: CVSCU Valve NP and CVSCU Nurse
- TVP and IV in place (no foley, no ET tube)
- Radial Line Pulled in the Hybrid OR if placed
- Ambulate 3.5 hours post procedure

THE HANDOFF PROVIDES DETAILED INFORMATION CONSISTING OF:

- Preprocedure history, examination, and vitals
- Preprocedure electrocardiogram
- Preprocedure medications
- Intraprocedure medications
- Valve deployed and procedural course
- Presence of any intraprocedural complications
- Postvalve deployment rhythm
- Postdeployment echocardiogram
- Postprocedural vitals
- Time arteriotomy was closed (perclose)

Michael Querijero

Post Transfemoral TAVR from (Hybrid OR)

Anesthesiologist and Operator will determine if patient is suitable for fast track recovery

- Review of inclusion criteria
 - Extubated – requiring only up to 4L NC o2
 - Cannot be TVP dependent
 - No Continuous infusions (i.e pressors, nicardipine, inotropes)
 - No Vascular complications (no cut downs, poorly controlled hematomas)
 - No Significant bleeding
 - No change in mental status or neurological deficits
 - No significant pain or uncontrolled pain
- Alert CVSCU – patient will be transported
- Anesthesiologist and staff will transport patient from Hybrid OR to CVSCU
 - Report to Accepting Nurse/ NP:
 - procedure course
 - medications given
 - time patient was extubated
 - last set of vitals
- Accepting team will monitor patient for 4 - 6 hours (as per order set)
 - Vitals
 - Vascular Access
 - Change in Mental Status/ Neuro deficits
- NP will reevaluate patient at 4 or 6 hours and determine if patient is suitable for floor
- Call step down floor (universal bed)
- Transport patient to stepdown telemetry floor
- Order Cardiac Physical Therapy on Arrival
- In Am Physical Therapy Evaluation
- In Am Social Work Assessment and discussion with family and patient
- Discharge plan developed

Step 4: Track Results of optimization efforts in outcomes Year 1 – September 2014 to August 2015

	Pre Sedation Protocol 1 Year	STS/TVT Registry 2014	Post Protocol 1 Year	
N	55	12,558	214	
Sedation Cases	0 (0%)	629 (5%)	194 (91%)	
LOS Days: Average (Median)	5.4 (5)	6.1 (5)	2.6 (2)	
ICU LOS Hours: Average (Median)	42.3 (25)	64.1 (33)	15.1 (8)	
Procedure Time: Average (Median)	2:37 (2:13)	144 (119)	1:28 (1:21)	
Dispo Home (excludes VA pts)	74%	68%	91%	
In Hospital Mortality	5.5%	4.0%	1.9%	

	Protocol Month 1-3	Protocol Month 4-6	Protocol Month 7-9	Protocol Month 10-12
N	55	42	58	59
Sedation Cases	42 (76%)	35 (83%)	58 (100%)	59 (100%)
LOS Days: Average (Median)	3.1 (2)	2.5 (2)	2.6 (2)	2.1 (2)
ICU LOS Hours: Average (Median)	23.6 (21)	15.4 (9)	11.7 (8)	10.2 (7)
Procedure Time: Average (Median)	1:37 (1:30)	1:33 (1:22)	1:23 (1:17)	1:20 (1:17)
Dispo Home (excludes VA pts)	86%	89%	91%	95%
In Hospital Mortality	3.6%	2.3%	0.0%	1.7%

- LOS fell from 5.4 days to 2.6
- Median ICU LOS 40+ hours to 8
- Median Procedure Time 2:13 hours to 1:21
- Mortality fell from 5.5 to 1.9

Finances

Alternate payment model

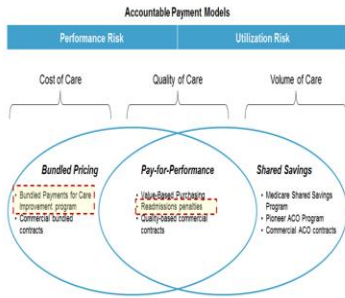
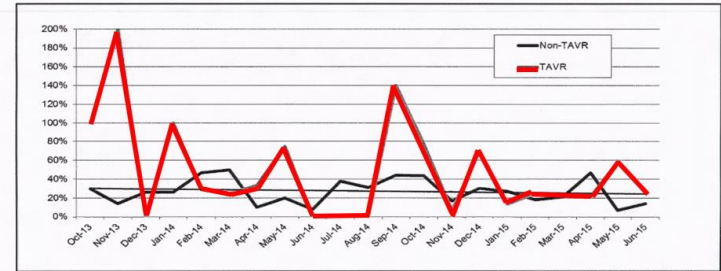


TABLE 1. BUNDLE PAYMENT FOR CARE IMPROVEMENT: PERFORMANCE SUMMARY	
Average Margin Per Case	Average DRG 90-day target price – average 90-day performance spend (ie, index admission + 90-day post-discharge payment)
Postdischarge Payment	<ul style="list-style-type: none"> • Readmission payments • In-patient rehab payments • Subacute rehab payments • Home care agency payments

Initial challenges

Monthly Readmission Rates since start of BPCI performance period (Q4 2013)

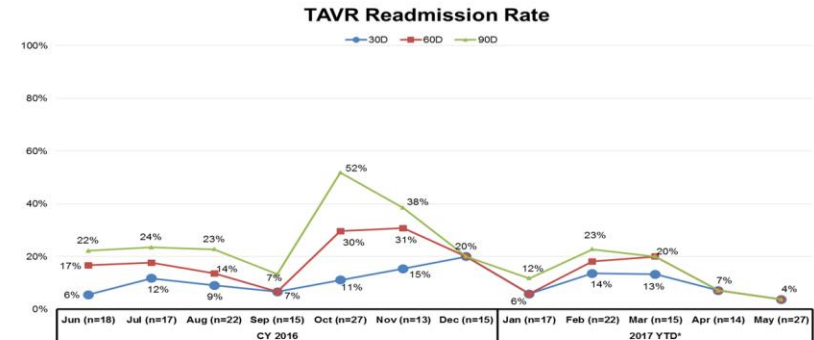


TAVR Program

- Took ownership of entire process including post discharge
- Partnered with hospital leadership and finance
- Full financial transparency
- Reinvest in success



CV Readmissions based on Bundled Payment Claims Data



Medicare Policy and Payment Changes Hospital Inpatient Prospective Payment System (IPPS)

FY 2019 (loss overall 4.46%)

- National weighted average payment for the TAVR MS-DRGs 266-267, on the whole, is proposed to decline by 4.46%

TAVR MS-DRGs - Combined Average Payments														
MS-DRG	Description	FY2018 Final Rule					FY2019 Final Rule					Change from FY2018 to FY2019		
		Relative Weight	National Average Payment ¹	Discharges	Percent of Discharges	MS-DRG Weighted Average Payment	Relative Weight	National Average Payment ²	Discharges	Percent of Discharges	MS-DRG Weighted Average Payment	Dollar Change in National Average Payment	Percent Change in National Average Payment	Percent Change in Weighted National Average Payment
266	Endovascular Cardiac Valve Replacement with MCC	7.7525	\$46,720	11,333	42.8%	\$41,043	7.1915	\$43,935	14,625	42.5%	\$39,213	(\$2,786)	-5.96%	-4.46%
267	Endovascular Cardiac Valve Replacement without MCC	6.1066	\$36,801	15,166	57.2%		5.8481	\$35,727	19,813	57.5%		(\$1,074)	-2.92%	
FY2018 Final Average Standardized Amount = \$6,028.08 FY2019 Final Average Standardized Amount = \$6,115.96 Data Source: IPPS FY2018 Final Rule and IPPS FY2019 Final Rule														

TAVR with MCC and w/o MCC Top 10 and NY state

Top 10

Hospital	Jan			Feb			Mar			Apr			Total (4m)
	266	267	% w MCC	266	267	% w MCC	266	267	% w MCC	266	267	% w MCC	
	29	30	49%	40	25	62%	24	27	47%	17	35	33%	227
	20	28	42%	15	32	32%	21	39	35%	13	40	25%	208
	10	25	29%	20	26	43%	24	39	38%	30	26	54%	200
	22	18	55%	16	23	41%	24	18	57%	16	18	47%	155
	7	20	26%	3	28	10%	4	31	11%	14	20	41%	127
	9	18	33%	10	21	32%	12	27	31%	11	16	41%	124
	12	14	46%	6	15	29%	9	18	33%	15	25	38%	114
	9	10	47%	9	20	31%	8	24	25%	5	21	19%	106
	7	13	35%	13	15	46%	13	17	43%	12	14	46%	104
NYU	9	14	39%	4	20	17%	6	22	21%	6	21	22%	102

New York State

Hospital	Jan			Feb			Mar			Apr			Total (4m)
	266	267	% w MCC	266	267	% w MCC	266	267	% w MCC	266	267	% w MCC	
	20	28	42%	15	32	32%	21	39	35%	13	40	25%	208
NYU	9	14	39%	4	20	17%	6	22	21%	6	21	22%	102
	11	14	44%	6	19	24%	8	13	38%	12	13	48%	96
	5	9	36%	9	15	38%	8	9	47%	5	13	28%	73
	10	2	83%	15		100%	9	9	50%	7	4	64%	56
	7	3	70%	8		0%	2	13	13%	6	4	60%	43
	1		100%	1		0%	2		0%				4

TAVR w/ MCC Workflow

- Educated Coders on higher MCC DRG
- Educated Clinicians on better documentation
- Accounts put on hold TAVR w/o MCC
- Reviewed by Structural Heart Team
- Released within three days

Current State

Structural Heart (DRG 266-267) Volume in All Facility

CY2021 Q3 to CY2022 Q2 Discharges

Date Source: Vizient database as of September 2022.

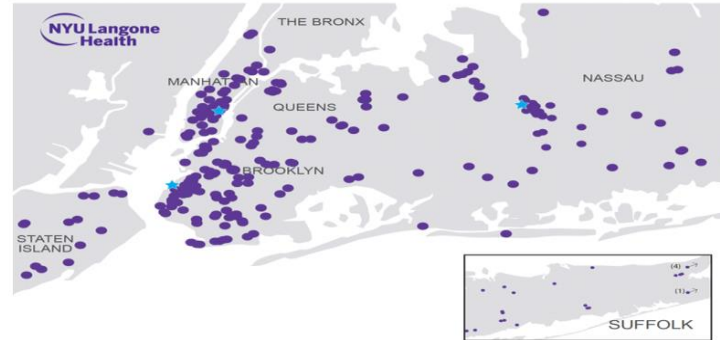
Hospital Code	Hospital	Volume by DC Quarter					% MCC Rate by DC Quarter				
		CY2021	CY2021	CY2022	CY2022	To	CY2021	CY2021	CY2022	CY2022	To
		230	254	220	220	924	64%	67%	64%	57%	63%
		227	217	196	198	838	60%	61%	56%	57%	59%
		186	191	152	214	743	28%	23%	24%	27%	26%
		178	179	163	180	700	20%	17%	20%	26%	20%
330214	NYU Tisch	159	158	126	166	609	50%	43%	46%	48%	47%
		145	138	159	152	594	32%	28%	28%	22%	27%
		130	159	139	146	574	24%	33%	29%	34%	30%
		130	144	160	132	566	32%	22%	34%	31%	30%
		129	135	115	125	504	39%	45%	41%	42%	42%
		115	105	120	111	451	43%	50%	31%	34%	39%
		101	125	114	105	445	52%	35%	40%	32%	40%
		108	104	90	104	406	44%	34%	28%	31%	34%
		106	101	79	117	403	25%	28%	33%	28%	28%
		100	89	107	106	402	15%	11%	11%	11%	12%
		113	102	110	74	399	23%	25%	22%	26%	24%
		80	108	103	104	395	20%	26%	30%	23%	25%
		110	90	95	97	392	26%	26%	22%	32%	27%
		111	108	76	96	391	83%	72%	64%	65%	72%
		121	108	68	92	389	36%	23%	37%	33%	32%
		84	105	96	101	386	51%	43%	36%	36%	41%
		95	91	95	102	383	18%	23%	20%	23%	21%
		83	95	86	111	375	94%	97%	93%	85%	92%
		93	95	85	85	358	27%	27%	33%	28%	29%
		86	85	82	100	353	35%	44%	39%	33%	37%
		85	92	64	101	342	35%	46%	25%	50%	41%
		74	82	84	100	340	86%	72%	63%	47%	66%
		114	98	65	60	337	21%	11%	35%	25%	22%
		96	85	76	79	336	63%	61%	86%	75%	70%
		89	82	67	93	331	17%	29%	24%	25%	24%
		89	77	83	81	330	30%	27%	28%	26%	28%
		80	76	84	89	329	79%	63%	79%	75%	74%

80	82	76	81	319	41%	26%	36%	26%	32%
78	85	67	88	318	28%	42%	45%	60%	44%
92	70	71	85	318	39%	43%	23%	36%	36%
86	67	80	83	316	30%	37%	36%	43%	37%
80	84	75	77	316	26%	18%	25%	21%	22%
86	88	61	80	315	38%	43%	43%	45%	42%
96	76	66	76	314	17%	14%	23%	21%	18%
74	63	77	92	306	15%	16%	29%	25%	22%
77	88	56	82	303	58%	48%	45%	35%	47%
84	78	70	68	300	32%	21%	27%	25%	26%
75	62	82	80	299	19%	32%	32%	31%	28%
61	77	71	82	291	20%	19%	27%	28%	24%
82	61	68	73	284	26%	46%	32%	22%	31%
71	69	61	83	284	30%	35%	57%	51%	43%
87	76	63	56	282	28%	26%	27%	32%	28%
67	62	67	74	270	52%	48%	57%	50%	52%
66	57	71	76	270	21%	14%	31%	12%	20%
74	63	63	68	268	32%	29%	41%	31%	33%
58	67	63	70	258	38%	27%	33%	17%	28%
73	57	62	64	256	34%	35%	37%	39%	36%
75	51	66	62	254	12%	8%	11%	15%	11%
62	69	62	60	253	26%	22%	32%	30%	27%
48	67	68	69	252	15%	24%	19%	23%	21%
62	55	64	68	249	31%	29%	28%	25%	28%
62	49	55	62	248	29%	47%	62%	54%	48%
62	63	69	62	246	25%	29%	38%	39%	33%
74	63	47	61	245	88%	87%	89%	90%	89%
64	54	60	65	243	38%	37%	32%	26%	33%
68	54	56	63	241	18%	17%	16%	19%	17%
52	55	56	76	239	58%	38%	45%	75%	56%
54	52	61	70	237	8%	12%	21%	29%	18%
63	59	48	66	236	13%	10%	19%	17%	14%
53	56	65	60	234	30%	29%	29%	25%	28%
65	57	43	66	231	31%	33%	23%	44%	34%
76	56	45	50	227	33%	29%	36%	28%	31%
59	53	51	63	226	36%	32%	39%	43%	38%
55	48	58	63	224	15%	19%	28%	24%	21%
56	62	49	50	217	45%	61%	65%	38%	50%
44	62	44	66	216	32%	35%	25%	33%	32%
37	43	61	74	215	27%	33%	34%	38%	34%
52	60	55	48	215	10%	17%	16%	21%	16%
57	56	51	49	213	14%	18%	16%	16%	16%
61	47	56	47	211	23%	23%	14%	19%	20%
50	53	54	52	209	44%	30%	39%	48%	40%
66	50	45	46	207	35%	32%	36%	30%	33%
54	51	53	47	205	50%	41%	45%	34%	43%
53	54	36	59	202	34%	48%	36%	32%	38%
61	54	46	38	199	64%	43%	67%	74%	61%

New and Old Challenges: Need to further optimize

Expansion

Infrastructure costs



Strength, Weakness, Opportunities, Threats Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • High Efficiency – optimal utilization of OR, room turnover, <u>periprocedure</u> timeliness, no ICU foot print • Staff Retention – job satisfaction • Quality/Outcomes – low mortality O:E, short LOS, low PPM, low complications rate • Strong Support Ancillary Services – Radiology, ECHO • Strong Brand especially within the institution and existing referrals • Positive Patient Experience – KP 14 nursing, <u>outpt</u> and <u>inpt</u> APPs, Kimmel experience • Imaging Expertise • Positive contribution margin – commercial insurance growth with low risk • Market Share Allows for Competitive pricing 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Awareness of experimental therapies/ device trails • Overall Readmission 8-10% • Loss of possible revenue VA and Bellevue • Referral retention – timely patient appointments • Patient Physician Preference • Geography – patient distance to travel
<p>Opportunities</p> <ul style="list-style-type: none"> • IT/ MCIT integration to promote timely care • Documentation improvement – capture higher DRG (malnutrition), optimize RF profile (ABI/PFTs) • NYU Heart align health system – Align Research • Expansion of NYU Health System LICH • Satellite Clinic Expansion • Marketing and outreach - Growing Elderly Population, Address Disparities of Care, Growing NYU FGP Cardiology Practices • Grow IC physician involvement research, operations, quality and new initiatives • CV service line (NYU Heart) – CME symposiums • Radiology Facility Expansion 	<p>Threats</p> <ul style="list-style-type: none"> • Competitive Market 21 TAVR programs within 30 miles • Inflation • Out of Network Leakage • COVID 19 - change in workflow in New York State and future surges • Reimbursement reduction starting 10/22 minus 2% for DRG 266,267 by Medicare • Future possible Physician/Patient Dissatisfaction

Steps to success

1. Streamline screening
 2. Intraprocedure optimization
 3. Optimize post procedure recovery
 4. Track Results, promote/ implement initiatives that will improve outcomes
1. Expanded CT slots to 20
 2. 30 minute turnover time
 3. Early mobilization, modified patient progression pathway
 4. Maintain and improve quality

Minimizing Permanent Pacemaker Following Repositionable Self-Expanding Transcatheter Aortic Valve Replacement

Minimizing the risk of permanent pacemaker following repositionable self-expanding transcatheter aortic valve replacement

Hasan Jiliahawi*, MD, Zhengang Zhao*, MD, Run Du, MD, Cezar Staniloae, MD, Muhamed Saric, MD, Peter Neuberger, MD, Michael Querijero, MS PA-C, Alan Vainrib, MD, Kazuhiro Hisamoto, MD, Homam Ibrahim, MD, Tara Collins, MS PA-C, Emily Clark, MS PA-C, Illya Pushkar, MPH, Daniel Bamira, MD, Ricardo Benenstein, MD, Afnan Tariq, MD, Mathew Williams, MD

Heart Valve Center

NYU Langone Health

Corresponding author:

Hasan Jiliahawi, MD

Associate Professor of Medicine and Cardiothoracic Surgery,

NYU Langone Health, New York, NY

Address: Suite 9V, 530 1st Avenue, New York, NY 10016

Phone: 646-501-0264

Fax: 212-263-2042

E-mail: hasanjiliahawi@gmail.com

*Authors contributed equally to this work

Word count: 4,218 words (text from the introduction to the conclusion, including references and figure legends).

Disclosures: Dr. Jiliahawi has been a consultant to Edwards Lifesciences and Venus Medtech, and has received grant/research support from Medtronic and Abbott Vascular. Dr. Williams has been a consultant to Medtronic, and has received research funding from Edwards Lifesciences and Medtronic. The other authors report no other disclosures.

Structured abstract (243 words)

Objectives: We sought to minimize the risk of permanent pacemaker implantation (PPMI) with contemporary repositionable self-expanding transcatheter aortic valve replacement (TAVR).

Background: Self-expanding TAVR traditionally carries a high risk of PPMI. Limited data exists on the use of the repositionable devices to minimize this risk.

Methods: At NYU Langone Health, 248 consecutive patients with severe aortic stenosis (AS) underwent minimalist TAVR under conscious sedation with contemporary repositionable self-expanding TAVR with standard approach to device implantation. A detailed

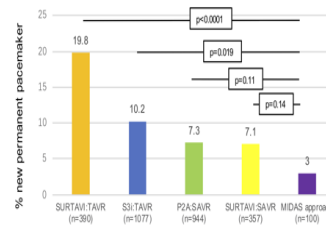
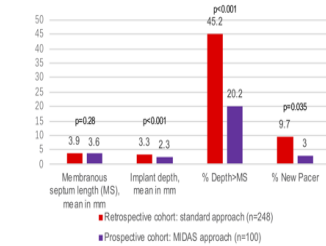
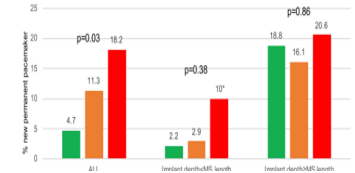
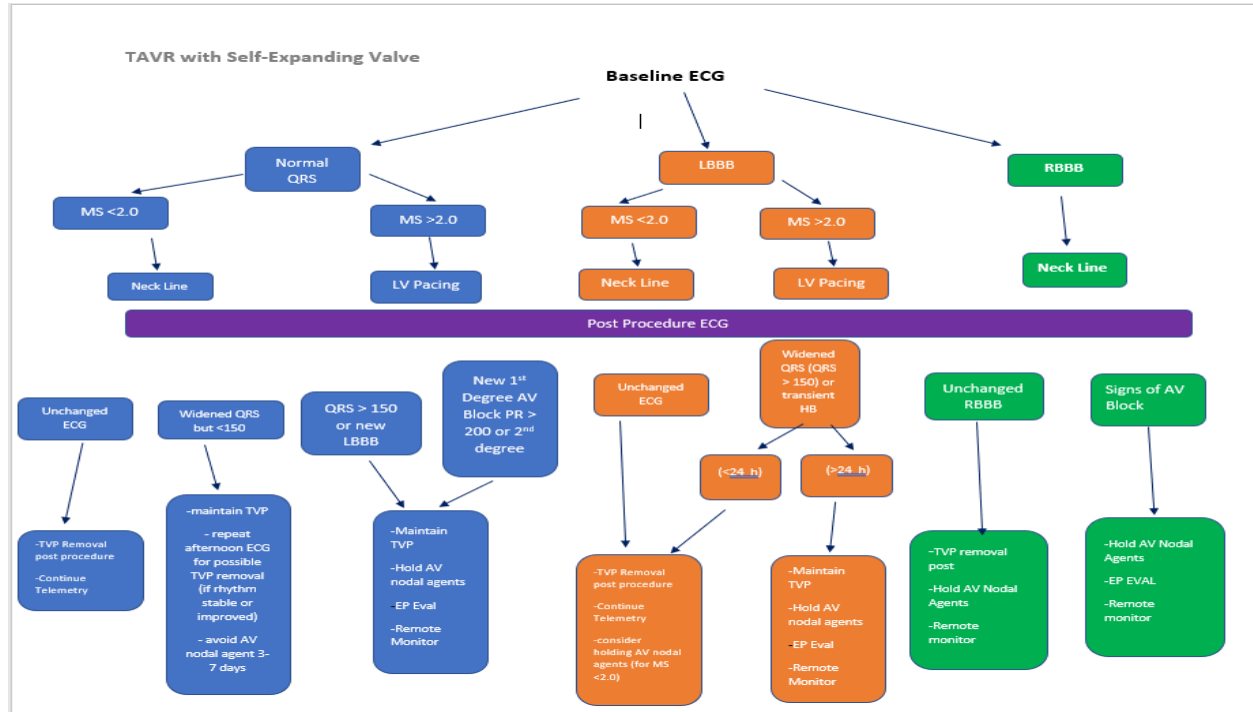


Figure 5. Depth of implant and PPMI (in isolation and in relation to patient-specific anatomy)

The rates of new PPMI are stratified according to implant depth above (aortic to) nominal (green), nominal (3-5 mm below the basal annular plane, orange) and below (ventricular to) nominal (red) in the retrospective standard cohort. Although regarding the data in total, there is a significant increase in PPMI rate with progressively ventricular implantation depth (left), when the implant depth was aortic to the MS length, PPMI rates were uniformly low (center); conversely, when implant depth was ventricular to the MS length, PPMI rates were uniformly high (right). *in this subset there was 1/10 new PPMI (a case with a 6.3 mm implant depth and a MS length of 7.5 mm).



Algorithms – Updates



Imaging-guided TAVR implant depth to reduce PPMI

NYU data: Evolut R / Pro

Prospective validation

Retrospective data

Standard as high as possible approach

Implant depth usually 2-4 mm by NCC

(measured pre-release)

Pacer rate **9.7%** (24/248)

Prospective data

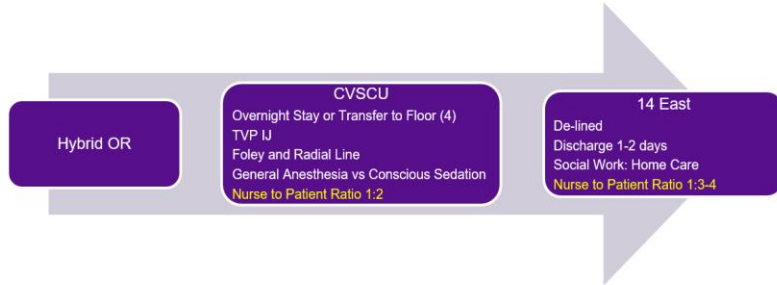
Image-guided approach

Position at a depth ≤ MS length (no implant depth <1 mm) by NCC

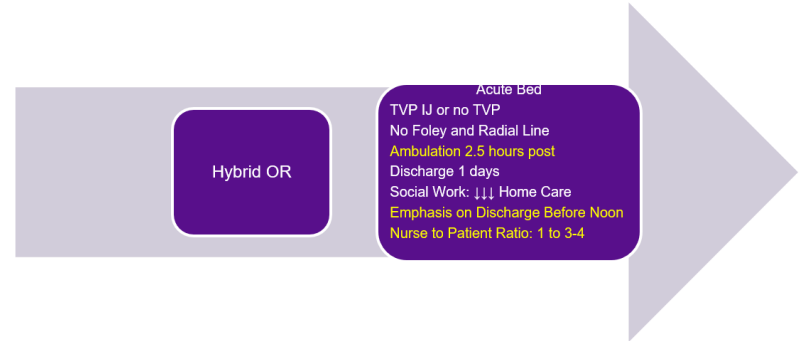
Pacer rate **3.8 %** (2/52)

Post Procedure Recovery

Fast Track



Current State



Outpatient Staffing: Heart Team

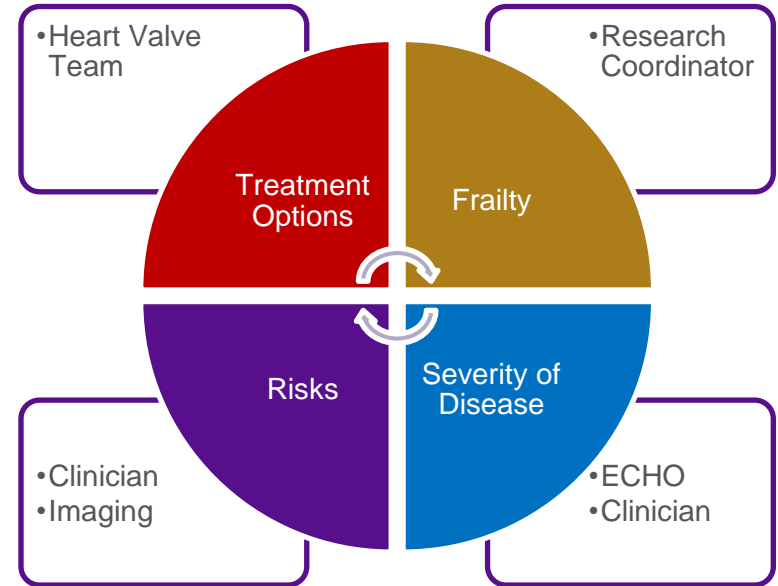
Heart Valve Clinic Workflow: Dedicated Clinic !

Staff

- Admin
- PA
- Structural Heart Fellow
- Interventional Cardiologist
- Cardiac Surgeon
- Project Assistant (Research Coordinator)
- Volume 25 - 30 New Patients/ Week (pre Covid) Now IN person 20-25 mixture of Televists

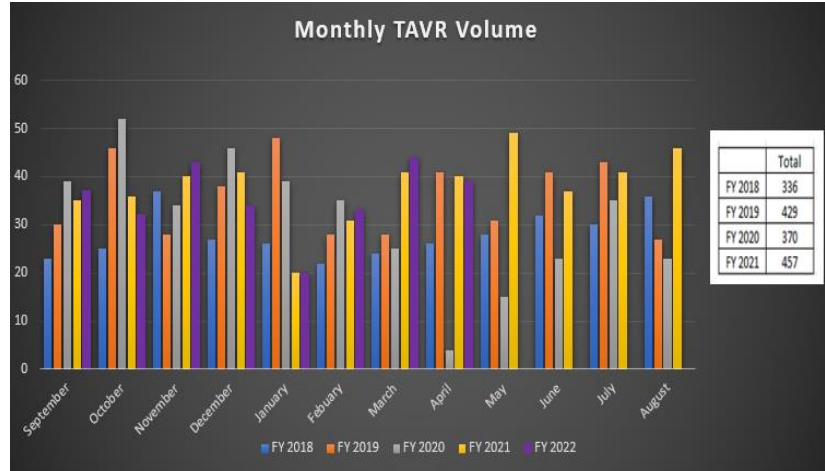
Michael Querijero

Clinic Patient Workflow



Historical Staffing Growth

	TAVR Volume	TEER and TMVR	Total Volume other structural Heart Procedures and surgeries	APPS FTEs	Administrative FTE	Research FTE
FY 2014	51	0				1
FY 2015	228	48	391	1	1	1.5
FY 2016	275	59	454	2	1	3.5
FY 2017	378	68	602	2	2	4.5
FY 2018	340	73	611	2	2	5.5
FY 2019	431	143	795	3	2	6
FY 2020	370	100	624	4	2	4
FY 2021	457	111	763	4	2	4
FY 2022	431	125	724	4	2	4



TAVR Outcomes 2021 R4Q

TVT Registry 2021 R4Q

NYULMC	2021	TVT All Participants(Q2 2021 - Q1 2022)
Total Commercial Cases	439	87,689
Mortality Rate	1.2%	1.1%
TAVR Outcome Metrics		
Significant Cardiac Event	0.0%	0.9%
Stroke	0.7%	1.4%
Acute Kidney Injury	1.0%	0.4%
Bleeding - Disabling	0.7%	1.5%
Vascular Access Site Complication (any)	1.1%	4.1%
Conduc/Native Pacer Disturb Req Pacemaker	3.9%	6.9%
Total LOS Mean	1.2	3.2
Total LOS Median	1	1
Post Proc LOS Mean	1.1	2.1
Post Proc LOS Median	1	1

Internal Dashboards

- 0 ICU Time
- Discharge Before Noon 84%
- 30 Day readmissions <5%
- Mortality O:E 0.41

Summary

- TAVR program from the beginning - have right staff in place and administration buy in
- MIMIC or Lean strategy results in better efficiencies
- Be Mindful of finances
- New expenses and challenges = new opportunities
- Successful optimization is patient centric

Thank You Team!

Heart Valve Team extends to Administration

NYU Heart Team

Anesthesiologists:

Dr. Seth Perelman
Dr. Liliya Pospishil
Dr. Peter Neuburger

Heart Team Interventionalists/ Cardiac Surgeon:

Dr. Cezar Staniloae
Dr. Homam Ibrahim

Quality Department

Michele Costa RN

Heart Valve Center Leadership: Dr. Mathew Williams

Heart Team Imaging Specialists:

Dr. Alan Vainrib
Dr. Muhamed Saric
Dr. Daniel Bamira
Dr. Richard Ro
Dr. Lilly Zhang

Heart Team NPs

Jessica Holmberg
Erika Breitinger
Catherine DiFrisco
Kristen La Rosa
Mary Boland
Victoria Filardi
Vincent Pennica

Heart Team APPs:

Tara Collins
Ariel Fischman
Kristen Mellin
Patrycja Puchala

Heart Team RNs and Surgical Techs:

Candice Crispino
Maurice Singleton
Maia Ashman
Michael Coltura
Michael Bautista
Rose Harrington



Industry



Business Planning & Pivoting During Challenging Times

Nicole Dellise, DNP, FNP-BC, CHFN

Director, Structural Heart Program

TriStar  **Centennial**
HEART & VASCULAR



TriStar Centennial Medical Center

Overview

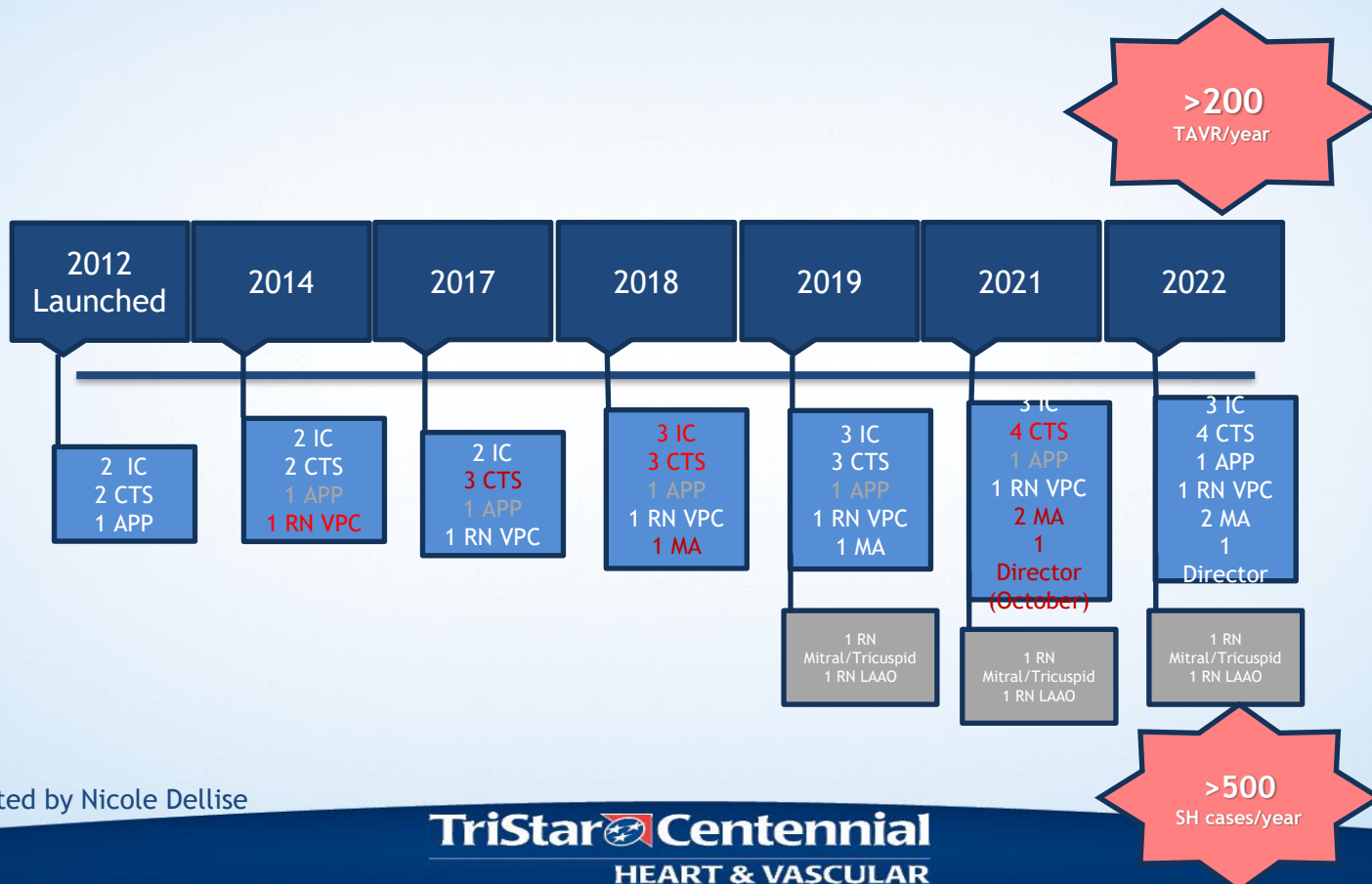
- 741-bed comprehensive facility
- Located in Nashville, TN



Presented and created by Nicole Dellise



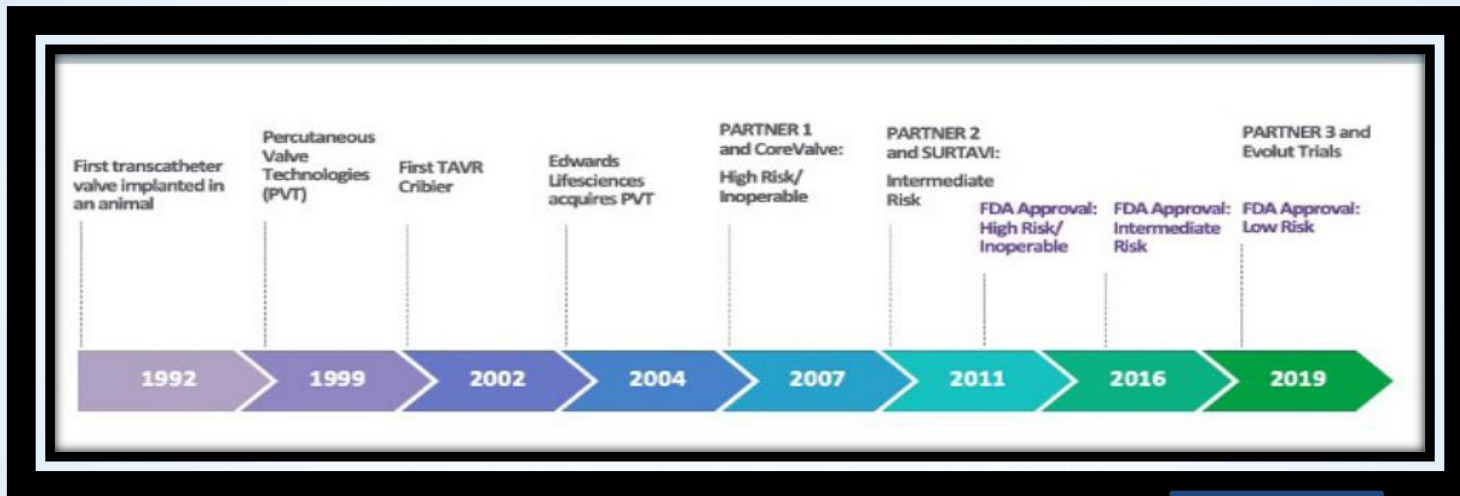
Program Growth: Historic Review



Presented and created by Nicole Dellise



Timeline In Structural Heart Therapy Evolution



HeartValveSurgery.com

The SH Marathon in Progress.....

2019 Trial Effect

- Increase in number of eligible patients
- Low Risk TAVR population

2020 COVID Pandemic

- Access to procedure
- Staffing
- Acuity

Other SH Trials

- Mitral
- Tricuspid
- LAAO



Referring Clinic
Staffing

SH Clinic
Staffing

Hospital
Staffing

Echo Techs
Outpatient Imaging

Presented and created by Nicole Dellise



Where Do You Start?



Opportunities

- ✓ Review internal staffing model to ensure top of license practice
- ✓ Review program growth and quality data
- ✓ Improve workflow efficiencies
- ✓ Build a business case

Threats?

- ✓ Patient wait times
- ✓ Patient outcomes
- ✓ Quality



SH Staffing

Optimizing Roles
&
Responsibilities

Presented and created by Nicole Dellise

Staffing Model Assessment Example

Scope Assessment

Staff

- ✓ RN Valve Coordinator
- ✓ Medical Assistant
- ✓ APP/MD

TAVR Pathway Phase

- ✓ Pre-Clinic
- ✓ Clinic
- ✓ Pre-Procedure
- ✓ Post-Procedure
- ✓ Quality Tasks

Structural Heart RN Coordinator: Scope Assessment				
Appropriate- Task is within scope of practice for RN				
APP/MD Provider Task				
Below Scope-Task needs reassignment to ancillary supportive staff (MA, MOS)				
	RN Appropriate	APP/MD Task	RN Below Scope	Variable
Pre-Clinic Task				
1. Receives referral, schedules new patient appointment, gathers outlying records.			X	
2. Reviews outlying records, determines testing needed for new patient evaluation and orders testing.		X		
3. Orders Pre-Clinic testing, provides patient with pre-imaging instructions and medication hold parameters.		X		
4. Prep's clinic note				X
5. Coordinates clinic appointment, testing, and referral appointment.			X	
6. Educates patient on clinic appointment expectations, develops written instruction document to send to patient.	X			
7. Mails new patient packet.			X	
Clinic Task				
1. Obtains HPI and documents in clinic note				X
2. Obtains <u>Sessler</u> walk test and patient questionnaires.	X			
3. Provides patient education on procedure and expectations	X			
4. Coordinates follow up and execution of provider plan	X			
5. Documents clinic note		X		
Pre-Procedure Task				
1. Orders PAT (standard order form)	X			
2. Reviews PAT results		X		
3. Interprets pertinent lab data or other objective data		X		
4. Reviews pre-procedure CT, Carotid US, labs, other diagnostics		X		
5. Documents Pre-Procedure HP or Updated Problem List		X		
6. Schedules and coordinates procedure date	X			
7. Provides patient with pre-procedure instruction and medication hold parameters.		X		
8. Educates patient on pre-procedure instructions, written and verbal	X			
9. Communicates case plan to industry rep	X			
9. Provides hospital team with pre-procedural paperwork and case plan	X			
Post Procedure Task				
1. Develops post procedure education discharge packet	X			
2. Provides patient education prior to discharge		X		
3. Orders post procedure follow up testing		X		
4. Schedules and coordinates post procedure follow up and testing			X	
5. Contacts patient 48-72 hours post discharge				Not being done
Programmatic Quality Task				
1. Completes Medicare Worksheet and provides to MD to sign	X			
2. Tracks and maintains working patient list (eval, pre-procedure, and post procedure)	X			
4. Reviews chart for complete documentation per registry requirements	X			
5. Reviews and addresses outliers per request of Parallon	X			
6. Prepares and maintains documents for weekly multidisciplinary conference.	X			
7. Communicates amongst implanting and referring teams via vital engine	X			



Leveraging Data

Assessing Growth & Quality

Presented and created by Nicole Dellise



Data Review

1). Clinic Volume

- ✓ New patient visits → referral volume
- ✓ Established visits
- ✓ Evaluate year to year growth
- ✓ ? Next available visit
 - ✓ Importance of timely follow up for quality patient outcomes and TVT registry compliance

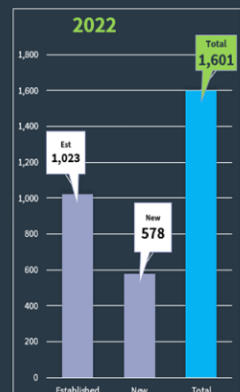
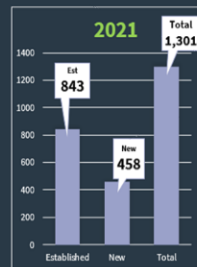
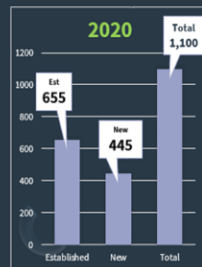
2). Procedure Volume

- ✓ Evaluate year to year growth

3). Quality Outcomes

- ✓ TVT registry compliance

Clinic Productivity & Growth





Data Review



TVT Registry Follow Up Tracker											
Base Procedure											
Patient	DOB	Referring	CTS	IC	Referral Date	Consult Date	Referral to Consult Time	Procedure Date	Consult to Procedure Time	Discharge Date	LOS (Procedure to DC)



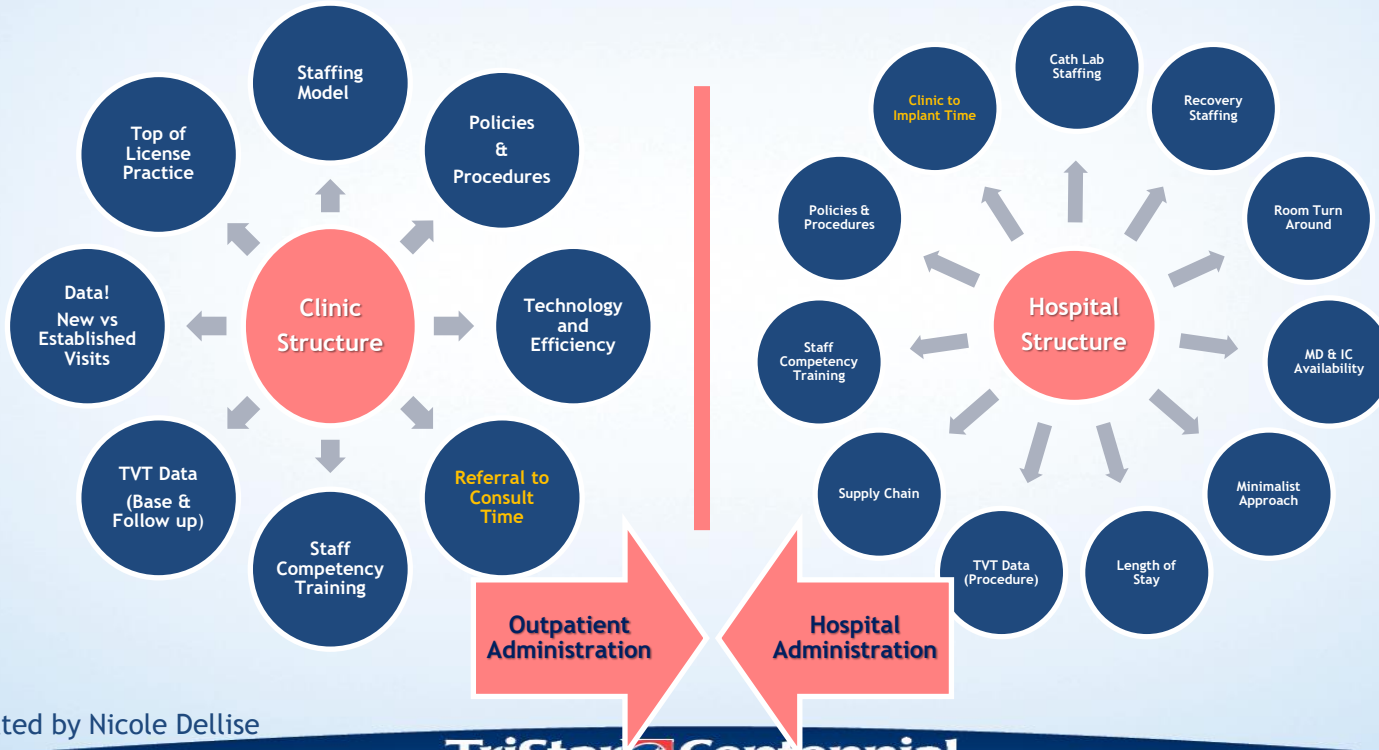
Presented and created by Nicole Dellise



Optimizing Workflow

Presented and created by Nicole Dellise

Inpatient vs Outpatient Considerations



Presented and created by Nicole Dellise



Optimizing Clinic Processes

1). Third Party Program Assessment

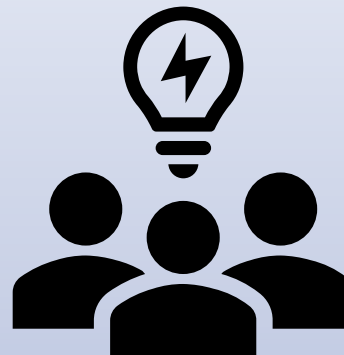
- ✓ Medtronic TAVR Advantage
- ✓ Lean Six Sigma

2). Clinic Efficiency Task Force

- ✓ Establish Goals
 - ✓ Decrease clinic visit times
- ✓ Promote Teamwork
- ✓ Improve employee satisfaction

3). Policies & Procedures

- ✓ Pre-Clinic
- ✓ TAVR CT
- ✓ Pre-Procedure

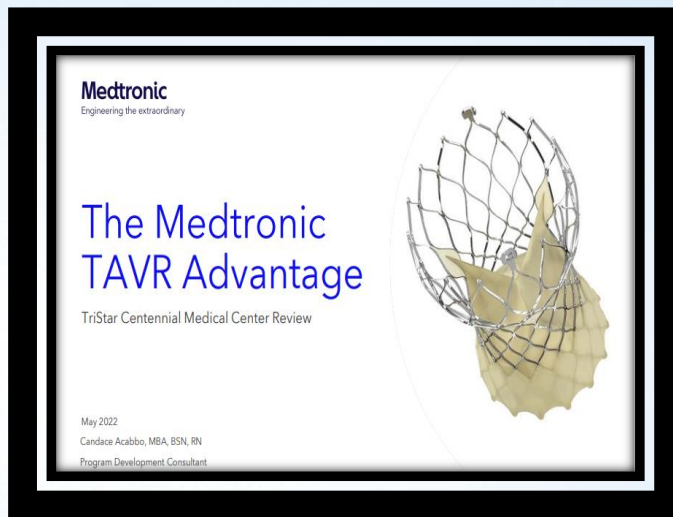




Medtronic TAVR Advantage Program

Benefits to the Program

- 1). Identified Targeted Opportunities
✓ Hospital vs Clinic
- 2). Facilitated Team Discussions
- 3). Provided Program Resources
- 4). Identify Change Initiatives



Medtronic TAVR Advantage took a comprehensive look **beyond the valve** to support opportunities for program and pathway optimization



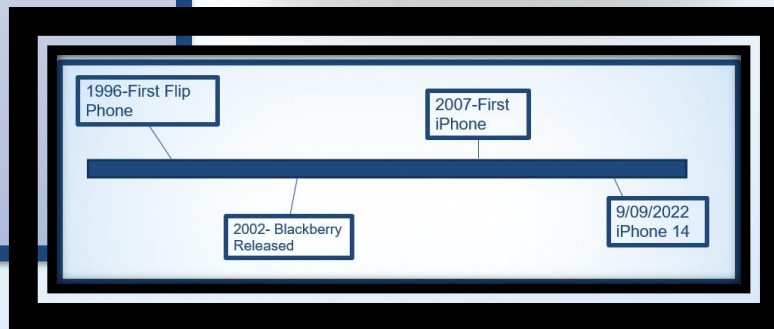
Leveraging Technology

1). Electronic Medical Record

- ✓ ? Workflow enhancements
- ✓ ? Documentation templates
- ✓ ? Patient communication
- ✓ Decrease patient phone time

2). Cloud Based Referral Platform

- ✓ **(Vital Engine)**
- ✓ Decrease referral processing time
- ✓ Improve communication
 - ✓ Local heart team
 - ✓ Industry
 - ✓ Referring





Building a Business Case

Putting it all Together

Presented and created by Nicole Dellise



Key Points

1). Know Your Data

- ✓ Year to Year SH **Procedure Growth**
- ✓ Year to Year SH **New Patient** Visit Growth (**Referrals**)
- ✓ Year to Year SH **Established Patient** Visit Growth
 - Snowball effect → increased procedures
- ✓ Referral to consult time (Clinic Staffing)
- ✓ Consult to referral time (Hospital Staffing)

2). Know Your Stakeholders

3). Know Your Opportunities

- ✓ Increase referral volume → procedure volume → clinic volume



Leveraging Data to Create a Business Plan

APP Revenue Proposal

Total Direct Revenue

\$91,440.00/year

- TAVR 1 year follow up (200/year-99214 @ \$132.00 = \$26,400.00)
- TEER 1 year follow up (50/year-99214 @ 132.00 = \$6,600.00)
- LAAC 6 month follow up (200/year-99213 @ \$93.00 = \$18,600.00)
- LAAC 1 year follow up (200/year-99213 @ \$93.00 = \$18,600.00)
- LAAC 2 year follow up (200/year-99213 @ 93.00 = \$18,600.00)
- Valve Disease Monitoring Visits (20/year- 99214 @\$132.00= \$2,640)

Total Generated Revenue per year

Exceeds \$158,147.00

Total Indirect Revenue

\$66,707.00/year PLUS Halo Effect

- Reallocate 470 established visits from MD schedule
 - + 235 additional new patient visits
- 235 New Pt Visits- 99215 @ 185.00= \$43,475.00
- Increase implant volume at a 75 % implant rate (implant rate demonstrated in 2020 and 2021)= +176/year procedure growth.
- 2024 addition of 176 follow ups/year- 99214= \$23,232.00
- Halo Effect (Echo, TEE, CUS, CT, Cath, CT surgery volume)
 - Increase Revenue

Increase MD availability for Procedures and New Patients



Pivot Accordingly

1). Continue to Optimize Workflow

2). Keep Building Your Business Case

- ✓ Procedure volume ↑
- ✓ Referral volume ↑
- ✓ Referral to clinic time
- ✓ Clinic to procedure time

3). Celebrate the WINS!



*Structural Heart Team Completes
OVER 200 TAVRS FOR 2022*



CELEBRATING OVER
200 LEFT ATRIAL APPENDAGE CLOSURE
DEVICE IMPLANTS IN 2022



Thank you



Presented and created by Nicole Dellise

Resources, Webinars, and Experts

Post Webinar Email

Medtronic

Metric considerations

Optimizing your TAVR program



"Taking a multidisciplinary team approach to reviewing comprehensive data can showcase the need for change in a growing program."

- Kristin Pasquarello, PA, Administrative Director

What could you consider tracking in your TAVR program? These key data points can support the need for program optimization or to improve capacity, throughput, and quality within a TAVR program.

Medtronic

Stakeholder considerations

Optimizing your TAVR program



"To achieve the highest standard of care and drive change, it is important to know who your champions are."

- Kristin Pasquarello, PA, Administrative Director of the Heart Value Center, St. Francis

Why it's important to engage key stakeholders within your Structural Heart program

The key to successful change implementation often starts by engaging with the following clinical and non-clinical stakeholders to support your program, capacity, throughput, and quality initiatives.

Examples of clinical and non-clinical stakeholders

Heart team

- TAVR IC physician(s)
- TAVR CV surgeon(s)
- Valve program coordinator
- Nurse navigator
- Anesthesia

Additional clinic teams

- Echocardiologist
- Imaging specialist
- Sonographers
- Scheduling
- Referring physician
- Heart failure specialist

Administration and support teams

- Hospital administrator
- Finance
- Quality/patient safety
- IT/data analytics/EMR expert
- Process Excellence (Lean six sigma)
- Scheduling – hospital/ procedure area

Patient care areas

- Nurse educators
- Clinical management and staff:
 - Pre-op
 - Procedural
 - Post-care unit
- Inpatient services (PT, cardiac rehab)
- Advanced practice providers (nurse practitioners and physician assistants)
- Case management/ discharge planners

Contact your...

Regional Economic Managers

SH&A, CS, PVH

Director Jeannine Pliis, RN, MS
jeannine.m.pliis@medtronic.com
518.573.5277

Robin Flint
robin.e.flint@medtronic.com
518.420.5083

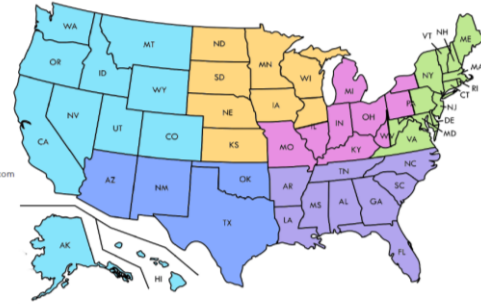
Kimberly Munro, BS, MS, CSMC
kimberly.a.munro@medtronic.com
440.340.8266

Teresa Stamper-Strelitz RN, BSN, MBA, CPC
teresa.g.stamper-strelitz@medtronic.com
404.242.6188

Stacy Mack, MBA, FACHE
stacy.m.mack@medtronic.com
908.873.5184

Fred Kurtz, MPH
fred.kurtz@medtronic.com
508.930.1197

Michael Maskow, MS
michael.maskow@medtronic.com
949.637.2122



Medtronic

UC20221671 EN | Regional Economic Manager (R&M) Map

Program Development Consultants

Structural Heart

Kim Crosby, MSN, RN, FNP-C, DCP, CVNP-BC
kim.j.crosby@medtronic.com
630.803.5134
Northstar / Brew Pack
Midwest / Chicago

Robin Mella, BSN, RN
robin.mella@medtronic.com
630.465.7076
Motor City
Steel Cities
Pioneer

Noel Harrington, MSN, RN
noel.harrington@medtronic.com
413.374.0989
Northeast
Greater NY
Jersey

Jennifer Grell, BSN, RN
jennifer.grell@medtronic.com
469.604.4212
Desert Sky
Rocky Mountains
Pacific Northwest

Sara Wallencheck, MBA, BSN, RN
sara.m.wallencheck@medtronic.com
714.501.5422
Golf Coast
SoCal
W. Arizona
Alaska

Susan Ullrich, MSN, ACNP-BC
susan.ullrich@medtronic.com
410.935.3005
Independence
Capital
Carolinas

Candace Acabbo, BSN, RN
candace.m.acabbo@medtronic.com
518.796.0983
SEC
E. Florida

Program Dev. Manager Gretis Robb, MBA, BSN, RN
gretis.k.robbs@medtronic.com
763.402.1823

Shannon Isbell, BSN, RN
shannon.s.isbell@medtronic.com
512.453.1606
Lonestar
Heart of Texas

Jennie Nicholson, FNP-BC
jennie.r.nicholson@medtronic.com
217.899.5942
Ozark
The Delta

Medtronic

UC20231049 EN January 2023

Medtronic