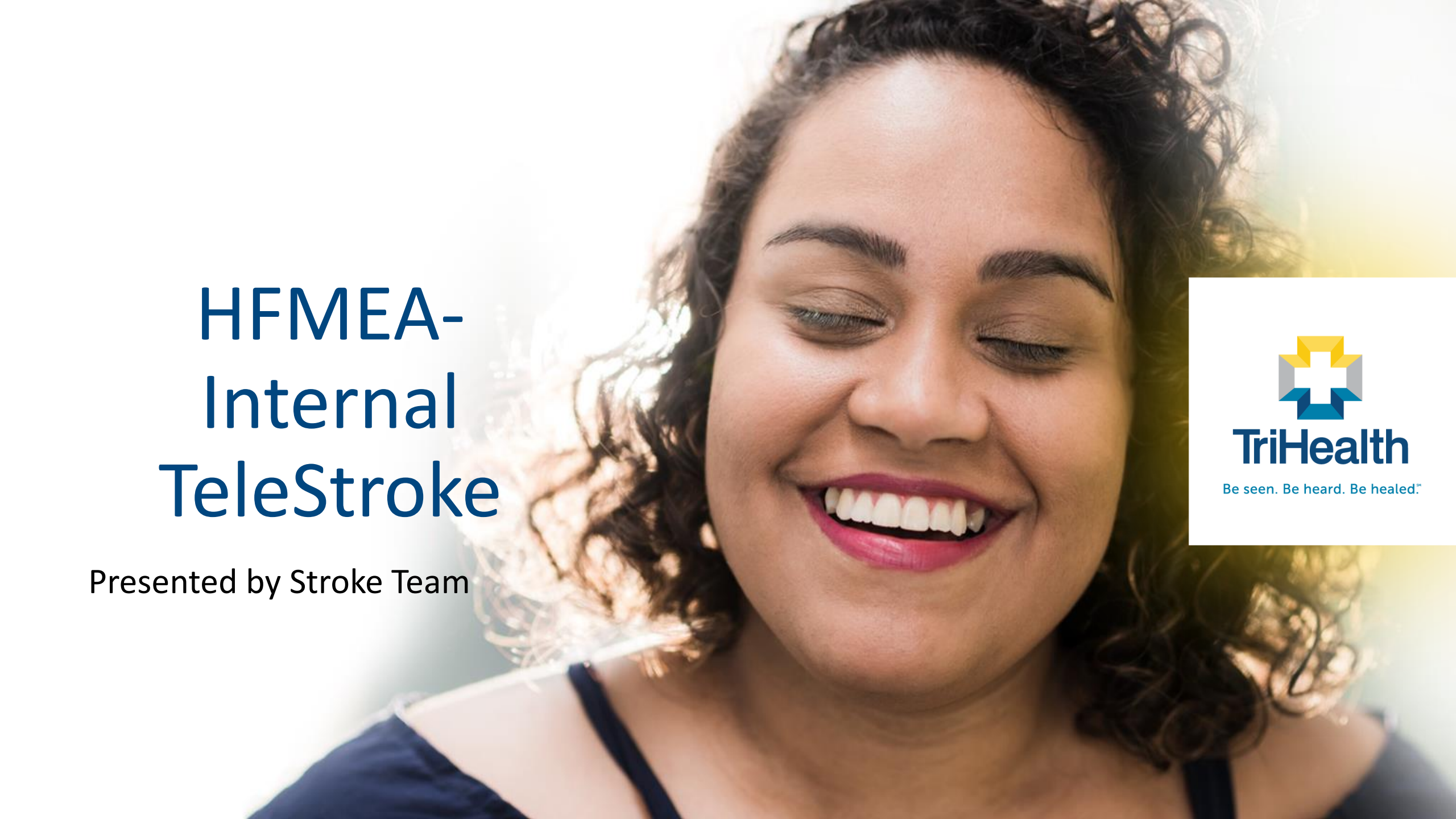
HFMEA- Internal TeleStroke

Presented by Stroke Team



TriHealth

Be seen. Be heard. Be healed.℠

TEAM WORK
Coming together is the
beginning
Keeping together is
progress
Working together is
success

Healthcare Failure Mode Effect Analysis (HFMEA)

Structured way to identify and address potential problems, or failures and their resulting effects on the system or process before an adverse event occurs.

Helps identify bottlenecks or unintended consequences prior to implementation.

Wins with completing FMEA Process

- Provided our clinical teams an avenue to work collaboratively together to gain consensus on the tele stroke process.
- Identified opportunities where processes weren't well defined, forcing communication and alignment.
- Transparency of the process.
- Gained confidence in the process change.
- Team members engaged and invested in the change.

Why Change to Internal Tele Stroke Process?

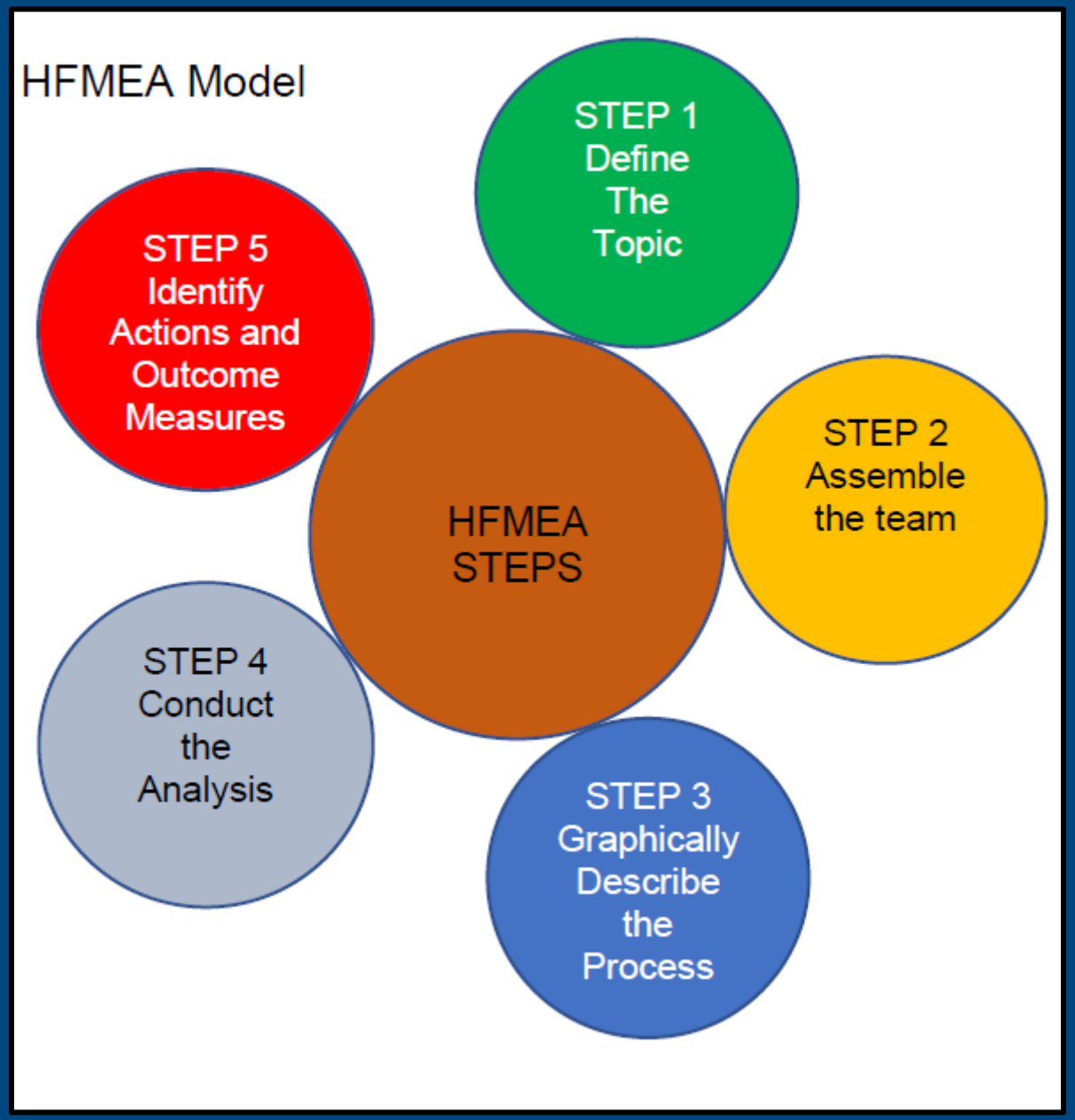
Improved patient outcomes

Improved treatment times for patients suffering neurologic emergencies including strokes

Improved door to thrombolytic times

Improved endovascular times for thrombectomy

Provides complex stroke care to the community offering expedited transfers to a highest level of stroke care at the GS comprehensive stroke center


HFMEA Model
STEP 1
Define
The
Topic
STEP 5
Identify
Actions and
Outcome
Measures
HFMEA
STEPS
STEP 2
Assemble
the team
STEP 4
Conduct
the
Analysis
STEP 3
Graphically
Describe
the
Process

Step 1 Define the Topic

Phase 1- **Internal Tele-Stroke Process**

- Provide teleconsultation between TriHealth Neuro Critical Care Intensivists and the care team and patient with suspected stroke at:

- **TriHealth ED's and Inpatient Units**
  - McCullough Hyde Memorial Hospital
  - Bethesda Arrow Springs
  - Western Ridge
  - Bethesda North Hospital
  - Bethesda Butler Hospital
  - Good Samaritan Hospital

Step 2 Assemble the Team

Multidisciplinary Team

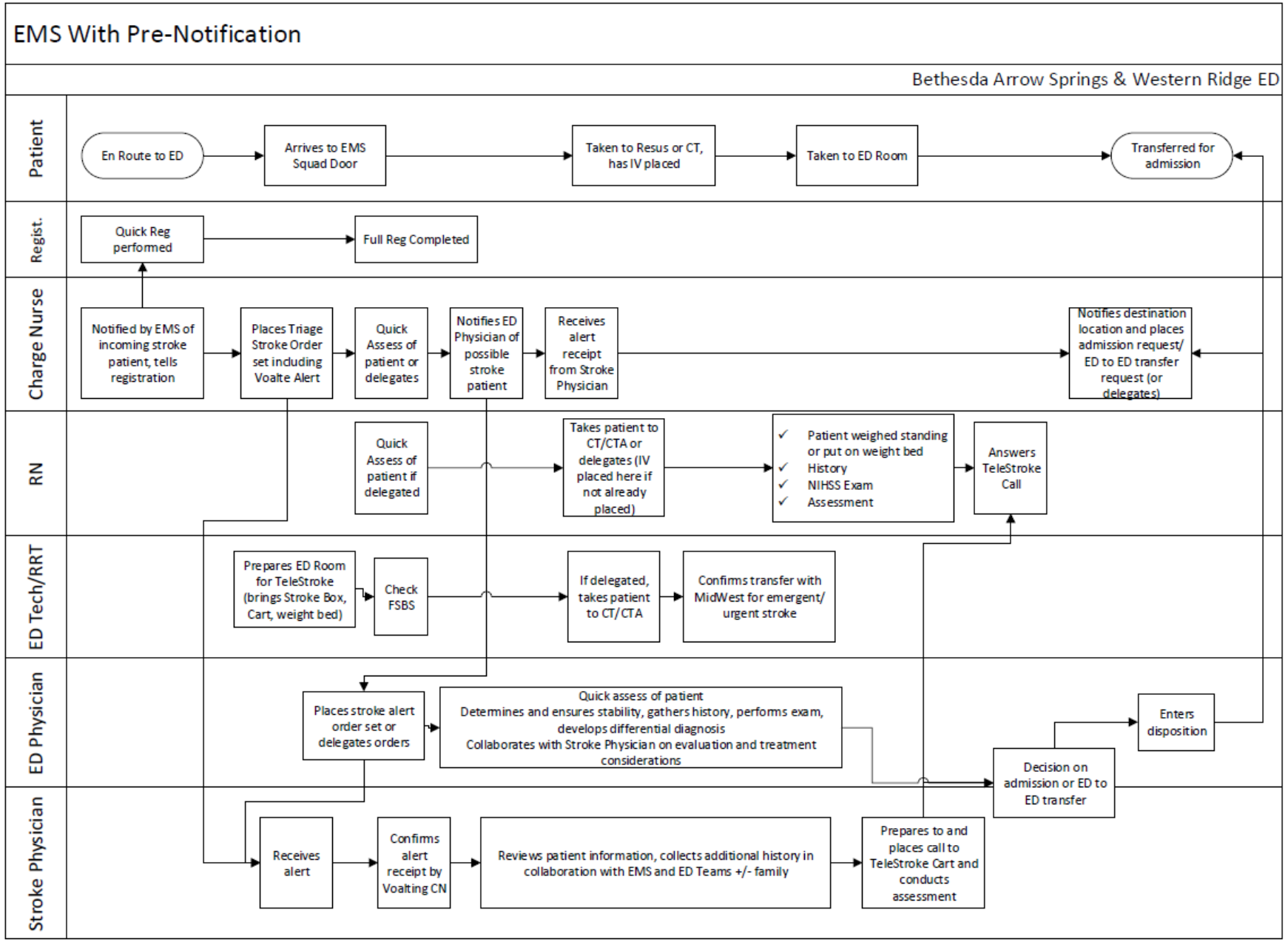
Project lead- Morgan Black	Lori Greiser, MSN, RN, CNOR	Kim Schmeusser, MSN, RN, CEN	Maria Ashdown, Vice President, Chief Nursing Officer	Dr. Zammit, Medical Director Stroke
Jennifer Rainer, VP Quality and Safety	Stroke Team	IT	Security	Operators
Physicians	Leadership	ICU Administration	Inpatient Teams- all sites represented	Emergency Room Teams-all sites represented

Step 3 Describe the Process

Overview of the work

- 6 TriHealth Locations, 6 ED's, 4 ICU's, 22 workflows completed
  - 6 Emergency Departments
    - Western Ridge
    - Arrow Springs
    - MHMH
    - Bethesda Butler
    - Bethesda North
    - Good Samaritan
  - 4 Inpatient Units (providing care to all inpatient units)
    - MHMH
    - Bethesda Butler
    - Bethesda North
    - Good Samaritan
- 75 hours of working meetings formulating and revising

TeleStroke WR and AS ED Workflow



Hazard Analysis

- Step 1: Identify and list the potential failure modes for each subprocess steps within the overall process
- Step 2: Determine the Severity and Probability of the potential failure mode and record these on the HFMEA Worksheet.
- Step 3: Use the HFMEA Decision Tree to determine if the failure mode warrants further action.

Appendix C. Severity Rating

	Patient Outcome	Visitor Outcome	Staff Outcome	Equipment or Facility
Catastrophic Event (4)	[a,b] Death, major permanent loss of function, suicide, rape, hemolytic transfusion reaction, surgery or procedure on the wrong patient or wrong body part	Death; or hospitalization of 3 or more visitors	A death or hospitalization of 3 or more staff	Damage equal to or more than $250,000. Any fire that grows larger than an incipient stage
Major Event (3)	[a] Permanent lessening of bodily function, disfigurement, surgical intervention, increased length of stay or level of care for 3 or more patients	Hospitalization of 1-2 visitors	Hospitalization of 1-2 staff, 3 or more staff with lost time or restricted duty injuries/illnesses	[c] Damage equal to or more than $100,000.
Moderate Event (2)	Increased length of stay or increased level of care for 1 or 2 patients	Evaluation and treatment for 1-2 visitors (less than hospitalization)	Medical expenses, lost time or restricted duty injuries or illness for 1-2 staff	Damage more than $10,000 but less than $100,000. A fire at incipient stage or smaller
Minor Event (1)	No injury, nor increased length of stay nor increased level of care	Visitor evaluated (no treatment or treatment refused)	First aid only (no lost time, restricted duty injuries or illnesses)	[c,d] Damage less than $10,000. Loss of utility system with no adverse outcome.

Appendix D. Probability Rating

HFMEA Probability Ratings
Frequent Event (4) Likely to occur immediately or within a short period (may happen several times in one year)
Occasional Event (3) Probably will occur (may happen several times in 1 to 2 years)
Uncommon Event (2) Possible to occur (may happen sometime in 2 to 5 years)
Remote Event (1) Unlikely to occur (may happen sometime in 5 to 30 years

HFMEA Hazard Matrix				
	Severity of Effect			
	Minor (1)	Moderate (2)	Major (3)	Catastrophic (4)
Frequent (4)	4	8	12	16
Occasional (3)	3	6	9	12
Uncommon (2)	2	4	6	8
Remote (1)	1	2	3	4

Step 5- Actions and Outcome Measures

Step 1: Identify the type of action to take:

- 1a. Eliminate - prevent all future occurrences by removing the failure point.
- 1b. Control - minimize all future occurrences by implementing mitigating factors.
- 1c. Accept - acknowledge and accept known risks.

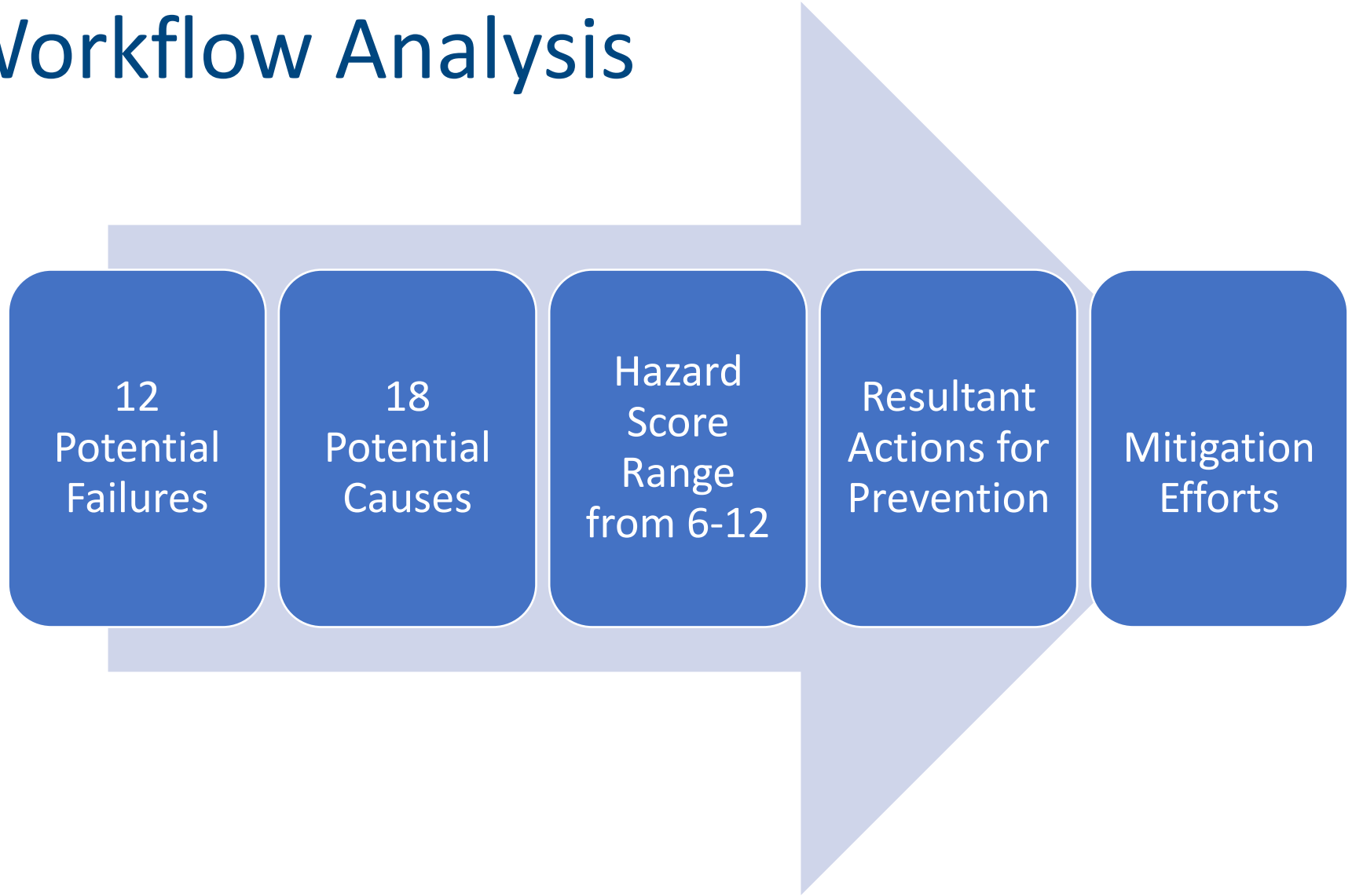
Step 2: Measure whether the action implemented was effective and if any unintended consequences occurred.

HFMEA-Deeper Dive

FMEA ED TeleStroke Workflow

Hazard Analysis										Idenitfy Actions and Outcomes				
Failure Mode	Potential Causes		Scoring			Decision Tree Analysis				Action Type (Eliminate/ Control/ Accept)	Resultant Actions	Outcome Measure	Person Responsible (outcome measurement)	Mitigation Efforts
			Severity	Probabilty	Haz Score	Single Point Weakness?	Exisiting Control Measure?	Detectability	Proceed?					
1. Stroke order set not entered by ED Physician (or delegate)	1a	Patient presented initially with other problem, stroke not recognized	3	4	12	Y	N	N	Y	C	ED Physician enters stroke alert order once realized	% stroke alerts placed out of all stroke diagnoses entered	Stroke Team	Training and education on workflow, Training on clinical recognition of when to activate
	1b	Human error, missed step	3	4	12	Y	N	N	Y	C	ED Physician enters stroke alert order once realized	% stroke alerts placed out of all stroke diagnoses entered	Stroke Team	Training and education on workflow
	1c	BN/GSH Stroke order set does not include alert, this	3	4	12	Y	N	N	Y	C	Decision by ED team was to make an individual order for easy	% stroke alerts placed out of all stroke diagnoses	Stroke Team	Training and education
9. TeleStroke call not received by ED Team	9a	TeleStroke Cart software/ hardware failure	3	3	9	Y	N	N	Y	C	ED Physician calls Stroke Physician On-Call using call list	Stroke Physician report	Stroke Team	Regularly occurring equipment checks
	9b	Poor internet connection in ED	3	3	9	Y	N	N	Y	C	ED Physician calls Stroke Physician On-Call using call list	Stroke Physician report	Stroke Team	IS to ensure quality connectivity in ED
10. Audio not working on TeleStroke Cart	10a	Technology failure	4	3	12	Y	N	N	Y	C	ED Physician calls Stroke Physician On-Call using call list, utilize backup cart	Stroke Physician report	Stroke Team	Regularly occurring equipment checks
11. Camera not working on TeleStroke Cart, Stroke Physician cannot see patient	11a	Technology failure	3	3	9	Y	N	N	Y	C	ED RN gets backup cart for use	Stroke Physician report	Stroke Team	Regularly occurring equipment checks
12. RN unavailable to perform assessment	12a	RN is with another patient or otherwise unavailable	4	2	8	Y	N	N	Y	C	Charge Nurse or ED Physician perform exam	Stroke Coordinator report	Stroke Team	

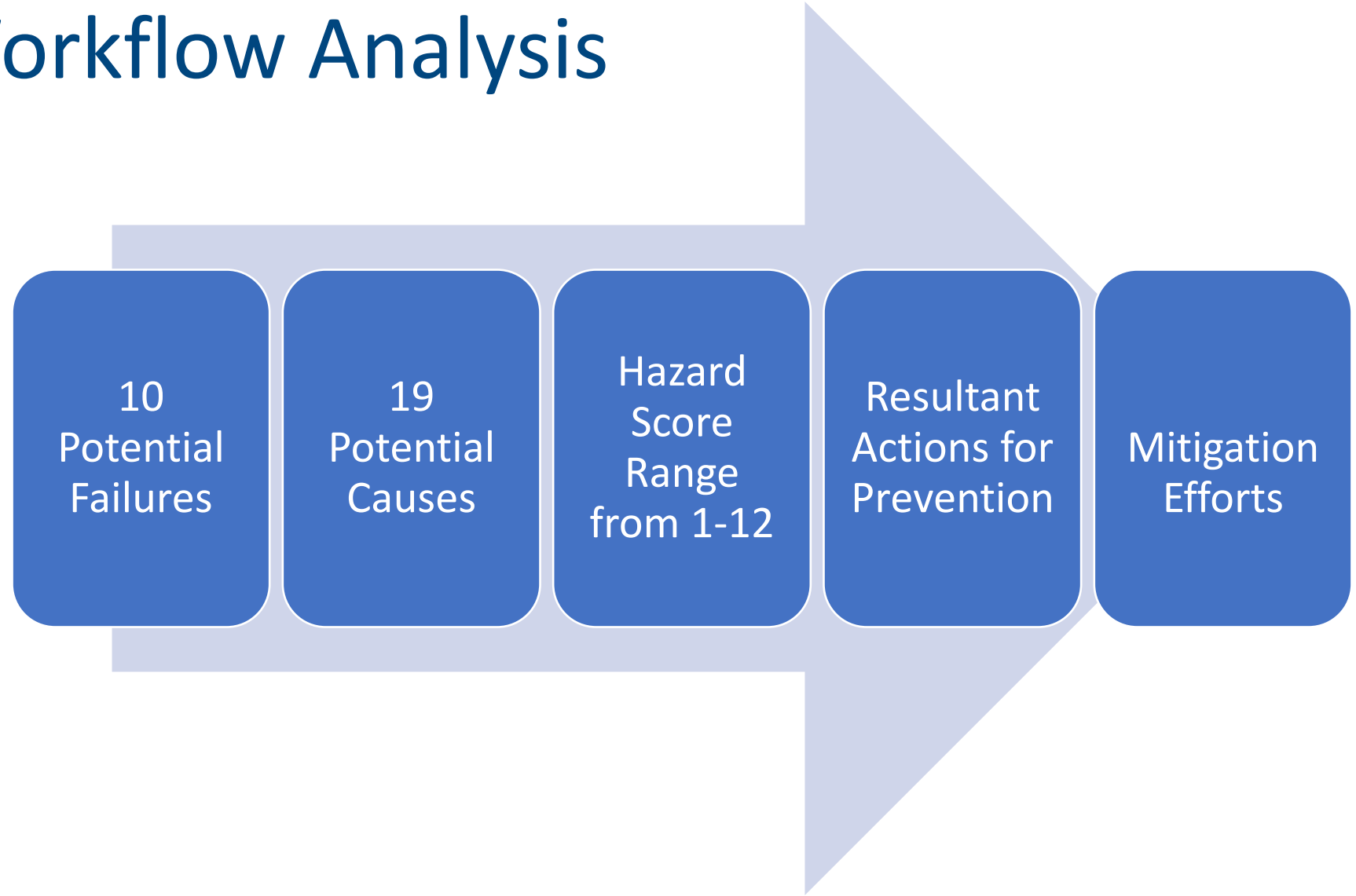
ED Workflow Analysis



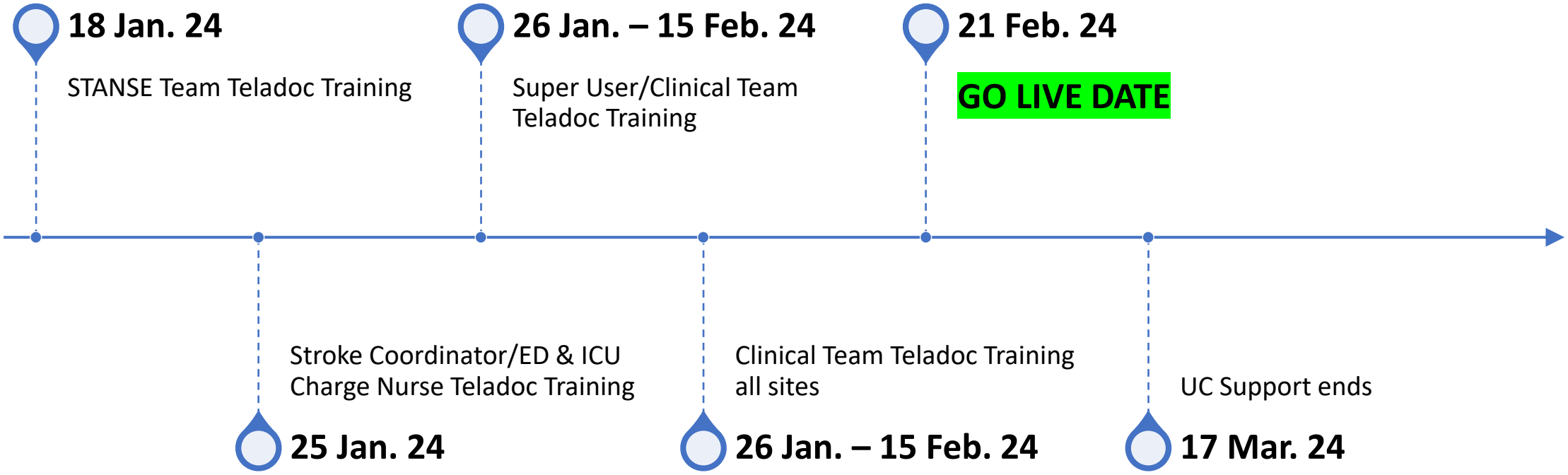
FMEA IP TeleStroke Workflow

Hazard Analysis										Idenitfy Actions and Outcomes				
			Scoring			Decision Tree Analysis								
Failure Mode	Potential Causes		Severity	Probabilty	Haz Score	Single Point Weakness?	Exisiting Control Measure?	Detectability	Proceed?	Action Type (Eliminate/ Control/ Accept)	Resultant Actions	Outcome Measure	Person Responsible (outcome measurement)	Mitigation Efforts
1. Wrong alert is called	1a	Miscommnication from Charge Nurse to Unit Clerk or CN or designee	2	2	4	Y	N	Y	Y	C	Intensive care responder calls Security and provides complete information	IRIS report	Unit manager	Training and education on workflow
	1b	Information breakdown from Unit Clerk to Security	2	2	4	Y	N	Y	Y	C	Intensive care responder calls Security and provides complete information	IRIS report	Unit manager	Training and education on workflow
2. Alert is called in to wrong location	2a	Unit Clerk/CN/RN/designee does not provide location to Security	2	2	4	Y	N	Y	Y	C	Unit Clerk/CN/RN/designee calls Security and provides complete information	IRIS report	Unit manager	Training and education on workflow
3. Response team does not receive IP Stroke Alert	3a	Voalte failure	2	2	4	Y	N	Y	Y	C	Do overhead (in house) (GSH/BN 7am-5pm and BBH/MHMH 24/7), call STANSE physician on call cell	IRIS report	Unit manager	
	3b	ICU Charge Nurse not signed in to role	1	1	1	Y	N	Y	Y	C	House supervisor calls Charge Nurse	IRIS report	Unit manager	Training and education on workflow
4. Stroke Physician [illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7. Stroke Physician unable to place video call to TeleStroke cart	7a	Stroke Physician technology or equipment failure	3	4	12	Y	N	Y	Y	C	Stroke Physician calls inpatient unit to connect with inpatient team	IRIS report	Stroke Team	Regularly occurring equipment checks, test calls
	7b	Stroke Physician internet connection failure	3	4	12	Y	N	Y	Y	C	Stroke Physician calls inpatient unit to connect with inpatient team	Stroke Physician report, IRIS Report	Stroke Team	Regularly occurring equipment checks, test calls
8. TeleStroke call not received by IP Team	8a	TeleStroke Cart software/ hardware failure	3	3	9	Y	N	Y	Y	C	Stroke Physician calls inpatient unit to connect with inpatient team	IRIS report	Unit manager	Regularly occurring equipment checks
	8b	Poor internet connection on inpatient unit	3	3	9	Y	N	Y	Y	C	Stroke Physician calls inpatient unit to connect with inpatient team	IRIS report	Unit manager	IS to ensure quality connectivity in ED
9. Audio not working on TeleStroke Cart	9a	Technology failure	4	3	12	Y	N	Y	Y	C	Stroke Physician calls inpatient unit to connect with inpatient team, utilize backup cart	IRIS report	Unit manager	Regularly occurring equipment checks
10. Camera not working on TeleStroke Cart, Stroke Physician cannot see patient	10a	Technology failure	3	3	9	Y	N	Y	Y	C	Inpatient RN gets backup cart for use	IRIS report	Unit manager	Regularly occurring equipment checks

IP Workflow Analysis



Accomplishments

- Selection of Telestroke Platform (Teladoc)-Equipment arrived 12/29/23
- Training protocols for Clinical Team are completed
- Dedicated space established for Telestroke encounters
- Training schedule for clinical team members established
- STANSE responding to all stroke alerts from 7-5, 7 days a week successfully.

Key Dates for implementation