

5-2019

# The Efficacy Of BE-FAST In Identifying Strokes

Henry Tan

Henry Ford Health System, HTan1@hfhs.org

Adam Alexander

Henry Ford Health System, AAlexan7@hfhs.org

Anu Gopalan

Henry Ford Health System, AGopala3@hfhs.org

Caroline Hannon

Henry Ford Health System, CHannon1@hfhs.org

Satheesh Gunaga

Henry Ford Health System, SGUNAGA1@hfhs.org

*See next page for additional authors*

Follow this and additional works at: <https://scholarlycommons.henryford.com/merf2019clinres>

---

## Recommended Citation

Tan, Henry; Alexander, Adam; Gopalan, Anu; Hannon, Caroline; Gunaga, Satheesh; Patel, Jared; and Bergeon, Dylan, "The Efficacy Of BE-FAST In Identifying Strokes" (2019). *Clinical Research*. 17.  
<https://scholarlycommons.henryford.com/merf2019clinres/17>

This Poster is brought to you for free and open access by the Medical Education Research Forum 2019 at Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Clinical Research by an authorized administrator of Henry Ford Health System Scholarly Commons. For more information, please contact [acabrer4@hfhs.org](mailto:acabrer4@hfhs.org).

---

**Authors**

Henry Tan, Adam Alexander, Anu Gopalan, Caroline Hannon, Satheesh Gunaga, Jared Patel, and Dylan Bergeon



# Evaluating the Utility of BE-FAST at Identifying Strokes in a Community ED Triage

PRESENTED BY HENRY FORD WYANDOTTE HOSPITAL QI TEAM 2018:

ANU GOPALAN DO, ADAM ALEXANDER DO, HENRY TAN DO,

CAROLINE HANNON DO, SATHEESH GUNAGA DO

JARED PATEL OMS-III, DYLAN BERGEON OMS-III



# Stroke Epidemiology

- ▶ #2 most common cause of death worldwide
- ▶ Estimated that there is 140,000 stroke deaths yearly
- ▶ By 2030, it is forecasted that about 1 in 25 Americans will have a stroke with it becoming the leading cause of adult disability
- ▶ Costs projected to more than double to approximately \$184 billion USD by 2030
- ▶ Posterior circulation strokes
  - ▶ Ataxia, Balance, Coordination disruptions
  - ▶ Visual disturbances – diplopia, blurring, visual field loss
  - ▶ **With/without** classic stroke symptoms
    - ▶ Slurred Speech, Weakness, Facial Droop

# F

FACE



Face Drooping.  
Look for an uneven smile.

# A

ARMS



Arm Weakness.  
Is one arm weak?  
Can you lift both arms?

# S

SPEECH



Speech Difficulty  
Listen for slurred speech.  
Do people understand  
your speech?

# T

IME



Time is Brain!  
Go to the hospital  
immediately, preferably  
with an acute stroke unit!

# B

**Balance**



**B is for Balance:**  
Does the  
person have  
a sudden loss  
of balance?

# E

**Eyes**



**E is for Eye:**  
Has the  
person lost  
vision in one  
or both eyes?

# F

**Face**



**F is for Face:**  
Does the  
person's face  
look uneven?

# A

**Arms**



**A is for Arm:**  
Is one arm  
hanging  
down?

# S

**Speech**



**S is for Speech:**  
Is the person's  
speech slurred?  
Does the person  
have trouble  
speaking or  
seem confused?

# T

**Time**



**T is for Time:**  
Call 911 now!

# BE-FAST Evidence

- ▶ Study 1 Aroor et al<sup>1</sup>
  - ▶ 736 patients with acute ischemic stroke
  - ▶ 104 (14.1%) had no FAST symptoms
  - ▶ 32 (4.4%) had no BE-FAST symptoms
- ▶ Study 2 Guli et al<sup>4</sup>
  - ▶ FAST failed to detect 38% of posterior cerebral strokes
  - ▶ Sensitivity of BE-FAST - 91%, FAST - 76%
  - ▶ Specificity of BE-FAST - 56%, FAST - 68%
- ▶ Study 3 Werring et al<sup>5</sup>
  - ▶ 216 patients with posterior circulation stroke
  - ▶ 60.6% with a posterior stroke had a FAST score of at least 1
  - ▶ 79.6% with a posterior stroke detected with BE-FAST

In all studies,  
BE-FAST was  
more sensitive,  
but less  
specific

# Methods



- ▶ 401 bed hospital
- ▶ 65,000 annual ED visits
- ▶ Primary Stroke Center
- ▶ BE-FAST screening Implemented into triage
- ▶ Comparative time frame from two months pre/post implementation



# Population Characteristics

Variable	Pre-Intervention	Post-Intervention
Code Strokes (n)	69	86
Age (yrs)	68.30	64.33
Women (%)	60.87	62.79
History of prior CVA (%)	36.23	34.88
History of AFib (%)	17.39	10.47
History of HTN (%)	71.01	70.93



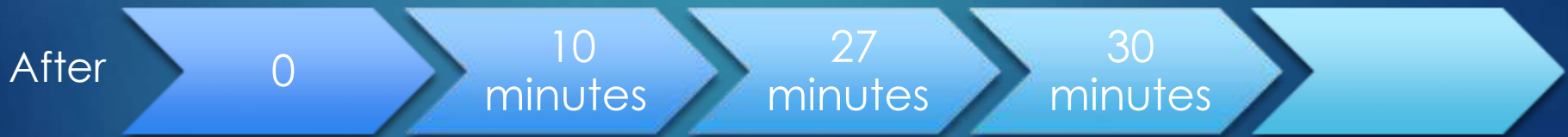
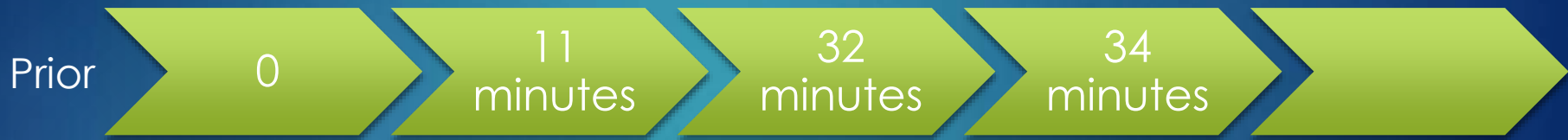
# Study Outcomes

Variable	Pre-Intervention	Post-Intervention
Code Strokes (n)	69	86
NIHSS at Arrival	4.258	2.462
Diagnosed stroke (n)	25	27
Diagnosed stroke(%)	36.23	31.40
Received tPA (n)	11	13
Received tPA (%)	15.94	15.12
Thrombectomy (n)	0	2
Thrombectomy (%)	0	2.33
Mortality (n)	4	2
Mortality (%)	0.06	0.02

# FAST vs BE-FAST

	FAST	BE-FAST
Sensitivity	84% (63, 94)	96% (79, 100)
Specificity	30% (17, 45)	17% (9, 29)
PPV	40% (27, 55)	35% (24, 47)
NPV	76% (50, 92)	91% (57, 100)

- ▶ Prior to intervention: 29 (36.2%) had acute strokes and presented with  $\geq 1$  FAST criteria
- ▶ After intervention: 27 (31.4%) had acute strokes, 23 (85.2%) presenting with  $\geq 1$  FAST and 26 (96.30%) with  $\geq 1$  BE-FAST criteria
- ▶ Among the 3 additional strokes detected using 'BE' symptoms, 1 patient was given tPA



# Sources

1. Aroor S, Singh R, Goldstein LB. BE-FAST (Balance, Eyes, Face, Arm, Speech, Time). *Stroke*. 2017;48(2):479-481. doi:10.1161/strokeaha.116.015169
2. Searls DE, Pazdera L, Korbel E. Symptoms and Signs of Posterior Circulation Ischemia in the New England Medical Center Posterior Circulation Registry. *Archives of Neurology*. 2012;69(3):346-351. doi:10.1001/archneurol.2011.2083
3. Pickham D, Valdez A, Demeestere J, et al. Prognostic Value of BEFAST vs. FAST to Identify Stroke in a Prehospital Setting. *Prehospital Emergency Care*. August 2018. doi:10.1080/10903127.2018.1490837
4. Gulli G, Markus HS. The use of FAST and ABCD2 scores in posterior circulation, compared with anterior circulation, stroke and transient ischemic attack. *Journal of Neurology, Neurosurgery & Psychiatry*. 2012;83(2):228-229. doi:10.1136/jnnp.2010.222091
5. Werring, David. "Posterior Circulation Ischaemic Stroke." *The BMJ*, British Medical Journal Publishing Group, 19 May 2014, [www.bmj.com/content/348/bmj.g3175](http://www.bmj.com/content/348/bmj.g3175).