Results Of The Systematic Evaluation Of Patients TReated With Neurothrombectomy Devices For AcuTe Ischemic Stroke (STRATIS) Registry: Key Messages

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DISCLOSURE

- STRATIS IS A MULTI-CENTER ACUTE ISCHEMIC STROKE LVO SOLITIARE AND MINDFRAME DEVICES REGISTRY SPONSORED AND COORDINATED BY MEDTRONIC

OVERALL STRATIS KEY RESULTS

BACKGROUND AND OVERVIEW

- **SINCE THE PUBLICATION OF 5 SEMINAL RANDOMIZED CONTROLLED TRIALS (RCTS) IN 2014-15, MECHANICAL THROMBECTOMY (MT) WITH STENT –RETRIEVERS HAS BECOME STANDARD OF CARE FOR TREATMENT OF ACUTE ISCHEMIC STROKE PATIENTS DUE TO LARGE VESSEL OCCLUSION (LVO), *RECOMMENDED* BY VARIOUS SCIENTIFIC SOCIETAL GUIDELINES *ACROSS THE WORLD*.**

- **GIVEN THE HIGHLY SELECTED PATIENT POPULATION IN SOME OF THESE RCTS, *QUESTIONS REMAIN WHETHER PROCESS TIMELINES, TECHNICAL AND FUNCTIONAL OUTCOMES CAN BE ACHIEVED IN A "REAL WORLD" SETTING*.**

- **HERE WE PRESENTS THE PRELIMINARY STRATIS REGISTRY RESULTS;**
  - OVERVIEW OF THE PRIMARY STRATIS RESULTS
  - OVERVIEW OF THE SYSTEM OF CARE OUTCOMES (TRANSFER VS DIRECT)
  - DIFFERENCE IN OUTCOMES BETWEEN VARIOUS ADJUNCTIVE MT TECHNIQUES

OVERALL STRATIS KEY RESULTS

METHODS

Design/Objective	▪ Independent Steering Committee, imaging and core lab, & statistician ▪ Prospective, multi-center, observational, single-arm registry designed to capture a "real world experience" without requirement of specialized triage imaging, age limits or technique exclusions at academic and non-academic centers in the USA. ▪ Patients with large vessel occlusion (LVO) acute ischemic stroke (AIS) were enrolled within 8 hours from symptom onset.
Endpoints & Evaluations	Performance ▪ Time from puncture to revascularization (mTICI ≥ 2b) ▪ Revascularization assessment at the end of the procedure using TICI score Clinical Efficacy ▪ mRS at 90 days Safety ▪ All-cause mortality (up to 90 days post procedure) ▪ Incidence of symptomatic ICH Reproducibility: ▪ A patient-level comparison with SEER database was performed
Devices	▪ First neurothrombectomy device use must be: ▪ Solitaire™ Revascularization Device ▪ MindFrame Capture™ LP Device

OVERALL STRATIS KEY RESULTS

METHODS: SPECIFIC ADDITIONAL AIMS

TARGET

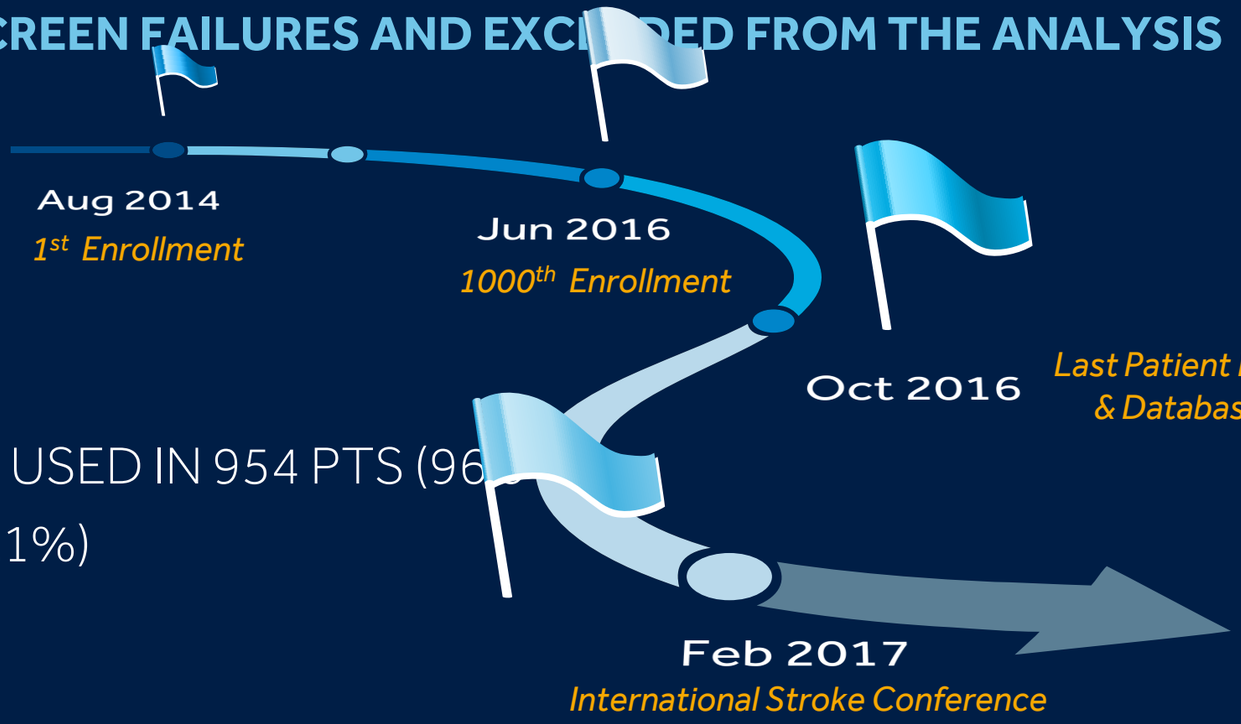
Answering the "real world" stroke questions and building a comprehensive representation of the patient population being treated with Medtronic stroke devices

1. **Systems of Care**
   What are the key variables affecting time to treatment?
2. **Role of Imaging**
   How does imaging selection method impact clinical outcome?
3. **Interventional Technique**
   How does interventional technique (proximal vs. lesional aspiration) affect technical efficacy and clinical outcome?
4. **General Anesthesia**
   What are the effects of general anesthesia on workflow and clinical outcome? Will not be discussed (ESOC 2017)
5. **Baseline Characteristics**
   What are the key baseline characteristics that affect clinical outcome? Will not be discussed

OVERALL STRATIS KEY RESULTS

PRIMARY RESULTS

- **AUGUST 2014 TO JUNE 2016**
  - 1,000 PATIENTS WERE ENROLLED AT 55 US CENTERS
    - **16 PATIENTS WERE IDENTIFIED TO BE SCREEN FAILURES AND EXCLUDED FROM THE ANALYSIS**
  - TOTAL OF 984 PATIENTS



- **DEVICES USED**
  - SOLITAIRE™ WAS THE FIRST MT DEVICE USED IN 954 PTS (96
  - MINDFRAME CAPTURE™ LP IN 30 PTS (3.1%)

OVERALL STRATIS KEY RESULTS

COMPARISON OF BASELINE & WORKFLOW CHARACTERISTICS, CONTINUED

Characteristic	SEER Intervention	STRATIS	P
Initial Qualifying NIHSS Score	16 .6 ± 4.9 (398) [17] (13,20)	17 .3 ± 5.5 (984) [17] (13,22)	**0.042**
IV t-PA delivered	80.5% (323/401)	64.0% (628/982)	**<0.001**
ASPECTS – per imaging core lab†	8.3 ± 1.7 (388) [9] (7.10)	8.2 ± 1.6 (763) [8] (8,9)	0.091
Target Intracranial Occlusion Location‡			**<0.001**
Not reported	2.5% (10/401)	0.8% (8/984)	
Internal Carotid Artery Terminus	18.2% (73/401)	22.6% (222/984)	
MCA – First segment (M1)	71.1% (285/401)	54.7% (538/984)	
MCA – Second segment (M2)	8.2% (33/401)	17.3% (170/984)	
MCA– Third segment (M3)	0.0% (0/401)	0.2% (2/984)	
Posterior Circulation	0.0% (0/401)	4.5% (44/984)	

Data are % (n/N), or mean±SD (N), [median] (IQR). Abbreviations: ASPECTS, Alberta Stroke Program Early CT Score; mRS, modified Rankin Scale; mTICI, modified Thrombolysis in Cerebral Infarction; NIHSS, National Institutes of Health Stroke Scale. The protocol was amended to restrict enrollment to mRS 0-1 to ensure consistency with SWIFT PRIME enrollment criteria. †Baseline imaging received for 835 patients, of whom 72 were not evaluated for ASPECTS (38 Posterior stroke, 30 no non-contract CT, 4 not evaluable), resulting in 763 patients evaluable for ASPECTS. ‡For STRATIS, assessed by the Techniques Core Lab based on operative reports.

OVERALL STRATIS KEY RESULTS

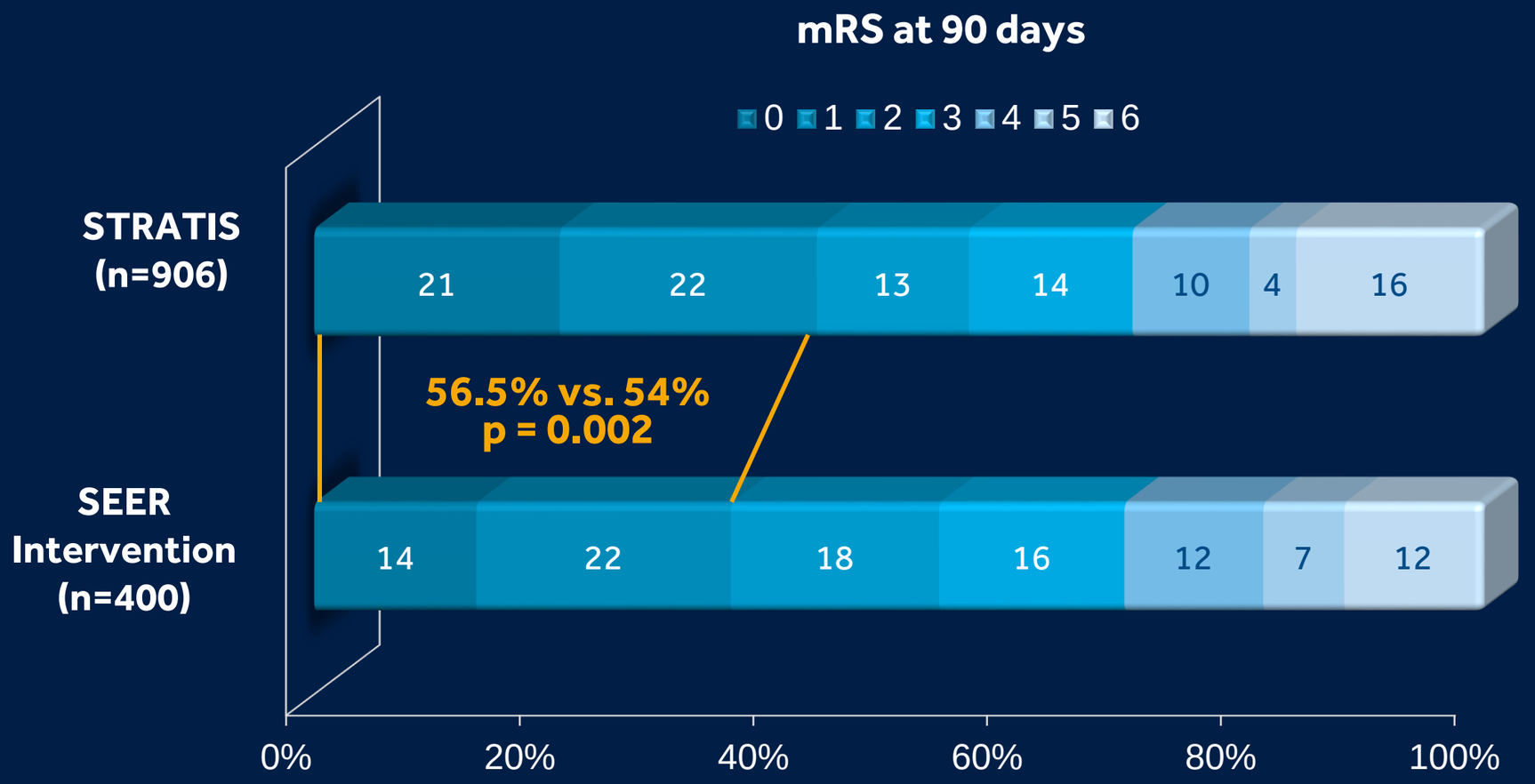
COMPARISON OF BASELINE & WORKFLOW CHARACTERISTICS, CONTINUED

Characteristic	SEER Intervention	STRATIS	P
Process Metrics			
Stroke onset to enrolling hospital arrival (door)	143.5 ± 122.2 (400)	149.3 ± 101.0 (907)	0.030
Stroke onset to alteplase initiation	122.9 ± 49.2 (322)	113.3 ± 50.5 (622)	0.001
Hospital arrival to alteplase initiation	28.7 ± 66.0 (265)	42.1 ± 26.5 (336)	0.503
Stroke onset to puncture	263.1 ± 194.7 (394)	226.4 ± 100.0 (976)	0.011
Hospital arrival to puncture	122.0 ± 173.7 (392)	80.1 ± 49.4 (901)	<0.001
Imaging to puncture	68.9 ± 34.7 (394)	71.2 ± 46.4 (824)	0.642
Alteplase to puncture	107.2 ± 206.5 (259)	102.0 ± 73.5 (613)	0.001
Puncture to TICI 2b/3 or completion	45.9 ± 31.0 (348)	45.6 ± 29.0 (939)	0.740
Stroke onset to TICI 2b/3 or completion	293.6 ± 126.5 (349)	271.1 ± 105.7 (945)	0.020

Data are % (n/N), or mean±SD (N). Abbreviations: ASPECTS, Alberta Stroke Program Early CT Score; mRS, modified Rankin Scale; mTICI, modified Thrombolysis in Cerebral Infarction; NIHSS, National Institutes of Health Stroke Scale. The protocol was amended to restrict enrollment to mRS 0-1 to ensure consistency with SWIFT PRIME enrollment criteria.

OVERALL STRATIS KEY RESULTS

PRIMARY CLINICAL EFFICACY OUTCOME: MODIFIED RANKIN DISTRIBUTION AT 90 DAYS



Shift analysis favored STRATIS over SEER
OR 1.38 (95% CI 1.11-1.71); p=0.004

OVERALL STRATIS KEY RESULTS

KEY FINDINGS

DESPITE ENROLLING **A NONSELECTIVE POPULATION WITH SIGNIFICANTLY HIGHER MEAN BASELINE NIHSS, HIGHER PERCENTAGE OF ICA T OCCLUSION, INCLUSION OF POSTERIOR CIRCULATION STROKES AND LONGER MEDIAN ONSET TO ARRIVAL TIME,**

FAVORING SEER; STRATIS ACHIEVED SIMILAR TECHNICAL, SAFETY AND CLINICAL OUTCOMES.

Outcome	SEER	STRATIS
Core Lab mTICI 2b-3	76.6%	87.9 % p<0.001
sICH	2.5%	1.4%
mRS 0-2 at 90 Days	54.0%	56.5%

WORKFLOW

- *MEAN* TIME FROM **ONSET TO ARRIVAL** WAS *SIGNIFICANTLY LONGER* IN **STRATIS** (5.8 MIN) COMPARED TO SEER.
- *MEAN* ONSET TO PUNCTURE TIME WAS 36.7 MINUTES SHORTER IN **STRATIS**, *PRIMARILY DRIVEN BY A 41.9 MINUTE SHORTER MEAN DOOR TO PUNCTURE TIME*.

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

SYSTEMS OF CARE: DIRECT VS. TRANSFERE AND SHOULD WE BYPASS?

INTERHOSPITAL TRANSFER PRIOR TO THROMBECTOMY IS ASSOCIATED WITH DELAYED TREATMENT AND WORSE OUTCOME IN THE STRATIS REGISTRY

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

DEMOGRAPHICS: DIRECT 539/984 (55%) TRANSFER 445/984 (45%)

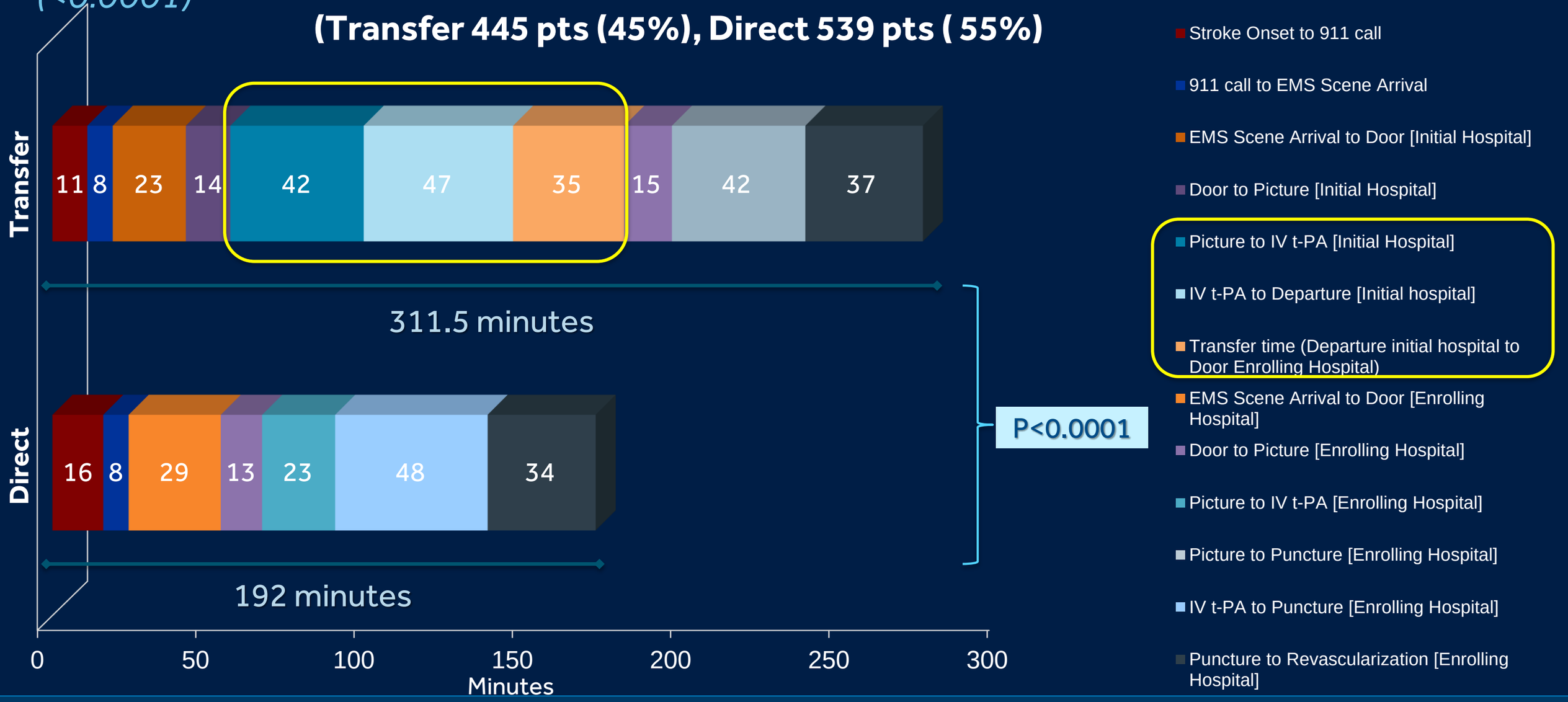
Characteristic	ALL (984)	Transfer (445)	Direct (539)	P
Age, mean (SD), y	67.8 (14.7)	66.9 (14.6)	68.5 (14.8)	0.10
Atrial flutter/Atrial fibrillation	369 (37.5)	165 (37.1)	204 (37.8)	0.80
Systemic Hypertension	712 (72.4)	321 (72.1)	391 (72.5)	0.89
Diabetes mellitus	252 (25.6)	108 (24.3)	144 (26.7)	0.38
Hyperlipidemia	414 (42.1)	184 (41.3)	230 (42.7)	0.68
Current or former tobacco use	465 (47.3)	222 (49.9)	243 (45.1)	0.13
Baseline mRS 0	748 (76.0)	326 (73.3)	422 (78.3)	
Baseline mRS 1	209 (21.2)	104 (23.4)	105 (19.5)	
Initial Qualifying NIHSS Score, mean (SD), median (IQR)	17.3 (5.5), 17.0 (13-22)	18.0 (5.5), 18.0 (13-22)	16.7 (5.5), 17.0 (12-21)	<0.001
Baseline ASPECTS – per core lab*	N=763	N=306	N=457	
Mean (SD), median (IQR)	8.2±1.6, 8.0 (8-9)	7.9 (1.8), 8.0 (7-9)	8.4 (1.4), 9.0 (8-9)	<0.001
Treatment with IV-tPA, No. (%)	628 (63.8)	299 (67.2)	329 (61.0)	0.044

*Baseline imaging received for 835 pts, of which 72 were not evaluated for ASPECTS (38 Posterior stroke, 3 CT not available, 4 not evaluable), resulting in 763 pts evaluable for ASPECTS.

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

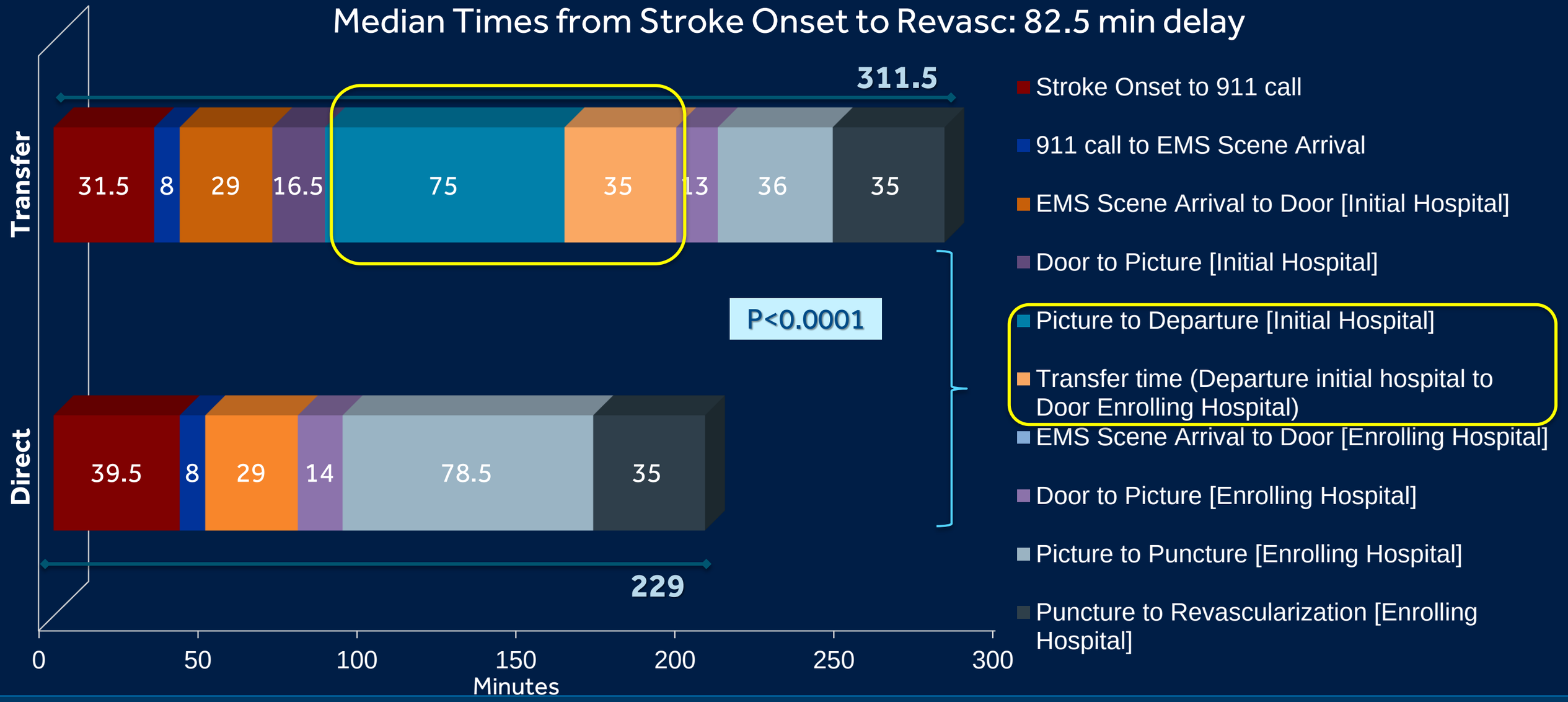
TIME DIFFERENCES FOR TPA + MT: 120 MINUTES TIME DIFFERENCE IN ONSET TO REVASC (<0.0001)

(Transfer 445 pts (45%), Direct 539 pts (55%)



II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

TIME DIFFERENCES FOR *MT ALONE*



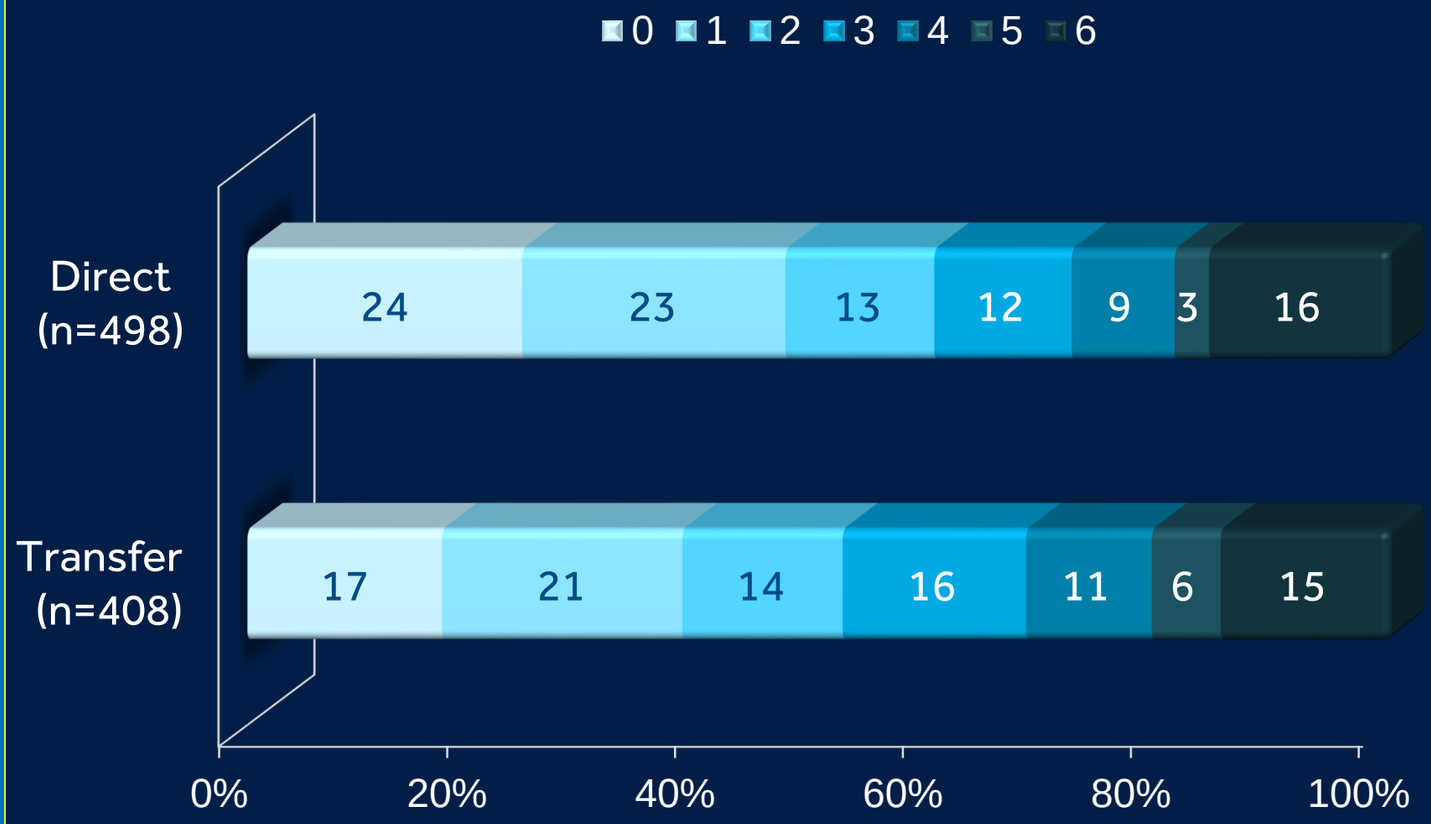
II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

MRS AT 90 DAYS

mRS 0-2:
- 60.0% direct
- 52.2% transfer
- OR 1.38 (1.06-1.79)

mRS 0-1:
- 47.4% direct
- 38.0% transfer
- OR 1.47 (1.13-1.92)

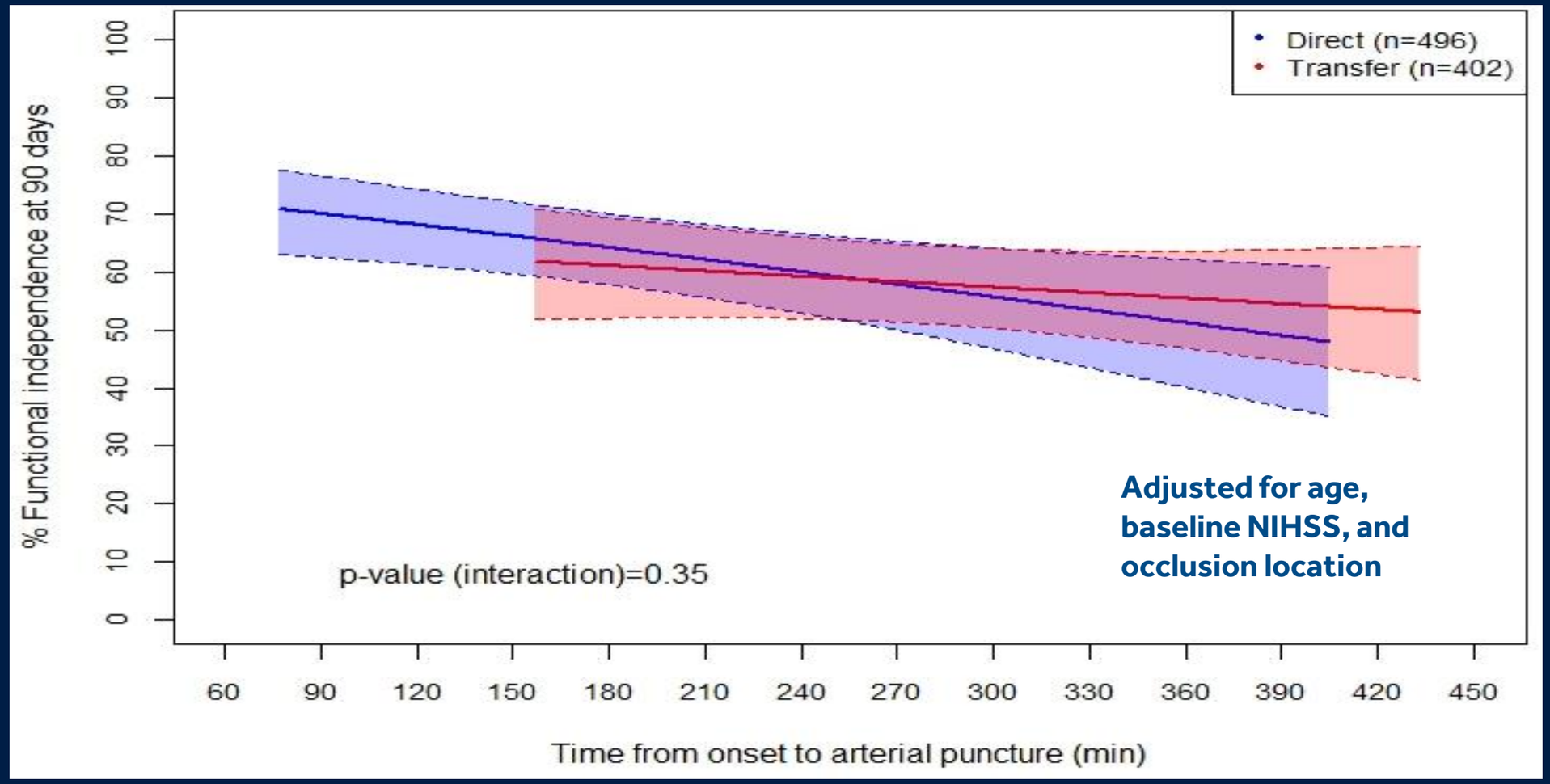
Mortality:
- 15.0% direct
- 13.7% transfer
- p=0.56



Shift analysis favored direct presentation (p=0.012 by Cochran-Mantel-Haenszel test).

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

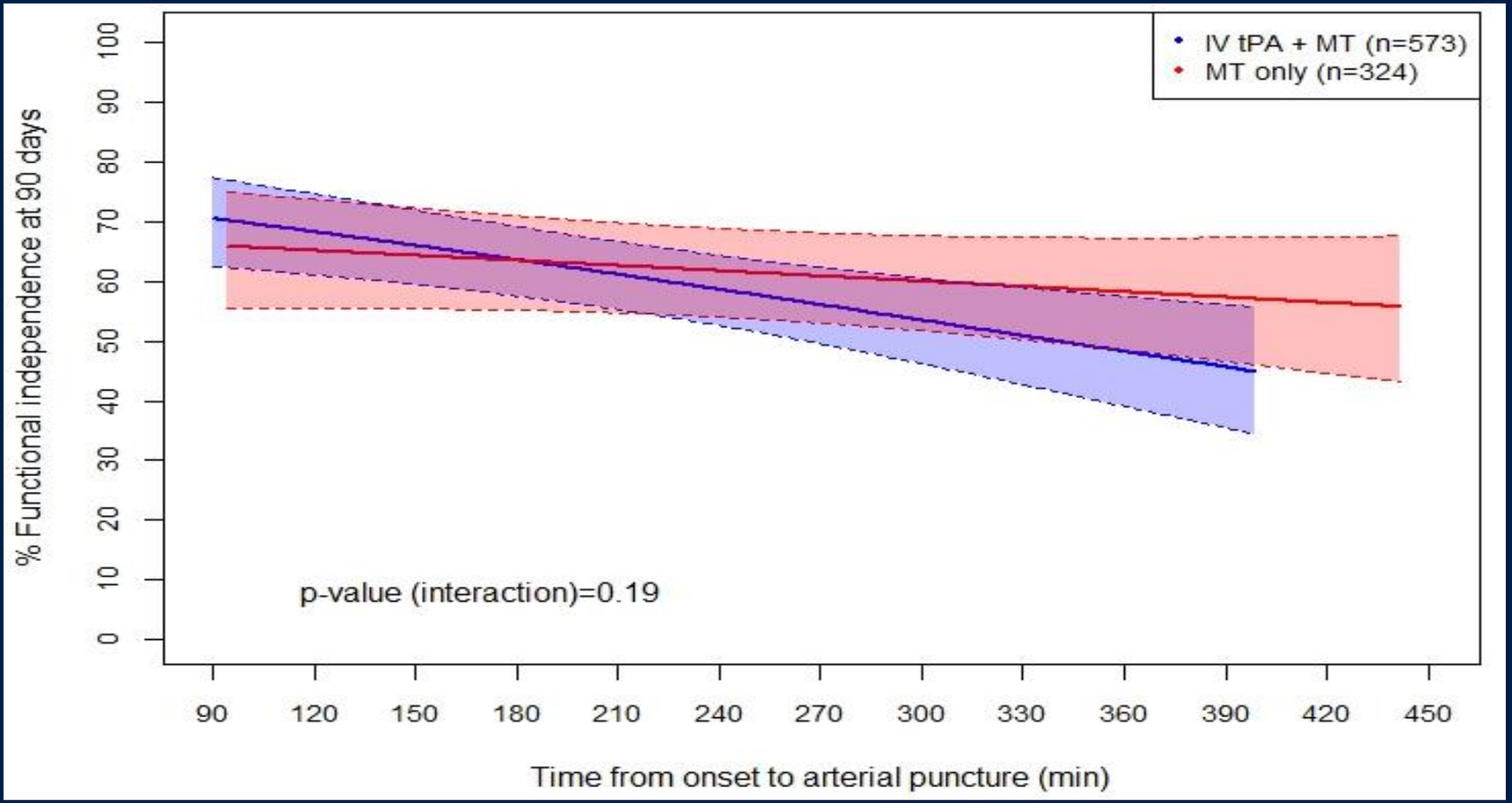
TIME DELAY ACCOUNTS FOR DIFFERENCE IN OUTCOMES



Across all patients, the absolute rate of functional independence decreased by **5.5% per hour** from alarm (911 call) to puncture.

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

TIME DELAY ACCOUNTS FOR DIFFERENCE IN OUTCOMES: IV+MT VS MT ALONE (BLUE)



Adjusted for age, baseline NIHSS, and occlusion location

After accounting for differences in outcome related to time to endovascular treatment, the administration of IV-tPA did not have a significant effect on outcome, either overall or in interaction with time.

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

SHOULD WE BYPASS?

BYPASSING THE COMMUNITY HOSPITAL MAY REDUCE TIME TO MT, BUT MAY INCREASE TIME TO IV-TPA OR MISSING THE IVTPA DUE TO BYPASS PSC.

WE PERFORMED VIRTUAL BYPASS SIMULATION ROUTING TO CALCULATE EFFECT ON TIMES DELAY TO TREATMENT: IDEA, TO ASSUME THAT TRANSFER PATIENTS WOULD BY PASS THE CLOSEST HOSPITAL:

WHAT WOULD BE THE TIME DELAY TO IVTPA

HOW MANY WOULD MISS IVTPA

INCLUSION ON THE VIRTUAL MODEL

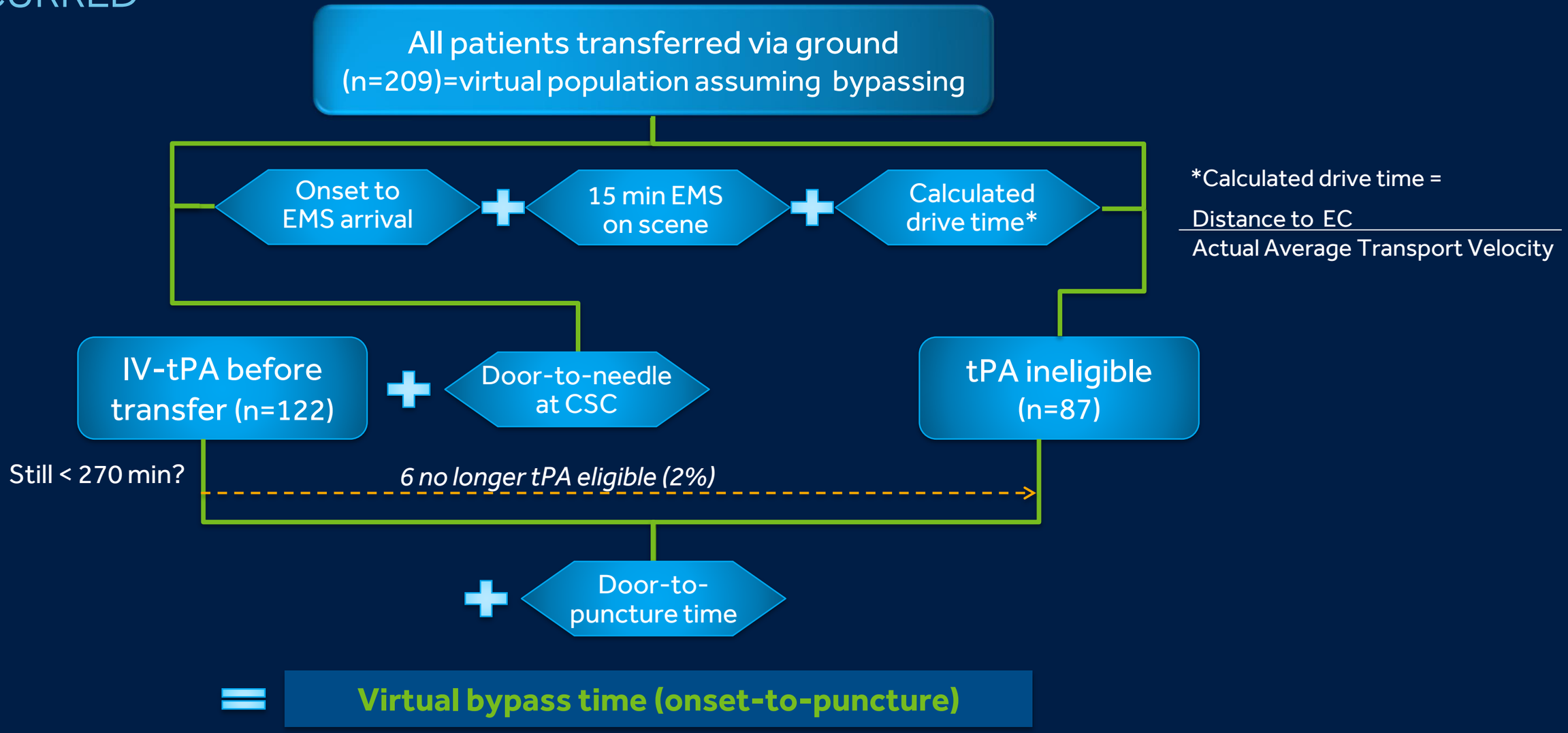
FOR GROUND TRANSPORT ONLY. AIR TRANSPORT EXCLUDED GIVEN LONGER DISTANCES AND HIGHER VARIABILITY.

BYPASS ANALYSIS PERFORMED FOR TWO SUBSETS:

ALL TRANSPORTED VIA GROUND, AND ONLY THOSE WITHIN 20 MILES OF ENDOVASCULAR CENTER (TO SEE THE EFFECT ON SPECIFIC DISTANCE FROM EC)

STRATIS

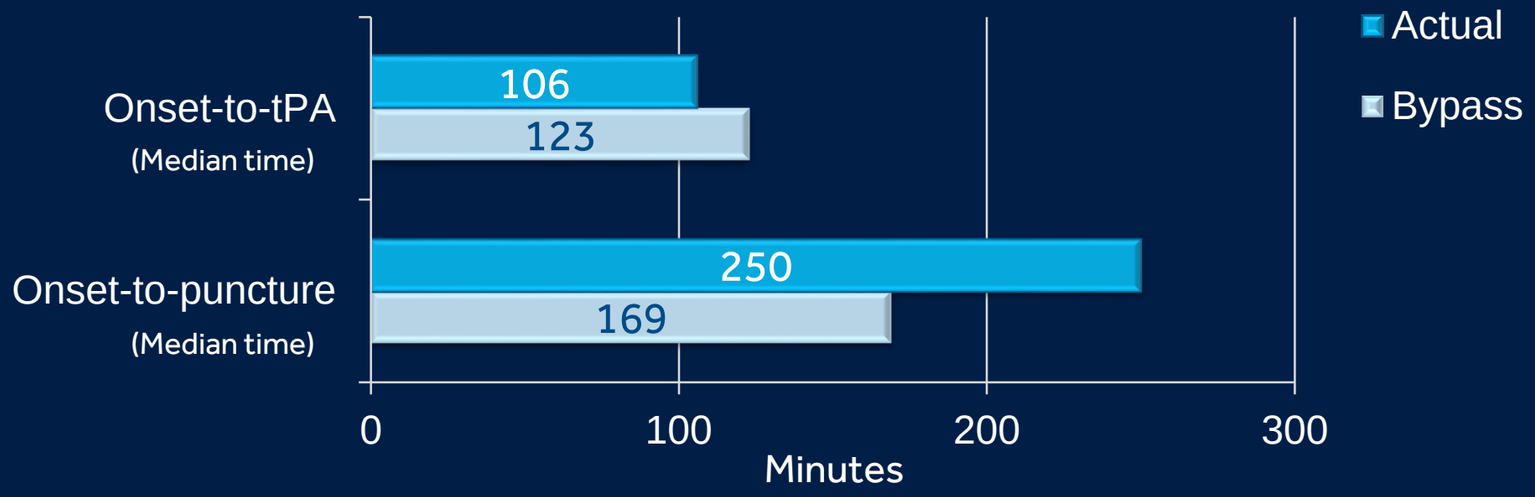
VIRTUAL BYPASS: 209 TRANSFERRED VIA GROUND ONSET TO PUCNCTURE IF BYPASS OCCURRED



II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

VIRTUAL BYPASS: DELAY IN TPA: 17 MIN, 6 NO TPA, DECREASE IN ONSET TO PUNCTURE: 81 MINUTES

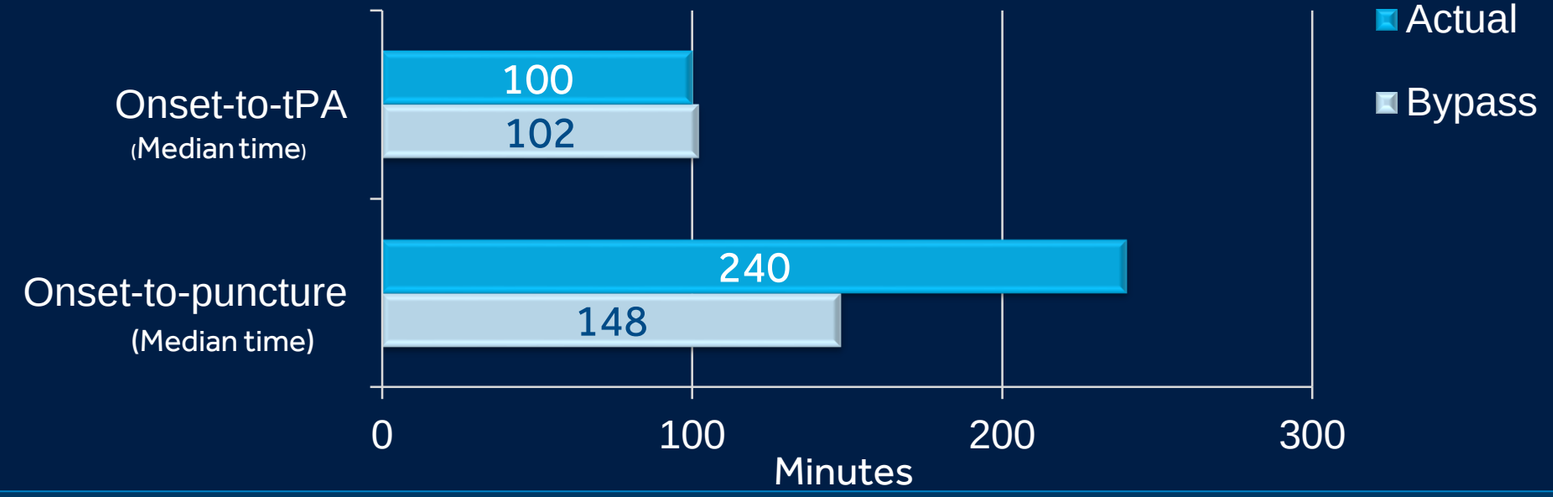
All patients transferred via ground (n=209, 122 w tPA)



VIRTUAL BYPASS IN STRATIS FULL COHORT:

- 6 no longer tPA eligible (5%)
- 17 min IVTPA Delay
- GAIN: 81 min shorter Median Onset to Puncture time (250 to 169 min)

Patients within 20 miles (n=130, 71 w tPA)



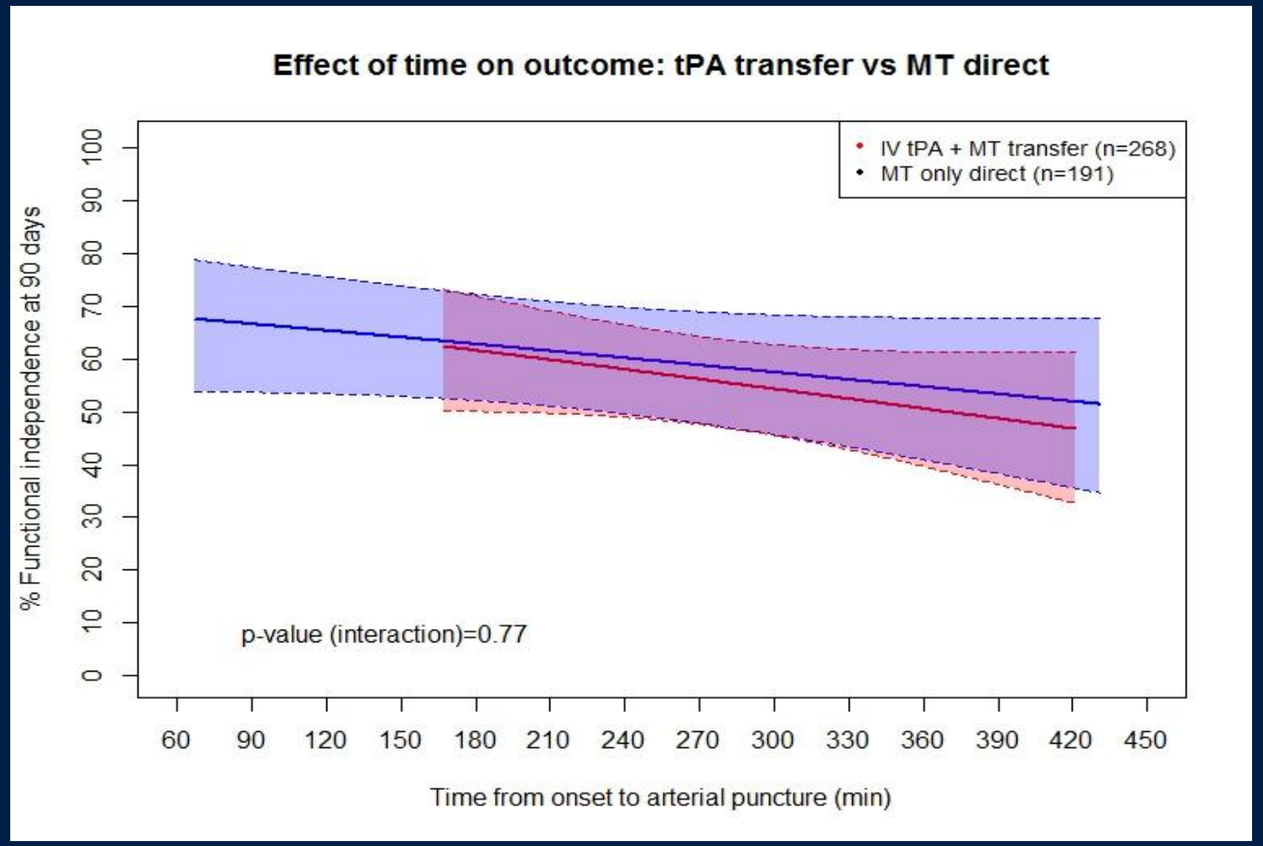
VIRTUAL BYPASS IN STRATIS 20 miles radius to EC Yielded:

- 2 no longer tPA eligible (3%)
- 2 min Delay in IVTPA
- GAIN: 92 min shorter Median Onset to Puncture time (240 to 148 min)

II. STRATIS SYSTEM OF CARE OUTCOME; TRANSFER VS. DIRECT

3-5 % MISS TPA IF BYPASSED (ALL VS 20 MILES BYPASS)

- *If tPA is missed* due to bypassing nearer hospital in favor of direct routing to endovascular care, there is no predicted difference in outcome
- **Outcome** remains dependent on time-to-treatment



III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

INFLUENCE OF BALLOON, CONVENTIONAL, OR DISTAL CATHETERS ON ANGIOGRAPHIC AND CLINICAL OUTCOMES IN THE STRATIS REGISTRY

III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

METHODS

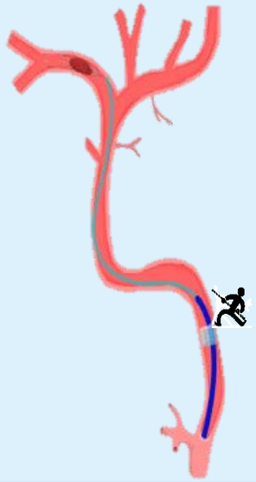
Objective	▪ **To evaluate the influence of thrombectomy adjunctive devices/techniques on angiographic and clinical outcomes from the STRATIS Registry: BGC+SR, DLBC with local or lesional aspiration, CGC**
Outcomes	▪ Modified First pass effect (FPE) defined as successful reperfusion of ≥TICI2b after first device pass ▪ True FPE defined as TICI 2c or 3 after first pass ▪ Number of passes ▪ Rate of good clinical outcome defined as mRS 0-2 at 90 days
Independent Evaluation	▪ A Technique Core Lab blinded to clinical outcome extrapolated the techniques and assessed FPE and True FPE based on procedural reports. ▪ An Image Core Lab blinded to clinical outcome assessed final angiographic reperfusion status.
Analysis Population	▪ Included anterior circulation target vessel occlusion ▪ Excluded subjects in whom combined BGC and DLBC approach was used

III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

INTERVENTIONAL TECHNIQUES

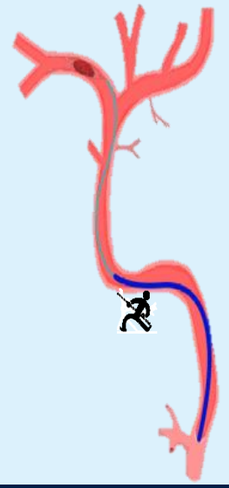
Interventional Techniques

Balloon Guide Catheter (BGC)



- BGC with proximal aspiration, no DLBC used (n=503)

Conventional Guide Catheter (CGC)



- Conventional guide/ sheath with proximal aspiration, no DLBC used (n=77)

Distal Large Bore Catheter (DLBC)

- CGC with BOTH lesional aspiration and retrieval with DLBC (n=72)
- CGC with lesional aspiration (DLBC) and proximal retrieval into CGC (n=229)
- CGC with DLBC with aspiration via CGC (n=1)

Technical approaches as assessed by the Technique Core Lab based on procedural reports

III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

STUDY POPULATION & BASELINE CHARACTERISTICS

- A total of **936** patients were included in the analysis.
  - Baseline characteristics were well balanced across groups with the exception of current or previous tobacco use.

Characteristic	BGC (503)	CGC (77)	DLBC (302)	P-value
Age (years)	67.7±15.22 (503)	68.8±14.66 (77)	68.7±14.29 (302)	0.7943
Sex - Male	261/503 (51.9%)	43/77 (55.8%)	162/302 (53.6%)	0.7635
Medical History				
Atrial fibrillation	210/503 (41.7%)	26/77 (33.8%)	110/302 (36.4%)	0.1919
Hypertension	360/503 (71.6%)	58/77 (75.3%)	230/302 (76.2%)	0.3350
Diabetes mellitus	119/503 (23.7%)	14/77 (18.2%)	89/302 (29.5%)	0.0617
Current or previous tobacco use	260/503 (51.7%)	33/77 (42.9%)	127/302 (42.1%)	0.0203

Data are % (n/N), or mean±SD (N). The protocol was amended to restrict enrollment to mRS 0-1 to ensure consistency with SWIFT PRIME enrollment criteria.

III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

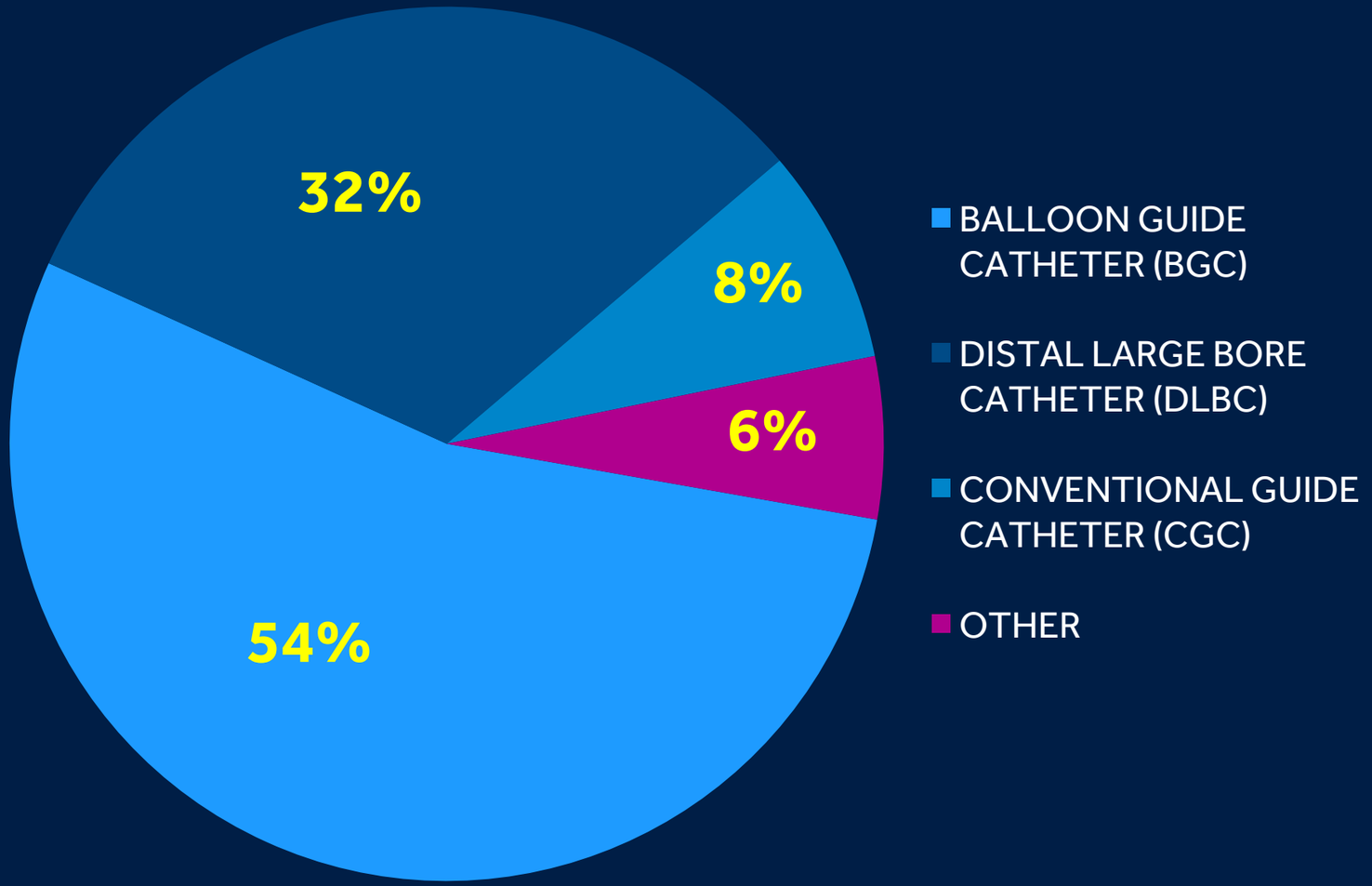
STUDY POPULATION & BASELINE CHARACTERISTICS, CONTINUED,

Characteristic	BGC (503, 54%)	CGC (77, 8%)	DLBC (302, 32%)	P-value
Pre-Procedure				
Initial Qualifying NIHSS Score	17.1±5.34 (503)	17.5±5.73 (77)	17.5±5.50 (302)	0.7489
IV t-PA delivered	328/503 (65.2%)	51/77 (66.2%)	195/302 (64.6%)	0.9489
ASPECTS – per imaging core lab†	8.3±1.59 (415)	8.5±1.28 (66)	8.1±1.59 (235)	0.0685
Intracranial Vessel treated on First Pass‡				0.1967
Internal Carotid Artery Terminus	105/503 (20.9%)	18/77 (23.4%)	89/302 (29.5%)	
Middle Cerebral Artery – First segment (M1)	300/503 (59.6%)	43/77 (55.8%)	164/302 (54.3%)	
Middle Cerebral Artery – Second segment (M2)	97/503 (19.3%)	16/77 (20.8%)	48/302 (15.9%)	
Middle Cerebral Artery – Third segment (M3)	1/503 (0.2%)	0	1/302 (0.3%)	

Data are % (n/N), or mean±SD (N). Abbreviations: ASPECTS, Alberta Stroke Program Early CT Score; mRS, modified Rankin Scale; mTICI, modified Thrombolysis in Cerebral Infarction; NIHSS, National Institutes of Health Stroke Scale. The protocol was amended to restrict enrollment to mRS 0-1 to ensure consistency with SWIFT PRIME enrollment criteria. †759 patients evaluable for ASPECTS. ‡Assessed by the Techniques Core Lab based on operative reports.

III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

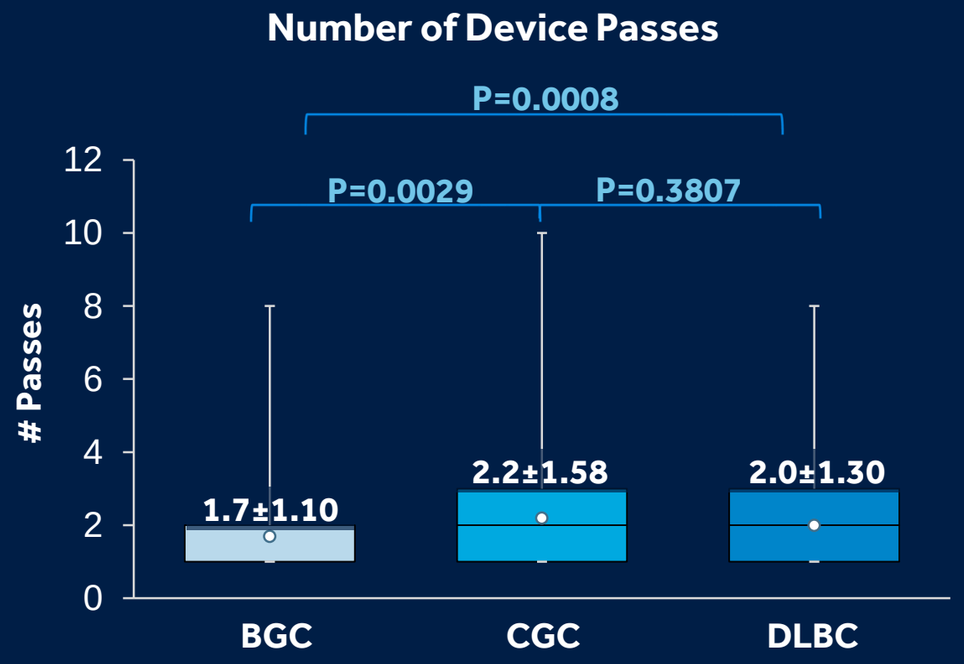
DISTRIBUTION OF TECHNICAL APPROACHES USED ON 1ST PASS

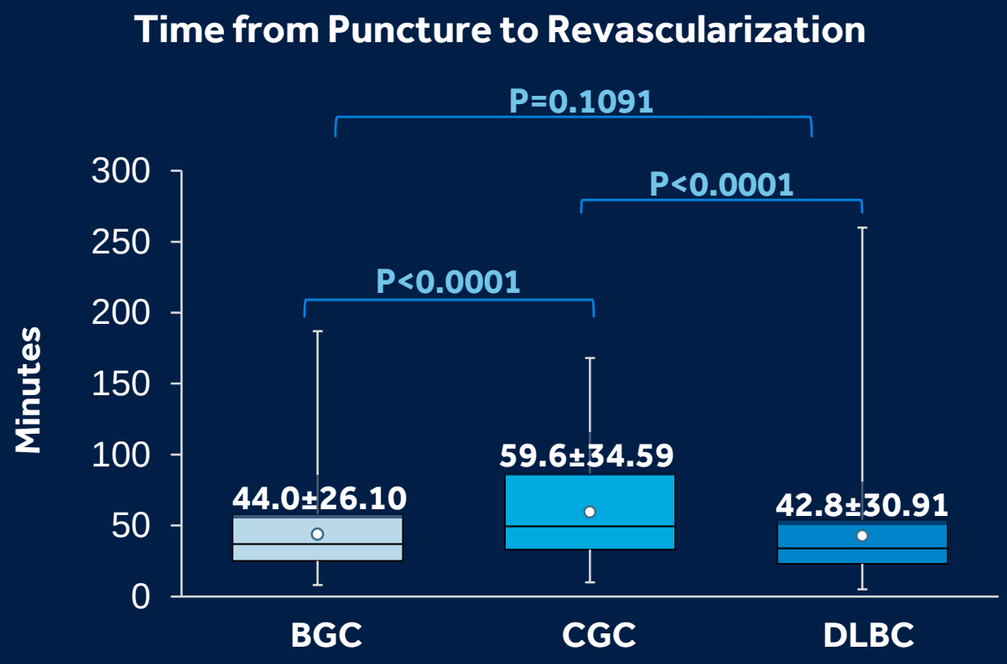


III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

PROCEDURAL OUTCOMES

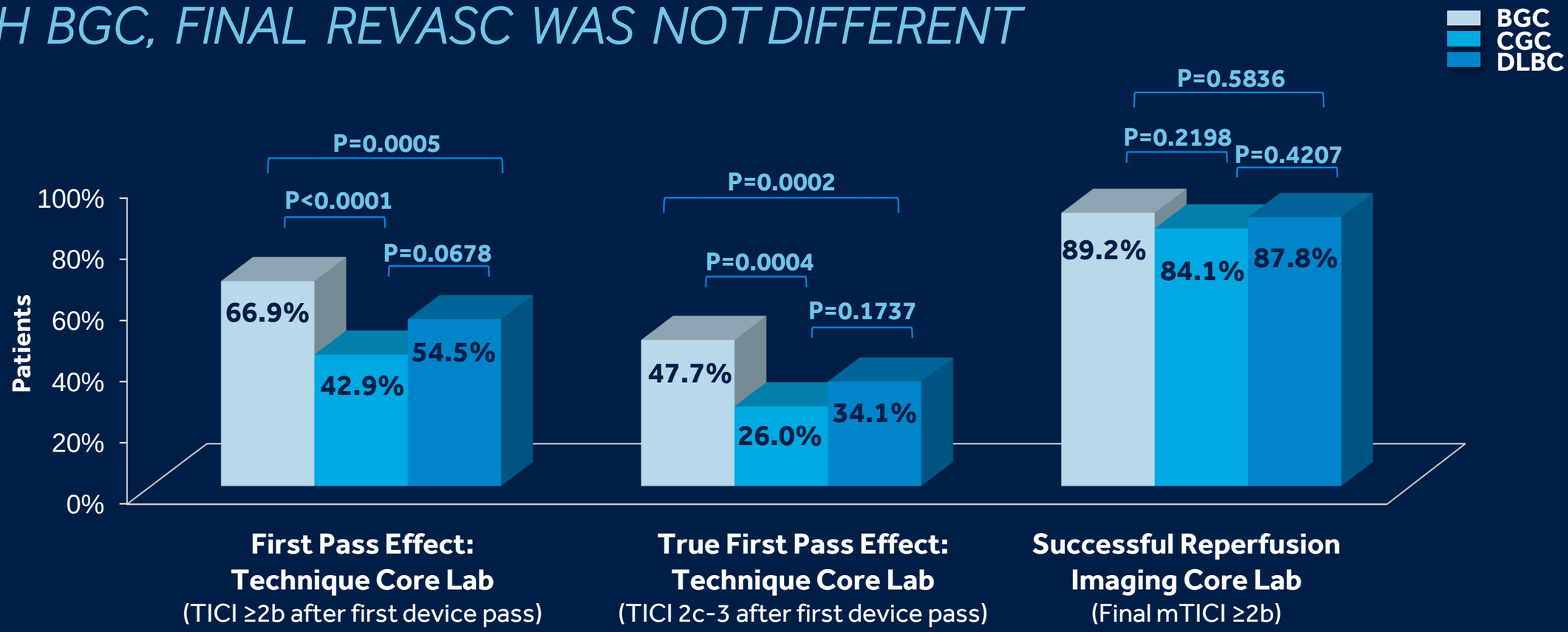
- **MEAN NUMBER OF *DEVICE PASSES* WAS SIGNIFICANTLY LOWER IN THE BGC GROUP WHEN *COMPARED TO* EITHER CGC OR DLBC GROUPS.**
- **MEAN TIME FROM *PUNCTURE TO REVASCULARIZATION* WAS SIGNIFICANTLY SHORTER IN BOTH THE BGC AND DLBC GROUPS WHEN *COMPARED TO* THE CGC GROUP.**





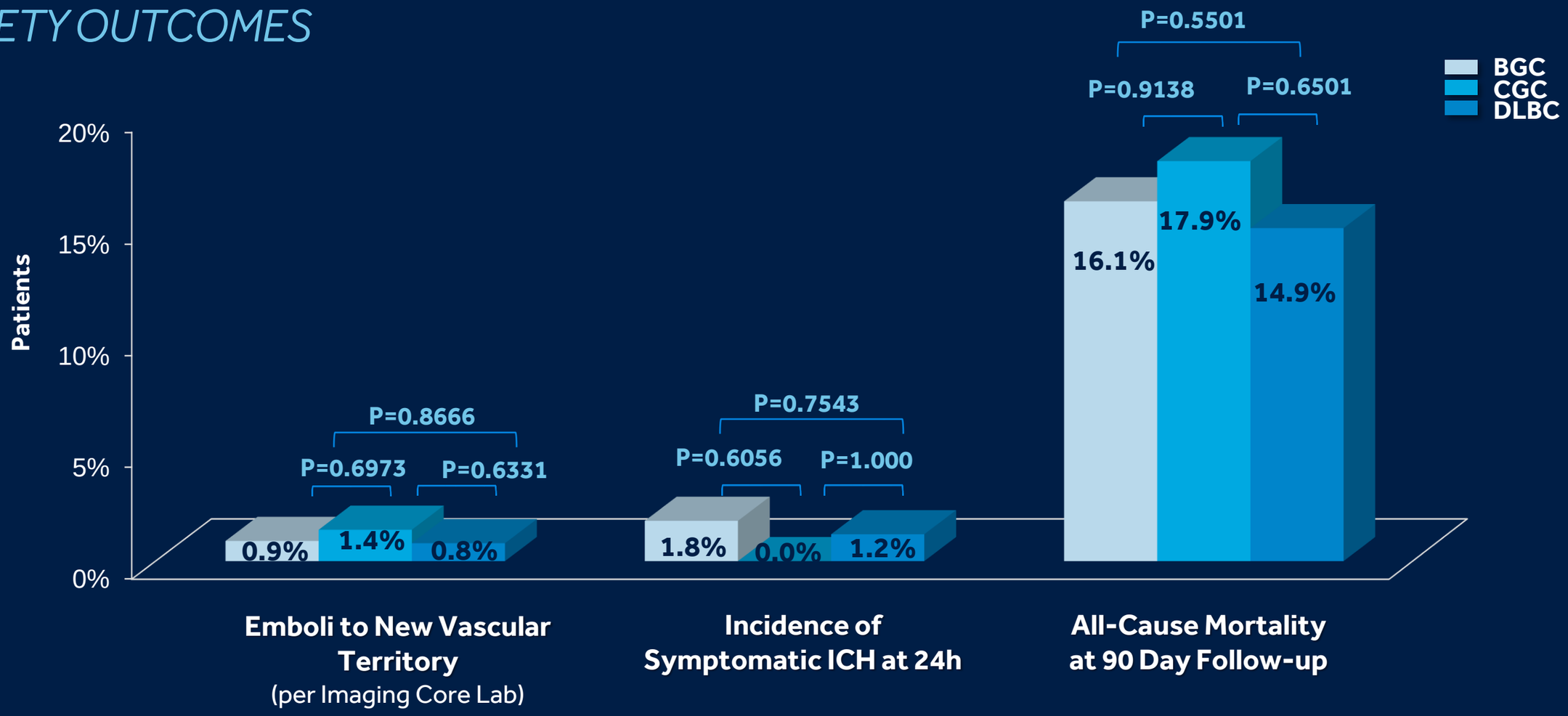
III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

REPERFUSION OUTCOMES: TFPE AND MFPE WERE SIGNIFICANTLY HIGHER WITH BGC, FINAL REVASC WAS NOT DIFFERENT



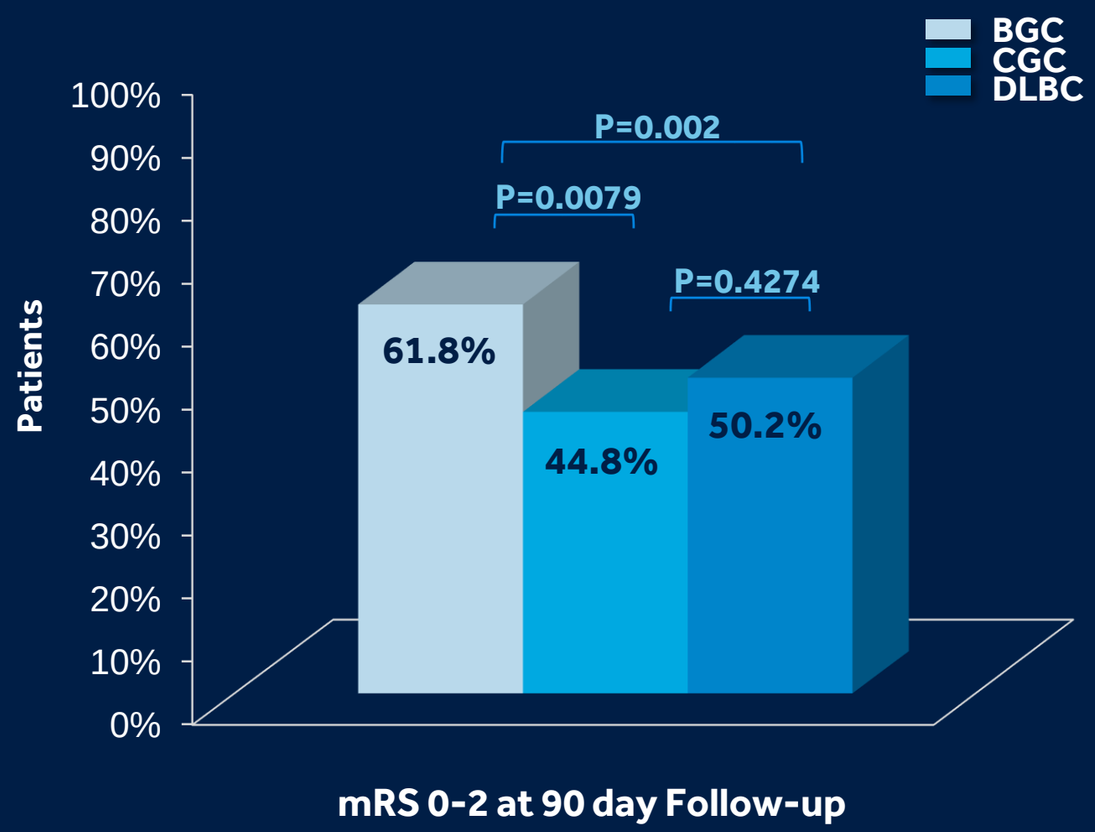
III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

SAFETY OUTCOMES



III. STRATIS ADJUCNTIVE TECHNIQUE OUTCOMES

GOOD CLINICAL OUTCOME: TECHNIQUE CORE LAB WAS BLINDED TO mRS



- **MFPE AND TRUE FPE WERE SIGNIFICANTLY HIGHER IN THE BGC GROUP WHEN *COMPARED TO* EITHER THE CGC OR DLBC GROUPS.**
  - OVERALL: MFPE 60.3%, TRUE FPE 47.7%
- **FINAL *SUCCESSFUL REPERFUSION* RATES WERE SIMILAR AMONG THE GROUPS.**
- **NO DIFFERENCES WERE OBSERVED IN ENT, SICH OR ALL-CAUSE MORTALITY RATES.**
- **RATE OF GOOD CLINICAL OUTCOME WAS SIGNIFICANTLY HIGHER IN THE BGC GROUP WHEN *COMPARED TO* EITHER THE CGC OR DLBC GROUPS**

STRATIS
CONCLUSIONS

- STRATIS DOCUMENTS THAT THE TECHNICAL AND CLINICAL OUTCOMES OF THE LANDMARK TRIALS USING THE SAME DEVICE CAN BE REPRODUCED IN A REAL-WORLD SETTING. *DESPITE* ENROLLING A POPULATION WITH HIGHER MEAN BASELINE NIHSS AND MORE RISK FACTORS THAN SEER, RESULTS DEMONSTRATE THAT MT WITH A MEDTRONIC STENT RETRIEVER IS BOTH SAFE AND EFFECTIVE
- THE SHORTER DOOR TO PUNCTURE INTERVALS IN STRATIS MAY SUGGEST AN INCREASING AWARENESS OF THE IMPORTANCE OF RAPID HOSPITAL WORKFLOW SINCE PUBLICATION OF THE SEER TRIALS.
- DIRECT PATIENTS IN STRATIS HAD BETTER CLINICAL OUTCOMES AND SHORTER ONSET TO PUNCTURE TIME VS. TRANSFER PTS. VIRTUAL BY PASS PROVIDED HIGHER GAIN IN SHORTENING ONSET PUNCTURE TIME WITH 3-5% LOSS OF TPA WITH LESS THBAN 17 MIN DELAY.
- *DESPITE HAVING SIMILAR FINAL SUCCESSFUL RECANALIZATION RATES*, BGC USE AS THE FIRST APPROACH IN STRATIS DEMONSTRATED A HIGHER RATES OF FPE AND GOOD CLINICAL OUTCOME AT 90 DAYS COMPARED TO CGC AND DLBC.

STRATIS
ENROLLING SITES

Nils H. Mueller-Kronast, MD Advanced Neuroscience Network/Tenet South Florida	**Rishi Gupta, MD** WellStar Kennestone Regional Medical Ctr
Diogo C. Haussen, MD Grady Memorial Hospital	**Ashutosh P. Jadhav, MD** University of Pittsburgh Medical Center
Frank R. Hellinger, Jr., MD Florida Hospital	**Ameer E. Hassan, DO** Valley Baptist Medical Center
Dileep R. Yavagal, MD University of Miami Hospital	**Coleman O. Martin, MD** St. Luke's Hospital of Kansas City
Tom L. Yao, MD Norton Healthcare	**Curtis A. Given, II, MD / Christian Ramsey, MD / Benjamin Newman, MD** Baptist Health Lexington/Central Baptist

55 US Centers

Geographic Distribution of Enrolling Hospitals

Hormozd Bozorgchami, MD Oregon Health and Science Univ Hosp	**Thomas J. Grobelny, MD** Advocate Christ Medical Center	**David F. Kallmes, MD** Mayo Clinic, Rochester
M. Ali Aziz-Sultan, MD Brigham and Women's Hospital	**Colin P. Derdeyn, MD / DeWitt Cross, MD** Barnes Jewish Hospital	**Ajit S. Puri, MD / David Rex, MD** University of Mass. Memorial Med Centr
Brijesh P. Mehta, MD South Broward Hospital	**Aamir Badruddin, MD** Presence St. Joseph Medical Center	**Eric M. Deshaies, MD** Crouse Hospital
Vivek Deshmukh, MD Providence St. Vincent Medical Ctr	**Alex Abou-Chebl, MD** Baptist Hospital Louisville	**Aniel Majjhoo, MD** McLaren Flint
Sidney Starkman, MD University of California Los Angeles	**Clemens M. Schirmer, MD /Tarun Bhalla, MD** Geisinger Clinic	**Osama O. Zaidat, MD** Froedtert Hospital
Scott H. McPherson, MD St. Dominic's - Jackson Memorial Hosp	**Gaurav Jindal, MD** University of Maryland Med Center	**M. Asif Taqi, MD** Los Robles Medical Center
M. Shazam Hussain, MD Cleveland Clinic	**Lucian Maidan, MD** Mercy San Juan Med Ctr/Mercy Gen.	**Peter Sunenshine, MD** Banner University Medical Center
Robert D. Ecker, MD Maine Medical Center	**Rohan Chitale, MD** Vanderbilt University Medical Center	**Richard D. Fessler, MD** St. John Providence Hospital, Detroit
Italo Linfante, MD Baptist Hospital of Miami	**P. Roc Chen, MD** Memorial Hermann Texas Med Ctr	**Shuichi Suzuki, MD** University of California Irvine
Nirav Vora, MD OhioHealth Riverside Methodist Hosp	**Travis M. Dumont, MD** University of Arizona Med Center	**James Bartscher, MD / David H. Robinson, MD** Virginia Mason Medical Center
Peter Kvamme, MD University of Tennessee Medical Ctr	**Abdulnasser Alhajeri, MD** University of Kentucky Hospital	**Blaise W. Baxter, MD** Erlanger Medical Center
Ike Thacker, MD Baylor University Medical Center	**Akram Shhadeh, MD / Khaled Asi, MD** Aurora Hospital, Milwaukee	**Mouhammad A. Jumaa, MD** ProMedica Toledo Hospital
Richard P. Klucznik, MD Methodist Hospital, Houston	**Jeffrey Carpenter, MD** West Virginia Univ/Ruby Memorial	**Josser E. Delgado Almandoz, MD** Abbott Northwestern Hospital
Stephen J. Monteith, MD Swedish Medical Center	**Adnan H. Siddiqui, MD** Buffalo General Medical Center	**Jerry C. Martin, MD** California Pacific Medical Center
Eric Sauvageau, MD Baptist Medical Center - Jacksonville	**Alan Boulos, MD** Albany Medical Center	**Joey D. English, MD** Carolinas Medical Center

THANK YOU