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Achieving BP Goals After Stroke
Stroke Advisory Council 11/2/2021

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Objectives

- To highlight the public health problem of hypertension in relation to stroke
- Data and new guidelines for ideal blood pressure after stroke
- To describe the aims and goals of the new PCORI-funded Telehealth-Enhanced Assessment and Management after Stroke—BP (TEAMS-BP)
- Our plans to scale this solution for other health systems

Hypertension: A Major Public Health Problem

Call to Action:

1) make hypertension control a national priority;

2) ensure that communities support hypertension control;

3) optimize patient care for hypertension control.

--Jerome Adams, MD, MPH and Janet Wright, MD

JAMA 2020; Oct 7 doi:10.1001/jama.2020.20356

Hypertension and stroke

- Key modifiable risk factor for stroke
- Strongest risk factor for recurrent stroke
- Prevalence of hypertension in patients with stroke ranges from 70% to 82%; associated with risk of major adverse cardiovascular events (recurrent stroke, MI, and cardiovascular death)
- Many trials of BP lowering have focused on primary prevention or only stroke survivors with mild deficits
- About 230,000 strokes could be prevented each year if SBP were lowered by 10 mm Hg or DBP by 5 mm Hg

Chimowitz, et al. NEJM 2011;365:993-1003; Benavente, et al. Lancet 2013;382:507-15.

Hypertension and Stroke: Vulnerable Populations

- African Americans are adversely affected by poorly controlled BPs

10 mm Hg increase in SBP → 24% ↑ in stroke in African Americans

→ 8% ↑ in whites

Howard G, Lackland DT, Kleindorfer DO, et al. Racial differences in the impact of elevated systolic blood pressure on stroke risk. *JAMA internal medicine.* 2013;173(1):46-51.

Hypertension and Stroke: Vulnerable Populations (cont.)

- Stroke patients with physical or cognitive deficits
- Stroke patients over age 75, higher risk for poor outcome
- Social determinants of health: poor access to medications and services that could impact BP

No clinical trials have specifically focused on how to most effectively lower BP in stroke patients with physical and cognitive disabilities, and those at highest risk for stroke, including African Americans and the elderly.

Controlling Blood Pressure Post Stroke

- Know your numbers
- Medication Management and Adherence
- Physical Activity
- Diet: low salt, high potassium

Evidence for better BP management

- BP self-monitoring by itself was not associated with BP lowering.

Self-monitoring combined with interventions such as systematic medication titration or lifestyle coaching was associated with a 6 mm Hg reduction of SBP

Tucker KL, Sheppard JP, Stevens R, et al. Self-monitoring of blood pressure in hypertension: A systematic review and individual patient data meta-analysis. *PLoS medicine.* 2017;14(9):e1002389.

New Secondary Prevention Guidelines

1	B-R	2. In patients with hypertension who experience a stroke or TIA, an office BP goal of <130/80 mm Hg is recommended for most patients to reduce the risk of recurrent stroke and vascular events.[185,190–194]
1	B-NR	3. In patients with hypertension who experience a stroke or TIA, individualized drug regimens that take into account patient comorbidities, agent pharmacological class, and patient preference are recommended to maximize drug efficacy.[188,189,195,196]
2a	B-R	4. In patients with no history of hypertension who experience a stroke or TIA and have an average office BP of ≥130/80 mm Hg, antihypertensive medication treatment can be beneficial to reduce the risk of recurrent stroke, ICH, and other vascular events.[190,191,193,197]

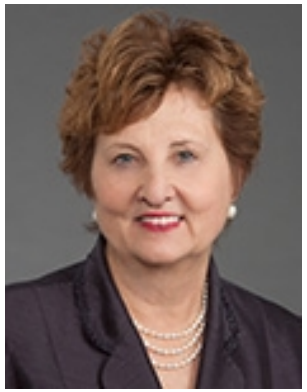
Knowledge gaps and future research

-Optimal timing to begin BP lowering after acute stroke?

-Do lower BP targets improve or worsen cognition?

-Optimal BP target for the very elderly or those with diabetes?

Pamela Duncan, PhD, PT, PI



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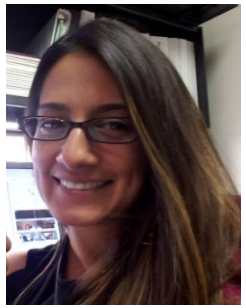
(COMPASS)- A Pragmatic Trial of Transitional Care

Transitional care model tested in real world practice



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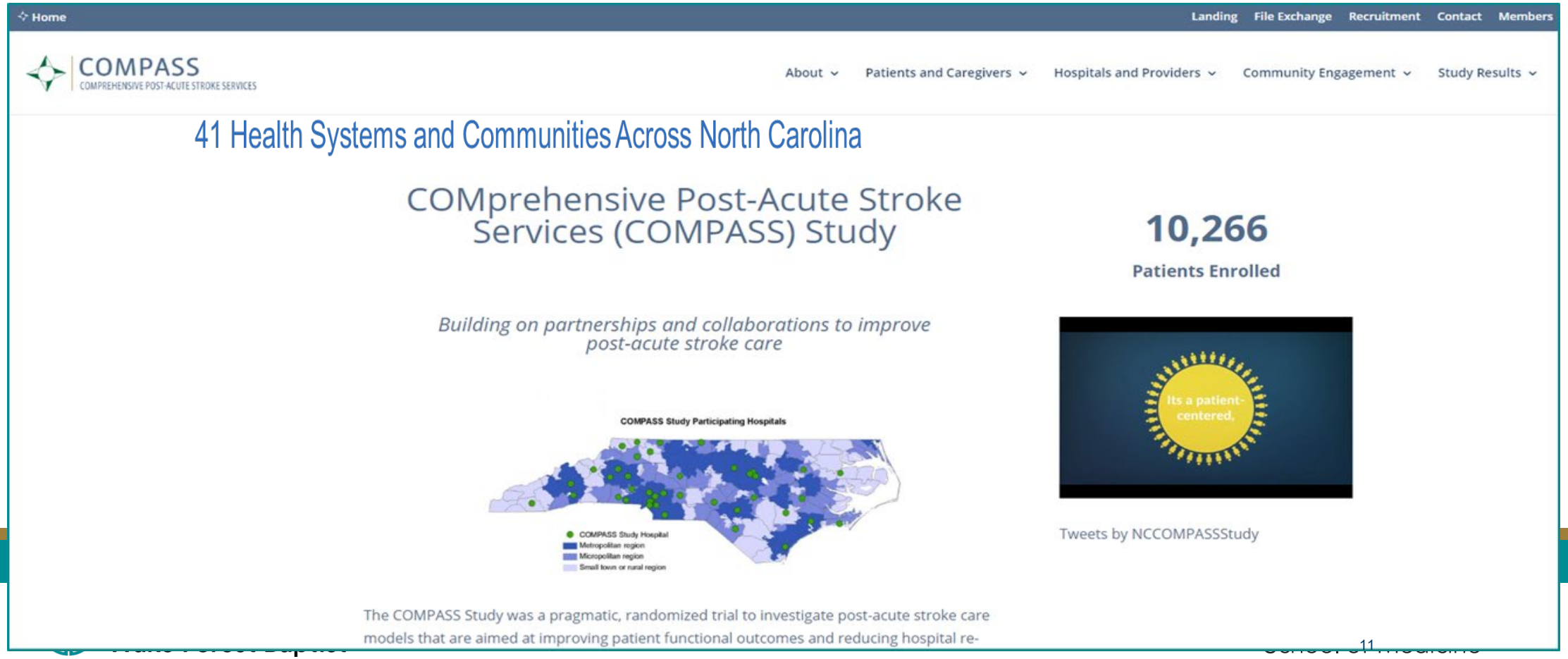
COMPASS-CP: Scaled, Implemented and Evaluated in Thousands of Stroke Patients and Diverse Health Systems



COMPASS

Care Team

- Advanced Practice Provider or Physician
- Post-Acute Care Nurse Coordinator

Intervention Highlights

- Digital tool to assess on research platformthe functional and social determinants of self-management and health
  - Individualized care plans
  - Secondary Prevention
  - Rehabilitation and Recovery
  - Caregiver Support
  - Referrals to Community Resources

Quality performance measures

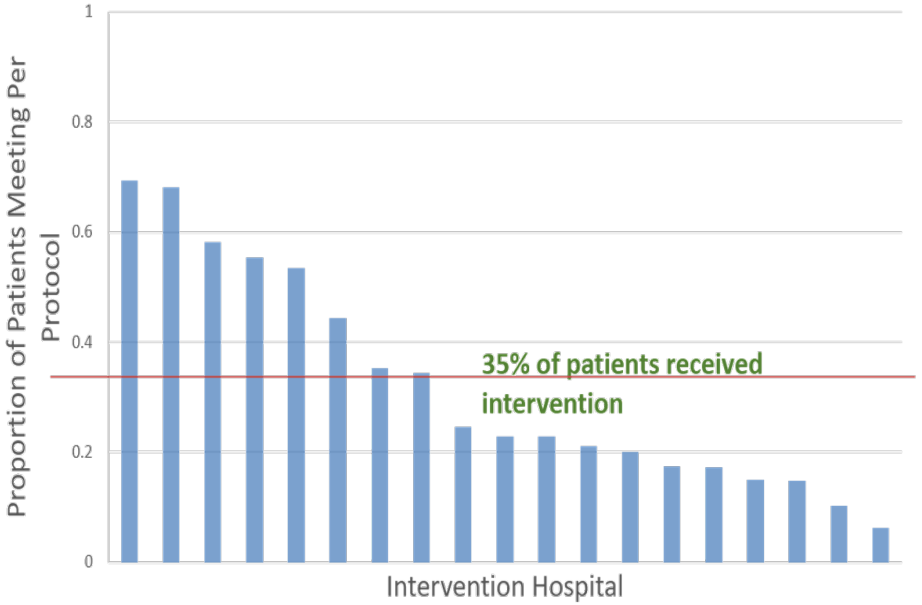
Numbers
Know your numbers - blood pressure, blood sugar, cholesterol, etc.

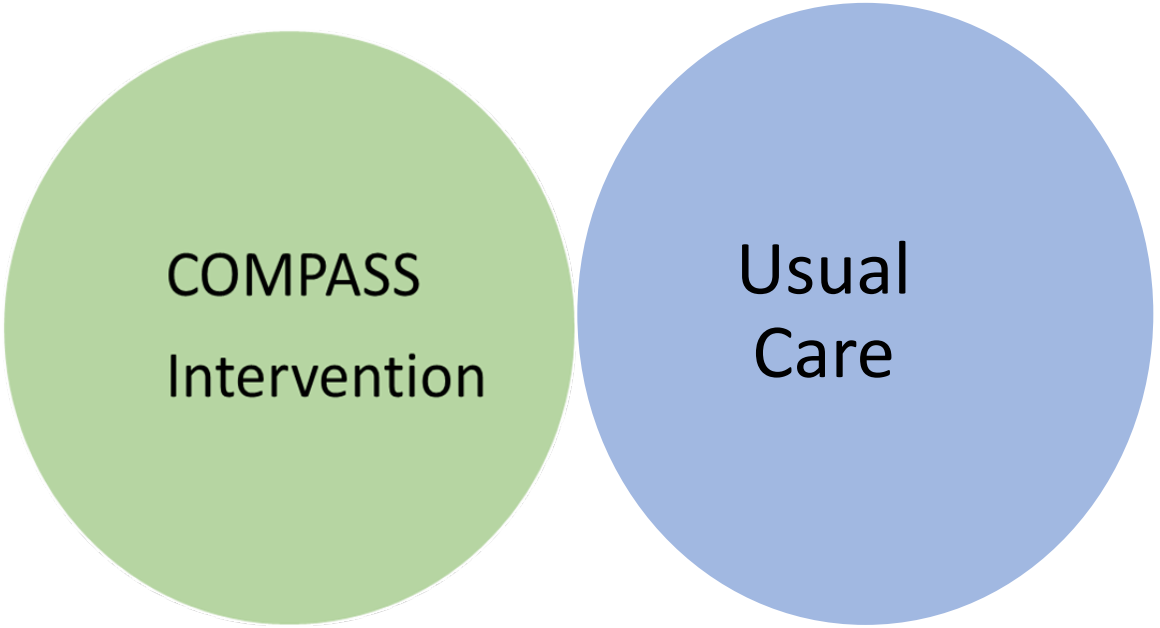
Engage
Be active - engage your mind and body

Support
Ask for help - for yourself and your caregivers from community resources

Willingness
Be willing – manage your medicines and lifestyle choices

Bushnell, C.D., Duncan, P.W., Lycan, S.L., et al. (2018) A Patient-Centered Approach to Post-Acute Stroke Care: The COMprehensive Post-Acute Stroke Services (COMPASS) Model. *American Geriatrics Society*, 66(5).



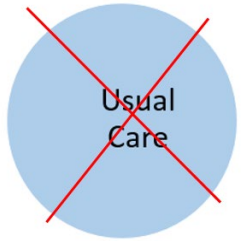


Variability in uptake across health systems only 35% of patients received the intervention

Intention to Treat – No differences in any outcomes measure except improvement in self-monitoring blood pressure

COMPASS-CP Produced Results

Within Intervention Hospitals



We looked at just the COMPASS intervention group and compared the patients who **GOT** the intervention with the patients who did **NOT GET** the intervention

Outcome: Improved 90-day Functional Status

- Decreased Disability
- Increased 90 day Survival
- Blood Pressure Monitoring
- Decreased Depression
- Decreased Falls

Duncan et al. A Randomized Pragmatic Trial of Stroke Transitional Care: The COMPASS Study (

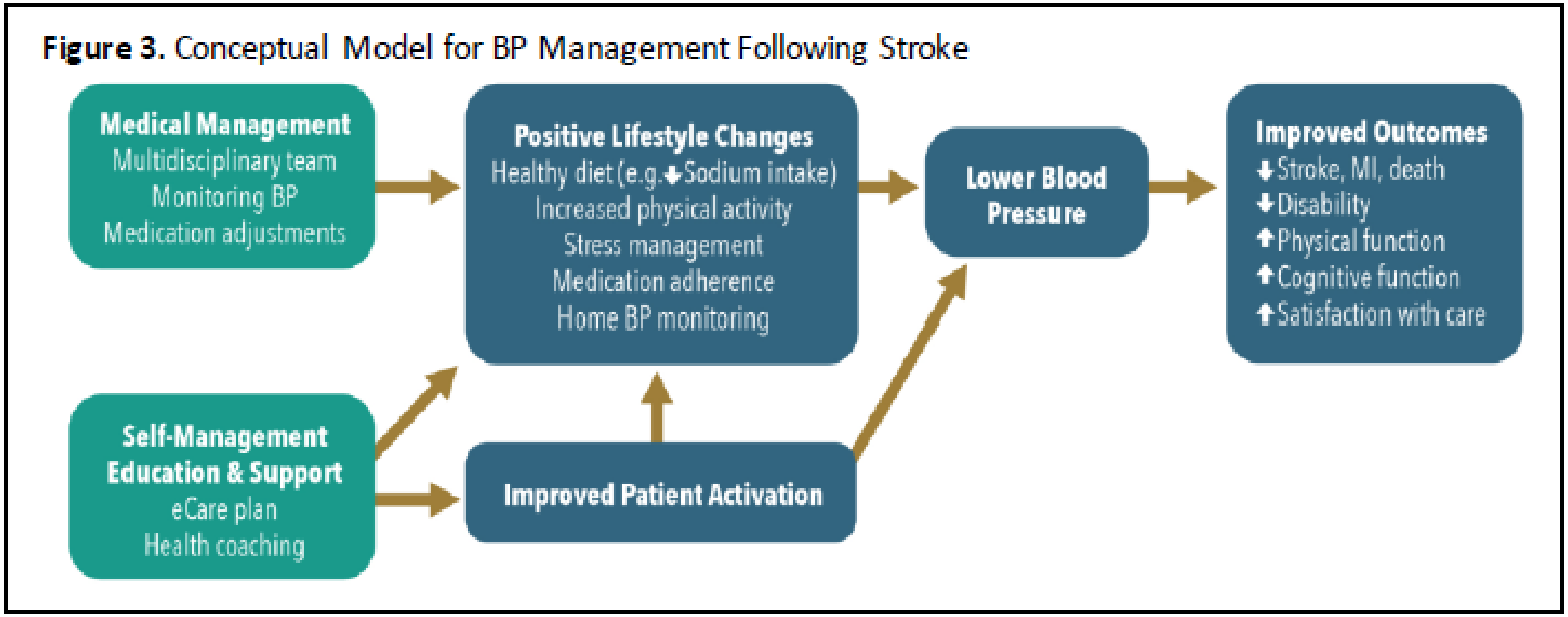
COMPASS Lessons Learned

- Successful delivery of the intervention related to organizational readiness and accountability
- System, provider, and patient barriers all led to poor uptake of the intervention
- Transitional care visits within14 days *may be necessary but not sufficient for management of complex stroke patients* and does not equal better long term outcomes
- We did not measure BPs so uncertain whether better self-monitoring at 90 days equates to better BP control

Next steps for COMPASS and secondary prevention

Telehealth-Enhanced Assessment and Management after Stroke—Blood Pressure (TEAMS-BP)

Conceptual Model



Target Blood Pressure For Secondary Prevention

- Transitional Care for 7-14 day NP visit for medical management, referrals and catalyst for chronic care management
- Complex Chronic Care Management – Coaching in collaboration with clinical management

<u>CMS Reimbursements</u>

- TCM Billing
- NP follow up visit
- Chronic Care Management for Coaching
- Remote Patient Monitoring

Monumental Challenges for Health care systems, Providers, and Payers

CMS.gov
Centers for Medicare & Medicaid Services

Recognized gaps and provides reimbursement for Transitional Care, Chronic Care Management, Remote Patient Monitoring

- ***Yet uptake < 28% for eligible patients***

WHY?

- Poor Electronic Medical Record Harmonization
- Lack of Digital Tools
- Lack of Evidence Based Care Models

Phased Large Awards for Comparative Effectiveness Research -- PCORI

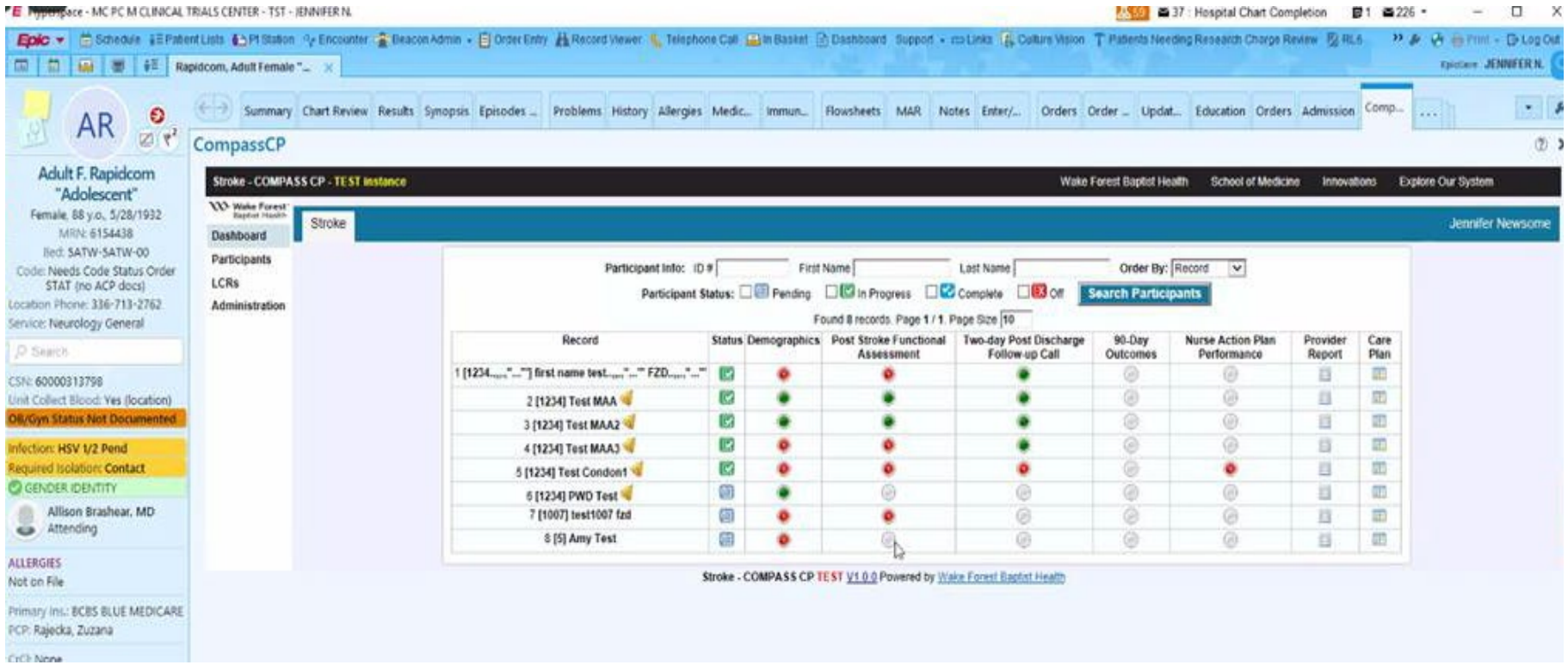
Comparing Intensive Tailored Telehealth (ITTM) vs Intensive Clinic Management

Integrating digital management tools, wearables, telehealth solutions, and coaching for individualized and *actionable* care of complex and vulnerable patients for blood pressure management

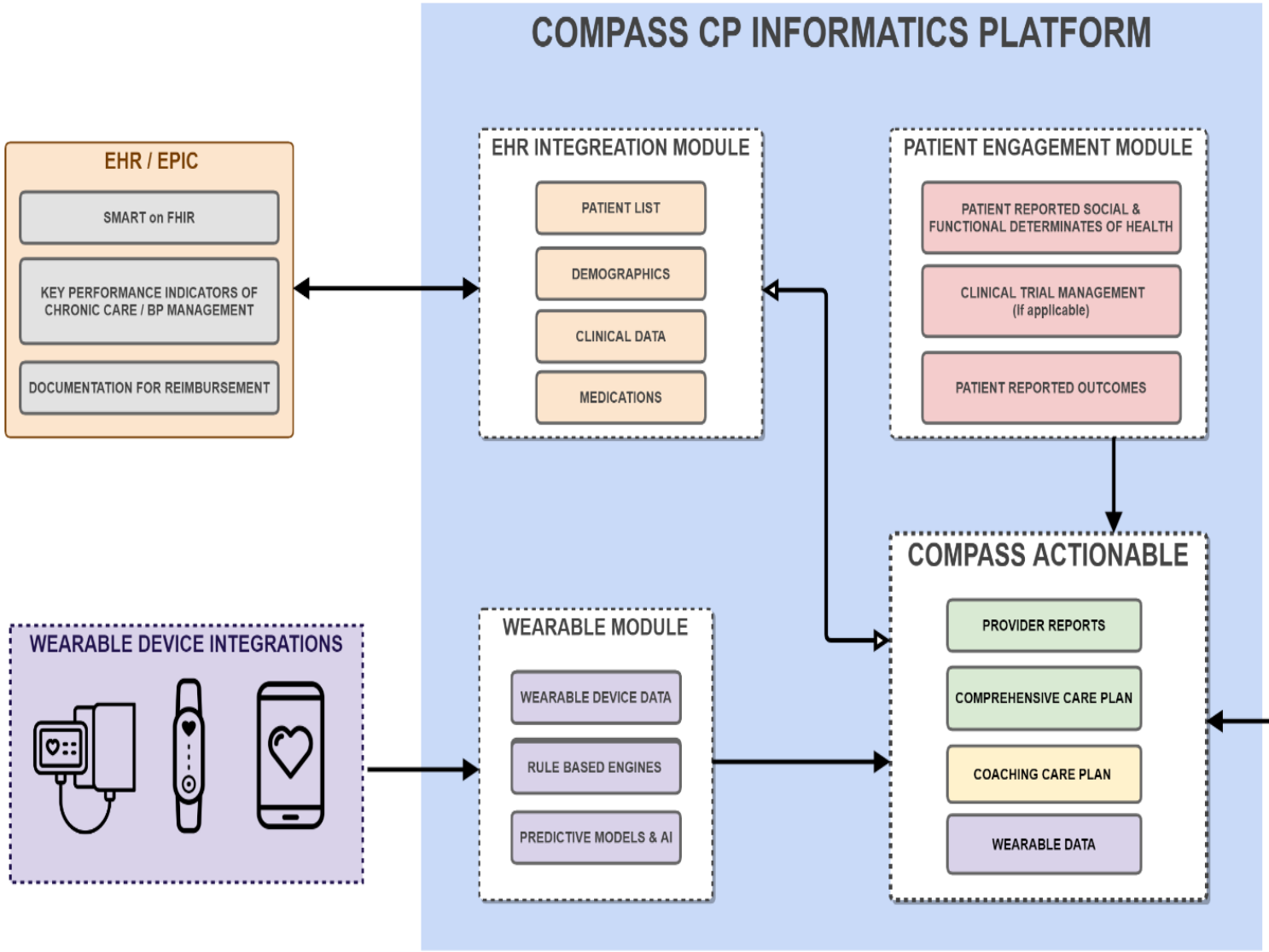
Tailored Telehealth-Enhanced Intervention using COMPASS-CP

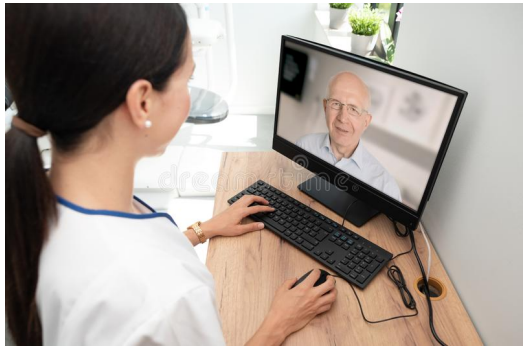
- ✓ EHR Integration
- ✓ Wearables
- ✓ Patient Reported Assessments Social and Functional Factors
- ✓ Develops Care Plans and Informs Coaching Plans
- ✓ Communicates with Clinical Providers, Coaching Teams, Patients, Caregivers
- ✓ **Data Back to EHR for Documentation and Billing**
- ✓ Artificial intelligence for analysis of data
- ✓ Database for Predictive Modeling

Dashboard and Navigation



- Overview of all accepted patients.
- Colors indicate status of patient.
- Clicking on patient name opens the timeline.
- Clicking on the Dashboard brings you to the Dashboard.

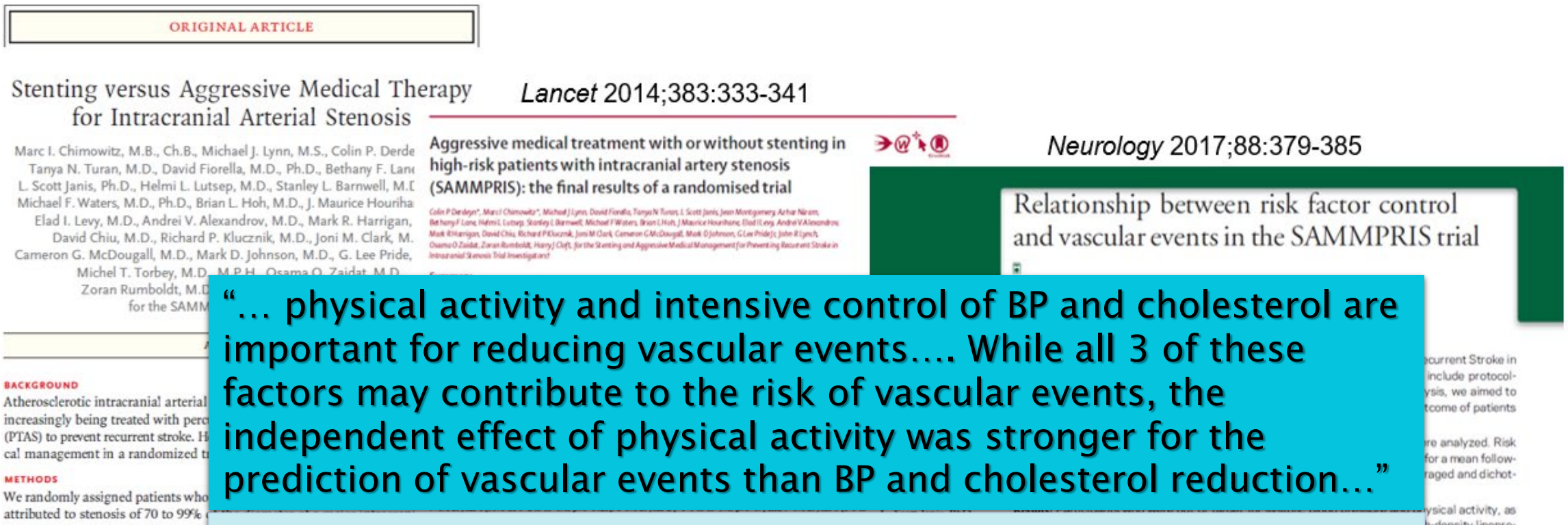

COMPASS CP INFORMATICS PLATFORM
EHR / EPIC
SMART on FHIR
KEY PERFORMANCE INDICATORS OF CHRONIC CARE / BP MANAGEMENT
DOCUMENTATION FOR REIMBURSEMENT
EHR INTEGREATION MODULE
PATIENT LIST
DEMOGRAPHICS
CLINICAL DATA
MEDICATIONS
PATIENT ENGAGEMENT MODULE
PATIENT REPORTED SOCIAL & FUNCTIONAL DETERMINATES OF HEALTH
CLINICAL TRIAL MANAGEMENT (If applicable)
PATIENT REPORTED OUTCOMES
COMPASS ACTIONABLE
PROVIDER REPORTS
COMPREHENSIVE CARE PLAN
COACHING CARE PLAN
WEARABLE DATA
WEARABLE DEVICE INTEGRATIONS
WEARABLE MODULE
WEARABLE DEVICE DATA
RULE BASED ENGINES
PREDICTIVE MODELS & AI
COACHING PARTNER
LIFESTYLE COACHING CARE PLAN
FREQUENCY AND DURATION OF COACHING



INTERVENT
Better Health for Life™

OUTSOURCE Coaching to INTERVENT

Stenting vs. Aggressive Medical Management for Preventing Recurrent Stroke in Intracranial Stenosis (SAMMPRIS)


The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Stenting versus Aggressive Medical Therapy for Intracranial Arterial Stenosis

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Zoran Rumboldt, M.D.
for the SAMM

BACKGROUND
Atherosclerotic intracranial arterial
increasingly being treated with perc
(PTAS) to prevent recurrent stroke. H
cal management in a randomized t

METHODS
We randomly assigned patients who
attributed to stenosis of 70 to 99%

Lancet 2014;383:333-341

Aggressive medical treatment with or without stenting in high-risk patients with intracranial artery stenosis (SAMMPRIS): the final results of a randomised trial

Neurology 2017;88:379-385

Relationship between risk factor control and vascular events in the SAMMPRIS trial

current Stroke in
include protocol-
ysis, we aimed to
tcome of patients

re analyzed. Risk
for a mean follow-
raged and dichot-

ysical activity, as
h-density lipopro-
ction, or vascular
ultivariable anal-
nyocardial infarc-

d be aggressively
events. Physical
rongest predictor

"… physical activity and intensive control of BP and cholesterol are important for reducing vascular events…. While all 3 of these factors may contribute to the risk of vascular events, the independent effect of physical activity was stronger for the prediction of vascular events than BP and cholesterol reduction…"

The increase in physical activity "was largely due to compliance with the lifestyle modification program [INTERVENT] provided in the trial, which also contributed to the high percentage of patients achieving other risk factor targets."

TEAMS-BP Overview

Overall Specific Aims:

1. Compare effectiveness of ITTM v. ICM on reaching target of SBP ≤130 mm Hg 6-months post-stroke.
2. Compare effectiveness of ITTM v. ICM on improving major adverse cardiovascular events (MACE) and patient activation for BP management.
3. Determine whether ITTM or ICM is most effective at improving SBP and patient activation among:
   - African Americans
   - Patients with physical (mRankin ≥ 2) or cognitive (Montreal Cognitive Assessment ≤ 22) disability
   - Patients aged ≥75 years

Outcomes and Measures: Feasibility

1) SBP control to 130 mmHg
2) PROs (patient activation)
3) patient and provider satisfaction
4) protocol adherence to BP measurement and visits

- REDCap provider surveys after first 10 participants in each group from each site and after 100 participants (pilot trial target)
- Research Participant Perception Survey to participants

Main Trial Outcomes

Primary outcome: SBP < 130 mm Hg at 6 months

Secondary outcomes:

- Mean change in SBP at 6 months
- Major adverse cardiovascular events (MACE)
- Patient Activation Measure (13-item PRO measuring knowledge, skills, and confidence to manage care; validated in stroke patients)

Sites: All using Epic electronic health record platform

- Wake*
- MUSC*
- Duke*
- UNC-CH*
- Vanderbilt*
- Mayo Clinic-Florida*
- Health Sciences South Carolina*
- UAB
- Erlanger Health (Chattanooga, TN)

*PCORNet site/STAR Network

COMPASS-CP Improved Provider and Patient Satisfaction

"[We] implemented this today and what a difference it made. Our time was greatly reduced from check in to check out~ You can't imagine what a sense of accomplishment that was!!!"

Young L MCA occlusion stroke w/cryptogenic etiology. PMH included anxiety, pelvic mass suspicious of cancer, heart fluttering (no atrial fib dx to date), PE w/last admission. I saw her during last hospitalization.

She presented today w/initial SBP 170. After visit SBP 140. Again, this was a classic engaged, yet "highly anxious" patient that had numerous concepts. Cryptogenic stroke w/high suspicion of hypercoag state (in the setting of [illegible] day of admission, she had stroke symptoms during her GYN visit to evaluate "pelvic mass" w/hysterctomy. She did not make it to surgery and came to [our hospital]. She had a occlusion to her left MCA and was treated with IV tPA (c[illegible] w/OB/GYN regarding her bleeding and pelvic mass). Post tPA her stroke score was 0-1. Her main concerns today centered around why she was feeling so [illegible] improving, yet her heart was racing and she couldn't sleep. [illegible] was taking a TCA (amitriptyline) for headaches at night...as per product recommendation, which may not be the best w/heart palpitations, new [illegible] new bilateral PE's. Long story short, I reduced her TCA to every other day and secured an appointment for her w/MMA Neurology to evaluate headache treatment w/ plans for

"... her anxiety was significantly reduced and she trusted our plan of care along w/appreciating both of us helping her navigate the multitude of her health concerns."

Summary

- TEAMS-BP takes COMPASS to the next level
- SBP outcome is clinically meaningful for stroke prevention and decrease in MACE
- COMPASS-CP can be scaled beyond the PLACER trial for chronic care management

COMPASS-CP Scalability

Good Care = Return on Investment for All Stakeholders

Increase sources of revenue (clinic visits, remote monitoring, chronic care management, and decrease no show rates for clinic visits)

Improve quality metrics for value-based care contracts (e.g., improve BP control)

Improved patient outcomes and increased patient & caregiver satisfaction

Avoid costly events (recurrent stroke, functional decline, falls, fractures)

Decrease readmission penalties and length of stay

Predictive Data Base for Population Health Management

Improves efficiency of clinical work and is easily implementable

Questions

COMPASS-CP – Integrates Key Elements of Clinical and Outpatient Care

Care Team

- Advanced Practice Provider or Physician
- Post-Acute Care Nurse Coordinator

Intervention Highlights

- Digital tool to assess the functional and social determinants of self-management and health

Individualized care plans

Caregiver Support

Referrals to Community Resources

Rehabilitation and Recovery

Secondary Prevention

Care Plan Integrated into the EHR