Transitions in Care: Piloting a Neuro Advanced Practice Provider Clinic

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PROJECT SETTING

Neuro ICU & Step-Down Unit

Academic Medical Center

Comprehensive Stroke Center

Small urban setting with a large rural catchment area

Diagnoses

Ischemic and hemorrhagic strokes

Traumatic brain injury (TBI)

Brain tumor

Neuromuscular disorders

Seizures

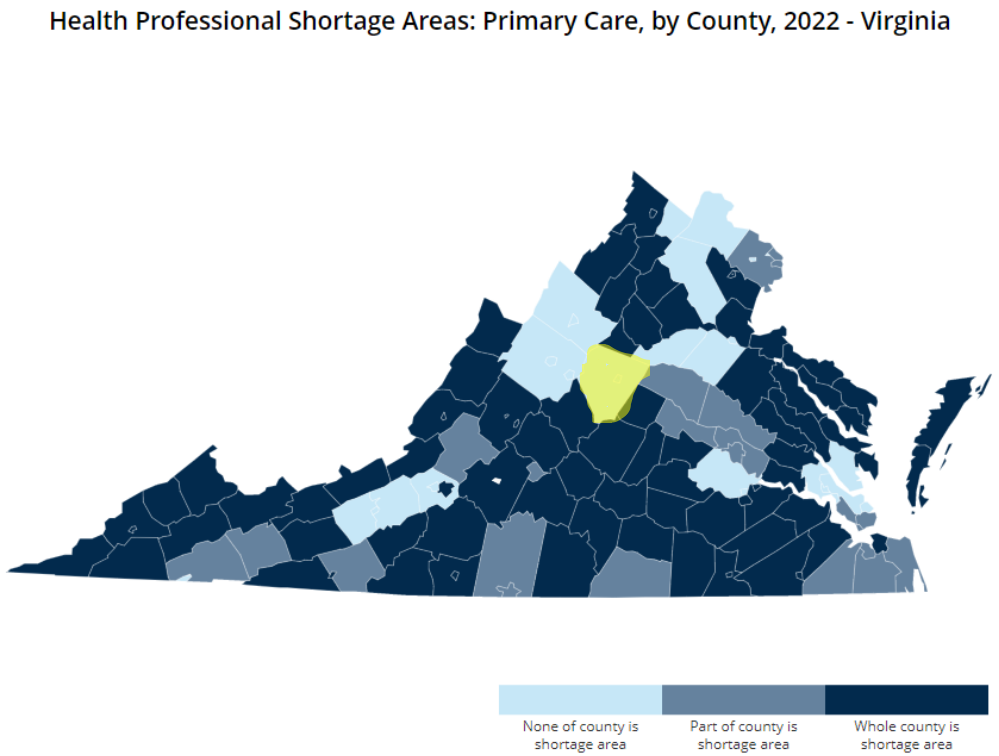
Background: Transitional Care

- Transitional care: hospital to home
  - Medication errors, falls and infections cause readmissions. (Dreyer, 2014)
- Transitional Care Model(Naylor et al., 2004, 2013).
  - Continuity of care, prevention of poor outcomes for at-risk populations. (Naylor et al., 2011)
- Readmission rates: financial incentives for quality outcomes
  - (Centers for Medicare & Medicaid Services, 2021).

Background: Provider Shortages

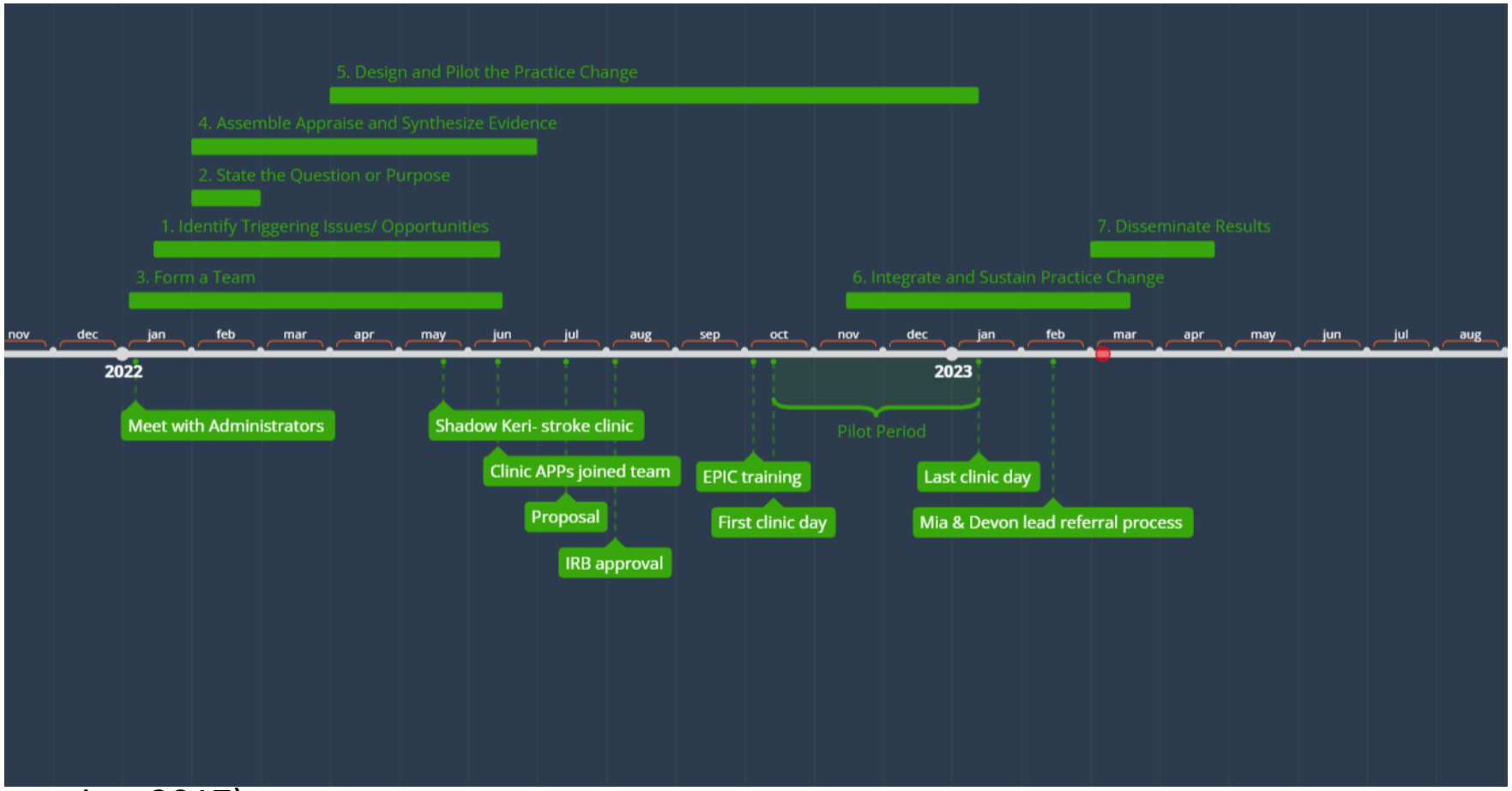
- PCP shortages in Virginia and Nationwide
- Nationwide Neurologist shortage: high demand due to aging population
  - 62% of states have 20% deficit
- Advanced Practice Providers (APPs) can fill gaps of neurologist shortages

(Majersik et al., 2021)



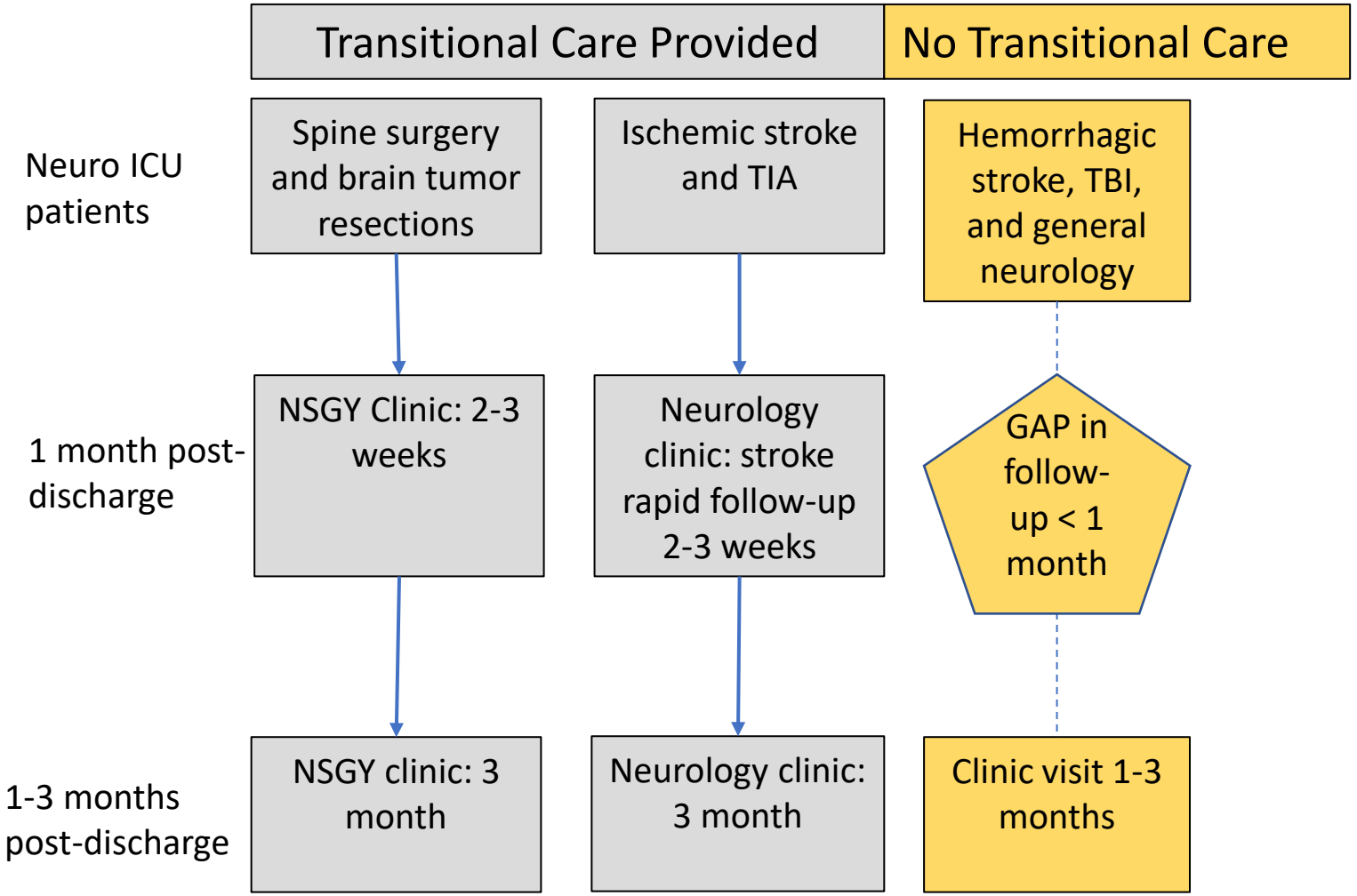
(Rural Health Information Hub, 2022)

Project Timeline: Adaptation of the Iowa Model



(Iowa Model Collaborative, 2017)

Step 1: Identify Triggering Issues



- 65% of readmitted SAH patients did not see a provider prior to readmission. (Chatrath et al., 2020)
- Opportunity: provide follow-up care to these patients through a neuro APP clinic

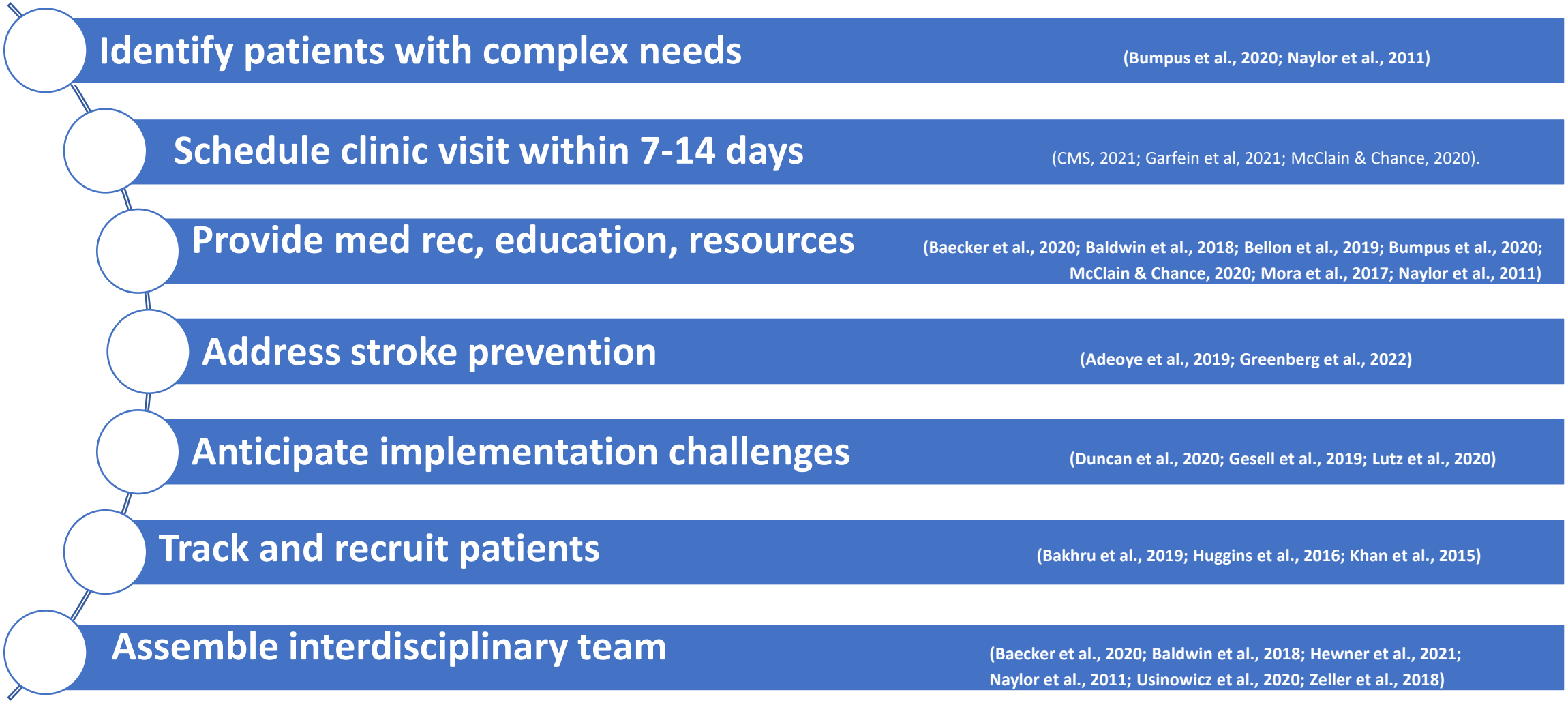
Step 2: Clinical Question

How do transitional care interventions by Advanced Practice Providers improve quality outcomes among recently hospitalized adult patients?

Step 3. Form a Team

- Project Mentor & Lead APP: William Lombardi DNP, AGACNP-BC
- Administrators: Tracey Gosse MBA, MSN; Susan Jackiewicz MHA, MSW
- Neurocritical Care APPs: Michelle Gibb NP; Laura Dubose NP; Mia Lukas DNP; Devon McCabe NP; Alyssa Benning PA; Steven Wiseman NP
- Neurology Clinic: Keri Johnson NP
- IT Senior Analyst for EPIC: Elizabeth Strickland
- Statistician: Ivora Hinton PhD

Step 4. Assemble, Appraise, & Synthesize the Evidence



Step 5. Designed and Piloted the Practice Change

Project Objective: Implement a patient tracking system and referral process for the pilot neuro APP clinic

Methods:

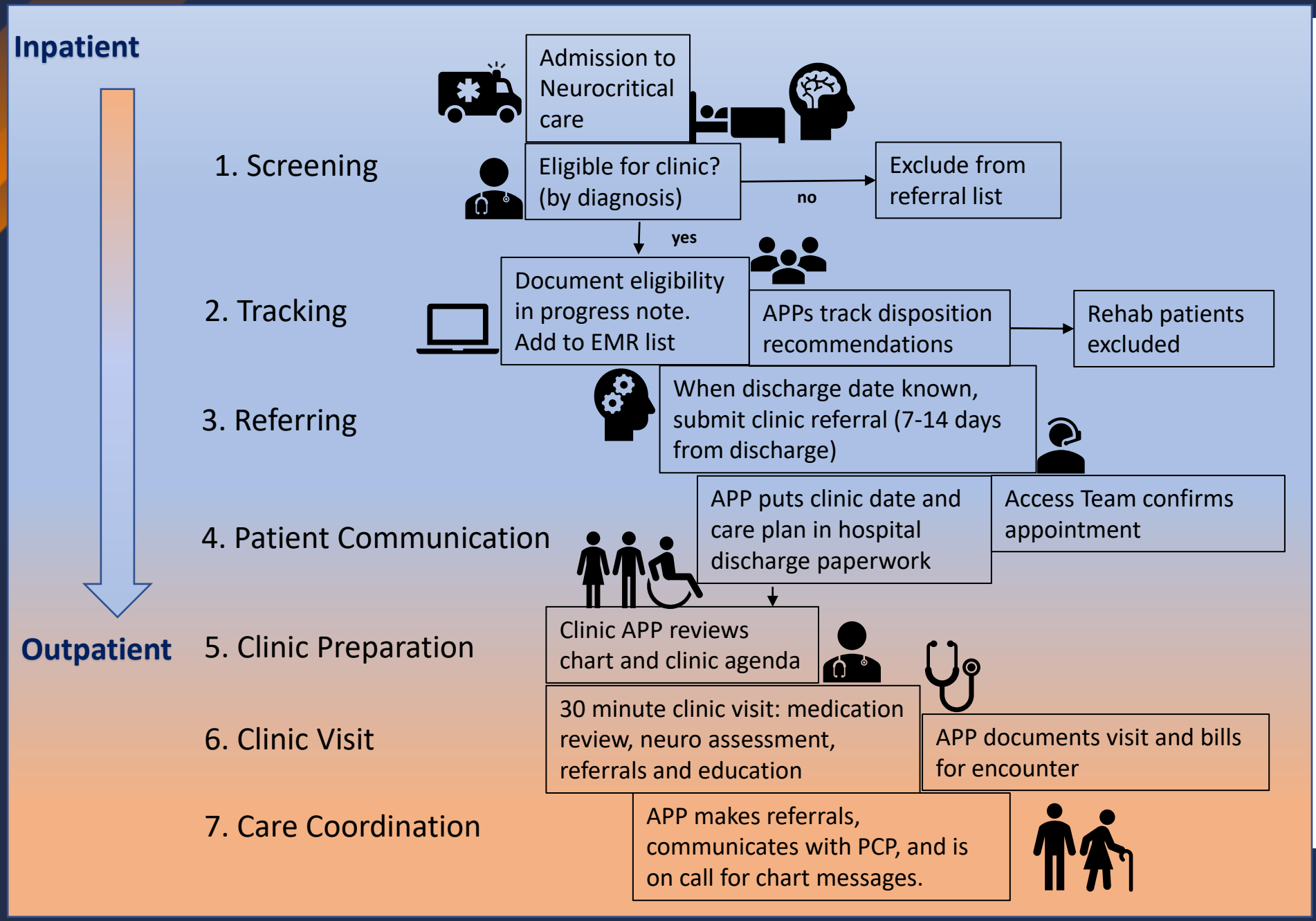
- Identified department gaps in transitional care
- Tracked eligible patients on shared EPIC list
- Appointments generated before discharge
- Incorporated methods into APP workflows

UVA IRB-HSR # 24027 waived of HSR 7/25/22

CLINIC DESIGN

- Neurology Clinic, Primary Care Center
- Friday 1pm-4pm
- Capacity: 4 patients visits per week
- 30 minute visits
- 1 APP each week, rotate
- 7-14 days after discharge
- Models rapid stroke follow-up clinic

Transitions in Care



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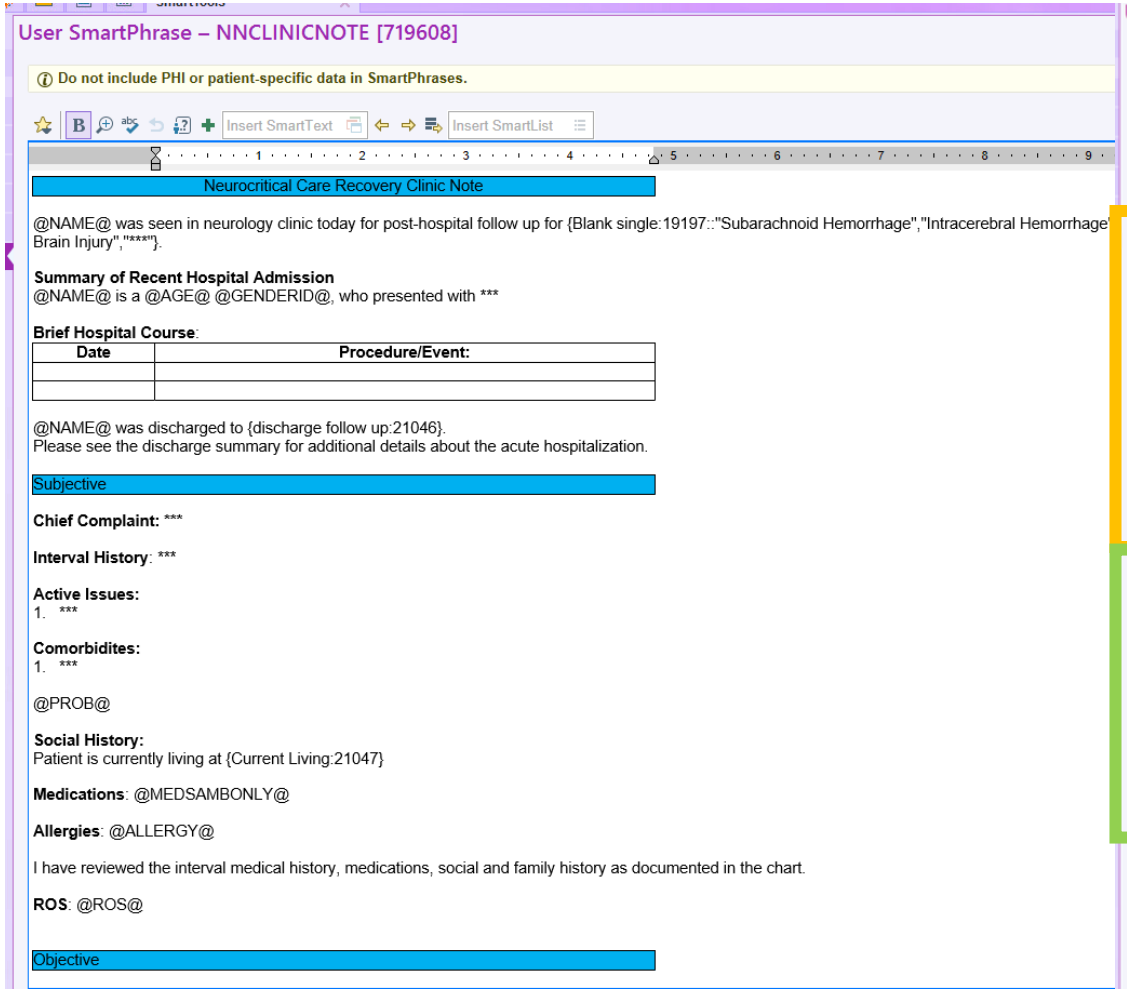
Clinic Documentation



User SmartPhrase – NNCLINICNOTE [719608]

Do not include PHI or patient-specific data in SmartPhrases.

Insert SmartText | Insert SmartList

Neurocritical Care Recovery Clinic Note

@NAME@ was seen in neurology clinic today for post-hospital follow up for {Blank single:19197::"Subarachnoid Hemorrhage","Intracerebral Hemorrhage","Traumatic Brain Injury","***"}.

Summary of Recent Hospital Admission
@NAME@ is a @AGE@ @GENDERID@, who presented with ***

Brief Hospital Course:

Date	Procedure/Event:

@NAME@ was discharged to {discharge follow up:21046}.
Please see the discharge summary for additional details about the acute hospitalization.

Subjective

Chief Complaint: ***

Interval History: ***

Active Issues:
1. ***

Comorbidites:
1. ***

@PROB@

Social History:
Patient is currently living at {Current Living:21047}

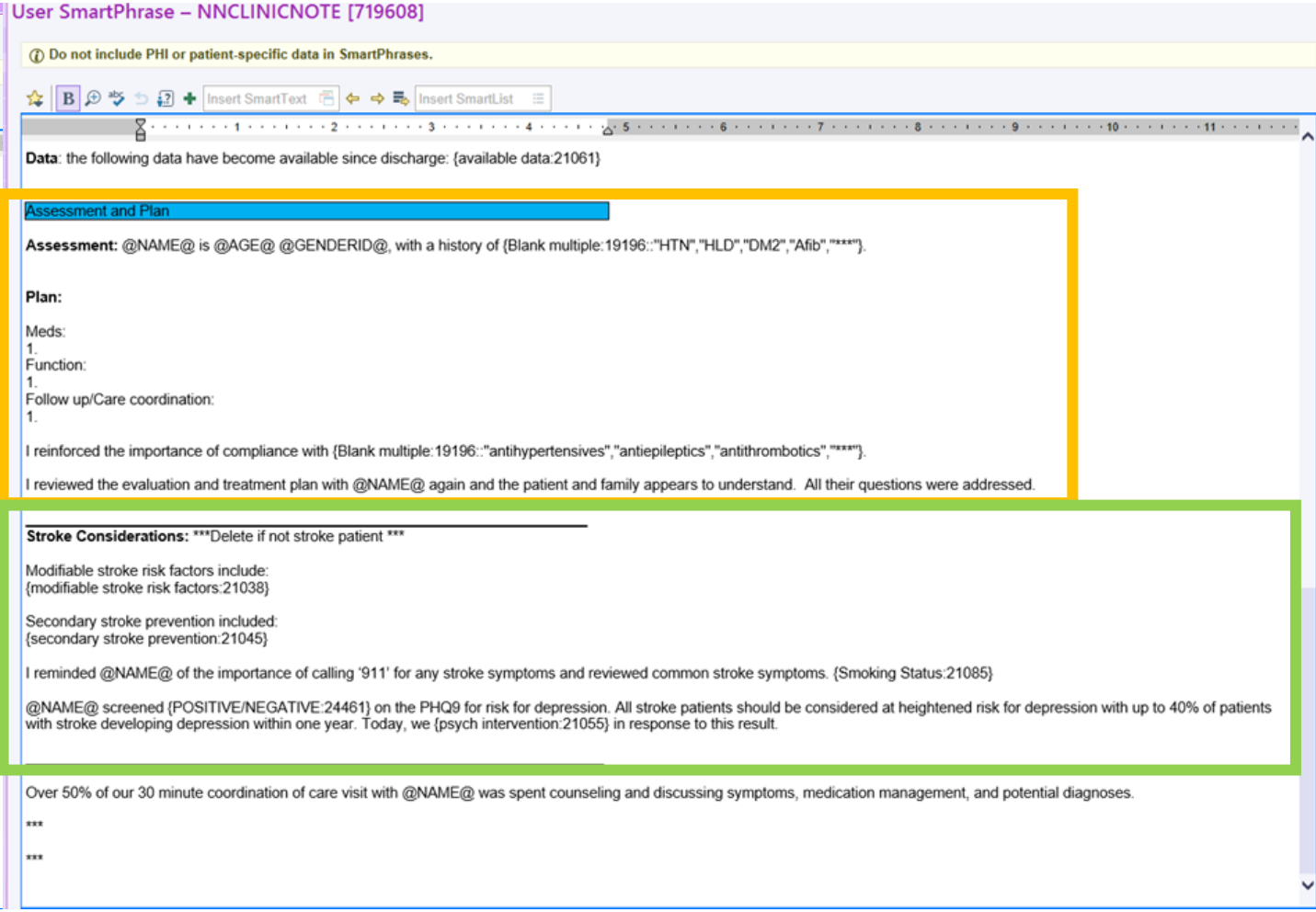
Medications: @MEDSAMBONLY@

Allergies: @ALLERGY@

I have reviewed the interval medical history, medications, social and family history as documented in the chart.

ROS: @ROS@

Objective



User SmartPhrase – NNCLINICNOTE [719608]

Do not include PHI or patient-specific data in SmartPhrases.

Insert SmartText | Insert SmartList

Data: the following data have become available since discharge: {available data:21061}

Assessment and Plan

Assessment: @NAME@ is @AGE@ @GENDERID@, with a history of {Blank multiple:19196::"HTN","HLD","DM2","Afib","***"}.

Plan:

Meds:
1.
Function:
1.
Follow up/Care coordination:
1.

I reinforced the importance of compliance with {Blank multiple:19196::"antihypertensives","antiepileptics","antithrombotics","***"}.

I reviewed the evaluation and treatment plan with @NAME@ again and the patient and family appears to understand. All their questions were addressed.

Stroke Considerations: ***Delete if not stroke patient ***

Modifiable stroke risk factors include:
{modifiable stroke risk factors:21038}

Secondary stroke prevention included:
{secondary stroke prevention:21045}

I reminded @NAME@ of the importance of calling '911' for any stroke symptoms and reviewed common stroke symptoms. {Smoking Status:21085}

@NAME@ screened {POSITIVE/NEGATIVE:24461} on the PHQ9 for risk for depression. All stroke patients should be considered at heightened risk for depression with up to 40% of patients with stroke developing depression within one year. Today, we {psych intervention:21055} in response to this result.

Over 50% of our 30 minute coordination of care visit with @NAME@ was spent counseling and discussing symptoms, medication management, and potential diagnoses.

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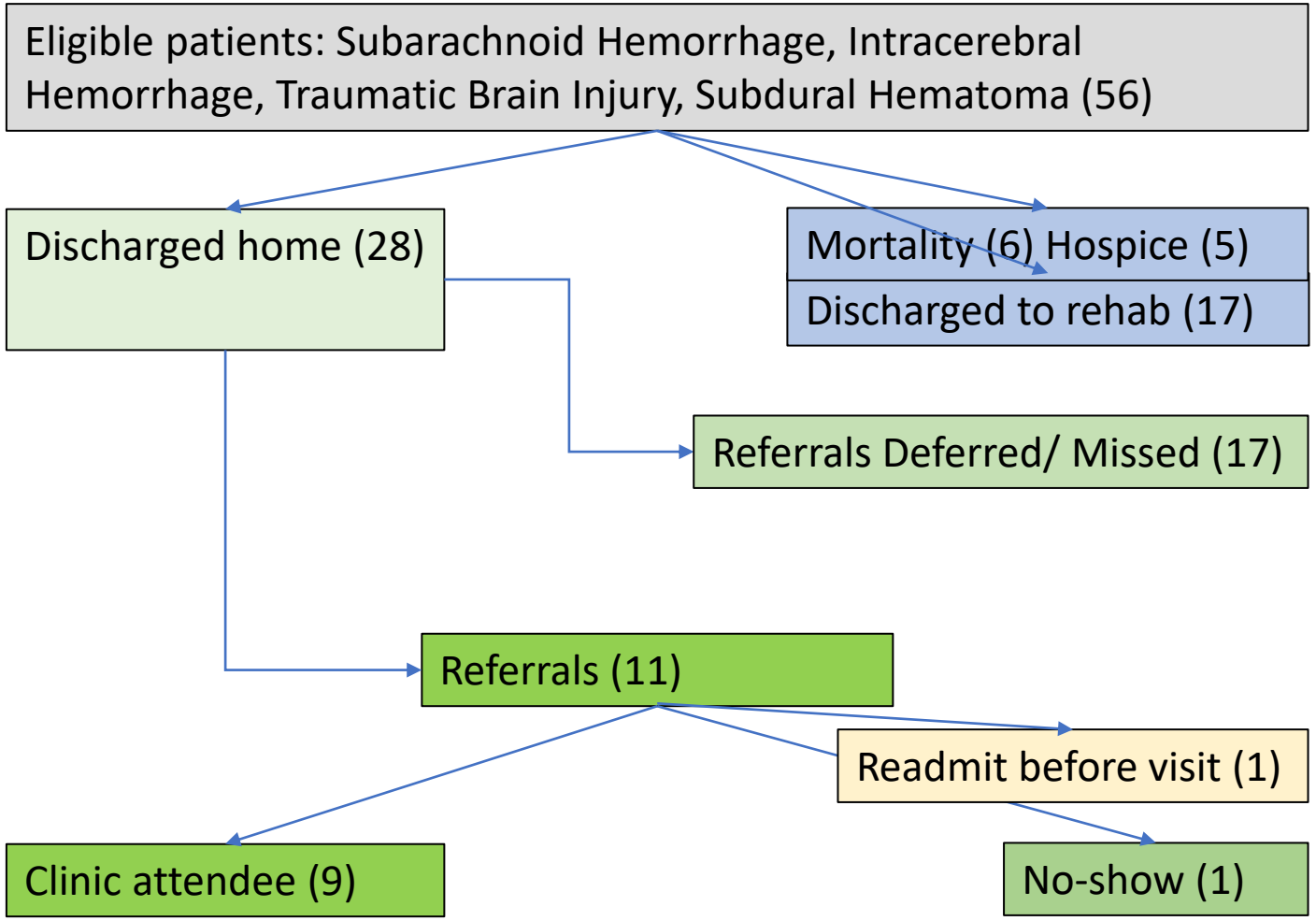
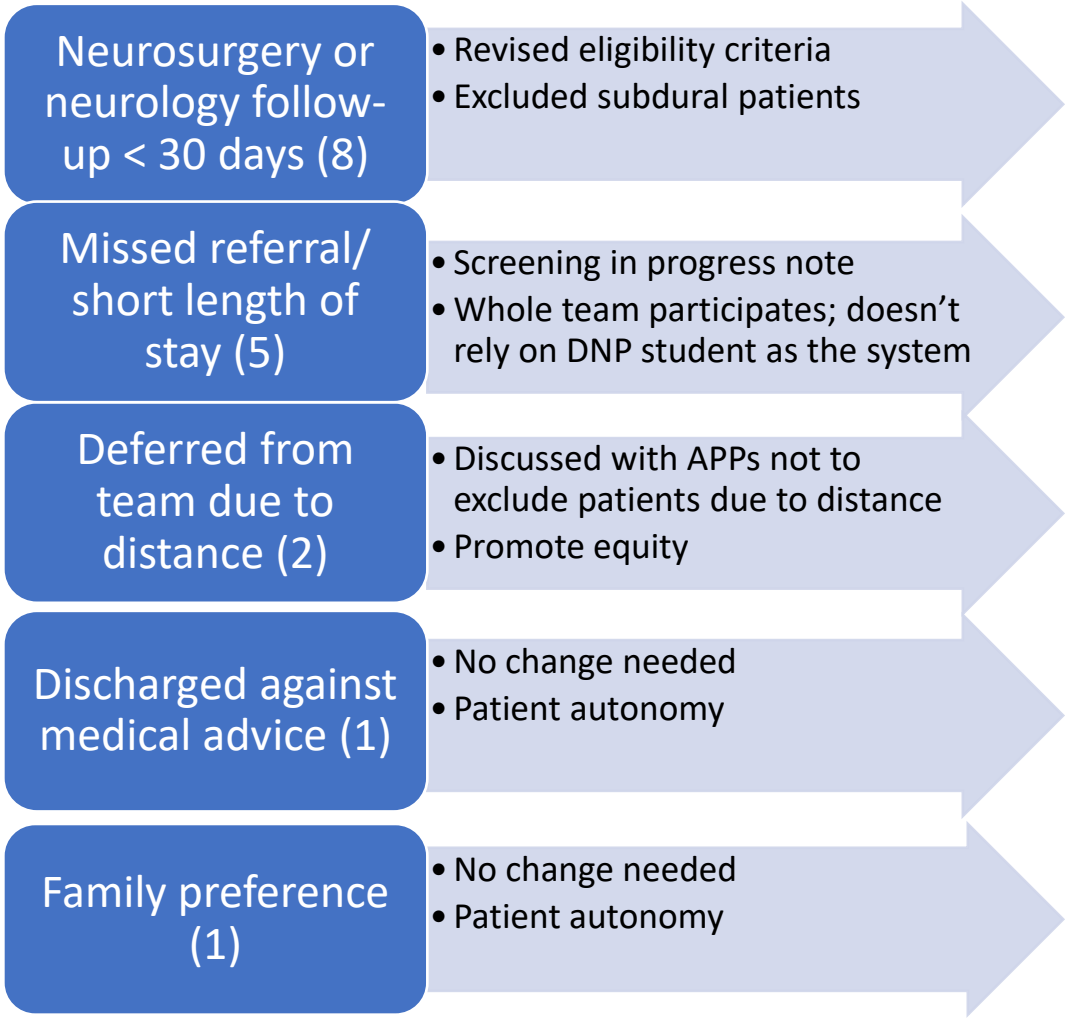
Shared EPIC List

Referral Process



Referral Process: Rapid Cycle Change

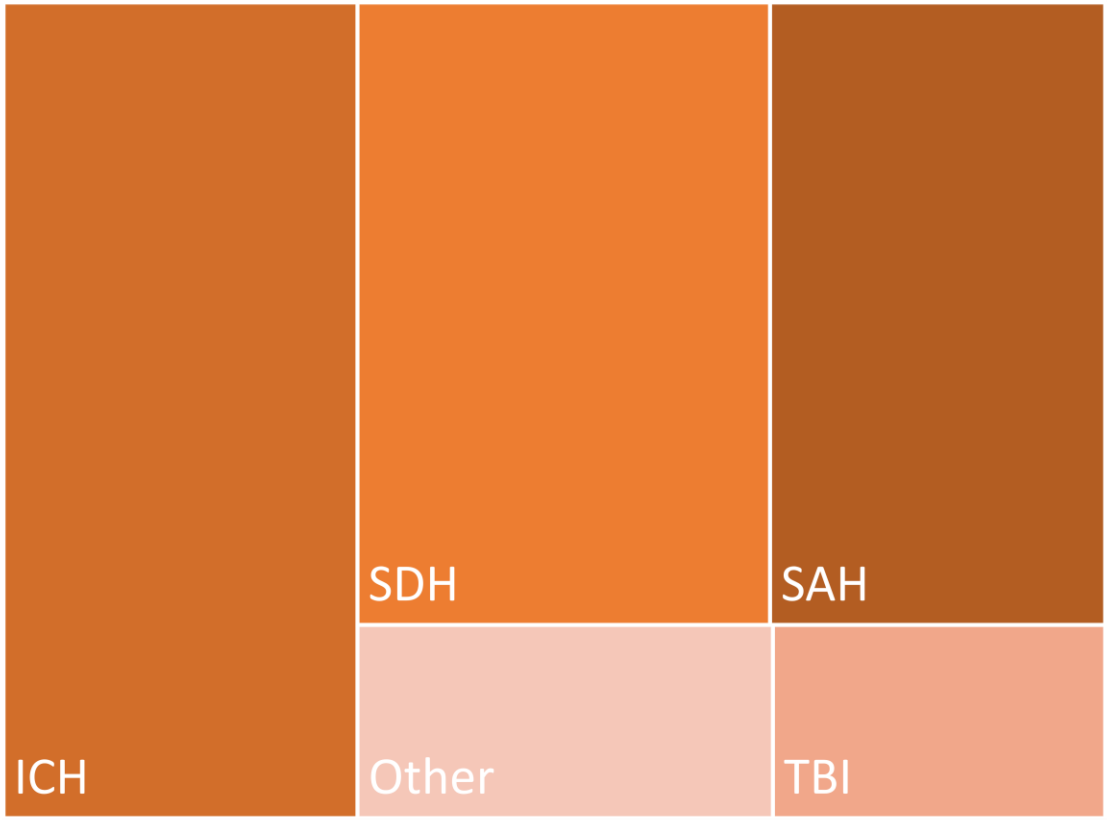


Missed Referrals (17)

Total Cohort (56)

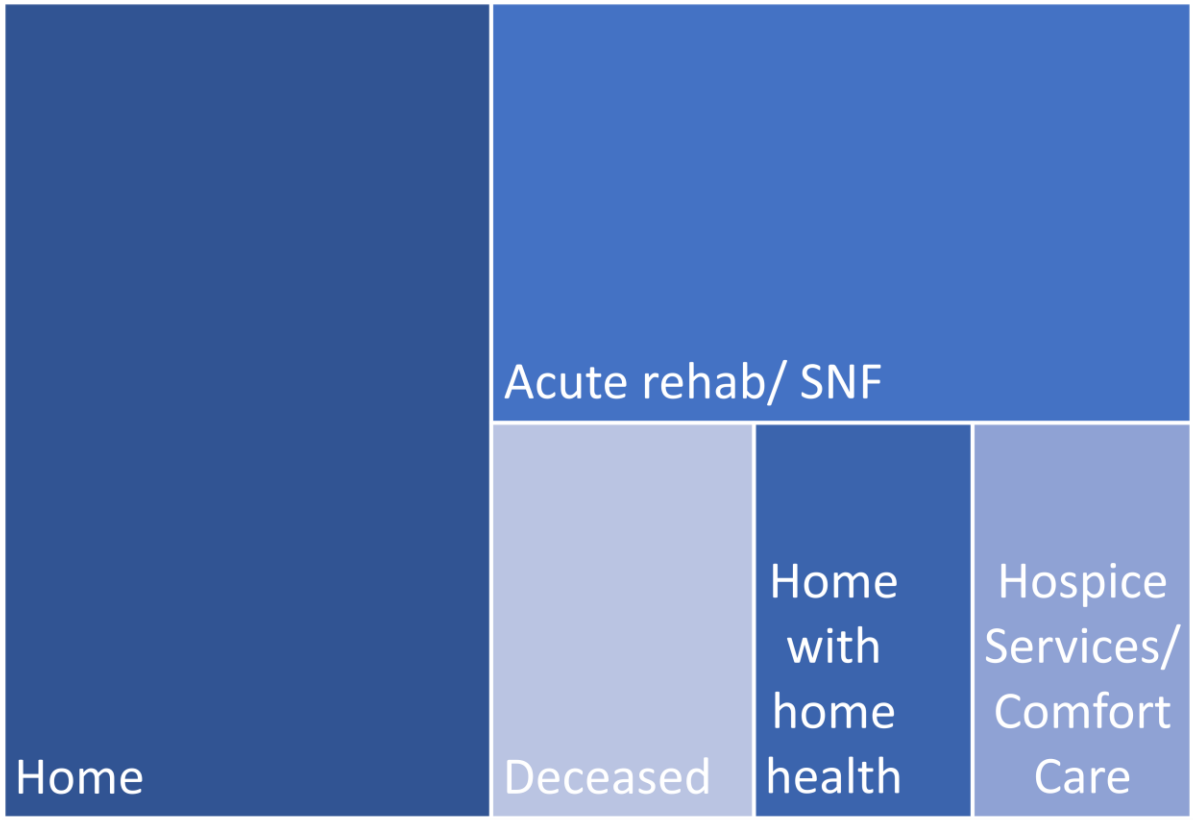
Table 1: Demographics and Clinical Acuity		
Demographic		**Statistic**
Age, Mdn (IQR)		67.5 (47.3-77.0)
Gender, n (%)		
	Male	30 (53.6%)
	Female	26 (46.4%)
Race, n (%)		
	White	38 (67.9%)
	Black or African American	11 (19.6%)
	Other	4 (7.1%)
	Asian	3 (5.4%)
Ethnicity, n (%)		
	Hispanic	3 (5.4%)
	Non-Hispanic	53 (94.6%)
Insurance, n (%)		
	Medicare	28 (50%)
	Medicaid	7 (12.5%)
	Private	17 (30.4%)
	Veteran's Insurance	3 (5.4%)
	Uninsured	1 (1.8%)
Length of Stay, Mdn (IQR)		
	LOS days	7.5 (4-13.8)
	LOS ICU days	2 (1-5)
Distance from Hospital, Mdn (IQR)		
	Distance (miles)	31.5 (13.5-52.3)

Admission Diagnosis



ICH= Intracerebral Hemorrhage
SDH= Subdural Hematoma
SAH= Subarachnoid Hemorrhage
TBI = Traumatic Brain Injury

Disposition



SNF = Skilled nursing facility

Pilot Outcomes

9 Clinic Attendees: 8 days post discharge (5-10 day range). 82% attendance: 1 no show, 1 readmit

45% did NOT have established PCP

NO readmissions among attendees

33% had medication changes

66% had referrals placed

Tailored education provided to all

Readmissions

Discharge to Home (28)

- 4 readmissions: 14% readmission rate
- 1- SAH- readmission for new stroke (was clinic referral)
- 3- SDH patients readmitted, referrals were deferred due to follow-up with neurosurgery within a couple weeks, or family refusal. Readmitted for neurosurgical intervention (2), peripheral vascular intervention (1)

Discharge to Rehab (17)

- 6 readmissions: 35% readmission rate
- Readmission reasons: non-neuro infections, altered mental status, new neurological symptoms requiring admission

Comparing Comorbidities: Home vs Rehab Patients

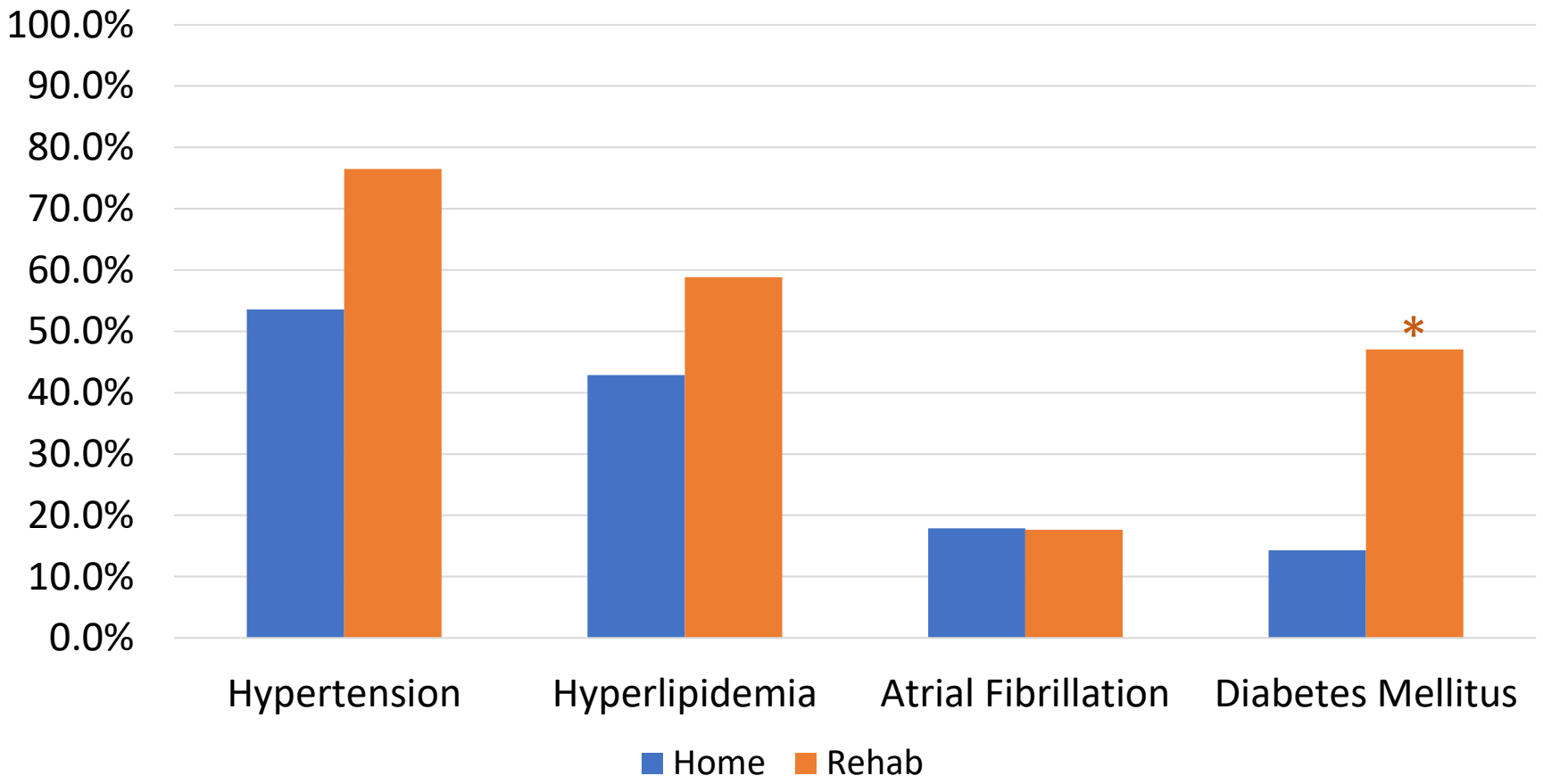


Figure: Mean difference in percentage of diabetes mellitus ($\chi^2 = 5.81$, $p = 0.034$) was statistically significant. Differences in hypertension ($\chi^2 = 1.486$, $p = 0.223$) hyperlipidemia ($\chi^2 = 0.535$, $p = 0.465$) and atrial fibrillation ($\chi^2 = 0.00$, $p = 1.0$) were not statistically significant.

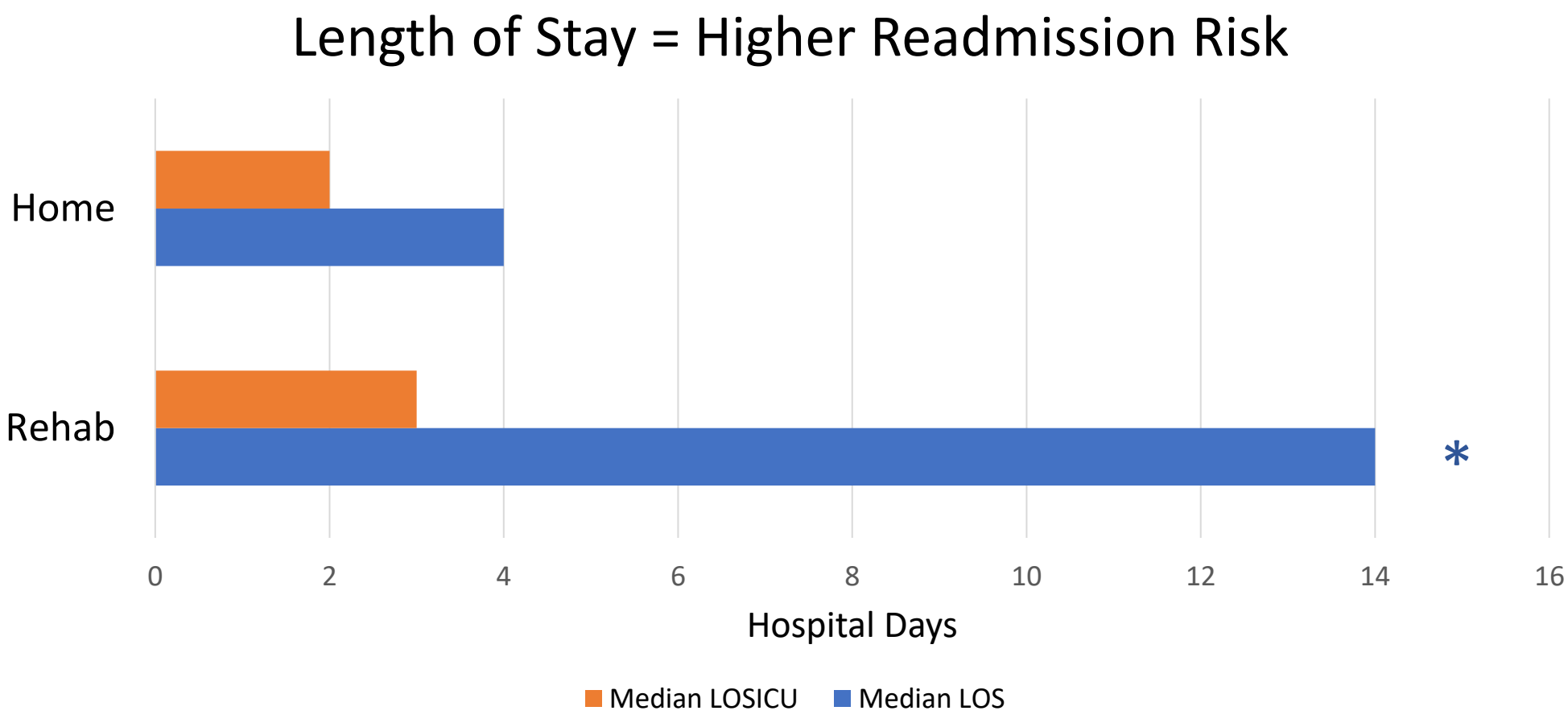


Figure: Median differences in length of stay (LOS) for ICU and hospital. **Mann Whitney U test performed**. There is statistically significant difference in LOS between rehab (14, 9-23.5) and home (4, 3-6.75) patients ($p<0.001$). There is not a statistically significant difference in ICU LOS between rehab (3, 1.5-6.5) and home (2, 1-3.5) patients ($p = 0.110$). (Median, IQR).

FINANCIAL ANALYSIS

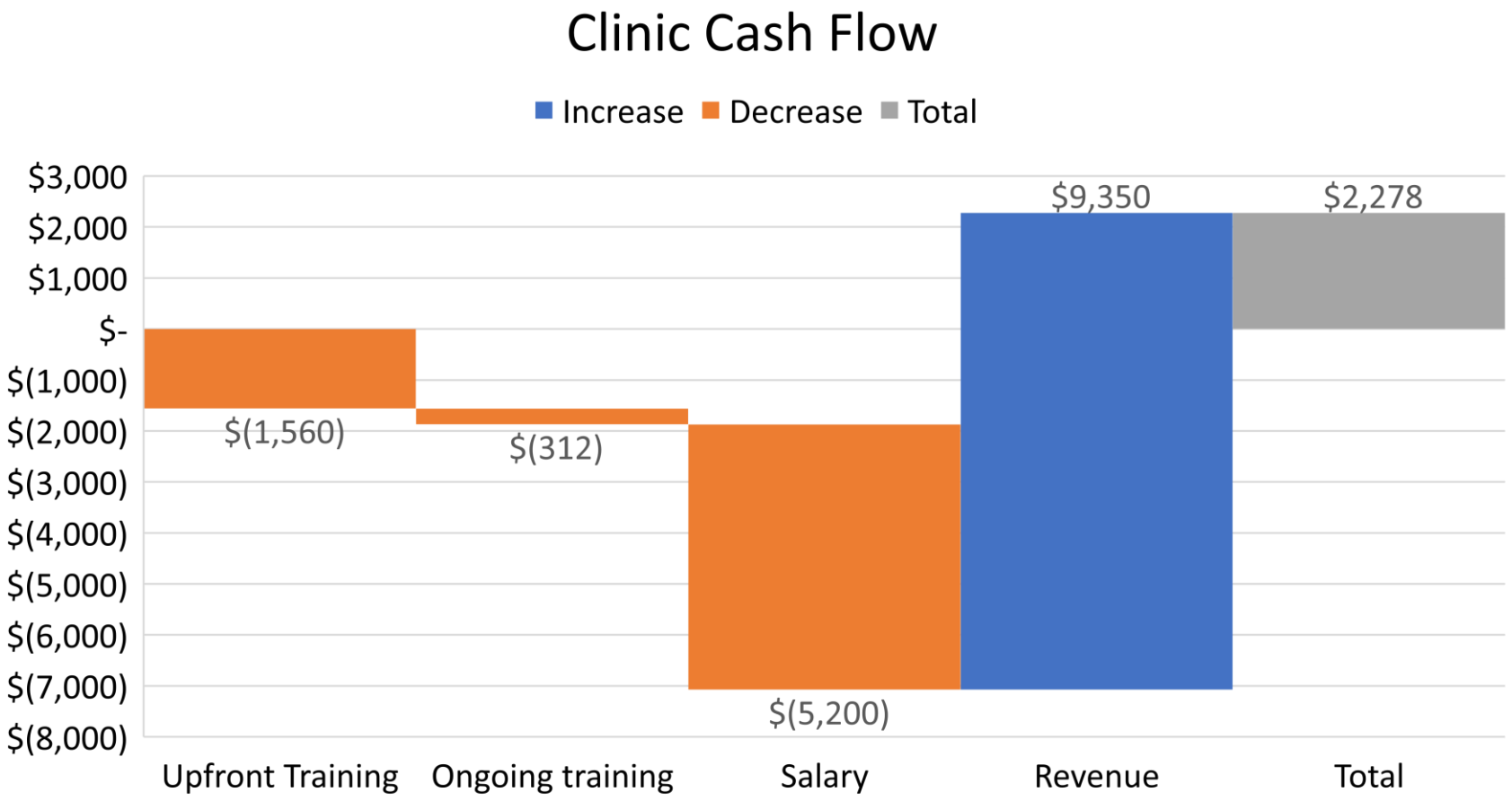


Table: Assumption: average 2 patients per week.
CPT code 99213, 99214 $91-129 : Medicare National Fee Schedule, 2022

STEP 6. INTEGRATE AND SUSTAIN PRACTICE CHANGE

- 50% of APPs involved: adopt referral methods into workflow
- Rapid cycle change: sustain referral methods into daily progress note
- Attended 7 clinic days: helped APPs acclimate to clinic environment
- Mia Ahn and Devan McCabe are maintaining the referral process since February
- Possibility of future MSN/ DNP projects to make advancements to the clinic

LESSONS LEARNED FROM PILOT DATA

- Medication changes and many referrals made
- Missing referrals and imaging orders on discharge
- Rehab patients have higher transitional care needs
- Stop gap measure to primary care and neurology provider shortages
- Highly feasible, low resource intensity

LIMITATIONS

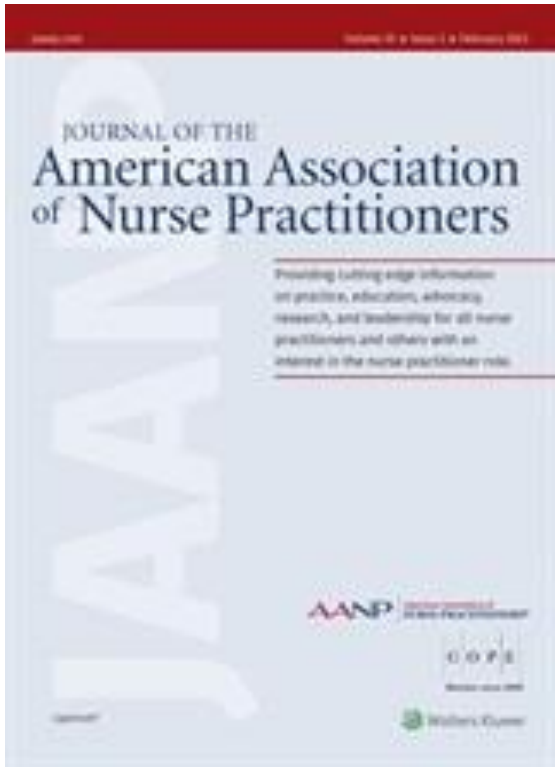
- Data retrieved from EMR data, not clinic visit observations
- Not homogenous patient population; varying clinical acuity and diagnosis
- Limited conclusions about readmission impact
- Did not evaluate patient perspective

FUTURE DIRECTIONS

- Include rehab patients
- Telemedicine
- Repeat visits when clinically necessary, especially if no PCP
- Interdisciplinary care: pharmacy
- Evaluate impact of clinic on ED visits and readmissions

STEP 7. DISSEMINATE RESULTS

- Report findings and recommendations to APP team, department stakeholders
- Submit manuscript to JAANP



ACKNOWLEDGEMENTS

QUESTIONS?

Adeoye, O., Nyström, K. V., Yavagal, D. R., Luciano, J., Nogueira, R. G., Zorowitz, R. D., Khalessi, A. A., Bushnell, C., Barsan, W. G., Panagos, P., Alberts, M. J., Tiner, A. C., Schwamm, L. H., & Jauch, E. C. (2019). Recommendations for the establishment of stroke systems of care: A 2019 update. *Stroke*, *50*(7), e187–e210. https://doi.org/10.1161/STR.0000000000000173

Baecker, A., Meyers, M., Koyama, S., Taitano, M., Watson, H., Machado, M., & Nguyen, H. Q. (2020). Evaluation of a transitional care program after hospitalization for heart failure in an integrated health care system. *JAMA Network Open*, *3*(12), e2027410. https://doi.org/10.1001/jamanetworkopen.2020.27410

Bakhru, R. N., Davidson, J. F., Bookstaver, R. E., Kenes, M. T., Peters, S. P., Welborn, K. G., Creech, O. R., Morris, P. E., & Files, D. C. (2019). Implementation of an ICU recovery clinic at a tertiary care academic center. *Critical Care Explorations*, *1*(8), e0034. https://doi.org/10.1097/CCE.0000000000000034

Baldwin, S. M., Zook, S., & Sanford, J. (2018). Implementing posthospital interprofessional care team visits to improve care transitions and decrease hospital readmission rates. *Professional Case Management*, *23*(5), 264–271. https://doi.org/10.1097/NCM.0000000000000284

Bumpus, S., Krallman, R., McMahon, C., Gupta, A., Montgomery, D., Kline-Rogers, E., & Vaishnava, P. (2020). Insights into hospital readmission patterns of atrial fibrillation patients. *European Journal of Cardiovascular Nursing: Journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology*, *19*(6), 545–550. https://doi.org/10.1177/1474515120911607

Centers for Medicare & Medicaid Services. (2021, July 19). *Community-based care transitions program.* [Government]. CMS.Gov. https://innovation.cms.gov/innovation-models/cctp

Centers for Medicare & Medicaid Services. (2023). *Search the physician fee schedule* [Government]. CMS.Gov. https://www.cms.gov/medicare/physician-fee-schedule/search

Chatrath, A., Soldozy, S., Sokolowski, J. D., Burke, R. M., Schultz, J. G., Rannigan, Z. C., & Park, M. S. (2020). Endovascular and surgical treatment is predictive of readmission risk after aneurysmal subarachnoid hemorrhage. *World Neurosurgery*, *142*, e494–e501. https://doi.org/10.1016/j.wneu.2020.07.079

CMS. (2021). *Transitional care management services* (No. MLN908628; pp. 1–12). https://www.cms.gov/outreach-and-education/medicare-learning-network-mln/mlnproducts/downloads/transitional-care-management-services-fact-sheet-icn908628.pdf

Dreyer, T. (2014). Care transitions: Best practices and evidence-based programs. *Home Healthcare Nurse*, *32*(5), 309–316. https://doi.org/10.1097/NHH.0000000000000069

Duncan, P. W., Bushnell, C. D., Jones, S. B., Psioda, M. A., Gesell, S. B., D'Agostino, R. B., Sissine, M. E., Coleman, S. W., Johnson, A. M., Barton-Percival, B. F., Prvu-Bettger, J., Calhoun, A. G., Cummings, D. M., Freburger, J. K., Halladay, J. R., Kucharska-Newton, A. M., Lundy-Lamm, G., Lutz, B. J., Mettam, L. H., … Rosamond, W. D. (2020). Randomized pragmatic trial of stroke transitional care. *Circulation: Cardiovascular Quality and Outcomes*, *13*(6), e006285. https://doi.org/10.1161/CIRCOUTCOMES.119.006285

Garfein, J., Cholack, G., Krallman, R., Feldeisen, D., Montgomery, D., Kline-Rogers, E., Eagle, K., Rubenfire, M., & Bumpus, S. (2021). Cardiac transitional care effectiveness: Does overall comorbidity burden matter? *The American Journal of Medicine*, *134*(12), 1506–1513. https://doi.org/10.1016/j.amjmed.2021.06.018

Gesell, S. B., Bushnell, C. D., Jones, S. B., Coleman, S. W., Levy, S. M., Xenakis, J. G., Lutz, B. J., Bettger, J. P., Freburger, J., Halladay, J. R., Johnson, A. M., Kucharska-Newton, A. M., Mettam, L. H., Pastva, A. M., Psioda, M. A., Radman, M. D., Rosamond, W. D., Sissine, M. E., Halls, J., & Duncan, P. W. (2019). Implementation of a billable transitional care model for stroke patients: The COMPASS study. *BMC Health Services Research*, *19*(1), 978. https://doi.org/10.1186/s12913-019-4771-0

Greenberg, S. M., Ziai, W. C., Cordonnier, C., Dowlatshahi, D., Francis, B., Goldstein, J. N., Hemphill, J. C., Johnson, R., Keigher, K. M., Mack, W. J., Mocco, J., Newton, E. J., Ruff, I. M., Sansing, L. H., Schulman, S., Selim, M. H., Sheth, K. N., Sprigg, N., & Sunnerhagen, K. S. (2022). 2022 guideline for the management of patients with spontaneous intracerebral hemorrhage: A guideline from the American Heart Association/American Stroke Association. *Stroke*, *53*(7), e282–e361. https://doi.org/10.1161/STR.0000000000000407

Hewner, S., Chen, C., Anderson, L., Pasek, L., Anderson, A., & Popejoy, L. (2021). Transitional care models for high-need, high-cost adults in the United States: A scoping review and gap analysis. *Professional Case Management*, *26*(2), 82–98. https://doi.org/10.1097/NCM.0000000000000442

Huggins, E. L., Bloom, S. L., Stollings, J. L., Camp, M., Sevin, C. M., & Jackson, J. C. (2016). A clinic model: Post-intensive care syndrome and post-intensive care syndrome-family. *AACN Advanced Critical Care*, *27*(2), 204–211. https://doi.org/10.4037/aacnacc2016611

Iowa Model Collaborative. (2017). *Iowa model of evidence-based practice: Revisions and validation.* (14(3); pp. 175–182). Worldviews on Evidence-Based Nursing. doi:10.1111/wvn.12223

Khan, B. A., Lasiter, S., & Boustani, M. A. (2015). CE: Critical care recovery center: An innovative collaborative care model for ICU survivors. *The American Journal of Nursing*, *115*(3), 24–31. https://doi.org/10.1097/01.NAJ.0000461807.42226.3e

Lutz, B. J., Reimold, A. E., Coleman, S. W., Guzik, A. K., Russell, L. P., Radman, M. D., Johnson, A. M., Duncan, P. W., Bushnell, C. D., Rosamond, W. D., & Gesell, S. B. (2020). Implementation of a transitional care model for stroke: Perspectives from frontline clinicians, administrators, and COMPASS-TC implementation staff. *The Gerontologist*, *60*(6), 1071–1084. https://doi.org/10.1093/geront/gnaa029

Majersik, J. J., Ahmed, A., Chen, I.-H. A., Shill, H., Hanes, G. P., Pelak, V. S., Hopp, J. L., Omuro, A., Kluger, B., & Leslie-Mazwi, T. (2021). A shortage of neurologists – we must act now: A report from the AAN 2019 transforming leaders program. *Neurology*, *96*(24), 1122–1134. https://doi.org/10.1212/WNL.0000000000012111

McClain, J. V., & Chance, E. A. (2020). The advanced practice nurse will see you now: Impact of a transitional care clinic on hospital readmissions in stroke survivors. *Journal of Nursing Care Quality*, *35*(2), 147–152. https://doi.org/10.1097/NCQ.0000000000000414

Naylor, M. D., Aiken, L. H., Kurtzman, E. T., Olds, D. M., & Hirschman, K. B. (2011). The importance of transitional care in achieving health reform. *Health Affairs*, *30*(4), 746–754.

Naylor, M. D., Bowles, K. H., McCauley, K. M., Maccoy, M. C., Maislin, G., Pauly, M. V., & Krakauer, R. (2013). High-value transitional care: Translation of research into practice. *Journal of Evaluation in Clinical Practice*, *19*(5), 727–733. https://doi.org/10.1111/j.1365-2753.2011.01659.x

Naylor, M. D., Brooten, D. A., Campbell, R. L., Maislin, G., McCauley, K. M., & Schwartz, J. S. (2004). Transitional care of older adults hospitalized with heart failure: A randomized, controlled trial. *Journal of the American Geriatrics Society*, *52*(5), 675–684. https://doi.org/10.1111/j.1532-5415.2004.52202.x

Rural Health Information Hub. (2022). *Health professional shortage areas: Primary care, by county, 2022- Virginia*. Retrieved February 27, 2023, from https://www.ruralhealthinfo.org/charts/5?state=VA

Usinowicz, E., Ronquillo, K., Matossian, B., Picewicz, B., Bartsch, E., Haddad, C., Abbate, K., & O'Connor, T. (2020). Reducing readmissions for heart failure. *Critical Care Nurse*, *40*(1), 82–86. https://doi.org/10.4037/ccn2020983

Zeller, J. L., Nair, P. K., & McComiskey, C. (2018). Transitional surgery center: Reducing 30-day hospital readmissions. *Jnp-Journal for Nurse Practitioners*, *14*(1), E17–E20. https://doi.org/10.1016/j.nurpra.2017.10.004

QUESTIONS?