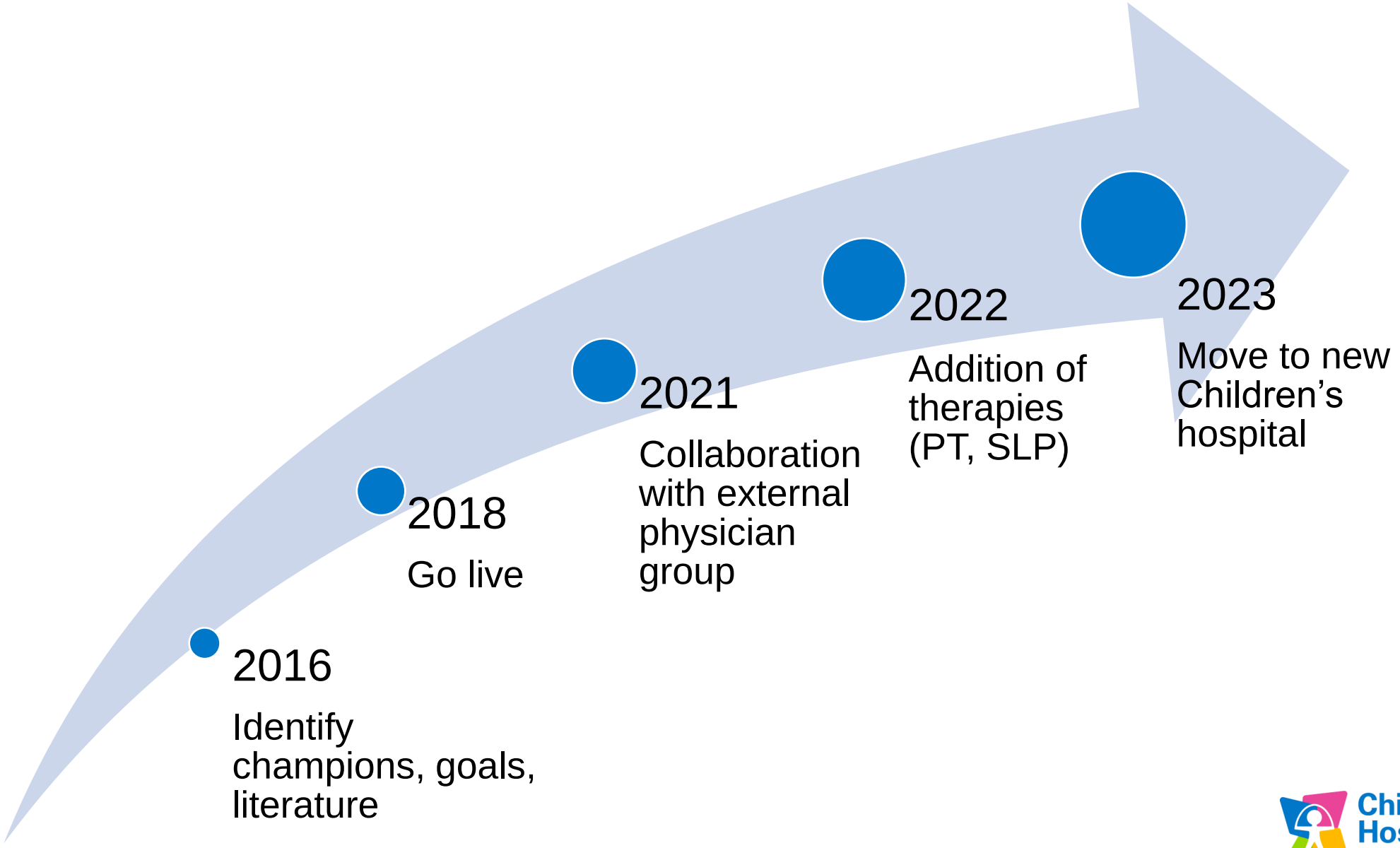
Children's Hospital of Richmond at VCU

Becoming a ~~Primary Stroke Center~~ Pediatric Stroke Center

My Why

Overall timeline of our journey



Pediatric stroke champions to pediatric stroke stakeholders

Champions:	Dr. Duane Williams	PICU intensivist
	Dr. Larry Morton	Child neurology
	Dr. Warren Felton	Vascular neurology, stroke expert
	Lorie Selleck	RN extraordinaire—stroke expert, peds, QA
	Stacie Stevens	Stroke Program Coordinator
	Jill McGehee	PICU Nurse Clinician
	Dr. Ewa Way	Child neurology resident/fellow
	Dr. Rashida Woods	Pediatric Emergency Medicine

Team to date

Peds ED physician

Peds ED RN

Neurosurgery

Endovascular interventionalist

PICU intensivist MD

PICU RN

Directors, C-suite

Pharmacy Peds

Pharmacy Adult

Child Neurology

Stroke specialist

Stroke Coordinator

PT

Speech

Neuroradiology –child

ED radiology (emergency, weekends, holidays, onsite-speed critical)

EMS –pre hospital notification

Comm room, telecommunications-build another alert system—who's on it

Pathology

Hematology

Acute care peds unit

Marketing-awareness

CT Techs

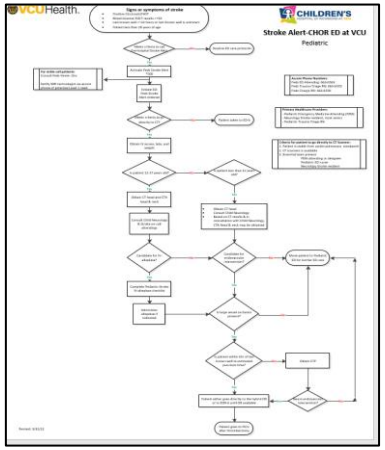
ED medics

Adult ED MD

Adult ED RN

IT-build order sets, CT orders

Stroke Alert - CHoR Pediatric ED



Suspected stroke (+FAST, BG ≥50, LKW ≤24hrs)

Activate Peds Stroke Alert; Initiate ED: Peds Stroke Alert Order set

For sickle cell patients:
Consult Peds Heme- Onc

Transport to CT, Obtain IV, labs, wt

Patient 12-17 years of age

Obtain Head CT & CTA H&N

Consult Child Neurology & Stroke Attending On Call

If candidate for TPA: complete Pediatric Stroke TPA checklist, administer if applicable.

No

Yes

Patient < 12 years of age

Obtain Head CT, Consult Child Neurology,
Based on CT results and in consultation with Child Neurology
CTA H&N may be obtained

Candidate for endovascular intervention?

No

Move patient to Peds ED for further ED care

Yes

Is large vessel occlusion present?

No

Yes

Is patient within 6hrs of LKW?

No

Obtain CTP

Yes

Patient either goes directly to hybrid OR or EDR-6 until OR available

Yes

Neuro endovascular intervention?

No

Patient goes to PICU after thrombectomy

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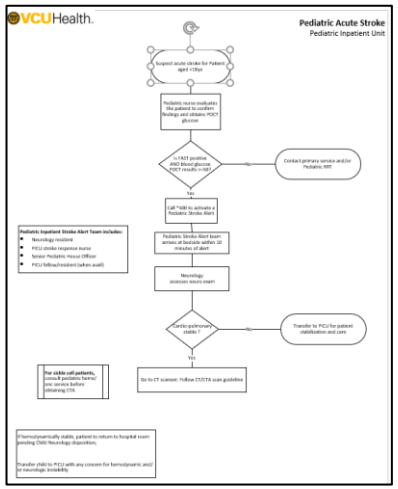
VCU Stroke Alert – Inpatient Pediatric



Suspected stroke

↓

Peds RN evaluates patient to confirm findings and obtains POCT glucose

↓

+ FAST and BG ≥50 — No → Contact primary service and/or Peds RRT

↓ Yes

Activate a Pediatric Stroke Alert

↓

Pediatric Stroke Alert team arrives at bedside within 10 minutes of alert

↓

Neurology assesses neuro exam

↓

Cardio-pulmonary stable? — No → Transfer to PICU for patient stabilization and care

↓ Yes

Go to CT scanner. Follow CT/CTA scan guideline.

Pediatric Inpatient Stroke Alert Team includes:
- Neurologist
- PICU stroke response nurse (RRT)
- PICU intensivist
- PICU fellow/resident (when avail)

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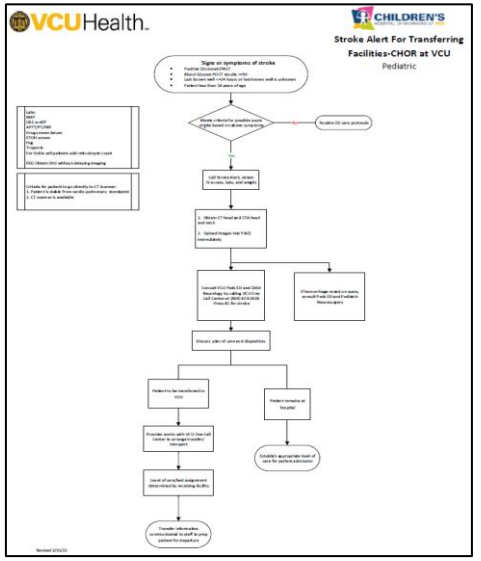
Stroke Alert for Transferring Facilities

Pediatric (less than 18yrs of age)



Labs:
BMP
CBC w diff
APTT/PT/INR
Drug Screen Serum
ETOH Screen
Hcg
Troponin
For Sickle Cell patients add reticulocyte count
EKG Obtain EKG without delaying imaging

Criteria for patient to go directly to CT:
1.Patient is stable from cardio-pulmonary standpoint
2. CT Scanner is available

Suspected stroke (+FAST, BG ≥50, LKW ≤24hrs)

↓

Call Stroke Alert, obtain IV, labs, wt

↓

Obtain Head CT & CTA H&N, Upload images into PACS

↓

Consult VCU Peds ED and Child Neurology by calling VCU One Call

↓

Discuss Plan of Care & Disposition

↓

Patient to be transferred to VCU

↓

Provider works with VCU One Call to arrange transfer

↓

Level of Care/Bed determined by receiving facility

↓

Transfer information communicated to staff to prep patient for departure

Patient remains at hospital

↓

Establish appropriate level of care for admission

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Next steps

SECTION: Pediatric General Medical Emergencies

PROTOCOL TITLE: Medical – Stroke/TIA

REVISED: 11/2022

Protocol 3-5

STROKE

OVERVIEW:
Pediatric stroke (age > 30 days) is a top 10 leading cause of disability and death in the U.S. There are two main mechanisms of stroke: (1) Blood vessel occlusion and (2) Blood vessel rupture. About 55% of pediatric strokes are ischemic. Ischemic strokes are most often caused by large vessel thrombosis or stenosis, although embolism or hypoperfusion can cause them. Hemorrhagic strokes are divided into intracerebral (ICH) and subarachnoid (SAH) hemorrhages. Causes of stroke include abnormal arteries in patients with sickle cell anemia or Down Syndrome, cardiac disease, vessel dissection (such as from a trauma), and infectious diseases. Risk factors for ICH include heart disease, brain tumors, and vascular anomalies. Signs and symptoms of stroke will vary depending on which area of the brain is being inadequately perfused.

In children, mimics of strokes occur more frequently than stroke, about 50-90% of focal neurological deficits are mimics. However, if you don't consider that your pediatric patient could be having a stroke, you will miss it.

PMHx	Signs and Symptoms within 24 hours
• Abnormal arteries of the brain • Cardiac disease • Clotting disorders • Sickle Cell • Acute infections • New onset seizure • Head and neck trauma • Lupus • Kawasaki disease	• Focal weakness or paralysis • Blindness or other sensory loss • Aphasia • Ataxia IN ADDITION, may have: • Altered mental status • Vertigo, dizziness • Vomiting • New onset headache • New onset seizures

	EMR	EMT	A	I	P
1. Perform general patient management.	•	•	•	•	•
2. Support life-threatening problems associated with airway, breathing, and circulation. *Be alert for aspiration, upper airway obstruction and hypoventilation.*	•	•	•	•	•
3. Administer oxygen to maintain SPO2 94 - 99%. Support respirations as necessary with a BVM.		•	•	•	•

- Build MRI protocol and order set
- Create and implement a Pediatric Stroke Protocol starting with ODEMSA

This

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Opening April 30th, 2023

First steps

Objective:

Provide evidence-based acute stroke care management, supportive care, prevention of complications and secondary stroke prevention in the pediatric population

Process:

Literature search, resources (other institutes, colleagues, ISC)

Identifying patient population.
Different diagnosis codes

Include sickle cell patients
Add Hematology

Lowered minimal age overtime.
Does not include in utero or neonates

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Obstacles:

Executive leadership approval

Legality / push back

ITPA (alteplase) is not FDA approved

Lack of robust evidence

Scope of practice

Staff education, competencies. Low volume, high risk

Bed assignment: Adult vs Peds ED, NSICU vs PICU

Create and maintain patient database.

Agree upon metrics

Create process for screening patients less than 14yo.

CT vs MRI

Radiation exposure

TPA vs TNK

Lack of IT resources

Build pediatric stroke specific EMR tools

- Order sets for Peds Stroke Alert, AIS, Hemorrhagic stroke, thrombolysis, thrombectomy, PICU admission, sickle cell subset
- Pediatric TPA checklist, TPA order

Transfer center- pediatric-specific protocols

Create pediatric stroke pager group

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