The Management of ED TIA Patients: What is the optimal outpatient work-up, treatment and disposition?

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An Emergency Department Diagnostic Protocol For Patients With Transient Ischemic Attack: A Randomized Controlled Trial

To determine if emergency department TIA patients managed using an accelerated diagnostic protocol (ADP) in an observation unit (EDOU) will experience:

shorter length of stays

lower costs

comparable clinical outcomes

. . . relative to traditional inpatient admission.

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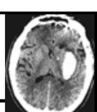
ADP Exclusion criteria



- Clinical:
  - Stroke / creshendo TIAs / Positive HCT / Large prior CVA
- Known clot source:
  - Atrial fib, carotid stenosis >50%, major valve ds, PFO
- Non-focal symptoms:
  - HT encephalopathy, severe dementia
- Social issues:
  - Discharge unlikely, IV drug use, to survive beyond study follow up period

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EDOU TIA DIAGNOSTIC PROTOCOL

- Four ADP Interventions :
  - Serial neuro exams
    - Unit staff, physician, and a neurology consult
  - Cardiac monitoring
  - Carotid dopplers
  - 2-D echo
- ADP discharge criteria
  - No recurrent deficits, negative workup
  - Appropriate antiplatelet therapy and follow-up

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Results: Performance of clinical testing

	Inpatient (n=74)	TIA-ADP (n=75)
Carotid imaging		
Number completed (n, %)	67 (90.5%)	73 (97.3%)
Time to completion	25.2 hr (17.3 – 37.1)	13.0 hr (8.4 – 18.0)
Echocardiography		
Number completed (n, %)	54 (73%)	73 (97.3%)
Time to completion	43.0 hr (23.8 – 63.8)	19.1 hr (16.7 – 22.5)

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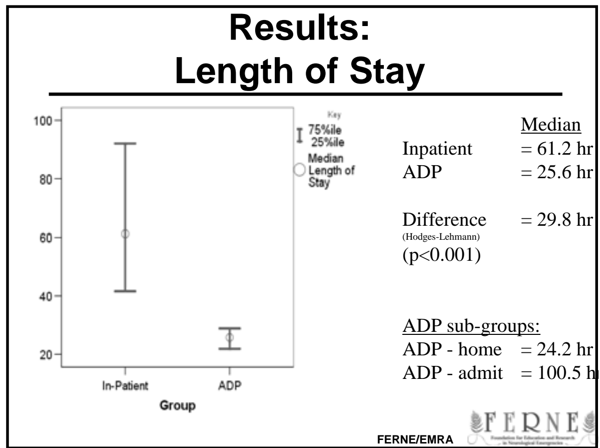
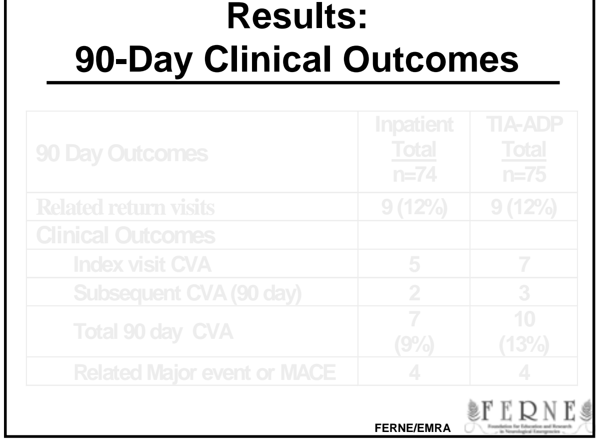
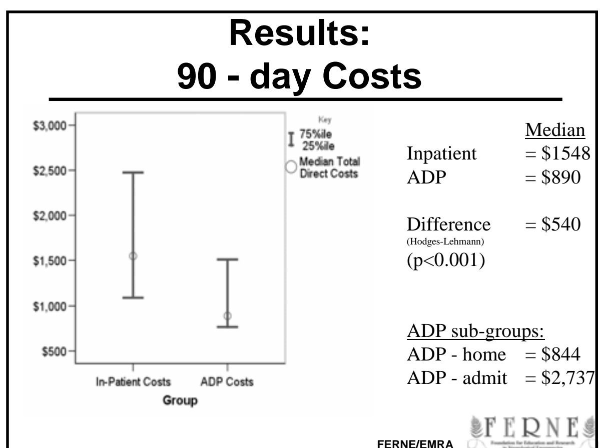




90 Day Outcomes	Inpatient Total n=74	TIA-ADP Total n=75
Related return visits	9 (12%)	9 (12%)
Clinical Outcomes		
Index visit CVA	5	7
Subsequent CVA (90 day)	2	3
Total 90 day CVA	7 (9%)	10 (13%)
Related Major event or MACE	4	4



Five critical issues:

1. Appropriate history and physical
2. ECG, monitor, HCT
3. Carotid dopplers - why, when, how?
4. Further clinical testing – echo, etc
5. Therapy – starting with aspirin

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1. History and physical - definition of TIA

- Re-definition of TIA
  - **…a brief episode of neurologic dysfunction**
  - **caused by focal brain or retinal ischemia,**
  - **with clinical symptoms typically lasting <u>less than 1hr</u>,**
  - **and <u>without evidence of acute infarction</u>".**

TABLE 1. FEATURES OF THE CURRENT AND PROPOSED DEFINITIONS OF TRANSIENT ISCHEMIC ATTACK.

CURRENT, TIME-BASED DEFINITION*	PROPOSED, TISSUE-BASED DEFINITION†
Based on an arbitrary 24-hour time limit	Based on the presence or absence of a biologic end point
Suggests transient ischemic symptoms are benign	Indicates that transient ischemic symptoms can cause permanent brain injury
Promotes diagnosis on the basis of the temporal course rather than pathophysiology	Encourages use of neurodiagnostic tests to identify brain injury and its cause
Fosters delays in interventions for acute cerebral ischemia	Facilitates rapid interventions for acute brain ischemia
Inaccurately predicts the presence or absence of ischemic brain injury	More accurately reflects the presence or absence of ischemic brain injury
Diverges from the distinction between angina and myocardial infarction	Consistent with the distinction between angina and myocardial infarction

*A transient ischemic attack is a sudden focal neurologic deficit lasting for less than 24 hours, of presumed vascular origin, and confined to an area of the brain or eye perfused by a specific artery.

†A transient ischemic attack is a brief episode of neurologic dysfunction caused by focal brain or retinal ischemia, with clinical symptoms typically lasting less than one hour, and without evidence of acute infarction.

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Utility of the H/P?

- TIA risk stratification
  - Johnston criteria
  - Rothwell criteria - "ABCD"
  - Combination of the above => stay tuned

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2. HCT, ECG

- ECG – **ATRIAL FIBRILLATION!!!**
  - Stroke risk – cardio-embolic risk
    - 4.6% at 1 month
    - 11.9% at 3 months
  - 61% reduction in annual risk of stroke (both ischemic or hemorrhagic) with coumadin

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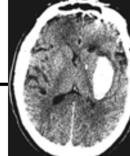
2. HCT, ECG



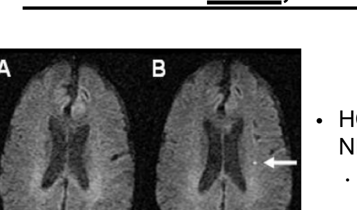


Figure 2. (A) Normal scan at baseline (no DWI lesion seen, no vessel occlusion, and no perfusion abnormality) in a 79-year-old man with a left hemispheric TIA lasting 90 minutes. (B) Arrow points to a small new DWI lesion in left middle cerebral artery territory seen at 30 days on follow-up MR. DWI = diffusion-weighted imaging.

- HCT - tumor, SDH, NPH, etc
  - Minor stroke and TIA associated with a 10% incidence of stroke on MRI.

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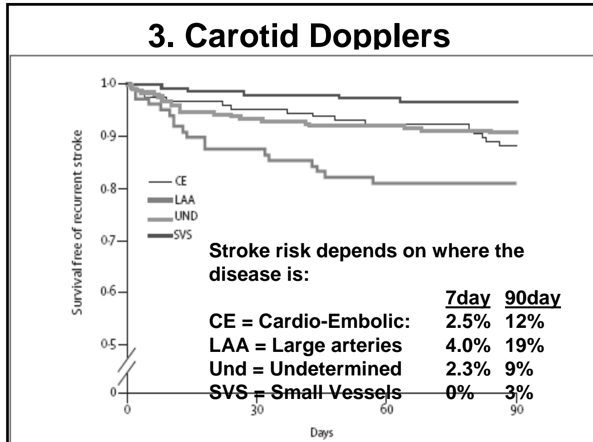
3. Carotid Dopplers



Stroke risk depends on where the disease is:

	7day	90day
CE = Cardio-Embolic:	2.5%	12%
LAA = Large arteries	4.0%	19%
Und = Undetermined	2.3%	9%
SVS = Small Vessels	0%	3%

3. Carotid dopplers
The BIG question - WHEN???

- **Carotid surgery if >70% stenosis lesions is "time sensitive".**
- **Stroke risk reduction if done within:**
  - **0-2 weeks**
    - **75% stenosis = 30.2%**
  - **2-4 weeks**
    - **75% stenosis = 17.6%**
  - **4-12 weeks**
    - **75% stenosis = 11.4%**
  - **+12 weeks**
    - **75% stenosis = 8.9%**
- **Similar for 50-70% lesions**

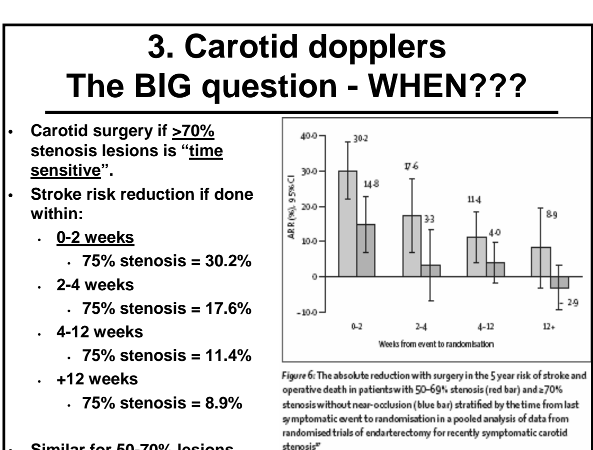


Figure 6: The absolute reduction with surgery in the 5 year risk of stroke and operative death in patients with 50-69% stenosis (red bar) and ≥70% stenosis without near-occlusion (blue bar) stratified by the time from last symptomatic event to randomisation in a pooled analysis of data from randomised trials of endarterectomy for recently symptomatic carotid stenosis. The numbers above the bars indicate the actual absolute risk reduction (ARR).

4. Further Clinical testing?

- Serial neurological exams?
  - 10.5% stroke within 3 months
    - Half within 2 days
    - Most within 1 day
- Monitoring for AF?
- 2-D echo?

A Stroke- and Event-Free Survival

Probability of Survival Free From Stroke and Adverse Events; Days After TIA (0, 7, 30, 60, 90); curves: Stroke, Adverse Events

No. of Patients at Risk	0	7	30	60	90
Stroke	1001	1577	1527	1480	1451
Adverse Events	1001	1462	1361	1293	1248

5. Medical management

- ***Antiplatelet Therapy*** **for non-cardioembolic cases:**
  - **Aspirin 50-325 mg/day**
  - **Clopidogrel or ticlopidine**
  - **Aspirin plus dipyridamole**
    - **Latter two if ASA intolerant or if TIA while on ASA**
- **Framingham risk factor management**
- **Routine anticoagulation not recommended**

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