

Project: Ghana Emergency Medicine Collaborative

Document Title: The Management of Acute Ischemic Stroke & TIA

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The Management of Acute Ischemic Stroke & TIA

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65 y.o. Fire Chief w/ Lt arm numbness & weakness X 15 minutes



Naval History and Heritage Command, [flickr](#)

- ◆ Has 15 minutes of symptoms now normal
- ◆ Wife takes him to ED
- ◆ Now refuses to be evaluated

70 y.o male “found down” while cutting lawn



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- ◆ Last seen 1hr to 911
- ◆ Rt arm/leg weakness
- ◆ Hx of HTN, DM, resolved old stroke

41y.o male w/ Lt eye deviation & drooling. RN notes initial BP= 200/110

- ◆ Brought to ED 5 hrs. after onset
- ◆ Lt. Eye deviation, drooling, slurred speech
- ◆ RN notes elevated BP=200/110

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Stroke Chain of Survival & Recovery



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Elsie esq., [flickr](#)

Detection



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Seattle Municipal Archive,
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Dispatch/Decision



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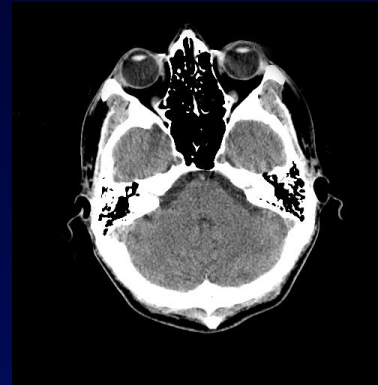
Delivery



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Drug



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Data



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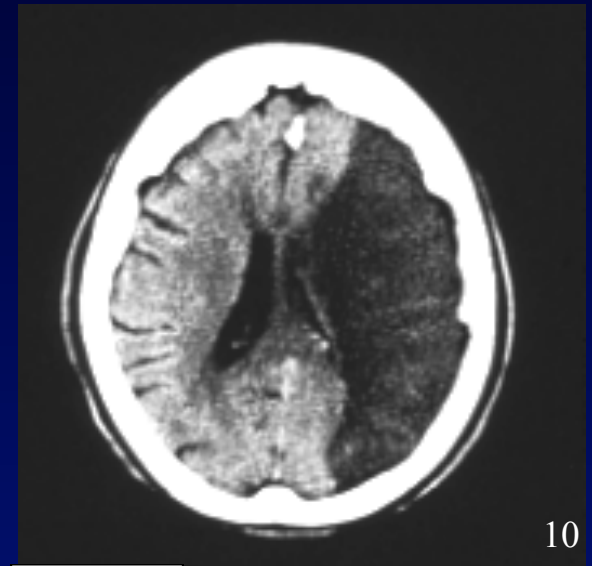
Door/Triage

Goals

- ◆ Stroke definitions
- ◆ Management of TIA
- ◆ Management of Ischemic Stroke
 - management of hyper-acute stroke

Definition of Stroke

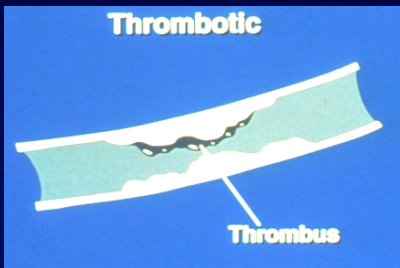
Any disease process that decreases vascular blood flow to a certain region of the brain causing neuronal cell death.



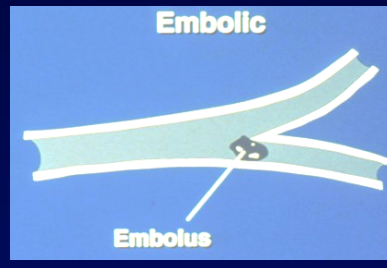
Stroke Subtypes

Ischemic
85%

Hemorrhagic
15%



Thrombotic

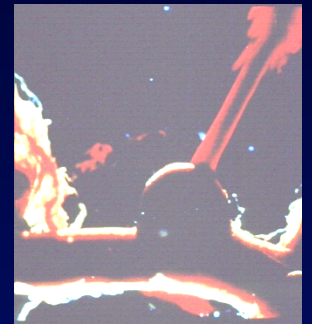


Embolic

Sources of images undetermined



Intracerebral
Hemorrhage



Subarachnoid
Hemorrhage

Stroke Vocabulary

- ◆ TIA : Symptoms <24 hrs
- ◆ Lacunar: Small infarcts
- ◆ “Mini-Stroke”: TIA

Current Management of TIA



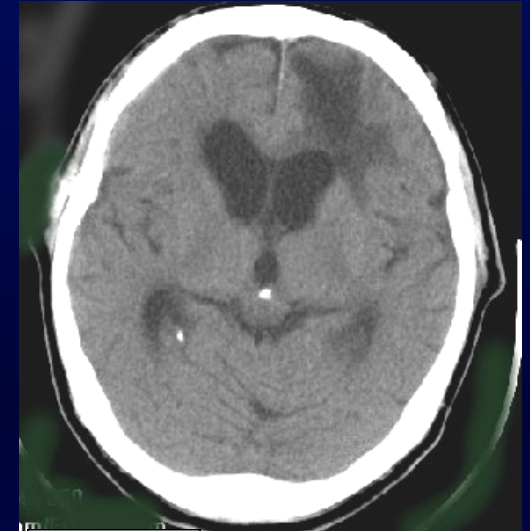
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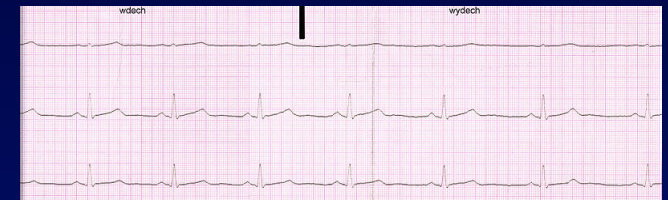
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Current Management of TIA

**All new onset TIAs
should be admitted!!!**

Short-term Prognosis after ED Diagnosis of TIA

- ◆ Cohort study
- ◆ 1707 patients w/ TIAs
- ◆ Followed for 90 days
- ◆ 3/97-2/98
- ◆ 16 EDs
- ◆ 10.5% stroked
- ◆ 1/2 w/in 2 days
- ◆ 25% had:
 - Stroke/TIA
 - Cardiac hospitalization
 - Death

Independent Risk Factor of Stroke within 90-days of a TIA

	Odds Ratio	<i>P</i> value
Age>60	1.8	.01
Diabetes	2.0	<.001
>10 min duration	2.3	<.005
Weakness	1.9	<.001
Speech	1.5	.01

90-day Stroke Risk by Number of Risk Factors

# Risks Factors	Patients N=	Stroke w/in 90 days
0	22	0%
1	179	3%
2	509	7%
3	584	11%
4	337	15%
5	76	34%

Medical Interventions in Patients with TIAs

Atrial fibrillation	Warfarin, Aspirin
Carotid stenosis	Heparin, Endarterectomy,
Cardiovascular event	r/o MI
Stroke in- evolution	Thrombolysis, Heparin, Endarterectomy

Exceptions to the Rule

◆ PMH of Stroke/TIA

- Negative ED CT
- recent negative stroke w/u
- Close Follow-up

◆ Minimal symptoms of short duration

- w/ negative ED w/u
- Negative doppler or MRA
- ±Echo
- Antiplatelet agent
- Close Follow-up

Current Management of TIA

**All new onset TIA's
should be admitted!!!**

65 y.o. Fire Chief w/ Lt arm numbness & weakness X 15 minutes

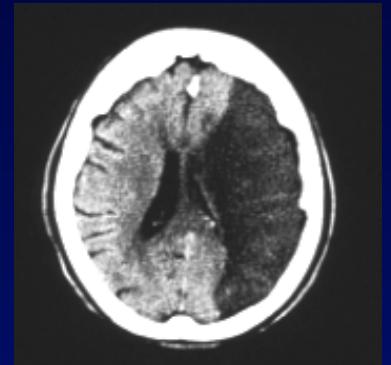


Naval History and Heritage Command, [flickr](#)

- ◆ Has 15 minutes of symptoms now normal
- ◆ Wife takes him to ED
- ◆ Now refuses to be evaluated

Management of Ischemic Stroke

- ◆ Diagnostic tests
- ◆ Anticoagulation
- ◆ BP management

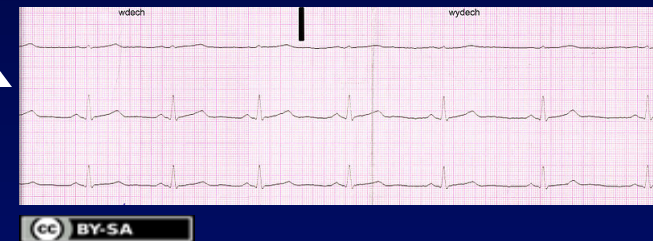
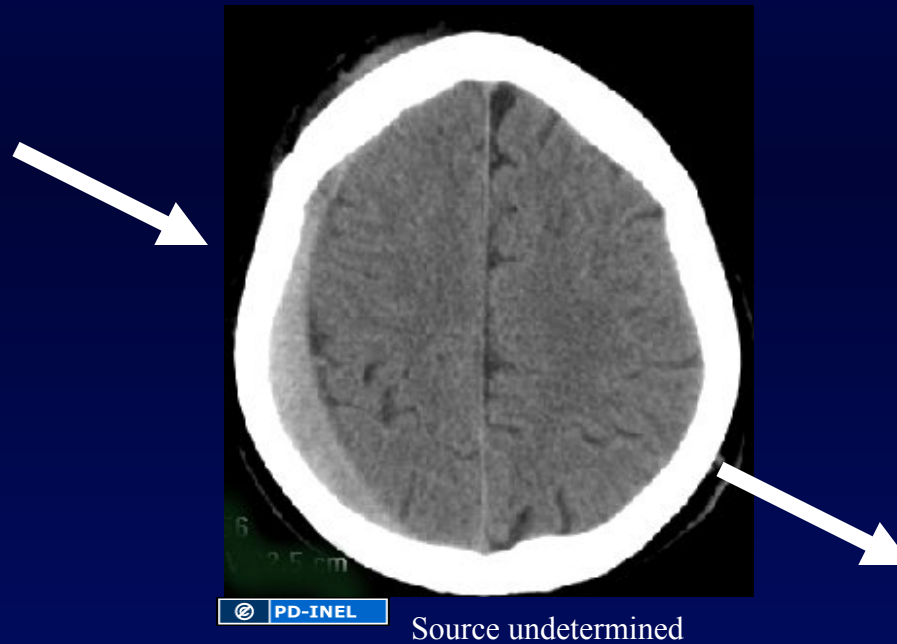


Diagnostic Tests

- ◆ Priority studies
- ◆ Recommended studies
- ◆ Elective studies

Priority Studies

dextrostick



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44 y.o male “found down” while cutting lawn



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- ◆ Last seen 1hr to 911
- ◆ Rt arm/leg weakness
- ◆ Hx of HTN, DM, old resolved stroke

Recommended Studies

- ◆ CBC with platelets
- ◆ Basic Metabolic Panel
- ◆ PT & INR
- ◆ CXR
- ◆ U/A

Individualized Tests

- ◆ Cardiac enzymes
- ◆ VDRL
- ◆ Antithrombin III antibodies
- ◆ Protein C & S deficiency
- ◆ Antiphospholipid antibodies



Anticoagulation



and parsecs to go, [flickr](#)

- ◆ Heparin, aspirin, ticlopidine, clopdiogrel, dipyridamole, warfarin
- ◆ Commonly used
- ◆ Unproven efficacy in acute stroke

Antiplatelet Agents

(aspirin, ticlopidine, clopidogrel, dipyridamole)

- ◆ Long-term reduction in stroke
- ◆ Long-term reduction in cardiovascular events
- ◆ Not proven in acute stroke



Antiplatelet Agents

(aspirin, ticlopidine, dipyridamole, clopidogrel*)

Event	Risk Reduction
Non-fatal Stroke	25%
Non-fatal MI	35%
Vascular death	15%
Death any cause	15%

Heparin

- ◆ Commonly used in acute setting
- ◆ No data supporting it's use

International Stroke Trial (IST)

- ◆ 467 Hospitals
- ◆ 19,435 Patients



- ◆ Factorial Design
 - Heparin 5,000/12,500 IU
 - Avoid Heparin
 - Aspirin
 - No Aspirin
- ◆ Treatment
 - w/in 48 hrs
 - for 14 days

International Stroke Trial: Results

	Heparin (N=9717)	No Heparin (N=9718)	Events preventable per 1000
Ischemic Stroke (recurrent)	2.9%	3.8%	9*
Hemorrhagic Stroke	1.2%	0.4%	-8*
Death or Non-fatal Stroke	11.7%	12%	4
Dead or Dependent	62.9%	62.9%	0
Transfused or fatal hemorrhage	1.3%	0.4%	-9*

* $2p < 0.05$

Lancet 1997:349

1989 Survey of Neurologist Regarding Heparin Use

- ◆ 82% might decrease recurrent emboli
- ◆ 70% might be indicated in progressing stroke
- ◆ 6% thought proven useful
- ◆ 16% thought proven ineffective

High Risk Stroke/TIA Patients

- ◆ Crescendo TIAs
- ◆ Vertebrobasilar TIA
- ◆ High grade carotid stenosis
- ◆ Carotid / vertebral dissection
- ◆ Small cardioembolic stroke



Thrombolytic Candidates

- ◆ Can treat patients who are on aspirin
- ◆ Avoid antiplatelet & anticoagulants X 24 hrs following thrombolysis

Blood Pressure Management



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- ◆ Non-Thrombolytic Candidates
- ◆ Thrombolytic Candidates
 - pre-treatment
- ◆ Thrombolysied Patients
 - during & post-treatment

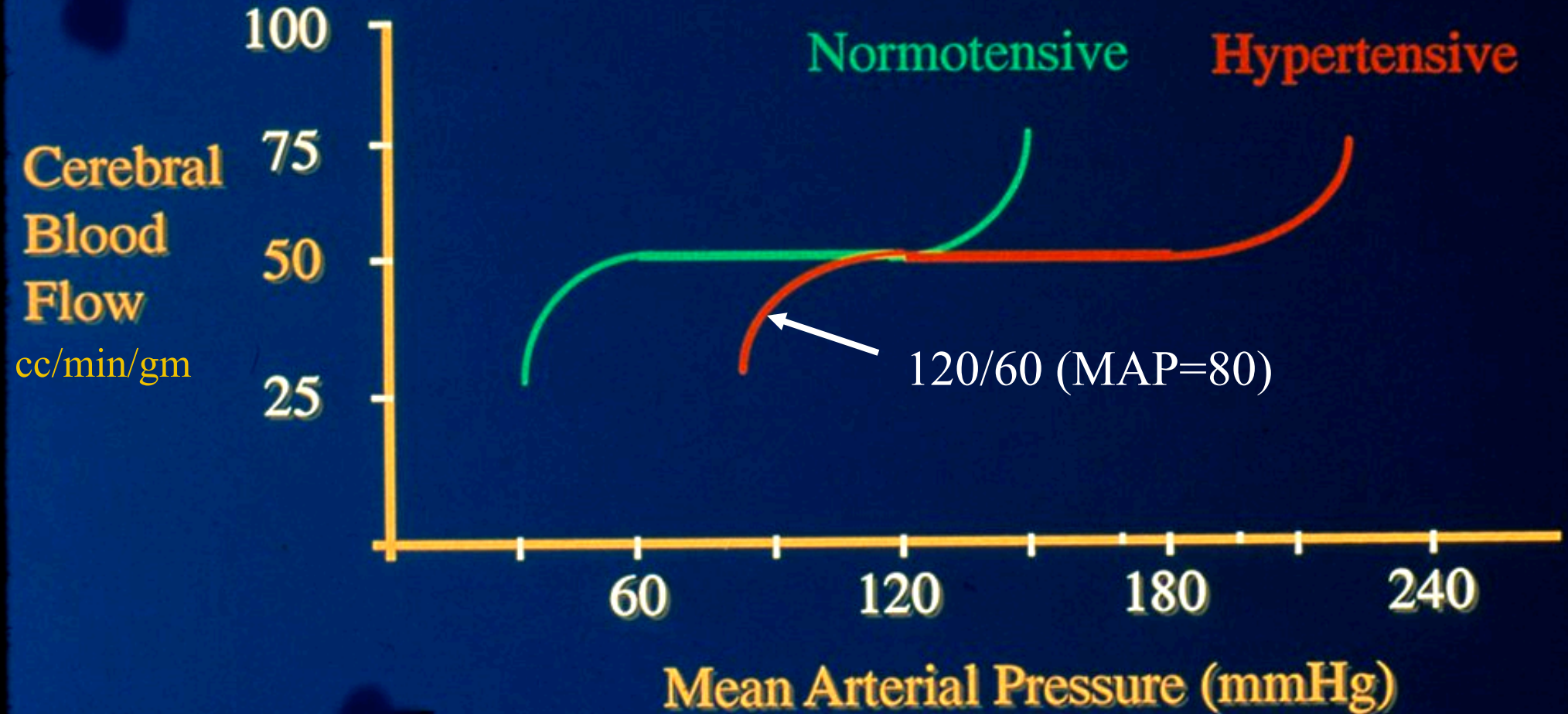
Blood Pressure Management In Stroke

- ◆ Guidelines in old ACLS (Advanced Cardiac Life Support) Handbook
- ◆ In ACLS cards that come with new handbook

BP Management for Non-Thrombolytic Candidates

- ◆ Recheck blood pressure
- ◆ DON' T TREAT acutely!

Cerebral Autoregulation



Current Guidelines

- ◆ Recheck BP
- ◆ Treat:
 - Systolic BP $>220-230$
 - Diastolic BP $>120-130$
- ◆ Reduce gradually

BP Management for Thrombolytic Candidates

◆ Pre-Treatment

- Be gentle
 - » Systolic 185>
 - » Diastolic 110>

◆ During/Post-Tx

- Be aggressive
 - » Systolic 185>
 - » Diastolic 105>

BP Management

- ◆ Non-Thrombolytic Candidate
 - Don't Treat!!!
- ◆ Pre-Thrombolysis
 - Be Gentle!!!
- ◆ During & Post-Thrombolysis
 - Be Aggressive!!!

41y.o male w/ Lt eye deviation & drooling. RN notes initial BP= 200/110

- ◆ Brought to ED 5 hrs. after onset
- ◆ Lt. Eye deviation, drooling, slurred speech
- ◆ RN notes elevated BP=200/110

Key Points

- ◆ Admit all new onset TIAs
- ◆ Avoid heparin use
- ◆ Treat only extreme HTN

**70 y.o. female w/ Rt. sided weakness.
RN notes initial BP= 200/110**

- ◆ Last seen normal 5 hrs.
PTA
- ◆ Slurred speech, Rt arm &
leg weakness
- ◆ RN notes elevated BP

Effectiveness of Heparin In Progressive

◆ Phase 1:

- Late 1970' s
- 310 patients
- ↓ speech/motor between 2 exams
- No Heparin

◆ Phase 2:

- Late 1980' s
- 907 patients
- 2 pt. ↓ in SSS
- Heparin infusion
 - » No bolus
 - » aPTT=50-80

41y.o male w/ Lt eye deviation & drooling. RN notes initial BP= 200/110

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