



KANSAS INITIATIVE FOR
STROKE SURVIVAL
A PROJECT BY AND FOR KANSANS

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Illicit Drugs and Stroke

“First Tuesdays” Lecture Series

Introduction and Goal of “First Tuesdays”

- Sabreena Slavin MD – Vascular Neurologist and Neurohospitalist at KU School of Medicine
- Didactic lecture series as part of the Kansas Initiative for Stroke Survival
- Updates in Practice and FAQ’s on Acute Stroke Care
- 20 minute didactic, 10 minutes for questions/discussion.

Epidemiology of drug use and stroke

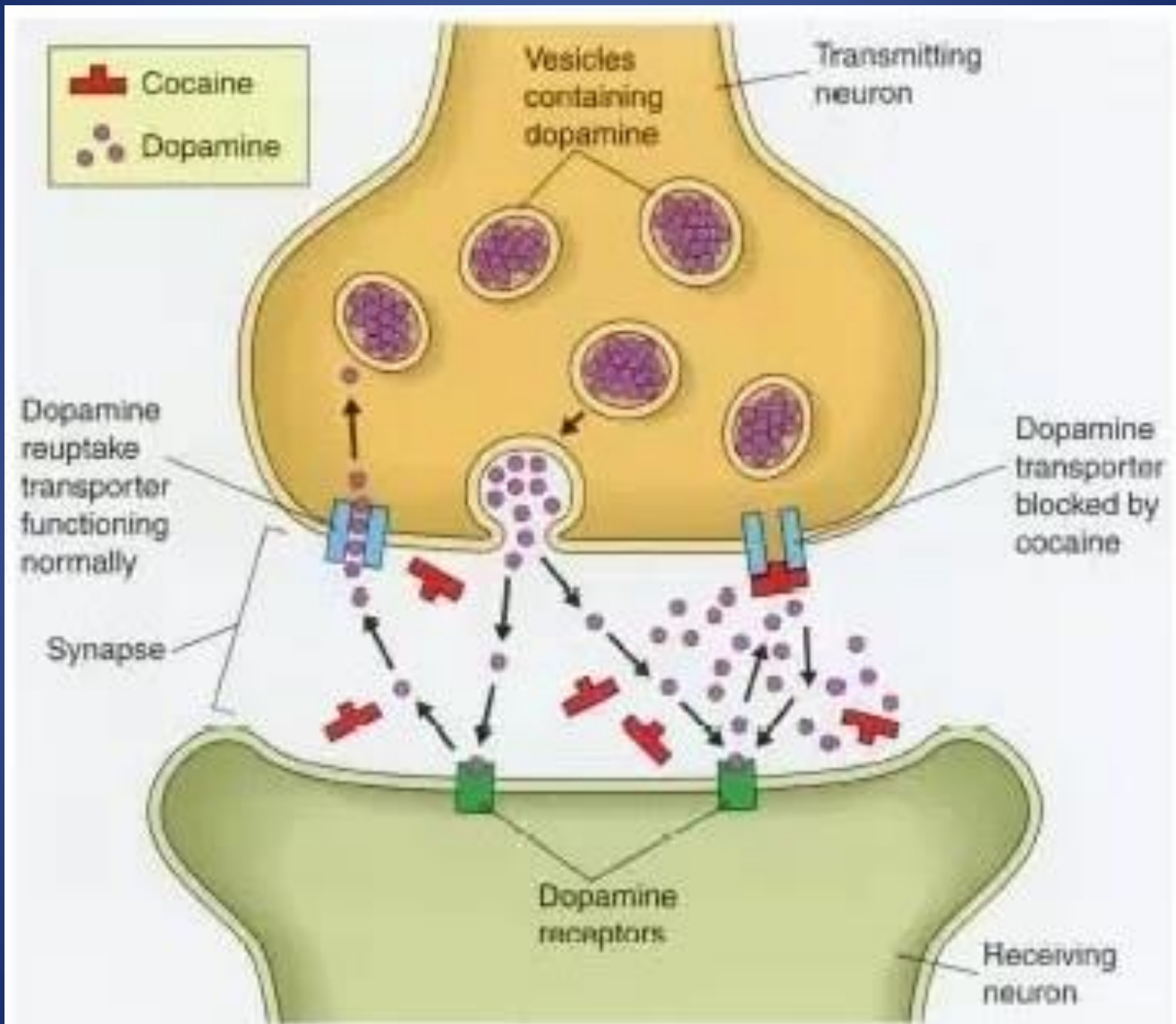
- Drug abusers had 6.5 increased risk of both hemorrhagic and ischemic stroke¹
- In Baltimore-Washington Young Stroke Study, 4.7% of patients had drug use as sole cause of stroke²
- All patients admitted with stroke should have a urine drug screen

Drugs which can cause stroke

- Cocaine: both hemorrhagic and ischemic stroke
- Amphetamines: mostly hemorrhagic stroke
- Ecstasy
- Opioids
- Cannabis

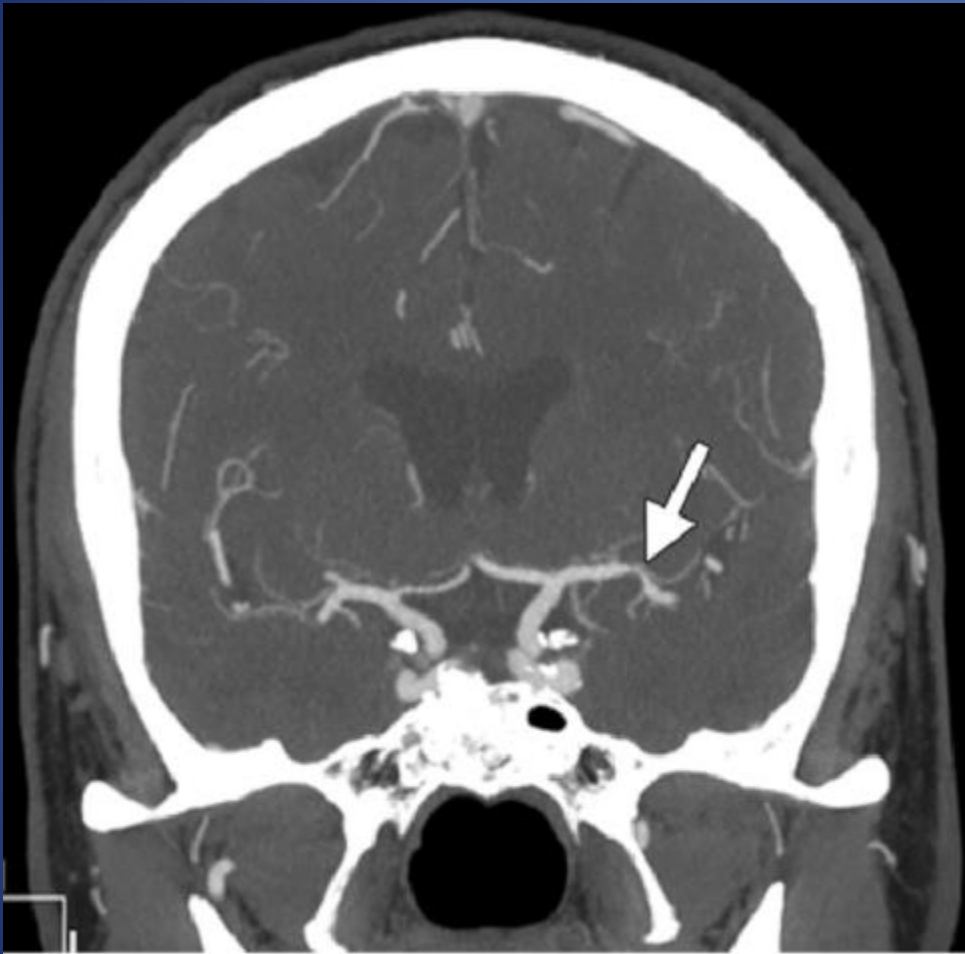
Cocaine

- Any form can cause stroke
- Mechanism: blocking of reuptake of catecholamines (norepinephrine, epinephrine, serotonin, dopamine) → excess sympathetic activity
- Acute mechanism: vasospasm, acute MI, arrhythmias, HTN (for hemorrhagic stroke)
- Chronic mechanism: cardiomyopathy, accelerated atherosclerosis

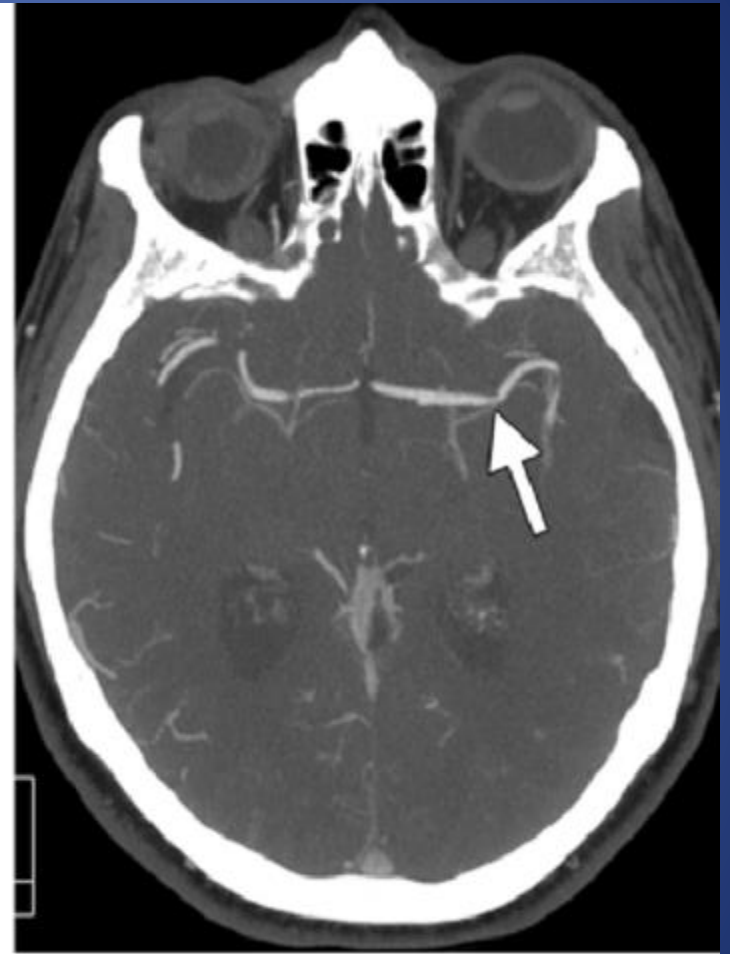


Cocaine-induced vasospasm

- Accumulating catecholamines, especially serotonin, causes vasoconstriction
- Usually occurs within hours



a.



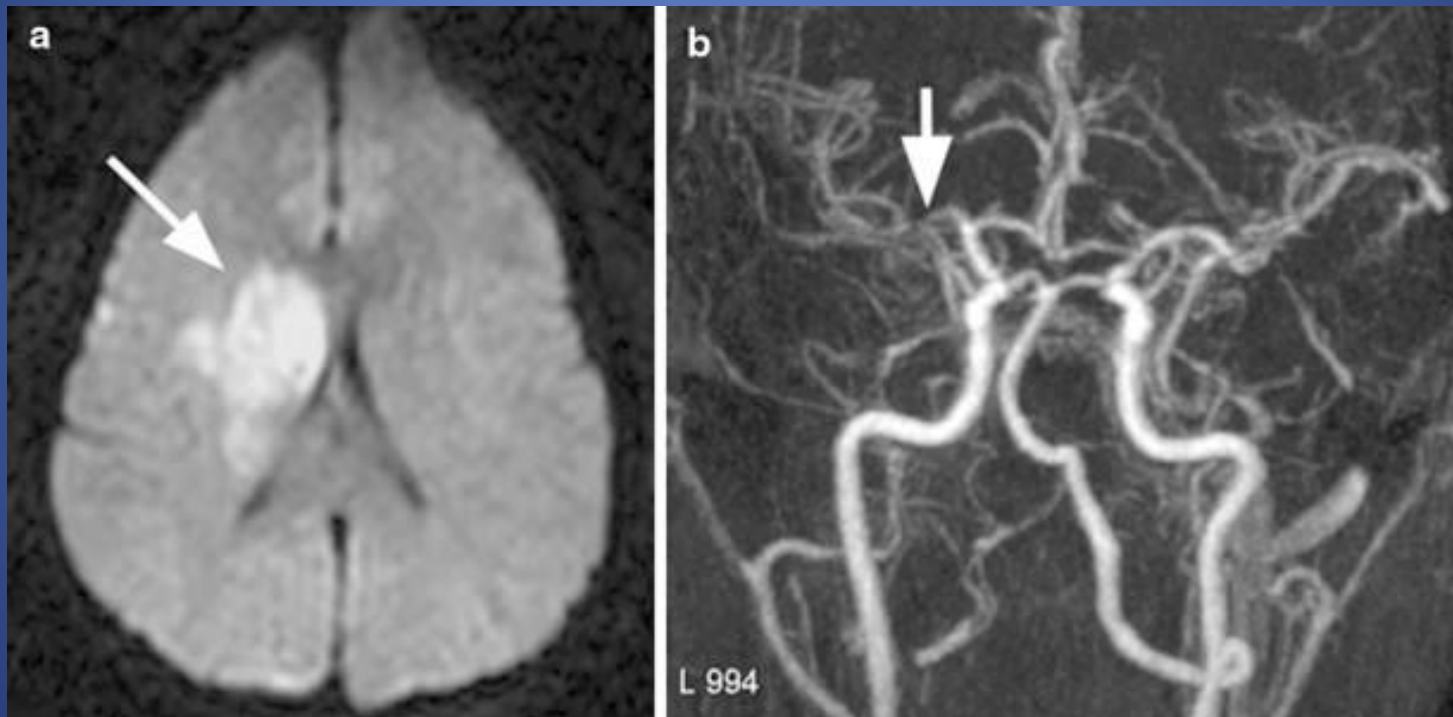
b.

Amphetamines

- Any form can cause stroke
- Mechanism: blocks reuptake of dopamine and also stimulates release of dopamine and norepinephrine → excess sympathetic activity
- Causes mostly HTN, arrhythmias, vasoconstriction, and cerebral vasculitis

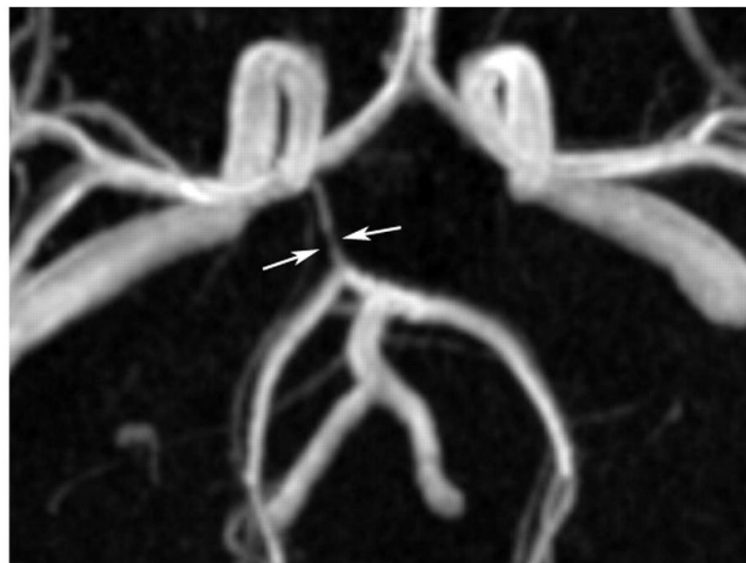
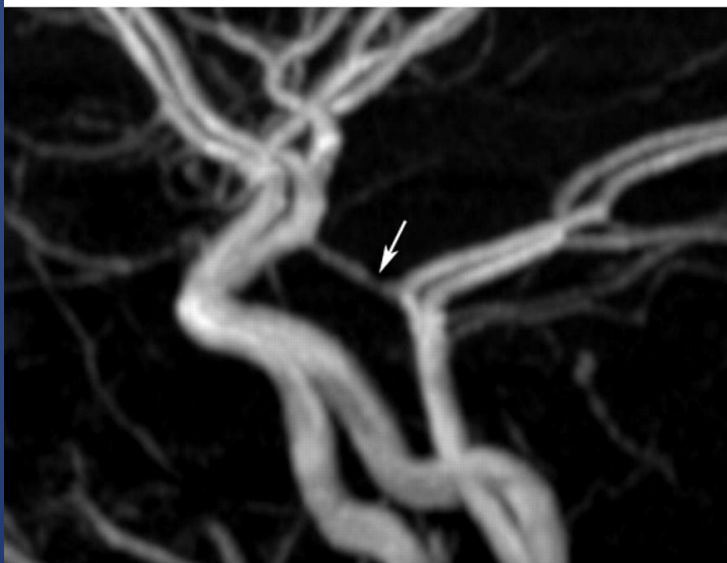
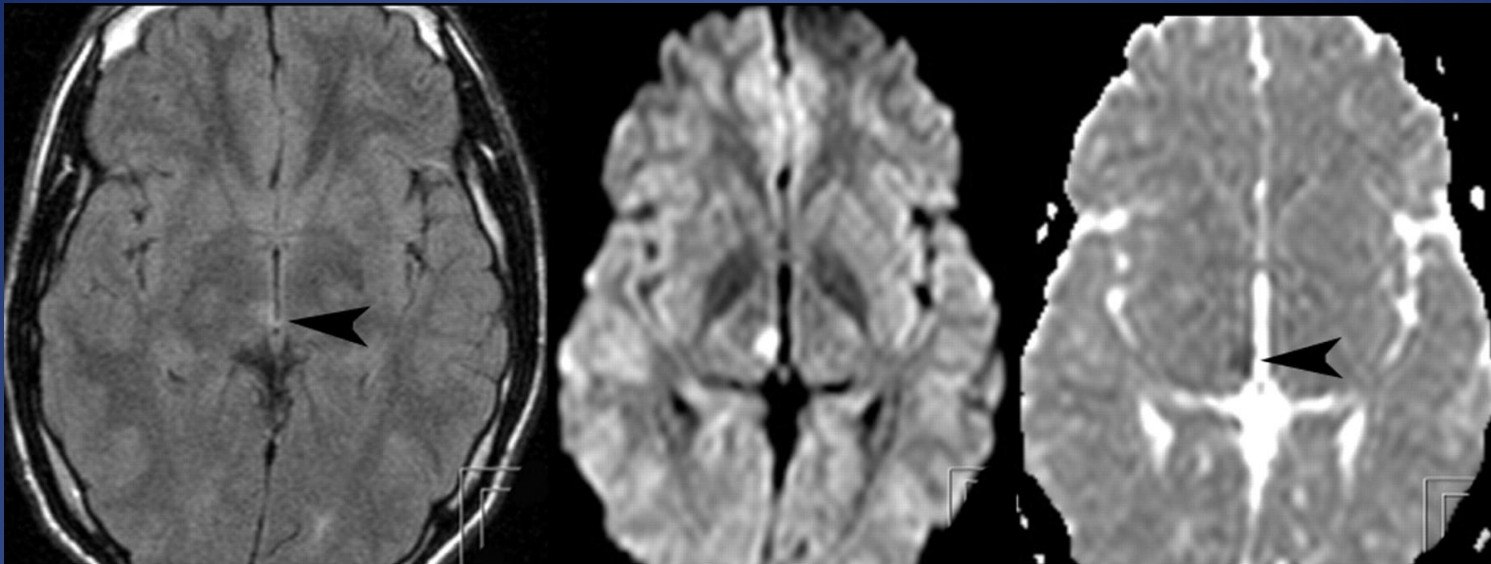
Cerebral vasculitis in amphetamine use

- Pathology has shown necrosis in cerebral arteries



Ecstasy/MDMA

- Mechanism: Causes rapid release of serotonin, which is a vasoconstrictor
- Usually strokes occur in occipital lobe and globus pallidus, areas with high expression of serotonin receptors



Opioids

- Mechanism: binds to endogenous opioid receptors and causes hypotension, bradycardia, respiratory depression
- Most due to IV heroin use, due to causing infective endocarditis leading to cardioembolic strokes
- Can also be related to global hypoperfusion, causing strokes in watershed territories
- Added impurities can also embolize to the brain or cause pulmonary HTN

Cannabis

- Rare, only some case reports causing stroke
- Inconclusive mechanism related to cannabis or mixed impurities: possibly altered cerebral autoregulation, hypotension, vasospasm/vasoconstriction, vasculitis, arrhythmias?

ICH outcomes with cocaine use

- Study including 45 patients with ICH who are cocaine-positive –
- Cocaine-positive patients had higher BP, more severe ICH scores, and were 3 times as likely to die during hospitalization compared to cocaine-negative

IV tPA in cocaine-positive stroke

- Retrospective review of acute ischemic stroke patients: 29 cocaine-positive vs 75 cocaine-negative who had IV tPA

Comparison of cocaine negative and cocaine positive AIS patients treated with IV tPA.

	Cocaine Negative (N=75)	Cocaine Positive (N=29)	<i>p value</i>
Age *	55 (32-91)	48 (19-67)	.001
Gender, Male, %	61.3	82.8	.039
Race, %			.423
White	34.7	20.7	
Black	50.7	65.5	
Hispanic	13.3	10.3	
Asian	1.3	3.4	
h/o HTN, %	70.7	67.9	.782
1 st SBP *	164 (96-223)	166 (101-257)	.545
1 st DBP *	89 (63-141)	99 (67-173)	.022
Glucose *	123 (62-354)	103.5 (81-286)	.003
CK *	135 (25-937)	192.5 (43-637)	.037
CK-Mb *	3.1 (0.8-10.5)	3.2 (1.4-67)	.614
Troponin *	.01 (.01-3.84)	.01 (.01-2.41)	.423
sICH	1.3% (1/75)	0% (0/29)	1.000
mRS on discharge *	2.0 (0-6)	2.5 (0-6)	.612
Favorable mRS on discharge (95% CI)	52.0% (42.3-61.5%)	50.0% (40.4-59.6%)	1.000
Favorable Disposition (95% CI)	72.0% (62.6-79.9)	82.8% (74.4-89.2%)	.319
Death (95% CI)	12.0% (9-20%)	3.4% (0.7-8.8%)	.276
Baseline NIHSS *	11 (3-35)	13 (4-23)	.777
Time to IV tPA, min *	141 (65-180)	116.5 (69-173)	.201

Conclusions

- Ischemic and hemorrhagic stroke occur most often after cocaine and amphetamine use, but can be rarely seen with others.
- All patients are still candidates for treatment, including IV tPA and endovascular thrombectomy.
- Treatment of further morbidity involves cessation of drug use in addition to usual risk factor modification.

Questions?

- Call for help anytime!
- <http://www.kissnetwork.us/>
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