The Courier for Stroke Thrombolysis

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Content

1) Stroke epidemiology and service need in HK
2) The rationale for stroke thrombolysis
3) Thrombolysis Delivery model – the Chain of Survival

1 in 6

people worldwide will have a stroke in their lifetime.

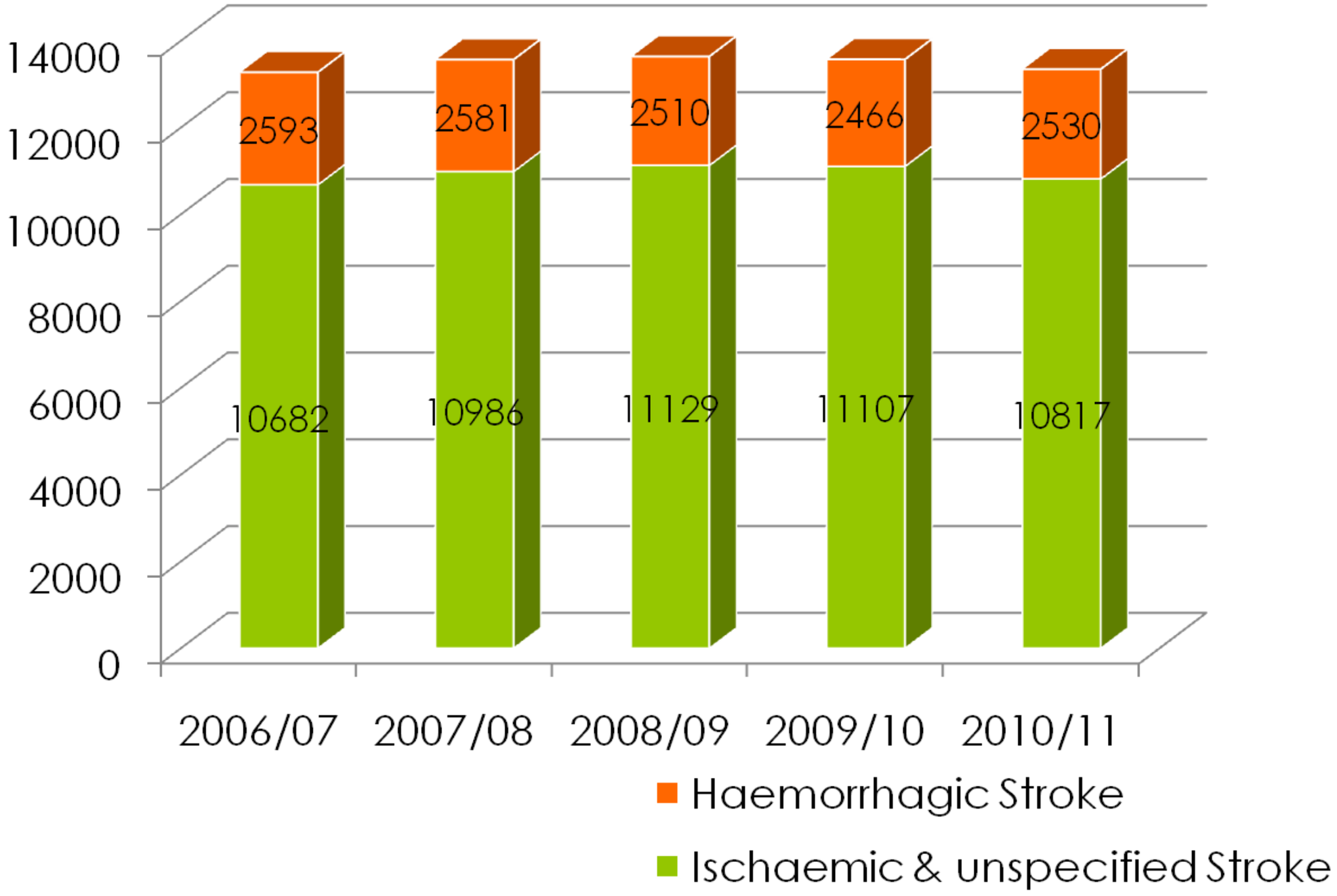
IT COULD BE YOU!

全球每6個人便有1人
於一生中患上中風

你極有可能是
其中之一

World Stroke Organization

Inpatient Service Demand



Source: MIPo

Thrombolysis Therapy is now a Standard Care in Acute Stroke

NICE guidelines

8.1.2 RECOMMENDATIONS

R20 Alteplase is recommended for the treatment of acute ischaemic stroke when used by physicians trained and experienced in the management of acute stroke. It should only be administered in centres with facilities that enable it to be used in full accordance with its marketing authorisation. (Alteplase TA122 2007)[70]

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ESTABLISHED IN 1812 SEPTEMBER 25, 2008 VOL. 359 NO. 13

Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke

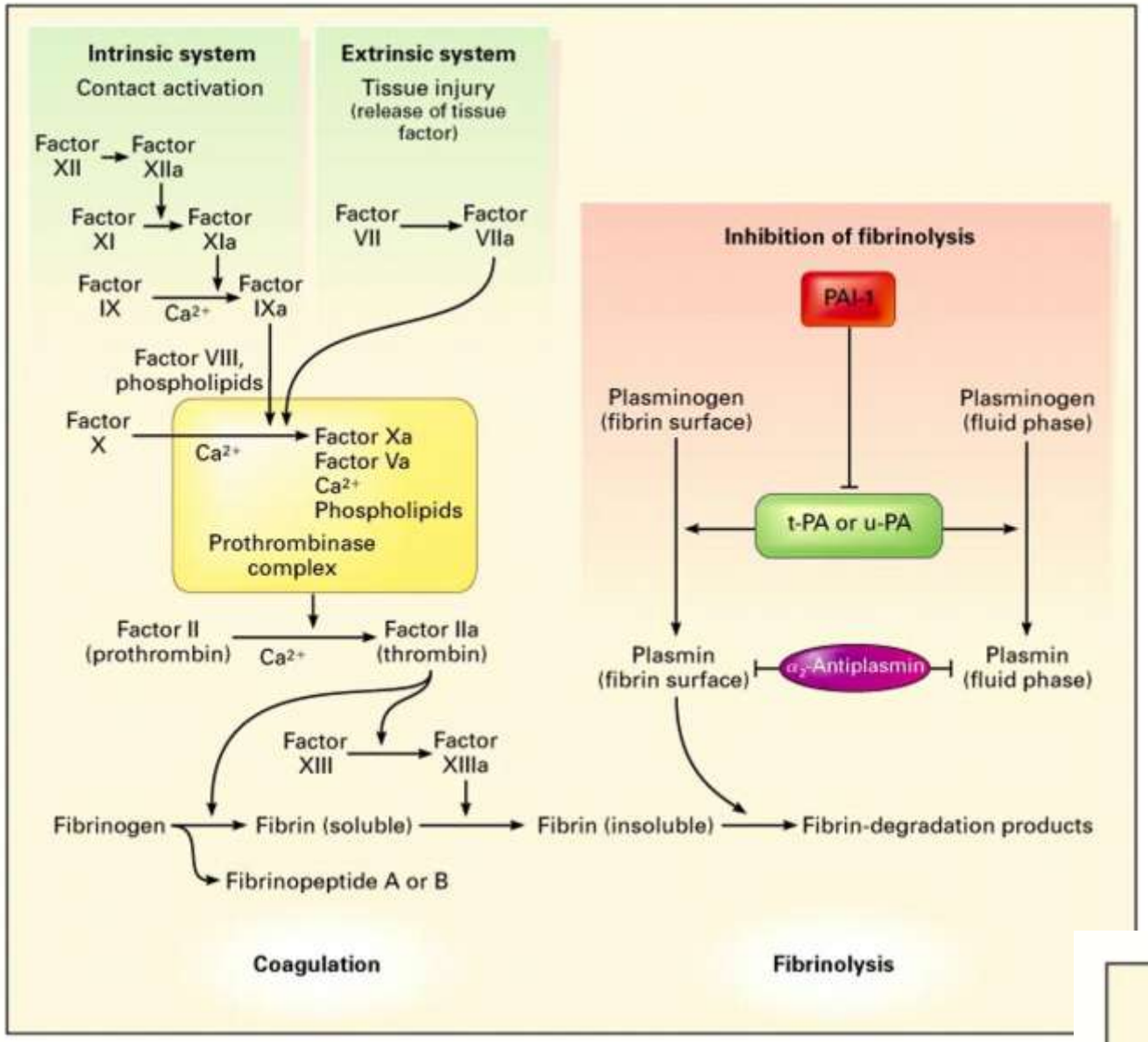
Werner Hacke, M.D., Markku Kaste, M.D., Erich Bluhmki, Ph.D., Miroslav Brozman, M.D., Antoni Dávalos, M.D., Donata Guidetti, M.D., Vincent Larrue, M.D., Kennedy R. Lees, M.D., Zakaria Medeghri, M.D., Thomas Machnig, M.D., Dietmar Schneider, M.D., Rüdiger von Kummer, M.D., Nils Wahlgren, M.D., and Danilo Toni, M.D., for the ECASS Investigators*

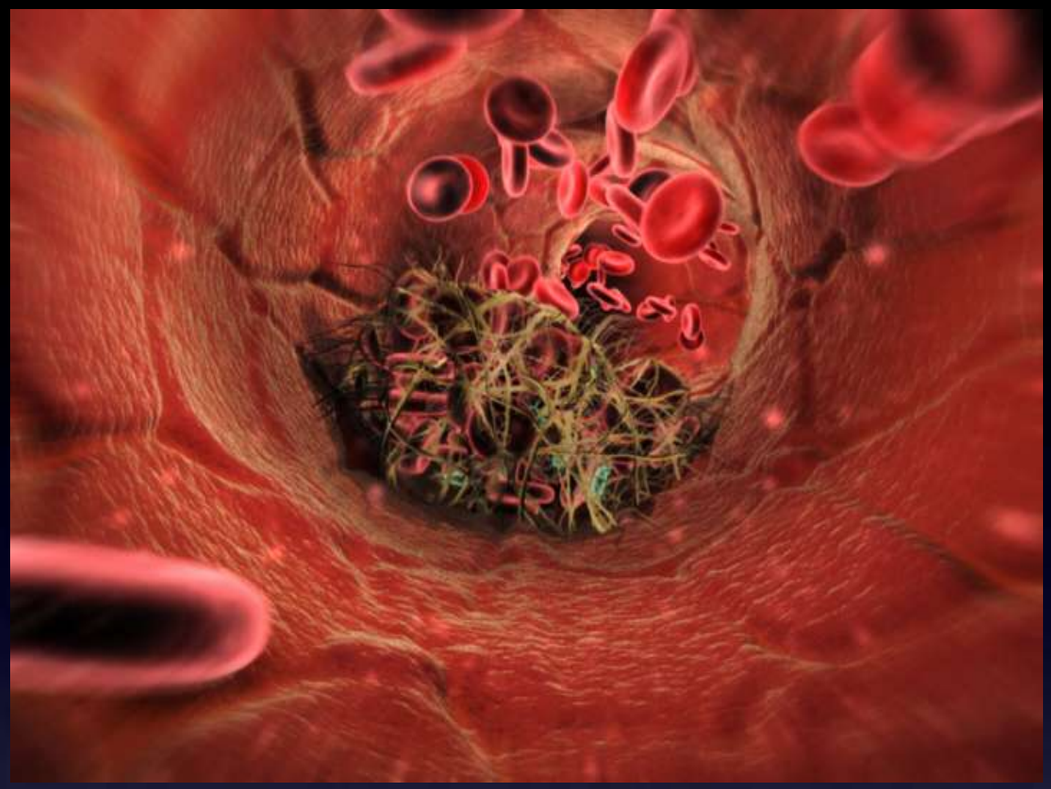
Class I Recommendations

1. **Intravenous rtPA (0.9 mg/kg, maximum dose 90 mg) is recommended for selected patients who may be treated within 3 hours of onset of ischemic stroke (Class I, Level of Evidence A). Physicians should review the criteria outlined in Table 11 (which are modeled on those used in the NINDS trial) to determine the eligibility of the patient. A recommended regimen for observation and treatment of the patient is described in Table 12. *This recommendation has not changed from previous statements.***
2. **Besides bleeding complications, physicians should be aware of the potential side effect of angioedema that may cause partial airway obstruction (Class I, Level of Evidence C). *This recommendation has been added since the previous guidelines.***

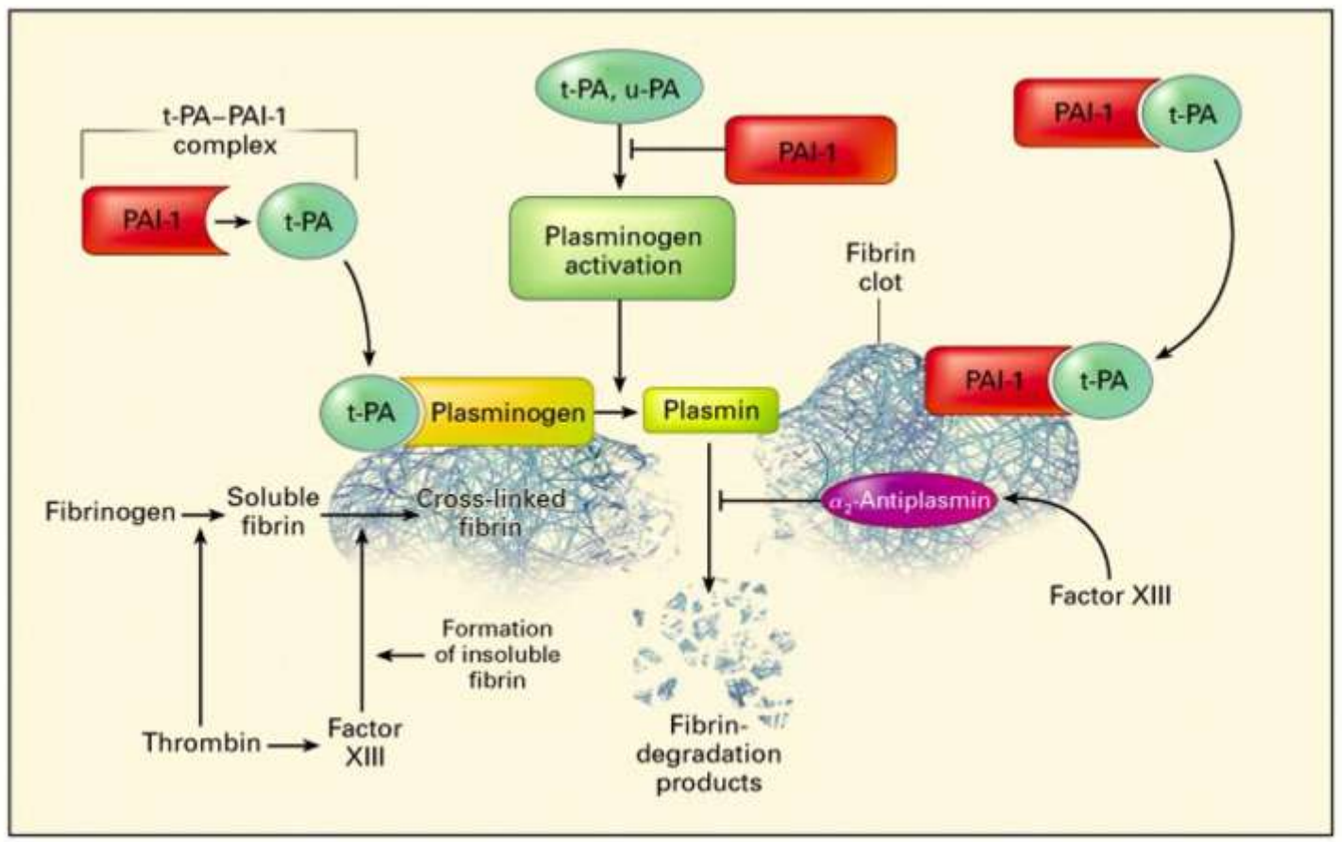
(*Stroke.* 2007;38:1655-1711.)

AHA/ASA Guideline


Intrinsic system
Contact activation
Extrinsic system
Tissue injury
(release of tissue factor)
Factor XII → Factor XIIa
Factor XI → Factor XIa
Factor IX → (Ca2+) Factor IXa
Factor VII → Factor VIIa
Factor VIII, phospholipids
Factor X → (Ca2+) Factor Xa
Factor Va
Ca2+
Phospholipids
Prothrombinase complex
Factor II (prothrombin) → (Ca2+) Factor IIa (thrombin)
Factor XIII → Factor XIIIa
Fibrinogen → Fibrin (soluble) → Fibrin (insoluble) → Fibrin-degradation products
Fibrinopeptide A or B
Inhibition of fibrinolysis
PAI-1
Plasminogen (fibrin surface)
Plasminogen (fluid phase)
t-PA or u-PA
Plasmin (fibrin surface)
α2-Antiplasmin
Plasmin (fluid phase)
Coagulation
Fibrinolysis

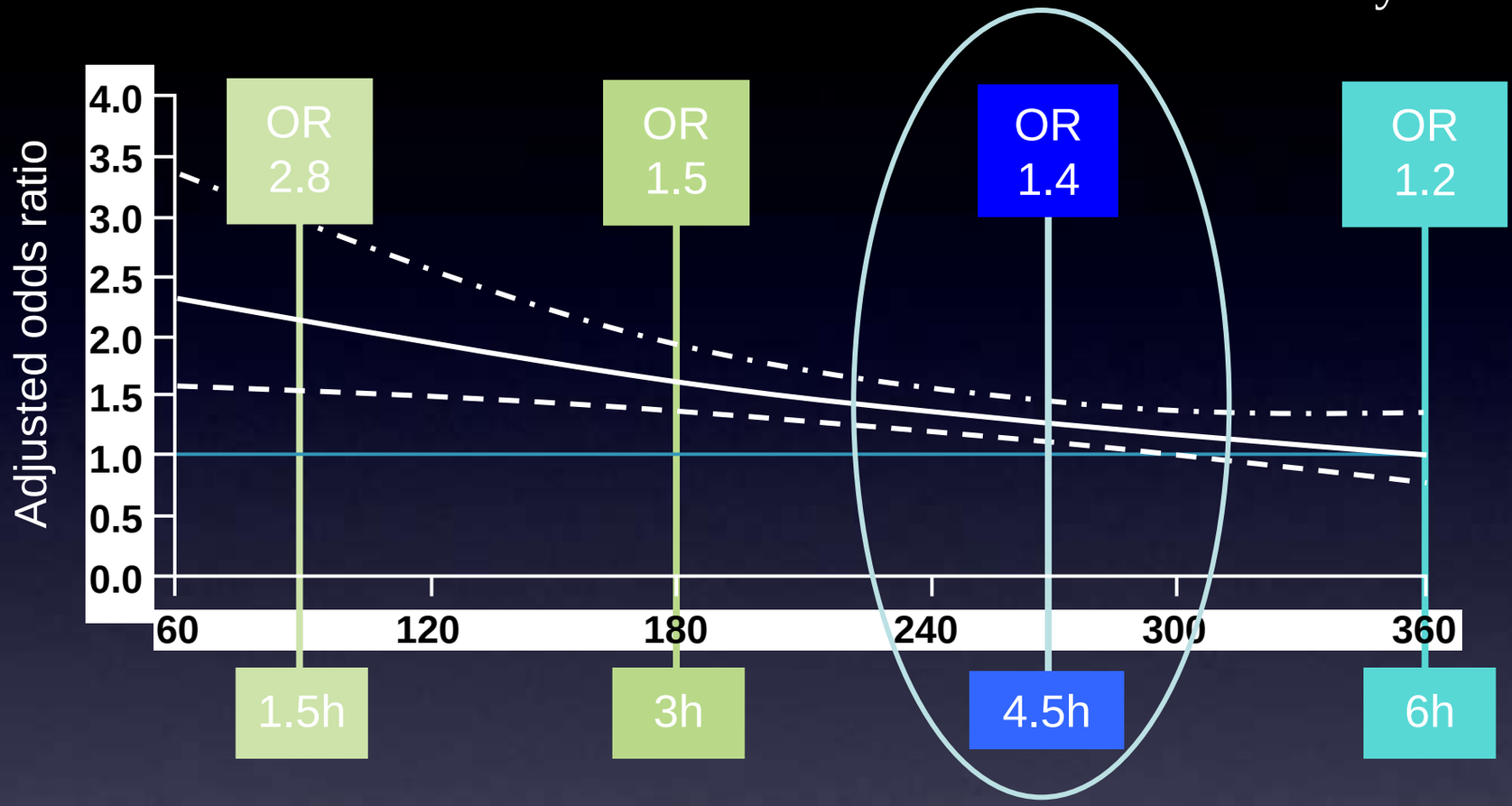


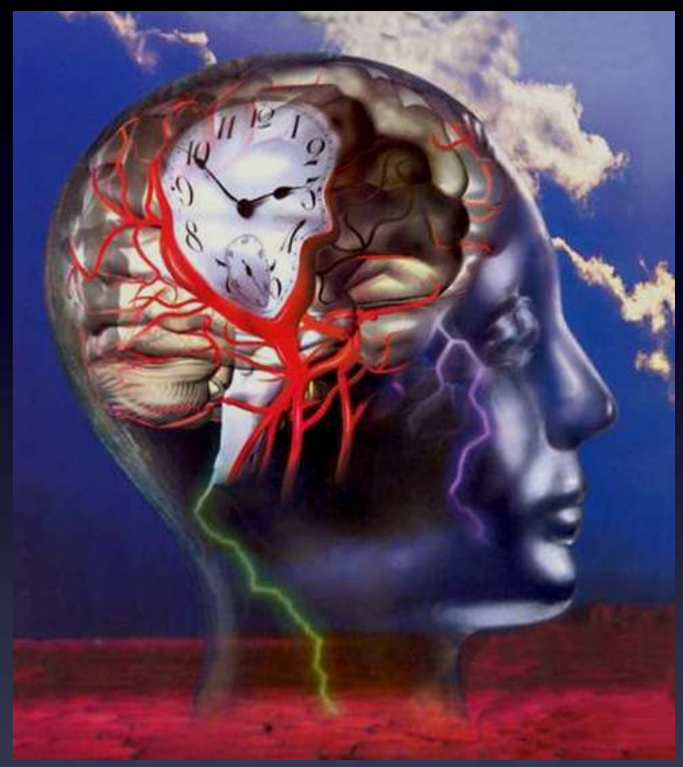

Actilyse
50 mg
20 mg


t-PA–PAI-1 complex
PAI-1
t-PA
t-PA, u-PA
PAI-1
Plasminogen activation
PAI-1
t-PA
Fibrin clot
t-PA
Plasminogen
Plasmin
PAI-1
t-PA
α2-Antiplasmin
Factor XIII
Fibrinogen
Soluble fibrin
Cross-linked fibrin
Formation of insoluble fibrin
Thrombin
Factor XIII
Fibrin-degradation products

The earlier the delivery, the better the outcome

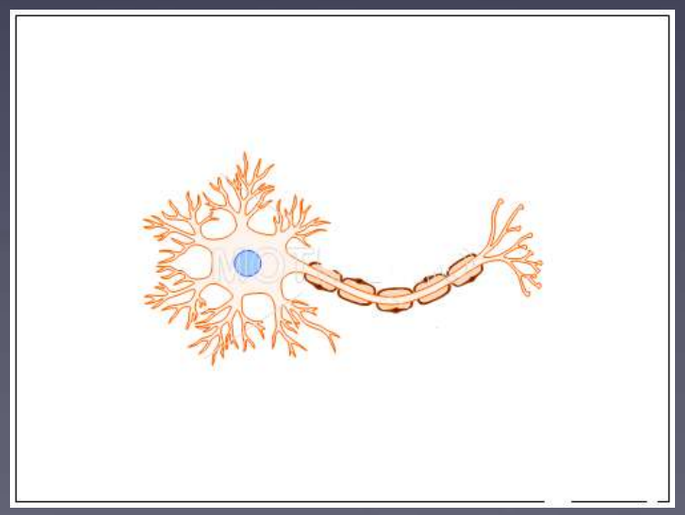
Pooled analysis of individual patient data (n=2775) from 6 trials of i.v. alteplase vs placebo showed that the effective treatment window may extend to 4.5 hours





Time Interval from onset of symptoms to treatment initiation [min]

Hacke et al. Lancet 2004; 363: 768–74



Estimated Pace of Neural Circuitry Loss in Typical Large Vessel, Supratentorial Acute Ischemic Stroke

	Neurons Lost	Synapses Lost	Myelinated Fibers Lost	Accelerated Aging
Per Stroke	1.2 billion	8.3 trillion	7140 km/4470 miles	36 y
Per Hour	120 million	830 billion	714 km/447 miles	3.6 y
Per Minute	1.9 million	14 billion	12 km/7.5 miles	3.1 wk
Per Second	32 000	230 million	200 meters/218 yards	8.7 h

ORIGINAL ARTICLE

An expedited stroke triage pathway: the key to shortening the door-to-needle time in delivery of thrombolysis

Alexander YL Lau 劉玉麟
Yannie OY Soo 蘇蘊欣
Colin A Graham
WK Woo 胡永強
Edward HC Wong 王浩中
Howan Leung 梁浩雲
Anne YY Chan 陳然欣
Lisa WC Au 區穎芝
Vincent HL Ip 葉慶龍
Cecilia SF Leung 梁淑芳
Venus Hui 許詩韻
WC Shum 岑偉政
Jill Abrigo
Deyond YW Siu 蕭容媛
Simon CH Yu 余俊豪
Lawrence KS Wong 黃家星
Thomas W Leung 梁慧康

Objectives To assess time management of stroke thrombolysis triage and functional outcomes in patients receiving recombinant tissue

Key words
Brain ischemia; Emergency medical services; Recombinant proteins; Stroke; Tissue plasminogen activator

Hong Kong Med J 2010;16:455-62

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ORIGINAL ARTICLE

Is stroke thrombolysis safe and efficacious in Hong Kong?

CME

Main

Edward HC Wong 王浩中
Alexander YL Lau 劉玉麟
Yannie OY Soo 蘇蘊欣
Deyond YW Si 蕭容媛
Venus SW Hu
Colin A Grahar
Thomas WH Leun
Lawrence KS Won

Objective To investigate the safety and efficacy of stroke thrombolysis in a local hospital.

Brain ischemia; Hong Kong; St
plasminogen activator; T

Hong Kong Med J 2

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Clinical Study

Intravenous alteplase for Chinese patients with stroke with borderline-eligibility

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ABSTRACT

Lack of efficacy and safety data among Chinese patients with stroke have attributed to the slow development of stroke thrombolysis as standard-of-care. We examined a retrospective cohort of 57 patients who received intravenous alteplase for acute ischemic stroke to identify predictors of outcome, including age, stroke severity, onset-to-treatment time, and early ischemic changes on brain CT scan. Overall, the mean National Institute of Health Stroke Scale (NIHSS) score was 15.7 and the mean onset-to-treatment time was 142 minutes. Twenty-nine (51%) patients had a favorable outcome with modified Rankin Scale (mRS) score of ⩽2 at three months. Ten (17.5%) patients were deceased at three months. Four (7%) patients developed symptomatic intracranial hemorrhage (sICH). For patients aged >80 years (n = 18), five (28%) achieved favorable outcome, six (33%) were deceased at three months and three (17%) had sICH. Prognosis was worst for patients with NIHSS score >25 (n = 5); one (20%) was dependent (mRS 4) and the other four (80%) were deceased. Multivariate analysis found that the Alberta Stroke Program Early CT Score (ASPECTS) was associated with favorable outcome (odds ratio [OR] 1.8, 95% confidence interval [CI] 1.1–3.0), and mortality (OR 0.5, 95% CI 0.3–0.9). Our findings showed advanced age and severe stroke were associated with less favorable outcome in Chinese patients receiving intravenous alteplase, ASPECTS can be used reliably to identify patients at risk of poor outcomes. Further studies are warranted.

港聞 > 港聞

及時拯救中風病人免癱
溶血藥注導管 對準腦動脈注射

【明報專訊】今年2月12日早上10
到羅女士的沙田家中打掃，打算跟
呼，但女傭發現羅沒有反應，恐防
於是告知羅女士的親人。羅的媳婦
一時間召救護車將她送入沙田威爾
及時，令羅女士趕及在溶血劑能有
「黃金3小時」內接受手術，避過嚴
脅。

健康Q&A

中風的黃金三小時

Q：甚麼是中風的黃金三小時？

A：在香港，中風是導致成人殘障最常見的病因。中風分出血性及缺血性兩大類，而盡速送醫院接受緊急治理十分重要，例如缺血性中風患者若能經臨床診斷和腦部電腦掃描檢查，於徵狀出現後三小時內接受適當治療，如溶栓治療，則可降低殘疾或死亡的機會。這種治療的效用跟時間掛鈎，愈早用藥療效亦會愈佳，因此治療急性缺血中風就有「黃金三小時」的概念。若任何人出現言語不清、半側肢體無力或麻木、嘴部歪斜、步伐不穩、視力模糊等中風徵狀，應立即就醫，以免喪失黃金三小時的救援機會。

Q：是否每間急症室也有溶栓治療？

明報新聞網訂戶專區

明報 電子報
Premium.MINGPAO.COM

港聞 > 港聞

何謂黃金3小時？

【明報專訊】病人羅女士中風後因搶救
殘，不用臥　或用支架輔助走路，訪問時
生。中大腦神經科主任黃家星教授說，國
得3小時有效治療期。幸好這位病人在早
檢查在內，醫生能為病人及時施救。

星期日檔案

主頁 | 每集內容 | 影片

« 返回所有集數

2011.07.24 - 黃金三小時

播出日期: 2011.07.24 (日)

腦中風每年大約有25,000宗病例，當中八成的中風塞引致，若能在發病三小時內，注射溶血劑，治癒障，所以有(黃金三小時)的說法。

伊利沙伯醫院2008年底成立，全港首支24小時急性風病人作出支援，至今已為72名病人進行治療，當務可否大幅增加？中風病人康復路漫長，心理上又

記者：關麗雯/趙嘉韻

兩中風病人 醫院等救等到死

男任由自生自滅

◆受害人家屬直斥周一嶽管治無能，不應獲頒金紫荊星章，要求他落台。 資料圖片

官僚冷漠，見死不救，已成為本港醫療系統的惡習，尤其是年紀老邁的腦中風病人，病發被送到醫院，都只能「等死」！最近有兩名腦中風病人，分別於病發時被送大埔那打素醫院及屯門醫院搶救，被送那打素醫院的婦人，疑因當值醫生見她病情複雜，置之不理七小時，終使她流血不止枉死。另一急性腦中風男子，由博愛醫院轉送屯門醫院後，亦因院方錯過為他注射溶血塊治療的時間，任由他自生自滅，留院四日後慘死。痛失親人的家屬狠批院方處理失當，還死不認錯，更怒斥食物及衞生局局長周一嶽管治無能，沒資格受頒金紫荊星章，應該落台。記者李嘉怡、林妙詩報道

◆李寶發（小圖）生前身體壯健，家屬指如父親入院後得到適切治療，結果可能會完全不同。

堅強爸爸不獲[redacted]開藥

八十歲的男子李寶發，今年三月二十六日，於工作期間突然左半身不能動彈，被送往博愛醫院急症室，證實右大腦血管栓塞，醫生表示李伯要立即進行溶栓治療，注射溶血塊藥物，需轉送設有急性腦內科護理病房的屯門醫院治療。

護士指主診醫生已收工

不過，他被送抵屯院後，院方未作任何檢查便將他送上病房，等了兩小時仍無醫生為他診治。直至下午三時許始有一名腦內科主診女醫生為他檢查，但有人向他家屬表示，由於已過了注射溶血塊藥物的有效時間，故再無藥物可以救治他。

當時李伯頭痛不止，家屬要求醫生為他止痛，護士竟指主診醫生已經收工。李伯女兒李小姐憶述事件時，激動落淚：「爸爸係個好堅強嘅人，但當時佢真係痛得好緊要，求我哋畀藥佢食，我哋做仔女嘅見到真係好心痛！」她指其父更痛至不停拍打頭部，但始終無醫護人員為他治療。李小姐於二十七日清晨收到醫院來電，指李伯病情惡化，右腦嚴重水腫，她趕到醫院時李伯已陷昏迷。醫院安排李伯做開腦手術，但手術後他一直昏迷，延至三月二十九日不治。

主診醫生卸責醫院制度

李小姐批評主診醫生於其父逝世後，不肯解答家屬的疑問：「佢（主診醫生）話佢唔係得一個病人，即使有問題都係醫院嘅制度問題。」她直斥院方根本沒有回應有否延誤治療。

屯門醫院發言人指，由於病人右腦細胞已呈壞死，不適合進行溶解血塊治療。不過，院方無解釋為何無再進行精細檢查。醫院承認與家屬溝通上出問題，但強調已經為病人提供適當治療。

李伯病死經過

1 李伯左半身不能動彈，被送往博愛醫院急症室證實右大腦血管栓塞，轉送屯門醫院治理。

2 被送屯門醫院後，有人當時指可為李伯注射溶血塊藥物的有效時間已過，其後根本沒為他治療，李伯最終不治。

病人組織：可民事索償

社區組織協會病人權益幹事彭鴻昌指出，以上兩宗事故，院方的處理明顯有問題，他建議家屬可向醫院民事索償。他說，公立醫院一向對中風長者的治療不積極，醫護人員往往指病人年紀大而不搶救，

【記者李嘉怡、林妙詩報道】官僚冷漠，見死不救，已成爲本港醫療系統的惡習，尤其是年紀老邁的腦中風病人，病發被送到醫院，都只能「等死」！ 最近有兩名腦中風病人，分別於病發時被送A醫院及B醫院搶救，被送A醫院的婦人，疑因當值醫生見她病情複雜，置之不理七小時，終使她流血不止枉死。另一急性腦中風男子，由C醫院轉送B醫院後，亦因院方錯過爲他注射溶血塊治療的時間，任由他自生自滅，留院四日後慘死 (9/09)

The Medico-legal Quagmire

Failure to use tPA (70%)

Malpractice

Delayed and Misdiagnosis

Bleeding Complications

Expert Witness Testimony

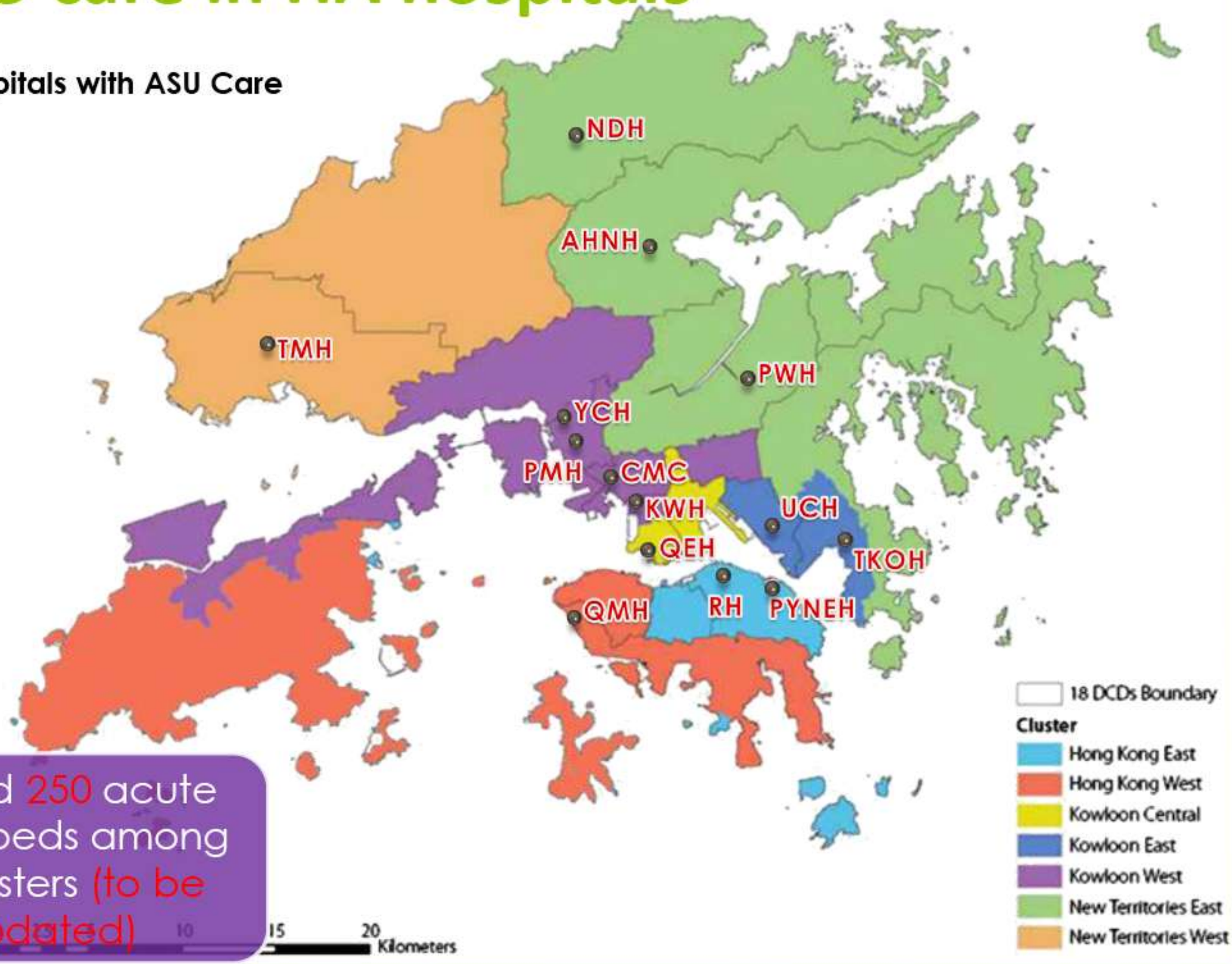
(*Stroke* 2006;37:1917-1922)
(*Ann Emer Med* 2008;52:160-164)
(*Arch Neurol* 2008;65:1429-1433)

Standard of Care vs Evolving Standard of Care

ASA vs CAEP vs AAEM
<2% of admitted patients received tPA (*JAMA* 2000; 283:1151-1158.
Stroke 2008;39:924-928)

ASU care in HA hospitals

- :14 hospitals with ASU Care



Around 250 acute stroke beds among all clusters (to be updated)

內科病房(腦血管病治療中心)

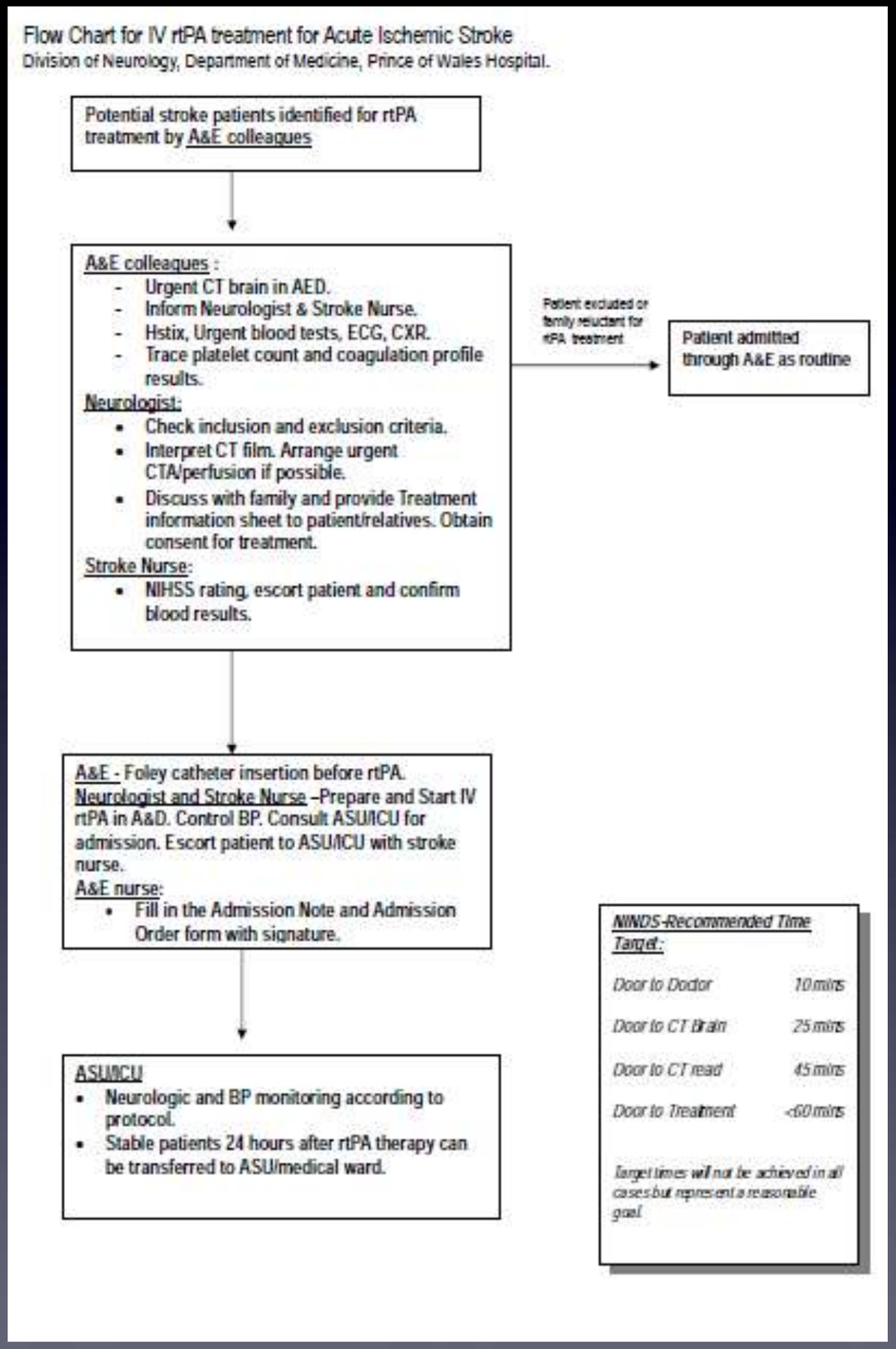
Acute Stroke Unit

A designated facility with skilled professionals.

Stroke neurologist, stroke nurse, physiotherapist, speech therapist, occupational therapist and rehabilitation physician.

ASU care is based on standardized stroke orders and integrated stroke pathways.

Effective in reducing morbidity and mortality of stroke



Logistic Hurdles

On-site, Team Approach: Neurologists/Physicians and Nurses

(Journal of Stroke and Cerebrovascular Diseases 2008;17:23-25)

Inter-departmental and inter-hospital collaboration: A&E, Radiology, Neurology, ASU/ICU

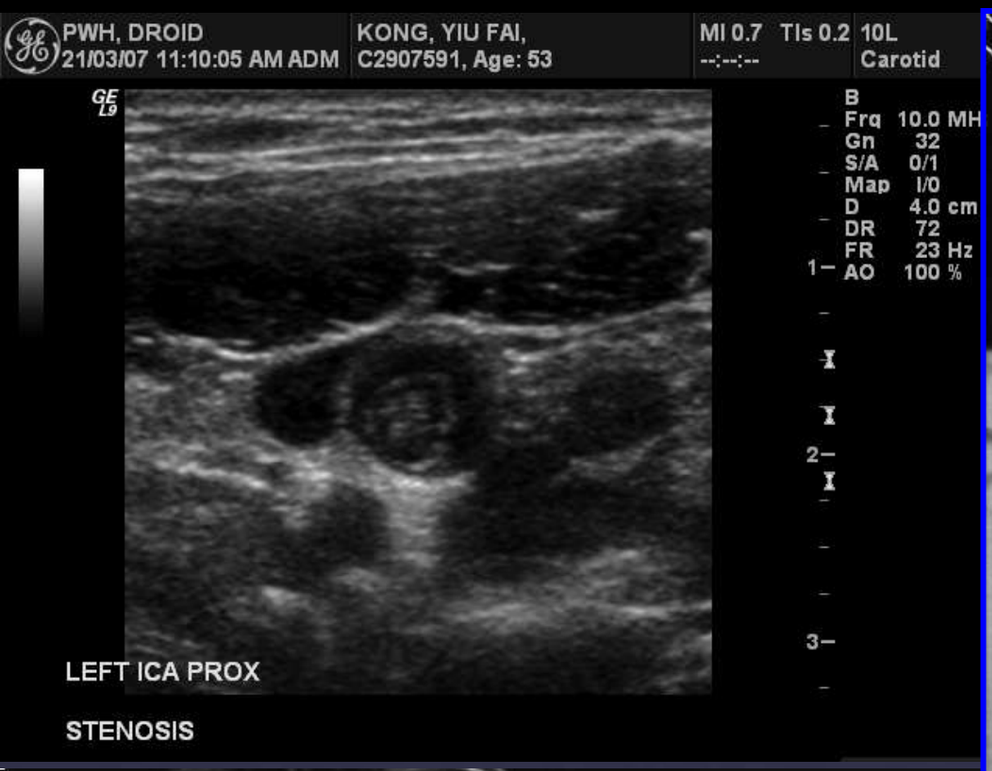
CC (stroke): Implement standardized service across 7 clusters

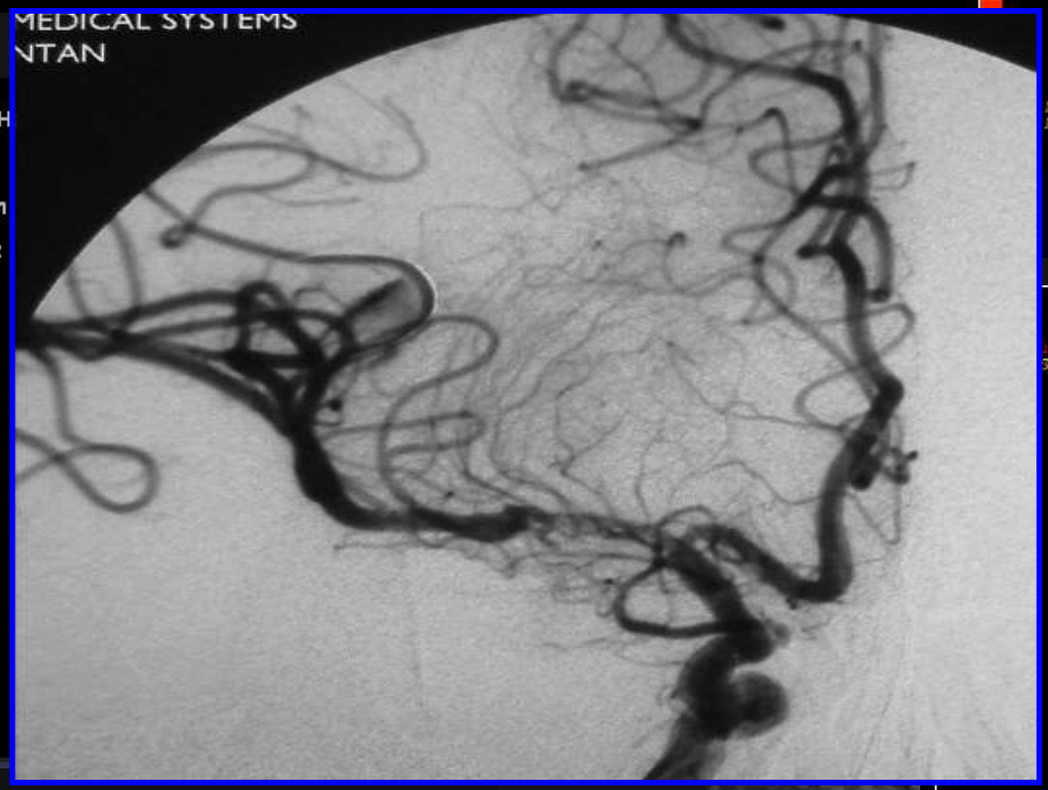
Doctors

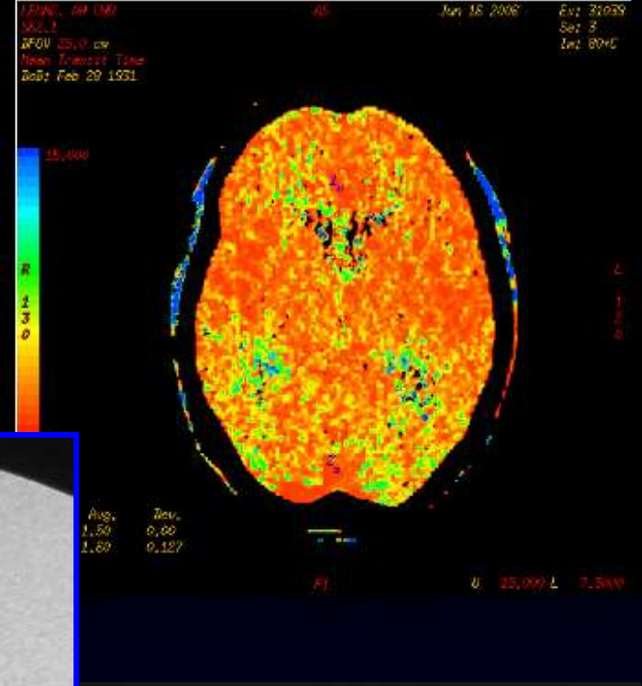
Nurses

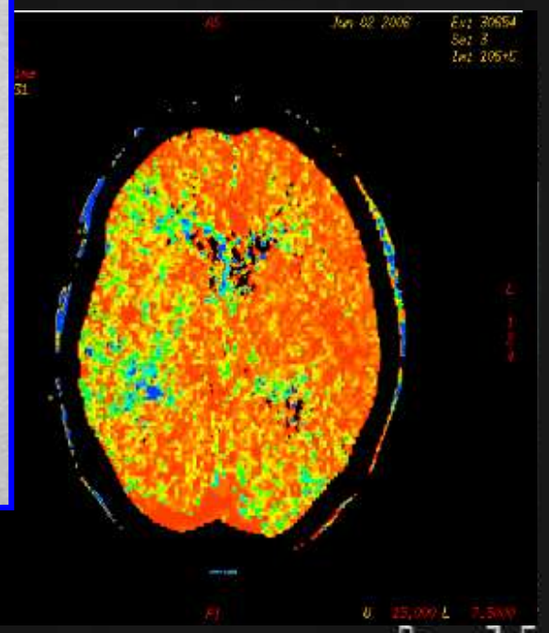
Paramedics

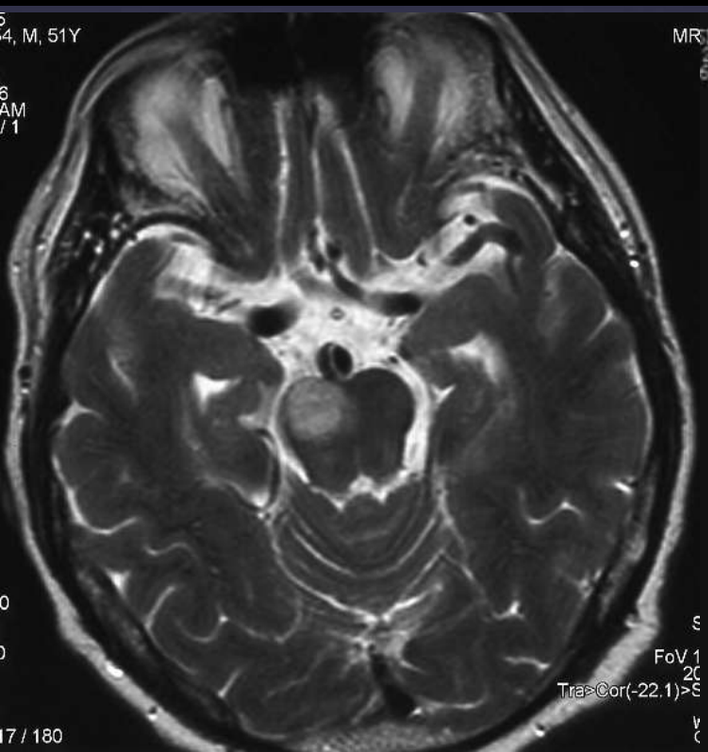
Heterogeneous disease
Specialist-led/coordinated service

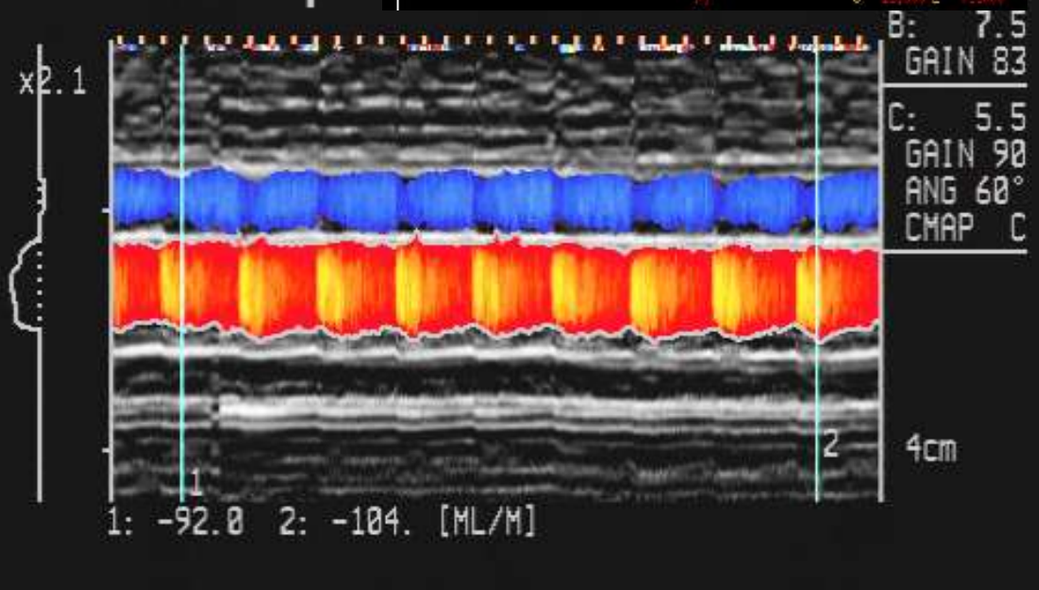










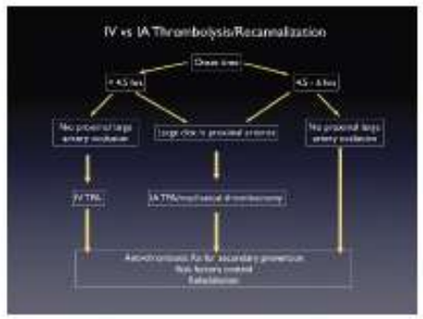


Stroke/tPA Nurse














Door to needle time <60 Minutes

rtPA thrombolyisis call

Stroke nursing role

1.Rapid response (arrive ED < 5 min)

2.Clarify onset time, perform NIHSS and other assessment

3.Triage (check inclusion & exclusion criteria)

4.Coordination; investigation & people

5.Preparation, drug administration, escort; observation and subsequent care

Nurses received stroke training by April 2012

PRCC stroke (1997-2012)	**Master degree stroke (2006-2012)**	**Hyper-acute Management (2010-2012)**
172	148	102(19APN)

Defining the roles for each team-mate:

Team Work !

Team-in-charge

1) Arrive with stroke nurse/NS
2) Confirm diagnosis and verify stroke onset time
3) Rate ASPECTS and HAT scores
4) Determine eligibility for tPA
5) Recruit team-mate(s) for assistance if patient eligible
6) Written documentation for pros and cons of tPA for that particular patient
7) Informed consent from patient/family
8) Supervise other team-mates during tPA delivery

Stroke nurse/Stroke Nursing Specialist

1) Arrive with the team-in-charge, and tPA box in hand
2) Immediate NIHSS, and report to the team-in-charge
3) Book CT/CTA/CT perfusion
4) Report BP every 3 minutes
5) Send urgent blood specimens to lab directly
6) Assist transfer of patient
7) Foley's catheter insertion
8) Set up micro-dripset and rate of infusion
9) Escort patient from A&E until arrival at ASU/ICU

nate

1) Recruited by team-in-charge when patient eligible
2) Take blood for urgent CBP, R/LFT, spot glucose, INR/PT/APTT and X-match
3) Set one 18G angiocatheter on each forearm
4) Prepare tPA, and give the bolus dose based on estimation of patient's body weight after Foley confirmed in-situ
5) Record and document initiation time and dose in patient's file
6) Ensure smooth infusion of tPA until completion
7) See family/relative once as team representative after tPA delivery

Second Supporting Team-mate

1) Recruited by team-in-charge when patient eligible
2) Check past medical history from CMS (including drugs and previous blood tests results) and report to team-mates
3) Detailed physical exam before tPA (especially CI and bleeding symptoms and signs)
4) Prepare and initiate labetalol infusion if hypertension
5) Ensure urinary catheter in-situ before tPA
6) Liaise with ASU/ICU for admission
7) Monitor neurological status during tPA delivery until arrival at ASU/ICU

Thrombolysis for Acute Ischaemic Stroke

Stroke Nurse Check List for Thrombolysis Triage During Nonworking Hours

Document Number: PWH/NEURO-P-TPA9- V1.1	**Effective Date:** 26th March 2012
Prepared by Dr. Yannie Soo, AC. DOMT. Miss Venus Hui, RN, DOMT.	**Approved by** Prof. Thomas Leung, Associate Professor, DOMT

1. **Objectives**

1.1. To facilitate Stroke Nurse in prompt and safe delivery of thrombolytic therapy for acute ischaemic stroke patients during nonworking hours.

2. **Scope**

2.1. Patients who present to PWH AED with suspected stroke within 2.5 hours of symptom onset during non-working hours (i.e. 5:30 to 8 p day during weekend and holidays) when thrombolysis service is available.

2.2. Thrombolytic therapy is now available from 8 am to 8 pm during weekdays. Starting hour will be extended gradually to 24 hours daily from Monday to Friday. Please ch thrombolytic therapy with AED or ASU if necessary.

2.3. Potential patients for thrombolysis should be triaged as category II patients in HDU

2.4. Stroke nurse should be informed if the patient fulfils all the preliminary screening crit

Protocol-driven

Accountability (esp for the nurses) and safety

Patien

Thrombolysis for Acute Ischaemic Stroke

AED Flow Chart During Nonworking Hours

Document Number: PWH/NEURO-P-TPA9- V1.0	**Effective Date:** 26th March 2012
Prepared by Dr. Yannie Soo, AC. DOMT.	**Approved by** Prof. Thomas Leung, Associate Professor, DOMT

1. **Objectives**

1.1. To facilitate AED in early identification and prompt referral of stroke patients who may benefit from thrombolytic therapy.

2. **Scope of Service**

2.1. Patients who present to PWH AED with suspected stroke within 2.5 hours of symptom onset during non-working hours (i.e. 5:30 pm to 8 pm during weekdays and all day during weekend and holidays) when thrombolysis service is available.

2.2. Thrombolytic therapy is now available from 8 am to 8 pm during weekdays. Starting from 26th March 2012, service hour will be extended gradually to 24 hours daily during weekdays. Please check the availability of thrombolytic therapy with AED or ASU if necessary.

2.3. Potential patients for thrombolysis should be triaged as category II patients in HDU or R room.

2.4. Stroke nurse should be informed if the patient fulfils all the preliminary screening criteria for TPA in AED.

Bringing life to these protocols:
Exposure, Intensive training and seminars
Examination and Certification
GCP: clear written documentation
Discussions, Reviews and Audit

Autonomy and self-actualization
Career pathway for stroke nurses

香港中文大學醫學院
Faculty Of Medicine
The Chinese University Of Hong Kong

醫院管理局
新界東醫院聯網
Hospital Authority
New Territories East Cluster

Joint Chinese University of Hong Kong-New Territories East Cluster Clinical Research Ethics Committee
香港中文大學-新界東醫院聯網 臨床研究倫理 聯席委員會

Flat 3C, Block B, Staff Quarters, Prince of Wales Hospital, Shatin, HK
Tel : (852) 2632 3935 / 2144 5926 Fax : (852) 2646 6653 Website : http://www.crec.cuhk.edu.hk

To: Dr. Thomas Wai Hong LEUNG (Principal Investigator)
Dept. of Medicine & Therapeutics
Prince of Wales Hospital

8 NOV '11

Ethics Approval of Research Protocol

CREC Ref. No.:	**CRE-2011.471**
Date of Approval:	**01 November 2011***
Study Title:	**The symbiosis of neuro-interventionists: from parallel practice to interdisciplinary patient care**
Investigator(s):	**Thomas Wai Hong LEUNG, Simon C. H. YU, George K.C. WONG, Deyond Y.W. SIU and Annie L.C. CHAN**

Certificate of Completion

This is to certify that

Leung Shuk Fong, Cecilia

has completed the

In house training and Clinical Assessment

on

Thrombolysis for Acute Ischaemic Stroke

held on

<24 Nov 2012 to 30 Jan 2012>

organised by

Prince of Wales Hospital
Acute Stroke Unit
New Territories East Cluster

(This Training is equivalent to5 CNE points.)

Prof. Thomas W. H. Leung
Director of Acute Stroke Unit
Prince of Wales Hospital

Ms. Angela Kwok
M&T DOM
Prince of Wales Hospital

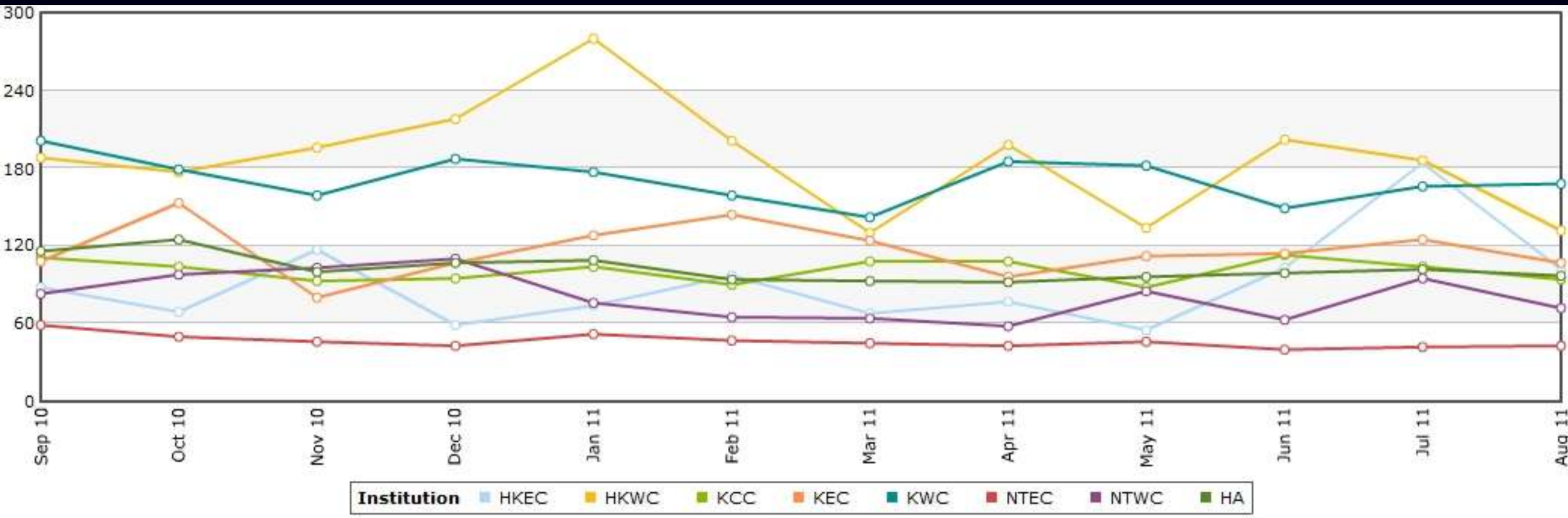
Medicine

Radiology

Emergency

A&E

Median A&E to CT Brain time



KPI: Pre-admission CT

Symptom Onset

AED Arrival

Emergency Physician Assessment

Blood Test, CXR, ECG, HB x2

CT brain

CT brain interpretation

Initiate Thrombolysis
Triage Call

>1 Hour

30-45 mins

IV Thrombolysis

Stroke Nurse

Clarify onset time

NIHSS

Neurologist assessment

Inclusion & Exclusion criteria

Checklist

Review CT brain

Consent for CTA/CTP

CT A / P

NIHSS

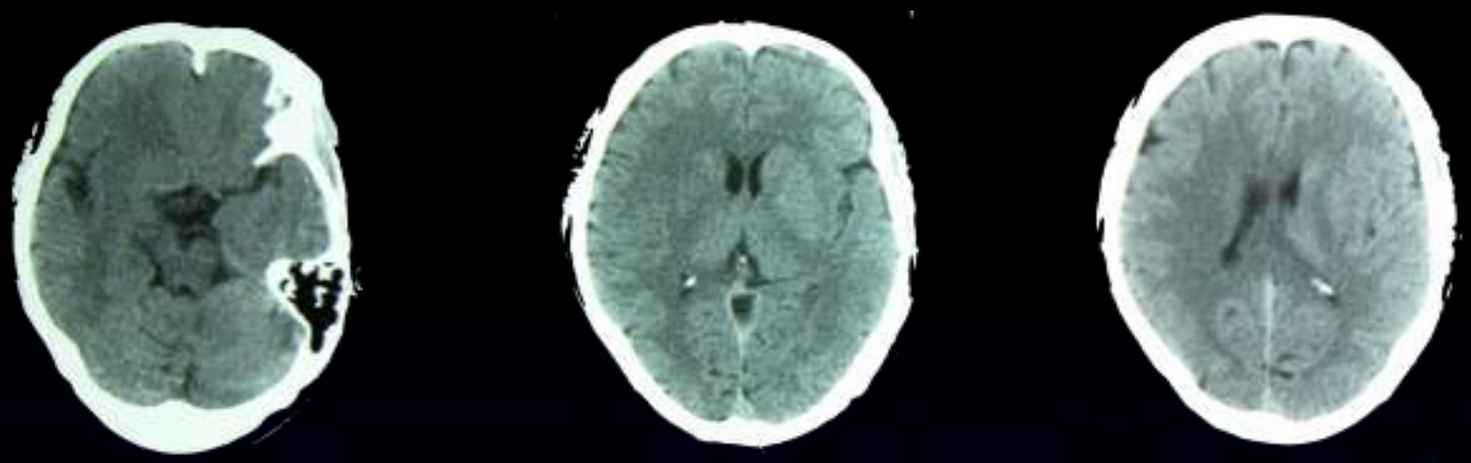
Control BP

Consent for TPA

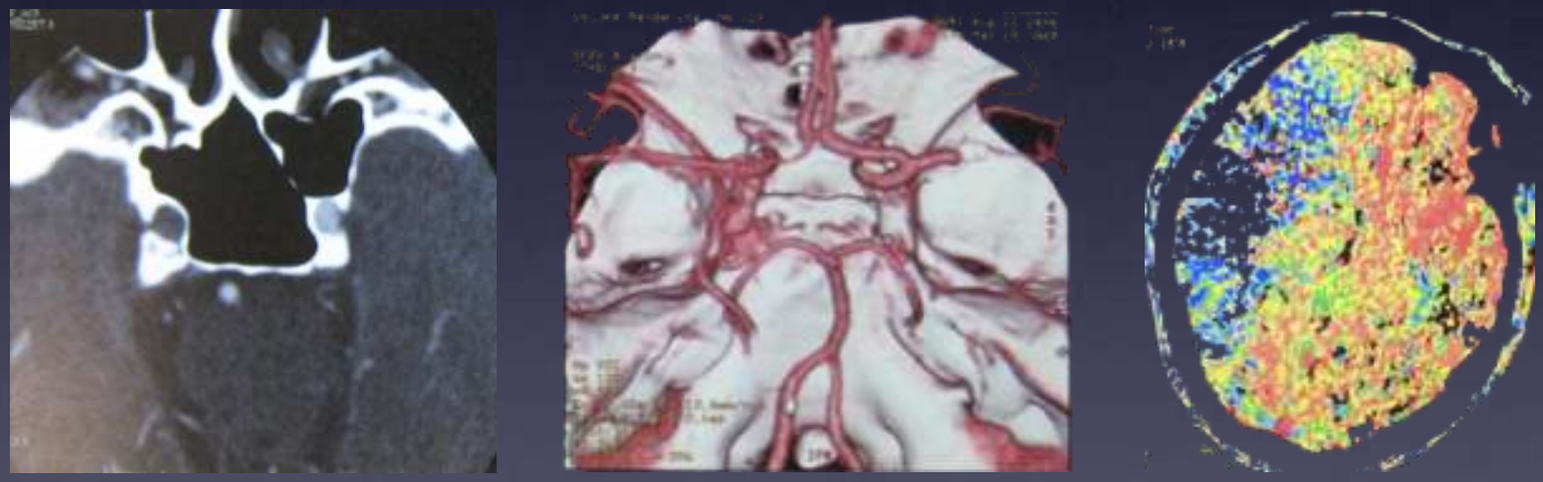
1 - 1.5 hr

IA Thrombolysis / Mechanical Thrombectomy

Door-to-needle time < 1 hour

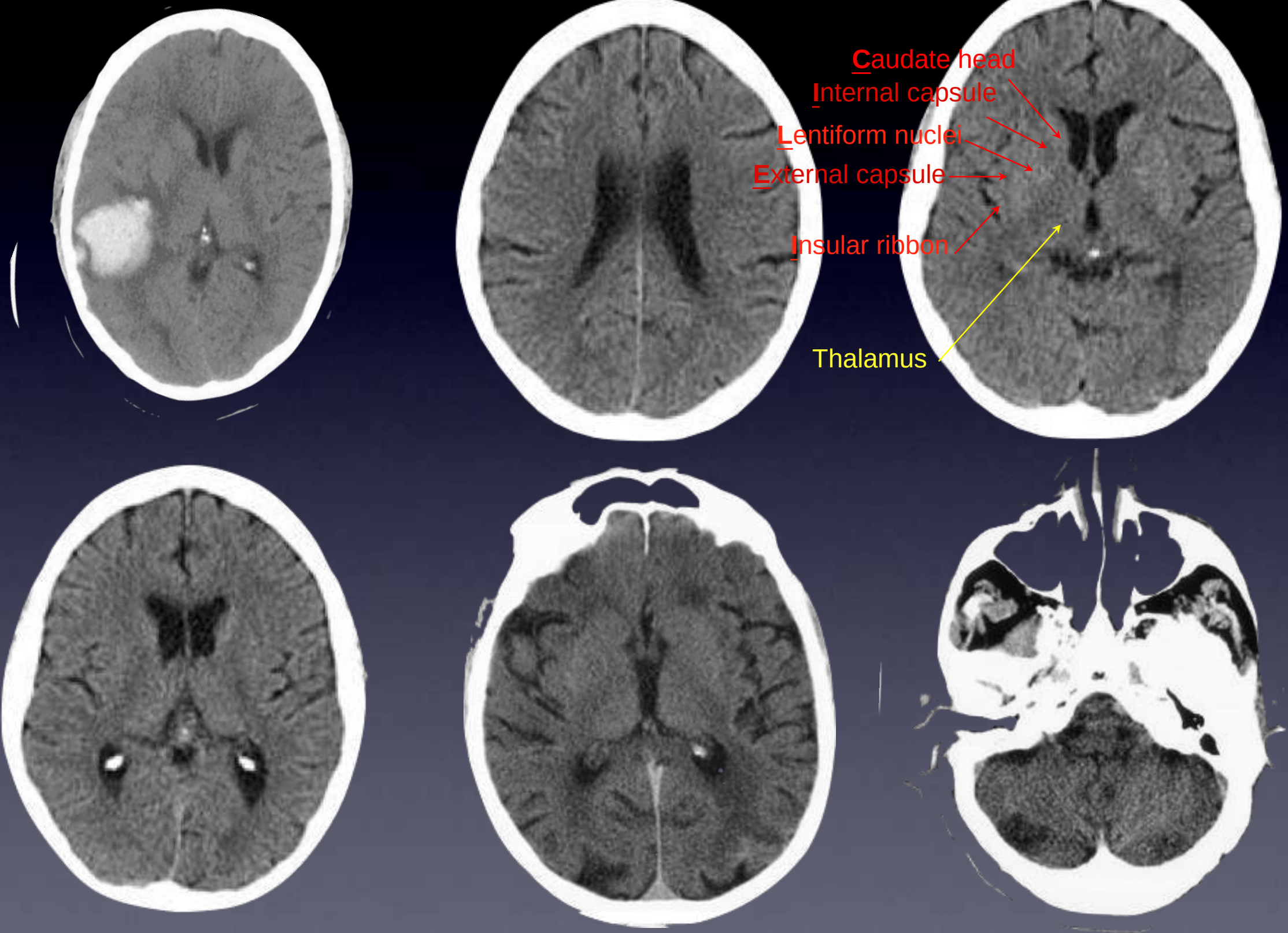


NCCT: Early ischemic changes over right BG, insular, and caudate



CTA: R ICA occlusion, R M1 occlusion
CTP: large area of perfusion deficit over R MCA territory

A plain CT


Caudate head
Internal capsule
Lentiform nuclei
External capsule
Insular ribbon
Thalamus

Consideration before Thrombolysis
A Complex Decision...

Benefit of Thrombolysis

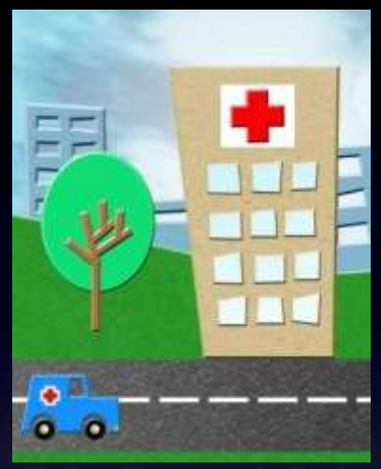
- Premorbid functional status
- Onset time
- Stroke severity
- Area of Penumbra (potentially salvageable area from CT / MR perfusion) ?
- Presence of thrombus in proximal large arterial trunk (particularly ICA , MCA)?

Risk of ICH related to TPA or reperfusion injury:

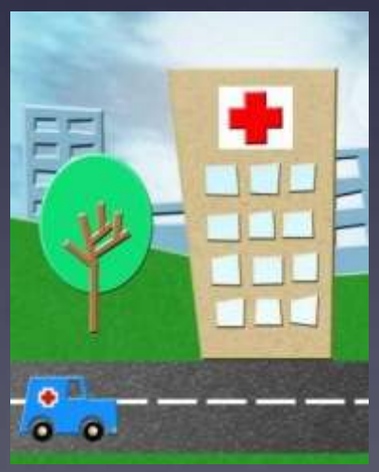
Underlying risk factors for ICH from PMH (e.g. prior ICH, AVM, aneurysm, recent invasive procedure or trauma etc)

DM
Blood pressure at presentation
Extensive early infarct on CT/MRI (e.g. > 1/3 MCA) particularly during the 3-4.5 hr time window)

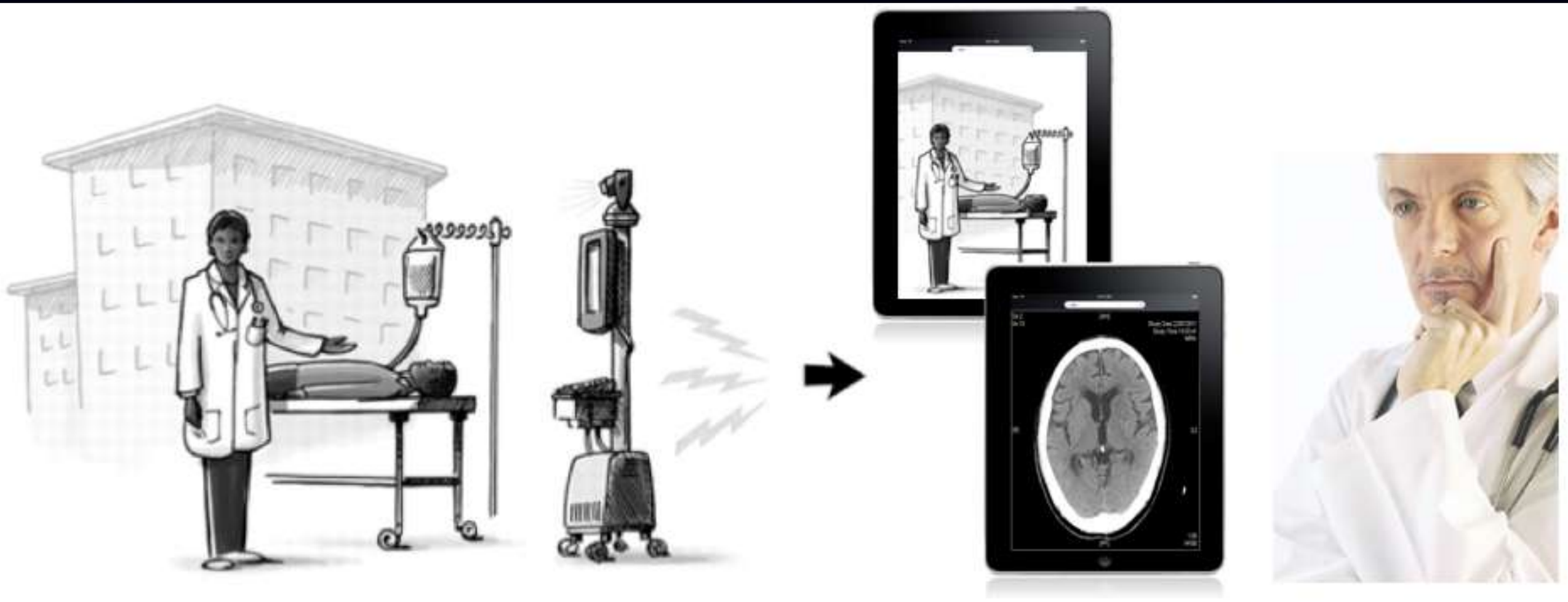
Reference:
SICH following thrombolytic therapy for acute ischaemic stroke: A review of the risk factors. Cerebrovasc Dis 2007:24:1-10
Haemorrhagic transformation in acute ischemic stroke following thrombolysis therapy: classification, pathogenesis and risk factors. Postgrad med. J. 2008;84;361-367
The HAT Score: A simple grading scale for predicting hemorrhage after thrombolysis. Neurology 2008;71;1417-1423
Extent of Early Ischemic Changes on CT before Thrombolysis. Prognostic Value of the Alberta stroke Program Early CT Score in ECAS II. Stroke 2006;37:973-978



北區醫院
NORTH DISTRICT HOSPITAL

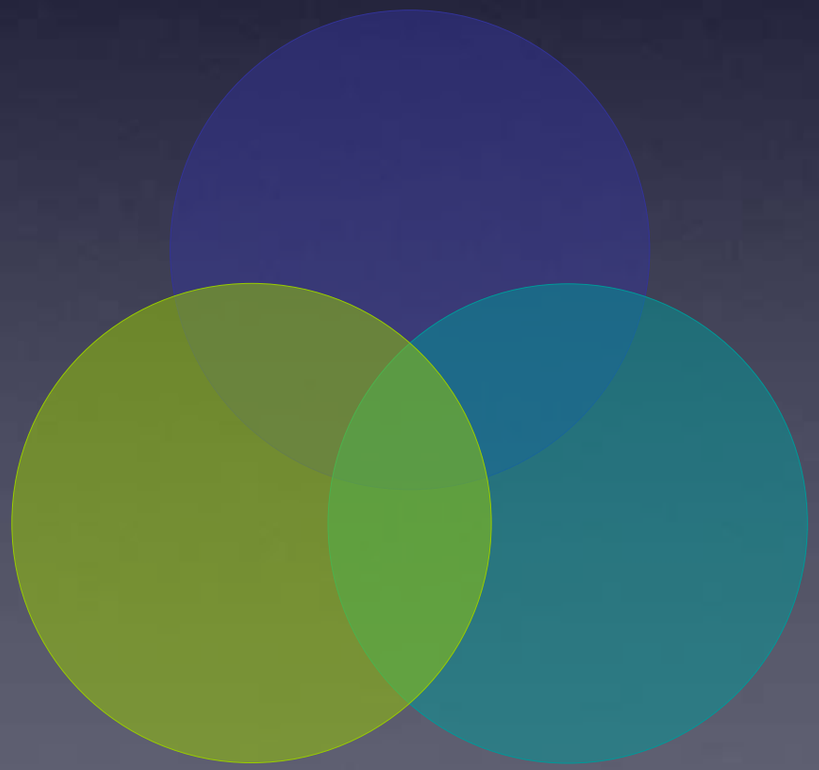


Telemedicine



A Computer-aided Mobile System for Prompt Assessment of Stroke Patients: A pilot study of telemedicine in NTEC (COMPASS study)

醫院管理局
HOSPITAL AUTHORITY



THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

	0	1	2	3	4
0	99	56	161	193	146
1	138	142	37	113	236
2	71	251	18	122	177
3	215	83	83	22	163
4	231	10	192	116	203
5	52	197	70	99	93

Raw image data

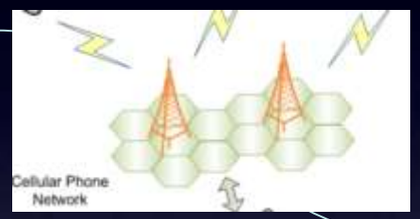
Transmitted through mobile 3G data network

Chan Tai Man
24/M
A123456

Triggered Through SMS

Secure Mobile imaging system for 24 hr tPA
Polytechnic University

Secure Token



HA firewall

HA eGateway
server

HA network

ePR Image
Distribution

CT send image to
PolyU
telemedicine
server directly

CT

PWH PACS network

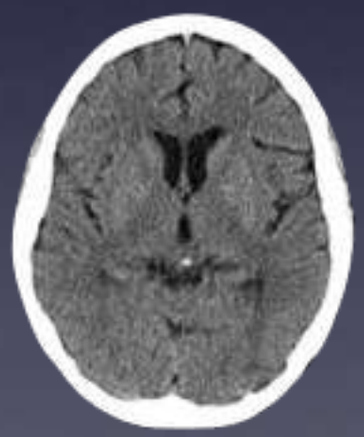
PACS server

PolyU
Telemedicine
Server

Will prompt User
for login password
and security code
to login

COMPASS Study

Stroke patient in PWH AED



Potential TPA Candidates

Acute Stroke Unit in PWH

Videoconference
(Mobile Phone)

ePR
Images with ID
Up to 30 mins

Poly U System
Images without ID
2.5 – 5 mins

Off-site Neurologist

3G or Wifi both available


SMC HK 11:10 AM
Instant Virtual Extranet
egateway.ha.org.hk/dan
Google
iGateway for Apple iOS (Security Device)
switch
Security Device
Username
Passcode
Sign In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Welcome to the iBRA Services
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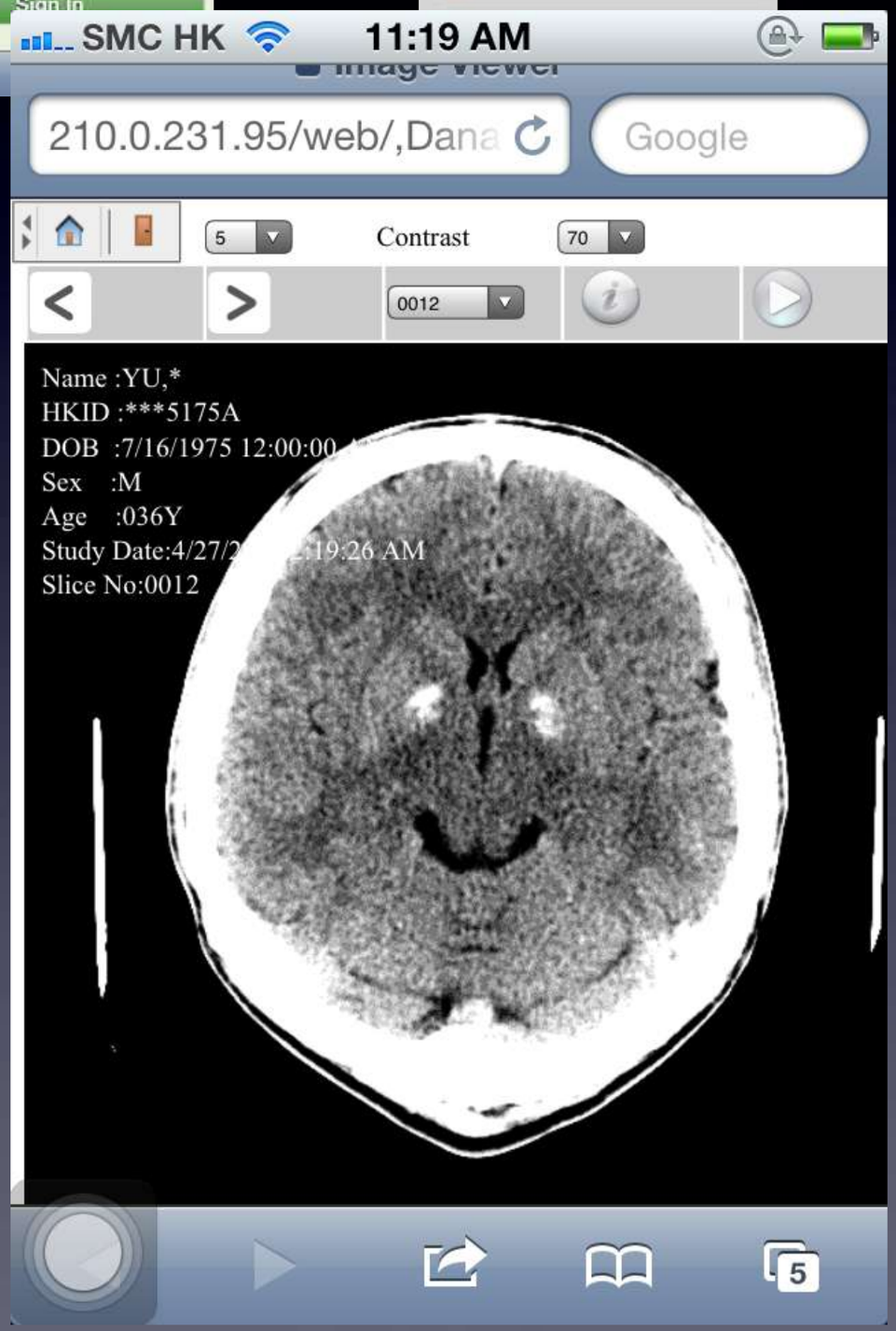
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Study Date:4/27/2
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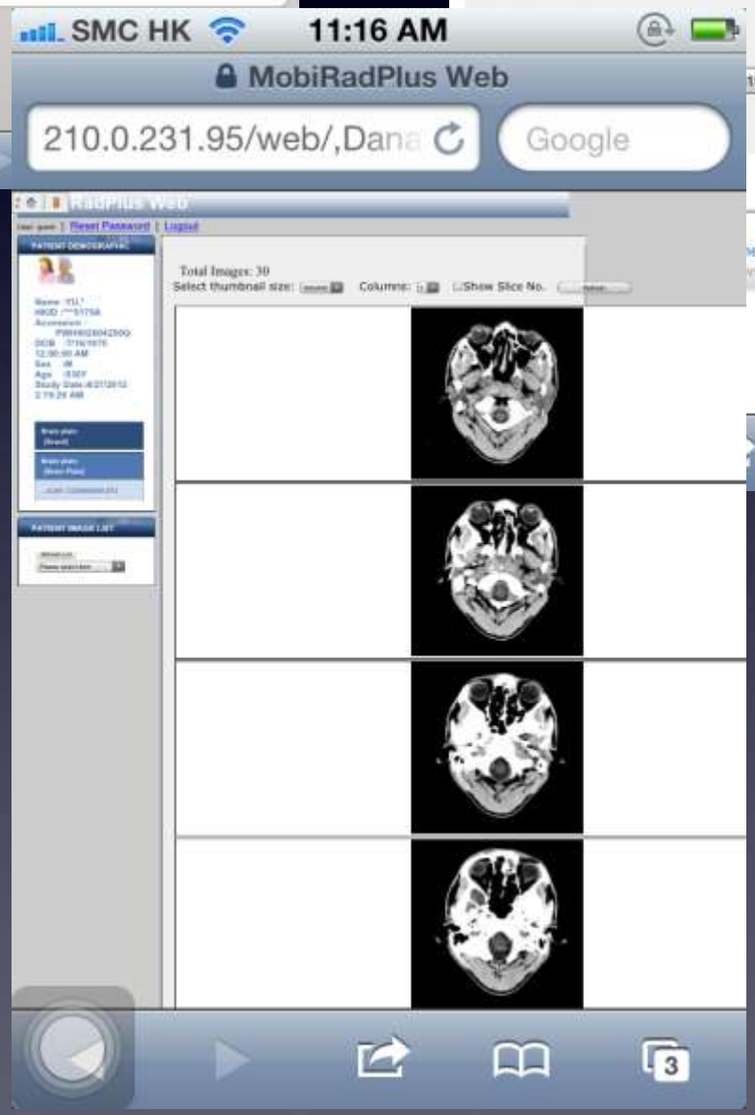
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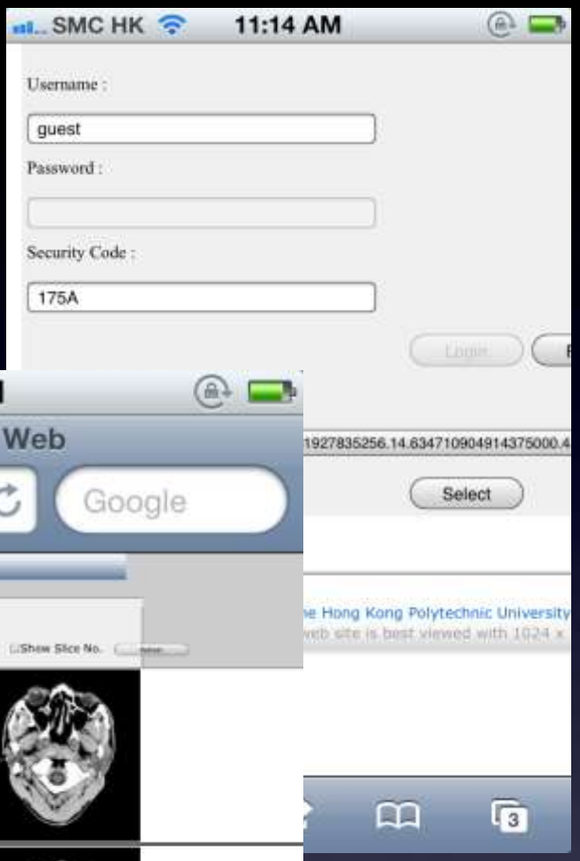
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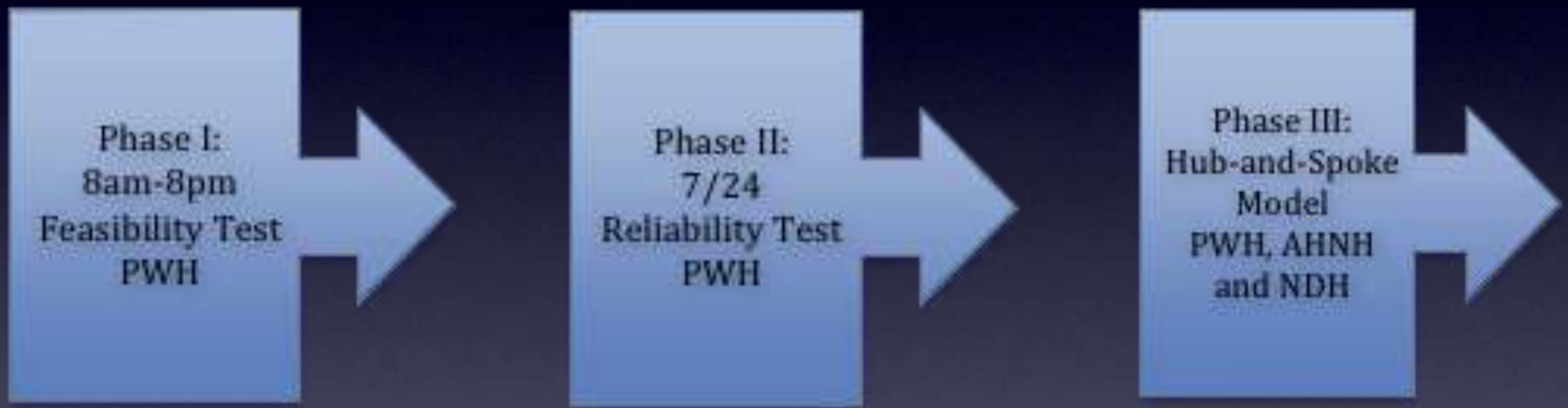
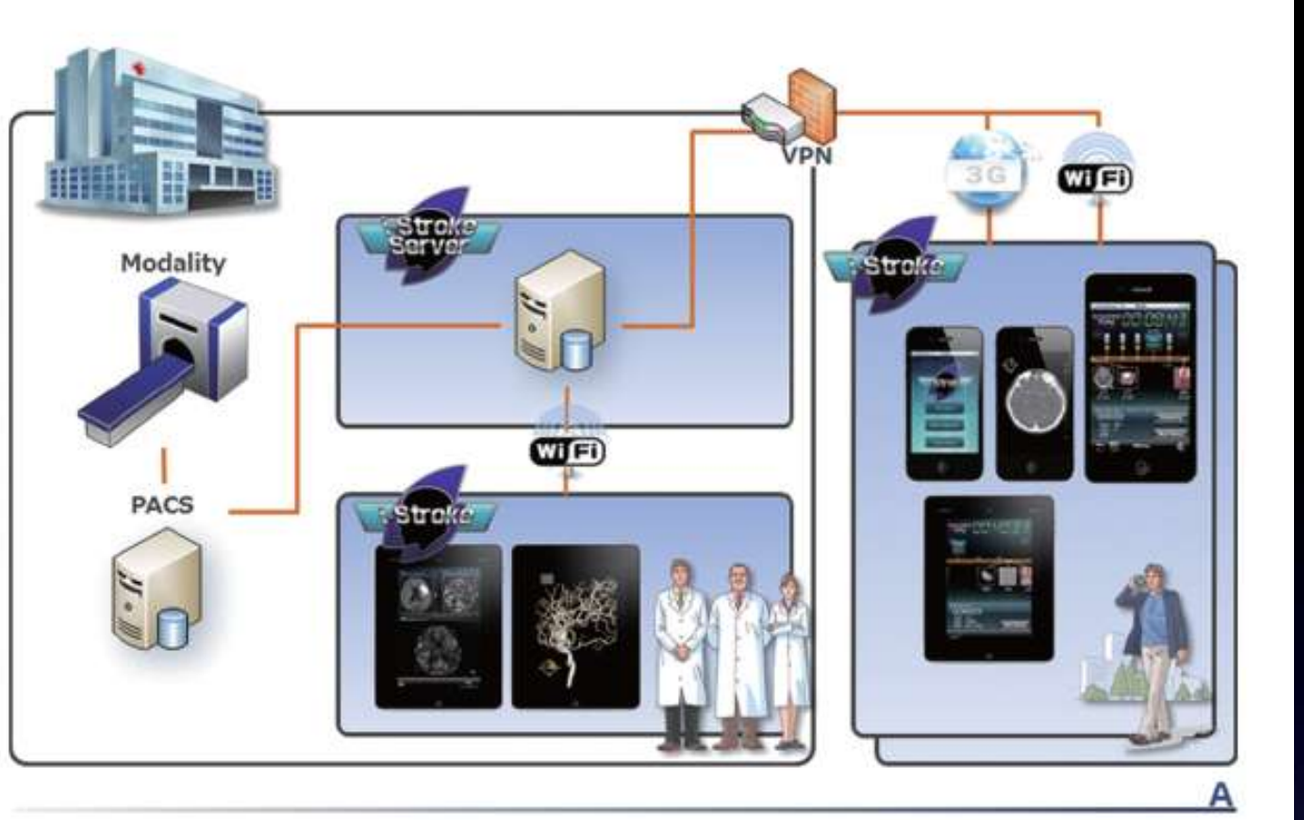
COMPASS Study



Future Directions



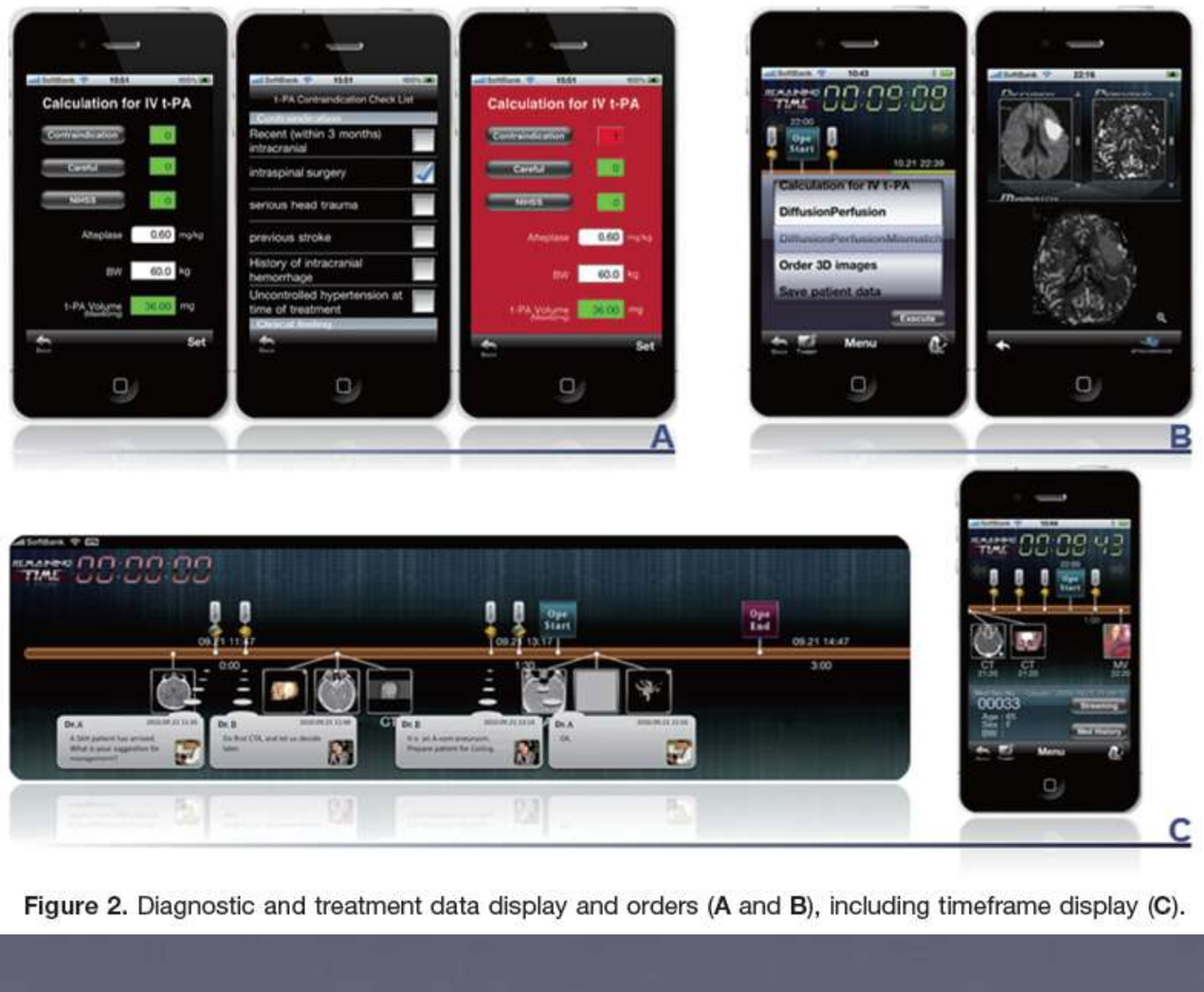
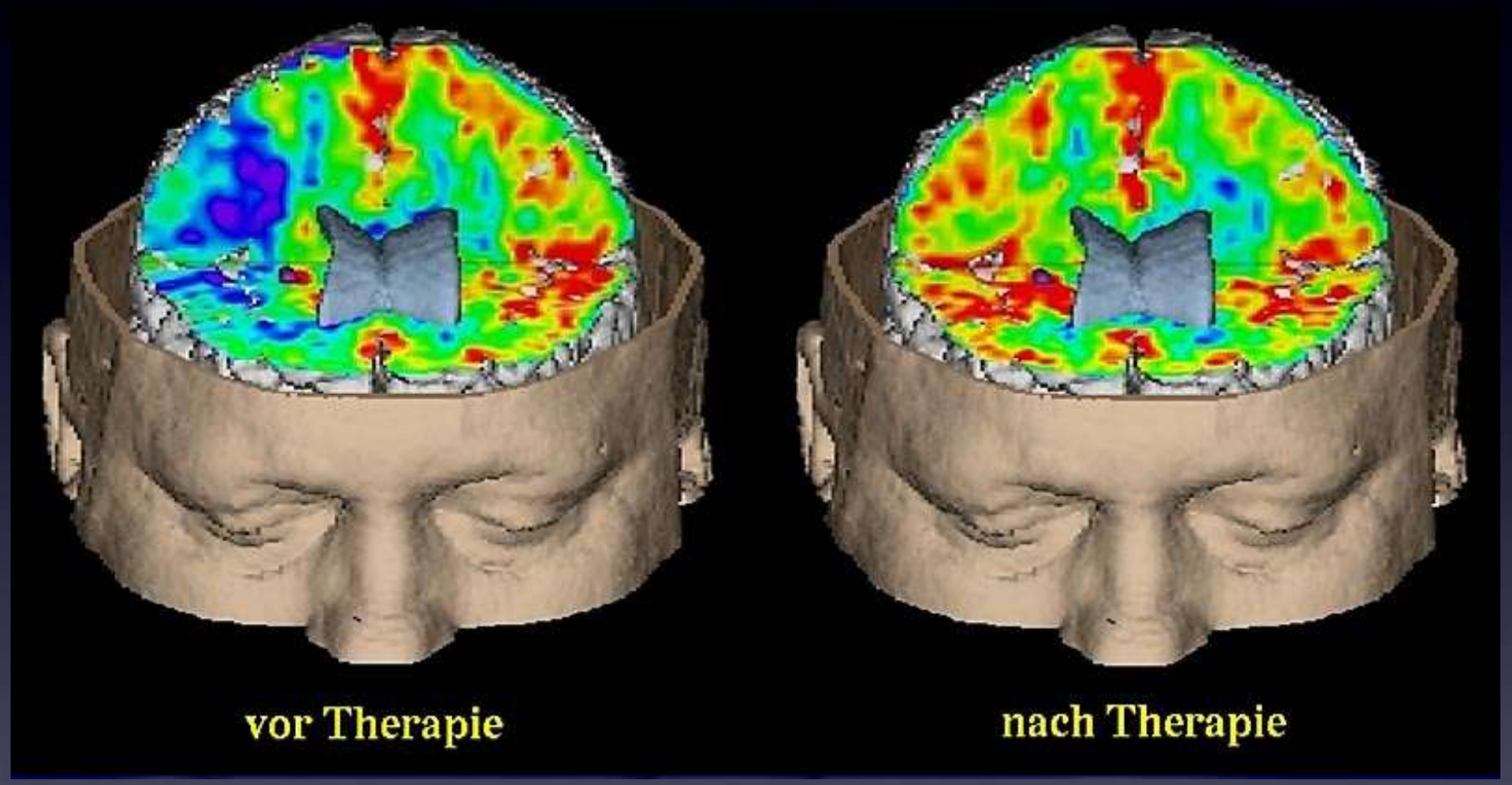


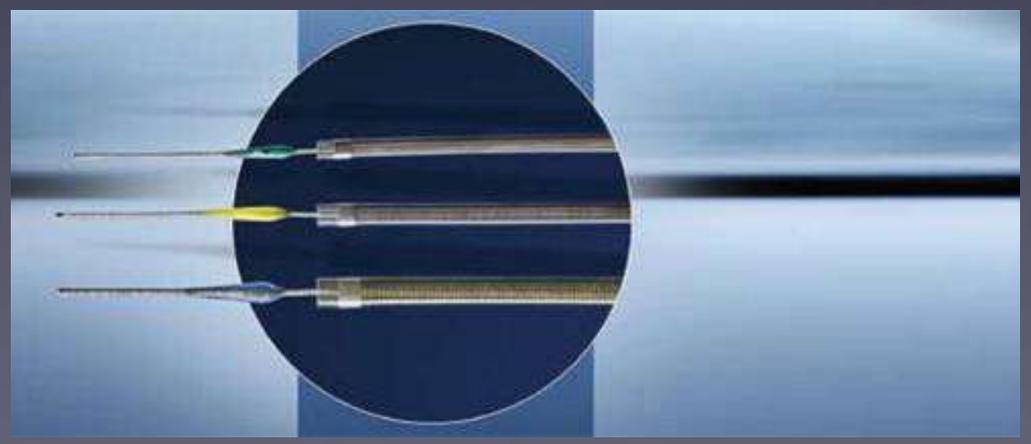
Figure 2. Diagnostic and treatment data display and orders (**A** and **B**), including timeframe display (**C**).

Stroke.2012;43:236-239

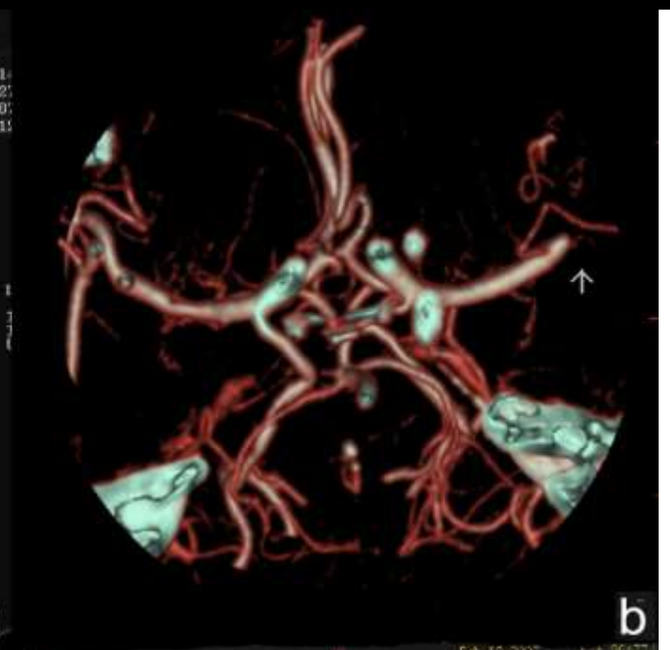
Extended use of tPA – Intra-arterial Thrombolysis

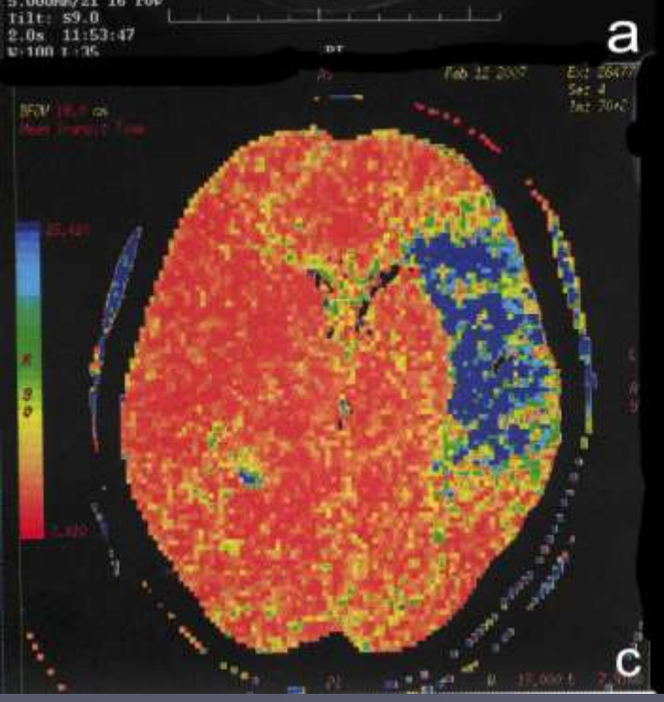
tissue plasminogen activator

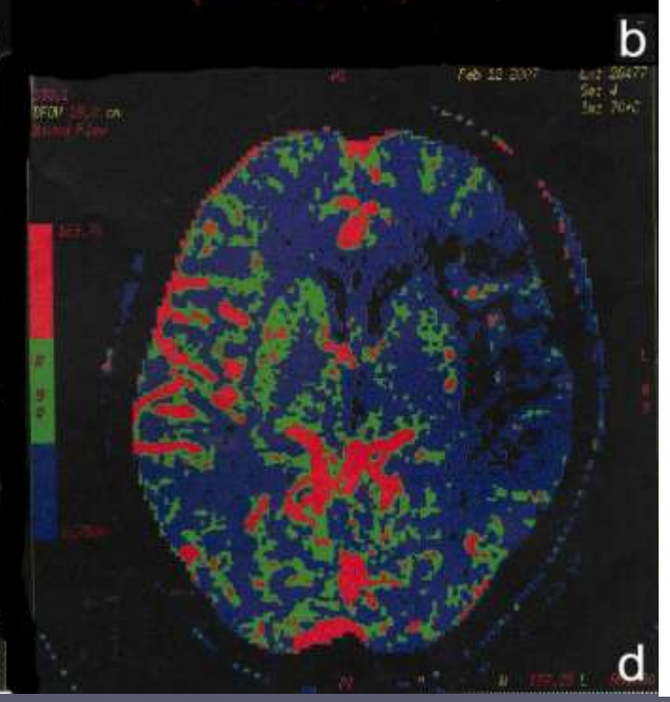


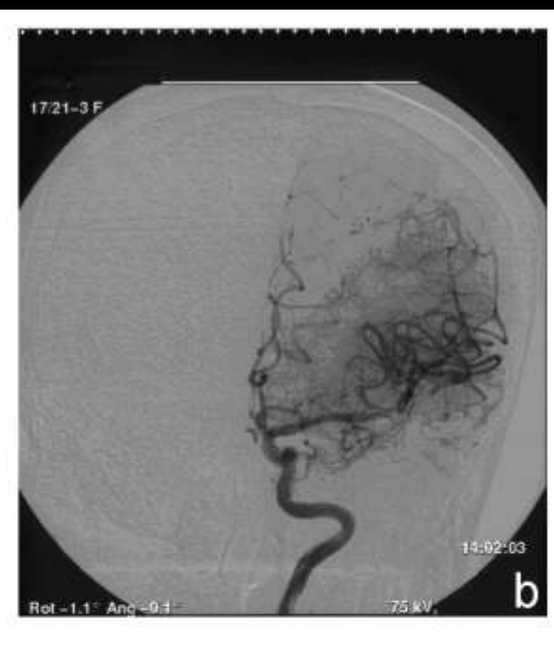


Neuro-imaging tools in practice



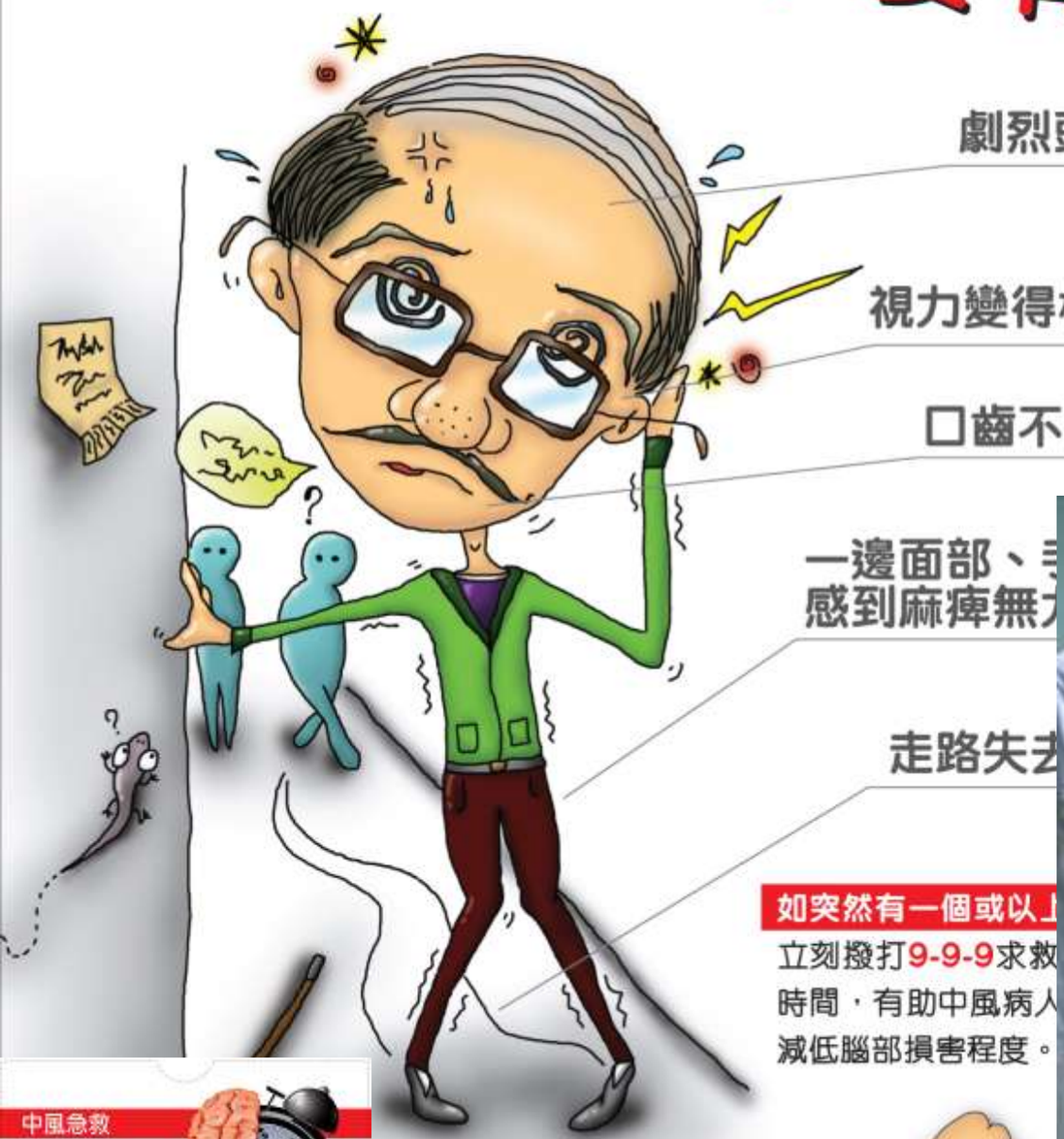






Hong Kong Med J 2008;14:271-4

認識
腦中風症狀
不要再等



劇烈頭痛

視力變得模糊或偏盲

口齒不清

一邊面部、手
感到麻痺無力

走路失去

如突然有一個或以上

立刻撥打9-9-9求救
時間，有助中風病人
減低腦部損害程度。