Stroke Care in Acute Stroke Unit

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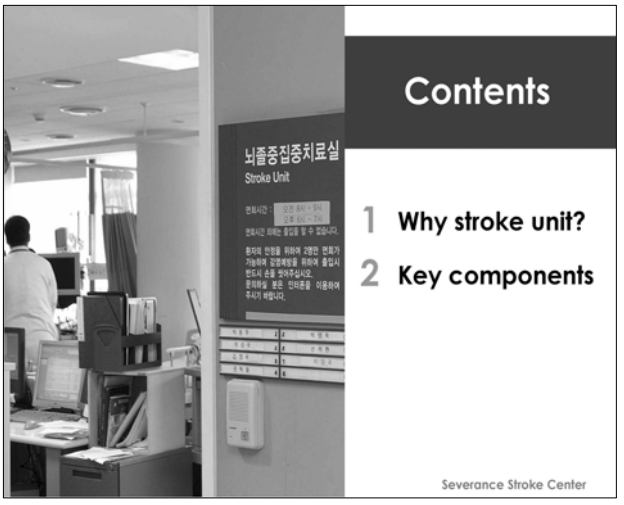
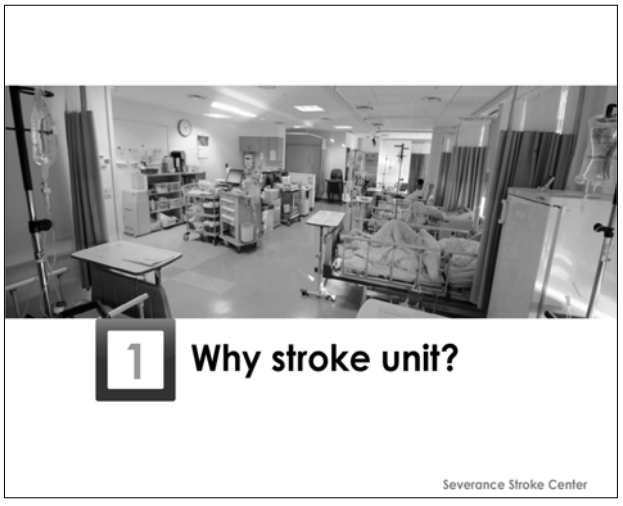
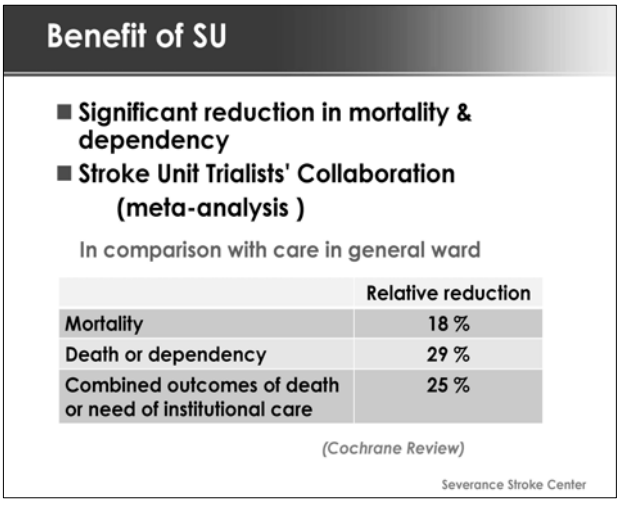






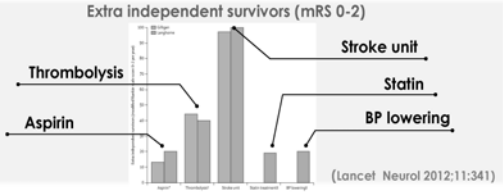
Proven benefit of stroke unit

One of four proven interventions supported by level I evidence

	Initial or important study, year	RRR (95% CI)	ARR	NNT_1
Acute stroke				
Proven				
Stroke unit[e]	Langhorne and colleagues, 1993	6·5%	3·8%	26
Thrombolysis (tPA)[e1]	NINDS, 1995	9·8%	5·5%	18
Aspirin[e2]	IST, 1997	2·6%	1·2%	83
Decompressive surgery for IS[e3]	Vahedi and colleagues, 2007	48·8%	23·4%	4*

(lancet 2008;371:1612-1623)

Extra independent survivors (mRS 0-2)



(Lancet Neurol 2012;11:341)

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Proven benefit of stroke unit

Benefit in real life

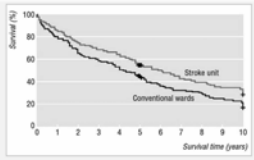
Sweden (Stroke 1999;30:709)
Stroke Units in Their Natural Habitat : Can Results of Randomized Trials Be Reproduced in Routine Clinical Practice?
Birgitta Stegmayr, Kjell Asplund, Kerstin Hulter-Åsberg, Bo Norrving, Markku Peltonen, Andreas Terént and P. O. Wester

Sweden (Stroke 2009;40:10)
Differences in Long-Term Outcome Between Patients Treated in Stroke Units and in General Wards : A 2-Year Follow-Up of Stroke Patients in Sweden
Eva-Lotta Glader, Birgitta Stegmayr, Lennarth Johansson, Kerstin Hulter-Åsberg and P.O. Wester

England, Wales, Ireland (Stroke 2009;40:10)
Stroke Unit Care and Outcome : Results from the 2001 National Sentinel Audit of Stroke (England, Wales, and Northern Ireland)
A.G. Rudd, A. Hoffman, P. Irwin, D. Lowe and M.G. Pearson

Australia (Stroke 2009;40:10)
Stroke Unit Care in a Real-Life Setting : Can Results From Randomized Controlled Trials Be Translated Into Every-Day Clinical Practice? An Observational Study of Hospital Data in a Large Australian Population
Melina Gattellari, John Worthington, Bin Jalaludin and Mohammed Mohsin

Long term benefit



(BMJ 2005;331:491)

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Stroke Units in Guidelines

- **Europe and USA**
  - Europe (EUSI) — LoE 1
  - United Kingdom (RCP) — Grade A+
  - Scotland (SIGN) — Grade A
  - United States — Class I, LoE A
- **Asia-Oceania**
  - Japan — Grade A
  - Singapore (MOH) — Grade A, Level Ia
  - Korea — Grade A, Level Ia
  - Australia

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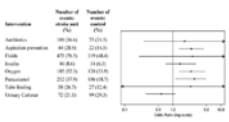
Reasons of benefit: Better utilization of evidence & Prevention of complications

- **Systematic review of 17 trials**
- **Improvement**

	OR
Use of oxygen	2.39
Aspiration prevention	2.42
Acetaminophen use	2.80
Urinary catheter use (nonsignificant)	



- **Reduction**

	OR
Case fatality	0.75
Stroke progression/recurrence	0.66
Chest infections	0.56
Other infections	0.56
Pressure sores	0.44

- **No difference**
  - Cardiovascular, physiological or other complications

(Stroke 2007;38:2536)

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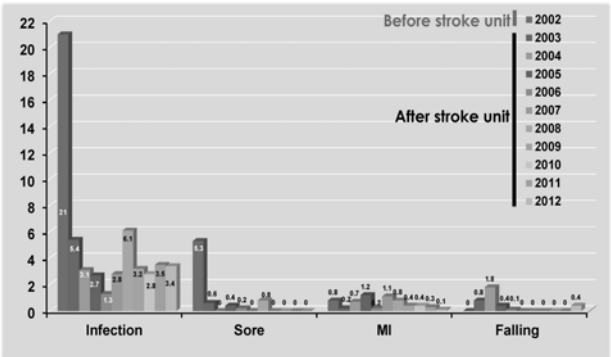
Beneficial effects of SU in reducing stroke complications



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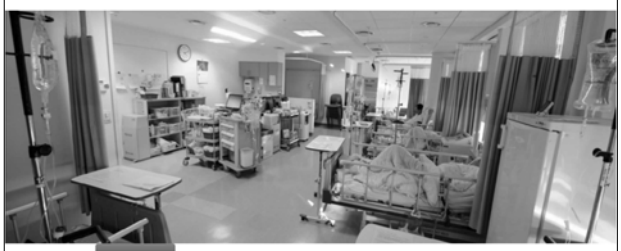

2 Key components

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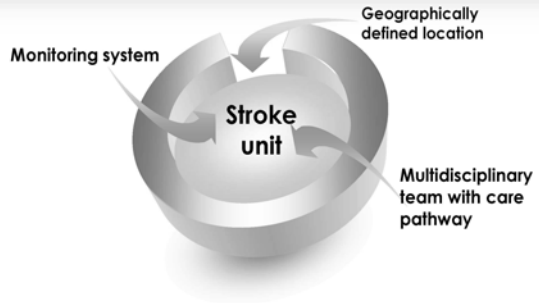
Key components of SU

A stroke ward with a multidisciplinary team approach for the optimal and organized stroke care



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Need geographically defined location?

SU vs GW with specialist stroke team support

- Better in the SU
  - Less complications (OR 0.6)
  - Fewer progression, chest infection, dehydration
- Reasons
  - A higher proportion of assessment for hyperglycemia, oxygenation and swallowing tests
  - Earlier evaluation for CT and duplex
  - A higher proportion received O_2, antipyretics if febrile, anti-aspiration measures, and early nutrition

A randomized controlled study (Lancet 2001, 358:1586)

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Monitoring system

- Clinical status
  - By use of stroke scales
- Physiological status (vital signs)
  - ECG
  - Oxygen saturation
  - Body temperature and respiration
  - Blood pressure
- Specialized monitoring
  - TCD and emboli detection

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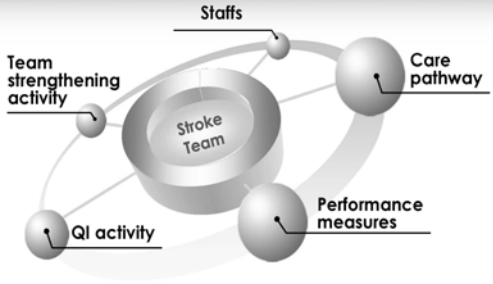
Effective multidisciplinary team



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Staffing level in 10-bed stroke unit

	Staff complement (Whole time equivalent)
Nurse	10
Medical	1-2
Physiotherapy	1-2
Occupational therapy	1
Speech & language therapy	0.5
Social worker	0.5

(Lancet Neurol 2012;11:341)

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Team strengthening activities

- Education and training
  - Stroke program and protocol
  - Knowledge on stroke
  - Stroke guidelines
- Regular team meeting
  - Individual patient care
  - Monitoring of performance measures
  - Report of SU operation & complications

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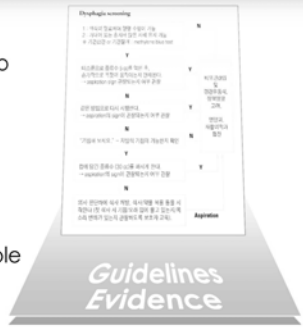
Critical (Care, Clinical) pathway

A **plan of care** that aims to promote **organized and efficient multidisciplinary care**

Based on the best available **evidence** and **guidelines**



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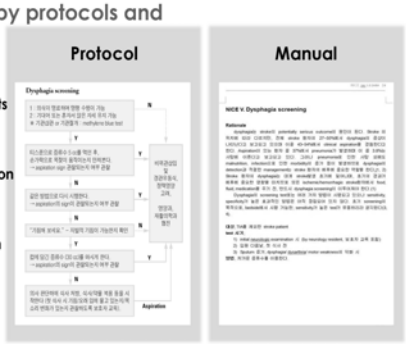
Protocols & manuals are essential

Some evidence can be implemented just by protocols and manuals

DVT prophylaxis
Use of antithrombotic agents
Consideration of t-PA use
Routine lipid profile check
Dysphagia screening
Smoking cessation education
Care plan for rehabilitation
Use of statin
Check the NIHSS score
Stroke discharge education



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Quality improvement

any **systematic, data-guided** activities designed to bring about **immediate improvement in health care delivery** in particular settings

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Common steps of QI approach

Identify — Determine what to improve

Analysis — Understand about the problems to make improvement

Develop — Using the information accumulated in the previous steps, determine what changes yield improvement

Test and Implement — Check to see if the proposed interventions or solutions yielded the expected improvement. If yes, standardize and implement the process

- Commonly used QI tools : PDSA. Six sigma

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Performance measures

- **are determined and subject to change based on guidelines and impact on patient outcome**
- **may be different between countries and assessing organizations**
- **help speed the translation of strong clinical evidence into practice**

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Different performance measures

Performance measures	PSC	HIRAS	GWTG (achievement)
Specialists availability (Neurol, Neurosurg, Rehab)		O	
Deep vein thrombosis prophylaxis	O (H)		O (H)
Antithrombotic medication within 48 hr	O	O	O
Anticoagulation in patients with atrial fibrillation	O	O	O
Discharged on antithrombotics	O	O	O
Consideration of tPA treatment		O	
tPA treatment within 60 min (HIRAS) Arrive within 2 hr and tPA initiation within 3 hr (PSC,GWTG)	O	O	O
Lipid profile check		O	
Screen for dysphagia		O (H)	
Smoking cessation education		O (H)	O (H)
Consideration of early rehabilitation	O (H)	O (H)	
Discharged on statin	O		O
Stroke education	O (H)		
Brain imaging within 1 hr		O (H)	

GWTG includes achievement, quality, descriptive, and reporting measures

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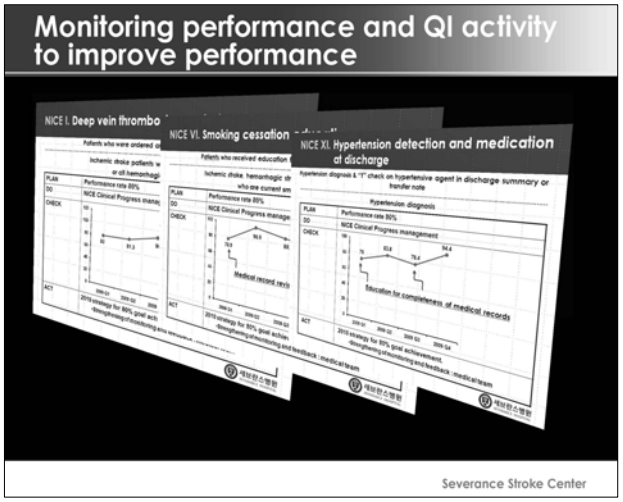
Monitoring performance and QI activity to improve performance
NICE I. Deep vein thrombo
NICE VI. Smoking cessation
NICE XI. Hypertension detection and medication at discharge
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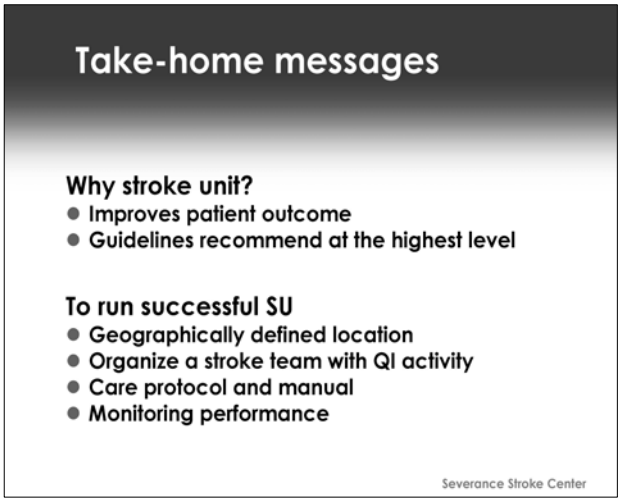
Take-home messages
Why stroke unit?
Improves patient outcome
Guidelines recommend at the highest level
To run successful SU
Geographically defined location
Organize a stroke team with QI activity
Care protocol and manual
Monitoring performance
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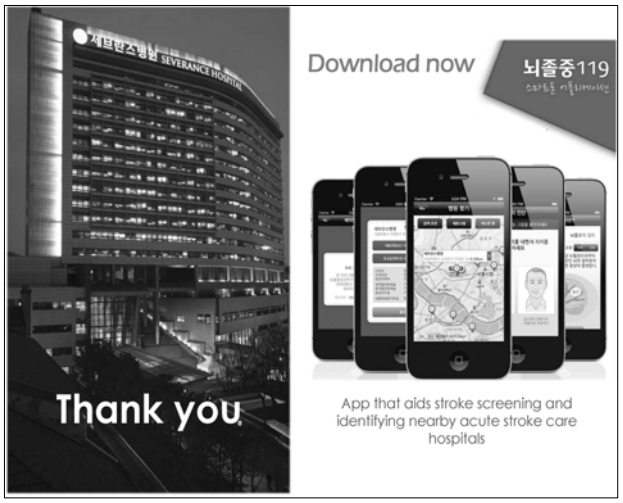
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Thank you
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뇌졸중119
App that aids stroke screening and identifying nearby acute stroke care hospitals