Extended Roles of Stroke Nurse to streamline Acute & Hyperacute Stroke Care Service

HA Convention 2017

May Mok
Nurse Consultant (Stroke) HKEC
16-5-2017
- Stroke is a very common and life-threatening serious disease.
- It is also well-known as the 4th leading cause of death in Hong Kong.
Nurses play a pivotal role in all phases of the stroke patient care.
Stepping into
New roles of Stroke Nurse
Varies from
Hospital to Hospital;
Country to Country

The medical nurse practitioner’s role in early stroke recognition

STROKE is common and affects millions of people worldwide, with stroke being the leading cause of disability and the second leading cause of death in many countries. Early intervention and recognition can significantly improve outcomes. In our A&E department, we are fortunate to have trained and experienced medical nurse practitioners who play a crucial role in the assessment and management of stroke patients.

Assessment – a crucial time
Patients suffering from an acute stroke, who are admitted to our A&E department, require immediate and thorough assessment. This involves a comprehensive evaluation of the patient’s symptoms, history, and neurological status. The nurse uses a clinical assessment proforma to ensure complete and accurate recording of patients’ details. It is hoped that the medical nurse practitioner’s intervention early on will improve outcomes for the patient.

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Abstract

This article highlights the importance of early recognition and intervention in stroke management. The role of the medical nurse practitioner in our setting is crucial, and we hope to continue to improve our stroke management protocol.
In the past, from Year 2000
New title for this Nurse in HK

Stroke Nurse

Worked as a Coordinator

Streamline stroke care service: ↓LOS, ↓recurrent CVA, ↓readmissions,
Stroke Service Development Plan
(MSDC 25th November, 2013)

1. Stroke Prevention
   - TIA Service
   - AF Awareness and management

2. Acute Stroke Management
   - Thrombolytic therapy
   - Acute Stroke Unit (ASU) Care

3. Stroke Rehabilitation
   - Standard and coordination of Stroke Rehabilitation Service
Position of Stroke Nurse

Problems:

• There are different titles for different stroke-related duties:
  - TIA Nurse
  - TPA Nurse
  - Discharge Nurse
  - Etc……..

• The roles of Stroke Nurse are not clearly defined / vary among hospitals
Experience Sharing

To meet Service Needs & Gaps

Pamela Youde Nethersole Eastern Hospital

HKEC
PYNEH Stroke Nurse Team Model

- A ward with 2 specialties (Neurosurgery & Neurology (ASU))
- All nurses working in this ward take care of these 2 specialty-patients
Stroke Nurse Team in PYNEH

- **Basic qualification for all Stroke Nurses**
  - Completed Post Registration Certificate Course (PRCC) in:
    - Stroke
    - Neurosurgery
    - Neurosciences or other equivalent qualification

- **Stroke Nurse Training**
  - Completed 3-month in-house Stroke Nurse Training Program & assessment
  - Completed PRCC in Hyper-acute Stroke Management for Nurses or other equivalent qualification (including 10 real cases practice for thrombolysis)

- **Advanced qualification for Stroke Nurse**
  - Completed Master Course in Stroke & Clinical Neurosciences by CUHK
    - (4 Nurses already completed the course & 1 still in studying)
  - Completed 2 to 5 weeks Overseas training on Acute Stroke Care Nursing
    - (4 Nurses already completed the training in 2010 & 2013 & 2016)

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**2002**
One
Stroke Nurse

**Sep-2011**
Started to train Stroke Nurses

**Feb-2014**
Formed Stroke Nurse Team

**One**
5 APNs
1 RN

Nurse Consultant (Stroke)

Stroke Nurse Specialist

Stroke Nurse
Enhancement of Acute Stroke Care

- Collaborate with different departments to improve stroke care service
Enhancement of Acute Stroke Service

**Stroke Nurse acts as a Coordinator**
(Stroke Nurse / Nursing Team)

- Optimize the use of ASU bed
- Early Supported Discharge Plan

**Stroke Nurse**
- Reduce unnecessary TIA admissions
- Facilitate Hyperacute Stroke Mx

**Collaboration with Multidisciplinary Care Team**

- AED / General wards
- TIA Service
- Thrombolysis Service

- Stroke Nurse acts as a Coordinator
- Stroke Nurse / Nursing Team

- Stroke Nurse / AED / General wards
- Stroke Nurse / TIA Service
- Stroke Nurse / Thrombolysis Service

- Discharge Planning
- ASU
- Direct to Home / OAH
- Out-patient Rehabilitation e.g. GDH MDW
- In-patient Rehabilitation e.g. TWEH

- The “time is brain” concept demands Acute Stroke Care
- Avoidance of delays
Streamline Stroke Care Pathway

Workflow for Acute Stroke Screening by Stroke Nurse at AED

1. Receive AED call
   - Record “Receive Call Time” from AED
   - Go to AED immediately

2. Arrive & report at AED Nurse Station
   - Record “Arrival Time” from AED
   - Receive information from AED staff

3. Get transfer information for next 2 hours
   - Confirm patient is AV by phone
   - Give patient information to AED
   - Inform stroke team (M.O. / nurse) for admission area
   - Not stroke diagnosis - ASU is full

4. Documentation (Progress Sheet)
   - No NS if ICH/IVH/SAH
   - Not stroke diagnosis - ASU is full

5. “Acute Stroke Unit” diagnosis
   - Confirm patient is AV by phone
   - Give patient information to ASU
   - Inform ASU staff (M.O. / nurse) for admission area

6. To NEU
   - Not stroke diagnosis

7. To ASU
   - Stroke diagnosis

8. To MED
   - Stroke diagnosis

Acute Stroke Unit (ASU)

- Stroke Nurses assess patients
- Stroke related investigations & risk factors screening
- Coordinate the beds
- Stroke Nurse coordinates the Discharge Plan with Multidisciplinary Team members
- Refer to Stroke Nurse Clinic for monitoring if needed

Consideration for Discharge

- Stroke Nurse will interview patient’s family

No rehab & direct to Home / OAH

Out-patient Rehab

In-patient Rehab
Enhancement of Acute Stroke Service Outcome in PYNEH

Protocol-driven Guideline

- Direct CT brain initiated at AED: >70%
- CT brain done within 12 hrs after AED: ~99%
Enhancement of Acute Stroke Service Outcome in PYNEH

Fully utilized ASU beds for appropriate stroke patients

- **Wrong diagnosis** of stroke to ASU
  - \(\downarrow \) from \(>20\%\) \(\rightarrow\) \(<5\%\)

- **Take over to NEU for care**
  - \(\uparrow \) from \(~30\%\) \(\rightarrow\) \(~60\%\)

Collaboration with different specialties

- Support \(~16\%\) to \(~19\%\) CVA / TIA patients
- Good LDL control \(~70\%\) &
- Good BP control \(~80\%\) of clients meet optimal range within post-stroke 6 months

Maintained

- All acute stroke admissions under ASU/NEU/ICU Care: \(~75\%\)

Attendance to Neurology Nurse Clinic (Stroke)

<table>
<thead>
<tr>
<th>2 sessions / week</th>
<th>2011 (Only 4Q)</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance (Nos.)</td>
<td>44</td>
<td>364</td>
<td>429</td>
<td>404</td>
<td>428</td>
<td>154</td>
</tr>
</tbody>
</table>
Early Supported Discharge Planning

Acute Stroke Multidisciplinary Team in ASU

- Neurologists
- Stroke Nurses
- All nurses in ASU
- Physiotherapists (PT)
- Occupational Therapists (OT)
- Speech Therapists (ST)
- Others:
  - Dietitian
  - MSW
  - Psychiatrists
  - Clinical Psychologists
  - DM Nurse
  - etc......

Weekly Case Conference for Patient discharge plan

Case Conference + Acute Stroke Multipliciplicated Care Plan (MCP) → Early Discharge Plan
Outcome for appropriate triage to ASU Admission & Early Discharge Planning Support + REHAB TRIAGE

Weekly Case Conference
By Acute Stroke Multidisciplinary Team in ASU

Acute Stroke Multipliciplinary Care Plan (MCP) in 2010

Suitable cases to Neurosurgery for operation

Mortality rate during hospitalization

Hyperacute / Acute stroke after receiving treatment

With other supplementary services support:
- ICM (Integrated Care Model)
- SMART Care for Carer
- Other NGO services

In-patient rehab.

Fast track out-patient Rehab. In Multidisciplinary Day Ward (MDW) / GDH

Direct to Home / OAH & no need for Rehab.
Facilitate Hyper-acute Stroke Mx

A coordinator & facilitator for enhancement of Hyperacute Stroke in 24 hours & 7 days service
In a typical acute ischemic stroke, every minute the brain loses

- 1.9 million neurons
- 14 billion synapses
- 7.5 miles myelinated fibers

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

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

Saver, Stroke 2005

The “Time is Brain” concept demands Acute Stroke Care

Alert Stroke Nurse

Avoidance of delays
Service Model for 24-hour tPA service

**Suspected stroke patient**

Early recognition and assessment by A&E Triage Nurse

Outside time window for rtPA

Do not fulfill preliminary criteria for rtPA

CT brain showed ICH

Follow usual assessment and management

Send to ASU/ICU for further close monitoring

Within rtPA time window

Upgrade to immediate R room admission, Attended by A&E Physician ASAP:
- Assessment and confirmation of the clinical Dx of acute stroke by A&E clinician
- Inform onsite Stroke Nurse for support

Potential candidate for stroke thrombolysis as concluded by A&E clinician and stroke nurse

Ultra-urgent CT brain

Blood test

CT brain showed no ICH

- Review of CT film +/- patient by off-site Neurologist with the support of stroke nurse via telemedicine
- Assessment of patient by onsite Medical Physician
- Informed consent process by onsite Medical physician/stroke nurse
Non-office hour
Neurologist off-site call

i-Pad
Hyperacute Stroke Service
Non-office hour
Neurologist off-site call

Code Stroke Call
Inform Neurologist
At AED

High BP >180 / 105
Decision-making by off-site Neurologist

- Ordered by Neurologist
- Prescribed by on-call MO

Post rt-PA monitoring in ASU by Stroke Nurse
24-hr tPA service was piloted in the QEH & PWH starting in 2008 & 2012, respectively. QMH has piloted 11-hour extended service since 2009.

Special Nursing Care:
- 24 hours nursing assessment & support in thrombolytic therapy in AED/ASU (onset)
- Support Tele-stroke
- Post-stroke specialist care/monitoring
- Process audit: Onset to assessment time; Door to CT time; Onset/Door to needle time;
- Outcomes: stroke severity, complications, independency level, length of stay

In 2016, the 24-hr tPA service had been extended to 7 cluster regional hospitals
Subsequently, extend the 24-hr tPA service to cover all A&E hospitals
Enhancement of Acute Stroke Service Outcome in PYNEH

Protocol-driven Guideline

IV / IA thrombolysis therapy given (%)

Complications of Thrombolytic Therapy (2010-2015)

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<tbody>
<tr>
<td>Symptomatic h'age</td>
<td>15.4%</td>
<td>9.5%</td>
<td>7.7%</td>
<td>7.5%</td>
<td>10.2%</td>
<td>1.9%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Yearly (Overall)</td>
<td>Triage to alert Stroke Nurse time</td>
<td>Door to CT time</td>
<td>CT to Needle time (involved IV rt-PA)</td>
<td>Door to Needle time (involved IV rt-PA)</td>
<td>Symptom to Needle time (involved IV rt-PA)</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Range (mins)</td>
<td>SD +/-</td>
<td>Mean (mins)</td>
<td>Range (mins)</td>
<td>SD +/-</td>
<td>Mean (mins)</td>
<td>Range (mins)</td>
</tr>
<tr>
<td>2011</td>
<td>20 - 110</td>
<td>43.73</td>
<td>80</td>
<td>16 - 108</td>
<td>20.03</td>
<td>40.0</td>
<td>52 - 175</td>
</tr>
<tr>
<td>2012</td>
<td>6 - 102</td>
<td>25.41</td>
<td>36.2</td>
<td>11 - 37</td>
<td>8.31</td>
<td>24.7</td>
<td>32 - 96</td>
</tr>
<tr>
<td>2013</td>
<td>0 - 79</td>
<td>16.34</td>
<td>18.5</td>
<td>3 - 54</td>
<td>9.83</td>
<td>17.0</td>
<td>19 - 143</td>
</tr>
<tr>
<td>2014</td>
<td>2 - 144</td>
<td>28.18</td>
<td>23.6</td>
<td>6 - 45</td>
<td>9.97</td>
<td>18.7</td>
<td>27 - 178</td>
</tr>
<tr>
<td>2015</td>
<td>5 - 31</td>
<td>7.53</td>
<td>13.2</td>
<td>5 - 51</td>
<td>8.85</td>
<td>17.1</td>
<td>20 - 97</td>
</tr>
<tr>
<td>2016</td>
<td>3 - 38</td>
<td>7.08</td>
<td>11.8</td>
<td>4 - 64</td>
<td>10.09</td>
<td>16.4</td>
<td>21 - 128</td>
</tr>
</tbody>
</table>

Why still not meet international standard?

Recommended time frame for rt-PA therapy

Time from AED arrival
- 10 minutes: Evaluation by AED physician
- 15 minutes: Notify stroke call physician
- 25 minutes: Initiate head CT
- 15 minutes: Interpret head CT
- 24/hrs: Administer IV rt-PA
- 3 hours: Patient transferred to In-patient setting

60 mins

Office hour

Non-office hour

* After admission & informed by ward nurse
Future Extended Roles of Stroke Nurse
Stroke Nurse

Progress:

• **CC (Stroke)** initiates the delineation process of the duties of Stroke Nurse

• **CC (Stroke)** works with Nursing Service Department to define the roles of Stroke Nurse
In collaboration with the neurologist (and/or other AH colleagues)  
To perform the following Core Roles

| **1. Emergency Brain salvage** | **In-house stroke** | • Coordinate & expedite **thrombolytic treatment**  
• Minimize door-to-needle time  
• Accurate assessment & ensure safe treatment delivery  
• To support A&E clinicians, on/off-site neurologists in management and monitoring of acute stroke patients |
| **AED** | **Management of ASU** | **ASU** | • Identify risk factors and help delineate stroke mechanism  
• Identify patients at risk of deterioration  
• Close monitoring & prevent acute complications |
| **Non-ASU (e.g. Medicine, AED and NS)** | **Support non-ASU patients** | **Non-ASU** | • Stroke screening & registry  
• Ensure nursing care standard  
• Take over from general medical if indicated |
| **ASU & Non-ASU** | **Coordination** | **TIA** | • Explain to Patient & Family cause, course & care plan  
• Support early discharge  
• Facilitate rehabilitation  
• Prevent long-term complication  
• Reduce TIA admission but investigate and start treatment early |
| **In-patient** | **5. Stroke consultation** | **Out patient** | • Provide immediate onsite support  
• Continuity of care in Nurse clinic + Post discharge Telephone FU |
| **Advanced Practice** | **6. Stroke training** | **To Staff** | • Staff education and promotion of stroke care knowledge  
• Patient and Carer Empowerment |
| **To Carers** | **Stroke consultation** | **In-patient** | **Out patient** |
STROKE NURSE

Stroke nurse has overarching coordination role

*At least one stroke nurse station round the clock
### PYNEH Stroke Nurse Team Model

- A ward with 2 specialties (Neurosurgery & Neurology (ASU))
- All nurses working in this ward take care of these 2 specialty-patients

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enhance specialty knowledge &amp; clinical skill to perform advanced practice independently</td>
<td>• Too stressful</td>
</tr>
<tr>
<td>Enhance &amp; strengthen decision making</td>
<td>• Too heavy workload</td>
</tr>
<tr>
<td>2. Perform multi-function roles</td>
<td>• Too heavy workload</td>
</tr>
<tr>
<td>3. Enhance job satisfaction</td>
<td>• Too rely on Stroke Nurse</td>
</tr>
<tr>
<td>4. A fixed team specialty nurses to run 24/7 thrombolysis service to enhance patient safety</td>
<td>• Too frequent Night Shift duty (5 Nights / month)</td>
</tr>
<tr>
<td>5. Provide one-stop service by acting as a coordinator, case manager, educator to enhance communication with multidisciplinary team members, patients/relatives</td>
<td>• Expensive cost (5 APNs + 1 RN)</td>
</tr>
<tr>
<td>6. No need for too much ward management skill</td>
<td>• Narrow career development</td>
</tr>
<tr>
<td>7. Enhance team-bonding &amp; team-spirit by small group</td>
<td>• Limited manpower to run 24-hrs service</td>
</tr>
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</table>
Roles of Nurses in ASU

Ward Nurses (Non-specialty trained)

To support:
1. Basic Nursing care
2. Protocol-driven procedures

Stroke Nurse Pool (Specialty trained) (Core Roles)

To support:
1. Acute stroke care for ASU & Non-ASU patients
2. Coordination of stroke rehabilitation
3. 24/7 TPA service

Stroke Nurse Pool (Specialty trained) (Advanced Practice)

To support:
1. Consultation,
2. Stroke Training
3. Stroke Nurse Clinic for secondary stroke prevention
4. Promote EBN

Nos. of Stroke Nurse Pool: ? At least 10 SN
Stroke Patient Care Pathway

1. Enhance patient safety
2. Provide continuity of stroke care service

AED & Angiosuit 急症室
1. Acute stroke screening at AED for triage acute stroke patients to ASU to receive appropriate treatment
2. Hyper-acute stroke Nursing - TPA thrombolysis Service
3. +/- Assist Neuro-intervention in Angiosuit
4. TIA or Stroke mimics screening to TIA Clinic

ASU & peripheral wards 急性中風病房
1. Screening in peripheral ward + stroke registry
2. Provide specialist care in ASU
3. CQI program e.g. Water Swallowing test
4. Transitional care to Stroke Rehabilitation
5. Enhance ICM / SMART Care program
6. Patient pre-discharge education & empowerment

Nurse-led Clinic 護士診所
1. Run Neurology Nurse Clinic (Stroke)
2. Collaborate with NGO

Ultrasonographic Studies 超聲波檢查 / 研究
1. Assess patient if fulfill the criteria for TIA clinic
2. Perform Carotid Doppler or TCD in TIA Clinic / ASU

Community 社區
1. Stroke Prevention talk
2. Caregiver Support
3. Stroke Awareness Promotion

Expertized Tour Guide

Emergency
References


• Imaging-guided acute ischemic stroke therapy: From "time is brain" to "physiology is brain". AJNR Am J Neuroradiol. 2006 Apr. 27(4):728-35.


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Thank you