Promoting Evidence-based Practice in Stroke Care: Development of a Clinical Practice Guideline for Hemiplegic Shoulder Protection

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On behalf of
Hemiplegic Shoulder Protection Subgroup
OT Stroke Working Group, OTCOC, HA
Background

- 2002 Stroke Project Group of OTCOC “Hemiparetic Upper Limb Training Guideline”
- Oct 02 - Jan 03 Audit project – 17 settings, 197 cases review, 170 identified as at risk of shoulder problem
- 2007 start working group on hemiplegic shoulder protection, under OT stroke working group, OTCOC, HA
The Shoulder Problem in Stroke

- Symptomatic shoulder is a common phenomenon in stroke
- Shoulder pain hinder the rehabilitation process significantly
- “Prevention is better than cure”
- Early protective intervention lower the risk of symptomatic shoulder, and indirectly shorten LOS
- It is a multi-disciplinary team effort
Types of Protective Measures for Hemiplegic Shoulder

- Hemiplegic Shoulder Assessment
- Slings & Support
- Bed Positioning
- Positioning During ADL
- Mobilization
Aims & Objectives

**Intent**
- To Provide Evidence-based Occupational Therapy Practice on the Use of Protective Measures for Hemiplegic Shoulder

**Aims**
- To Therapists: Give evidence-based directive guideline on use of protective measures to hemiplegic shoulder and finally, align the clinical practices among OT, especially practices with high level evidence support
- To Patients: To reduce incidence of symptomatic shoulder or shoulder injury for stroke patients

**Objectives**
- Reduce risk of mis-management of hemiplegic shoulder
- Practise explicit high level of evidence supported recommendations on various shoulder protective measures
- Improve quality of care in shoulder assessment and use of protective measures on hemiplegic shoulder
- Propose framework for alignment of OT clinical practice in hemiplegic shoulder protection
- To facilitate documentation and auditing.
Process of Guideline Development

- Ongoing Review
- Literature Review
- Preliminary Drafting
- Appraisal
- External Validation
- Internal Peer Review
Literature Search Strategy

- Grade A: Existing good quality guidelines for hemiplegic shoulder protection and national guidelines for stroke
- Grade A: Systemic reviews from computerized database; good RCT studies by using PEDro and OT seeker
- Grade B: Published clinical trials
- Grade C: Textbooks or course materials from renowned authors or speakers
- Grade D: Consenses of guideline working group members based on clinical experiences
Literatures Review

- Relevant guidelines (5)
- Systematic reviews or RCT (13)
- Observational group studies, qualitative studies (17)
- Textbooks, course material (36)

60 Clinical Recommendations

Peer Discussion on controversial items

Preliminary Draft
Preliminary Drafting

- Independent Appraisal by external assessor from CAHE using CAHE guideline checklist & AGREE
- Internal Peer Review by HA OT and other MD team members
- External Validation by NGO OT and stroke out-patient

CAHE: Center of Allied Health Evidence
AGREE: Appraisal of Guidelines for Research and Evaluation
Summary of recommendations

By level of evidence using grading system

EO : Experts Opinion
WG CE : Working Group Members’ Clinical Experience
Recommendation for ASSESSMENT with Grade A Evidence

- Early Assessment even in Acute Care and must take preventive measures as early as possible (Grade A)
- Continuous Monitoring throughout the rehabilitation process
2.2 Decision Tree on Clinical Application of Protective Measures for Hemiplegic Shoulder

Patient with stroke

Shoulder subluxation?

- yes
  - identify type of shoulder subluxation
  - reduction of subluxation

- no

Shoulder pain?

- yes
  - Pain Assessment:
    - palpate location of pain
    - measure pain intensity
    - check inflammation
    - impact of pain in ADL

- no

Sensory loss of pain?

- yes
  - Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder pain management & monitor pain intensity
  - Emphasize on
    - inform medical officer for further investigation of musculoskeletal problem if patient has severe pain and/or swelling over shoulder
    - assess any central pain, any hypo or hypersensitivity to shoulder
    - usually encourage resting of shoulder
    - avoid side-lying on affected side
    - gradual self-assisted mobilization under close monitoring if allowed to do so.
    - sling is necessary no matter has subluxation or not when a flaccid arm being unsupported in sitting, transfer or walking
    - encourage proper positioning & support

- no

Shoulder stiffness?

- yes
  - Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder pain management & monitor pain intensity
  - Emphasize on
    - inform medical officer for further investigation of musculoskeletal problem if patient has severe pain and/or swelling over shoulder
    - assess any central pain, any hypo or hypersensitivity to shoulder
    - usually encourage resting of shoulder
    - avoid side-lying on affected side
    - gradual self-assisted mobilization under close monitoring if allowed to do so.
    - sling is necessary no matter has subluxation or not when a flaccid arm being unsupported in sitting, transfer or walking
    - encourage proper positioning & support

- no

Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder pain prevention

Emphasize on

- early detection of pain occurrence
- early identification of scapular mal-alignment & loss of range of shoulder movement
- positioning & support for pain prevention
- sling may not be necessary if patient can take careful handling of the affected arm
- shoulder mobilization to end range carefully
- patient/ caregiver education for pain prevention

Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder protection & management

Emphasize on

- consider longer regime of arm sling for patient with flaccid arm & hemi-neglect
- aim at functional range of shoulder
- emphasize caregiver education for patient with cognitive deficit

Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder pain management & monitor pain intensity

Emphasize on

- shoulder mobilization in pain free range
- sling may consider during transfer & mobility
- self-assisted mobilization with shoulder abduction not beyond 90° & external rotation of humerus

Follow “2.3 The Clinical Approach Chart” to evaluate risk factor for shoulder pain management & monitor pain intensity

Emphasize on

- shoulder mobilization as pain tolerated
- Rest for tendonitis
- positional stretch if necessary esp. for capsulitis
- sling may not be necessary
- encourage self-assisted mobilization with humeral external rotation
2.3 Clinical Approach for Hemiplegic Shoulder Protection

**Assessment on Hemiplegic Shoulder**

- **A:** Tone normalization
- **B:** Educate patient on proper bed & chair positioning
- **C:** Prescribe shoulder sling for ambulatory patient / arm support on W/C for chairbound patient
- **D:** Passive self-mobilization
- **E:** Positional stretch
- **F:** Educate control facilitation in functional activities
- **G:** Active control & passive range of motion

**Risk Factors**

- **Hypertone**
- **Hypotone or flaccid**
- **Subluxation**
- **Shoulder impingement**
- **Scapula & humerus mal-alignment**
- **Joint stiffness & contracture / ↓ PROM**
- **Loss of AROM / muscle weakness**
- **Sensation loss**
- **Sign of unilateral inattention, diminished midline sense**

**Interventions**

- **A:** Tone normalization
- **B:** Educate patient on proper bed & chair positioning
- **C:** Prescribe shoulder sling for ambulatory patient / arm support on W/C for chairbound patient
- **D:** Passive self-mobilization
- **E:** Positional stretch
- **F:** Educate control facilitation in functional activities
- **G:** Active control & passive range of motion
- **H:** Scapula & humerus reduction & re-alignment
- **I:** Teach compensatory strategies for neglect & sensation loss
- **J:** Caregiver education on proper positioning & mobilization
HOSPITAL AUTHORITY
Occupational Therapy
Hemiplegic Shoulder Management Form

Please Fill in or Affix Patient Label

HN No.: _______________ I.D. No.: _______________
Name: ____________________
Sex: _____ Age: _____ Chinese Name: ____________________
Ward: _______ Bed: _____ Dept: ___________

Risk Factor Assessment
- Abnormal muscle tone
- Neglect of the upper extremity
- Impaired sensation to pain
- Impaired cognitive function
- Communication problem (___ aphasia/___ dysphasia)
- Depressed mood
- Inappropriate handling (pls specify: ____________________________)
- Prolonged onset of stroke (date of onset: ________________________)

Shoulder Assessment
FTHUE-HK level (1-7) _____________
Other Test: ____________________________
Shoulder pain: □ Yes (onset: ____________________________ indicate on the diagram)
- (location of pain: ____________________________ indicate on the diagram)
- (occurrence of pain: _______ resting/ moving/ others: ____________)
- (intensity of pain: NRS ____________________________)
□ No
Loss of active / passive range of shoulder movement: ______ flexion/ abduction < 90°, ______ external rotation <60°
Shoulder subluxation: □ Yes (type of subluxation: ______ inferior
- inferior-anterior
- superior )
□ No
Scapula malalignment: □ Yes (remark: ____________________________ ) □ No
Impact of shoulder pain on daily life: pain on dressing/ sleep disturbance/ unable to lie on affected side/ other:
___________________________________________________________________________________________

Sign & symptom of shoulder-hand syndrome: □ Yes (stiffness/ movement induced pain/ swelling/ vasomotor change)
□ No

Intervention
□ Positioning on bed/ chair: □ pillow support □ lab tray □ others _____________
Regime: ___________________________________________________________________________________
- Starting date: (__________)
- Termination date: (__________)
□ Shoulder sling: trough arm sling/ humeral cuff
Regime: ___________________________________________________________________________________
- Starting date: (__________)
- Termination date: (__________)
□ Shoulder mobilization: □ by trained staff □ self-assisted mobilization
□ Shoulder realignment: _______________________________________________________________________
□ Patient/ caregiver education: _______________________________________________________________________
□ Printed material given to patient / caregiver: □ sling □ positioning □ self-assisted mobilization
□ Ongoing checking of shoulder sling/positioning device/complication e.g pressure point or occlusion symptoms
□ Others: _____________________________________________________________________________________
Recommendations for SLINGS & SUPPORT with Grade B Evidences

- Any patient with persistent more troublesome shoulder pain can be considered use of shoulder strapping (Grade B)
- Prescription should be based on sound clinical judgment
- Caregivers education or instruction pamphlets to ensure proper wearing and wearing compliances
Well support the hemiplegic upper limb in external rotation of shoulder joint, while body keep in good alignment simultaneously (Grade B)

Special attention during ADL especially bed mobility, dressing, functional transfer, functional mobility, sitting out & standing upright activities
Recommendations for MOBILIZATION with Grade A Evidence

- Support the proximal humerus & maintain external rotation and not just holding the wrist during passive mobilization (Grade A)
- Shoulder re-alignment before passive mobilization to avoid traction injury to shoulder (Grade A)
- Gentle arm movement must be performed to those with significant functional loss (Grade A)
- Must not use overhead pulleys especially patients with shoulder pain (Grade A)
Facilitate the compliances & Implementation of the guideline

- Protocol of practices, educational pamphlets attached in appendices
- Presentation in a one day workshop of Advanced OT specialty training course
- Practicuum by applying the guideline principles on one case
- Trial running training workshop to nurses and health care workers in wards of KH
- These work need to be continued in more and more hospitals, hence guideline was sent to all HAOT department and uploaded to eKG
Content of Appendice

Appendix 1
CAHE guideline checklist
Grading system summary table

Appendix 2
Systematic techniques for assessment of shoulder subluxation & pain

Appendix 3
Shoulder sling fabrication & application
Therapeutic strapping techniques

Appendix 4
Proper positioning on bed and on chair

Appendix 4
Pamphlets on Shoulder protection during ADL and positioning program

Appendix 5
Shoulder mobilization activities in different form of shoulder movement
中風病人偏癱上肢的復康及護理

中風初期，偏癱上肢肌肉缺乏張力或各組肌肉張力發展不協調，常令肩關節出現半脫位，加上不恰當的處理，常引致嚴重肩膊痛；影響日常活動，睡眠，甚至整個復康計劃。

肩膊痛主要由以下原因組成

一）創傷
中風後，各肌肉可能有不同程度的張力，令肩胛骨協調活動喪失。在此情況下，不恰當的扶抱方法或運動，將偏癱上肢拉扯（圖一），使肩關節受創，致關節組織發炎及腫痛。

二）不正確擺放姿勢
不恰當的擺放，例如把偏癱上肢沿垂（圖二）可引起肩膊痛楚。

醫管局管理局
職業治療師統籌委員會
中風工作小組
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<td>Neglect</td>
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<td>Impaired sensation</td>
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<td>Communication problem</td>
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<td>Depressed mood</td>
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<td>Inappropriate handling</td>
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<td>Prolonged onset</td>
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<td>Level 6</td>
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| Shoulders pain               | Yes  | 13 | No | 24 |
| Shoulder subluxation         | Yes  | 20 | No | 17 |
| Scapula Mal-alignment        | Yes  | 17 | No | 20 |
| Shoulder-hand syndrome       | Yes  | 7  | No | 30 |

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<td>Sitting out with lab tray</td>
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<td>Shoulder sling</td>
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<tr>
<td>Shoulder mobilization*</td>
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<td>Educational Pamphlets</td>
<td>22</td>
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<tr>
<td>Ongoing checking</td>
<td>23</td>
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(*) Numbers of cases using Grade A or Grade B recommendations

37 OT applied on trail of 1 case
Learning Points

Guiding Direction is the EVIDENCES

Ground work: Professional Knowledge in guideline development

Peer Discussion, Peer Review & Appraisal to make it hit the RIGHT TARGET
Points to note

- Reservation on its representativeness as one HA cluster not joining the working group
- **No external review** from caregivers of stroke patients
- Limited grade A high level evidences in this clinical subject, yet, the recommendations still reflect their significance in clinical practices. It needs more research in this area!
Final Words

- To keep monitoring practices of grade A and grade B evidence is the prioritized audit work
- A guideline is **not the golden rule in every clinical situation**
- It always works with **sound clinical judgment** and common sense
- **Updated at regular time frame** to keep updated with the newly published evidences
Acknowledge

Working Group Members:
Mr. Albert Tsai, Ms. Teresa Leung
Antonia Soo, Ms. Dora Chan
Fion Chan, Ms. Doris Lam
Florence Leung, Ms. Rebecca Wong
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Special Thanks to Dr. Kumar for his kind assistance and coaching