Multi-disciplinary shared-care in triage and clinical management enhanced Safety, Efficiency & Quality in managing mechanical back & neck pain:

A multi-centers study involving 9 acute hospitals
Chan YK1, Yeung R2, Tsang R3, Wong YW4, Wong WC5, Ho YF6, Sun LK7, Law SW8, Cheung KKY9, Chow HC10, Yu SJ11, Chien PH12, Chung OM13, Chan GTM2, Yuen J14, Lui M2, Chu DWS15, Lam C16, Luk W17, Chan G3, Man E18, Cheung S19, Tsui M20, Tam E21, Cheung A22, Wong P23, Wong T24, Lau PY7, Cheng MY25,

**Orthopaedics & Traumatology:**
HKEC1, QMH4, KWH5, CMC6, UCH7, PWH8, AHNH9, NDH10, PMH11, QEH12, YCH13,

**Physiotherapy:**
HKEC2, QMH3, PMH14, UCH18, KWH19, CMC20, PWH21, NDH22, AHNH23, QEH24,

**Family Medicine:**
HKEC & HKWC15, NTEC16, KWC17, HAHO25
Problem: Heavy demand on O&T SOPD
Large volume of patients with axial spine pain
Long waiting time for routine spine case
(median [9 hospitals]: 55 weeks)
Task Force on Back Pain Management (O&T COC) : Aims

1. Establish effective triage & appropriate referral system
2. Allocate patients to appropriate level of medical care
3. Timely medical consultation
4. Promote the correct attitude and habit of patient
5. Consolidate cooperation among generalist, therapist & specialist

Optimal Outcome:

1. Improve triage quality
2. Timely medical attention
3. Efficient shared medical care
4. Effective medical treatment, improved health outcome
5. Minimize disease chronicity and treatment dependency
6. Safe/ Effective/ Efficient
First Challenge:
Back & Neck Pain - Difficult in Triage

- Symptoms
- Heterogeneous diagnoses
- Difficulty to determine its severity
- No unified objective assessment methods
Referral letters Quality Audit
Focus on 15 Audit Items (Aug 2005)

• 1. Diagnosis
• 2. Duration of symptoms
• 3. Major chief complaint
• 4. Aggravating factors
• 5. Easing factors
• 6. Response to previous treatment
• 7. Past Health

• 8. Range of motion
• 9. Sensation
• 10. Motor weakness
• 11. Tenderness
• 12. Nerve root tension
• 13. Red Flag ruled out
• 14. X-Ray results
• 15. Other Ix results (e.g. blood tests, MRI)

• 60 referrals audit
• Mean score: 5.4 items included in referral (out of 15 items)
• Information from referral letters was not adequate for effective triage
Strategy 1: Unified Reliable Triage Tool
Spinal Problem Questionnaire

Checking for complicated pathologies:
Cord Signs/ Spinal Claudication/
Red Flags Signs (infection/ tumor/ fracture)
### Validity of Spinal Problem Triage Questionnaire:
Diagnosis matching during first O&T SOPD consultation, 1st tested in 2005 (290 pts)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number</th>
<th>Average completion</th>
<th>Matched diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical back &amp; neck pain</td>
<td>108</td>
<td>85.6%</td>
<td>89.8%</td>
</tr>
<tr>
<td>Cervical myelopathy</td>
<td>7</td>
<td>93.6%</td>
<td>85.7%</td>
</tr>
<tr>
<td>Cervical / Lumbar Radiculopathy</td>
<td>29</td>
<td>86.5%</td>
<td>82.8%</td>
</tr>
<tr>
<td>Spondylosis</td>
<td>33</td>
<td>72.8%</td>
<td>72.7%</td>
</tr>
<tr>
<td>Spinal stenosis</td>
<td>22</td>
<td>80.2%</td>
<td>81.8%</td>
</tr>
<tr>
<td>Sub-total:</td>
<td>199</td>
<td>83.7%</td>
<td>82.6%</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No diagnosis</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total answered</td>
<td>245</td>
<td>78.8%</td>
<td>72.7%</td>
</tr>
<tr>
<td>Unanswered questionnaire</td>
<td>45(15.6%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Diagnosis matching [2nd tests: 8 hospitals] (2007-8):

**Kappa value: 0.735**

<table>
<thead>
<tr>
<th>Prelim. Diagnosis</th>
<th>Central neck/ back pain</th>
<th>Cervical/ lumbar radiculopathy</th>
<th>Cervical myelopathy</th>
<th>Spinal stenosis</th>
<th>Red flag condition: infection/ tumour/ fracture</th>
<th>Not spinal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central neck/ back pain</td>
<td>209</td>
<td>17</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>232</td>
</tr>
<tr>
<td>Cervical/ lumbar radiculopathy</td>
<td>28</td>
<td>222</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>11</td>
<td>267</td>
</tr>
<tr>
<td>Cervical myelopathy</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Spinal stenosis</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Red flag condition: infection/ tumour/ fracture</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Not spinal</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>241</strong></td>
<td><strong>249</strong></td>
<td><strong>5</strong></td>
<td><strong>19</strong></td>
<td><strong>10</strong></td>
<td><strong>28</strong></td>
<td><strong>552</strong></td>
</tr>
</tbody>
</table>

**Specificity**

- Central neck/ back pain: 86.7%
- Cervical/ lumbar radiculopathy: 89.2%

**Definitive diagnosis 6 months after triage**
Shared Care: Pilot test (Oct 05- Mar 06 1 year FU)

- Routine case waiting time: from 58 to 24wks (↓ 48%)
- P1/2 to routine case ratio: 1:1.75 → 5:1 (↑ 8X)

FM waiting time: 4-5 wks
Consultation no.: mean 2 (80% < 3)
A&E attendance: 15 patients

Family physician (Triage)
(394 patients, 7 [1.8%] refused)

Spine Specialist
(219 patients 59%)
(4.8%) 19 patients

Therapist
(13 patients 2.9%, triage as P1/P2 case)

414 referrals suggestive of uncomplicated spine case (out of 985 spine referrals)
Keys to Patient’s acceptance:

- Patient’s understanding (+ patient has a choice): knowing that the unified assessment questionnaire was designed by & the assessment results will be seen by orthopaedic specialist
- A fast tract referral (6-8 weeks) of complicated or refractory cases to Orthopaedic specialist was present to ensure safety
Family Medicine / Physiotherapist gate keeping Orthopaedic Back Up (07-08 project, 8 hospitals)

All Spine Referral: Triage via questionnaire +/- Physiotherapist physical screening Orthopaedic Specialist Endorsement

Program 2

Mechanical Neck/ Back pain

Program 1

Early Access to Spinal Therapy (EAST)
Physical Assessment +/- Education Empowerment +/- Treatment

FM Clinic

Responsive

Responsive, no FM support

P1, P2, (upgraded case)

Spine Clinic

Complicated problems

Complicated spinal problems/ Refractory

Conjoint Orthopaedic Physiotherapy Round up Clinic

Complicated problems

Program 1

Complicated problems

Program 2

Mechanical Neck/ Back pain

Early Access to Spinal Therapy (EAST)
Physical Assessment +/- Education Empowerment +/- Treatment

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Responsive, no FM support

P1, P2, (upgraded case)

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Complicated problems

Complicated spinal problems/ Refractory

Conjoint Orthopaedic Physiotherapy Round up Clinic

Complicated problems
Results: 8-hospitals
Prospective study
(Recruitment Jul- Sep 07, FU-duration: 6 months)

Orthopaedic Specialist clinic
(50% cases: 3.3 + 3.6 + 1.8 + 11.3 + 14.1 + 54.8 x 0.3)

Family Medicine Clinic
(358 patients 76.7%)

Physiotherapist 23.7% (585 referrals)

Sessions: 9[50%], 13[70%], 17[90%]

(243 patients, 54.8%)

FM waiting time: median 3 wks, <70% 5wks, 100% 8 wks

Consultation no.: 3 (98%)

A&E attendance: 14 patients (3.3%)

467 Routine
Back Case

(6 patients, 1.8%)

(12 patients 3.6%)

Within 6-8 wk

65 routine cases refused to FM [14.1%]

Within 6-8 wk

(53 patients/ 11.3% routine referrals triage as P1/P2 cases)
Results: 7-hospitals Prospective study (Recruitment Jul-Sep 07, FU-duration: 6 months)

Orthopaedic Specialist clinic (3 patients 2%)

(2 patients, 1.3%)

215 Routine Neck Case (271 referrals)

Physiotherapist (78.1%)

(17 patients/ 7.9% routine referrals triage as P1/P2 cases)

39 routine cases refused to FM [18.1%]

Family Medicine Clinic (151 patients, 70%)

FM waiting time: median 3 wks, <84% 5 wks, 100% 8 wks

Consultation no.: 3 (95.6%) A&E attendance: 3 patients (1.4%)
### Control cases (90)

<table>
<thead>
<tr>
<th>Symptomatic Areas Involved</th>
<th>Control</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominant back symptoms</td>
<td>37</td>
<td>213</td>
</tr>
<tr>
<td>Predominantly leg symptoms</td>
<td>22</td>
<td>114</td>
</tr>
<tr>
<td>Back &amp; leg symptoms similarly involved</td>
<td>30</td>
<td>127</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>463</td>
</tr>
</tbody>
</table>

### Study cases (467)

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Predominant back symptoms</td>
<td>213</td>
<td>45.6</td>
</tr>
<tr>
<td>Predominantly leg symptoms</td>
<td>114</td>
<td>24.4</td>
</tr>
<tr>
<td>Back &amp; leg symptoms similarly involved</td>
<td>127</td>
<td>27.2</td>
</tr>
<tr>
<td>Predominantly neck symptoms</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>Neck &amp; arm symptoms similarly involved</td>
<td>4</td>
<td>.9</td>
</tr>
<tr>
<td>Total</td>
<td>463</td>
<td>99.1</td>
</tr>
</tbody>
</table>

### Missing data:
- Few
<table>
<thead>
<tr>
<th>Clinical &amp; Functional Outcome (after 6 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*=PT cases/ # = all cases</td>
</tr>
<tr>
<td>Control (90 back)</td>
</tr>
<tr>
<td>Roland Morris disability score</td>
</tr>
<tr>
<td>Numeric pain s.</td>
</tr>
<tr>
<td>Mean rank of improvement</td>
</tr>
<tr>
<td>Numeric gross response score</td>
</tr>
<tr>
<td>Day absent work (pain)</td>
</tr>
<tr>
<td>Minor pain attack (baseline)</td>
</tr>
<tr>
<td>Minor pain attack (at 6 M)</td>
</tr>
<tr>
<td>A&amp;E consultation</td>
</tr>
</tbody>
</table>
Waiting time for routine spine case [9 hospitals]: before and after program (referral no./ month)

- Waiting time: weeks
- 9 hospitals:
  - Decreased waiting time for Hospital 5-7 (started program in 2006) & Hospital 8 (other hospitals: no FM support, $0 consultation fee, ? reason)
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Strategy 2: The circles of shared responsibility

Disease sophistication

**Family Physician**
- Holistic care
- Health education
- Primary prevention
- Treatment of uncomplicated disease
- Secondary triage

**Orthopaedic Specialist**
- Protocol & system design
- Treatment of complicated disease which required special technique or experience, multi-disciplinary contribution or surgical intervention
- Lead outcome study to improve clinical outcome
- Back up on:
  - Grey clinical situation
  - Difficult patient
  - Sophisticated socio-legal issue
  - Repeated health care utilization
- Provide Training to other health care providers

**Therapist**
- Triage: primary/secondary
- Health education
- Physical training
**Next step:** Complicated spinal problems (P2) timely primary & secondary triage program

- Protocol designed, tests interpretation and system control by orthopaedic surgeons for
  - Spinal claudication
  - Incapacitating Sciatica
- **Primary Triage** by questionnaire by therapist
- **Secondary triage** with functional physical tests, therapeutic trial with physical training by therapist
- **Stable cases:**
  - spaced out follow up consultations
- Patients **refractory** to active conservation treatment /compromised function/ **deterioration:**
  - Early consultation (Fast Track channel)
  - Early definitive (surgical) treatment planning
Spinal Claudication: Physiotherapist triage/ rehabilitation (EAST) & Early Orthopaedic definitive treatment

Nov 07-Jan 08

100 referral letters

? Spinal claudication:

A: **Incapacitating** spinal claudication: 13 cases
   - Operation scheduled: 4
   - Refused operation: 7
   - OT not suggestive: 2 [old age]

B: Poor functional test results but tolerable symptoms: 4 (SOPD FU)

C: 20 spinal claudication cases **responsive** to active conservative treatment (space-out FU)

D: Found **not suffering from** spinal claudication: 18 cases, no need for early consultation

Triage effectiveness: A+C+D 92.7%

Enhanced safety: A 23.6%

Physiotherapy effectiveness: C 36.3%

23 refused PT assessment before O&T consultation

77 patients: Triage Objective functional testing Active physiotherapy
55 cases completed