

Evidence-based-chiropractic care: an exciting challenge or just a pain in the neck?

Rachid Salmi, PU-PH

**INSERM U897 Centre de Recherche en Epidémiologie et
Biostatistique ; Institut de Santé publique, d'épidémiologie et
de développement (ISPED), Université Victor Segalen
Bordeaux 2 ; Service d'information médicale, CHU, Bordeaux**

**Conference on the Neck Pain Patient
Paris, April 4, 2009**

Outline of presentation



- **Defining what is Evidence-Based Medicine (Médecine fondée sur les faits)**
- **Clarify some sources of misunderstanding**
- **Analyze potential obstacles to the diffusion of EBM/MFF**
- **Suggest some challenges to implement an evidence-based chiropractic care**

Historical introduction



- **“Recent” approach to clinical practice**
 - ✓ Clinical epidemiology and critical reading
 - ✓ To provide explicit arguments for medical decision
- **PubMed**
 - ✓ Medical Subject Heading introduced in 1997
 - ✓ 32 439 references (18/03/2009)
 - ✓ oldest article in 1992
 - ✓ chiropractic: 54 articles; only one in French
 - ✓ neck pain: 35 articles; none in French

Conference on the Neck Pain Patient, Paris, April 4, 2009, 3

Definition



- **Ability**
 - ✓ to access,
 - ✓ to summarize available information, and
 - ✓ to apply it to solve
 - ✓ daily practical
 - ✓ clinical (or public health) problems
- **Utilization of documented facts**

Faits documentés

Conference on the Neck Pain Patient, Paris, April 4, 2009, 4

Terminology



➤ Synonyms

- ✓ *Evidence-Based Medicine (EBM)*
- ✓ Médecine basée sur les preuves/niveau de preuve

➤ Problem with the French terminology

- ✓ “Evidence” is not “proof” (« preuve »)
- ✓ Variations of conclusions in time

➤ Suggestions

- ✓ Médecine factuelle
- ✓ Médecine fondée sur les faits (MFF)

Conference on the Neck Pain Patient, Paris, April 4, 2009, 5

BEST EVIDENCE TOPIC REPORTS

Role of flexion/extension radiography in neck injuries in adults



Bridging the gap between research and practice: a continuing challenge

**The neck is not the back:
obvious, but the research gap should be reduced**

Using decision aids to help patients navigate the “grey zone” of medical decision-making

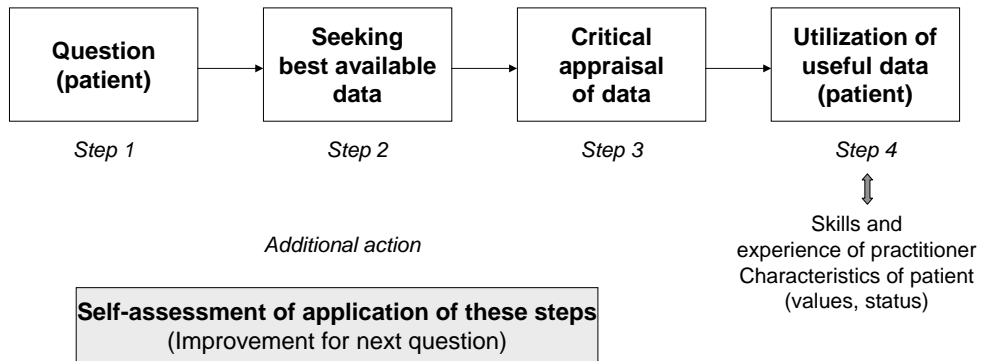
**Supporting patients facing
difficult health care decisions**

Use of the Ottawa Decision Support Framework

Conference on the Neck Pain Patient, Paris, April 4, 2009, 6

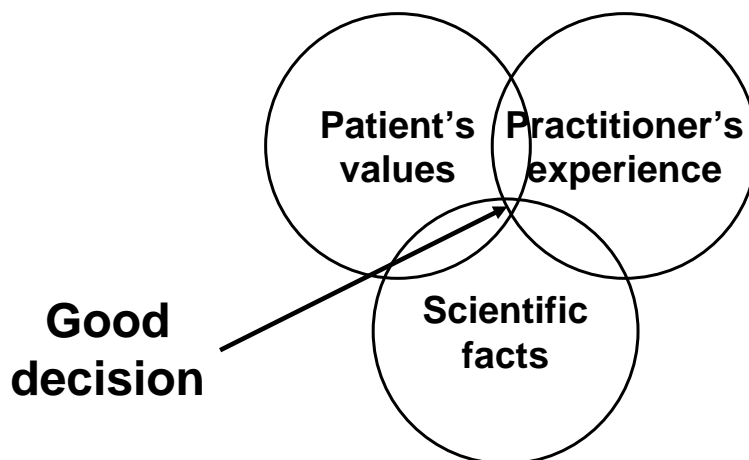
Principles of EBM

Several steps “from patient to patient”




Conference on the Neck Pain Patient, Paris, April 4, 2009, 7

Decision model of EBM



Conference on the Neck Pain Patient, Paris, April 4, 2009, 8

Necessary skills for practicing EBM



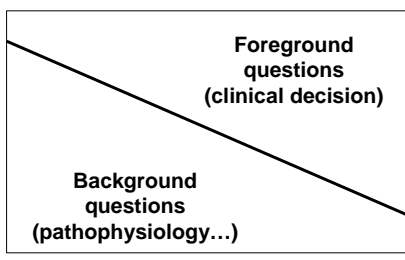

```
graph LR; S1[Question (patient)] --> S2[Seeking best available data]; S2 --> S3[Critical appraisal of data]; S3 --> S4[Utilization of useful data (patient)];
```

Step 1 Step 2 Step 3 Step 4

Conference on the Neck Pain Patient, Paris, April 4, 2009, 9

Necessary skills for practicing EBM

Asking good questions (1)



- Diagnosis (positive, differential, etiological)
- Prognosis
- Prescription
- Follow-up
- Information

Level of experience of a given clinical presentation →

- Prevention and screening
- Aetiology

Conference on the Neck Pain Patient, Paris, April 4, 2009, 10

Necessary skills for practicing EBM Asking good questions (2)



➤ Clinical scenario

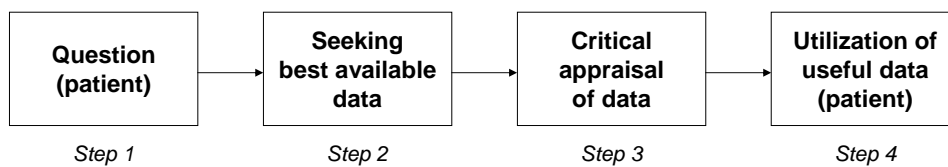
A man attends the emergency department having been involved in a high speed road traffic accident. He complains of neck pain and midline neck spinal tenderness but has no neurological signs or symptoms. Standard 3-view cervical spine radiology shows no abnormality. You wonder if a flexion/extension radiograph would show any significant injury/instability.

➤ Three part question

In [a neurologically intact adult patient with neck pain following trauma but normal plain radiographs] do [flexion/extension xrays] aid [diagnosis of ligamentous or soft tissue injury with instability]? (Pitt E, Thakore S. Emerg Med J 2004;21:587.)

Conference on the Neck Pain Patient, Paris, April 4, 2009, 11

Necessary skills for practicing EBM



Conference on the Neck Pain Patient, Paris, April 4, 2009, 12

Necessary skills for practicing EBM Bibliographical search (1)



| Tasks | Difficulties |
|--|--|
| <ul style="list-style-type: none">✓ Identification of bibliographical sources✓ Selection of relevant sources✓ Identification of relevant key-words✓ Formulation of equations✓ Access of original documents | <ul style="list-style-type: none">✓ Specialized areas✓ Languages✓ Quality of sources✓ Management of abundance✓ Costs |

Conference on the Neck Pain Patient, Paris, April 4, 2009, 13

The screenshot shows the PubMed website interface. At the top, it features the NCBI logo and the text "PubMed a service of the U.S. National Library of Medicine and the National Institutes of Health". Below this is a search bar with "PubMed" selected in a dropdown menu. Navigation tabs for "All Databases", "PubMed", "Nucleotide", "Protein", "Genome", and "Structure" are visible. A sidebar on the left contains links for "About Entrez", "Text Version", "Entrez PubMed", "Overview", "Help | FAQ", "Tutorials", "New/Noteworthy", "E-Utilities", "PubMed Services", "Journals Database", "MeSH Database", "Single Citation Matcher", "Batch Citation Matcher", and "Clinical Queries". The main content area includes a "Limits" button checked, a "Limits: only items with links to free full text" message, and instructions: "To get started with PubMed, enter one or more search terms. Search terms may be topics, authors or journals." A prominent notice titled "The NIH Public Access Policy May Affect Does NIH fund your work?" is displayed, stating that manuscripts must be made available in PubMed if funded by NIH.

Conference on the Neck Pain Patient, Paris, April 4, 2009, 14

Necessary skills for practicing EBM Bibliographical search (2)

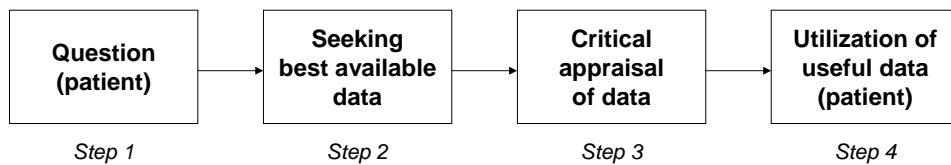


Search strategy

Medline 1966-05/04 and Embase 1980-05/04 using the Ovid interface. [exp neck injuries/OR neck trauma.mp OR cervical spine trauma.mp OR exp spinal injuries/OR exp spinal cord injuries/Or exp spinal fractures/OR exp fractures/OR cervical spine injur\$.mp OR exp dislocations/OR exp cervical vertebrae/OR cervical spinal cord trauma.mp OR exp spinal cord compression/] AND [flexion-extension.ti OR dynamic cervical spine radiograph\$.mp OR flexion-extension radiograph\$.mp OR flexion-extension cervical spine radiograph\$.mp OR flexion-extension x-ray\$.mp] AND [exp joint instability/OR ligamentous injury.mp OR ligament injury.mp OR cervical vertebrae/OR exp fractures/OR ligamentous instability.mp OR exp soft tissue injuries/OR soft tissue injury.mp] LIMIT to human AND English.

Conference on the Neck Pain Patient, Paris, April 4, 2009, 15

Necessary skills for practicing EBM



Conference on the Neck Pain Patient, Paris, April 4, 2009, 16

Necessary skills for practicing EBM Critical reading (1)



Tasks

- ✓ Read
- ✓ Understand
- ✓ Extract key information
- ✓ Assess quality
- ✓ Assess relevance
- ✓ Conclude

Difficulties

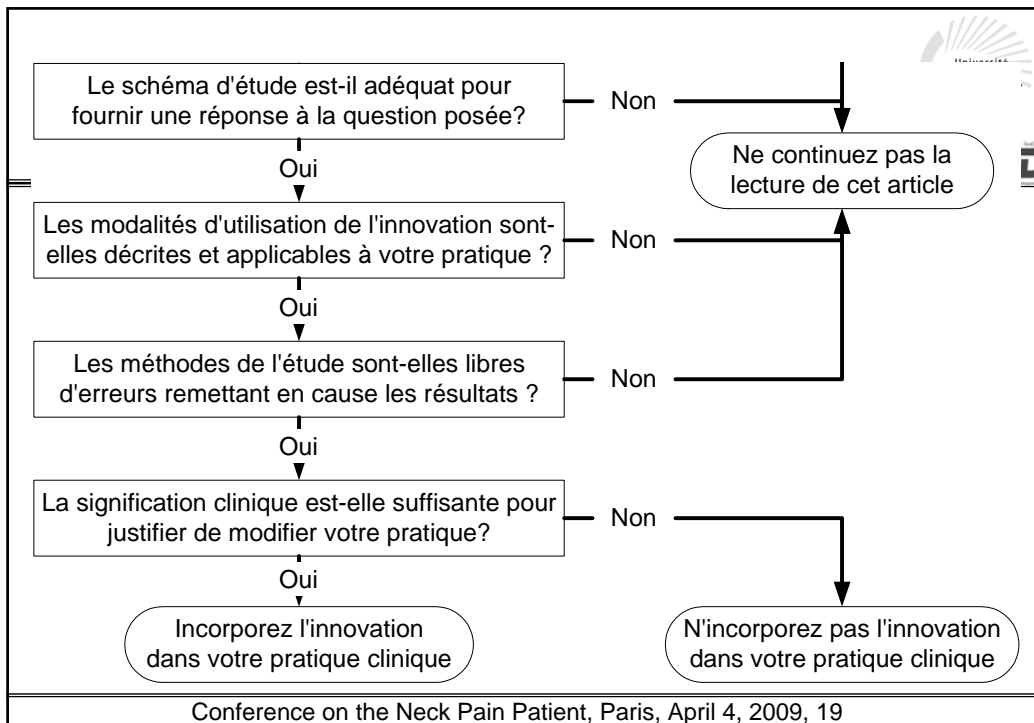
- ✓ Language
- ✓ Quality of support
- ✓ Time
- ✓ Availability of tools
- ✓ Methodological skills
- ✓ Knowledge of clinical context (the patient)

Conference on the Neck Pain Patient, Paris, April 4, 2009, 17

Présentation synoptique des étapes de lecture critique

| Section | Point | Question à se poser | Éléments particuliers selon l'objet de l'étude | | | | ECN* | |
|--------------|---|---|--|---|--|--|--|------------------------|
| | | | Thérapeutique | Diagnostique | Pronostique | Étiologique | Éléments du résumé | Objectifs pédagogiques |
| Titre | 1 | Reflète-t-il une question pertinente ? | | | | | | 1, 24 |
| | 2 | Reflète-t-il une population pertinente ? | | | | | | |
| Résumé | 3 | Rapporte-t-il des résultats informatifs ? | Mesures d'efficacité | Mesures de pronostic | | Mesures d'association | Le résumé de l'étude est supprimé pour l'épreuve | |
| Introduction | 4 | Les lacunes dans les connaissances, évoquées pour justifier la question posée, sont-elles claires et logiques ? | | | | | I | 22 |
| | 5 | La justification repose-t-elle sur une revue brève et synthétique des connaissances ? | | | | | | |
| | 6 | L'introduction se termine-t-elle par l'énoncé d'un objectif clair et complet ? | | | | | II | |
| | 7 | L'objectif reflète-t-il une question pertinente ? | | | | | | |
| | 8 | L'objectif reflète-t-il une population pertinente ? | | | | | | 1, 2, 24 |
| Méthodes | 9 | Commencez-elles par une description de la structure générale de l'étude (schéma d'étude/design) ? | Essai randomisé (cohorte ou cas-témoins critiques) | Comparaison avec un test de référence (gold standard) | Étude de cohorte (cas-témoins critiques) | Étude de cohorte, cas-témoins ou transversale représentative | III | 8, 22 |
| | 10 | Le schéma d'étude est-il cohérent avec la question posée ? | | Panorama complet des maladies et des non-malades | Panorama complet de la maladie ; début du suivi précis | Début du suivi précis ; maladie et facteur d'exposition | | 3, 4, 22 |
| | 11 | La population étudiée est-elle bien définie (critères d'inclusion et d'exclusion) ? | Indication pertinente | | | | | |
| | 12 | Les modalités de sélection sont-elles décrites et correctes ? | Similaires pour tous les groupes, quelles que soient les caractéristiques des sujets | | | | IV | 4, 14, 22 |
| | 13 | La répartition dans les groupes comparés est-elle décrite et correcte ? | Répartition aléatoire vraie | Définition claire des groupes comparés | | | | 5, 14, 22 |
| 14 | Les règles éthiques sont-elles respectées ? | Déclarations réglementaires ; confidentialité ; consentement éclairé | | | | | 10, 22 | |
| 15 | Les modalités d'utilisation de l'innovation proposée sont-elles décrites et applicables ? | Traitements comparés | Description des | Description des | | | 17, 21, 22 | |

Conference on the Neck Pain Patient, Paris, April 4, 2009, 18



Necessary skills for practicing EBM Critical reading (2)



SPINE Volume 33, Number 4S, pp S5-S7
©2008, Lippincott Williams & Wilkins

The Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders

Executive Summary

Scott Haldeman, DC, MD, PhD,* Linda Carroll, PhD,† J. David Cassidy, DC, PhD, DrMedSc,‡
Jon Schubert, CMA,§ and Åke Nygren, DDS, MD, DrMedSc¶

Necessary skills for practicing EBM Data synthesis (1)



Tasks

- ✓ Standardized critical appraisal
- ✓ Narrative description
- ✓ Meta-analysis
- ✓ Decision analysis
- ✓ Consensus techniques
- ✓ Evidence grading
- ✓ Recommendation writing

Difficulties

- ✓ Methodological skills
- ✓ Writing skills
- ✓ Experience
- ✓ Timeliness

Conference on the Neck Pain Patient, Paris, April 4, 2009, 21

Necessary skills for practicing EBM Data synthesis (2)




| Author, date and country | Patient group | Study type(level of evidence) | Outcomes | Key results | Study weaknesses |
|-----------------------------------|--|-------------------------------|---|--|--|
| Lewis LM <i>et al</i> , 1991, USA | 141 consecutive adult trauma patients who had flexion extension cervical spine radiography (FECSR) after static cervical spine radiography (SCSR) series | Retrospective review | Radiological abnormality on SCSR Instability on FECSR Neurological sequelae from performing radiographs | 11 of 141 instability on FECSR of which four had normal SCSR. Four had equivocal SCSR and three had fractures on SCSR FECSR (compared with SCSR alone) increased the sensitivity and specificity for recognising injury from 71% to 99% and 89% to 93% respectively but this was not statistically significant because of small numbers No neurological complications from FECSR | Retrospective No comment on blinding or not of radiologist If abnormal SCSR, CT as well as FECSR done but sometimes before FECSR. Not clear if diagnosis made on CT or FECSR Adequacy of radiography not defined |
| Wang JC <i>et al</i> 1999, USA | 290 patients after trauma—with neck pain, alert, neurologically intact had FECSR | Retrospective review | Instability on FECSR | 1 of 290 (0.34%) instability on FECSR | Retrospective |

Pitt E, Thakore S. *Emerg Med J* 2004;21:587

Conference on the Neck Pain Patient, Paris, April 4, 2009, 22

Necessary skills for practicing EBM




```
graph LR; S1[Question (patient)] --> S2[Seeking best available data]; S2 --> S3[Critical appraisal of data]; S3 --> S4[Utilization of useful data (patient)];
```

Step 1 Step 2 Step 3 Step 4

Conference on the Neck Pain Patient, Paris, April 4, 2009, 23

Necessary skills for practicing EBM

Decision making (1)



- Possible if conclusions are clear

- Difficult circumstances
 - ✓ No available (good) study
 - ✓ No convincing results
 - ✓ Several possible options

Conference on the Neck Pain Patient, Paris, April 4, 2009, 24

Example



- Smith GCS, Pell JP. Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials. *BMJ* 2003;**327**:1459-61.

- **Results**

Our search strategy did not find any randomised controlled trials of the parachute.



Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

- **Discussion: 2 options**

Conference on the Neck Pain Patient, Paris, April 4, 2009, 25

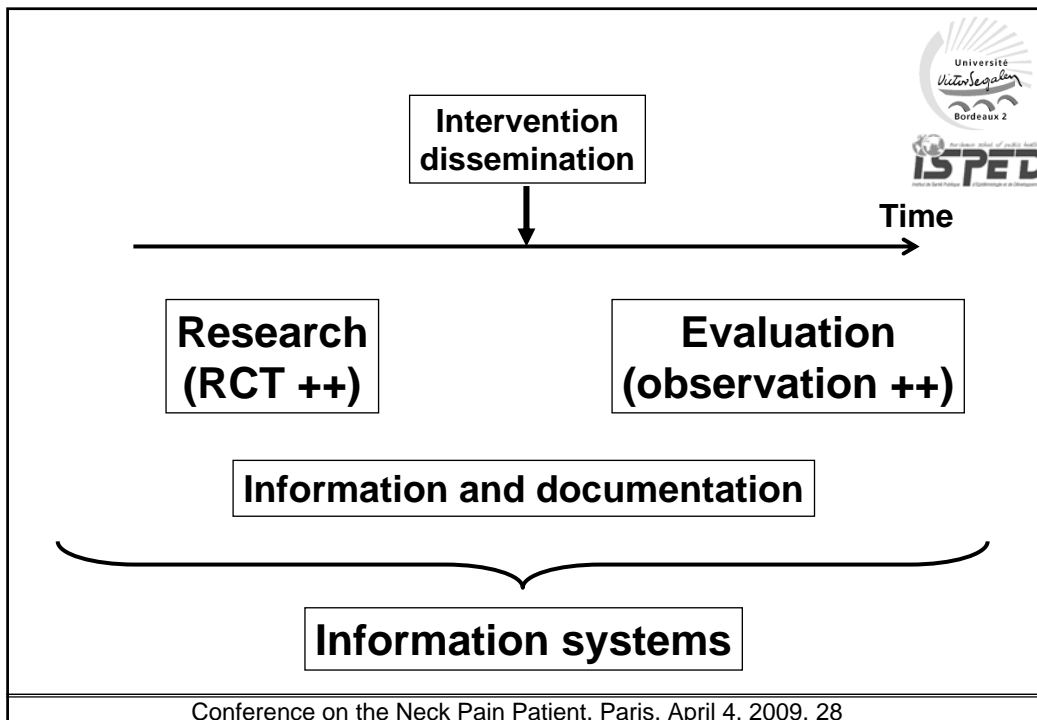
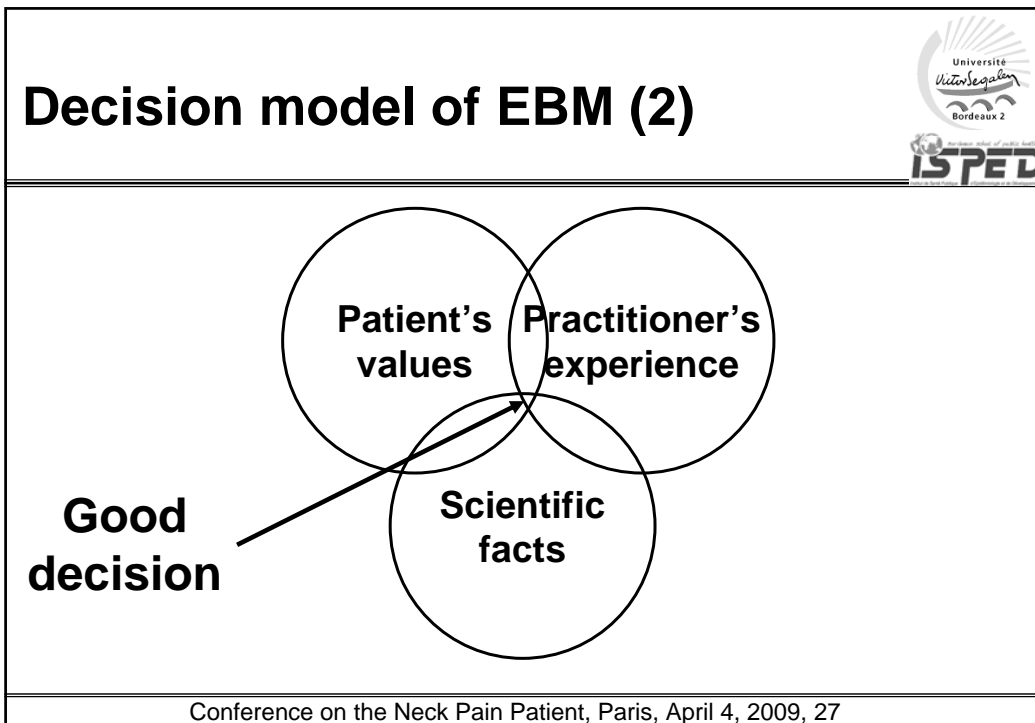
Necessary skills for practicing EBM Decision making (2)



- **Implications**

- ✓ EBM, if only based on scientific information, does not solve everything
- ✓ The lack of scientific information is an information
- ✓ EBM must include other kind of information

Conference on the Neck Pain Patient, Paris, April 4, 2009, 26



Necessary skills for practicing EBM Decision making (3)



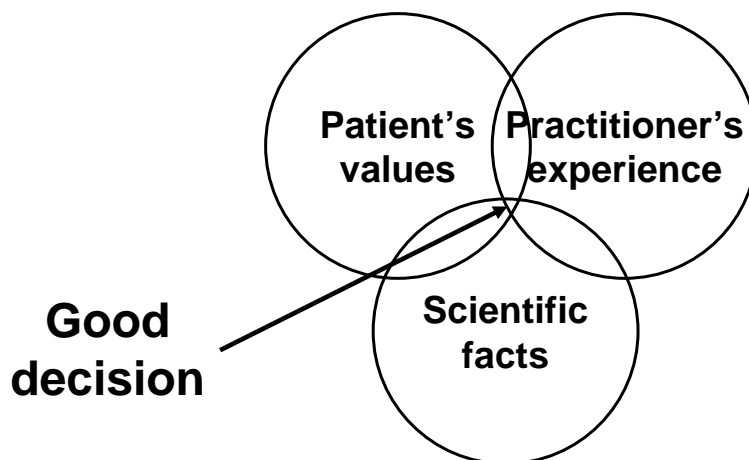
AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 49:557-568 (2006)

Capturing Cases in Workers' Compensation Databases: The Example of Neck Pain

Dwayne Van Eerd, MSc,^{1*} Pierre Côté, PhD,^{1,2} Dorcas Beaton, PhD,^{1,3,4,5}
Sheilah Hogg-Johnson, PhD,^{1,2,6} Marjan Vidmar,¹ and Vicki Kristman, MSc^{1,2}

Conference on the Neck Pain Patient, Paris, April 4, 2009, 29



Decision model of EBM (3)



Conference on the Neck Pain Patient, Paris, April 4, 2009, 30

BEST EVIDENCE TOPIC REPORTS

Role of flexion/extension radiography in neck injuries in adults

Bridging the gap between research and practice: a continuing challenge

The neck is not the back: obvious, but the research gap should be reduced

Using decision aids to help patients navigate the “grey zone” of medical decision-making



Supporting patients facing difficult health care decisions

Use of the Ottawa Decision Support Framework

Conference on the Neck Pain Patient, Paris, April 4, 2009, 31

Necessary skills for practicing EBM

Decision making (4)

Deciding about spinal manipulation


| Reasons to try spinal manipulation for acute low back pain | Reasons not to try spinal manipulation for acute low back pain |
|---|--|
| <ul style="list-style-type: none"> You do not have leg pain or numbness. You do not have severe pain. You know of a reputable practitioner who will coordinate treatment with your other health professional(s). <p>Are there other reasons you might want to try spinal manipulation?</p> | <ul style="list-style-type: none"> You also have leg pain or numbness. You have severe pain, and your doctor has not yet ruled out a serious medical cause. You are uncomfortable with manual treatments that involve physical contact. <p>Are there other reasons you might not want to try spinal manipulation?</p> |

The IPDAS assessment of this decision aid indicates that it meets:

| | |
|---|--|
| 8 | out of 14 of the content criteria |
| 4 | out of 9 of the development process criteria |
| 0 | out of 2 of the effectiveness criteria |

Conference on the Neck Pain Patient, Paris, April 4, 2009, 32

Necessary skills for practicing EBM Decision making (5)



Guide personnel pour la prise décision (Ottawa)

Date: _____

Décision: Quelle décision devez-vous prendre? _____
 Quand la décision doit-elle être prise? _____
 Où en sont vos réflexions sur cette décision?
 aucune réflexion réflexion en cours sur le point de choisir le choix est fait
 Favorisez-vous une option? Non Oui laquelle? _____

Certitude: Etes-vous certain du meilleur choix pour vous? Non Oui

Connaissance: Connaissez-vous les options disponibles pour vous? Non Oui
 Connaissez-vous les avantages et les désavantages de chaque option? Non Oui


Valeurs: Connaissez-vous les avantages / désavantages qui ont le plus d'importance pour vous? Non Oui

A. Au tableau suivant, énumérez les options ainsi que les avantages / désavantages pour chacune que vous connaissez déjà. ?
 B. Soulignez, selon vous, les avantages / désavantages les plus susceptibles de survenir.
 C. Identifiez par le nombre d'étoiles [*] (5 étoiles signifiant le maximum) l'importance pour vous des avantages / désavantages.

| | Avantages (raison pour choisir) | Importance (*) | Désavantage (raison pour éviter) | Importance (*) |
|----------|------------------------------------|----------------|-------------------------------------|----------------|
| Option 1 | _____ | _____ | _____ | _____ |
| | _____ | _____ | _____ | _____ |
| | _____ | _____ | _____ | _____ |

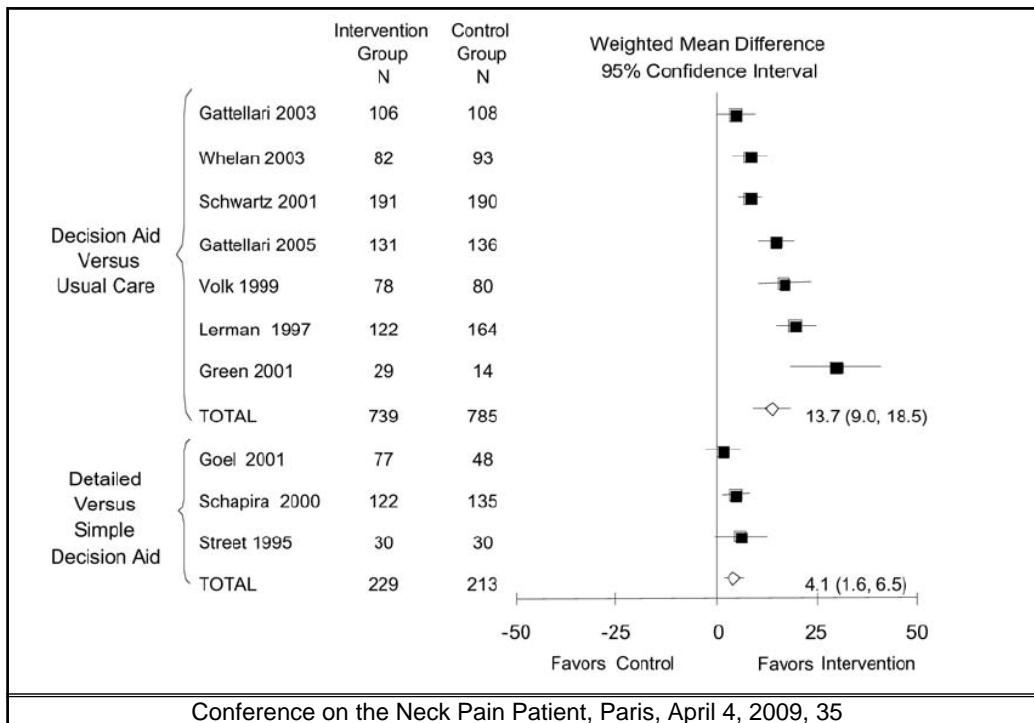
Conference on the Neck Pain Patient, Paris, April 4, 2009, 33

Necessary skills for practicing EBM Decision making (6)



| État | Intitulé | Utilités |
|------|--|---|
| 3 | Conducteur ayant une incapacité médicale à la conduite identifiée | Le pire état imaginable _____ Le meilleur état imaginable |
| 4 | Conducteur faussement identifié comme ayant une incapacité médicale à la conduite | Le pire état imaginable _____ Le meilleur état imaginable |
| 5 | Blessé grièvement | Le pire état imaginable _____ Le meilleur état imaginable |
| 6 | Effets secondaires de l'arrêt volontaire de la conduite | Le pire état imaginable _____ Le meilleur état imaginable |
| 9 | Décès | Le pire état imaginable _____ Le meilleur état imaginable |

Conference on the Neck Pain Patient, Paris, April 4, 2009, 34



Necessary skills for practicing EBM Decision making (7)



Physicians' intentions and use of three patient decision aids

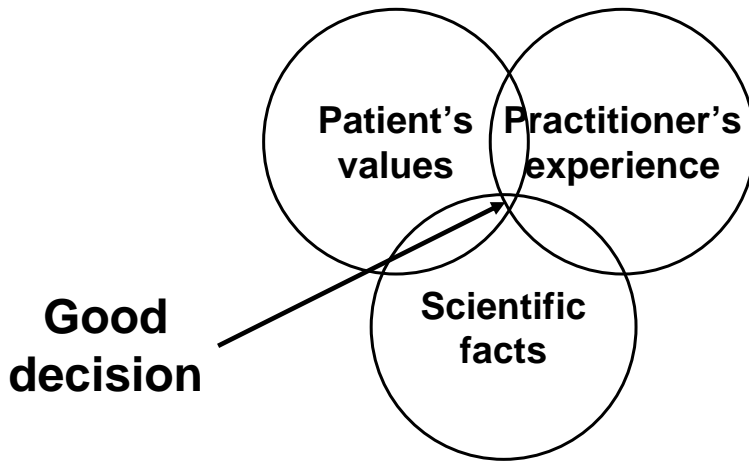
Ian D Graham^{*1,2,3}, Jo Logan², Carol L Bennett¹, Justin Presseau¹,
Annette M O'Connor^{1,2,3}, Susan L Mitchell⁴, Jacqueline M Tetroe¹,
Ann Cranney^{1,3,5}, Paul Hebert^{1,3} and Shawn D Aaron^{1,3,6}

BMC Medical Informatics and Decision Making 2007, 7:20

| | Family Physicians n = 84 | Geriatricians n = 67 |
|---|-----------------------------|----------------------|
| Need for decision aid | 54 (64%) | 56 (84%) |
| Comfortable, very comfortable offering decision aid to patients | 68 (81%) | 57 (85%) |
| Likely, very likely to use decision aid within 3 months | 51 (61%) | 30 (45%) |

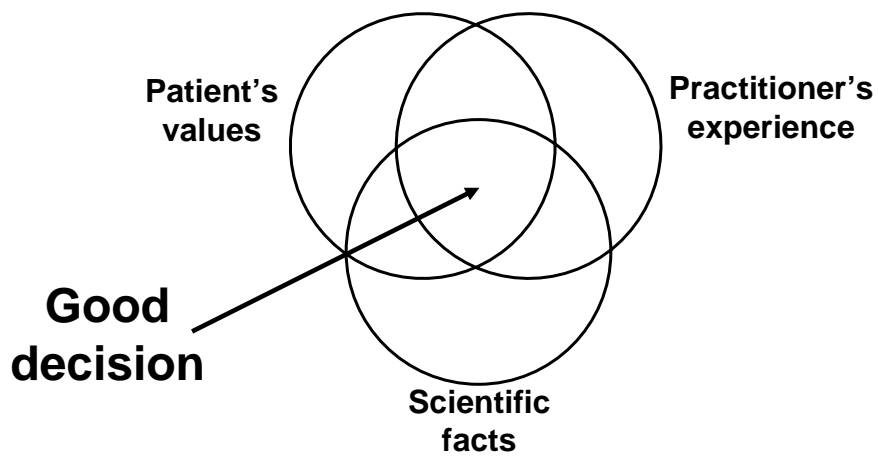
Conference on the Neck Pain Patient, Paris, April 4, 2009, 36

Decision model of EBM (4)

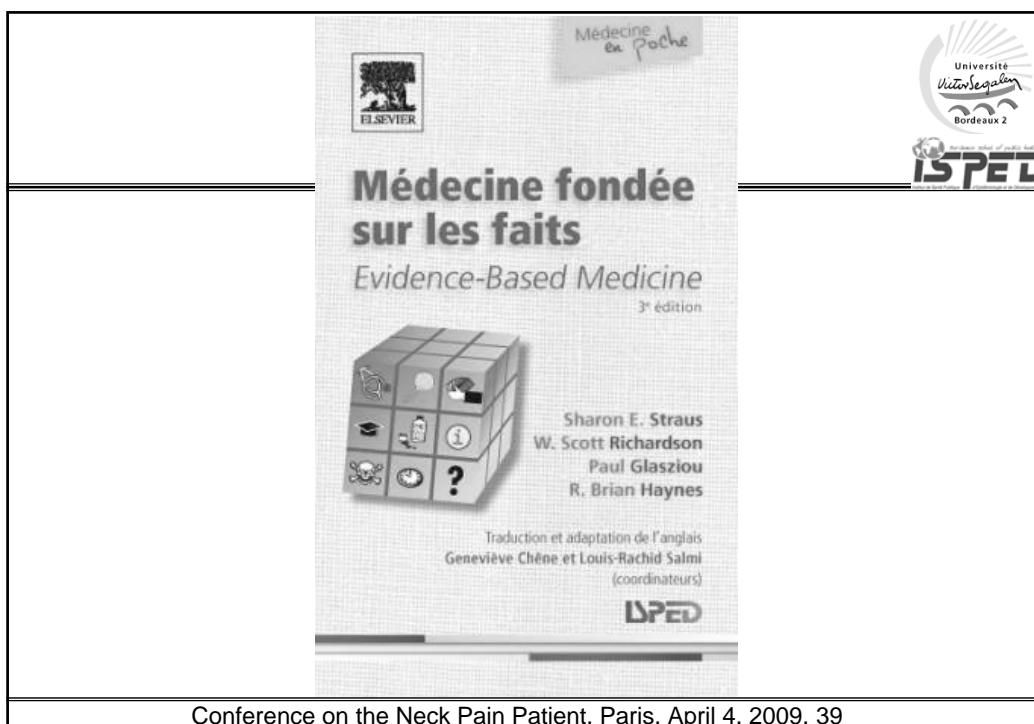


Conference on the Neck Pain Patient, Paris, April 4, 2009, 37

Decision model of EBM (5)



Conference on the Neck Pain Patient, Paris, April 4, 2009, 38



Conference on the Neck Pain Patient, Paris, April 4, 2009, 39