



UNIVERSITY OF ALBERTA
FACULTY OF REHABILITATION MEDICINE

A Scoping Review of Clinical Decision Support Tools for Managing MSK Disorders

Doug Gross, Ivan Steenstra, Ziling Qin
doug.gross@ualberta.ca
isteenstra@iwh.on.ca

Open plenary Institute for Work & Health
April 28, 2015

“uplifting the whole people”

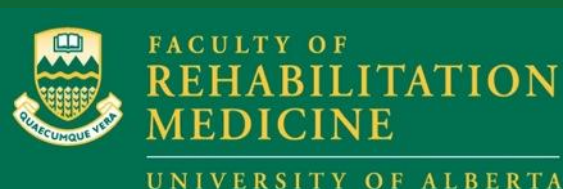
— HENRY MARSHALL TORY, FOUNDING PRESIDENT, 1908

Acknowledgements

Funding for scoping review provided by the
Research and Workplace Innovation
Program WCB-Manitoba



Team Members: Bill Shaw, Nicola Shaw, Jan
Hartvigsen, Susan Armijo, Kelly Williams-Whitt,
Christine Ha, Linda Woodhouse



Department of
Physical Therapy





Clinical Decision-Making

Disability Determination: Validity With Occupational Low Back Pain

Raymond C. Tait,* John T. Chibnall,* Elena M. Andresen,[†] and Nortin M. Hadler[‡]

Perspective: African American race was negatively associated with disability ratings and also with diagnosis/surgery and medical costs. Disability ratings, however, correlated only weakly with post settlement status at 21-month follow-up. The association between race and disability ratings suggests that inequities operate in disability determination.



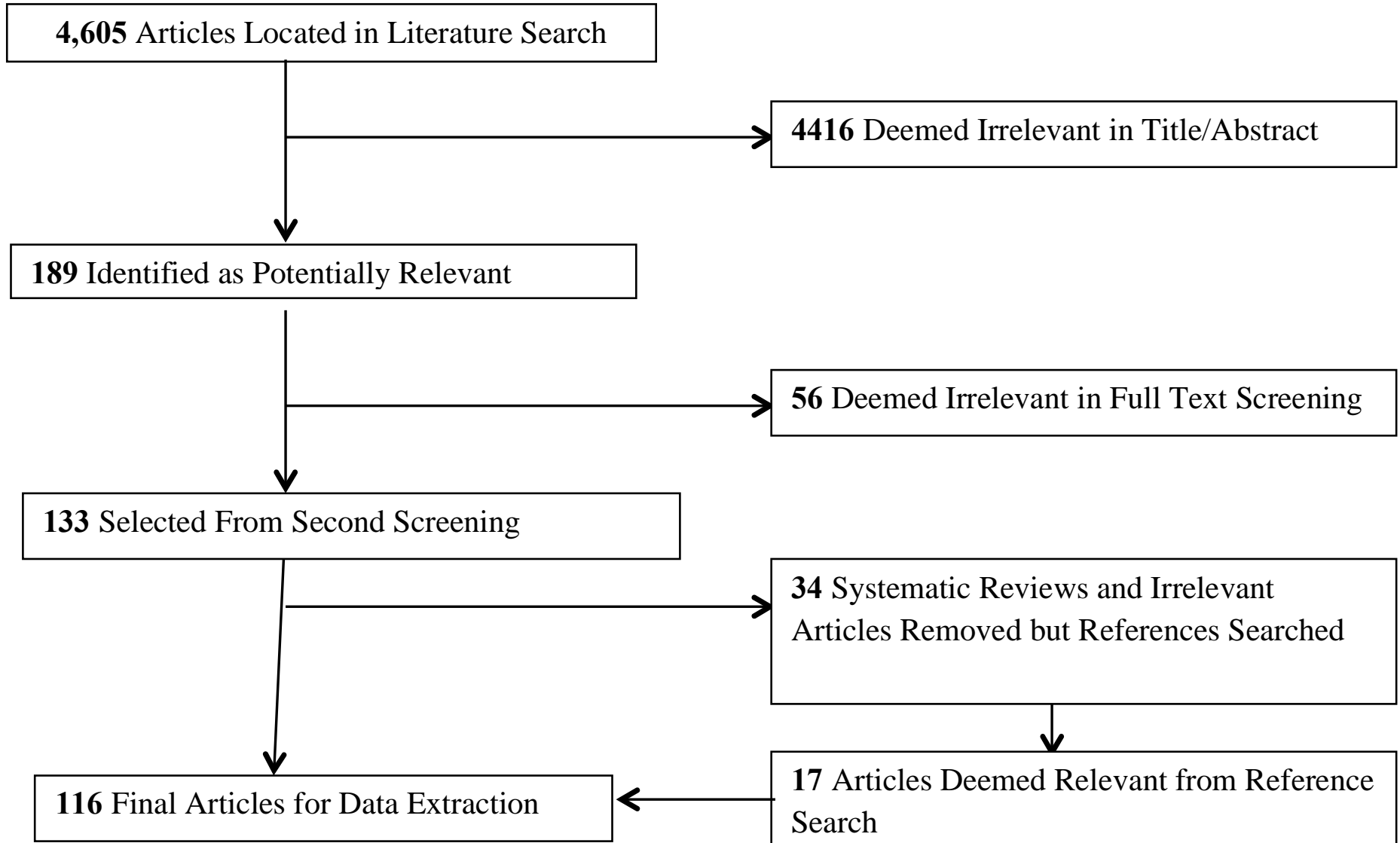
Clinical Decision Support Tools

- CDS Tool = Any resource designed to aid directly in making therapeutic choices for patients
- Use patient characteristics to generate ***specific*** recommendations
- May incorporate technology/ computers

Our Project = Scoping Review

- Purpose** – Comprehensively search for information on CDS tools (scientific and “grey”)
- Searched healthcare, computing science and management literature
 - Identify and inventory available tools
 - Comment on status of the research

Study Flow Chart



Results – Description of Papers

	# of Articles (%)
<i>Discipline of Lead Authors</i>	
Health Care	116 (100%)
<i>Type of Tool Discussed in the Article</i>	
Computer-Based Tool	5 (4%)
Questionnaire	11 (10%)
CPR/Classification System	79 (68%)
Treatment Algorithm	15 (13%)
Theoretical/Empirical Model	6 (5%)
<i>Condition Aimed at by Tool</i>	
Low Back Pain	67 (58%)
Neck/ Shoulder/Arm Pain	21 (18%)
General MSK Disorders	12 (10%)

Inventory of Available Tools

Questionnaires/Surveys

Keele STarT Back Screening Tool

Pain Recovery Inventory of Concerns and Expectations

‘Computerized’ CDS Tools

Work Assessment Triage Tool

WCB-Alberta Soft Tissue Continuum of Care Model

Repetitive Strain Injury Quick Scan

Pain Management Advisor

Decision Support Software

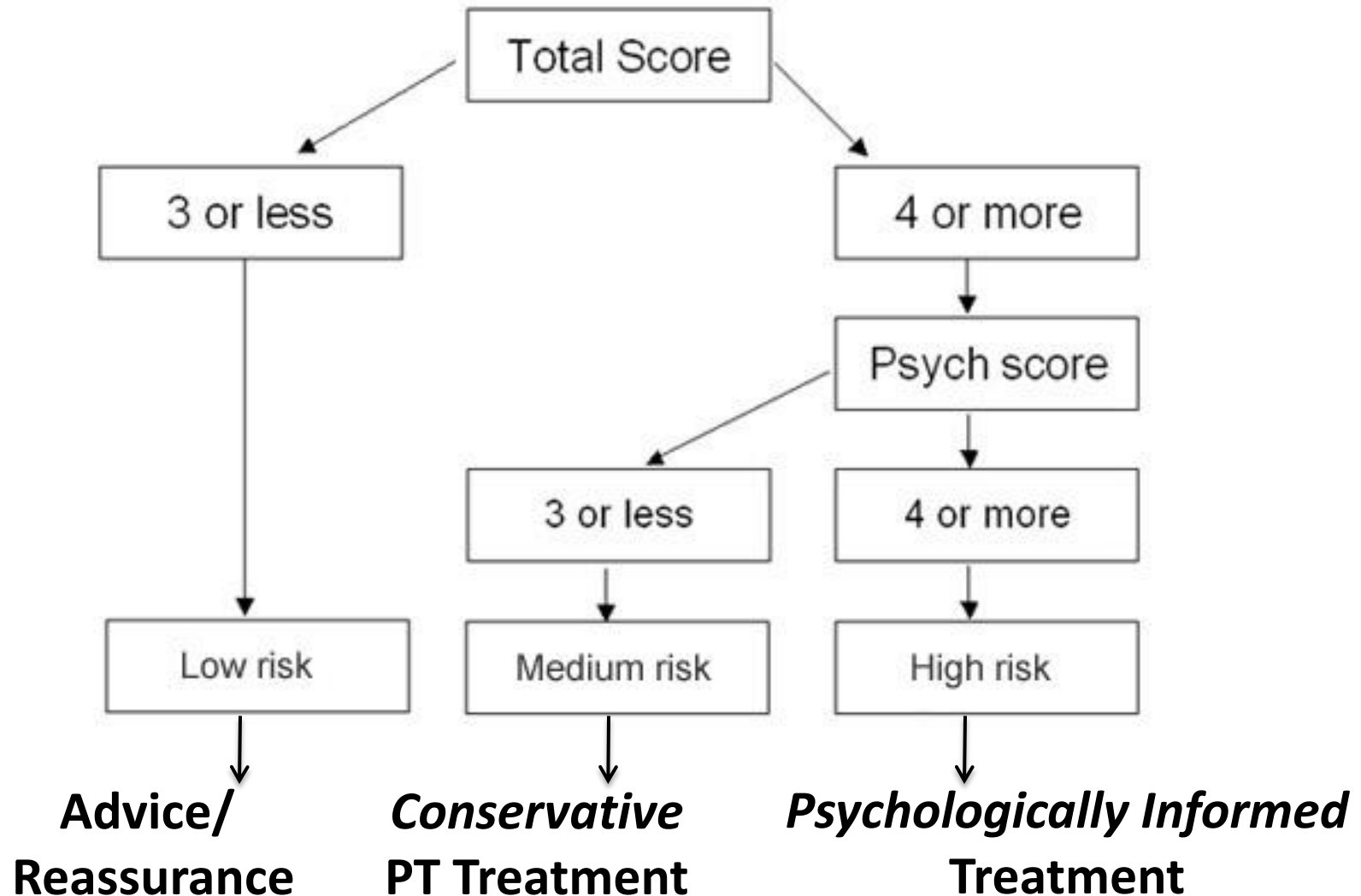
38 other “clinical” algorithms or examination tools

Classification Tool for Back Pain



STarT Back Questionnaire
– Perhaps the most
developed and validated

STarT Back produces two scores: Overall scores and *psych* subscale scores



Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial

Jonathan C Hill, David G T Whitehurst, Martyn Lewis, Stirling Bryan, Kate M Dunn, Nadine E Foster, Kika Konstantinou, Chris J Main, Elizabeth Mason, Simon Somerville, Gail Sowden, Kanchan Vohora, Elaine M Hay

Lancet 2011; 378: 1560-71

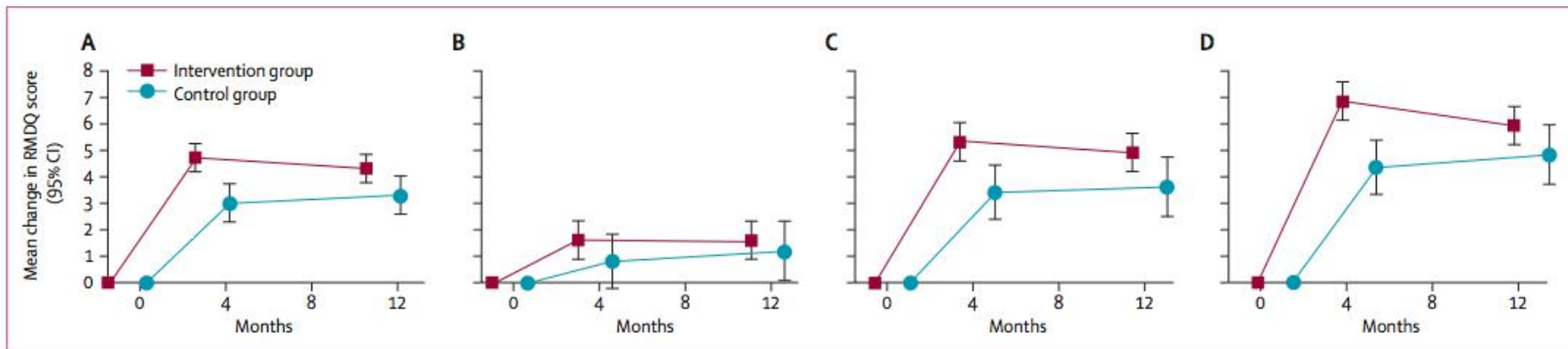


Figure 2: Mean change from baseline in RMDQ (primary outcome measure) scores at 4-month and 12-month follow-ups in all participants (A), low-risk participants (B), medium-risk participants (C), and high-risk participants (D)

RMDQ=Roland and Morris Disability Questionnaire.

STarTBack Low Back Pain Screening Questionnaire

[View More By This Developer](#)

By MSK2Media

Open iTunes to buy and download apps.

[View in iTunes](#)

\$2.99

Category: Medical

Released: Sep 13, 2012

Version: 1.0

Size: 2.3 MB

Languages: English, German

Seller: Venture Australis Pty Ltd

© 2012 Venture Australis Pty Ltd

Ltd

Rated 4+

Requirements: Compatible with iPhone 3GS, iPhone 4, iPhone 4S, iPhone 5, iPod touch (3rd generation), iPod touch (4th generation), iPod touch (5th generation) and iPad. Requires iOS 4.0 or later.

Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

Description

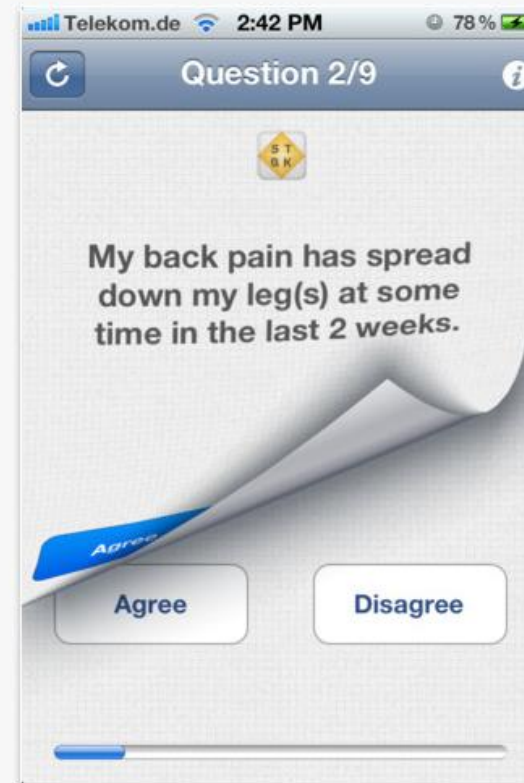
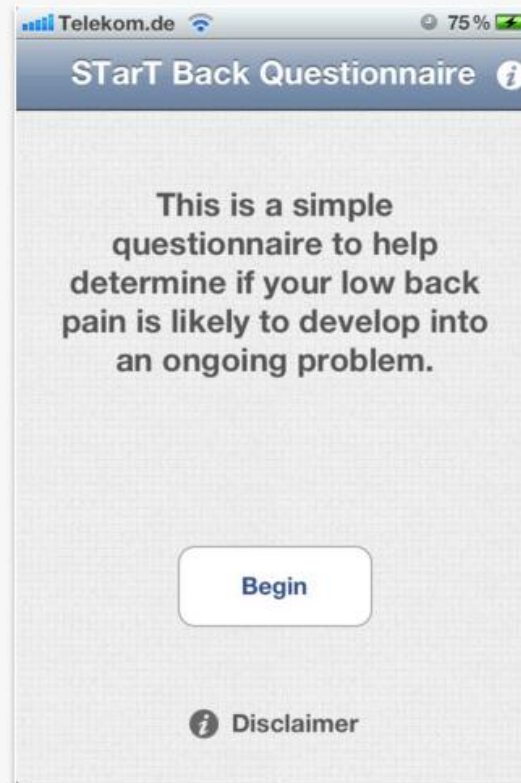
Screen low back pain patients to produce better management outcomes.

Back pain remains an international challenge for primary health clinicians and suffers of back pain. Using a

[MSK2Media Web Site](#) > [STarTBack Low Back Pain Screening Questionnaire Support](#) >

[...More](#)

iPhone Screenshots



Pain Recovery Inventory of Concerns and Expectations (PRICE)

Pain Recovery Inventory of Concerns and Expectations (PRICE)

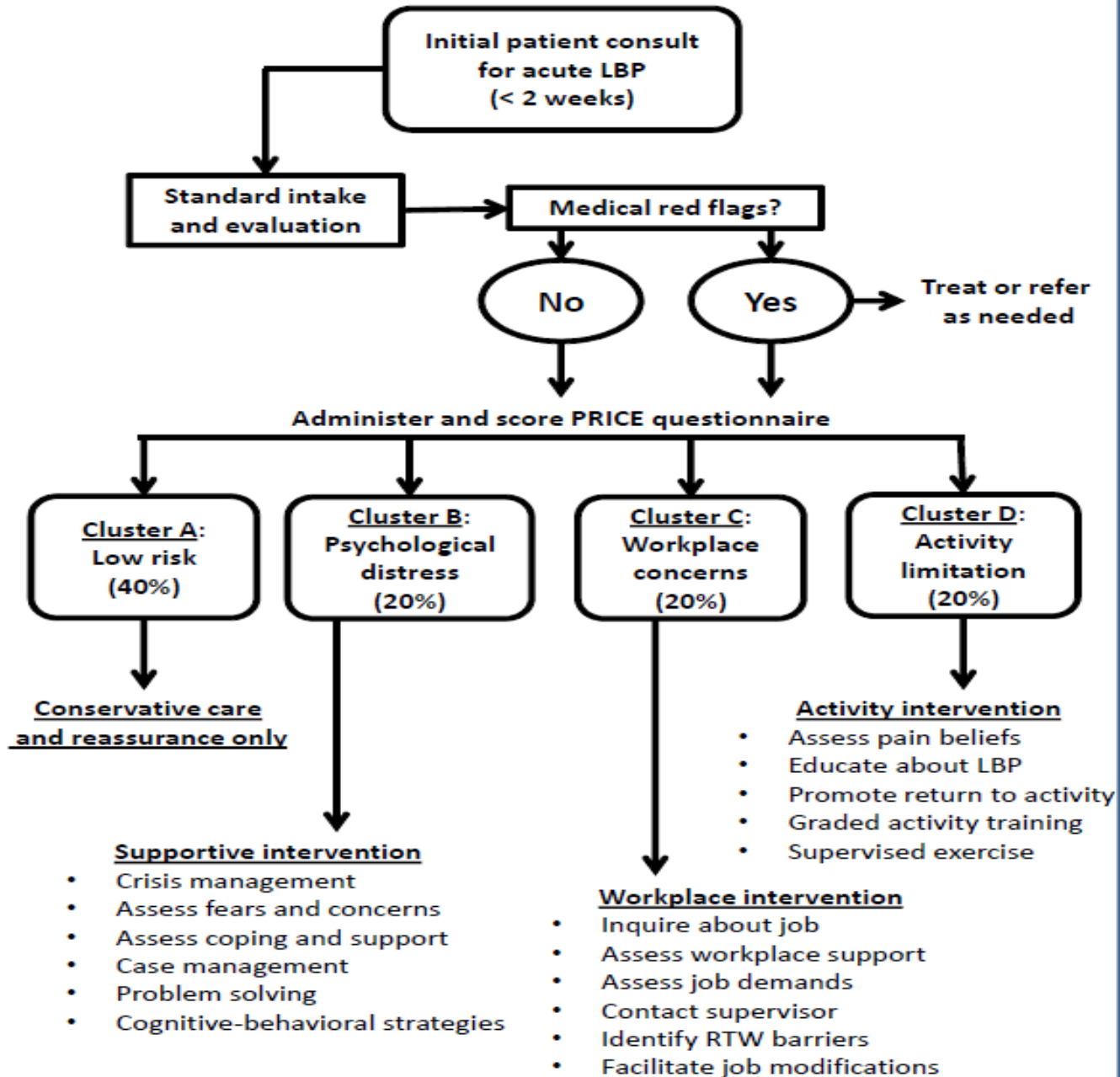
Instructions: The following survey will ask you about your current limitations due to back pain, your work about recovery, and your current levels of pain and distress. Your responses will help your clinicians provide and support. The survey consists of 46 questions that should take approximately 5-10 minutes, but you Please answer every question unless you find it inappropriate or irrelevant to your situation.

Today, would you find it difficult to perform the following activities because of your back pain?:

	0 Not difficult at all	1 Minimally difficult	2 Somewhat difficult
1. Stand up for 20-30 minutes.	0	1	2
2. Climb one flight of stairs.	0	1	2
3. Walk a few blocks (1000 feet).	0	1	2
4. Walk several miles.	0	1	2
5. Reach up to high shelves.	0	1	2
6. Throw a ball.	0	1	2
7. Run one block (about 300 feet).	0	1	2
8. Take food out of the refrigerator.	0	1	2
9. Make your bed.	0	1	2
10. Put on socks (or pantyhose).	0	1	2
11. Bend over to clean the bathtub.	0	1	2
12. Move a chair.	0	1	2
13. Pull or push heavy doors.	0	1	2
14. Carry two bags of groceries.	0	1	2
15. Lift and carry a heavy suitcase.	0	1	2

- Survey for patients with back pain
- Consists of 46 items
- Targets 3 interventions (Functional restoration, Workplace-based, or Chronic pain program)

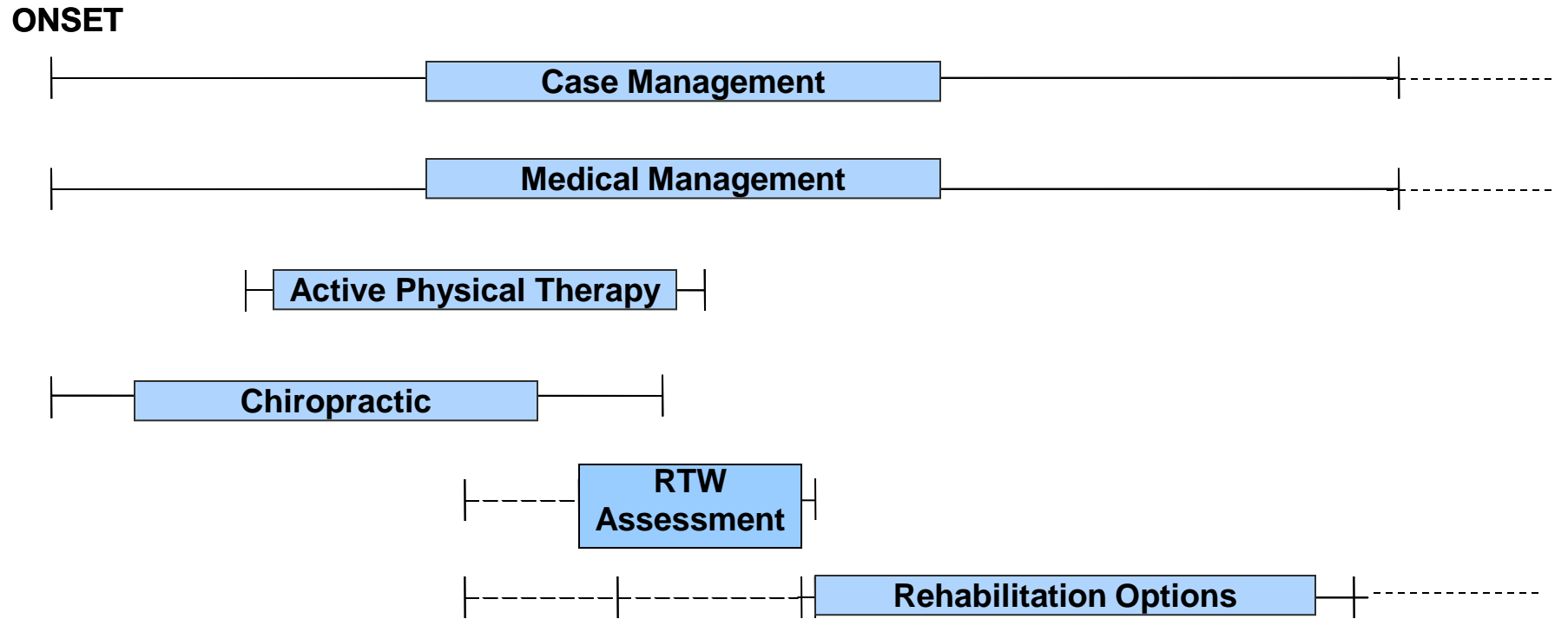
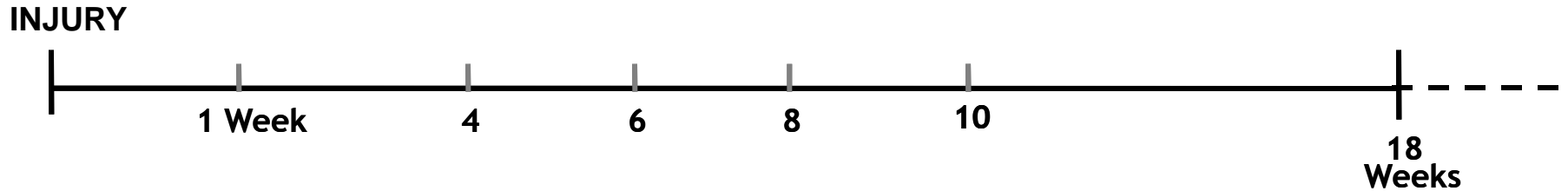
PRICE Early Intervention Decision Algorithm



WCB-Alberta Continuum of Care

- Involved 3 components:
 - Staged application of rehab services*
 - Case management protocols (computerized prompts)*
 - Contracted services with providers*
- The impact and effectiveness of the model has been evaluated.
- Still clinically used in the WCB-Alberta system

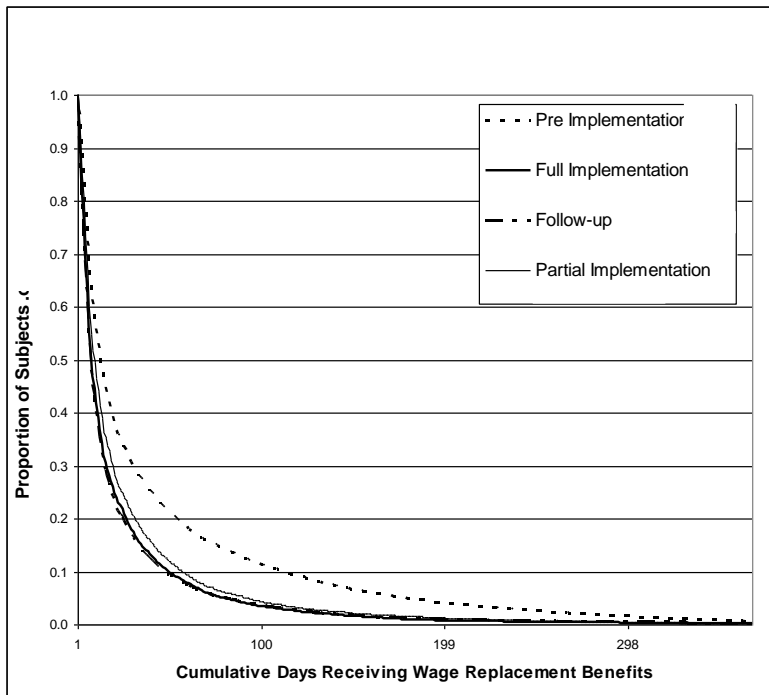
WCB-Alberta Continuum of Care



- Functional Restoration
- Worksite-Based Services
- Biopsychosocial Chronic Pain Management
- Hybrid / Integrated Vocational Rehab

The Influence of a Continuum of Care Model on the Rehabilitation of Compensation Claimants With Soft Tissue Disorders

Brian Stephens, PhD,* and Douglas P. Gross, PhD†



n = 171,736

Days to RTW

	Intervention	Control
Before	13	10
After	8	10

Work Assessment Triage Tool (WATT)

- Web-based tool for selecting rehabilitation programs for injured workers.
- Developed with data from WCB-Alberta
- **Internal validity** - Higher accuracy than 'humans'
- **External validity**: Moderate agreement compared to 'humans' but more likely to recommend evidence-based programs of care



WORK ASSESSMENT TRIAGE TOOL

WORKER JOB INFO

Does worker have a job to return to?

0-No



Occupational Category

0-Management occupations



Currently working

0-No



Modified work available

0-No



Worker's score (out of 10) on the Occupational Item of the Pain Disability Index (PDI). To view the PDI visit [here](#).

0



Pain VAS out of 10 at assessment

0



Mrs. Green

Background: Right elbow pain for 6 weeks

Profile: 42 year old technical draftsman

Symptoms: Intermittent elbow pain that has been slowly improving. Is currently working and is able to do most of her work activities, but needs to take breaks every two hours.

Imaging: X-ray unremarkable

Treatment: Physical Therapy involving exercises mainly. Slow improvement.

Assessment: Some restricted active and passive movement in elbow. Demonstrated most job demands on functional assessment. PDI very low (occupational item 1/10). SF36 golfing item limited some of the time (3/10).

Recommended Program?

WATT Recommendations:

- 1) Worksite-based intervention
- 2) Physical therapy
- 3) Functional restoration program

Prediction from positive rules	Duration	Confidence	Rules Number	Rules
Worksite-based	25 days	1	4	Rules
Community Single Service Provider	0 days	0.99	2	Rules
Provider-based	24 days	0.84	1	Rules

Mr. Black

Background: Traumatic injury to shoulder 7 weeks ago

Profile: 45 year old truck driver (rated as heavy work).

Presenting Problem: Strained right shoulder when he slipped getting out of his truck - grabbed for support and R arm supported entire body weight. No longer job attached. MRI indicates surgery not indicated.

Symptoms: Moderate dull ache in shoulder and upper arm.

Treatment: 6 weeks Physical Therapy. Slow improvement.

Assessment: Not meeting job demands for manual handling. VAS = 6/10. Moderate disability on PDI and SF36.

Recommended Program?

WATT Recommendation:

1) Functional restoration program

Prediction from positive rules	Duration	Confidence	Rules Number	Rules
Provider-based	24 days	0.84	1	Rules

Mr. White

Background: Traumatic injury to shoulder *17 months ago*

Profile: 45 year old truck driver (rated as heavy work).

Presenting Problem: Fractured right shoulder when he slipped getting out of his truck - grabbed for support, slipped and fell to ground. No longer job attached.

Symptoms: *Severe* dull ache in shoulder and upper arm.

Treatment: Physical Therapy and previous rehab program. *No improvement, in fact the shoulder pain is getting worse.*

Assessment: Not meeting job demands for manual handling. Functioning at sedentary level. VAS = 8/10.

SF36 bathing and lifting limited all the time.

Recommended Program?

WATT Recommendations:

- 1) Chronic pain program
- 2) Functional restoration program

the Decision Support System

- Spreadsheet-based database designed for one worksite to identify ergonomic risks for work-related upper extremity disorders
- Qualitatively tested in one study
- Not used in 'rehab' settings

RSI Quick Scan

**arbo
unie** aan de slag

[CompuFit QuickScan](#) [Survey](#) [Results](#) [See the demo](#) [More info](#)

- Test your knowledge RSI

Tablets: the new cause of RSI?

Tablets offer mobility and convenience. And that makes them particularly popular. Even in the workplace, the use of the tablets rapidly increasing. Write an e-mail, read a text, surf the Internet ... What impact does this have on the healthy functioning of workers?

[Read more](#)

[Log in to do the survey](#)

User Id:

Password:

[Go to your homepage](#)



- Dutch tool to evaluate risk of RSI based on work/office ergonomics
- Was not found to be cost-effective
- Still in use by 'Arbo-Unie'

Pain Management Advisor (PMA)

- Designed to enhance management of chronic pain.
- Relies on rule-based algorithms derived from expert knowledge of pain specialists.
- Limited information available online and the corresponding author of the article was unresponsive.

Other Algorithms/ Clinical Prediction Rules

- Very popular for management of back pain
- Examples include Fritz rule for identifying responders to manipulation and Delitto's classification system
- Evaluation has shown **mixed** or **unsuccessful** results

Conclusions

- Identified 7 CDS tools (2 surveys and 5 computer-based tools) and 38 other “clinical” tools.
- Some promising results, but none appear ready for widespread use in clinical practice

Ontario LOW BACK PAIN STRATEGY: Toolkit for Primary Care Providers

Download an overview of the toolkit
[Colour](#) | [Black & White](#)

Clinical Tools

Download PDFs of the tool in colour or black & white.

- Clinically Organized Relevant Exam (CORE) Back Tool
[Colour](#) | [Black & White](#)
- CORE Back Tool Guide
[Colour](#) | [Black & White](#)

Supporting Tools

Download PDFs of the tool in colour or black & white.

- Opioid Risk Tool
[Colour](#) | [Black & White](#)
- Patient Education Inventory
[Colour](#) | [Black & White](#)
- Personal Action Planning for Patient Self Management
[Colour](#) | [Black & White](#)
- The Keele StarT Back Screening Tool
[Colour](#) | [Black & White](#)

In addition to the listed, the following reference tools are available for additional support

Note that the following tools are available through the websites of external organizations/groups. The developers of these reference tools are responsible for the currency, accuracy and completeness of the content published. Tools below have not been translated as part of the Provincial Strategy and are currently available in English only, unless otherwise indicated.

For Providers

- **Pharmacy Tables** : St. Michael's Hospital, Department of Family and Community Medicine
 - [Acute and Subacute Low Back Pain \(LBP\) - Pharmacological Alternatives](#)
 - [Acute and Subacute Low Back Pain \(LBP\) - Topical and Herbal Products](#)
 - [Evidence Summary for Management of Non-specific Chronic Low Back Pain \(POCKET\)](#)

Acknowledgements

Funding for scoping review provided by WCB-Manitoba



Team Members: Bill Shaw, Nicola Shaw, Jan Hartvigsen, Susan Armijo, Kelly Williams-Whitt, Christine Ha, Linda Woodhouse



Department of Physical Therapy

