

20 Years in Stroke Rehabilitation: Trials, Tribulations and Tomorrow

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Outline

Trials

Stroke rehabilitation research

- Changes over recent years
- Quality, funding and new directions

Tribulations

Challenges faced by clinicians

- Improving care with tight resources
- Accessing & staying abreast of evidence
- Changing practice in the face of new evidence
- Controlling / leading change

Tomorrow

What might rehabilitation look like in the future?

Take home messages



What is Stroke Rehabilitation?

- “..neurological rehabilitation, a scientific adolescent which, as is the way with adolescents, has precocious spending habits” *Pomeroy & Tallis, 2002*
- Rehabilitation costs in the *first year after stroke* estimated at AUD \$ 166 million

Dewey et al, 2001



Looking Back



Looking Back

- **Service provision**
 - Post acute in separate facility
 - Outpatient services on discharge
 - Therapy departments close to ward
 - Woodwork valued as an occupational pursuit, patients in long enough to use it!



Rehab Length of Stay - 1989

- Time from stroke onset to admission to rehabilitation
 - 22.0 days (SD 17.2) **blxxy acute hosp*
- Stroke rehabilitation *average* LOS
 - 84.9 days (SD 66.0)
- Outcome: 75% home, 7.5% Hostel, 16% NH



Rehab Length of Stay - 1995

- Time from stroke onset to admission to rehabilitation
 - 17.6 days ↓ 22.0 days
- Stroke rehabilitation *average* LOS
 - 54.9 days (SD 32.5) ↓ 54.9 days
- Outcome: 77.2% home, 9.6% Hostel, 13.3% NH

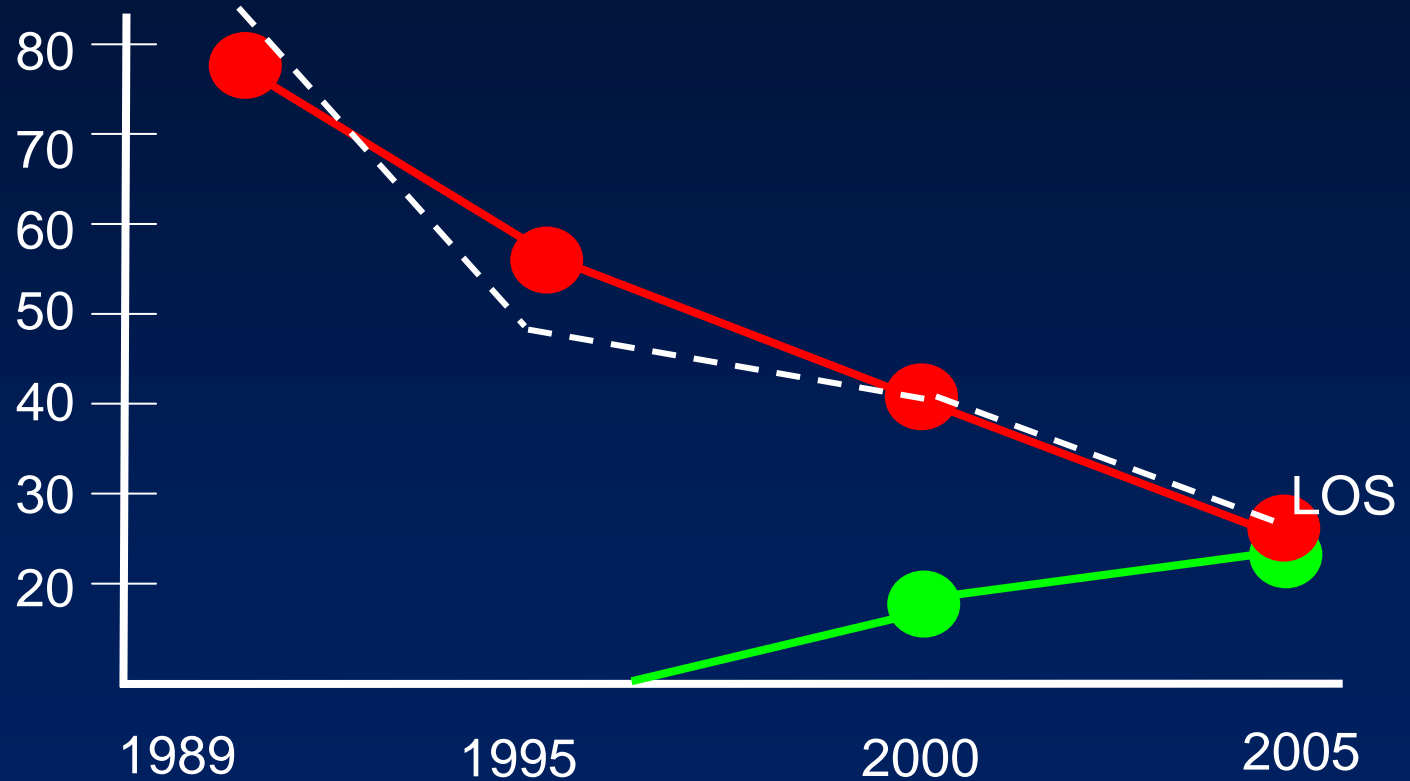


Rehab Length of Stay - 2005

- Time from stroke onset to admission to rehabilitation
 - 14.2 days ↓ 17.6 days
- Stroke rehabilitation *average* LOS
 - 34.9 days (SD 16.5) ↓ 84.9 days
- Outcome: 80.2% home, 9.6% Hostel, 12.0% NH



Number of Rehabilitation Beds



What else has changed?



Rehabilitation Environment

Ward



Gym



How Active Rehabilitation?

Author	Subjects	Location	Active therapy
Tinson, 89	15	Rehab	62 min/day
Lincoln, 96	39	SU	46 min/day
Mackey, 96	16	Rehab	45% doing nothing
Esmonde, 97	17	Rehab	33% in therapy, (50% non therapy time doing nothing)
Ada, 99	16	Gym	66% time inactive when alone
Bernhardt, 04	58	SU	24 min/day 53% time inactive, 60% alone
Tay, 06	21	Rehab	21% in therapy 72% day in bedroom



What's Changed?

Changed

Facilities

Models

Equipment

Paperwork

Patient access

LOS

When rehab starts

Same

Patient activity

MDT

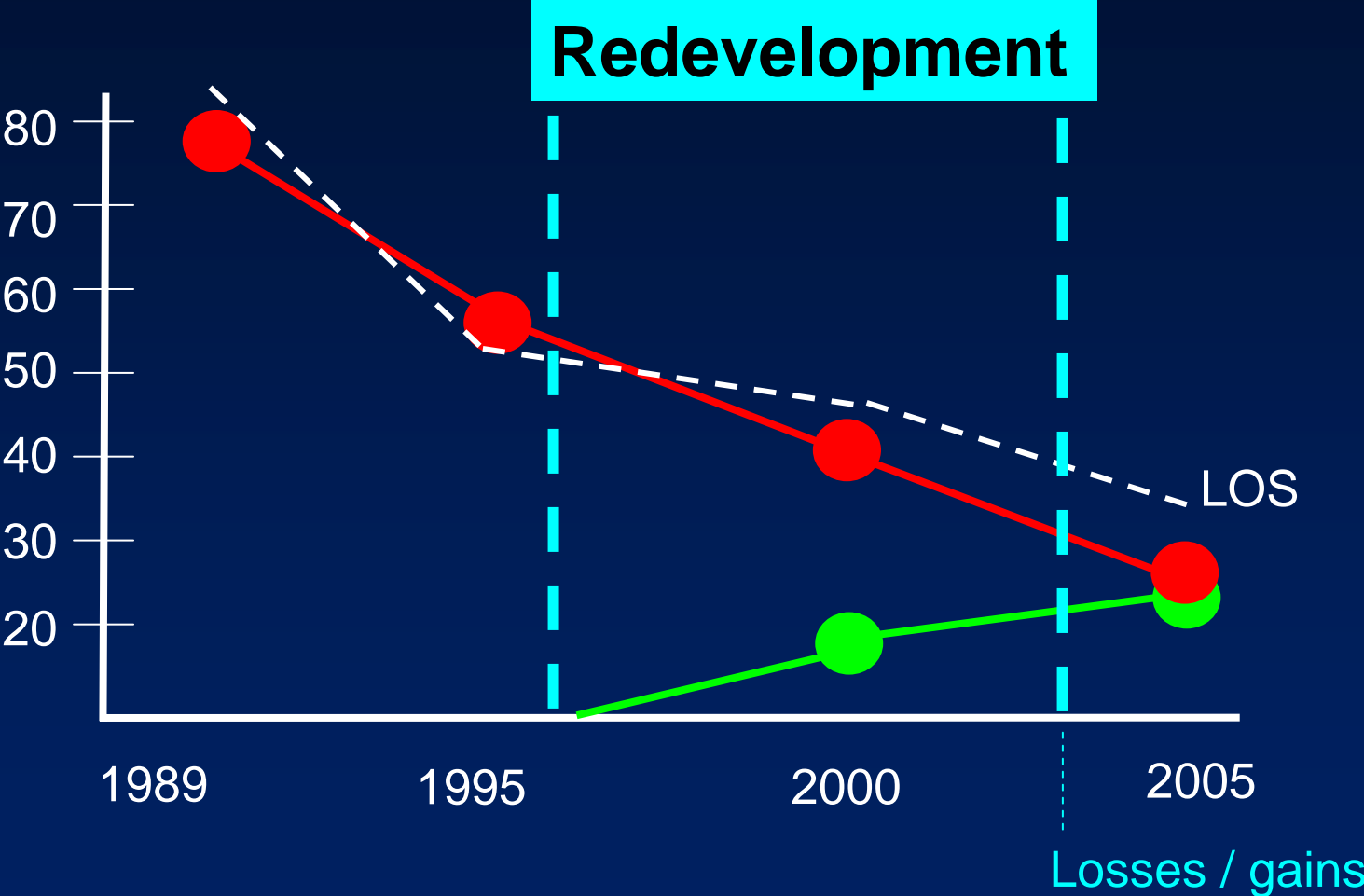
Routines (hours)

Case conferences

No continuum care



Number of Rehabilitation Beds



Rehabilitation Environments

Lost in redevelopment(s)

- Patient dining area in ward
- Therapy areas close to ward
- Nursing / therapist combined staff rooms
- Close proximity between OT / PT / SP

No evidence of benefit **BUT**
No one listened to the clinicians



Stroke Rehabilitation Now

- Fewer inpatient beds but greater diversity in models of care
- Starts sooner (Day 1!) / shorter LOS
- ? Greater opportunity / imperative to be “Evidence based”
- Greater use of technologies
 - Gait labs
 - FES, treadmill training
 - Other equipment *typically before evidence*



Who and what *leads* change?

- *Administrators, DHS, architects*
- *WE SHOULD*



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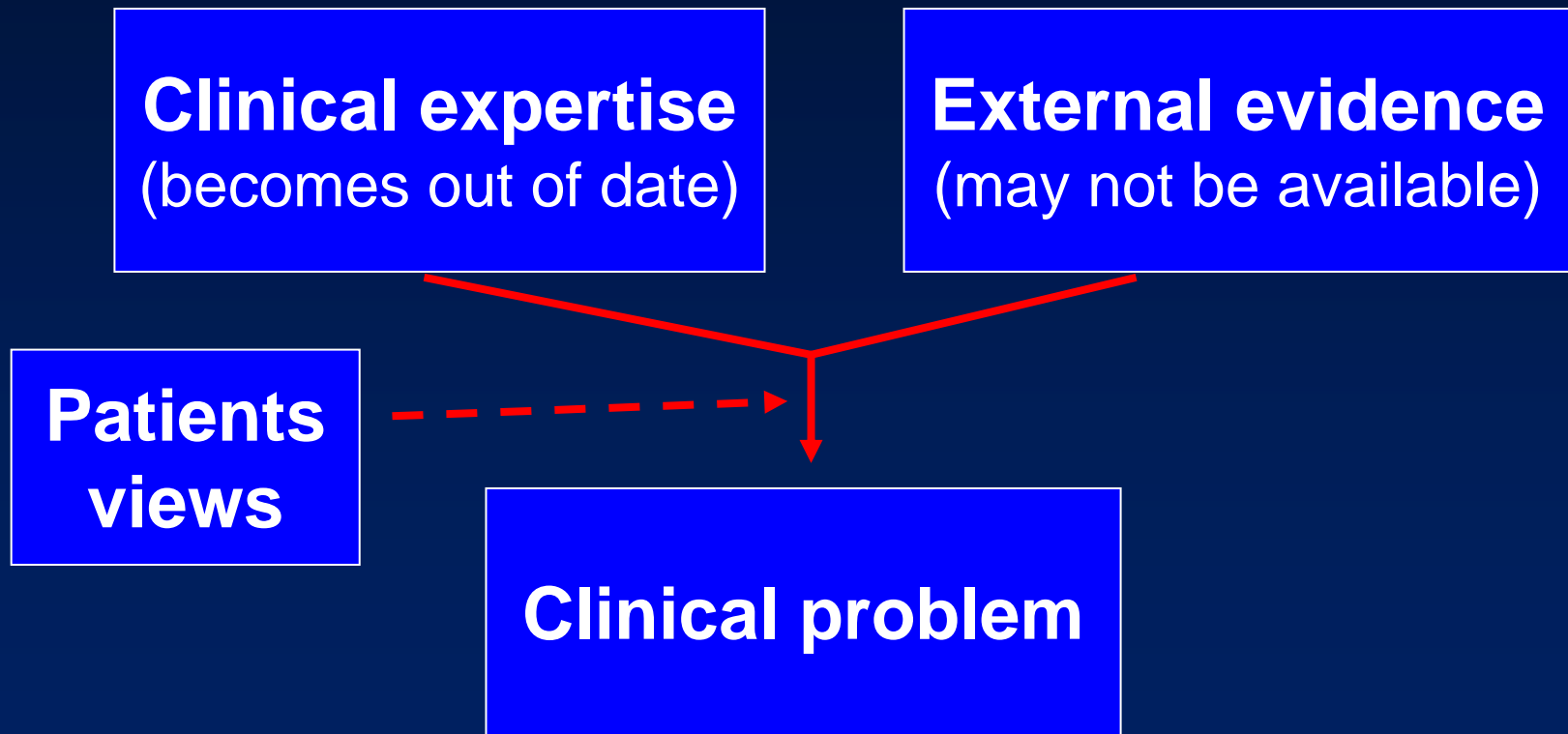
Tomorrow

What might rehabilitation look like in the future?

Take home messages



Evidence Based Practice is Good Clinical Practice



Finding the Evidence

The screenshot shows a Microsoft Word 2000 window titled "DearWorld.doc". The menu bar includes File, Edit, View, Insert, Format, Tools, Table, Window, and Help. The toolbar contains icons for file operations and a zoom level of 100%. A yellow dialog box with a paperclip icon is overlaid on the document. The dialog box has a title "Looks like you're committing suicide!" and a message: "Office Assistant can help you write your suicide note. First, tell us how you plan to kill yourself." Below the message are six buttons: Pills, Jump, Pastry, Tips, Options, and Close. The document text reads: "Dear World," followed by "I just cant take it anymore **I cant find any stroke rehabilitation evidence!**". The status bar at the bottom shows "(C)2000 David Deckert. dgd-filt@visar.com. Feel free to redistribute." and page information: Page 1, Sec 1, 1/1, At 1.3", Ln 3, Col 43, REC, TRK, EXT, OVR, English (U.S).

DearWorld.doc - Microsoft Word

File Edit View Insert Format Tools Table Window Help

100% 12

Looks like you're committing suicide!

Office Assistant can help you write your suicide note. First, tell us how you plan to kill yourself.

Pills Jump Pastry

Tips Options Close

Dear World,

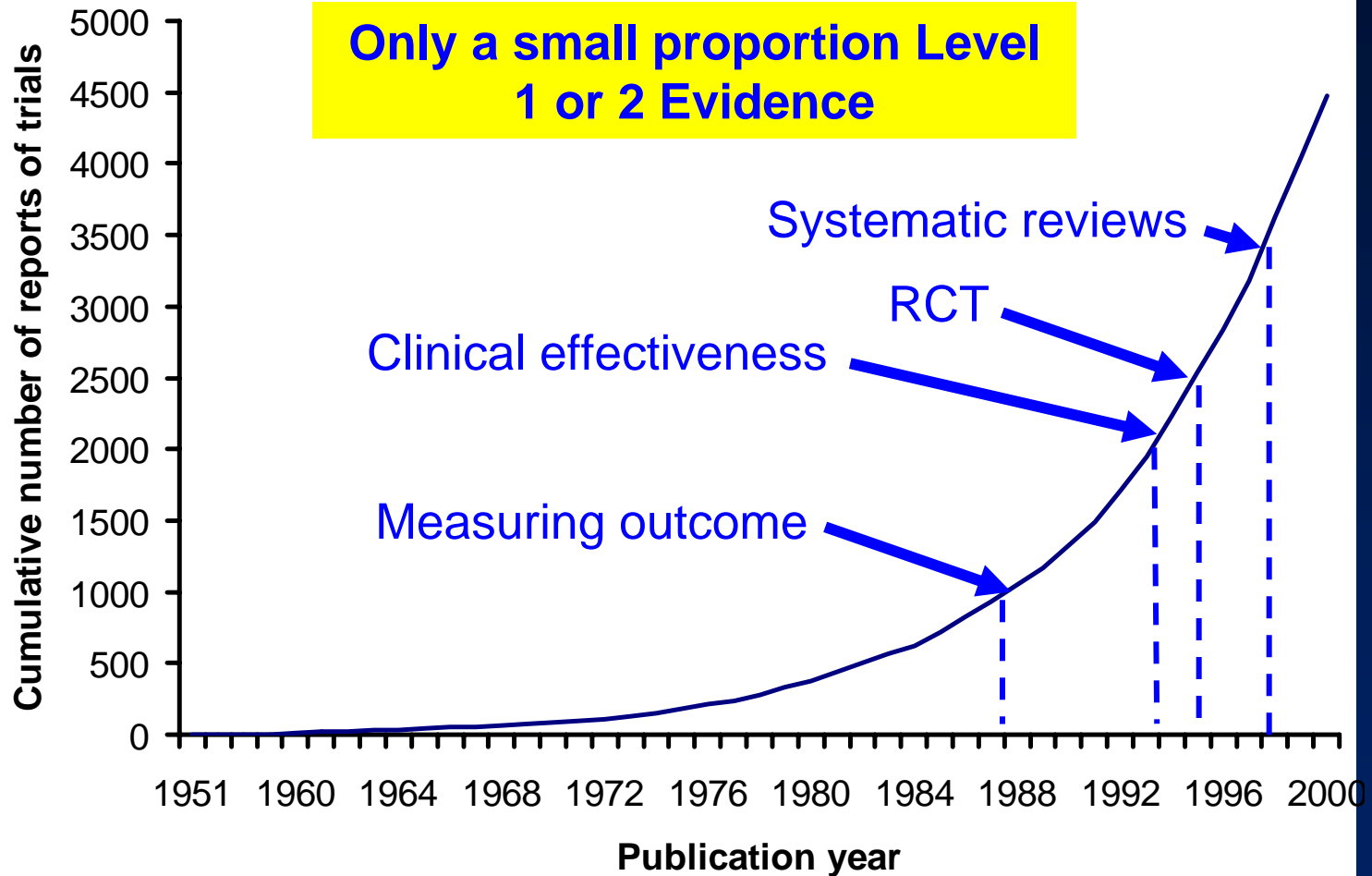
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Page 1 Sec 1 1/1 At 1.3" Ln 3 Col 43 REC TRK EXT OVR English (U.S)



Stroke Research



Stroke Rehabilitation Research

	PEDro	OTseeker
Clinical practice guidelines	12	-
Systematic reviews	40	40
RCT's related to stroke	~300	~300

High proportion are low quality effectiveness trials leading to conclusion “Unknown effectiveness”



Stroke Rehabilitation Efficacy Trials

- Often too small – we expect to have a huge benefit! Unrealistic!!
- Intervention not detailed / monitored
- No follow up
- Use of multiple outcome measures (each trial is different)
- Do not address possible harms



Rehabilitation Benefit

*If only we could randomise to groups:
rehabilitation versus no rehabilitation*

Some
rehabilitation

versus

More
rehabilitation

Rehabilitation
setting A

versus

Rehabilitation
setting B



What benefit might we expect?

(Hankey & Warlow, 1999)

	Stroke units*	Aspirin*	tPA*
Absolute risk red*	5.6%	1.2%	6.3%
NNT	18	83	16
Approx cost	? Nil added	\$83	\$36,000

*Risk of death / dependency
(*hard* outcome)

* **Level 1 evidence**

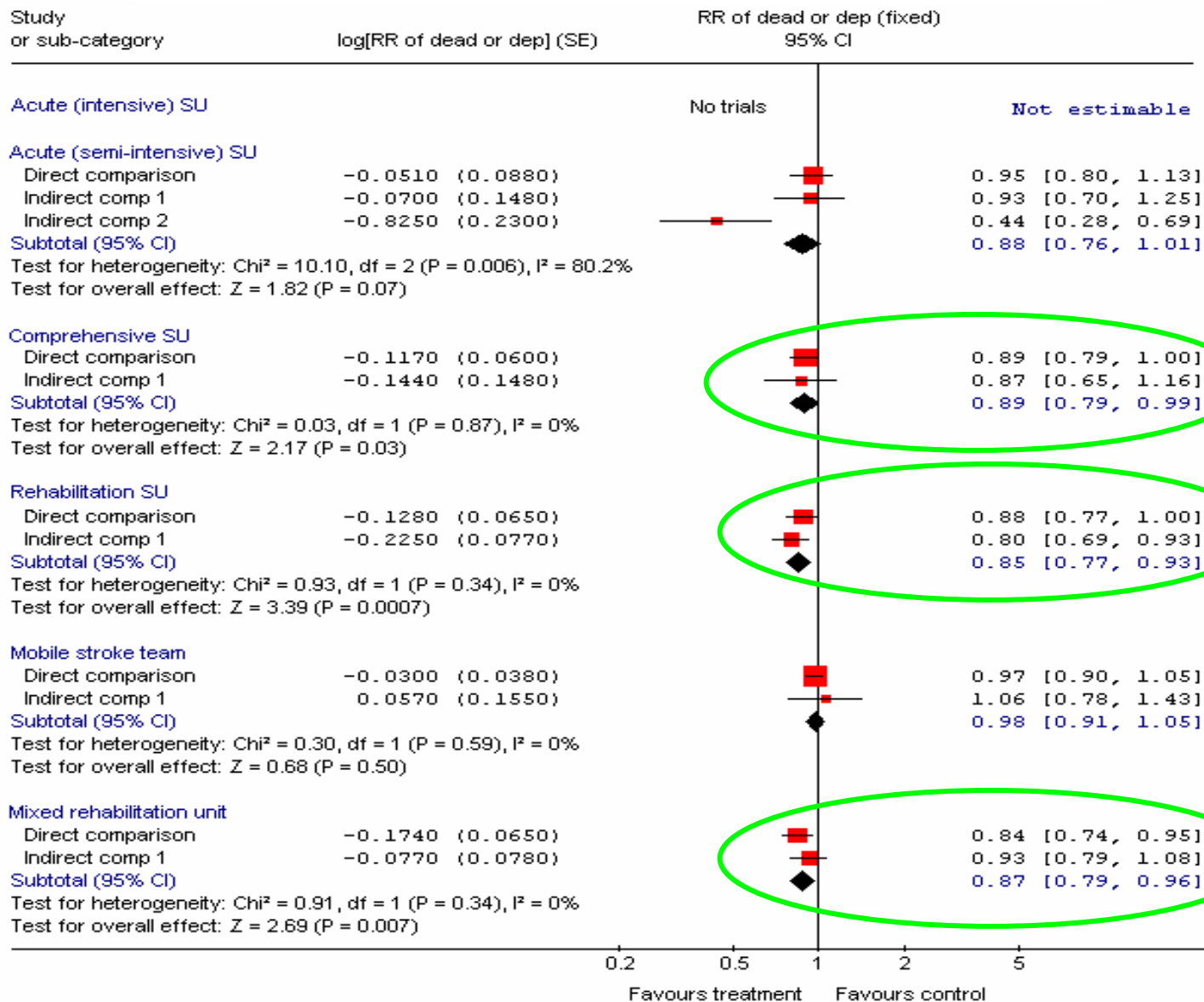


Types of Stroke Units

Type	Admission	Discharge	Features
Acute, intensive	Acute (hours)	Days	High nurse staffing Life support facilities
Acute, semi-intensive	Acute (hours)	Days	Close physiological monitoring
Comprehensive	Acute (hours)	Days–weeks	Acute care / rehabilitation Conventional staffing
Rehabilitation	Delayed	Weeks	Rehabilitation
Mobile team in hospital	Variable	Days-weeks	Medical / allied health advice
Mixed rehabilitation	Variable	Weeks	Mixed patient group Rehabilitation



Death of dependency by scheduled follow up



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Why Are Rehabilitation Trials Different?

Drug trials*

Patient passive

Dose straightforward
(may be single dose)

Double blinding easy

Placebo/dose controlled

Outcomes simple

Confounding variables

Costs limited

Funded by DRUG companies

Rehab intervention trials

Patient active participant

Complex provider / patient
interaction

Double blinding often impossible

Difficult to ensure uniform dose

Outcomes made complex

Confounding variables

Costs high (salaries)

Funded by ??????



*Gold standard methods



AVERT

- **Large, multi-centre (10 sites) randomised controlled trial of very early rehabilitation versus standard care**
 - **Best practice RCT methods – like a drug trial**
 - **Hard outcomes (death/disability) with long term follow up (12 months)**
 - **Multi-disciplinary**
 - **n > 2000 patients (to detect 7% benefit)**
 - **2.8 Million \$\$ to complete**



How Do We Improve our Research Base?



How Do We Improve Research?

Better training opportunities for allied health nursing

Work collaboratively across disciplines

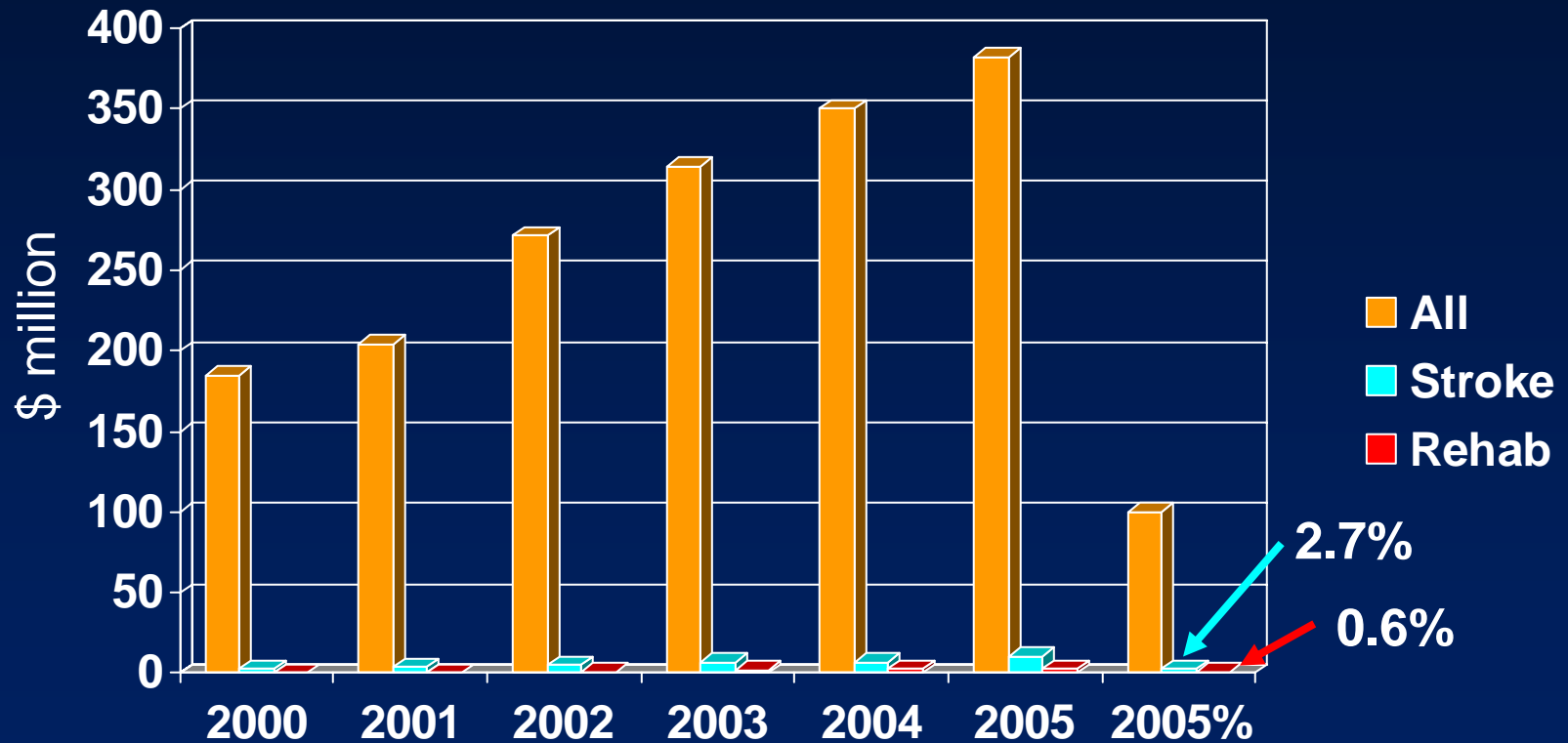
Adequate Funding!!!

Conduct research at all levels
cost-effective interventions

Support research at all levels
student placements
Grants



Little Funding in the Grand Scheme



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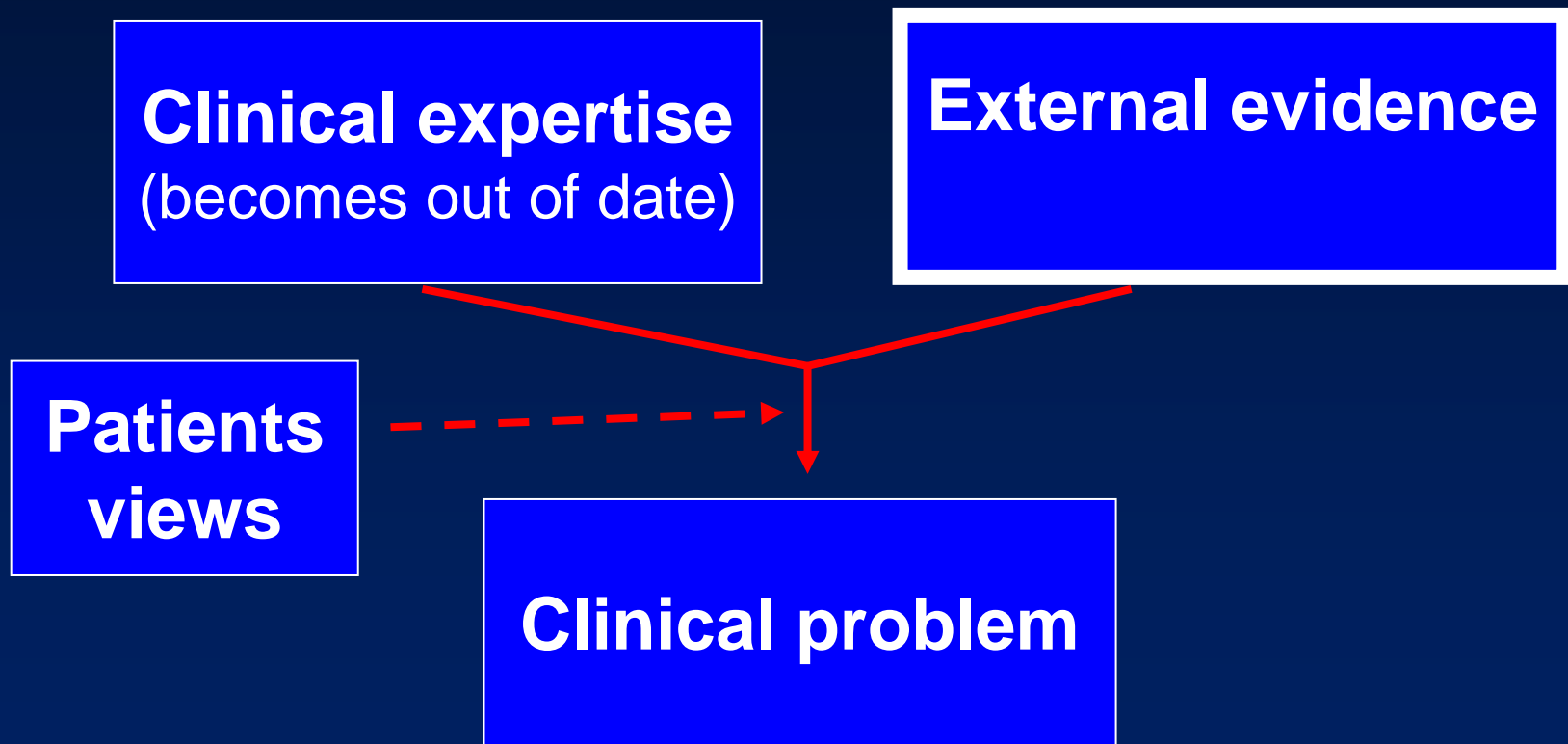
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What might rehabilitation look like in the future?

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Good Clinical Practice



Who Knows the Evidence?



Why Don't We Change Practice When There *is* Evidence?

Ability

- Lack of confidence in validity of research findings
- Lack of confidence in their ability to read and understand research

Opportunity

- Insufficient time to keep up to date

Implementation

- Difficulty making change happen



National Stroke Foundation

www.strokefoundation.com.au/

- **Acute guidelines for stroke (2003)**
 - 20 Guidelines supported by Level 1, 2 evidence
- **Rehabilitation and recovery guidelines for stroke (August 2005)**
 - “The most comprehensive in the world”
- **Consumer versions – in progress**





www.effectivestrokecare.org

...a systematic, accessible, and transparent database of the evidence of effectiveness of interventions in stroke care

Lynn Legg



Search the Database

GO

Most popular searches currently ...

Browse Evidence

- Patients
- Caregivers
- Services

Information

- About EffectiveStrokeCare.org
- About STEP
- Evidence Based Practice
- What is the Cochrane Library?
- Sponsors
- Terms and Conditions

Useful Links

- SIGN Guidelines
- RCP Guidelines
- Glossary

Welcome to EffectiveStrokeCare.org

EffectiveStrokeCare.org is a continually updated source of current best evidence in stroke care. It provides a concise account of the evidence on the prevention and treatment of clinical conditions within stroke and alternative ways of organising services based on thorough searches and appraisal of the literature.

EffectiveStrokeCare.org has been developed in a direct attempt to breakdown the barriers that prevent health professionals keeping up to date with rapidly increasing volumes of high quality research, and to provide clear evidence-based answers to the clinical questions asked by health professionals working in the field of stroke care. This web-enabled evidence-based practice resource requires: -

- No special training
- Is free and requires no registration

Provides quick and easy access to:

- Summaries of evidence of effectiveness of interventions used in stroke care
- National Guidelines on stroke care
- Has a search function
- Will be regularly updated
- Uses transparent and explicit methods

EffectiveStrokeCare.org enables you to:

- Quickly find the best approach to managing your patients' problems
- Explore alternative ways of managing problems or organising services in stroke care
- Save time and find accurate, up-to-date and comprehensive information based on the best available evidence
- Simplify your search for evidence by exploring the effectivestrokecare.org database
- Avoid duplication of effort in the searching, appraising and summarising of evidence
- Learn about the process of evidence-based practice



Thursday, 7 July 2005 2:47a

Search the Database

GO

Most popular searches currently ...

- [-] PATIENTS - Optimising outcomes after stroke
 - [+] [Folder] Adjusting to life after stroke
 - [+] [Folder] Managing acute stroke
 - [+] [Folder] Managing common problems
 - [+] [Folder] Preventing stroke

Browse Evidence

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Search input field with a GO button and a list of popular searches currently ...

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Useful Links

- N Guidelines
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PATIENTS - Optimising outcomes after stroke >> Managing common problems >> Accidents, injuries and wounds >> Falls, prevention or reduction of >> Effectiveness of dietetic interventions to prevent/reduce the number of falls?

- PATIENTS - Optimising outcomes after stroke
+ Adjusting to life after stroke
+ Managing acute stroke
- Managing common problems
- Accidents, injuries and wounds
- Falls, prevention or reduction of
- Effectiveness of dietetic interventions to prevent/reduce the number of falls?
- Nutritional supplementation
- Vitamin supplementation
+ Effectiveness of home safety interventions to prevent/reduce the number of falls?
+ Effectiveness of multidisciplinary interventions to prevent/reduce the number of falls?

Unknown effectiveness

- Nutritional supplementation
Vitamin supplementation



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- Adjusting to life after stroke
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Effectiveness of multidisciplinary interventions to prevent/reduce the number of falls?
Effectiveness of ophthalmic interventions to prevent/reduce the number of falls?
Effectiveness of pharmacological interventions to prevent/reduce the number of falls?
Effectiveness of physical exercise interventions to prevent/reduce the number of falls?
Pressure care

Likely to be beneficial
Multifactorial, health/environmental risk factor screening and intervention



Search the Database

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+ Effectiveness of home safety interventions to prevent/reduce the number of falls?
+ Effectiveness of multidisciplinary interventions to prevent/reduce the number of falls?
- Multifactorial, health/environmental risk factor screening and intervention
+ Effectiveness of ophthalmic interventions to prevent/reduce the number of falls?
+ Effectiveness of pharmacological interventions to prevent/reduce the number of falls?

Intervention Description: Multifactorial, health/environmental risk factor screening and intervention
Effectiveness Category: [] Likely to be beneficial

- Evidence Statement Benefits Harms Comments Accepted References Rejected References Guidelines

One systematic review of RCTs has found evidence that multidisciplinary, multifactorial, risk factor screening and intervention has a beneficial effect on falls, in the populations of elderly people both with and without known risk factors for falling.



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Intervention Description: Multifactorial, health/environmental risk factor screening and intervention
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We found one systematic review (search date 2003, 62 trials, 21,668 participants) which explored the effects of multidisciplinary, multifactorial, risk factor screening and intervention on populations of elderly people with and without known risk factors for falling. Eight trials (older people without known risk of falls): pooled data from 4 of these trials (1651 people) showed that multidisciplinary, multifactorial, risk factor screening and intervention was beneficial in reducing the number of falls (RR 0.73, 95% CI 0.63 to 0.85). Five trials (1176 participants with known risk of falls) showed that multidisciplinary, multifactorial, risk factor screening and intervention was beneficial in reducing the number of falls (RR 0.86, 95% CI 0.76 to 0.98).



Thursday, 7 July 2005 2:47am

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Intervention Description: Multifactorial, health/environmental risk factor screening and intervention
Effectiveness Category: [] [x] Likely to be beneficial

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We found no evidence of harm.



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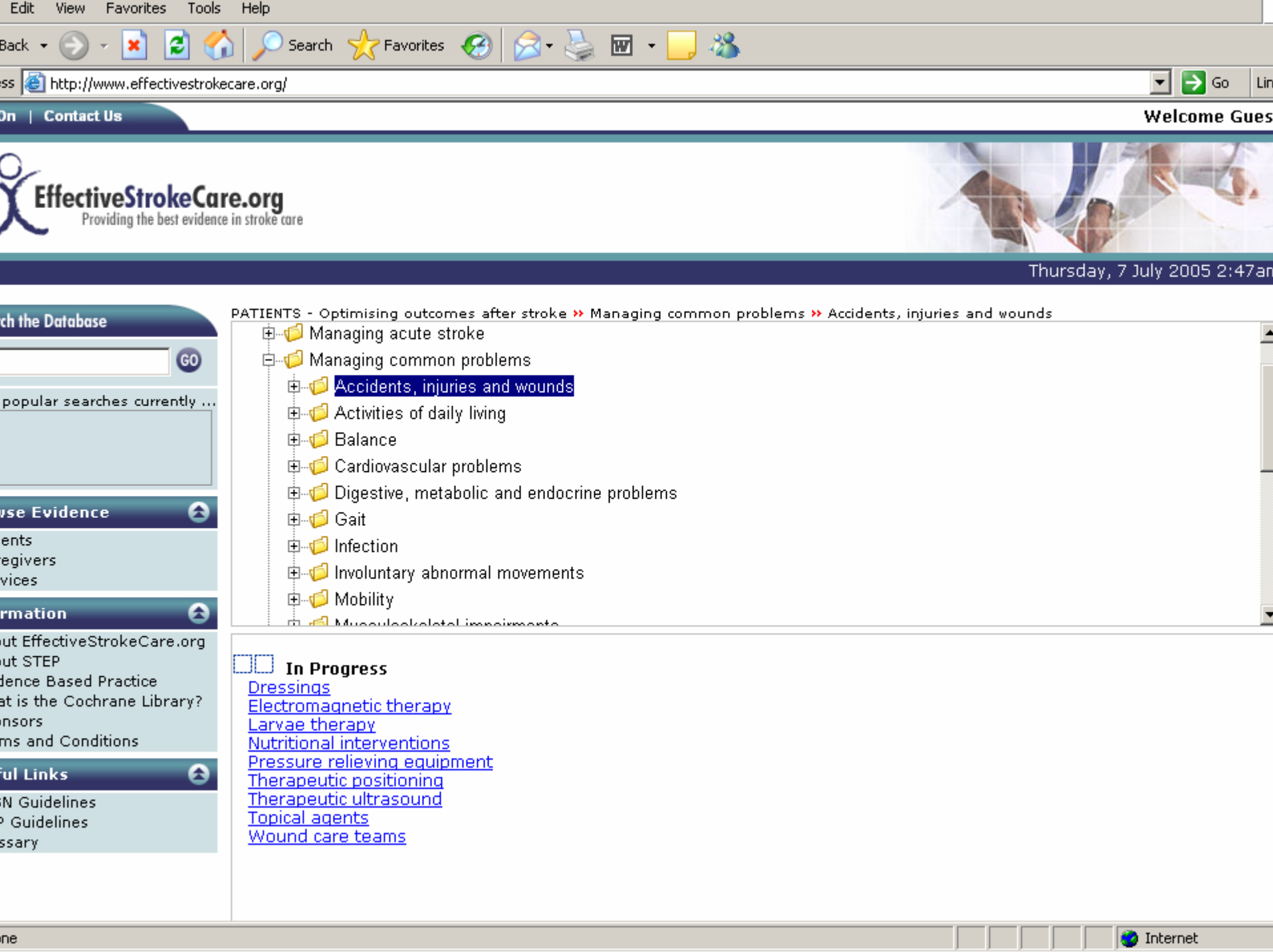
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Volume of Evidence: No comment

Generalisability: These results are from studies of older people with and without known risk of falls, and should therefore be generalisable to the population of patients with stroke. However one of the five trials with people with known risk factors did exclude patients with stroke.



Search the Database

GO
popular searches currently ...

Use Evidence

Information

- about EffectiveStrokeCare.org
 - about STEP
 - Evidence Based Practice
 - What is the Cochrane Library?
 - Consors
 - Terms and Conditions
- Useful Links
- Guidelines
 - Guidelines
 - Essary

PATIENTS - Optimising outcomes after stroke >> Managing common problems >> Accidents, injuries and wounds

- Managing acute stroke
- Managing common problems
 - Accidents, injuries and wounds
 - Activities of daily living
 - Balance
 - Cardiovascular problems
 - Digestive, metabolic and endocrine problems
 - Gait
 - Infection
 - Involuntary abnormal movements
 - Mobility
 - Musculoskeletal impairments

- In Progress
- [Dressings](#)
 - [Electromagnetic therapy](#)
 - [Larvae therapy](#)
 - [Nutritional interventions](#)
 - [Pressure relieving equipment](#)
 - [Therapeutic positioning](#)
 - [Therapeutic ultrasound](#)
 - [Topical agents](#)
 - [Wound care teams](#)



Search the Database

Search input field with a GO button and a list of popular searches currently ...

Browse Evidence

- Patients
- Interventions
- Outcomes

Information

- About EffectiveStrokeCare.org
- About STEP
- Evidence Based Practice
- What is the Cochrane Library?
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- Outcomes and Conditions

Useful Links

- NICE Guidelines
- WHO Guidelines
- Essential

PATIENTS - Optimising outcomes after stroke >> Managing common problems >> Speech and language problems >> Aphasia >> Effectiveness of specific treatment strategies?

- + Physical fitness
- + Psychological problems
- + Respiratory problems
- + Sensory function and pain
- + Sleep and tiredness
- Speech and language problems
 - Aphasia
 - + Effectiveness of pharmacological interventions?
 - + **Effectiveness of specific treatment strategies?**
 - + Effectiveness of speech and language therapy interventions for aphasia?
 - + Apraxia of speech

In Progress

- [Increased frequency of practice \(number of practice sessions on daily basis\)](#)
- [Intensity of therapy \(frequency and duration of therapy over a distinct time period\)](#)

Implementation: Knowing the Evidence Is Not Enough!

We have to change our practice

Getting started

- Simple measures of care
- Access clinical guidelines and try to implement *even 1 guideline*
- How will you know you have been successful?



Imperatives to Change

- **Cost of rehabilitation**
- **Mounting evidence for and against interventions**
 - Not only need to adopt those of proven efficacy, *must* discard those that are ineffective
- **Pressure from consumers**
 - Consumer guidelines for best practice stroke care coming soon!



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Take home messages



EBP Stroke Rehabilitation in the Future?



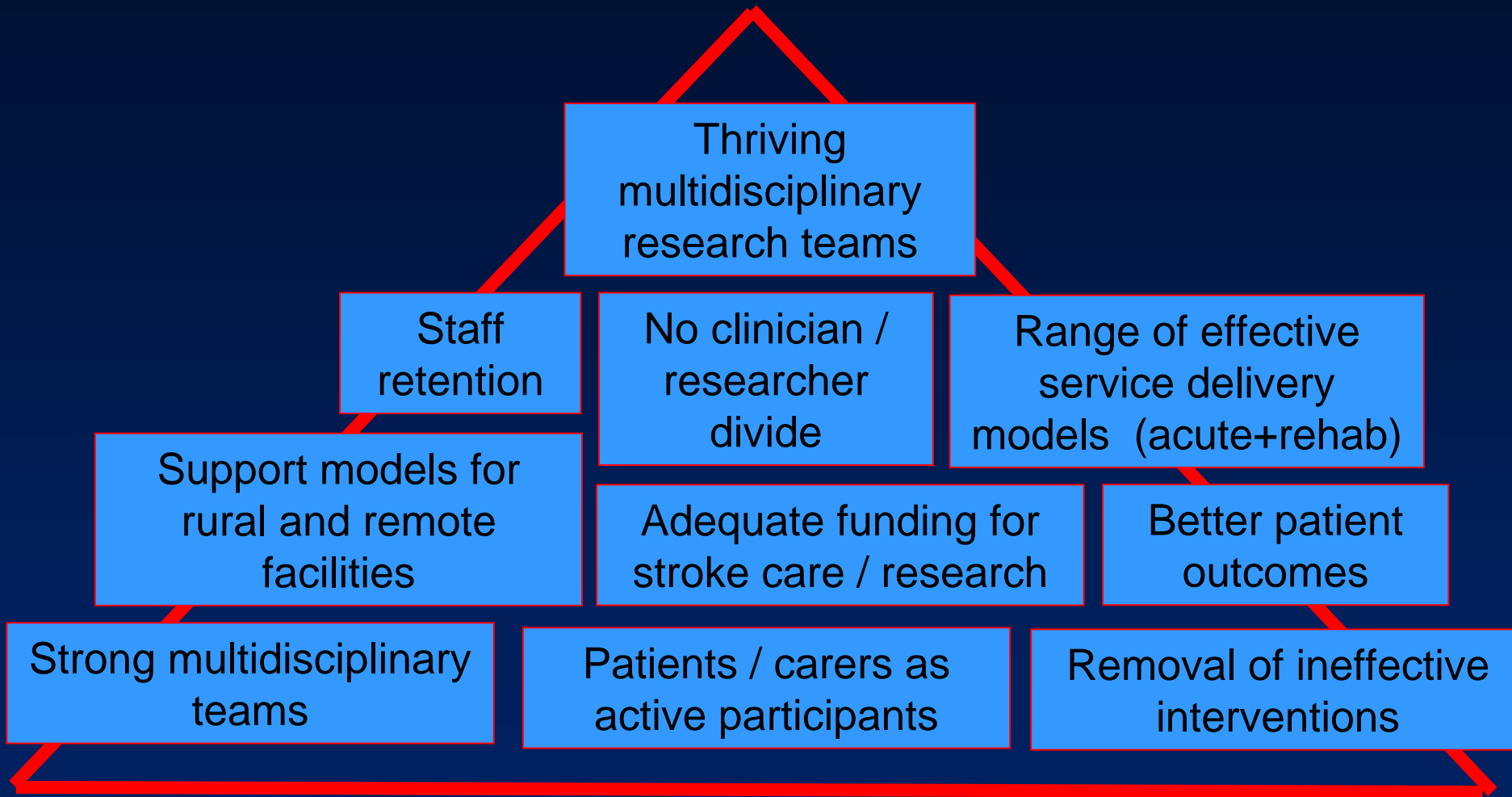
Evidence based
decision tree

Standardised
assessment
recording tool

Best practice
care for stroke
patients



Foundations for a Great Future



Take Home Messages

- **Stroke rehabilitation has changed radically in 20 years & will continue to do so**
- **Evidence to guide practice is more accessible now than ever and **MUST** be adopted**
- ***We must lead the change or be led***
- **Researchers / clinicians / consumers must work side by side**



Sugar Plum Fairies – Patient Christmas Concert, Mount Royal Hospital 1991



Thank you



AVERT – Phase 3

