EVIDENCE BASED PRACTICE IN CLASSIFICATION

APPLICATION OF SYSTEMATIC REVIEW IN WHEELCHAIR RUGBY

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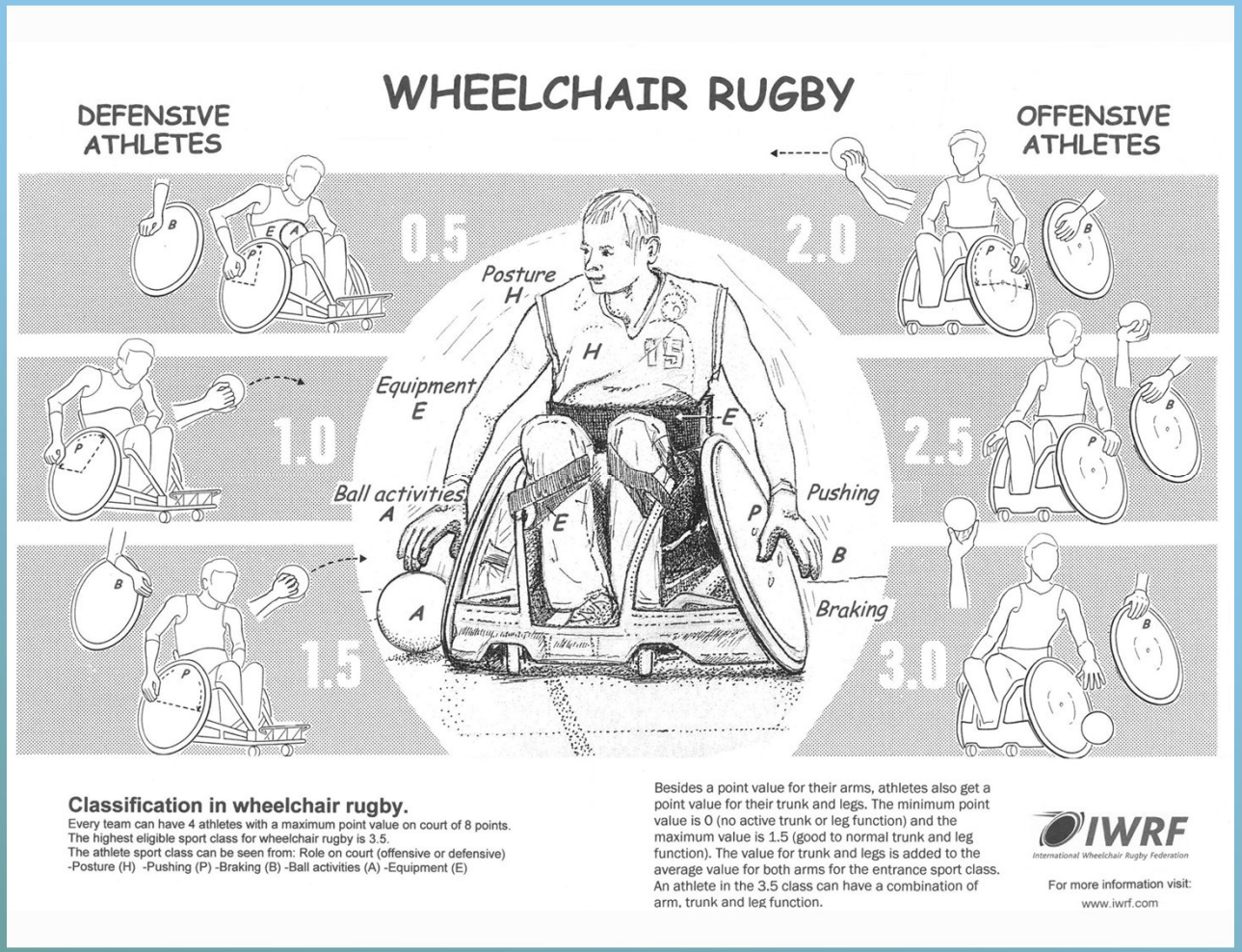
CLASSIFICATION

WHAT & WHY?



"to promote participation in sport by minimizing the impact of impairment on the outcome of competition"

IPC Classification Code, 2007; Position Statement, 2011

TO DREAM THE IMPOSSIBLE DREAM

- Evaluate existing classification systems in over 25 sports
- Develop classification systems for emerging sports in Paralympic Movement

ONE STEP AT A TIME

Purpose

Reaching for the Goal – Evidence Based Classification

- Systematic review of literature is an achievable step in evidence-based classification
- Methodology example from wheelchair rugby
  - **to systematically review, impact of trunk impairment on performance in wheelchair activities**

Altmann et al, 2011. Improvement of the classification system for wheelchair rugby: athlete priorities.

METHODS

- Search and Appraisal
  1. **Formulate a researchable objective**
  2. **Finding studies**
  3. **Appraisal of quality**
- Three independent researchers
  - **Two researchers searching literature experienced wheelchair rugby classifiers**

Stroup et al 2000. MOOSE.

SEARCH STRATEGY
DATA SOURCES

Objective: To study the influence of trunk impairment on wheelchair skills performance in a manual wheelchair

- Database searches
  1. **Medline (1950-2012.11)**
  2. **CINHAL (1981-2012.11)**
  3. **Embase (1980-2012.11)**
- Combining MeSH terms & text words
  - **Relevant conditions**
    - Spinal cord injury
    - Polio
    - Neuromuscular disease
    - Cerebral palsy
    - Amputation
  - **Trunk (Torso)**
  - **Trunk muscles (Abdominal muscles)**
  - **Postural balance**
  - **Posture**
  - **Wheelchair**
  - **Combining either torso or abdominal muscles with either postural balance or posture with wheelchair or any of the relevant health conditions using AND**

STUDY SELECTION

- Inclusion criteria
  - **Experienced wheelchair users**
  - **Compared persons with different levels of trunk impairment or compared persons who were able-bodied with persons with trunk impairment**
  - **Compared persons with trunk impairment with and without compensation by equipment**
  - **Reported outcome measures in wheelchair activities presented by quantitative data**
- Exclusion criteria
  - **Only persons who were able-bodied**
  - **Trunk impairment not defined or no comparison of trunk impairment or compensation for trunk impairment**
  - **Only qualitative data, expert opinion, or case report**

QUALITY ASSESSMENT
STROBE

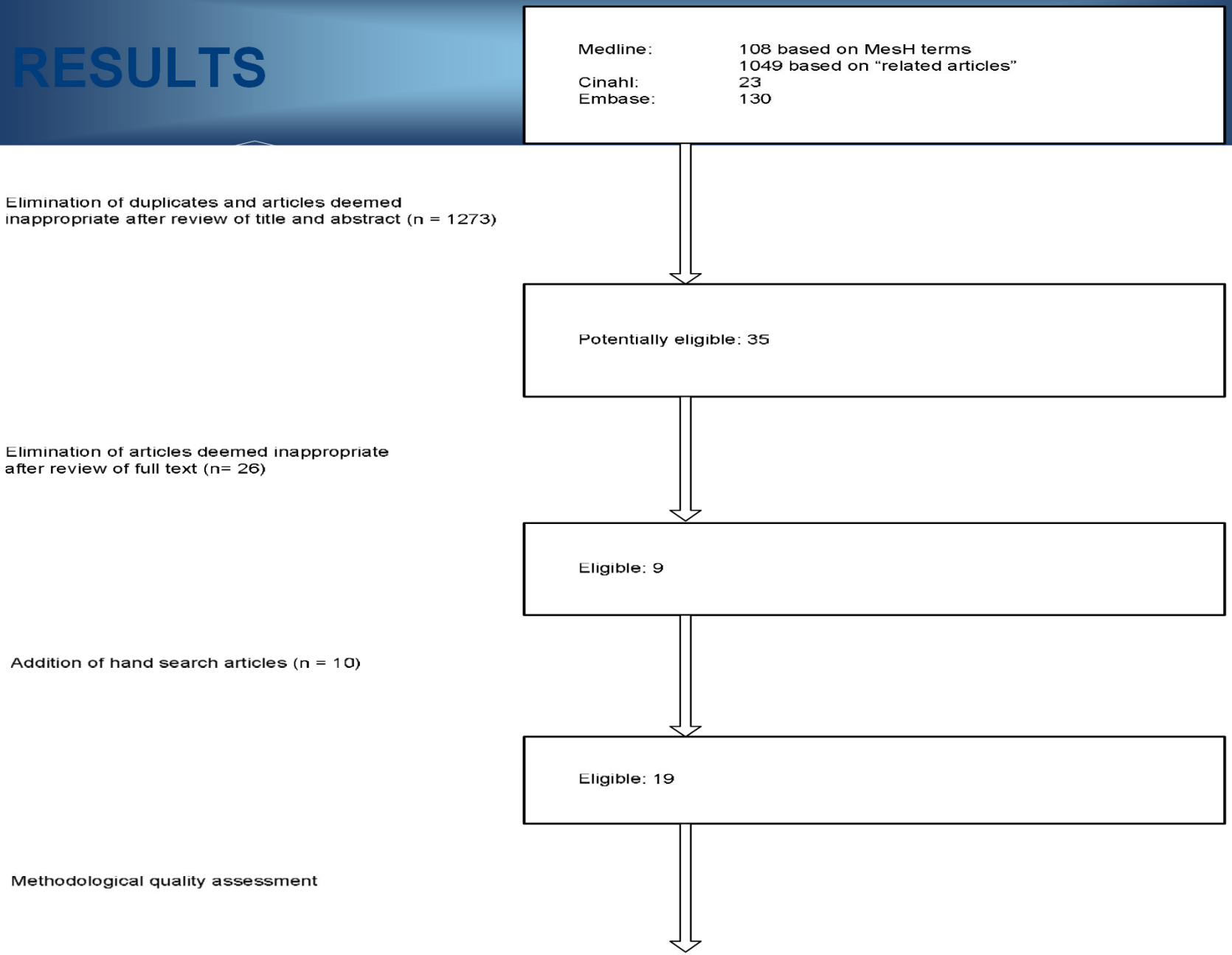
- STROBE – Strengthening the reporting of observational studies in epidemiology (2007)
  - **Scored independently by each researcher who did literature search**
  - **If disagreement on items, third researcher made final decision**

STROBE Statement—checklist of items (22) that should be included in reports of observational studies

- Title and abstract
- Introduction
- Methods
- Results
- Discussion

Vandenbroucke JP, von Elm E, Altman DG et al. Strengthening the reporting of observational studies in epidemiology (STROBE): Explanation and elaboration. PLoS Med. 2007 Oct 16;4(10):e297.

RESULTS


Medline: 108 based on MesH terms
1049 based on "related articles"
Cinahl: 23
Embase: 130
Elimination of duplicates and articles deemed inappropriate after review of title and abstract (n = 1273)
Potentially eligible: 35
Elimination of articles deemed inappropriate after review of full text (n= 26)
Eligible: 9
Addition of hand search articles (n = 10)
Eligible: 19
Methodological quality assessment

METHODOLOGY ASSESSMENT SCORING ON STROBE CHECKLIST

	item no.																						
article	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total score	Total score 5-6,12,14-16
Vanlandewijck 2011	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	19	8
Kamper, Barin 1999	1	1	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	17	6
Kamper, Parnianpour 1999	1	1	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	17	6
Chen 2003	1	1	1	0	0	1	1	1	1	0	1	1	0	1	1	0	1	1	1	1	0	1	16	6
Curtis 1995	1	1	1	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	1	0	1	16	7
Potten 1999	1	1	1	1	0	0	1	1	0	0	1	1	0	1	1	1	1	1	1	1	0	1	16	6
Boswell-Ruys 2009	1	1	1	0	0	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	0	15	4
Janssen Potten 2001	1	1	1	1	0	0	1	1	0	0	1	1	0	1	1	1	1	1	0	1	0	1	15	6
Janssen Potten 2002	1	1	1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	1	0	1	0	1	15	6
Seelen 2001	1	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	0	15	6
Janssen Potten 2000	1	1	1	0	0	0	1	1	0	0	1	1	0	1	1	1	1	1	0	1	0	1	14	6
Seelen 1997	1	1	1	1	0	0	1	1	0	0	1	1	0	1	1	1	1	1	0	1	0	0	14	6
Seelen, Potten, Adam 1998	0	1	1	1	1	1	1	1	0	0	1	0	0	1	1	0	1	1	0	1	0	0	13	6
Seelen, Potten, Drukker 1998	0	1	1	1	1	1	1	1	0	0	1	0	0	1	1	0	1	1	0	1	0	0	13	6
Kerk 1995	1	1	1	0	0	0	0	1	1	0	1	0	0	1	1	0	0	1	1	1	0	1	12	3
Seelen, Vuurman 1991	0	1	1	0	0	0	1	1	0	0	1	1	0	1	1	1	0	1	1	0	0	0	11	6
Requejo 2008	0	1	1	0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	1	0	1	10	4
Schantz 1999	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	0	1	8	3
Bernard 1994	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	4	3

If the item is present, the score is 1.

If the item is absent, the score is 0.

Item numbers correspond with the item numbers in the STROBE checklist for observational studies.

Vanlandewijck YC, Verellen J, Beckman E, Conninck M Trunk strength effect on track wheelchair start: implications for classification Med Sci Sports Exerc. 2011 Dec;43(12):2344-51.

CONCLUSION

Finding no answer is finding an answer – The answer at this time is we don't know….not yet.

- First systematic review on effect of trunk impairment on performance in wheelchair activities
  - **Literature limited to observational studies**
- Based on preset qualitative criteria for inclusions derived from STROBE checklist, only one study out of 19 eligible articles identified in the search strategy showed sufficient methodological quality
  - **Vanlandewijck et al, 2011**
  - **Limited information relevant to the aim of this study**
- Effect of trunk impairment on wheelchair activities is largely unknown

NORTHERN ARIZONA UNIVERSITY

Sint Maartenskliniek

QUESTIONS?

NORTHERN ARIZONA UNIVERSITY

Sint Maartenskliniek

NEXT STEPS NEEDED

- Provide definition of trunk impairment independent of health condition
- Develop standardized wheelchair activities
  - **Sport specific activities**
    - Overlap in activities
    - Reaching for ball sports
    - Acceleration for wheelchair racing and team sports
  - **Activities in daily life**
    - Overlap between activities in sport and daily life
  - **Rule out confounding factors such as equipment that can effect performance in the standardized wheelchair activities**

If all these steps are followed, a major contribution to developing evidence based classification regarding trunk impairment can be made.

Systematic review – why & How

- A systematic review uses transparent procedures to find, evaluate and synthesize the results of relevant research. The purpose is to sum up the best available research on a specific question.
- Procedures are explicitly defined in advance, to ensure that the exercise is transparent and can be replicated.
- A systematic review must have:
  - **Clear inclusion/ exclusion criteria**
  - **An explicit search strategy**
  - **Systematic recording and analysis of included studies**

SYSTEMATIC REVIEW
ADVANTAGES & DISADVANTAGES

ADVANTAGES

- Answer a specific question,
- reduce bias in the selection and inclusion of studies,
- Appraise biases of included studies, and
- summarise literature objectively.

DISADVANTAGES

- Takes longer and requires more people than a simple narrative review.
- In early stages of exploration, may exclude useful studies.

OBSERVATIONAL RESEARCH

- A form of descriptive research in which individuals are observed or certain outcomes are measured.
- No attempt is made to affect the outcome (for example, no treatment is given).
- Useful for developing insight and leading to information that can solve problem.
- Much of medicine, psychology, ecology, and social sciences

- **Cohort studies**
  - Follow people over time (longitudinal), common characteristic or experience
  - Causal association
- **Case-control studies**
  - two existing groups differing in outcome are identified and compared on the basis of some supposed causal attribute.
- **Cross sectional studies**
  - Observation of all of a population, or a representative subset, at one specific point in time

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