AN EVIDENCE-BASED REVIEW OF AMPUTATION REHABILITATION MODELS OF CARE

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AMPEBR UPDATE: Models of Care - OUTLINE

- Objectives & Methods
- Impact of a Programmatic Approach
- Impact of Key Components of a Program
- Outcomes of Different Program Venues on Function
- Gaps in Literature

AmpEBR – Objectives

1. Outcome Measurement Tools

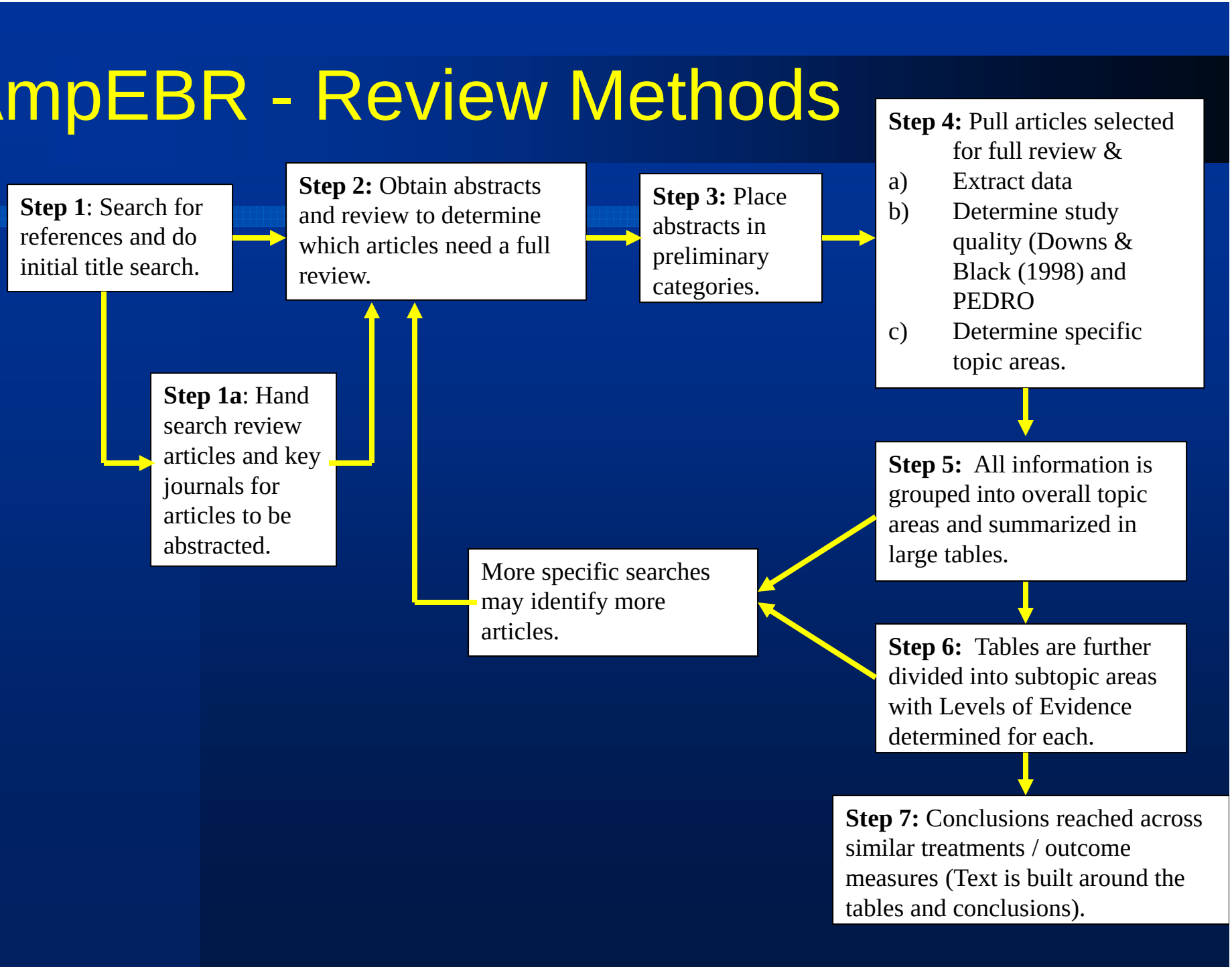
    • A guide for the clinician for selection of appropriate outcome tools.

2. Review of Rehabilitation Practice and Patient Outcomes

    • A guide for the evaluation and development of programs and services.

    • A vehicle for setting the research agenda.

AmpEBR - Review Methods



AmpEBR - Chapters

Main Chapters	
Outcome Tools Psychometrics	Rehabilitation Treatment
Knowledge Transfer	Model of Care
Psychological Issues & Status	Tx Approaches
Quality of Life	Defn of Success
Epidemiology	Costs
Amputation - Prevention	Prosthetic Analysis
Amputation - Surgery	Exercise & Fitness
Amputation - Wound Healing	Sport & Recreation
Amputation - Complications	Pediatrics
Amputation - Pain	Upper Limb Amputation
Rehabilitation Outcomes	Vocational Rehabilitation

Article Selection – A Work in Progress

- Numerous articles identified that address some component of a model of care (n = 65)
- **Focus** on those that employ some sort of comparison (n=6)
  - Kaplow et al. (1983) Can J Surg 26:368-369.
  - Stewart and Jain (1993) P&O Int 17:14-20.
  - Ham et al. (1987) P&O Int 11:25-30.
  - Durance et al. (1989) Int Disabil Studies 11:127-132.
  - Fletcher et al. 2001 Arch Phys Med Rehabil 82:776-779.
  - Uiterwijk et al. (1997) Clin Rehabil 11(3):253-262.

In-Patient Program
- Impact of a Programmatic Approach

- Kaplow et al. (1983) Can J Surg 26:368-369
  - Team (n=248) vs control (n=294) hospital (with no coordinator) in same city

Team Hospital	**Control Hospital**

• Team Coordinator of Care [pre-op →F/U]
  • ward rounds
  • weekly OPD clinics F/U q 6 months or problem based
• Specialized training in amp surgery and rehab
• Acute care hospital –> Associated rehab facility
• Collaborative decision-making
	• Treat amputees individually without a team coordinator
	• Same **type** of medical and paramedical staff

In-Patient Program
- Impact of a Programmatic Approach

- Stewart and Jain (1993) P&O Int 17:14-20
  - Compares region with “integrated” team to rest of country (Scotland) and to Finland (literature)
- Model of Care
  - Step 1: Identified surgical candidate referred to Tayside Amputee Service
  - Step 2: Ninewells Hospital - vascular lab, specialized orthosurgical units
  - Step 3: Post-op 1wk transfer to Dundee Limb Fitting Centre:
  - bi-weekly ward rounds multidisciplinary
  - Step 4: D/C planning with visiting nurse and social worker

In-Patient Program - Impact of a Programmatic Approach - Results

- Kaplow et al. (1983) Can J Surg 26:368-369
  - 56% BK vs 23% BK (but with ↑ revisions and ↑ LOS)
  - ↑ successful prosthetic fittings (66% vs 28% of survivors)
  - Increased success rate beyond age 40 and by level (> age 40 for AK and > age for BK)
- Stewart and Jain (1993) P&O Int 17:14-20
  - ↑ BK:AK ratio (AK 26% vs 42% (Scotland), 63% (Finland)
    - All data population-based
  - ↑ successful prosthetic fittings (although more required a w/c) - (81% vs 27% in Finland)

Conclusion
- Impact of a Programmatic Approach

- Introduction of a coordinated approach (i.e., especially having a clinical coordinator) is associated with …
  - ↑ proportion of BK vs AK
  - ↑ rate of prosthetic fitting
  - (with ↑ community integration)
    - Cost →inpatient LOS or

      ↑ W/C use

Impact of Key Components of a Program on Various Outcomes

- Ham et al. (1987) P&O Int 11:25-30
  - Phased introduction of a team approach (2 centre report with inter-site variation)

1. Baseline – Management in **General** Hospital without immediate access to limb fitting centre
2. Addition of on-site limb-fitting resources (i.e., prosthetist) and beginning of coordination (i.e., PT)
3. Surgical involvement in team + $TcPO_2$ measurement as standard of care
4. Personnel changes
5. Transfer from 1 site to other with more complete team approach; Continued personnel changes

Impact of Key Components of a Program on Various Outcomes – Results → Ham et al. (1987)

Phase

1. Of those not rehabilitated in hospital (long wait to receive prosthesis – 65 + 30 days) → many PT OPD visits & few gain good functional use of the prosthesis (36% at 1 year)
2. Prosthetics + IP PT + coordination impacts LOS (71 → 63 days), OPD visits, usage at 1yr; Without adequate PT → ↓ benefits
3. Adding surgical involvement ↓ AK's (62 → 39%) and ↓ LOS (51 days)
4. (& 5) Results can be maintained despite staff changes (provided there is one experienced person to coordinate and teach)
   - Increased % good functional use by 3-fold

Impact of Key Components of a Program on Various Outcomes

- Durance et al. (1989) Int Disabil Studies 11:127-132
  - Compares 3 rehab programs wrt BK (study originally designed to assess differences between 2 sockets but noted strong effect of team bias/practice on outcome)

Centre

1. 2 teams; Meetings periodically; Communicate usually by phone; D/C Criteria (walk ind. with canes)
2. 3/wk structured meetings; Employed badge system to signify independence; Encouraged prosthetic use on ward; D/C Criteria (walk ind. with canes)
3. 1/ wk formal meeting + frequent informal meetings; D/C Criteria (walk ind. with walker with further progress at home with home care therapists)

	Sunnybrook	WestPark	Kingston
	C-1	C-2	C-3
Structural	Team 1 - program series in rehab wing of gen. Hosp. and contains prosthetic dept. Team 2 – bed ward in convalescent hospital 10 km away 15-20 amps	26 bed amp unit in rehab/chronic care facility therapy in same blg on separate floor avail prosthetics	3-8 amps in 20 bed regional rehab centre in an acute care hosp. Therapy and prosthetics in same bldg
Team	2 teams Meetings periodically Communicate usually by phone	3/wk structured meetings	weekly formal meeting + frequent informal meetings
Prosthetic Routines	Temp plaster socket pylons + waist belt Δ 3 as In-pt off 48 hrs D/C with temporary Definitive in 6 months	Same as C-1	Modular sockets cuff suspension Δ30min D/C modular Custom if not a comfortable fit
D/C Criteria philosophy	Walk Ind. with 0-1-2 canes	Highly emphasized walk Ind. with 0-1-2 canes Badge indicating level of supervision required and walking aid	Walker Ind. - progress at home with home care therapists to come

Impact of Key Components of a Programme on Various Outcomes – Results → Durance et al. (1989)

- Increased socket wearing time (prosthetic use) at Centre 2
  - No difference in % fit / satisfaction with fit
- Discharged with different aids
  - More likely canes or independent at Centre2 >> Centre 1 >> Centre 3
    - ↑ LOS at Centre 1 and 2

% W/C or Walker as Usual Aid Indoors

	Centre 1	Centre 2	Centre 3
D/C	28%	8%	60%
F/U	32%	16%	47%

Conclusion - Impact of Key Components of a Program on Various Outcomes

- Team approach can and does work in a hospital that is not a specialist amputee centre (Ham et al. 1987)
  - Coordination , PT, Retention of at least 1 key staff are essential
- Differences in outcomes were largely attributable to differences in expectations and program philosophy (Durance et al. 1989)

Outcome of Different Program Venues on Function

- Fletcher et al. 2001 Arch Phys Med Rehabil 82:776-779
  - Pop'n based study of all geriatric (> 65 yrs) vascular-related amputations (Olmstead Co, Mn) compared to referral-based studies in literature
  - Subgroup analysis comparing those referred to amputee clinic vs those not referred (Clinic subsequently triaged those to IP vs OP therapy)
    - Those not referred received a direct referral to the prosthetist or were not referred at all
  - Amputee clinic comprised of physiatry, prosthetists, PT

Outcome of Different Program Venues on Function – Results Fletcher et al. 2001

- As compared to those not seen at the Amp Clinic, those seen were …
  - more likely to be successfully fitted (74% vs 9% non-referred)
    - combined successful fit rate of 36% (based on pop_n)
  - more likely to have BK amp (83% vs 51%)
  - Less likely to have AK amp (17% vs 41%)
  - more likely to be seen by a PM&R service (98% vs 64%)

Outcome of Different Program Venues on Function

- Uiterwijk et al. (1997) Clin Rehabil 11(3):253-262.
  - Descriptive study at a **General** Dutch Hospital (Case Series, n = 124)
  - Analysis of "routing" through the health system → Venue options for patients with major LLA where main aim was to enable patients to live independently at home
  - Physician attends 2x weekly to triage & recommend …
    1. Home → OPD Treatment
    2. In-Patient rehab centre
    3. Short stay in Nursing Home
    4. Long stay in Nursing Home

Outcome of Different Program Venues on Function – Results Uiterwijk et al. (1997)

Outcome of Rehab	Total N=90	Home (OP) N=20	IP Rehab N=47	NH Short Stay N=19
Age		67.5 yrs	69.8 yrs	78.3 yrs
LOS in Rehab		155 days	157 days	210 days
Rehab D/C Status	%	%	%	%
Had Prosthesis	68 [N=57]	78	64	42
Functional Use	91 [N=52]	100	77	63
F/U 1yr Post-op	N=88			
Mortality	28.5% [N=35 of 123]	1.1%	19.6%	32%

Conclusion - Outcome of Different Program Venues on Function

- The high probability of successful prosthetic fitting reported among referral practices cannot be generalized to unselected elderly individuals
  - When benchmarking, ensure you are using apple-apple comparisons
- Information may provide criteria for IP Rehab admittance vs other options (Uiterwijk et al. 1997)
    - Criteria for IP Rehab
      - Co-morbidity 66%
      - Unsuitable home accommodation 49%
      - Insufficient help 40%
      - Stump problems 34%

Gaps Noted Across Literature (to date)

- No comparison reports in the literature evaluating Day Hospital programs
- No comparison reports in the literature analysing the “USA” model of rehab in short stay Nursing Homes or direct referral to prosthetic firms vs IP rehab
- No reports on outcomes by variation in service delivery models within a nation-wide single payer model [Canada]
    - Deathe 02 - The Status of Outcome Measurement in Amp Rehab in Canada

Summary

- **Paucity of literature**
- **What there is, is retrospective**
- **What there is, is old**
- **Program descriptors are poor**

- **Lots of opportunity for work in the area of looking at models of care**