Gruppo di ricerca geriatrica

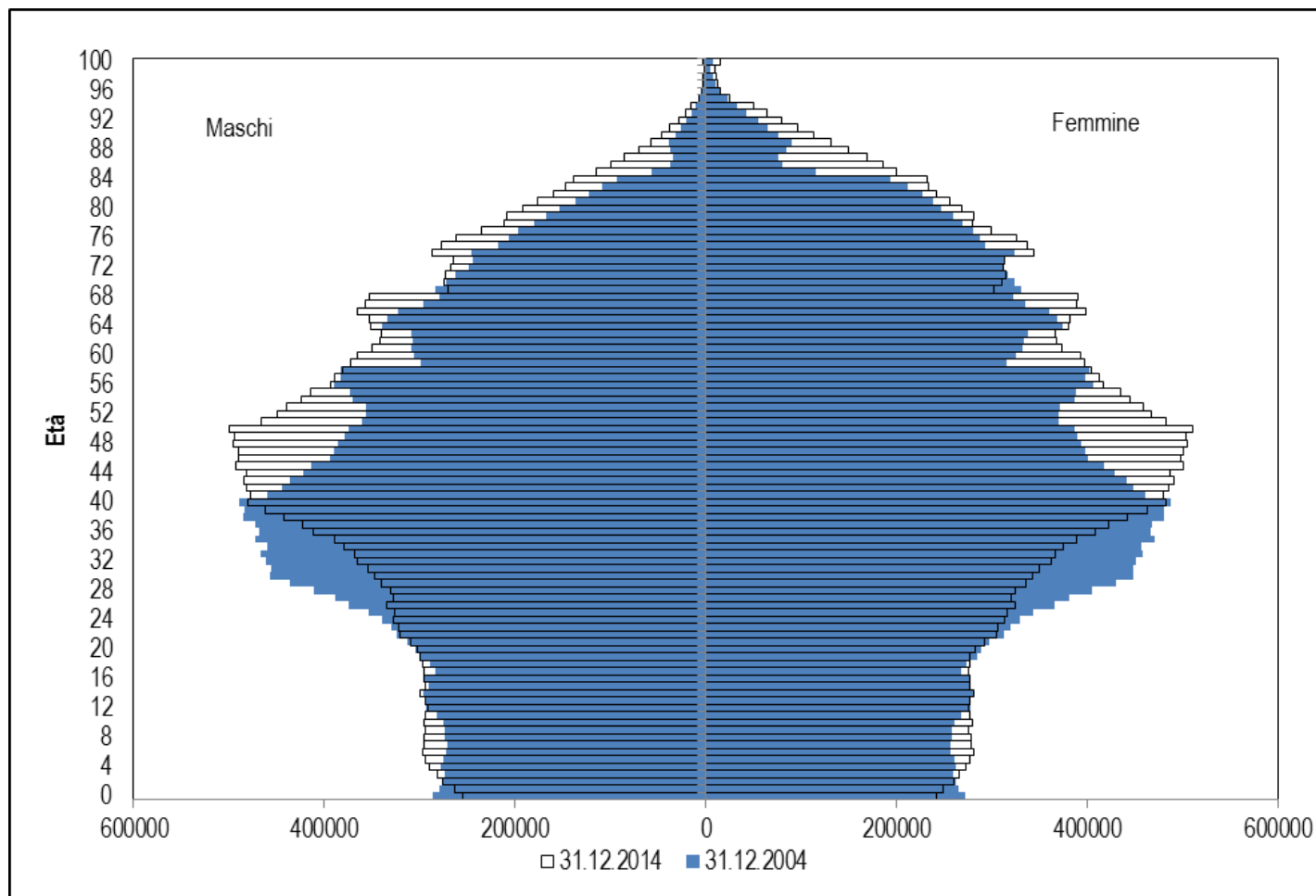# RIABILITAZIONE ED ASPETTATIVA DI VITA NELLA POPOLAZIONE ANZIANA
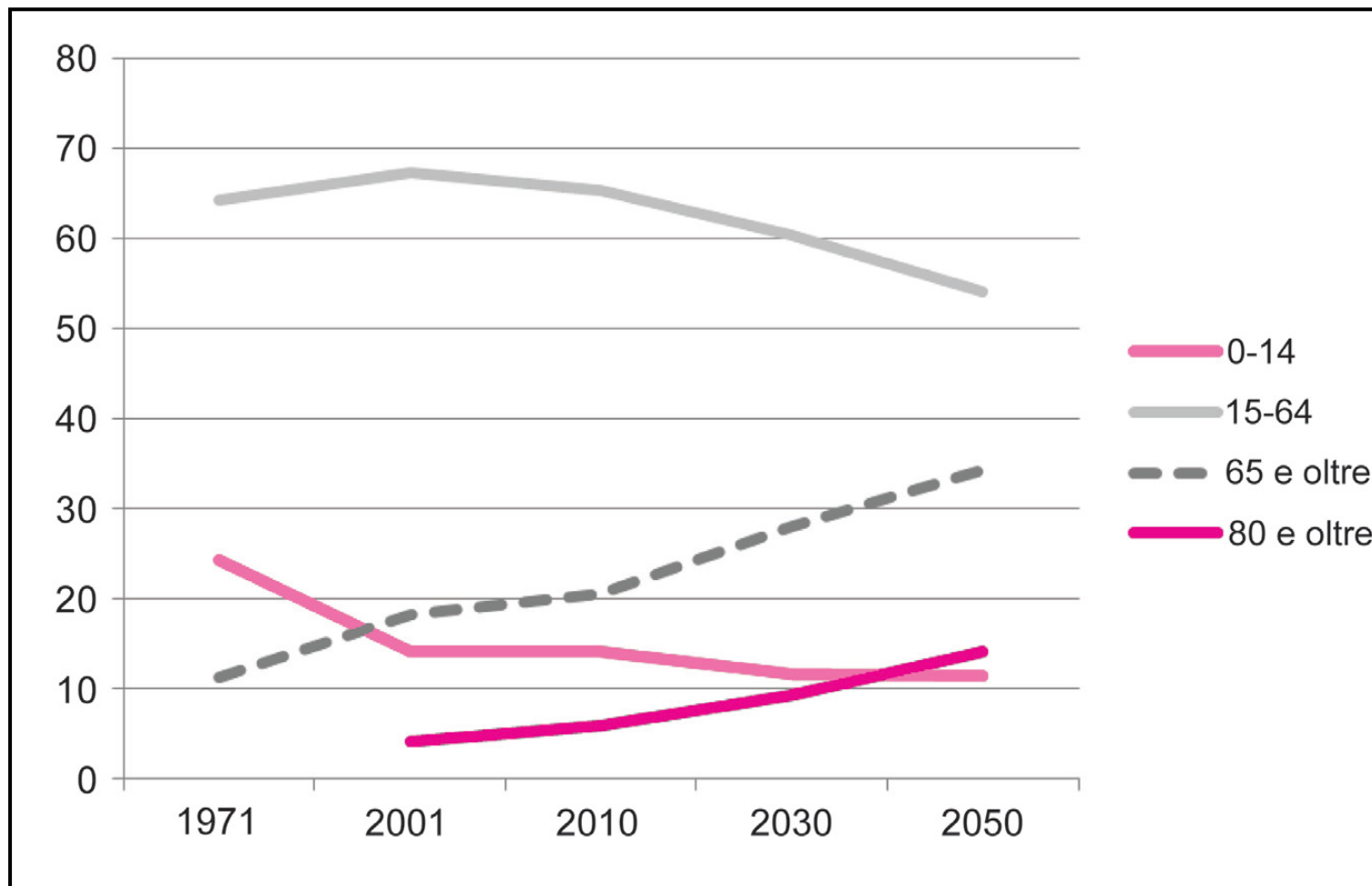
Dr CAMILLO FERRANDINA

BRESCIA, 29/04/2016

POPOLAZIONE E DINAMICA DEMOGRAFICA IN ITALIA

NEL 2015 LA SPERANZA DI VITA ALLA NASCITA ERA DI 80,1 ANNI PER I MASCHI E 84,7 ANNI PER LE FEMMINE.
AL 1° GENNAIO 2016 L'INDICE DI VECCHIAIA E' PARI A 161,1.
IL TASSO DI FECONDITÀ TOTALE NEL 2012 ERA PARI A 1,42

AUMENTO DEI SOGGETTI ANZIANI, NEL PERIODO 1970-2025,CIRCA 694 MILIONI DI UNITÀ.

LE PREVISIONI RELATIVE ALL'ITALIA PARLANO DI UN INCREMENTO ANCOR MAGGIORE DELLA POPOLAZIONE SOPRA I 65 ANNI, CHE NEL 2050 SI STIMA POSSA ARRIVARE AL 34,4% DELLA POPOLAZIONE, MENTRE GLI ULTRAOTTANTENNI ARRIVEREBBERO AL 14,2%.

L'invecchiamento è un processo cui consegue una perdita progressiva delle riserve organiche e funzionali della maggior parte degli apparati con compromissione dell'omeostasi:

- **piu' lento recupero da uno sforzo**

- **maggior fragilità**
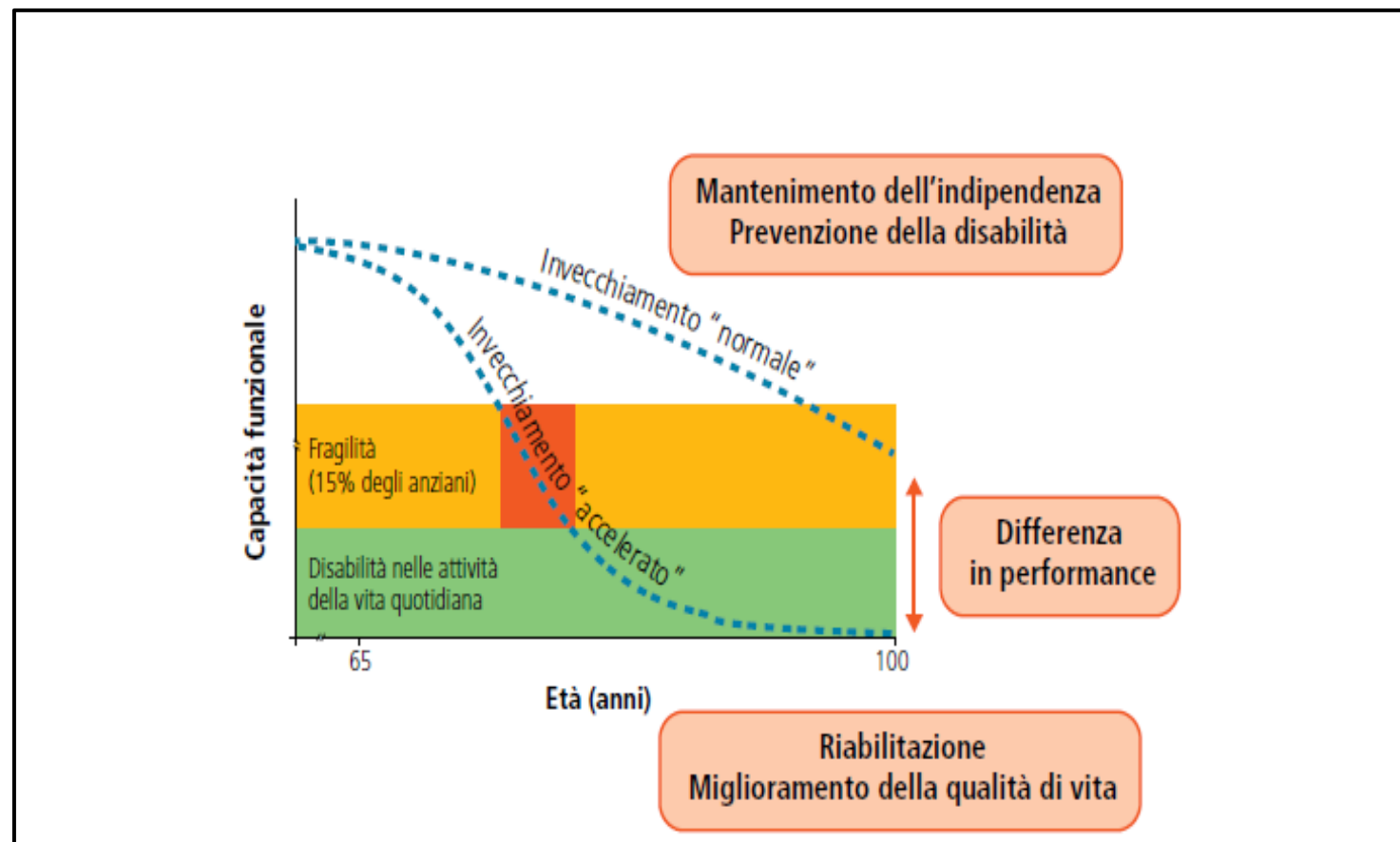
LA PERDITA PROGRESSIVA DELLE CAPACITA' FUNZIONALI E' UN FENOMENO OSSERVABILE A COMINCIARE DAI 65-70 ANNI D'ETA', MA NON UGUALE IN TUTTI I SOGGETTI.
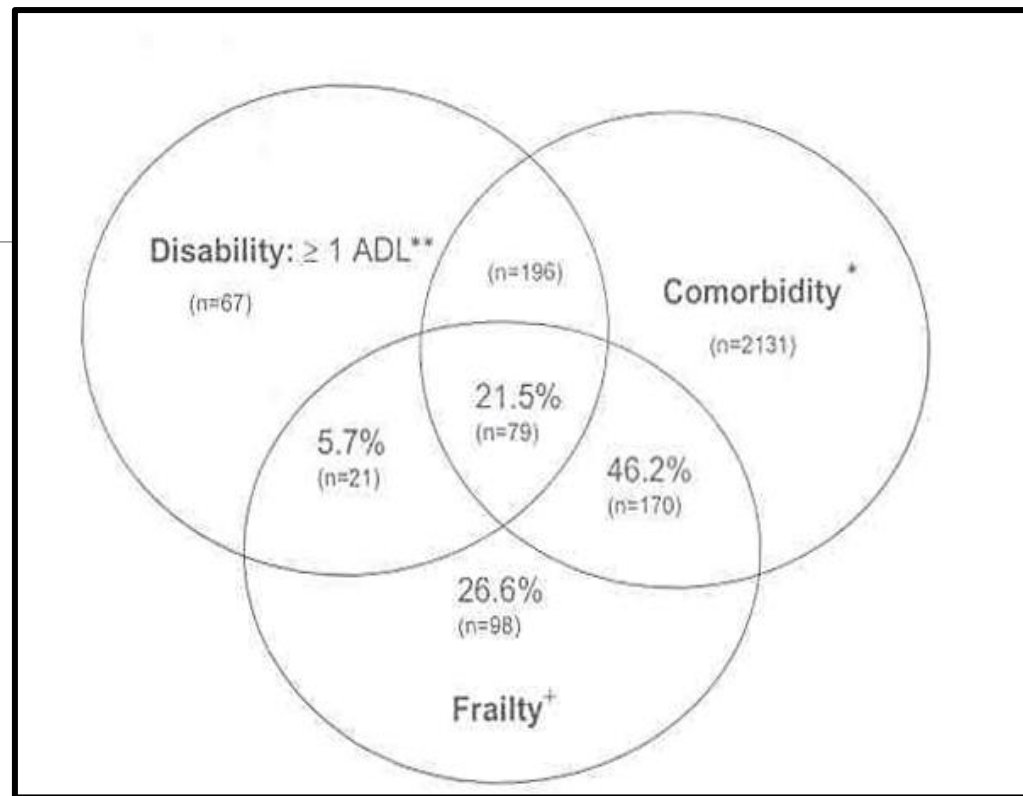
FRAGILITÀ NON È SINONIMO DI DISABILITÀ E COMORBILITÀ

Fried et al. J Gerontol Med Sci 2001; 56A: M146-M156

FRAGILITA'

SINDROME BIOLOGICA E CLINICA CARATTERIZZATA DA RIDUZIONE DELLE RISERVE E DELLA RESISTENZA AGLI STRESS, PROVOCATA DAL DECLINO CUMULATIVO DI PIÙ SISTEMI FISIOLOGICI, IN CONSEGUENZA DI FATTORI BIOLOGICI, PSICOLOGICI, SOCIALI.
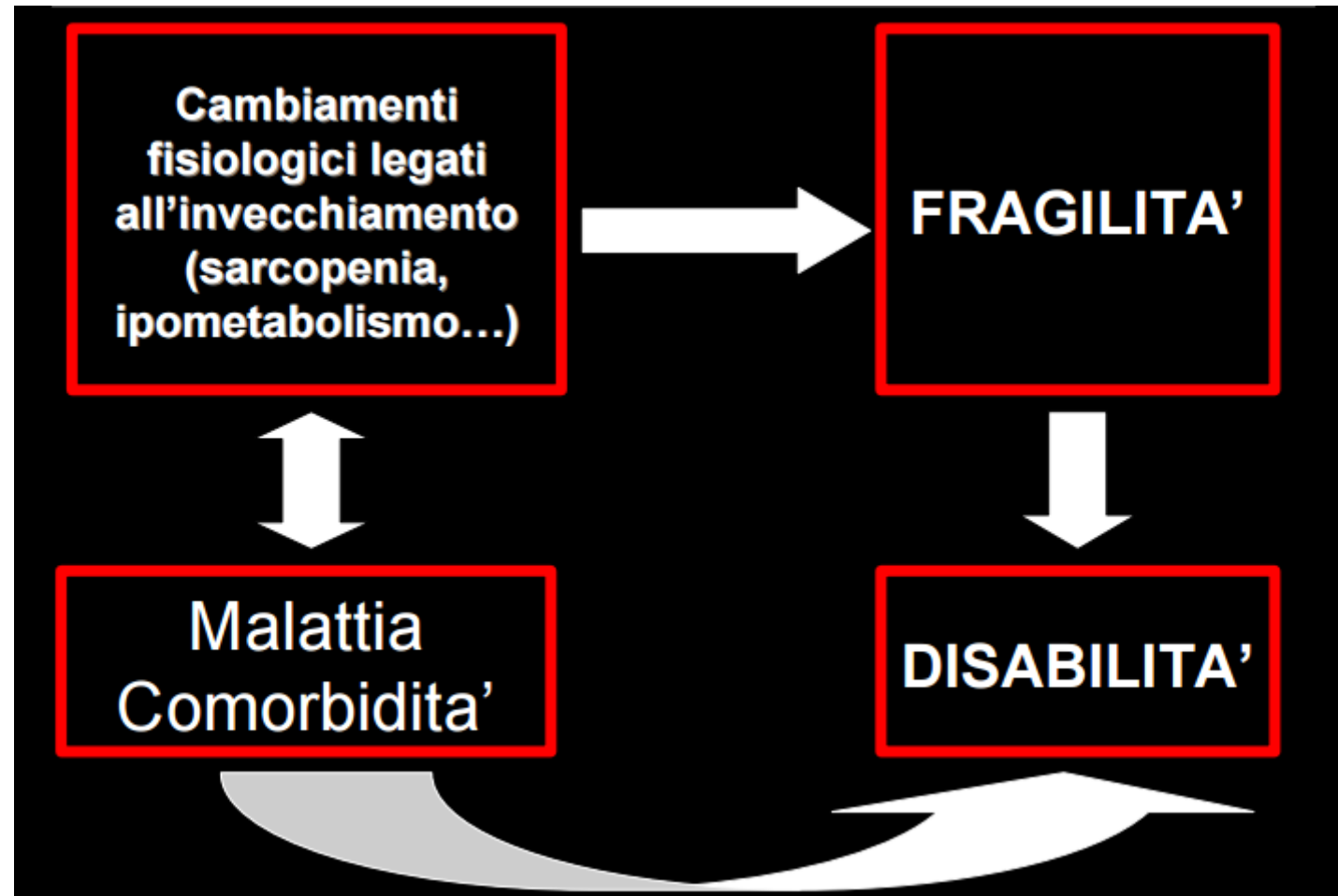
Fried (2001) propone una definizione operativa, utile sia al riconoscimento della fragilità sia all'individuazione di un progetto di cura, configurando un **"fenotipo fragile"** caratterizzato da cinque punti:

1- perdita di peso (maggiore di 4,5 Kg. nell'ultimo anno)

2- affaticamento (almeno 3 giorni/settimana);

3- riduzione della forza muscolare (hand-grip) (<5,85 per i maschi e 3,37 Kg per le femmine);

4- ridotta attività fisica, valutabile con la scala PASE (Physical Activity Scale for the Elderly);

5-riduzione della velocità del cammino (>7 secondi per percorrere 5 m su percorso noto)

<u>Vi è fragilità se sono presenti 3 o più di questi criteri</u>.

Secondo il Canadian Study on Health and Aging (CSHA) (Rockwood 2005) possono caratterizzare la fragilità 70 item comprendenti segni, sintomi e test anormali.

Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. J Gerontol A Biol Sci Med Sci 2001

FRAGILITA' E DISABILITA'
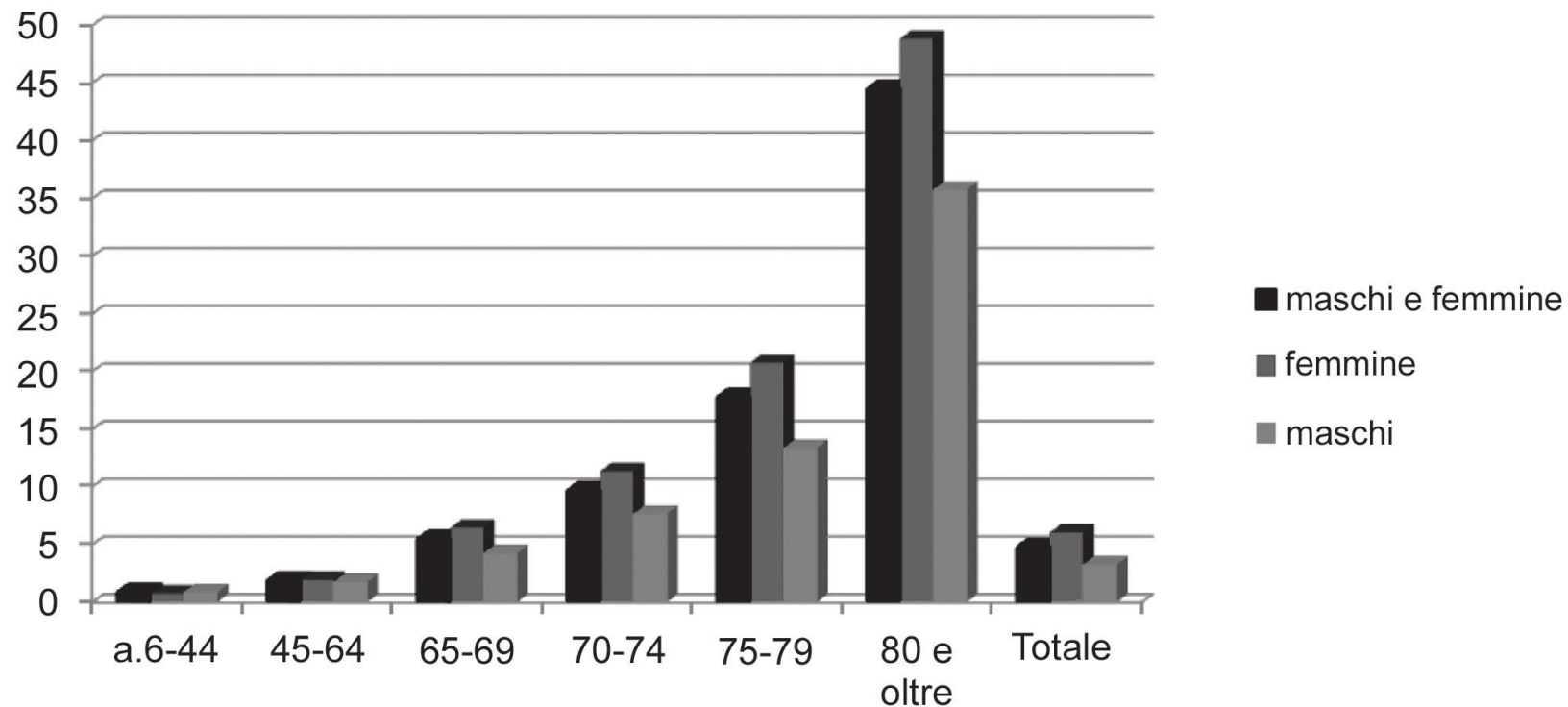
CON L'AUMENTO DELL'ETÀ AUMENTANO LE PATOLOGIE NON TRASMISSIBILI CRONICO-DEGENERATIVE E LE MALATTIE MENTALI, CHE DEVONO FAR PARTE DI UNA VALUTAZIONE OMNICOMPRENSIVA DEL SOGGETTO ANZIANO.

CARATTERISTICHE DEGLI INDICI DI COMORBILITÀ

- VALUTANO L'EFFETTO DI **SOMMAZIONE** DELLE SINGOLE PATOLOGIE

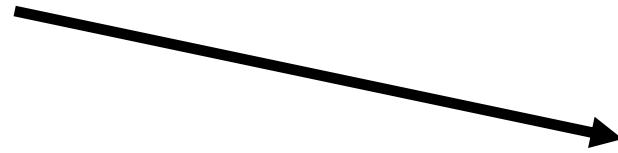- VALUTANO L'EFFETTO DI **INTERAZIONE** DELLE SINGOLE PATOLOGIE

INDICE DI COMORBIDITÀ DI CHARLSON

PUNTEGGIO   MALATTIE

1   INFARTO MIOCARDICO
           INSUFFICIENZA CARDIACA CONGESTIZIA
           VASCULOPATIA PERIFERICA
           VASCULOPATIA CEREBRALE
           DEMENZA
           BPCO
           CONNETTIVOPATIE
           MALATTIA ULCEROSA
           DIABETE MELLITO

2   EMIPLEGIA
           INSUFFICIENZA RENALE CRONICA
           DIABETE CON DANNO D'ORGANO
           NEOPLASIA

3   CIRROSI EPATICA

CURVE DI SOPRAVVIVENZA IN RELAZIONE ALL'INDICE DI COMORBILITÀ DI CHARLSON
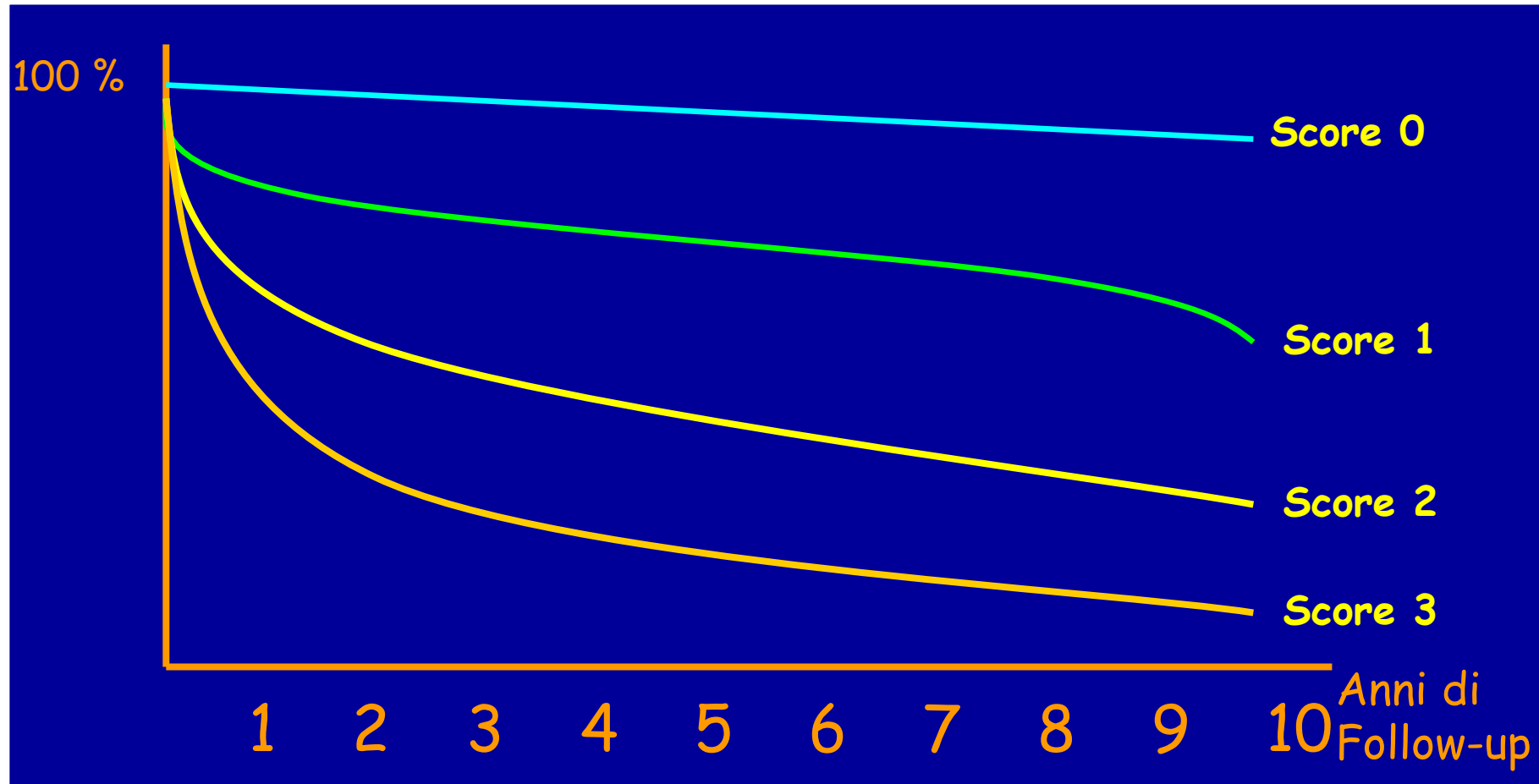
INDICE GERIATRICO DI COMORBILITÀ

Classe 1	soggetti con 1 o più patologie asintomatiche
Classe 2	soggetti con 1 o più patologie sintomatiche adeguatamente trattate
Classe 3	soggetti con 1 sola patologia non controllata dalla terapia
Classe 4	soggetti con 2 o più patologie non controllate dalla terapia o con una o più patologie al massimo della lora gravità

Rozzini et al, 1997

N= 354
1 YEAR FOLLOW-UP

BMC
Family Practice

RESEARCH ARTICLE

Open Access

Geriatric screening tools are of limited value to predict decline in functional status and quality of life: results of a cohort study

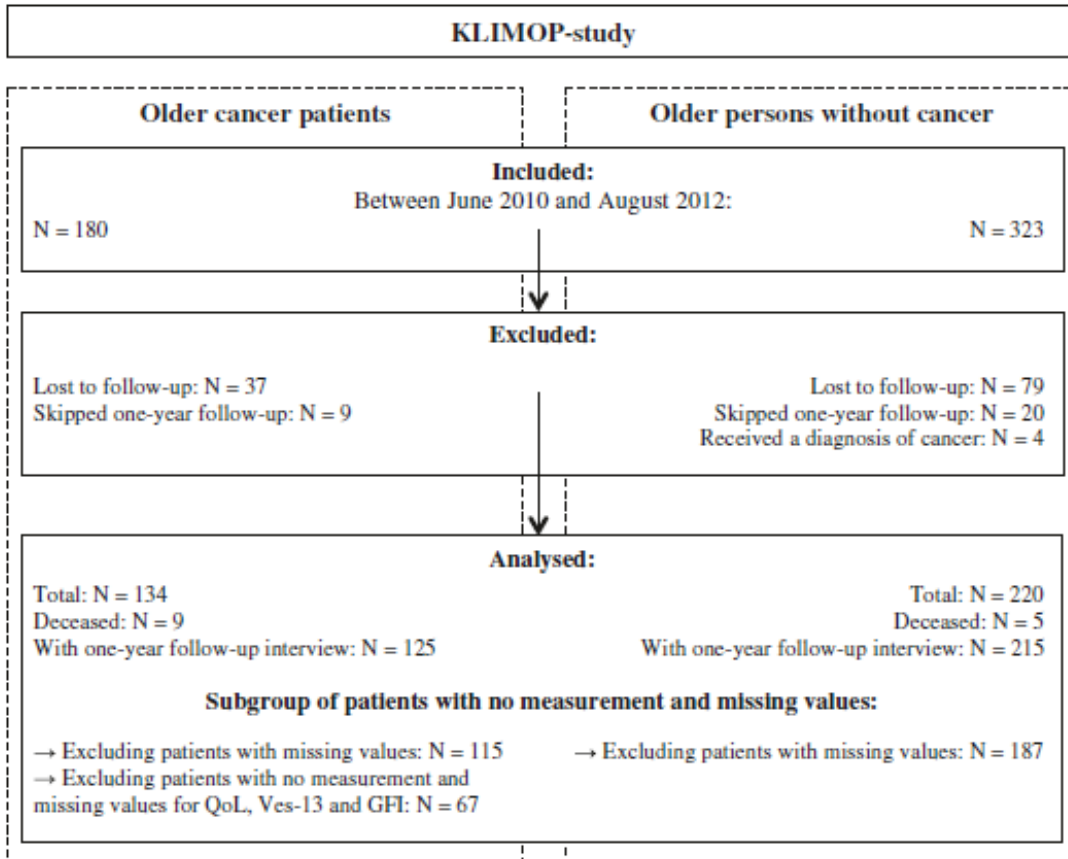Laura Deckx[1*], Marjan van den Akker[1,2], Liesbeth Daniels[1], Eric T De Jonge[3], Paul Bulens[4], Vivianne CG Tjan-Heijnen[5], Doris L van Abbema[5] and Frank Buntinx[1,2]

KLIMOP-study

Older cancer patients | Older persons without cancer

Included:
Between June 2010 and August 2012:

N = 180 | N = 323

Excluded:

Lost to follow-up: N = 37 | Lost to follow-up: N = 79
Skipped one-year follow-up: N = 9 | Skipped one-year follow-up: N = 20
| Received a diagnosis of cancer: N = 4

Analysed:

Total: N = 134 | Total: N = 220
Deceased: N = 9 | Deceased: N = 5
With one-year follow-up interview: N = 125 | With one-year follow-up interview: N = 215

Subgroup of patients with no measurement and missing values:

→ Excluding patients with missing values: N = 115 | → Excluding patients with missing values: N = 187
→ Excluding patients with no measurement and missing values for QoL, Ves-13 and GFI: N = 67

THE DATA FOR THIS STUDY WERE COLLECTED AS PART OF THE KLIMOP-STUDY, AN ON-GOING OBSERVATIONAL COHORT STUDY OF OLDER CANCER PATIENTS AND A GENERAL OLDER PRIMARY CARE POPULATION WITHOUT A HISTORY OF CANCER (EXCEPT NON-MELANOMA OF THE SKIN),AGED 70 YEARS AND ABOVE. THE FOCUS OF THIS STUDY IS THE LONG-TERM WELLBEING OF OLDER CANCER PATIENTS. FOR THE CURRENT STUDY WE SELECTED ONLY CANCER PATIENTS WITH A NEW DIAGNOSIS OF BREAST OR COLORECTAL CANCER, AND CANCER STAGE I – III.

RESEARCH ARTICLE

Geriatric screening tools are of limited value to predict decline in functional status and quality of life: results of a cohort study

Laura Deckx[1*], Marjan van den Akker[1,2], Liesbeth Daniels[1], Eric T De Jonge[3], Paul Bulens[4], Vivianne CG Tjan-Heijnen[5], Doris L van Abbema[5] and Frank Buntinx[1,2]

Evaluate the value of four geriatric screening tools to predict functional decline and decline in QoL in a population of older cancer patients with a considerable life expectancy (>6 months). We also aim to evaluate the predictive value of these tools in a general older primary care population without a history of cancer

SCREENING TOOLS:

-aCGA (four items from the 15-item Geriatric Depression Scale, three items from ADL, four items from IADL, and four items from the Mini Mental State Examination; ≥1)

-G8 (age, nutritional status, weight loss, body mass index, mobility, psychological status, number of medications, and self-perception of health; ≤14)

-The GFI (Groningen Frailty Indicator (GFI) (mobility, assistance needed with toileting and shopping, physical fitness, poor hearing and vision, medicine use, weight loss, and complaints about memory, feelings of isolation, depression, and anxiety; ≥4).

-VES-13 (six physical and five functional activities, their self-rated health, and their age; ≥3)

BMC
Family Practice

RESEARCH ARTICLE　　　　Open Access

Geriatric screening tools are of limited value to predict decline in functional status and quality of life: results of a cohort study

Laura Deckx[1*], Marjan van den Akker[1,2], Liesbeth Daniels[1], Eric T De Jonge[3], Paul Bulens[4],
Vivianne CG Tjan-Heijnen[5], Doris L van Abbema[5] and Frank Buntinx[1,2]

Table 2 Diagnostic accuracy of geriatric screening tools to predict decline in functional status and QoL

			Sensitivity		Specificity		Positive predictive value		Negative predictive value		Area under the curve		Univariate logistic regression		Multivariate logistic regression[c]	
		N total	Se	(95% CI)	Sp	(95% CI)	PPV	(95% CI)	NPV	(95% CI)	AUC	(95% CI)	OR	(95% CI)	OR	(95% CI)
Functional decline[a]																
aCGA	Cancer patients	115	71%	(59% - 82%)	33%	(20% - 48%)	59%	(47% - 70%)	46%	(29% - 63%)	0.52	(0.43 - 0.61)	1.20	(0.54 - 2.67)	0.61	(0.23 - 1.64)
	Persons without cancer	187	67%	(55% - 78%)	52%	(43% - 62%)	49%	(39% - 59%)	70%	(59% - 80%)	0.60	(0.53 - 0.67)	**2.23**	**(1.22 - 4.09)**	1.87	(0.93 - 3.78)
G8	Cancer patients	115	64%	(51% - 75%)	37%	(23% - 52%)	58%	(45% - 69%)	43%	(28% - 59%)	0.50	(0.41 - 0.59)	1.02	(0.47 - 2.19)	0.67	(0.28 - 1.65)
	Persons without cancer	187	65%	(53% - 75%)	57%	(47% - 66%)	51%	(40% - 61%)	70%	(59% - 79%)	0.61	(0.54 - 0.68)	**2.38**	**(1.31 - 4.35)**	1.80	(0.90 - 3.60)
GFI	Cancer patients	67	54%	(37% - 71%)	59%	(41% - 76%)	59%	(41% - 76%)	54%	(37% - 71%)	0.57	(0.45 - 0.69)	1.74	(0.66 - 4.58)	1.23	(0.35 - 4.35)
	Persons without cancer	187	58%	(46% - 69%)	63%	(53% - 72%)	52%	(41% - 63%)	69%	(59% - 78%)	0.61	(0.53 - 0.68)	**2.35**	**(1.29 - 4.26)**	1.83	(0.92 - 3.65)
VES-13	Cancer patients	67	57%	(39% - 74%)	66%	(47% - 81%)	65%	(45% - 81%)	58%	(41% - 75%)	0.61	(0.50 - 0.73)	2.55	(0.95 - 6.85)	2.58	(0.59 - 11.22)
	Persons without cancer	187	62%	(50% - 73%)	66%	(56% - 75%)	55%	(44% - 66%)	72%	(62% - 80%)	0.64	(0.57 - 0.71)	**3.11**	**(1.70 - 5.71)**	**2.83**	**(1.35 - 5.95)**
Decline in QoL[b]																
aCGA	Cancer patients	67	47%	(21% - 73%)	37%	(24% - 51%)	18%	(7% - 33%)	70%	(50% - 86%)	0.42	(0.27 - 0.56)	0.50	(0.16 - 1.61)	0.44	(0.10 - 1.91)
	Persons without cancer	187	56%	(41% - 70%)	45%	(36% - 53%)	27%	(19% - 37%)	74%	(63% - 83%)	0.50	(0.42 - 0.58)	1.02	(0.53 - 1.96)	1.14	(0.55 - 2.39)
G8	Cancer patients	67	67%	(38% - 88%)	39%	(25% - 53%)	24%	(12% - 40%)	80%	(59% - 93%)	0.53	(0.39 - 0.67)	1.25	(0.37 - 4.19)	1.47	(0.36 - 6.05)
	Persons without cancer	187	40%	(26% - 55%)	44%	(35% - 53%)	21%	(13% - 30%)	67%	(56% - 76%)	0.42	(0.34 - 0.50)	0.52	(0.27 - 1.00)	0.48	(0.22 - 1.03)
GFI	Cancer patients	67	40%	(16% - 68%)	50%	(36% - 64%)	19%	(7% - 36%)	74%	(57% - 88%)	0.45	(0.30 - 0.60)	0.67	(0.21 - 2.14)	0.50	(0.11 - 2.20)
	Persons without cancer	187	42%	(28% - 57%)	53%	(45% - 62%)	25%	(16% - 35%)	72%	(62% - 80%)	0.48	(0.40 - 0.56)	0.83	(0.43 - 1.59)	0.89	(0.42 - 1.88)
VES-13	Cancer patients	67	47%	(21% - 73%)	54%	(40% - 68%)	23%	(10% - 41%)	78%	(61% - 90%)	0.50	(0.36 - 0.65)	1.02	(0.32 - 3.23)	0.53	(0.10 - 2.83)
	Persons without cancer	187	42%	(28% - 57%)	53%	(45% - 62%)	25%	(16% - 35%)	72%	(62% - 80%)	0.48	(0.40 - 0.56)	0.83	(0.43 - 1.59)	0.88	(0.40 - 1.92)

IN OLDER PERSONS WITH A RELATIVELY GOOD PROGNOSIS, GERIATRIC SCREENING TOOLS ARE OF LIMITED USE IN IDENTIFYING PERSONS AT RISK FOR DECLINE IN FUNCTIONAL STATUS OR QUALITY OF LIFE AFTER ONE YEAR. HENCE, A GERIATRIC SCREENING TOOL CANNOT BE RELIED ON IN ISOLATION, BUT THEY DO PROVIDE VERY VALUABLE INFORMATION AND MAY PROMPT PHYSICIANS TO ALSO CONSIDER DIFFERENT ASPECTS OF FUNCTIONING.

LA VMD GERIATRICA È UNA VALUTAZIONE MULTIDISCIPLINARE NELLA QUALE:

- 1. Sono identificati, descritti e spiegati i molteplici problemi dell'anziano

- 2. Vengono definite le sue capacità funzionali

- 3. Viene stabilita la necessità di servizi assistenziali

- 4. Viene sviluppato un piano di trattamento e di cure, nel quale i differenti interventi siano commisurati ai bisogni ed ai problemi

COMPONENTI DELLA VALUTAZIONE MULTIDIMENSIONALE NELL'ANZIANO

Salute Fisica
◦ Elenco dei problemi medici tradizionali
◦ Indicatori di Severità di malattia

Capacità funzionale generale
◦ Attività della vita quotidiana
◦ Valutazione del cammino e dell'equilibrio
◦ Capacità di performance fisica

Salute psico-cognitiva
◦ Tests psicometrici di capacità cognitiva
◦ Tests psicometrici di stato affettivo

Indicatori sociali e ambientali
◦ Risorse e necessità sociali
◦ Situazione ambientale

VALUTAZIONE DELLA DISABILITÀ

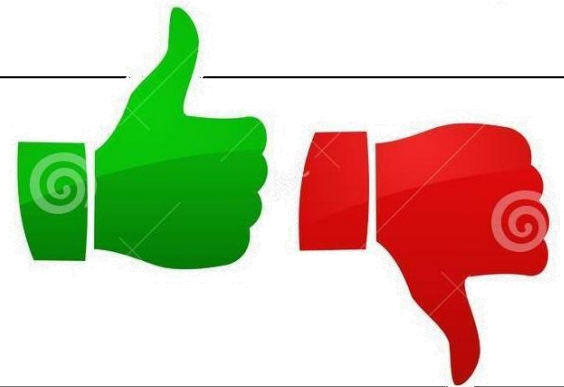| ADL	ACTIVITIES OF DAY LIVING
IADLs	INSTRUMENTAL ACTIVITIES OF DAY LIVING

VALUTAZIONE DELLA DISABILITÀ

ADL

- LAVARSI
- VESTIRSI
- ALIMENTARSI
- SPOSTARSI
- CONTROLLARE LA CONTINENZA
- USO DEI SERVIZI

- SOMMINISTRATORE: ESAMINATORE O PAZIENTE STESSO
- SENSIBILITÀ BASSA
- COSTO MOLTO BASSO
- NON RICHIEDE ABILITÀ PARTICOLARI
- UTILE PER DEFINIRE OBIETTIVI E BISOGNI

PRO

CONTRO

VALUTAZIONE DELLA DISABILITÀ

IADLs

A) CAPACITA' DI USARE IL TELEFONO
1. Usa il telefono di propria iniziativa (alza la cornetta, compone il numero.....)
2. Compone solo alcuni numeri ben conosciuti
3. Risponde al telefono ma non è capace di comporre i numeri
4. Non è in grado di usare il telefono
0. Rifiuto - non applicabile

B) FARE ACQUISTI
1. Fa tutte le proprie spese senza aiuto
2. Fa piccoli acquisti senza aiuto
3. Ha bisogno di essere accompagnato ogni volta che deve acquistare qualcosa
4. Non è in grado di fare acquisti
0. Rifiuto - non applicabile

C) PREPARAZIONE DEL CIBO
1. Organizza, prepara e serve i pasti in modo adeguato e senza aiuto
2. Prepara pasti adeguati se gli vengono forniti gli ingredienti
3. Scalda e serve pasti preparati oppure prepara cibi, ma non mantiene una dieta adeguata
4. I pasti gli devono essere preparati e serviti
0. Rifiuto - non applicabile

D) CAPACITA' DI ACCUDIRE LA CASA
1. Sbriga le faccende domestiche da solo o con assistenza occasionale per i lavori pesanti
2. Esegue autonomamente i lavori domestici non pesanti (rifà il letto, lava i piatti.....)
3. Esegue autonomamente i lavori domestici non pesanti ma non è in grado di mantenere un adeguato livello di pulizia della casa
4. Necessita di aiuto per tutti i lavori domestici
5. Non partecipa a nessuna azione di governo della casa
0. Rifiuto - non applicabile

E) AUTONOMIA NEL LAVAGGIO DELLA BIANCHERIA
1. Lava personalmente tutta la sua biancheria
2. Lava solo i piccoli capi di biancheria (calzini, fazzoletti)
3. Tutta la biancheria deve essere lavata e stirata da altri
0. Rifiuto - non applicabile

F) MEZZI DI TRASPORTO
1. Si sposta da solo utilizzando i mezzi pubblici o guidando la propria auto
2. Per spostarsi usa il taxi, ma non i mezzi pubblici
3. Usa i mezzi pubblici se assistito o accompagnato da qualcuno
4. Può spostarsi soltanto in taxi o in auto con l'assistenza di qualcuno
5. Non si sposta con alcun tipo di mezzo di trasporto
0. Rifiuto - non applicabile

G) RESPONSABILITÀ NELL'USO DEI MEDICINALI
1. Assume i medicinali prescritti nelle dosi giuste e negli orari corretti
2. Assume i medicinali solo se preparati in anticipo in dosi separate
3. Non è in grado di assumere correttamente le terapie da solo
0. Rifiuto - non applicabile

H) CAPACITA' DI GESTIRE LE PROPRIE FINANZE
1. Gestisce le proprie finanze in modo autonomo (scrive assegni, paga le tasse, va in banca, raccoglie e tiene nota delle entrate, riscuote la pensione)
2. E' in grado di fare piccoli acquisti ma necessita di aiuto per le operazioni più complesse (operazioni bancarie, acquisti maggiori....)
3. Non è in grado di maneggiare denaro
0. Rifiuto - non applicabile

✓ Target: pazienti non ospedalizzati
✓ Somministratore: esaminatore o paziente stesso
✓ Sensibilità bassa
✓ Possibilità di BIAS (variabili sesso-dipendenti)
✓ Costo basso
✓ Valuta abilità: 1. Fisiche
                    2. Mentali
                    3. Motivazionali
                    4. Contatti sociali
✓ Non richiede abilità particolari

PRO   CONTRO

TEST DI PERFORMANCE FISICA

1. Misurazione oggettiva

2. Possibilità di monitoraggio delle variazioni

3. Si suddividono in:

a. Qualitativi

b. Quantitativi

TEST DI PERFORMANCE FISICA

PRO

- __VALUTAZIONE QUALITATIVA__:

NON SI QUANTIFICANO PARAMETRI, CON TEMPO O SPAZIO, MA SI CONSIDERA LA QUALITÀ DELL'AZIONE ATTRAVERSO LA SUA DESCRIZIONE: NORMALE, SCORRETTA OD IMPOSSIBILE DA COMPIERE.

- __VALUTAZIONE QUANTITATIVA__:

POSSONO VALUTARE QUANTITATIVAMENTE QUALSIASI COMPITO. I DUE PARAMETRI PIÙ VALUTATI SONO TEMPO DISTANZA.

CONTRO

-1 I RISULTATI SPESSO NON HANNO SIGNIFICATO PRATICO

-2 AUMENTANO IL TEMPO DI VALUTAZIONE DEL PAZIENTE E LO POSSONO ESPORRE A RISCHIO DI CADUTE

VALUTAZIONE DELLE FUNZIONI COGNITIVE E DELLO STATO AFFETTIVO

Mini Mental Test

GDS (Geriatric Depression Scale)

MMSE (Mini Mental State Examination)

item	descrizione	puntegg
1	In che anno siamo?	
2	In che stagione siamo?	
3	In che mese siamo?	
4	Qual è la data di oggi?	
5	Qual è il giorno della settimana?	
6	Dove siamo?	
7	In che stato siamo?	
8	in che provincia siamo?	
9	in che città siamo?	
10	A che piano siamo?	
11	limone	
12	chiave	
13	pallone	
14	100-7	
15	93-7	
16	86-7	
17	79-7	
18	72-7	
19	limone	
20	chiave	
21	pallone	
22	che cos'è questa? (matita)	
23	che cos'è questo? (orologio)	
24	ripeti dopo di me: niente se o ma	
25	prendi questo foglio di carta con la destra, piegalo in due ed appoggialo a terra	
26	se corretto in tre step	
27	se corretto in tre step	
28	leggi quello che c'è scritto sul foglio ed esegui (chiudi gli occhi)	
29	scrivi una frase completa di un soggetto e verbo	
30	copia questo disegno	

30 ITEMS
- Orientamento nel tempo
- Orientamento nello spazio
- Memoria
- Capacità di calcolo
- Altro

24 – 30   non patologico

< 24   patologico (deficit cognitivo)

GDS (Geriatric Depression Scale)

30 Items

- **Cut-off normale = 0-9**

- **Depressione lieve = 10 - 19**

- **Depressione Grave = 20 - 30**

CDR (CLINICAL DEMENTIA RATING SCALE)

	Normale CDR 0	Demenza dubbia CDR 0,5	Demenza lieve CDR 1	Demenza moderata CDR 2	Demenza grave CDR 3
Memoria	Memoria adeguata o smemoratezza occasionale	Lieve smemoratezza permanente; parziale rievocazione di eventi	Perdita di memoria modesta per eventi recenti; interferenza con attività quotidiane	Perdita di memoria severa; materiale nuovo perso rapidamente	Perdita di memoria grave; rimangono alcuni frammenti
Orientamento	Perfettamente orientato		Alcune difficoltà nel tempo; possibile disorientamento topografico	Usualmente disorientamento temporale, spesso spaziale	Orientamento solo personale
Giudizio e soluzione di problemi	Risolve bene i problemi giornalieri; giudizio adeguato rispetto al passato	Dubbia compromissione nella soluzione di problemi; analogie e differenze (prove di ragionamento)	Difficoltà moderata; esecuzione di problemi complessi; giudizio sociale adeguato	Difficoltà severa nell'esecuzione di problemi complessi; giudizio sociale compromesso	Incapace di dare giudizi o di risolvere problemi
Attività sociali	Attività indipendente e livelli usuali in lavoro, acquisti, pratiche burocraiche	Solo dubbia compromissione nelle attività descritte	Incapace di compiere indipendentemente le attività, a esclusione di attività facili	Nessuna pretesa di attività indipendente fuori casa; in grado di essere portato fuori casa	Nessuna pretesa di attività indipendente fuori casa; non in grado di uscire
Casa e tempo libero	Vita domestica e interessi intellettuali conservati	Vita domestica e interessi intellettuali lievemente compromessi	Lieve ma sensibile compromissione della vita domestica; abbandono hobby e interessi	Interessi ridotti, non sostenuti, vita domestica ridotta a funzioni semplici	Nessuna funzionalità fuori dalla propria camera
Cura personale	Interamente capace di curarsi della propria persona	Richiede facilitazione	Richiede aiuto per vestirsi, igiene, utilizzazione di effetti personali	Richiede molta assistenza per cura personale; non incontinenza urinaria	Richiede molta assistenza per cura personale; incontinenza urinaria

CDR 4: demenza molto grave

Il paziente presenta severo deficit del linguaggio o della comprensione, problemi nel riconoscere i famigliari, incapacità a deambulare in modo autonomo, problemi ad alimentarsi da solo e nel controllare la funzione intestinale o vescicale

CDR 5: demenza terminale

In paziente richiede assistenza totale perché completamente incapace di comunicare, in stato vegetativo, allettato, incontinente.

CONSEGUENZE DELLA LONGEVITÀ

- AUMENTO DELLE PATOLOGIE CRONICHE

- AUMENTO NON AUTOSUFFICIENZA (20.40 % DI N. A. IN SOGGETTI > 75 ANNI)

- BISOGNI IN CRESCITA ESPONENZIALE

- MAGGIOR RICHIESTA ASSISTENZIALE

OBIETTIVI DELL'ASSISTENZA:

CONFINARE LA DISABILITÀ AGLI ULTIMI ANNI DELLA VITA, RIDUCENDO IL DIVARIO TRA SPERANZA DI VITA E VITA ATTIVA.

STRUMENTI DELL'ASSISTENZA

- PREVENZIONE

- CURA

- RIABILITAZIONE

PREVENZIONE

- **PRIMARIA**: CONTROLLO DEI FATTORI DI RISCHIO, DIAGNOSI PRECOCE, SCREENING MALATTIE NEOPLASTICHE

- **SECONDARIA**: TRATTAMENTO ADEGUATO DELLE MALATTIE ACUTE E DEI FATTORI DI RISCHIO DOPO UN PRIMO EPISODIO PER EVITARE UNA RECIDIVA

- **TERZIARIA**: INTERVENTI SPECIFICI PER LIMITARE LA COMPARSA DI DISAUTONOMIA

CURA

- CORREZIONE DEPRIVAZIONE SENSORIALE (ISOLAMENTO)

- INTENSITÀ DI INTERVENTO (MA NON ACCANIMENTO TERAPEUTICO)

- CURA DELLA SOFFERENZA (TERAPIA DEL DOLORE)

- POLIFARMACOTERAPIA

- RAPPORTO RISCHIO – BENEFICIO (ANCHE IN FASE DIAGNOSTICA)

- AUMENTO DELLA QUALITÀ DELLA VITA

- RISPETTO DELLA VOLONTÀ DEL PAZIENTE

RIABILITAZIONE GERIATRICA
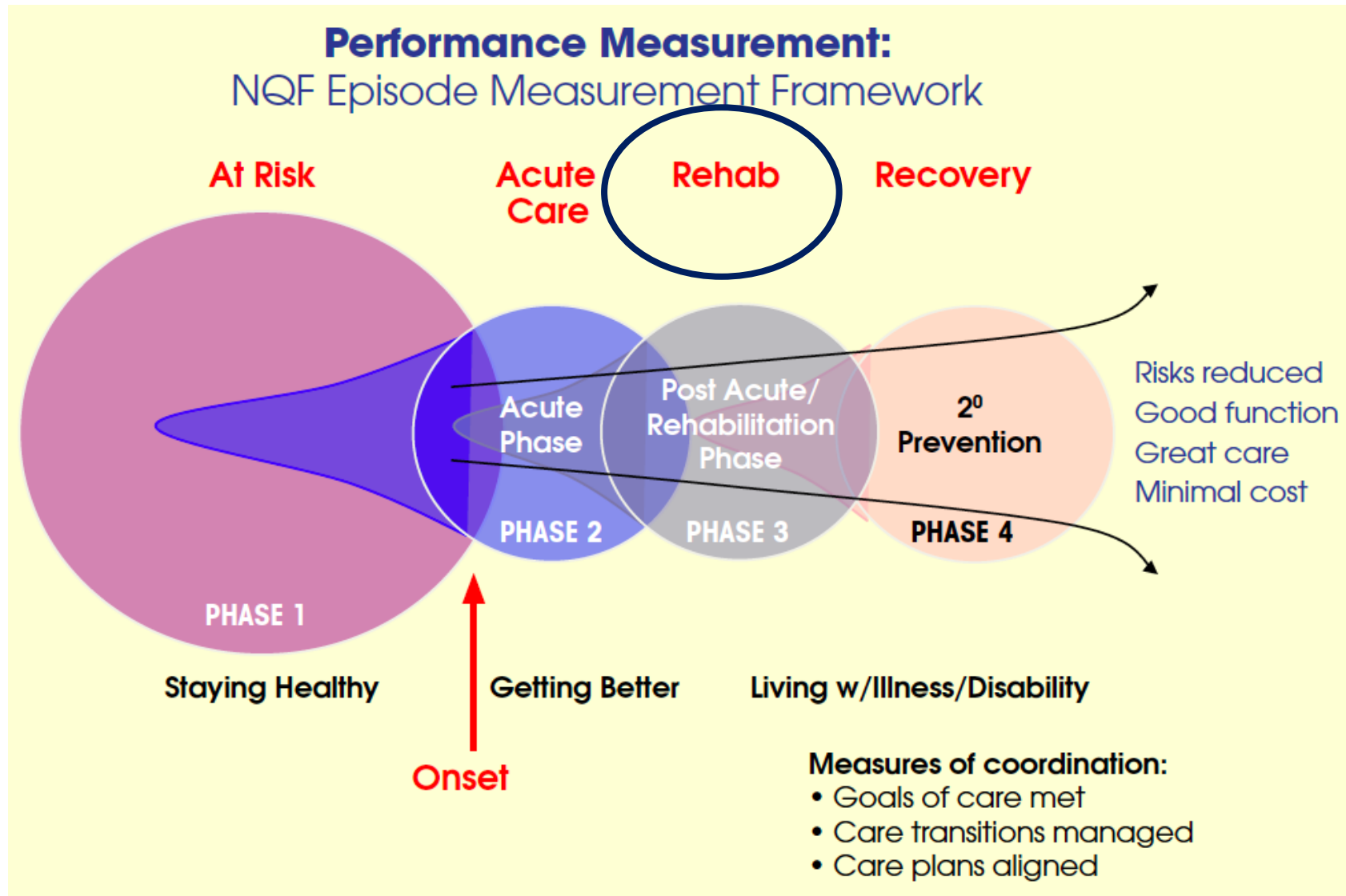
GLI OBIETTIVI DELLA RIABILITAZIONE GERIATRICA

1 STABILIZZAZIONE CLINICA

2 RIATTIVAZIONE FUNZIONALE

3 RIVALUTAZIONE DIAGNOSTICA NELLA
 FASE POST-ACUTA

Box 2. Issues to Be Addressed in Making a Discharge Plan

**Identifying the Most Suitable Type of Care**

What goal are you trying to maximize?

What options are available? (see Table 2).

How well does each option achieve the desired outcomes?

What are the risks associated with the option? Will the patient have to move again? Will the option require a new physician? How big a risk is discontinuity of care in this case?

What are the costs involved in each option? Will third parties pay for some options but not others?

TEMPO

RIABILITAZIONE GERIATRICA

NON AUTOSUFFICIENZA
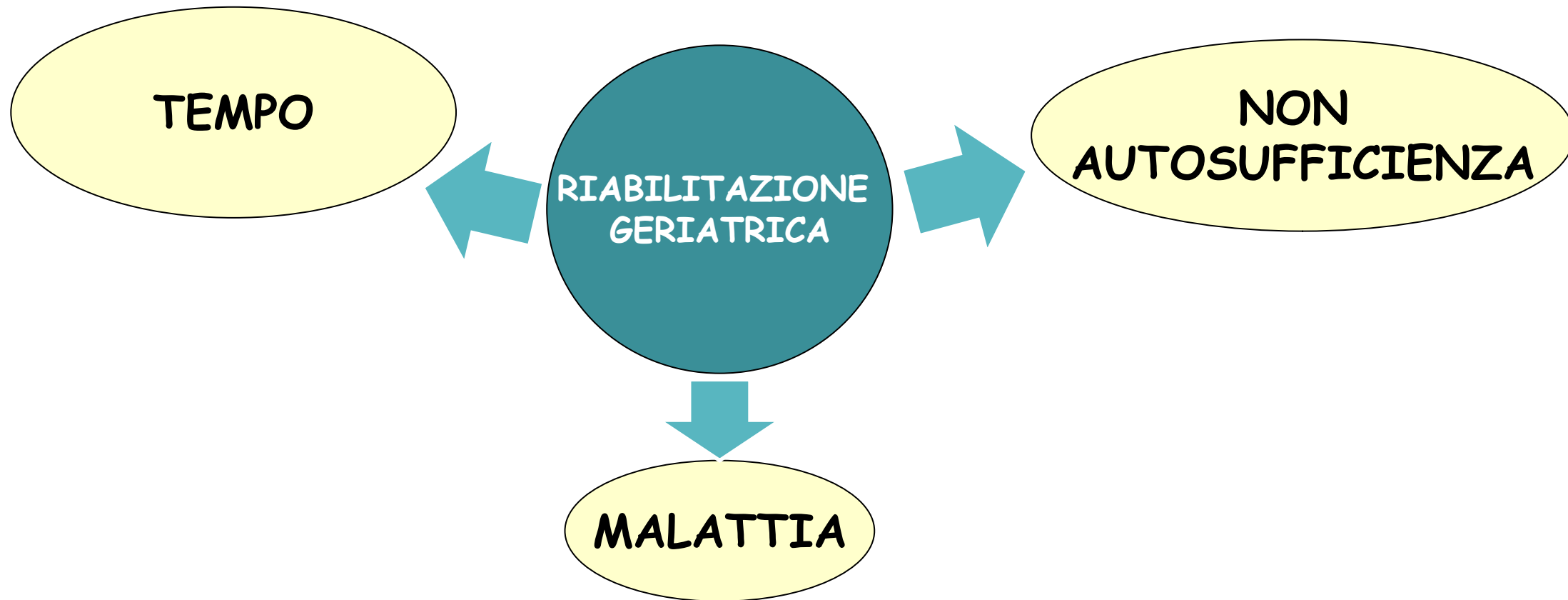
MALATTIA

LA RIABILITAZIONE GERIATRICA E' UNA SFIDA CLINICA PERCHE' L'ANZIANO :

- HA MOLTE MALATTIE
- È FRAGILE
- PARTE DA UNA CONDIZIONE DI RIDOTTA AUTONOMIA
- DISPONE DI UN TEMPO DI VITA LIMITATO

LE TAPPE DELLA RIABILITAZIONE GERIATRICA.

1 VALUTARE LE PERDITE ALL'INTERNO DI UNO SCENARIO SOMATICO, PSICOLOGICO, RELAZIONALE, DEI SERVIZI. LA VMD DEVE TENERE PARTICOLARMENTE IN CONTO LA FUNZIONE PRIMA DELL'EVENTO ACUTO (O DELL'INIZIO DI UNA PERDITA PROGRESSIVA) E LE CAPACITÀ DI RESILIENZA DEL SINGOLO INDIVIDUO, PERCHÉ LA RIABILITAZIONE È UN ALLEATA DELLA NATURALE CAPACITÀ VITALE DI OGNI INDIVIDUO.

2 DEFINIRE GLI OUTCOME ATTESI PER TRACCIARE UNA GLIDEPATH ALLA QUALE ATTENERSI CON VERIFICHE CONTINUE NEL TEMPO.

3 INTERVENIRE CON LA RIABILITAZIONE FISICA SULLA MENOMAZIONE, CON LA CLINICA PER "STERILIZZARE" IL RAPPORTO DISEASE-DISABILITY, CON GLI STRUMENTI DELLA RELAZIONE SULLA FAMIGLIA E DELLA PROGRAMMAZIONE SULL'AMBIENTE. PARAMETRARE GLI INTERVENTI RISPETTO AI LIVELLI DI FRAGILITÀ, DI INSTABILITÀ, DI INCERTEZZA PROGNOSTICA.

LE TAPPE DELLA RIABILITAZIONE GERIATRICA.

4 MISURARE I RISULTATI, PER RILEVARE I SUCCESSI (LA STRADA DA PROSEGUIRE), LE INADEGUATEZZE (L'EQUIPE DEVE CAMBIARE STRADA), LE DIFFICOLTÀ CLINICHE OGGETTIVE.

5 STUDIARE PER AVVICINARE LE INFORMAZIONI DELLA MEDICINA SCIENTIFICA ALLE INDICAZIONI DEL MONDO REALE. UNA PROBLEMATICA IN CONTINUA EVOLUZIONE.

Trends in Function and Postdischarge Mortality in a Medicine for the Elderly Rehabilitation Center Over a 10-Year Period

Miles D. Witham, PhD, Lynn Ramage, MD, Suzanne L. Burns, MB, ChB, Neil D. Gillespie, MD, Jennifer Hanslip, MB, ChB, Simon Laidlaw, MB, ChB, Carolyn A. Leslie, MB, ChB, Marion E. McMurdo, MD

PTS (N=4449) ADMITTED FOR REHABILITATION AFTER MEDICAL AND SURGICAL ILLNESS, STROKE AND FRACTURED NECK OF THE FEMUR.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total	P for Trend*
No. of patients	410	545	472	538	578	445	442	397	382	240	4449	NA
Age (y)	81.2±7.8	81.6±7.8	81.9±7.4	81.9±7.3	81.7±7.6	81.5±7.5	81.5±7.6	81.6±7.2	82.5±7.5	82.1±8.0	81.7±7.6	.260
Men	175 (43)	212 (39)	183 (39)	225 (42)	232 (40)	171 (38)	178 (40)	163 (41)	136 (36)	67 (28)	1742 (39)	NT
Admitted from:												
Orthopedics	41 (10)	12 (2)	26 (6)	38 (7)	30 (5)	24 (5)	34 (8)	23 (6)	24 (6)	18 (8)	270 (6)	NT
Stroke	55 (14)	30 (6)	27 (6)	66 (12)	44 (8)	34 (8)	49 (11)	30 (8)	29 (8)	17 (7)	381 (9)	NT
Other	311 (76)	503 (92)	419 (88)	434 (81)	504 (87)	385 (87)	359 (81)	344 (86)	329 (86)	205 (85)	3798 (85)	NT
Mean admission Barthel score	10.4±3.7	10.4±4.1	10.1±3.5	9.9±3.8	10.3±4.0	10.3±4.1	10.8±3.7	10.1±3.9	10.2±3.3	9.8±3.6	10.2±3.8	.530
Mean discharge Barthel score	14.2±5.1	13.7±5.0	13.8±4.7	13.5±4.8	13.9±4.9	14.5±4.9	14.8±4.4	14.0±4.8	14.4±4.5	14.8±4.1	14.1±4.8	.002
Mean change in Barthel score	3.5±3.6	3.3±3.5	3.6±3.4	3.4±3.5	3.4±3.7	3.9±3.9	4.0±3.4	3.8±3.4	4.1±3.4	4.8±3.3	3.7±3.5	<.001
Admission swallowing score	2.8±0.5	2.8±0.5	2.7±0.6	2.7±0.6	2.8±0.6	2.8±0.6	2.7±0.6	2.7±0.6	2.7±0.5	2.6±0.7	2.8±0.6	<.001
Admission cognition score	2.5±0.8	2.4±0.7	2.4±0.7	2.4±0.7	2.4±0.7	2.4±0.7	2.3±0.7	2.4±0.7	2.4±0.7	2.4±0.6	2.4±0.7	.002
Admission mental health score	2.5±0.7	2.4±0.7	2.4±0.6	2.4±0.7	2.3±0.7	2.3±0.7	2.3±0.6	2.3±0.7	2.3±0.6	2.3±0.6	2.4±0.7	<.001
Admission dietary intake score	2.3±0.8	2.3±0.8	2.2±0.8	2.2±0.9	2.0±0.8	2.2±0.8	2.2±0.8	2.1±0.8	2.2±0.7	2.2±0.7	2.2±0.8	<.001
Admission fluid intake score	2.1±0.6	2.1±0.5	2.0±0.6	2.1±0.5	2.0±0.5	2.0±0.6	2.0±0.6	2.0±0.5	2.1±0.5	2.0±0.5	2.1±0.6	<.001
Admission understanding score	2.7±0.6	2.6±0.6	2.6±0.6	2.5±0.7	2.5±0.6	2.5±0.7	2.5±0.7	2.5±0.6	2.5±0.6	2.6±0.5	2.6±0.6	<.001
Admission expression score	2.6±0.7	2.5±0.7	2.5±0.7	2.5±0.8	2.4±0.7	2.5±0.8	2.4±0.8	2.5±0.7	2.5±0.7	2.5±0.6	2.5±0.7	.650
Median length of stay (IQR)	35 (42)	32 (43)	34 (49)	30 (48)	32 (46)	34 (44)	32 (45)	33 (44)	32 (45)	37 (47)	33 (44)	.100
Discharged to home	292 (71)	354 (65)	290 (61)	335 (62)	337 (58)	318 (71)	320 (72)	285 (72)	290 (76)	182 (76)	3003 (67)	<.001
Dying in hospital	22 (5)	44 (8)	51 (11)	72 (13)	84 (15)	39 (9)	33 (7)	34 (9)	21 (5)	5 (2)	405 (9)	NT

FUNCTION AND MORTALITY IN OLDER PEOPLE, Witham

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POSTDISCHARGE MORTALITY, STRATIFYIED BY YEAR OF ADMISSION

Year of Admission	No. (%) Alive at 1 Year	Unadjusted Mortality Hazard Ratio (95% CI)	Adjusted Mortality Hazard Ratio* (95% CI)
1999–2000	568/772 (73.6)	1.00	1.00
2001–2002	508/688 (73.8)	1.02 (.92–1.14)	0.95 (.85–1.07)
2003–2004	500/670 (74.6)	0.84 (.75–0.94)	0.87 (.76–0.99)
2005–2006	450/588 (76.5)	0.85 (.75–0.96)	0.87 (.75–1.00)
2007–2008	350/458 (76.4)	0.76 (.65–0.90)	0.75 (.61–0.91)

MORTALITY AFTER DISCHARGE FELL MARKEDLY BETWEEN THE START OF THE STUDY PERIOD (1999-2000) AND THE END (2007-2008), AS SHOWN BY THE UNADJUSTED MORTALITY HAZARD RATIOS DERIVED FROM COX REGRESSION ANALYSIS.

Trends in Function and Postdischarge Mortality in a Medicine for the Elderly Rehabilitation Center Over a 10-Year Period

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COX REGRESSION ANALYSIS COEFFICIENTS FOR POSTDISCHARGE SURVIVAL

Variable	Exp(B) (95% CI)	P
Age (per year increase)	1.044 (1.038–1.051)	<.001
Sex (women vs men)	0.621 (0.565–0.682)	<.001
Discharge Barthel (per point increase)	0.950 (0.940–0.960)	<.001
Admission expression score (per point increase)	1.017 (1.003–1.031)	.016
Discharge dietary intake (per point increase)	0.938 (0.925–0.952)	<.001
Discharge swallowing (per point increase)	0.975 (0.955–0.996)	.019
Statin prescription at discharge	0.752 (0.656–0.862)	<.001
No. of medications at discharge	1.039 (1.023–1.056)	<.001

FUNCTIONAL AND MORTALITY OUTCOMES IMPROVED OVER A 10-YEAR PERIOD IN THIS REHABILITATION UNIT, DESPITE SIMILAR BARTHEL SCORES ON ADMISSION AND EQUIVALENT LENGHTS OF STAY.

RIABILITAZIONE GERIATRICA: CRITICITA'.

- ✓ CHI trattare (es. polipatologia, demenza, depressione),
- ✓ QUANDO trattare,
- ✓ COME trattare,
- ✓ PER QUANTO tempo,
- ✓ DOVE trattare (ospedale, strutture intermedie, casa).

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

Peter Nordström[a,*], Karl Michaëlsson[b], Ami Hommel[c], Per Ola Norrman MD[c], Karl-Göran Thorngren[c], Anna Nordström[d]

The study cohort included all inhabitants of Sweden ≥ 50 years of age registered with a hip fracture in the Swedish quality register RIKSHÖFT the years 2004-2012, N=89,301

Inpatient hospital with two different alternatives defined for the present study

N=18628

N=70673

The majority of patients is given care at geriatric wards at least one day during the total hospital time, defined as geriatric ward hospitals for the present study, N=8

Death during hospital stay
N=866   N=2763

The majority of patients is not given care at geriatric wards during the total hospital time, defined as regular ward hospitals for the present study, N=71

Discharge location

N=6162 → Own home ← N=19952

N=10228 → Nursing home ← N=41577

TO INVESTIGATE THE EFFECTS OF GERIATRIC REHABILITATION ON SHORT-TERM RISK OF DEATH AND READMISSION AFTER A HIP FRACTURE WERE INVESTIGATED IN A NATIONWIDE COHORT, STUDY EVALUATED AMONG PATIENTS RECEIVED INPATIENT CARE IN GERIATRIC WARDS, AND THOSE TREATED AT 71 REGULAR HOSPITALS. THE RISK OF DEATH WAS INFLUENCED BY DISCHARGE LOCATION AND INPATIENT LENGTH OF STAY (LOS).

THE COHORT CONSISTED OF 89,301 INDIVIDUALS AT LEAST 50 YEARS OF AGE, WITH A FIRST HIP FRACTURE REGISTERED IN THE SWEDISH QUALITY REGISTER RIKSHÖFT (2004-2012).

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

Peter Nordström[a,*], Karl Michaëlsson[b], Ami Hommel[c], Per Ola Norrman MD[c], Karl-Göran Thorngren[c], Anna Nordström[d]

COMPARED WITH PATIENTS TREATED AT REGULAR HOSPITALS, THOSE WHO RECEIVED CARE AT GERIATRIC WARD HOSPITALS HAD A LONGER MEAN LOS (BY 2.4 DAYS) AND WORSE ASA SCORE

Table 1
Baseline Characteristics of Patients With Hip Fracture According to Hospital Type

	Geriatric Ward Hospital	Regular Hospital	P
	n = 18,628	n = 70,673	
Length of stay, d, mean ± SD	14.9 ± 13.3	12.5 ± 10.4	<.001
Age, y, mean ± SD	81.7 ± 9.4	82.0 ± 9.4	.001
Female sex, %	67.5	68.4	.02
Living independently, %	72.9	78.3	<.001
Walking ability, %			<.001
No walking aid	44.8	44.4	
One walking aid (cane, crutch, stick)	8.0	6.5	
Two walking aids (canes, crutches, sticks)	1.8	1.9	
Walker	41.8	43.8	
Wheelchair/bedridden	3.6	3.5	
Diagnoses before fracture, %			
Dementia	17.7	15.1	<.001
Myocardial infarction	11.6	11.9	.27
Ischemic stroke	13.4	12.6	.002
Diabetes mellitus	14.4	13.1	<.001
Renal failure	3.8	3.8	.96
Chronic pulmonary disease	8.1	7.2	<.001
ASA score* at admission, %			<.001
Healthy	5.9	7.7	
Well-controlled disease without effect	39.8	39.4	
Minor effect of disease on daily living	45.9	44.0	
Major effect of disease in daily living	8.2	8.8	
Moribund	0.1	0.2	
Type of fracture, %			<.001
Femoral neck fracture without dislocation (Garden 1, 2)	14.6	15.0	
Femoral neck fracture with dislocation (Garden 3, 4)	39.4	36.2	
Basocervical femoral neck fracture	4.6	3.3	
Trochanteric two-fragment fracture	20.2	21.9	
Trochanteric fracture with >2 fragments	12.6	16.0	
Subtrochanteric fracture	8.6	7.6	
Type of surgery, %			<.001
Two pins or screws	18.5	20.2	
Nail-plate	33.1	29.9	
Intramedullary nailing	12.4	18.1	
Hemiprosthesis	28.2	24.1	
Other	7.8	7.7	
Diagnoses during hospital stay, %			
Dementia	10.8	9.0	<.001
Myocardial infarction	1.3	1.0	<.002
Ischemic stroke	1.1	0.7	<.003
Renal failure	0.9	0.9	.98
Chronic pulmonary disease	3.7	3.3	.004

Geriatric ward hospital: most patients with hip fracture treated in geriatric ward; regular hospital: most patients with hip fracture not treated in geriatric ward.
*American Society of Anesthesiologists physical status classification.

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

Peter Nordström[a,*], Karl Michaëlsson[b], Ami Hommel[c], Per Ola Norrman MD[c], Karl-Göran Thorngren[c], Anna Nordström[d]

N= 89.301

ASSOCIATIONS BETWEEN THE MAIN EXPOSURE (INPATIENT TREATMENT AT GERIATRIC WARD VERSUS REGULAR HOSPITALS) AND THE OUTCOMES OF DEATH AND READMISSION

Main Exposure	Outcome					
	Death Within 30 d of Admission		Readmission Within 30 d of Discharge		Readmission Within 15−30 d of Admission	
	Hazard Ratio	95% CI	Odds Ratio	95% CI	Hazard Ratio	95% CI
Geriatric ward hospitals						
Unadjusted	0.96	0.91−1.02	0.88	0.83−0.93	0.85	0.77−0.94
Adjusted for age, sex, living conditions, ASA score*	0.91	0.85−0.97	0.87	0.82−0.92	0.85	0.77−0.95
Adjusted for all variables	0.91	0.85−0.97	0.86	0.81−0.91	0.79	0.71−0.88

GERIATRIC WARD HOSPITAL ADMISSION WAS ASSOCIATED WITH AN AVERAGE 14% LOWER RISK OF READMISSION WITHIN 30 DAYS OF DISCHARGE (ODDS RATIO 0.86, 95% CI 0.80-0.91).

P. Nordström et al. , JAMDA (2015)

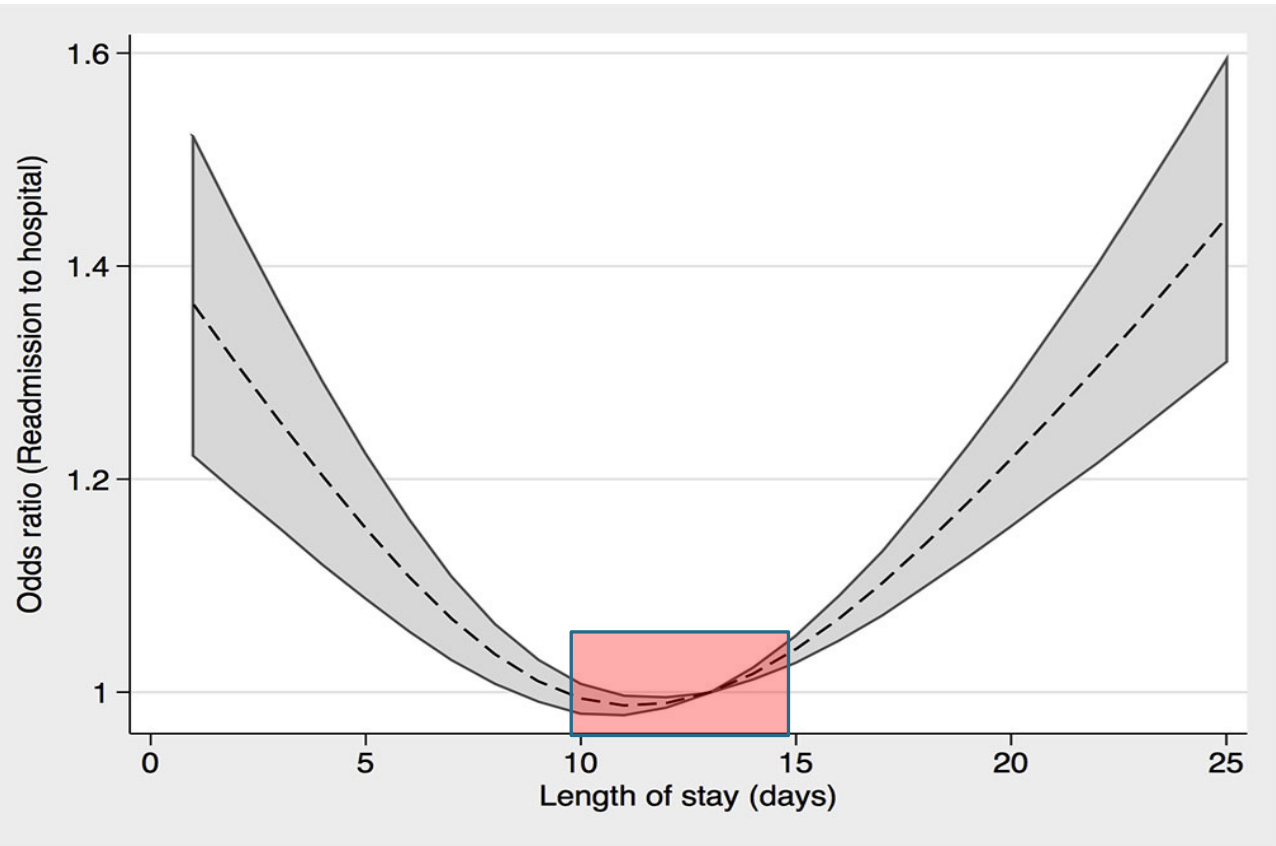# Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

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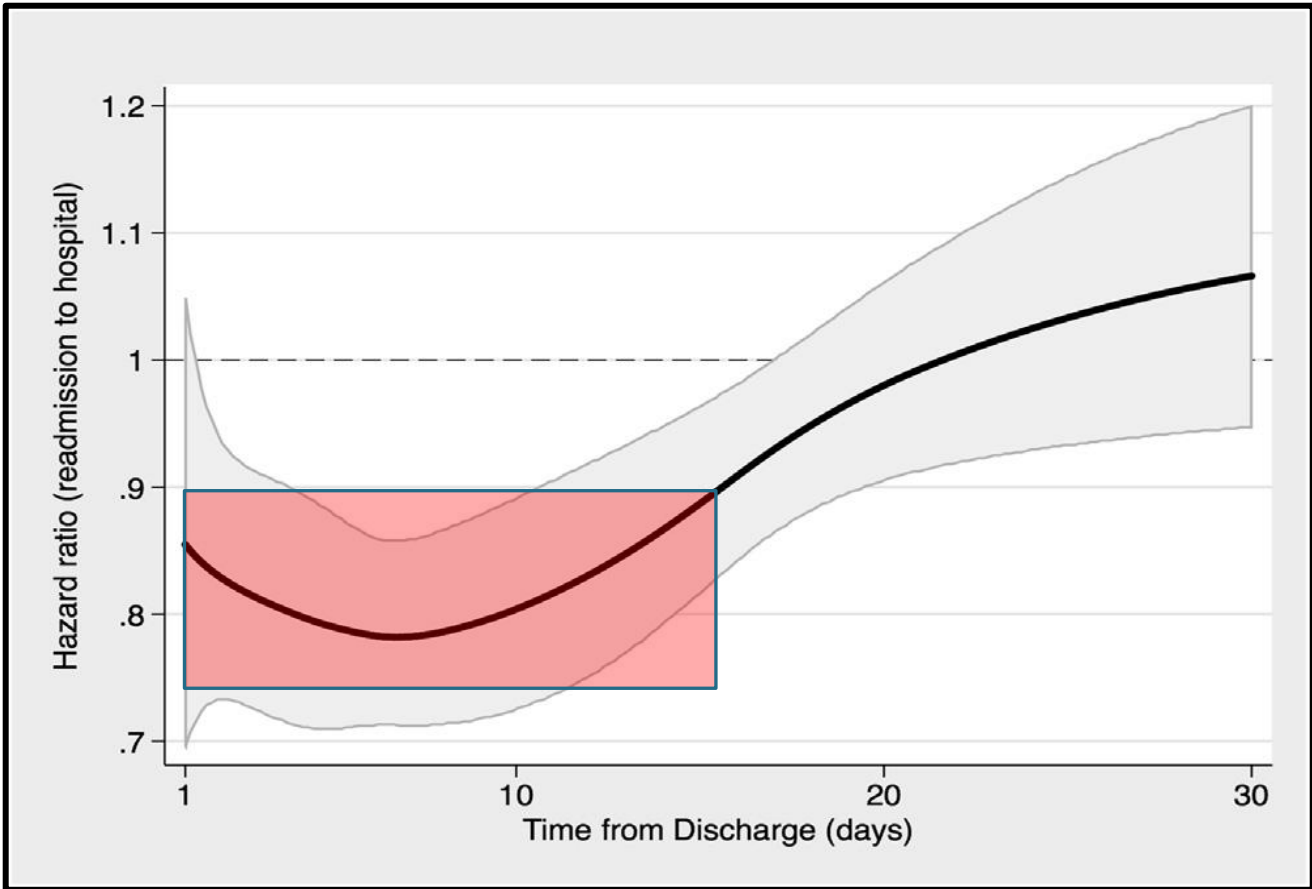
RISK OF READMISSION BY HOSPITAL TYPE IN RELATION TO FOLLOW-UP TIME AFTER DISCHARGE

THE RISK REDUCTION WAS ESPECIALLY PRONOUNCED DURING THE FIRST 15 DAYS OF DISCHARGE.

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

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N= 89.301

Discharge to short-term nursing home

Discharge to permanent nursing home

Discharge to own home

RISK OF DEATH WITHIN 30 DAYS OF DISCHARGE ACCORDING TO DISCHARGE LOCATION AND LOS IN HOSPITAL. A LOS OF 13 DAYS WAS USED AS REFERENCE, AND THE ASSOCIATIONS WERE ADJUSTED FOR AGE AND SEX.

PATIENTS DISCHARGED TO SOME SORT OF NURSING HOME HAD A SIGNIFICANTLY HIGHER RISK OF DEATH WITHIN 30 DAYS OF DISCHARGE (HR 3.0, 95% CI 2.7-3.5).
THIS INCREASED RISK WAS HIGHLY DEPENDENT ON HOSPITAL LOS ($P_{INTERACTION}$ < .001). THUS, FOR PATIENTS DISCHARGED TO SHORT-TERM NURSING HOMES WITH A LOS OF 10 DAYS OR LESS (N = 6872), EACH ADDITIONAL DAY OF LOS REDUCTION INCREASED THE RISK OF DEATH WITHIN 30 DAYS OF DISCHARGE BY 13% (HR 1.13, 95% CI 1.08-1.18), AFTER ADJUSTMENT FOR AGE AND SEX. IN PATIENTS DISCHARGED TO PERMANENT NURSING HOMES (N =15,853), THIS ASSOCIATION WAS SIGNIFICANTLY WEAKER (HR 1.04, 95% CI 1.02-1.07), AND NOT SIGNIFICANT (HR 1.00, 95% CI 0.91-1.10) FOR THOSE DISCHARGED TO OWN HOME (N =15,625).

THE RISKS OF DEATH AND READMISSION WERE LOWER IN PATIENTS WITH HIP FRACTURE WHO RECEIVED CARE IN HOSPITALS WITH GERIATRIC WARDS.

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

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N= 89.301

THE ODDS OF READMISSION TO HOSPITAL IN RELATION TO LOS. THE ASSOCIATIONS WERE ADJUSTED FOR THE INFLUENCE OF AGE, SEX, LIVING CONDITIONS, AND ASA SCORE. A LOS OF 13 DAYS WAS USED AS REFERENCE

INPATIENT CARE IN GERIATRIC WARD HOSPITALS WAS ASSOCIATED WITH AN APPROXIMATELY 14% LOWER RISK OF READMISSION WITHIN 30 DAYS OF DISCHARGE, AND 8% LOWER RISK OF DEATH WITHIN 30 DAYS OF ADMISSION.

Geriatric Rehabilitation and Discharge Location After Hip Fracture in Relation to the Risks of Death and Readmission

Peter Nordström[a,*], Karl Michaëlsson[b], Ami Hommel[c], Per Ola Norrman MD[c], Karl-Göran Thorngren[c], Anna Nordström[d]

N= 89.301

CONCLUSIONS

INPATIENT CARE AFTER HIP FRACTURE IN HOSPITALS WHERE
MOST PATIENTS ARE ATTENDED IN GERIATRIC WARDS WAS ASSOCIATED
WITH LOWER RISKS OF SHORT-TERM DEATH AND READMISSION.
IN ADDITION, DISCHARGE TO NURSING HOMES WAS ASSOCIATED WITH A
GREATER RISK OF DEATH THAN WAS DISCHARGE TO PATIENTS' OWN HOMES,
AND THAT THIS RISK INCREASED WITH SHORTER HOSPITAL.

BMJ

Inpatient rehabilitation specifically designed for geriatric patients: systematic review and meta-analysis of randomised controlled trials
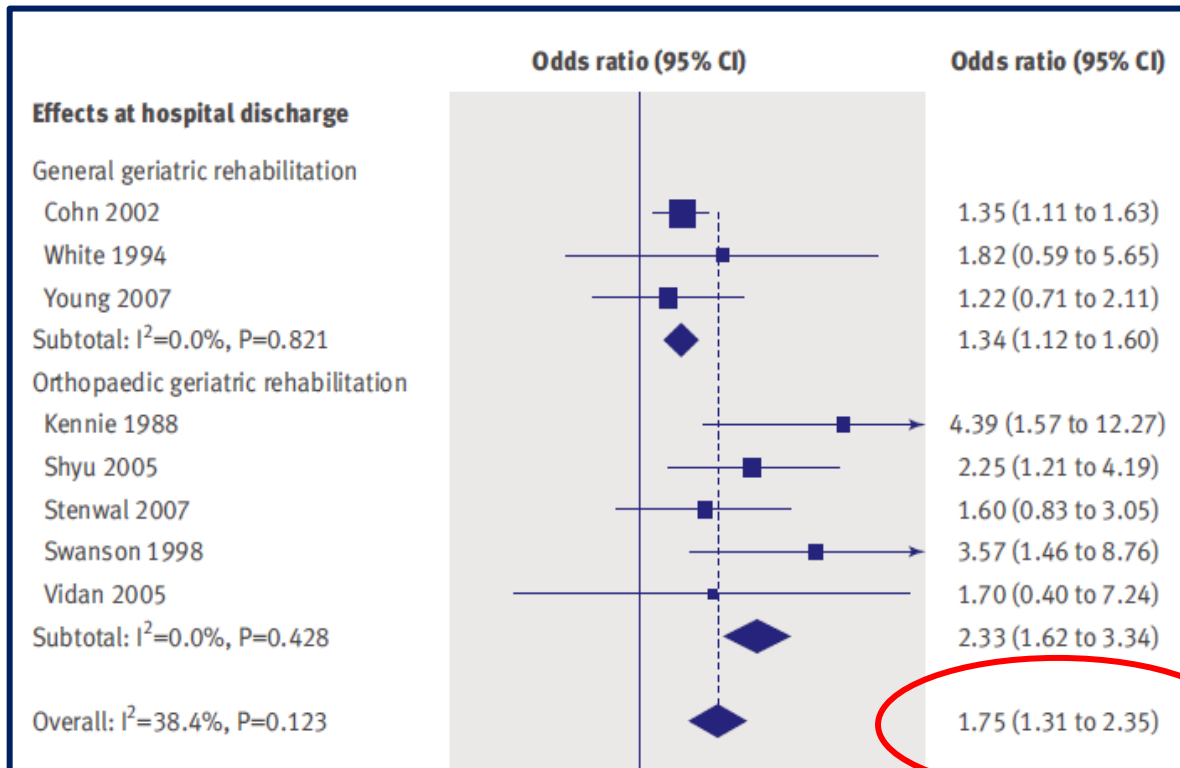
Stefan Bachmann, Robert Bosch Foundation postdoctoral research fellow in geriatrics,[1,2] Christoph Finger, doctoral student,[1] Anke Huss, assistant professor in environmental epidemiology,[3,4] Matthias Egger, professor of epidemiology and public health,[3,5] Andreas E Stuck, professor of geriatrics,[1] Kerri M Clough-Gorr, senior research fellow in epidemiology and geriatrics[1,3,6]

Articles identified by search of titles and abstracts (n=932):
 Embase and Medline (n=689)
 Cochrane (n=204)
 Additional references from reference lists (n=39)

Full text articles retained for assessment of eligibility (n=119)

Articles rejected (n=92):
 Not randomised controlled trial (n=25)
 Age <55 (n=17)
 Not inpatient programme (n=20)
 Acute care programme (n=9)
 Consultation service (n=3)
 Non-comprehensive multidisciplinary rehabilitation (n=3)
 No outcome data (n=7)
 Control group did not receive usual care (n=8)

Articles included in meta-analysis (n=27)
(27 articles reporting on 17 randomised controlled trials)

OBJECTIVE

TO ASSESS THE EFFECTS OF INPATIENT REHABILITATION SPECIFICALLY DESIGNED FOR GERIATRIC PATIENTS COMPARED WITH USUAL CARE ON FUNCTIONAL STATUS, ADMISSIONS TO NURSING HOMES, AND MORTALITY.

17 TRIALS WITH 4780 PEOPLE

BMJ

Study characteristics	Short term (at discharge)			Longer term (at 3-12 month follow-up)		
	Functional improvement	Nursing home admission	Mortality	Functional improvement	Nursing home admission	Mortality
Type of intervention programme:						
General geriatric rehabilitation	1.34 (1.12 to 1.60)	0.53 (0.33 to 0.86)	0.76 (0.54 to 1.06)	1.02 (0.86 to 1.21)	0.90 (0.71 to 1.13)	0.88 (0.75 to 1.04)
Orthopaedic geriatric rehabilitation	2.33 (1.62 to 3.34), P=0.04*	0.72 (0.56 to 0.91)	0.66 (0.42 to 1.04)	1.79 (1.24 to 2.60), P=0.01*	0.79 (0.61 to 1.02)	0.77 (0.61 to 0.96)
Mean age of study population (years):						
≤80	1.88 (1.19 to 2.97)	0.42 (0.27 to 0.64)	1.01 (0.47 to 2.16)	1.26 (0.87 to 1.82)	0.82 (0.58 to 1.16)	0.85 (0.62 to 1.16)
>80	1.74 (1.05 to 2.88)	0.75 (0.58 to 0.96), P=0.045*	0.68 (0.50 to 0.92)	1.45 (1.08 to 1.94)	0.88 (0.72 to 1.07)	0.82 (0.70 to 0.95)
Intervention programme: length of hospital stay after randomisation in intervention group:						
≤21 days	2.38 (1.53 to 3.70)	0.67 (0.42 to 1.09)	0.59 (0.29 to 1.22)	1.43 (1.00 to 2.05)	0.99 (0.69 to 1.42)	0.84 (0.67 to 1.05)
>21 days	1.52 (1.08 to 2.13)	0.61 (0.45 to 0.83)	0.76 (0.56 to 1.04)	1.30 (0.95 to 1.78)	0.81 (0.67 to 0.98)	0.85 (0.73 to 0.99)
Outpatient follow-up after inpatient rehabilitation for patients in intervention group:						
Yes	—	—	—	1.49 (0.93 to 2.39)	0.76 (0.64 to 0.92)	0.84 (0.61 to 1.16)
No/NR	—	—	—	1.29 (1.00 to 1.66)	0.88 (0.69 to 1.12)	0.82 (0.71 to 0.96)
Length of follow-up for outcome evaluation (months):						
≤6	—	—	—	1.44 (0.94 to 2.21)	0.82 (0.67 to 1.00)	0.83 (0.66 to 1.05)
>6	—	—	—	1.32 (0.99 to 1.76)	0.90 (0.68 to 1.19)	0.85 (0.73 to 0.99)
Intervention programme quality: intervention included initial multidimensional geriatric assessment:						
Yes	1.75 (1.31 to 2.35)	0.60 (0.46 to 0.78)	0.75 (0.57 to 0.99)	1.36 (1.07 to 1.71)	0.81 (0.69 to 0.94)	0.86 (0.77 to 0.97)
No/NR	NA	0.84 (0.54 to 1.29)	0.40 (0.13 to 1.18)	NA	1.23 (0.75 to 2.02)	0.90 (0.61 to 1.33)
Intervention programme quality: intervention included patient assignment (to therapies and goal setting):						
Yes	1.81 (1.23 to 2.67)	0.54 (0.37 to 0.78)	0.68 (0.39 to 1.19)	1.32 (0.90 to 1.92)	0.88 (0.62 to 1.26)	0.83 (0.68 to 1.00)
No/NR	1.80 (0.96 to 3.37)	0.71 (0.53 to 0.94)	0.74 (0.53 to 1.03)	1.40 (1.02 to 1.90)	0.86 (0.71 to 1.04)	0.85 (0.71 to 1.02)
Methodological trial quality: concealed randomisation:						
Yes	1.61 (1.21 to 2.13)	0.61 (0.45 to 0.83)	0.75 (0.56 to 1.02)	1.45 (1.02 to 2.06)	0.78 (0.68 to 0.91)	0.90 (0.79 to 1.03)
No/NR	2.91 (1.36 to 6.24)	0.66 (0.40 to 1.07)	0.54 (0.24 to 1.22)	1.29 (0.99 to 1.68)	1.05 (0.72 to 1.54)	0.77 (0.60 to 0.98)
Methodological trial quality: data assessment by an independent assessor:						
Yes	1.39 (1.17 to 1.65)	0.59 (0.33 to 1.06)	0.63 (0.31 to 1.26)	1.34 (0.97 to 1.85)	0.81 (0.68 to 0.95)	0.92 (0.80 to 1.06)
No/NR	2.43 (1.47 to 4.00)	0.63 (0.47 to 0.85)	0.72 (0.48 to 1.07)	1.40 (0.97 to 2.03)	0.93 (0.66 to 1.30)	0.76 (0.62 to 0.93)

IN METAREGRESSION ANALYSES, THERE WAS GREATER FUNCTIONAL IMPROVEMENT FOR ORTHOPAEDIC COMPARED WITH GENERAL GERIATRIC REHABILITATION PROGRAMMES (ODDS RATIO 2.33 (1.62 TO 3.34) V 1.34 (1.12 TO 1.60), P=0.04); AND A LARGER REDUCTION IN ADMISSIONS TO NURSING HOMES IN TRIALS WITH YOUNGER PATIENTS (MEAN AGE OF STUDY POPULATION≤80) THAN WITH OLDER PATIENTS (>80) (RELATIVE RISK 0.42 (0.27 TO 0.64) V 0.75 (0.58 TO 0.96), P=0.045).

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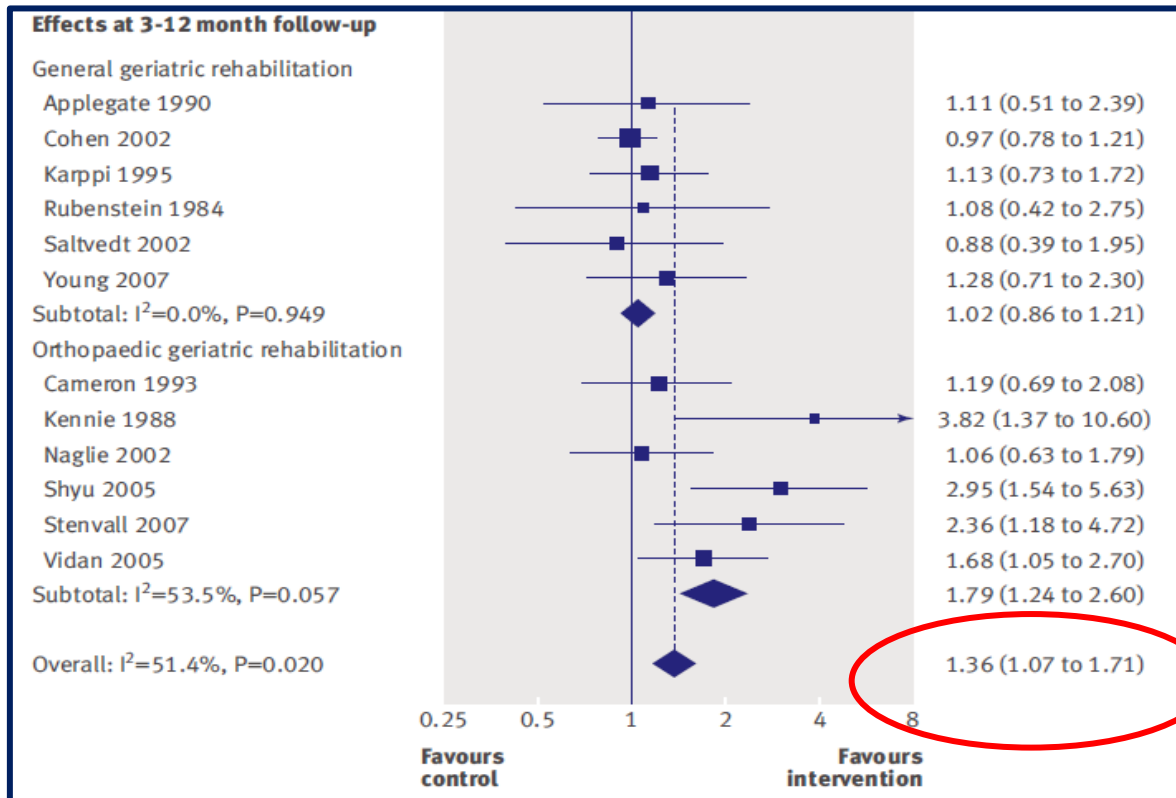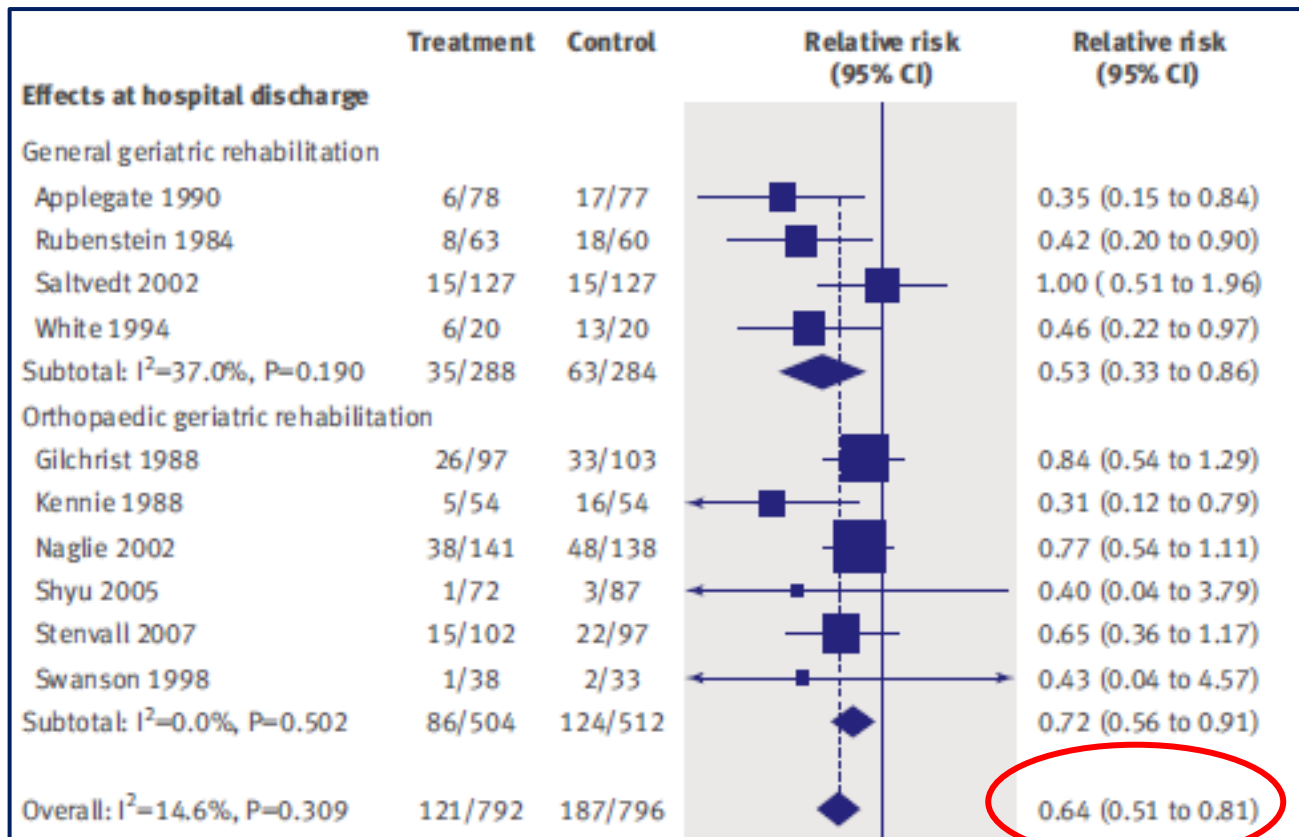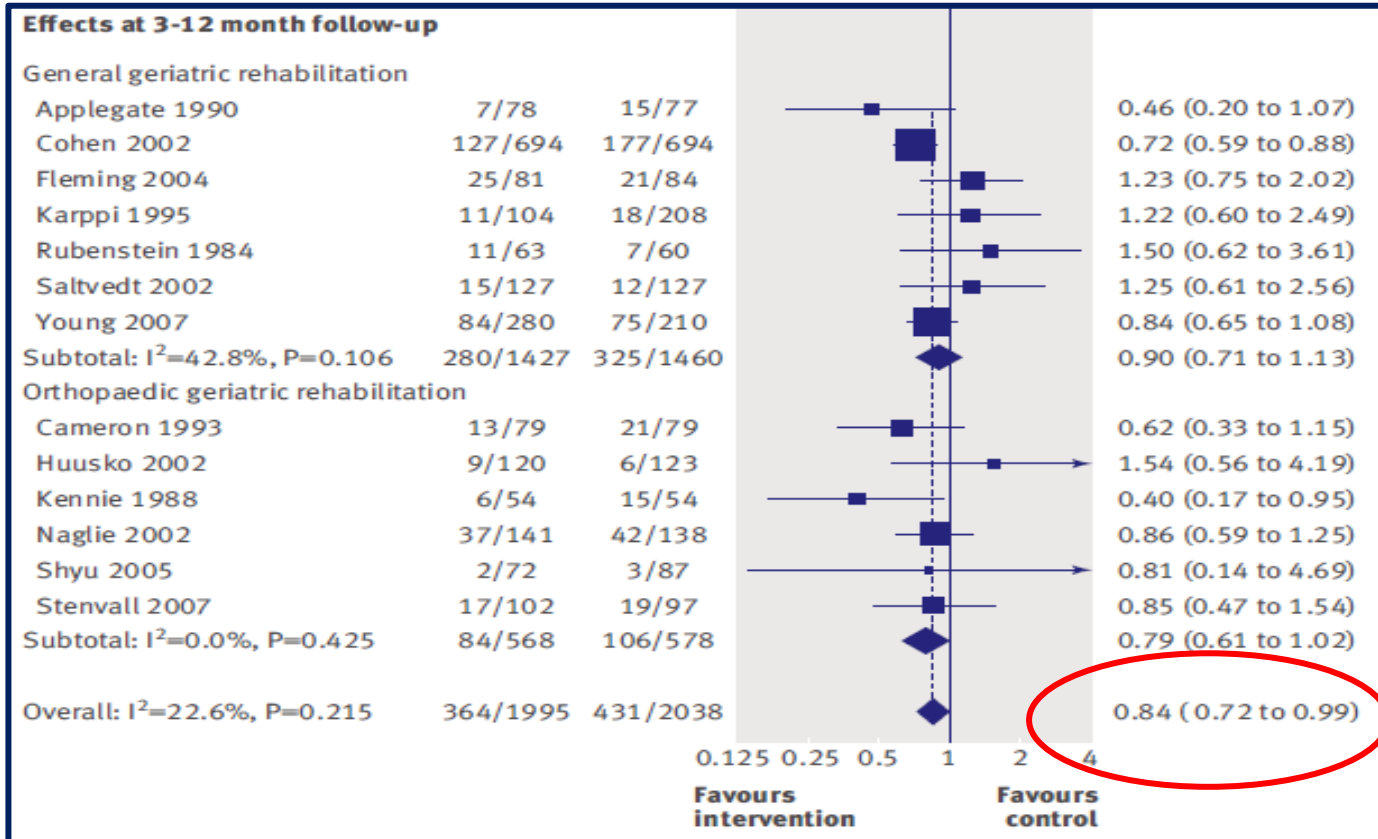
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EFFECT OF INPATIENT REHABILITATION SPECIFICALLY DESIGNED FOR GERIATRIC PATIENTS ON FUNCTIONAL IMPROVEMENT AT HOSPITAL DISCHARGE.

EFFECT OF INPATIENT REHABILITATION SPECIFICALLY DESIGNED FOR GERIATRIC PATIENTS ON FUNCTIONAL IMPROVEMENT AT FOLLOW-UP.

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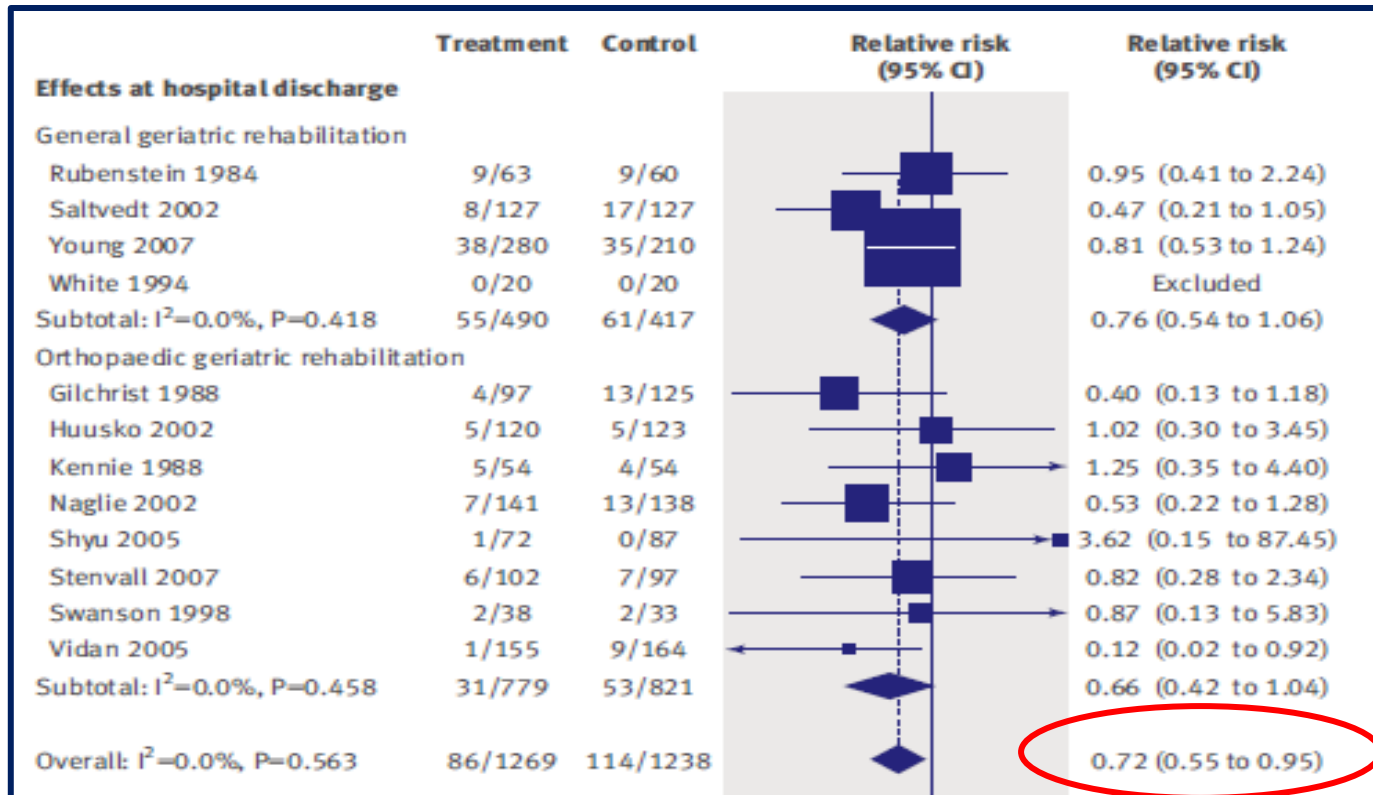
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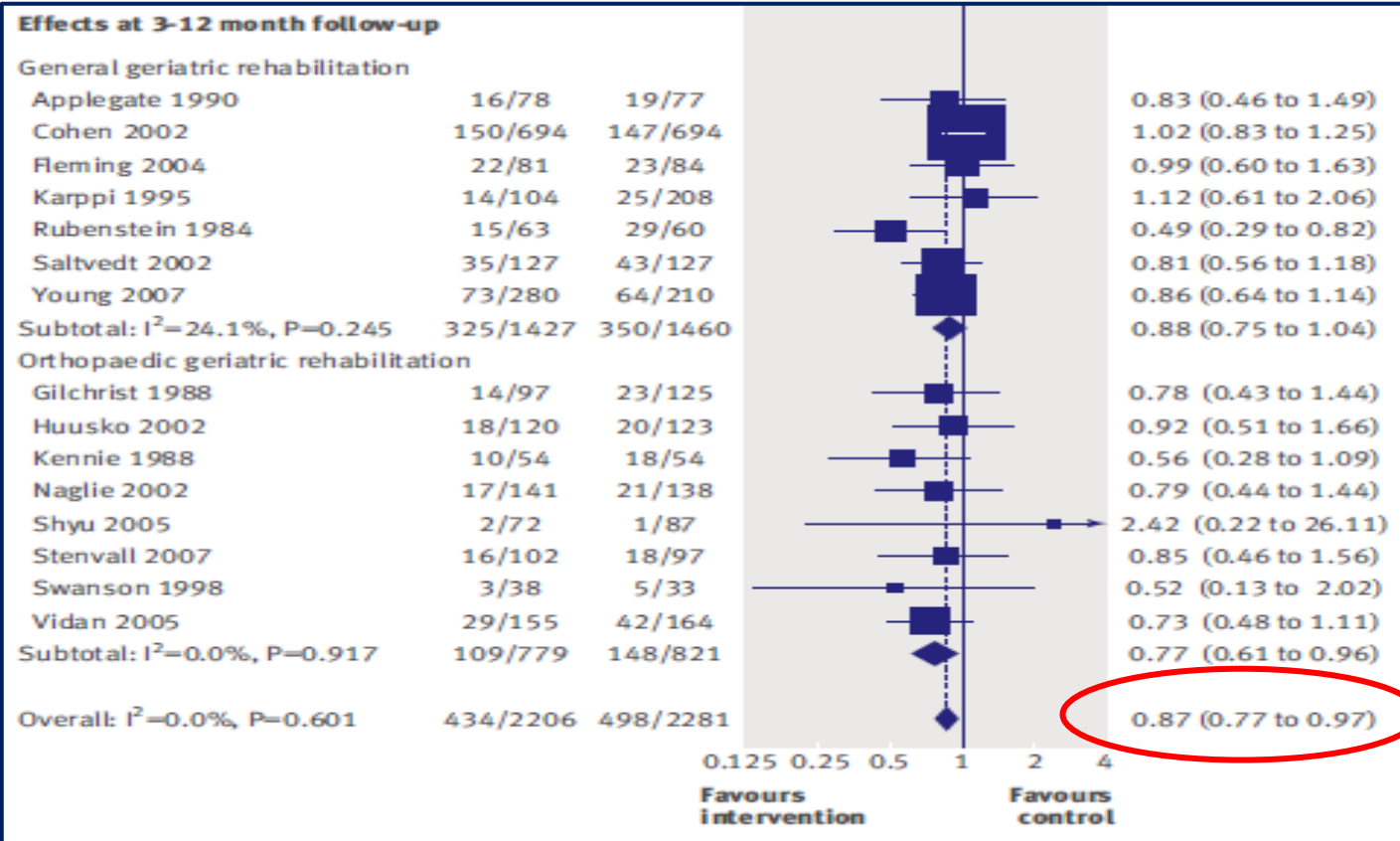
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EFFECT OF INPATIENT REHABILITATION SPECIFICALLY DESIGNED FOR GERIATRIC PATIENTS ON MORTALITY AT HOSPITAL DISCHARGE.

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Effects at 3–12 month follow-up

General geriatric rehabilitation				
Applegate 1990	16/78	19/77		0.83 (0.46 to 1.49)
Cohen 2002	150/694	147/694		1.02 (0.83 to 1.25)
Fleming 2004	22/81	23/84		0.99 (0.60 to 1.63)
Karppi 1995	14/104	25/208		1.12 (0.61 to 2.06)
Rubenstein 1984	15/63	29/60		0.49 (0.29 to 0.82)
Saltvedt 2002	35/127	43/127		0.81 (0.56 to 1.18)
Young 2007	73/280	64/210		0.86 (0.64 to 1.14)
Subtotal: I^2=24.1%, P=0.245	325/1427	350/1460		0.88 (0.75 to 1.04)
Orthopaedic geriatric rehabilitation				
Gilchrist 1988	14/97	23/125		0.78 (0.43 to 1.44)
Huusko 2002	18/120	20/123		0.92 (0.51 to 1.66)
Kennie 1988	10/54	18/54		0.56 (0.28 to 1.09)
Naglie 2002	17/141	21/138		0.79 (0.44 to 1.44)
Shyu 2005	2/72	1/87		2.42 (0.22 to 26.11)
Stenvall 2007	16/102	18/97		0.85 (0.46 to 1.56)
Swanson 1998	3/38	5/33		0.52 (0.13 to 2.02)
Vidan 2005	29/155	42/164		0.73 (0.48 to 1.11)
Subtotal: I^2=0.0%, P=0.917	109/779	148/821		0.77 (0.61 to 0.96)
Overall: I^2=0.0%, P=0.601	434/2206	498/2281		0.87 (0.77 to 0.97)

0.125 0.25 0.5 1 2 4

Favours intervention — Favours control

EFFECT OF INPATIENT REHABILITATION SPECIFICALLY DESIGNED FOR GERIATRIC PATIENTS ON MORTALITY AT FOLLOW-UP.

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TAKE HOME MESSAGE

WHAT IS ALREADY KNOWN ON THIS TOPIC

Inpatient rehabilitation programmes specifically designed for patients with cardiac, neurological, pulmonary, or musculoskeletal problems have been shown to improve outcomes

Older patients admitted to acute care hospitals are at increased risk for decline in functional status and admission to nursing homes

WHAT THIS STUDY ADDS

Inpatient geriatric rehabilitation programmes specifically designed for older people show sustained effects on improving functional status and reducing admissions to nursing homes and mortality

Such programmes might increase or decrease the overall length of hospital stay, depending on type and concept of the programme

Reduction in admissions to nursing homes might result in cost savings or offset additional costs of the initial inpatient rehabilitation

Predictors of improved functional outcome in elderly inpatients after rehabilitation: a retrospective study

RETROSPECTIVE COHORT STUDY WITH 1,079 PTS (AGE ,70 <YEARS: N=331, AGE> 70 YEARS: N=748)

	Below 70 yr	Above 70 yr	P-value
N (M/F)	331 (180/151)	748 (270/478)	
Age (yr)	53.9±14.1	82.9±6.8	<0.0001*
Length of hospital stay (day)	28.9±27.7	33.4±24.4	<0.0001*
FIM score			
At admission	82.2±25.3	56.0±26.2	<0.0001*
At discharge	108.0±23.9	76.6±34.9	<0.0001*
FIM gain	25.8±23.3	20.6±21.5	<0.0001*
FIM efficiency	1.44±1.5	0.83±1.0	<0.0001*
Residence at admission			
Home	313	568	<0.0001**
Hospital†	18	180	
Residence at discharge			
Home	287	445	<0.0001**
Hospital†	38	280	
Dead	6	23	

FIM™ instrument

		NO HELPER
7 Complete Independence (Timely, Safely) 6 Modified Independence (Device)		NO HELPER
Modified Dependence 5 Supervision (Subject = 100%+) 4 Minimal Assist (Subject = 75%+) 3 Moderate Assist (Subject = 50%+)		HELPER
Complete Dependence 2 Maximal Assist (Subject =25%+) 1 Total Assist (Subject = less than 25%)		HELPER

L E V E L S

	ADMISSION	DISCHARGE	FOLLOW-UP
Self-Care A. Eating B. Grooming C. Bathing D. Dressing – Upper Body E. Dressing – Lower Body F. Toileting			
Sphincter Control G. Bladder Management H. Bowel Management			
Transfers I. Bed, Chair, Wheelchair J. Toilet K. Tub, Shower			
Locomotion L. Walk/Wheelchair M. Stairs			
Motor Subtotal Score			
Communication N. Comprehension O. Expression			
Social Cognition P. Social Interaction Q. Problem Solving R. Memory			
Cognitive Subtotal Score			
TOTAL FIM Score			

NOTE: Leave no blanks. Enter 1 if patient not testable due to risk

THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PREDICTORS OF IMPROVED FUNCTIONAL OUTCOME AFTER REHABILITATION OF ELDERLY INPATIENTS. FUNCTIONAL INDEPENDENCE MEASURE (FIM) SCORES WERE MEASURED BOTH AT ADMISSION AND DISCHARGE TO CALCULATE FIM GAIN AND EFFICIENCY.

Predictors of improved functional outcome in elderly inpatients after rehabilitation: a retrospective study
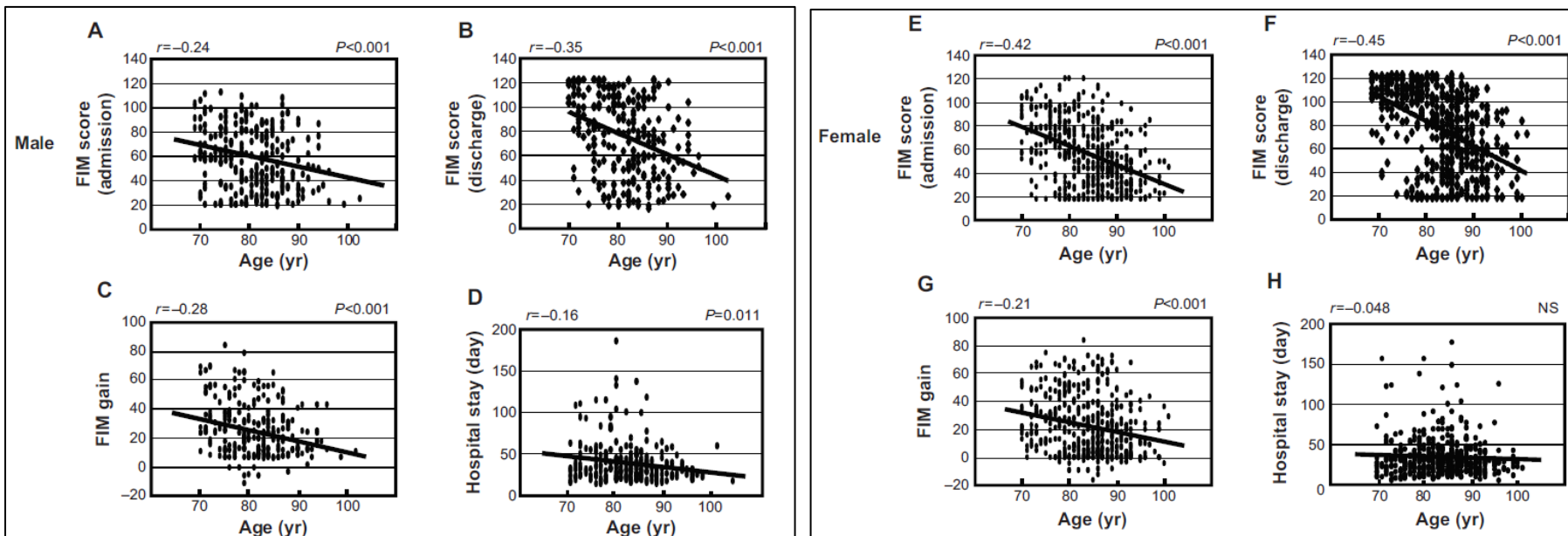
THE ASSOCIATION BETWEEN AGE AND FIM SCORES IN MALES AND FEMALES

AS SHOWN IN FIGURE, THERE WAS A SIGNIFICANT NEGATIVE CORRELATION BETWEEN FIM SCORE AT ADMISSION, DISCHARGE AND FIM GAIN WITH AGE IN MALES (FIM SCORE AT ADMISSION: R=-0.24, P,0.001; FIM SCORE AT DISCHARGE: R=-0.35, P,0.001; FIM GAIN: R=-0.28, P,0.001). SIMILARLY, THERE WAS A SIGNIFICANT NEGATIVE CORRELATION BETWEEN FIM SCORE AT ADMISSION, DISCHARGE AND FIM GAIN WITH AGE IN FEMALES (FIM SCORE AT ADMISSION: R=-0.42, P,0.001; FIM SCORE AT DISCHARGE: R=-0.45, P,0.001; FIM GAIN: R=-0.21, P,0.001). THERE WAS A NEGATIVE CORRELATION BETWEEN THE LENGTH OF HOSPITAL STAY AND AGE IN MALES, BUT NOT IN FEMALES (MALES: R=-0.16, P=0.011; FEMALES: R=-0.048, P=0.30).

Predictors of improved functional outcome in elderly inpatients after rehabilitation: a retrospective study

	Male	Female	P-value
N	256	469	
Age (yr)	81.3±6.4	83.8±6.8	<0.0001*
Length of hospital stay (day)	32.7±26.3	33.3±23.4	0.094
FIM score			
At admission	56.6±26.2	56.3±26.0	0.855
At discharge	77.7±33.7	78.3±34.4	0.813
FIM gain	21.2±19.9	22.0±21.0	0.992
FIM efficiency	0.92±1.1	0.84±1.0	0.338

COMPARISON OF SEX IN FIM SCORE DURING HOSPITAL STAY

ALTHOUGH THERE WAS A STATISTICAL DIFFERENCE IN AGE BETWEEN MALES AND FEMALES (MALES: 81.3±6.4 YEARS, N=256; FEMALES: 83.8±6.8 YEARS, N=469, P,0.0001, MANN–WHITNEY U-TEST) THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN MALES AND FEMALES IN FIM GAIN OR FIM EFFICIENCY.

Naruishi et al, Clinical Interventions in Aging 2014:9 2133–2141

Predictors of improved functional outcome in elderly inpatients after rehabilitation: a retrospective study

Factor	Class	N (M/F)	FIM gain	FIM efficiency	FIM improve (%)
Posterior occlusion	Stable	203 (72/131)	17.1±20.4	0.668±0.95	42.2±65.6
	Loss	59 (29/30)	12.7±17.8	0.436±0.63	37.7±56.5
			P=0.129	P=0.0672	P=0.646
Lips closure	Closed	222 (82/140)	17.8±20.4	0.702±0.90	20.7±41.4
	Opened	40 (19/21)	6.5±13.1	0.133±0.65	44.8±66.2
			P<0.0001*	P<0.0001*	P=0.002*
Tongue movement	Functional	196 (72/124)	19.1±20.8	0.731±0.95	47.8±68.5
	Dysfunctional	66 (29/37)	7.2±13.6	0.273±0.58	21.5±40.1
			P<0.0001*	P<0.0001*	P<0.0001*
Teeth	Remaining	171 (72/99)	17.0±20.8	0.642±0.97	42.7±66.4
	Edentulous	91 (29/62)	14.3±18.0	0.565±0.70	38.3±57.9
			P=0.375	P=0.653	P=0.437
Mobile teeth	Presence	39 (19/20)	15.8±22.7	0.665±1.3	51.8±95.7
	None	223 (82/141)	16.1±19.4	0.607±0.81	39.3±56.2
			P=0.840	P=0.633	P=0.588
Cerebrovascular disease	Presence	120 (50/70)	13.8±18.4	0.586±0.79	36.5±56.5
	None	142 (51/91)	18.0±21.0	0.640±0.97	45.1±68.9
			P=0.0824	P=0.329	P=0.220
Cerebrovascular disease + Loss of posterior occlusion	Presence	30 (13/17)	8.1±14.8	0.366±0.67	27.9±56.1
	None	232 (88/144)	17.1±20.3	0.648±0.91	42.9±64.4
			P=0.0073*	P=0.0199*	P=0.073
Cognitive impairment	Presence	150 (55/95)	12.1±17.9	0.467±0.78	37.5±62.8
	None	112 (46/66)	21.5±21.2	0.814±0.98	46.2±64.6
			P<0.0001*	P<0.0001*	P=0.009*
Aspiration pneumonia	Presence	62 (26/36)	9.23±16.0	0.330±0.59	26.7±48.3
	None	200 (75/125)	18.2±20.5	0.704±0.95	45.7±69.1
			P=0.0002*	P=0.0001*	P=0.002*

THE ABILITY TO CLOSE THE LIPS AND FUNCTIONAL TONGUE MOVEMENT WERE SIGNIFICANT PREDICTORS OF INCREASED FIM GAIN, FIM EFFICIENCY, AND THE RATIO OF FIM IMPROVEMENT AFTER REHABILITATION (P,0.001, MANN–WHITNEY U-TEST, RESPECTIVELY). NO SIGNIFICANT DIFFERENCE BETWEEN STABLE OR LOST POSTERIOR, ABSENCE OF TEETH OR PRESENCE OF MOBILE TEETH. THERE WAS A SIGNIFICANT NEGATIVE CORRELATION BETWEEN THE PRESENCE OF COGNITIVE IMPAIRMENT OR ASPIRATION PNEUMONIA AND FIM GAIN, FIM EFFICIENCY OR RATIO OF FIM IMPROVEMENT.

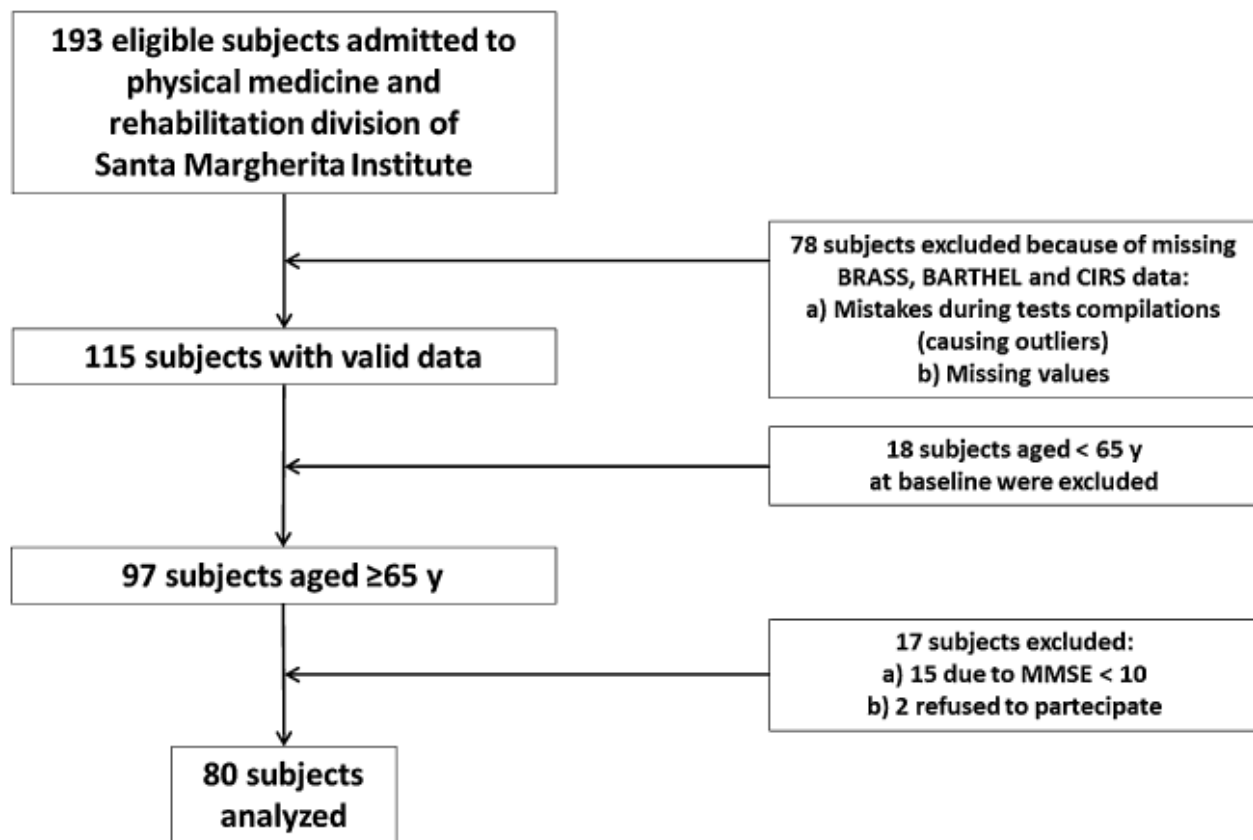# Predictors of improved functional outcome in elderly inpatients after rehabilitation: a retrospective study

Factor	Odds ratio	95% CI	P-value
Stable posterior occlusion	2.23	1.2~4.1	0.008*
Closed lips	5.15	2.3~11.7	<0.0001*
Functional tongue movement	5.74	3.0~11.0	<0.0001*
Remaining teeth	1.16	0.70~1.9	0.57
Presence of mobile teeth	1.16	0.58~2.3	0.68
Presence of cerebrovascular disease	0.65	0.40~1.1	0.09
Presence of cerebrovascular disease + Loss of posterior occlusion	0.31	0.13~0.73	0.005*
Presence of cognitive impairment	0.29	0.17~0.49	<0.0001*
Presence of aspiration pneumonia	0.27	0.15~0.51	<0.0001*

STABLE POSTERIOR OCCLUSION, ABILITY TO CLOSE THE LIPS AND FUNCTIONAL TONGUE MOVEMENT WERE SIGNIFICANT FACTORS PREDICTING AN IMPROVEMENT OF FIM SCORE. THERE WAS A SIGNIFICANT NEGATIVE CORRELATION BETWEEN THE PRESENCE OF COGNITIVE IMPAIRMENT OR ASPIRATION PNEUMONIA AND THE IMPROVEMENT OF FIM SCORE, WHEREAS THERE WAS NO CORRELATION BETWEEN PRESENCE OF CEREBROVASCULAR DISEASE AND IMPROVEMENT OF FIM SCORE. INTERESTINGLY, THERE WAS A SIGNIFICANT NEGATIVE CORRELATION BETWEEN THE COMBINATION OF CEREBROVASCULAR DISEASE AND LOSS OF POSTERIOR OCCLUSION AND THE IMPROVEMENT OF FIM SCORES.

A comorbidity prognostic effect on post-hospitalization outcome in a geriatric rehabilitation setting: the pivotal role of functionality, assessed by mediation model, and association with the Brass index
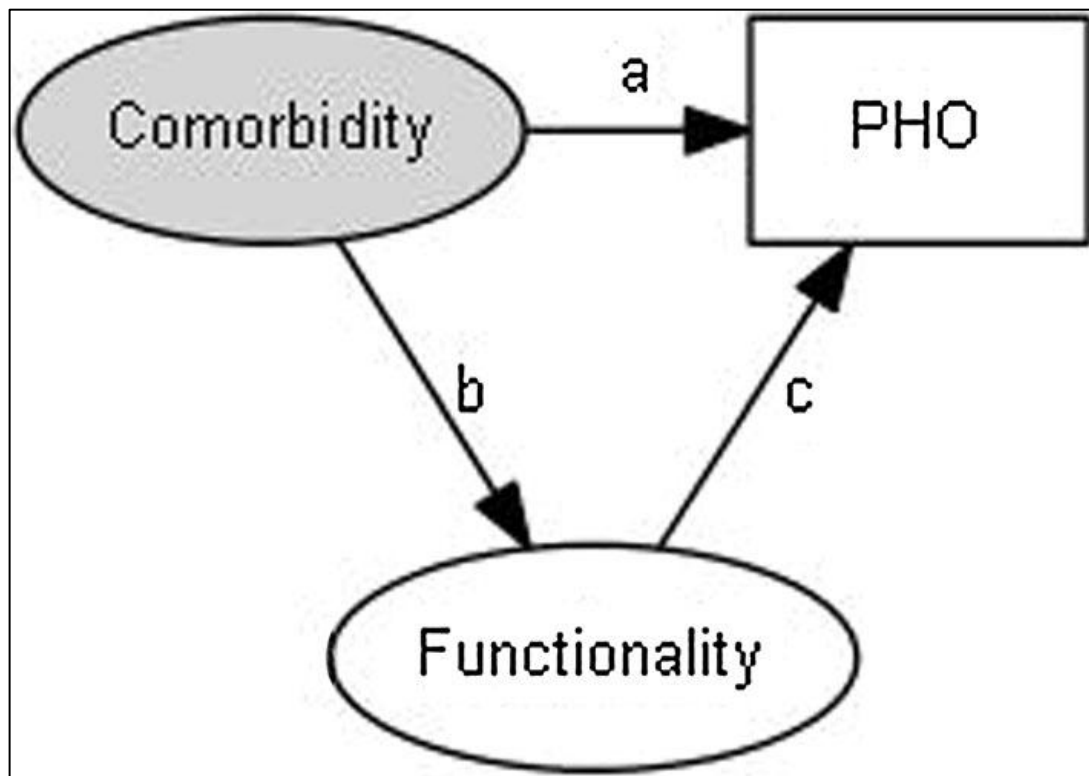
Davide Guido[1] · Simone Perna[2] · Gabriella Peroni[2] · Fabio Guerriero[3] · Mariangela Rondanelli[2]

193 eligible subjects admitted to physical medicine and rehabilitation division of Santa Margherita Institute

78 subjects excluded because of missing BRASS, BARTHEL and CIRS data:
a) Mistakes during tests compilations (causing outliers)
b) Missing values

115 subjects with valid data

18 subjects aged < 65 y at baseline were excluded

97 subjects aged ≥65 y

17 subjects excluded:
a) 15 due to MMSE < 10
b) 2 refused to partecipate

80 subjects analyzed

AIM OF THIS STUDY WAS TO EVALUATE THE EFFECTS OF COMORBIDITY AND FUNCTIONALITY IN IDENTIFYING PATIENTS WHO ARE AT RISK OF DISCHARGE PROBLEMS. IT WAS ALSO INVESTIGATED THE ASSOCIATION BETWEEN BLAYLOCK RISK ASSESSMENT SCREENING SCORE, BRASS INDEX (BI), AND POST-HOSPITALIZATION OUTCOME (PHO).

A comorbidity prognostic effect on post-hospitalization outcome in a geriatric rehabilitation setting: the pivotal role of functionality, assessed by mediation model, and association with the Brass index

Davide Guido[1] · Simone Perna[2] · Gabriella Peroni[2] · Fabio Guerriero[3] · Mariangela Rondanelli[2]

COMORBIDITY MEASUREMENT BY CUMULATIVE ILLNESS RATING SCALE (CIRS)

ELDERLY FUNCTIONALITY MEASUREMENT BY BARTHEL INDEX

HOSPITALIZATION RISK MEASUREMENT BY BLAYLOCK RISK ASSESSMENT SCREENING

A comorbidity prognostic effect on post-hospitalization outcome in a geriatric rehabilitation setting: the pivotal role of functionality, assessed by mediation model, and association with the Brass index

Davide Guido[1] · Simone Perna[2] · Gabriella Peroni[2] · Fabio Guerriero[3] · Mariangela Rondanelli[2]

	Estimate (β)	P ($|Z| > z$)	95 % CI
Comorbidity → PHO (a) (direct)	−0.133	0.735	−0.901; 0.636
Comorbidity → PHO ($b \times c$) (indirect)	0.703	0.019	0.115; 1.291
Comorbidity → functionality (b)	−30.279	0.001	−47.44; −13.12
Functionality → PHO (c)	−0.023	<0.001	−0.035; −0.012

COMORBIDITY (CIRS-G MEASURED) DID NOT RESULT DIRECTLY LINKED TO PHO "FRAILTY" (A = -0.133, P = 0.735[0.05 NOT SIGNIFICANT). CONVERSELY, A TENFOLD UNIT INCREASE IN FUNCTIONALITY (BARTHEL MEASURED), DECREASES PHO BY C = 0.23 (P\0.001) STANDARD UNITS.
COMORBIDITY RESULTED VERY NEGATIVELY RELATED WITH FUNCTIONALITY (P = 0.001): FOR UNIT INCREASE OF COMORBIDITY, FUNCTIONALITY DECREASE OF B = 30.279 BARTHEL UNITS

A comorbidity prognostic effect on post-hospitalization outcome in a geriatric rehabilitation setting: the pivotal role of functionality, assessed by mediation model, and association with the Brass index

Davide Guido[1] · Simone Perna[2] · Gabriella Peroni[2] · Fabio Guerriero[3] · Mariangela Rondanelli[2]

TAKE HOME MESSAGE

THE COMORBIDITY HAS A ROLE IN GETTING WORSE PHO, BUT ITS EFFECT IS POSSIBLE ONLY THROUGH THE MEDIATION OF FUNCTIONAL STATUS. THE STUDY ALSO DEMONSTRATED THE POSITIVE ASSOCIATION BETWEEN BI AND PHO.

Heterogeneity of Physical Function Responses to Exercise Training in Older Adults

Elizabeth A. Chmelo, MS[1], Charlotte I. Crotts[1], Jill C. Newman[2], Tina E. Brinkley, PhD[1], Mary F. Lyles, MD[1], Xiaoyan Leng[2], Anthony P. Marsh, PhD[3], and Barbara J. Nicklas, PhD[1]

N= 95

	Aerobic Training (n=40)	Resistance Training (n=55)
Age (yrs)	69.0 (3.6)	69.1 (3.4)
Female No. (%)	31 (78%)	28 (50%)
Whites No. (%)	33 (83%)	48 (87%)
BMI (kg/m²)	34.1 (3.1)	30.6 (2.4)
Percent body fat (%)	44.2 (5.3)	38.4 (6.4)
Fat mass (kg)	41.8 (6.9)	32.8 (5.8)
Lean mass (kg)	52.9 (9.9)	55.0 (12.1)
Waist (cm)	104.3 (11.1)	96.2 (9.4)
Hip (cm)	117.2 (8.3)	108.3 (6.7)
WHR	0.89 (0.10)	0.89 (0.10)
Systolic blood pressure (mmHg)	133.5 (12.9)	137.2 (22.5)
Diastolic blood pressure (mmHg)	75.2 (10.8)	77.1 (11.0)
Self-reported comorbidity		
Hypertension	23 (58%)	26 (47%)
Diabetes*	8 (20%)	8 (15%)
Sleep apnea	13 (33%)	16 (29 %)
Arthritis	31 (78%)	32 (58%)
Chronic back pain	15 (38%)	10 (18%)
Medication use		
Anti-hypertensive	26 (65%)	31 (56%)
Cholesterol-lowering	21 (53%)	22 (40%)
Glucose control	8 (20%)	7 (13%)
Thyroid	5 (13%)	15 (27%)
Anti-depressant/mood	16 (40%)	8 (15%)

PARTICIPANTS' ENROLLED CRITERIA:

(A) AGE 65–79 YEARS,
(B) SEDENTARY (<2×/WEEK OF STRUCTURED EXERCISE),
(C) BMI=27–40 KG/M$_2$,
(D) NON-SMOKING FOR THE PAST YEAR,
(E) NORMAL COGNITIVE FUNCTION,
(F) NO EVIDENCE OF CLINICAL DEPRESSION, HEART DISEASE, CANCER, LIVER OR RENAL DISEASE, CHRONIC PULMONARY DISEASE, UNCONTROLLED HYPERTENSION, PHYSICAL IMPAIRMENT OR ANY CONTRAINDICATION FOR EXERCISE

Assessments

Baseline assessments were conducted within three weeks of the start of interventions and post-assessments were conducted 20–21 weeks after the start of intervention while participants were still exercising. Physical function assessments were performed by all participants, except for the peak aerobic capacity test, which was only conducted in the AT study and the isokinetic knee extensor strength test which was only conducted in the RT study.

Body composition (whole body fat mass, lean mass and percent body fat) was measured by dual x-ray absorptiometry (DXA; Hologic Delphi QDR, Bedford, MA).

Peak aerobic capacity (VO$_2$peak) was determined on a motorized treadmill during a graded exercise test to exhaustion using a Ramp protocol as previously described,[27] in which speed was held constant as the grade increased incrementally. Each test achieved two of the following three criteria to be considered:[28;29] 1) plateau in oxygen consumption with increasing workload (< 200 ml/min); 2) respiratory exchange ratio ≥1.10; and 3) maximal HR within 90% of age-predicted.

Mobility was assessed using a 400-meter walk test.[28;29] Participants were instructed to complete the distance (10 laps on a flat indoor surface 20m in length) as quickly as possible. Time to complete the walk was recorded in seconds. Standardized encourage was given every lap.

Lower extremity function was assessed using the Short Physical Performance Battery (SPPB).[30] The battery consists of three measures including usual gait speed over a 4m course, time to complete five repeated chair rises without use of their arms, and a standing balance test. Results from each of the three tests are scored from 0, indicating inability to perform the test, to 4 indicating highest function. Scores from the three tasks are summed for the total SPPB score, ranging from 0 (lowest function) to 12 (highest function).

Maximal knee extensor strength was measured on an isokinetic dynamometer (Biodex) at a speed of 60° per second with the participant sitting and the hips and knees flexed at 90°. Participants were asked to extend the knee and push as hard as possible against the resistance pad. Strength of the right leg recorded as peak torque in Newton-meters (Nm) was used for analyses.

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Physical Function Variables Before and After 5-months of Either Aerobic or Resistance Training

	Aerobic Training			Resistance Training		
	Pre-ex	Post-ex	p-value	Pre-ex	Post-ex	p-value
400-meter walk time (min:sec)	5:25 ± 1:05	5:00 ± 1:01	<0.001	5:08 ± 0:51	5:10 ± 1:05	0.58
Usual gait speed (m/sec) *	1.02 ± 0.18	1.10 ± 0.19	<0.001	1.15 ± 0.19	1.23 ± 0.21	<0.01
Chair rise time (sec)	13.7 ± 3.7	12.0 ± 3.1	<0.01	12.0 ± 3.3	10.2 ± 2.5	<0.001
SPPB score (0–12)	10.3 ± 1.8	10.9 ± 1.4	<0.01	10.8 ± 1.2	11.4 ± 1.1	<0.01
VO$_2$peak (ml/kg/min)	18.8 ± 3.7	20.3 ± 4.0	<0.001		Not Measured	
Knee extensor strength (Nm)		Not Measured		122 ± 44	130 ± 46	<0.01

AT BASELINE, PARTICIPANTS HAD A MEAN SPPB SCORE >10, A USUAL GAIT SPEED >1.0 M/SEC, AND WERE ABLE TO COMPLETE THE 400-METER WALK IN LESS THAN FIVE AND ONE-HALF MINUTES. ON AVERAGE, PHYSICAL FUNCTION MEASURES SIGNIFICANTLY IMPROVED IN RESPONSE TO AT AND RT (WITH THE EXCEPTION OF THE 400-M WALK IN RT).
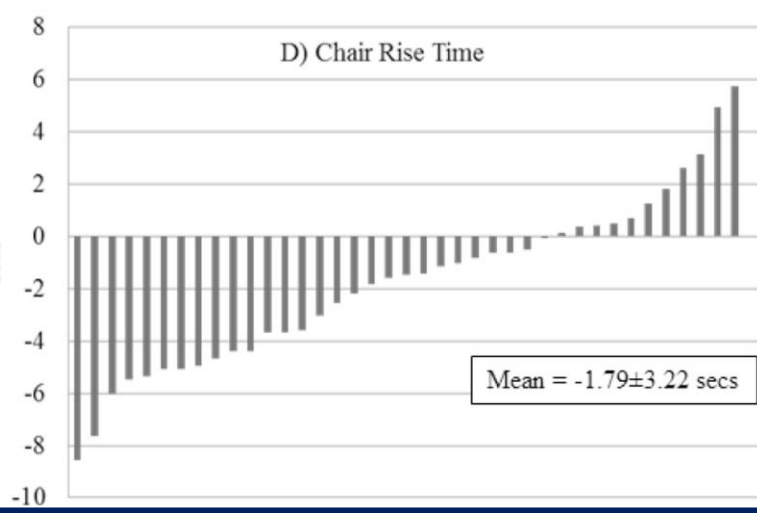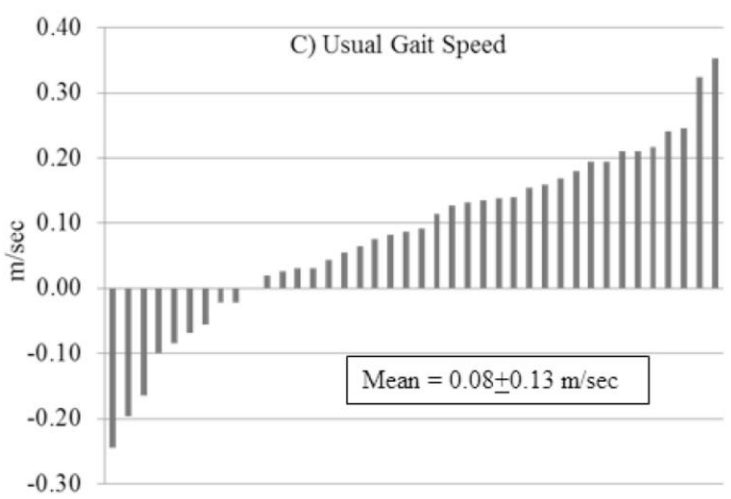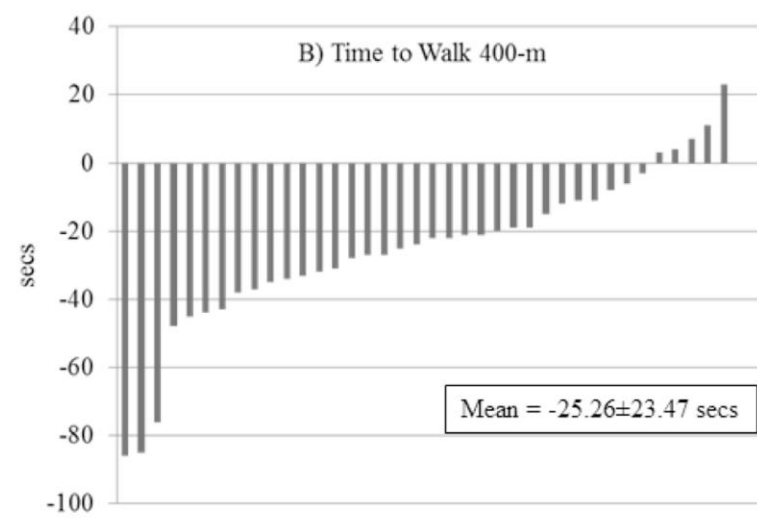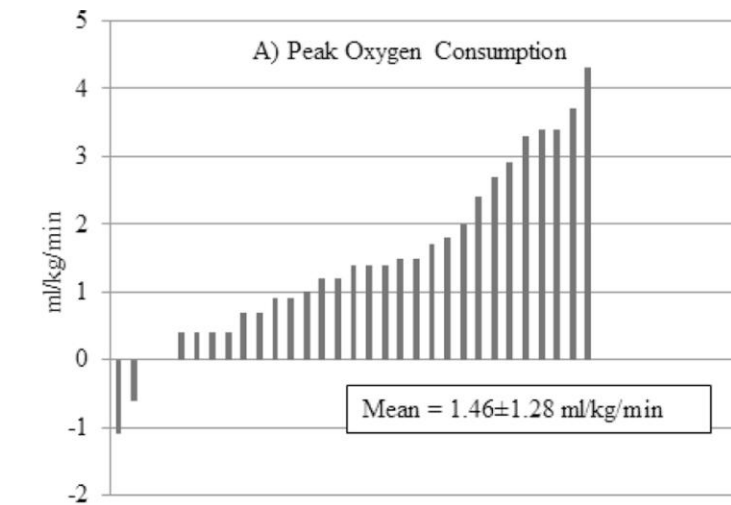
Physical Function Response Variability by Percent Improvement from Baseline

Aerobic Training

Function variable (% change as X±SD, n)	No Improvement			Improvement			
	≤ −20%	−10 − 19.9%	−0.1 − 9.9%	None	0.1 − 9.9%	10 − 19.9%	≥20%
400-m walk time (−7.6±6.8%, n=38)	0	0	4	2	20	11	1
Usual gait speed (7.0±12.0%, n=40)	1	2	6	1	11	16	3
Chair rise time (−10.3±22.4%, n=39)	4	2	4	1	6	4	18
SPPB score (9.4±24.6%, n=40)	2	1	5	11*	4	6	11
VO_2peak (7.9±6.9%, n=31)	0	0	2	2	17	9	1

Resistance Training

Function variable (% change; X±SD)	No Improvement			Improvement			
	≤ −20%	−10 − 19.9%	−0.1 − 9.9%	None	0.1 − 9.9%	10 − 19.9%	≥20%
400-m walk time (1.2±13.2%, n=54)	6	2	19	2	15	8	2
Usual gait speed (5.6±12.8%, n=55)	2	5	8	1	18	13	8
Chair rise time (−10.4± 25.7%, n=54)	4	6	5	3	7	7	22
SPPB score (5.8±12.8%, n=55)	1	5	0	23*	0	17	9
Knee extensor strength (8.1±15.4%, n=53)	2	2	10	2	14	13	10

DESPITE SUFFICIENT LEVELS OF ADHERENCE TO BOTH EXERCISE INTERVENTIONS, SOME PARTICIPANTS DID NOT IMPROVE FUNCTION, AND THE MAGNITUDE OF IMPROVEMENT VARIED WIDELY.

A) Peak Oxygen Consumption — Mean = 1.46±1.28 ml/kg/min

B) Time to Walk 400-m — Mean = -25.26±23.47 secs

C) Usual Gait Speed — Mean = 0.08±0.13 m/sec

D) Chair Rise Time — Mean = -1.79±3.22 secs

IN RESPONSE TO AT, THERE WAS AN OVERALL 7.9% INCREASE IN VO2 PEAK. ALTHOUGH THE MAJORITY OF PARTICIPANTS IMPROVED THEIR 400-M WALK TIME (N=32, 84%), USUAL GAIT SPEED (N=30, 75%), AND CHAIR RISE TIME (N=28, 72%) WITH AT, THERE WAS LARGE VARIATION IN THE MAGNITUDE OF IMPROVEMENT AND A SUBSET OF PARTICIPANTS EXPERIENCED NO CHANGE OR A DECLINE IN THESE FUNCTIONAL VARIABLES.

A) Knee Extensor Strength — Mean = 0.08±17.10 Km

B) Time to Walk 400-m — Mean = 3.13±41.15 secs

C) Usual Gait Speed — Mean = 0.80±0.17 m/sec

D) Chair Rise Time — Mean = -1.71±3.05 secs
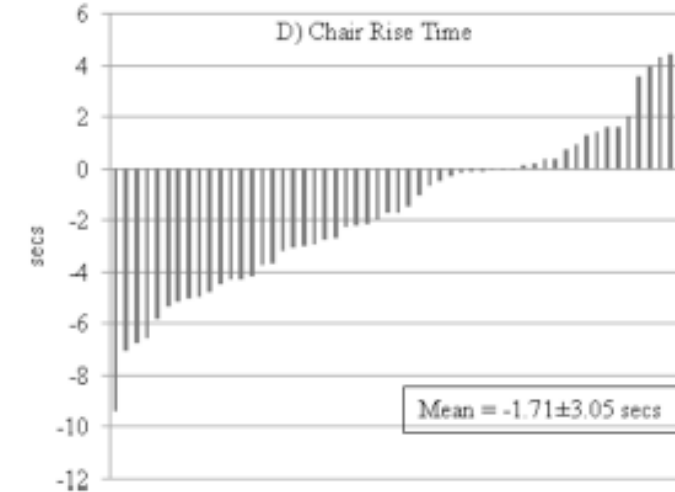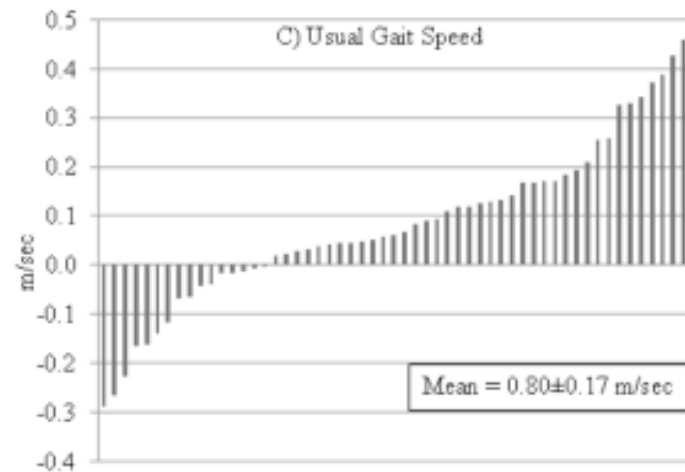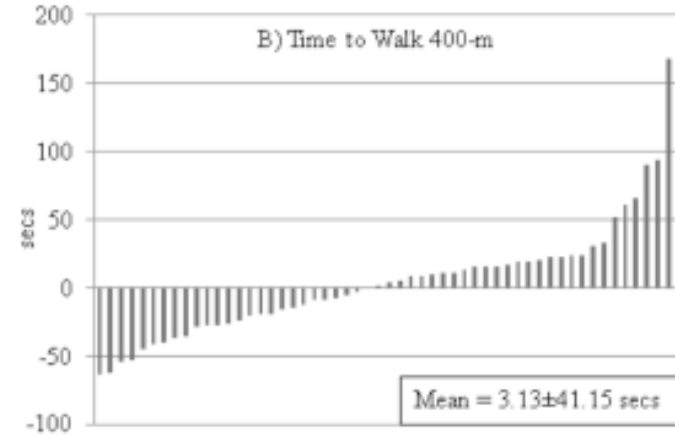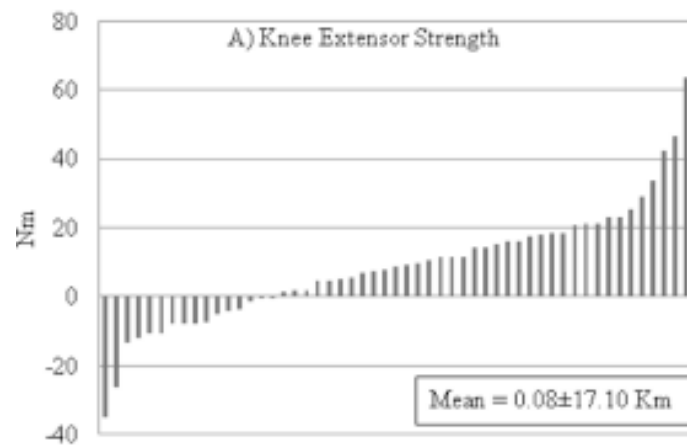
IN RESPONSE TO RT, KNEE EXTENSOR STRENGTH IMPROVED AN AVERAGE OF 8.1% AMONG PARTICIPANTS. THE MAJORITY IMPROVED THEIR USUAL GAIT SPEED (N=39, 71%) AND CHAIR RISE TIME (N=36, 67%) WITH RT, BUT, AGAIN, THERE WAS WIDE VARIATION IN THE MAGNITUDE OF IMPROVEMENT AND SOME PARTICIPANTS EXPERIENCED NO CHANGE OR A DECLINE IN USUAL GAIT SPEED AND CHAIR RISE TIME

CONCLUSIONI

LA RIABILITAZIONE GERIATRICA RAPPRESENTA UNA SFIDA CLINICA

IDENTIFICARE LE "BARRIERE" ALLA RIABILITAZIONE

SONO NECESSARI STUDI PER INDIVIDUARE GLI STRUMENTI OGGETTIVI PER MISURARE I RISULTATI, PER RILEVARE I SUCCESSI (LA STRADA DA PROSEGUIRE), LE INADEGUATEZZE (L'EQUIPE DEVE CAMBIARE STRADA), LE DIFFICOLTÀ CLINICHE OGGETTIVE.

PRECOCE IDENTIFICAZIONE DEGLI EVENTI ACUTI INTERCORRENTI (WHAT HAS CHANGED?)

PROTOCOLLI RIABILITATIVI/PERCORSI SPECIFICI PER PERSONE CON DECADIMENTO COGNITIVO (QUALI OBIETTIVI?), DENUTRIZIONE, MALATTIE SOMATICHE O NEUROLOGICHE: MANUTENZIONE O RESTAURO.

AVVICINARE LE INFORMAZIONI DELLA MEDICINA SCIENTIFICA ALLE INDICAZIONI DEL MONDO REALE. UNA PROBLEMATICA IN CONTINUA EVOLUZIONE.

Gruppo di ricerca geriatrica

Meglio aggiungere vita ai giorni
che non giorni alla vita.
Rita Levi-Montalcini