
ANCE
Cardiologia Italiana del Territorio

# Riabilitazione e scompenso cardiaco: realtà emergente

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# Riabilitazione nello Scompenso Cardiaco

- Linee guida
- Stato dell'arte su riabilitazione e scompenso cardiaco (SC)
- Quali pazienti riabilitare?
- Quale riabilitazione utilizzare ?
- Dati dal mondo reale

# Linee Guida

**Cardiac rehabilitation**

Rehabilitation programmes need to be structured, with clear ob
a monitoring component.

- Offer people with heart failure a personalised, exercise b
  rehabilitation programme, unless their condition is unstal
  programm
  - Should b
    for the p
  - Should b
    or in the
  - Should i
  - May be
    program
  - Should b
    healthca

(Updated recom

*7.3.1.6. Activity, Exercise Prescription, and Cardiac Rehabilitation: Recommendations*

**Class I**

1. **Exercise training (or regular physical activity) is rec-**

**vith HF**
**onal sta-**
**ally sta-**
**apacity,**
**404,406–411**

Per i pazienti con scompenso cardiaco si ravvisava priorità per un accesso ad una struttura di CR degenziale:

- per i soggetti in fase di protratta instabilità (prevalentemente in classe NYHA III-IV) specie se con necessità di terapie farmacologiche in fase di titolazione o di terapie infusive e/o con necessità di trattamento riabilitativo intensivo (educazione sanitaria intensiva, training fisico o di ricondizionamento);
- necessità di valutazione per porre indicazione a trapianto cardiaco o per verifica della persistenza all'indicazione.

| Recommendation | | |
|---|---|---|
| It is recommended th | | |
| It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization. | I | A |
| It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality. | I | A |

NICE GL; BMJ 2018;362; ESC HF GL 2016 ACC/AHA HF GL 2013
POSITION PAPER 2018 GICR-IACPR 3

# Benefici attività fisica

**Brain**

↑Arterial baroreflex sensitivity/control

↑Sympathoexcitation/vasoconstriction (gut/muscle/skin/general)

**Arteries**

↑Sympathovagal balance (↓resting heart rate, ↑heart rate recovery)

↑Systemic arterial compliance, ↑CPCs, ↑Endothelium-mediated vasodilation, ↑NO bioavailability, ↑tetraidrobiopterine ($BH_4$), ↓ROS, ↓Catecholamines, ↓Endothelin-1, ↓Angiotensin II, ↓Arginine-vasopressin, ↓BNP, ↓NT-proBNP, ↓Circulating cytokines

**Inflammatory markers**

↓TNF-, ↓IL-1β ↓IL-6 (background and phasic), ↑IL-10, IIra, Soluble TNF receptors I and II, ↓C-reactive protein, ↓adhesion molecules
*[Overall, exercise training exerts antinflammatory effect)*

**Lung**

↓Vascular pressure/↓ventilation/perfusion mismatch

↓Stiffness/↑Diffusion capacity

↓Pulmonary artery resistance/pressure

↓Alveolar-arterial $O_2$ gradient

*Respiratory muscle:* ↓Blood Flow, ↓$VO_2$

**Kidney**

↓Sympathoexcitation/vasoconstriction

**Heart**

↓LV remodelling, LV size, LVEDP

↑Ejection fraction, Stroke Volume, Maximal cardiac output, Endothelium-mediated coronary dilation

↓Total peripheral resistance

**Muscle**

↑Blood flow, Capillaries per fiber, Mitochondrial volume/oxidative enzyme activity, $O_2$ diffusing capacity, $O_2$ delivery-$VO_2$ matching, NO availability and Endothelium-mediated vasodilation, Apoptosis/atrophy, Muscle pump

↓iNOS, Vascular stiffness, metaboreflex

↓

All these changes contribute to increase speed $VO_2$ kinetics (↑$VO_2$max, Critical Power, Lactate Threshold, ↓$O_2$ cost of exercise

↓

**↑ EXERCISE TOLERANCE**



Giallura et al Monaldi Archives for Chest Disease 2018; 88:987

# Risultati della riabilitazione nello SC

| | All Trials (N = 44) | Trials Published 2015-2018 (n = 10) |
|---|---|---|
| Publication year | | |
| 1990-1999 | 5 (11) | - |
| 2000-2009 | 22 (50) | - |
| 2010 onward | 17 (39) | 10 (10) |
| Study location | | |
| Europe | 26 (59) | 5 (50) |
| North America | 12 (27) | 1 (10) |
| Other | 6 (14) | 4 (40) |
| Single center | 38 (86) | 7 (70) |
| Sample size | 59 (19-2,331) | 61 (27-343) |
| Population characteristics | | |
| Sex | | |
| Males | 13 (30) | 1 (10) |
| Females | 0 (0) | 0 (0) |
| Both males and females | 33 (75) | 9 (90) |
| Not reported | 1 (2) | 0 (0) |
| Age, yrs | 63 (51-81) | 67 (56-77) |
| Diagnosis | | |
| Ejection fraction, % | 32 (21-49) | 36.5 (34-49) |
| HFpEF included† | 6 (14) | 3 (30) |
| Not reported | 7 (16) | 4 (40) |
| NYHA functional class IV included | 7 (16) | 1 (10) |
| Not reported | 14 (31) | 5 (50) |
| Intervention characteristics | | |
| ExCR type | | |
| Exercise-only programs | 31 (68)‡ | 7 (70) |
| Comprehensive programs | 14 (32)‡ | 3 (30) |
| Exercise type | | |
| Aerobic only | 32 (73) | 10 (100) |
| Aerobic and resistance | 12 (27) | 0 (0) |
| Dose of exercise | | |
| Duration, months | 6 (2–30) | 6 (2–8) |
| Frequency, sessions/week | 1-7 | 1-3 |
| Length, min/session | 10-120 | 30-60 |
| Intensity | | |
| Maximal heart rate, % | 40–80 | 40–80 |
| Maximal oxygen uptake, % ($VO_{2max}$) | 50–85 | 60–70 |
| Borg rating | 11-18 | 6-20 |
| Setting | | |
| Center-based only | 21 (47)* | 5 (45)* |
| Both center- and home-based | 14 (31) | 2 (18) |
| Home-based only | 9 (20)* | 4 (36)* |
| Not reported | 1 (2) | 0 (0) |
| Duration of follow-up, months | 6 (6-74) | 6 (6-62) |

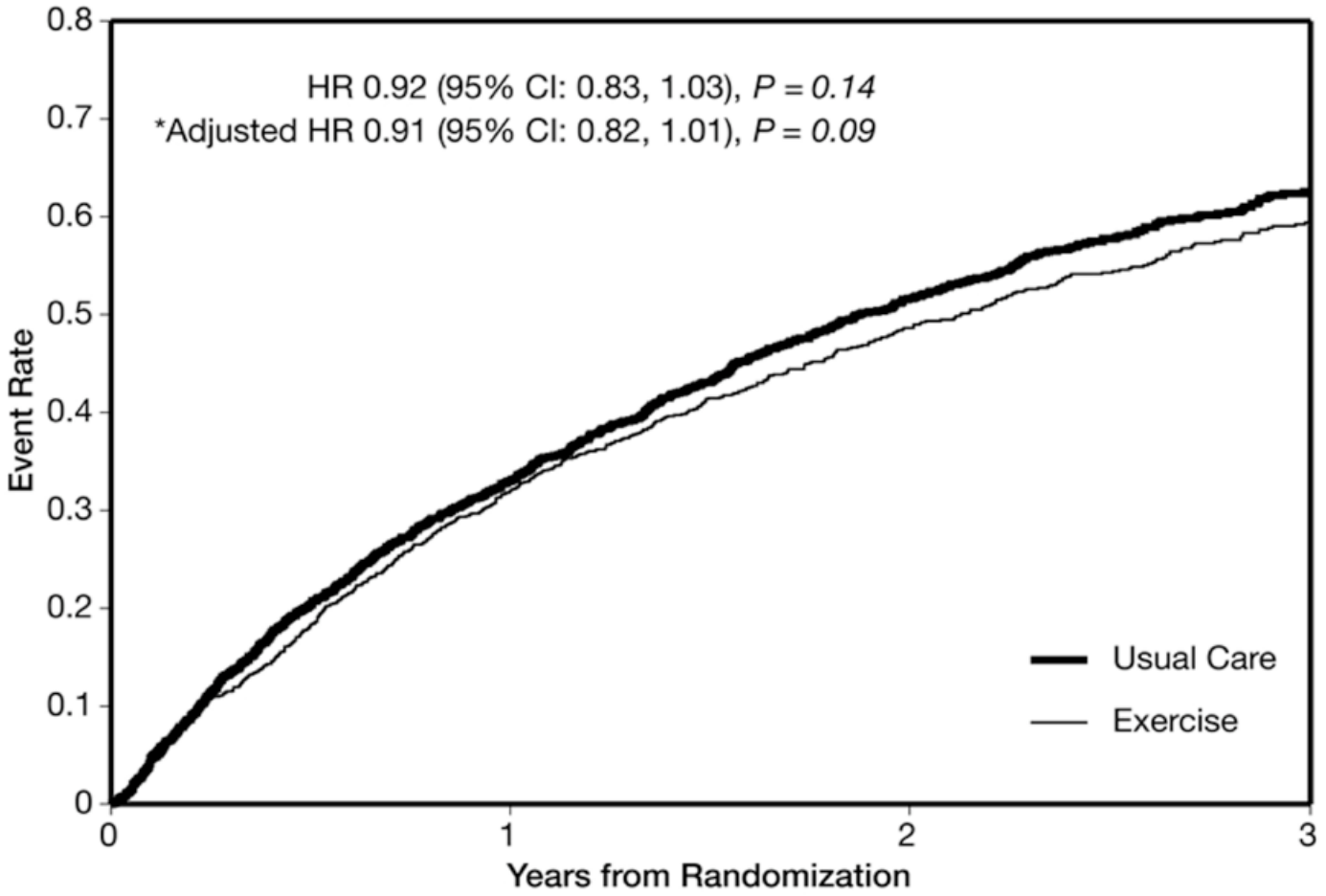
Taylor, R.S. et al. J Am Coll Cardiol HF. 2019;7(8):691–705

# Risultati della riabilitazione nello SC

| Outcome | n Trials (n comparisons) | Number of ExCR patient events/ total patients | Control (Number of control patient events/total patients) | Mean Treatment Effect (95% CI) | Statistical Heterogeneity ($I^2$ statistic; chi-square p value) | GRADE Quality Rating |
|---|---|---|---|---|---|---|
| All-cause mortality 6-12 months follow-up | 27 (28) | 67/1,302 | 75/1,294 | RR: 0.89 (0.66-1.21) | $I^2$ = 0%; p = 0.97 | Low*† |
| All-cause mortality ≥12 months follow-up | 6 (6) | 244/1,418 | 280/1,427 | RR: 0.88 (0.75-1.02) | $I^2$ = 34%; p = 0.18 | High |
| All-cause hospitalization 6-12 months follow-up | 21 (21) | 180/1,093 | 258/1,089 | RR: 0.70 (0.60-0.83) | $I^2$ = 19%; p = 0.22 | Moderate‡ |
| All-cause hospitalization ≥12 months follow-up | 6 (7) | 772/1,348 | 825/1,343 | RR: 0.70 (0.47-1.05) | $I^2$ = 66%; p = 0.007 | Very low ‖¶ |
| HF-related hospitalization 6-12 months follow-up | 14 (15) | 40/562 | 61/552 | RR: 0.59 (0.42-0.84) | $I^2$ = 11%; p = 0.32 | Low†‡ |
| MLWHF 6-12 months follow-up | 17 (18) | - | - | MD: −7.1 (−10.5 to −3.7) | $I^2$ = 82%; p < 0.0001 | Low†# |
| MLWHF ≥12 months follow-up | 3 (3) | - | - | MD: −9.5 (−17.5 to −1.5) | $I^2$ = 73%; p < 0.03 | Low††*** |
| All HRQoL outcome 6-12 months follow-up | 27 (29) | - | - | SMD: −0.60 (−0.82 to −0.39) | $I^2$ = 87%; p < 0.0001 | Low†** |

Taylor, R.S. et al. J Am Coll Cardiol HF. 2019;7(8):691–705

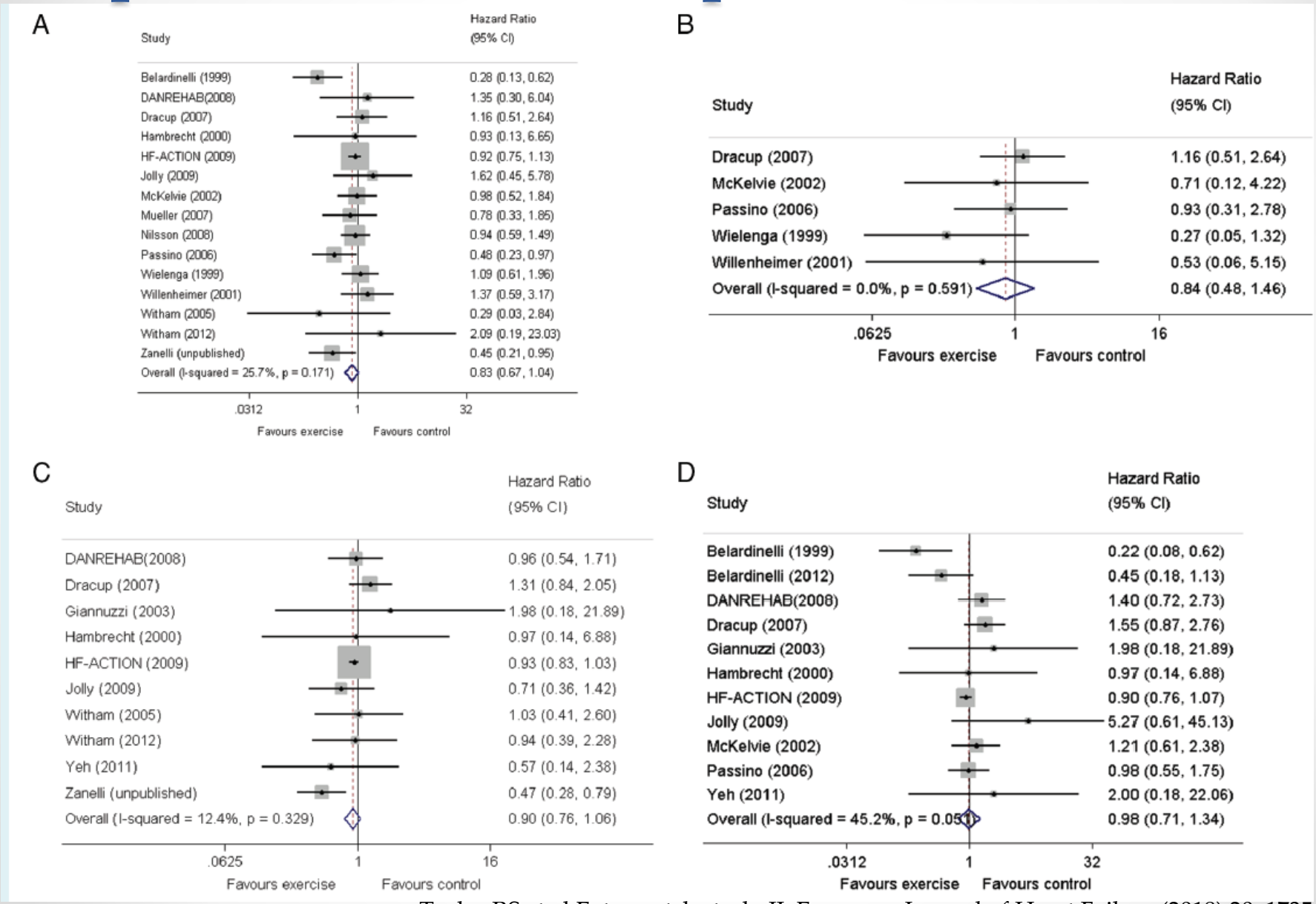
# Risultati della Riabilitazione: HF Action Mortalità e ospedalizzazione tot e CV




| No. at Risk | | | | |
|---|---|---|---|---|
| Usual Care | 1172 | 753 | 418 | 202 |
| Exercise Training | 1159 | 756 | 432 | 209 |

O' Connor et al JAMA . 2009 April 8; 301(14): 1439–1450

# Risultati della Riabilitazione su mortalità e ospedalizzazione tot e per SC: Extramatch II




Taylor RS et al Extramatch study II. European Journal of Heart Failure (2018) 20, 1735–1743

# SC in Lombardia: mortalità e re-ricoveri

| | Group A ($n = 100,843$) (72%) | Group B ($n = 39,709$) (28%) | *P* value |
|---|---|---|---|
| Yes | 77,568 (76.9) | 34,059 (85.8) | |

**Table 2.** Multivariate predictors of all-cause mortality in the overall study population.

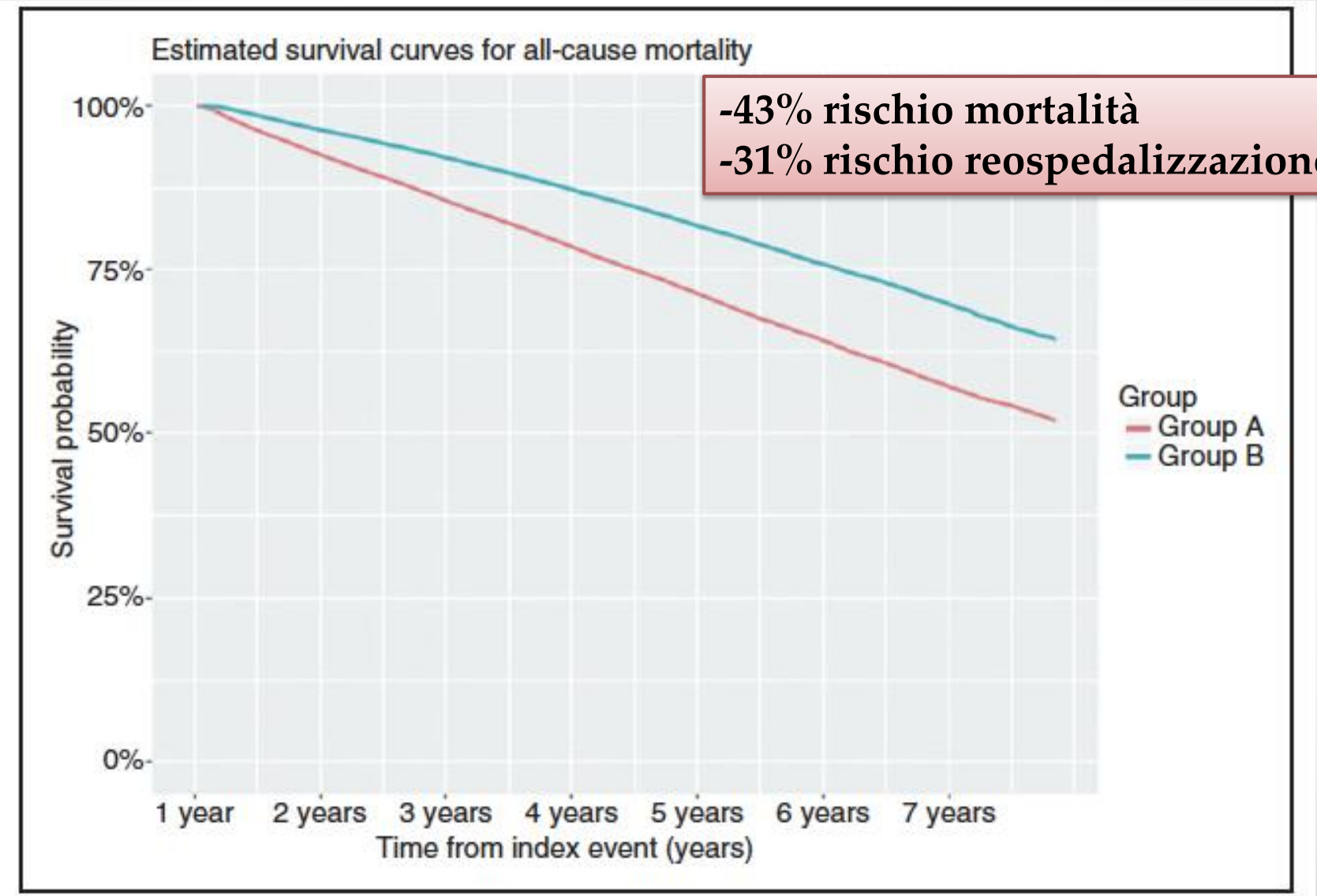
| Covariates | HR (95% CI) | SE | *P* value |
|---|---|---|---|

**Table 3.** Multivariate predictors for all-cause readmissions in the overall study population.

| Covariates | HR (95%CI) | SE | *P* value |
|---|---|---|---|
| Intercept | 1.3565 (1.2228; 1.5052) | 0.0719 | <0.0001 |
| Male gender | 1.2642 (1.2304; 1.2889) | 0.0175 | <0.0001 |
| Age | 0.9932 (0.9920; 0.9944) | 0.0006 | <0.0001 |
| Diagnosis groups | | | |
| Group 2 | 1.0165 (0.9780; 1.0550) | 0.0196 | NS |
| Group 3 | 0.7930 (0.7621; 0.8238) | 0.0157 | <0.0001 |
| Comorbidities (>2) | 1.8051 (1.7809; 1.8296) | 0.0124 | <0.0001 |
| Surgical procedures | 1.2508 (1.1832; 1.3225) | 0.0355 | <0.0001 |
| ACE/ARB (yes/no) | 0.9712 (0.9689; 0.9734) | 0.0012 | <0.0001 |
| Beta-blockers (yes/no) | 0.9581 (0.9564; 0.9598) | 0.0009 | <0.0001 |
| Outpatient care | 0.9858 (0.9846; 0.9869) | 0.0006 | <0.0001 |
| Group B participation | 0.7997 (0.7758; 0.8244) | 0.0124 | <0.0001 |

S Scalvini et al. European Journal of Preventive Cardiology2019

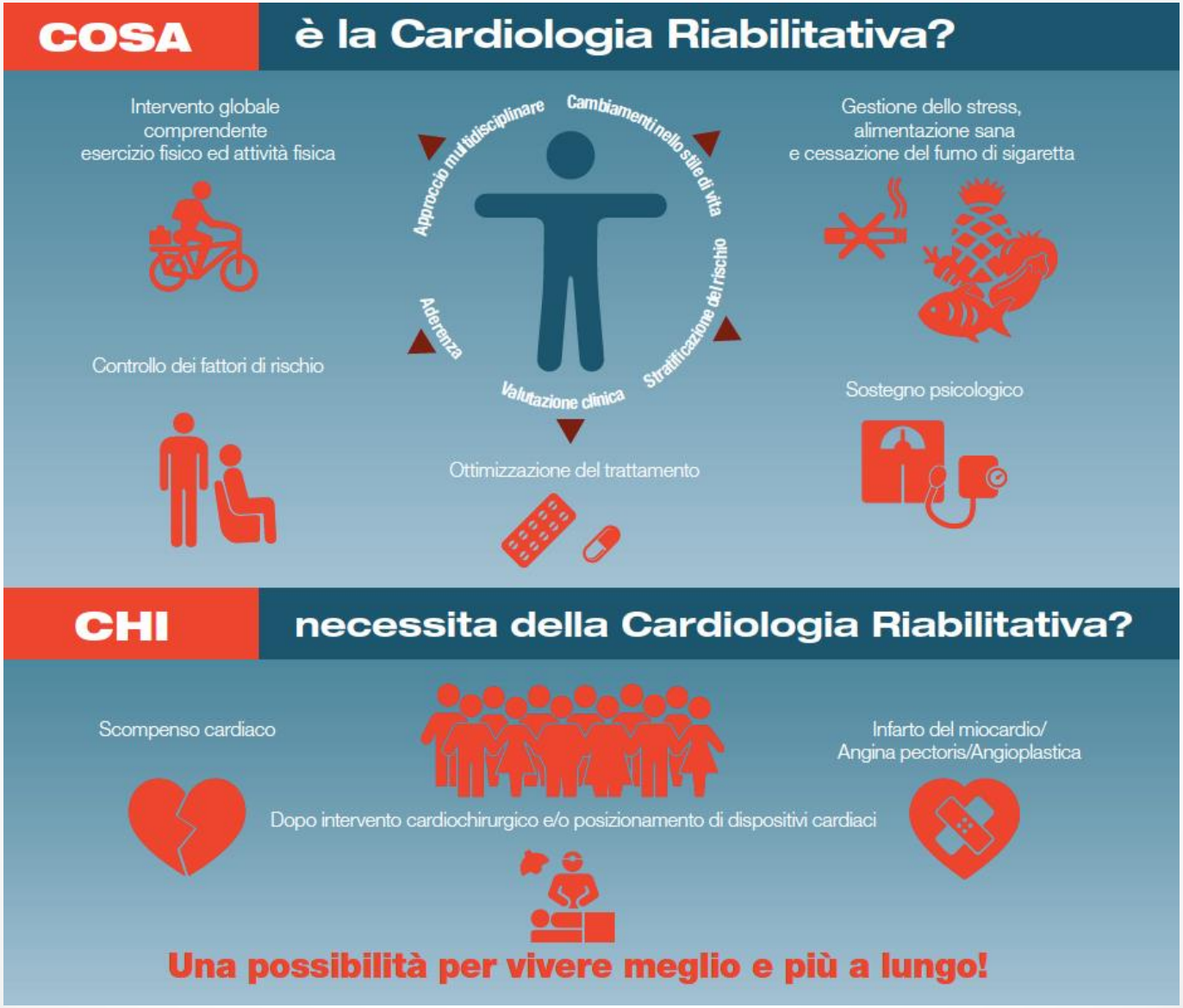
# Riabilitazione SC in Lombardia




**-43% rischio mortalità**
**-31% rischio reospedalizzazione**

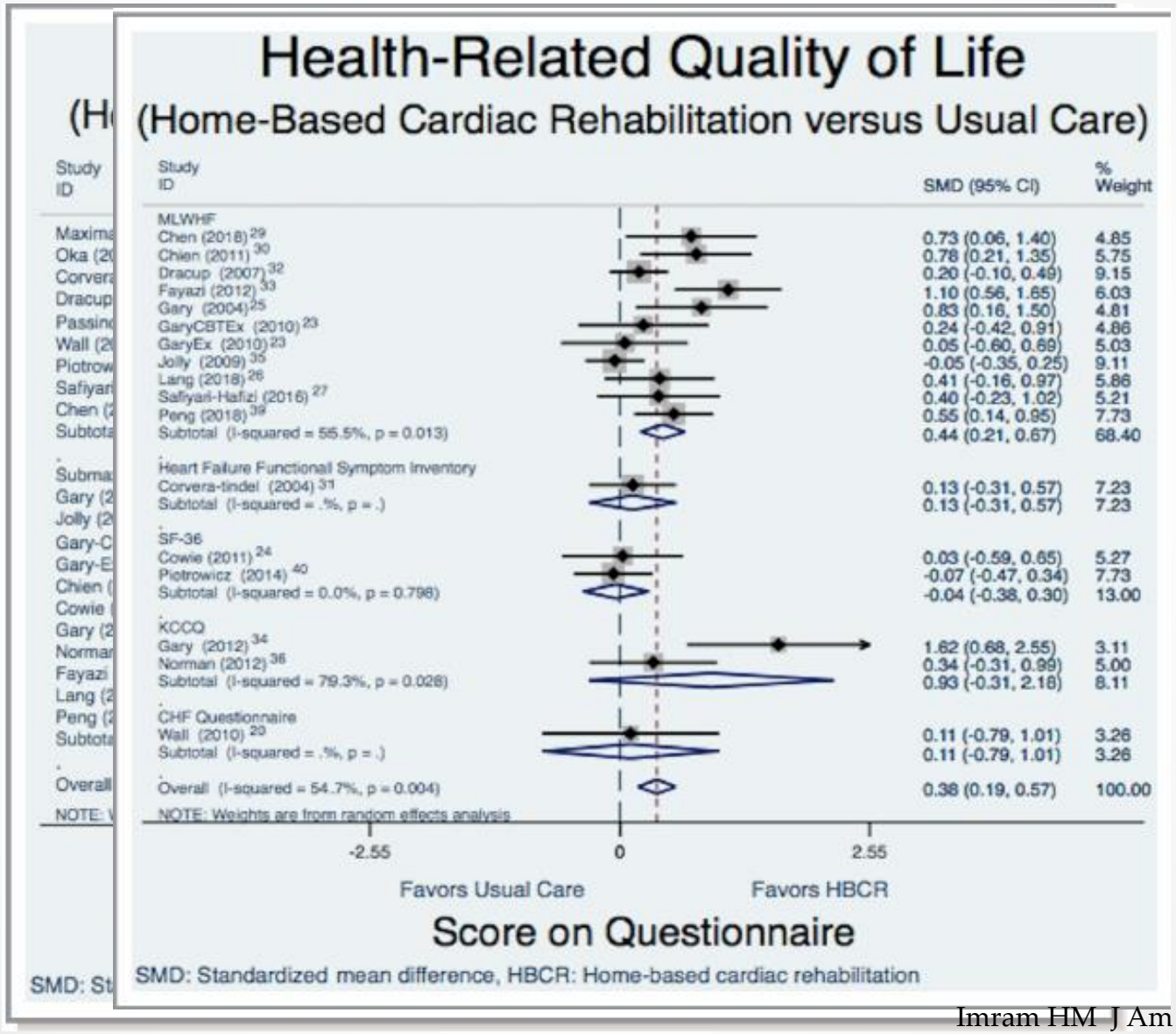
S Scalvini et al. European Journal of Preventive Cardiology2019

# Riabilitazione Cardiologica è un percorso multidisciplinare



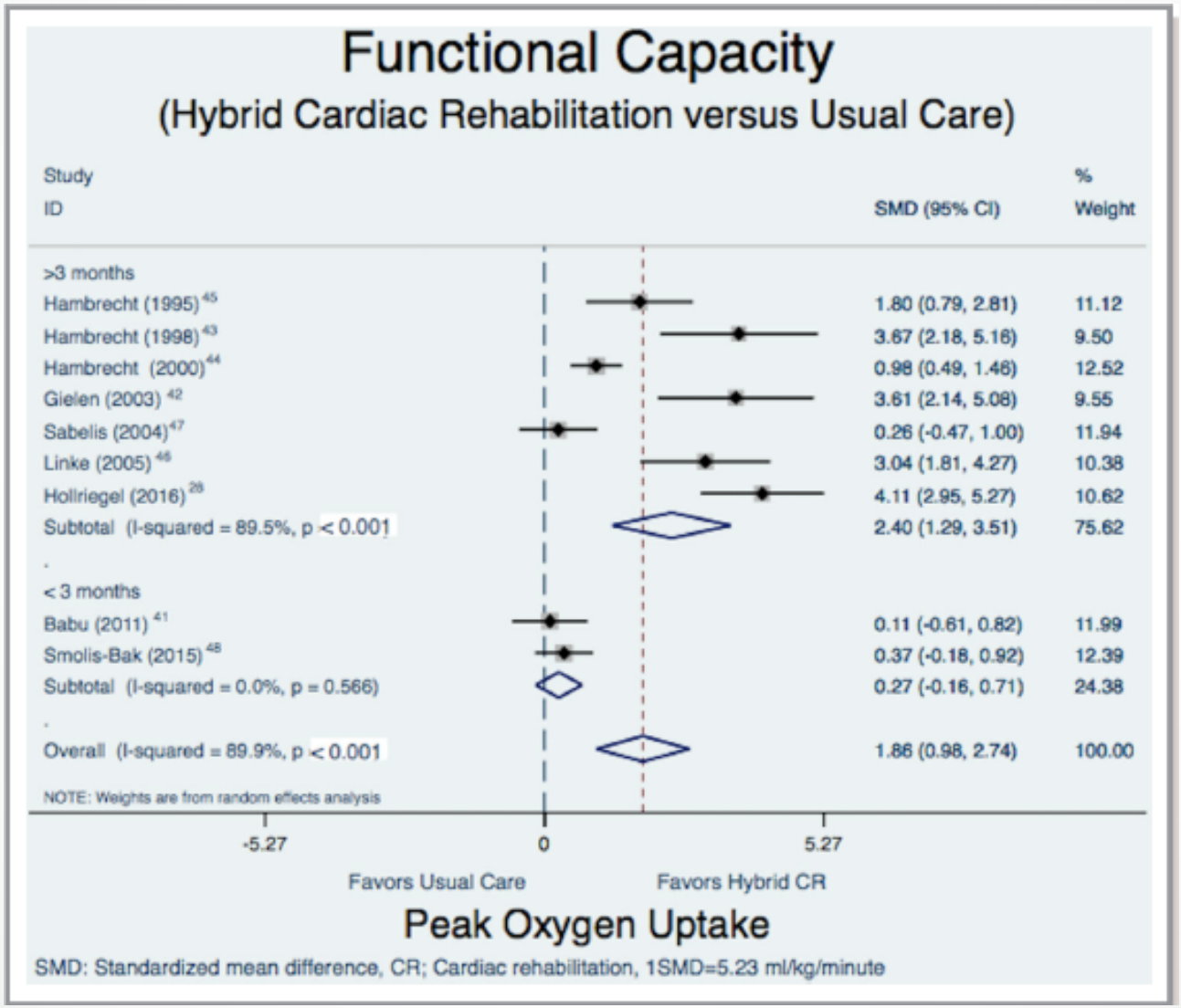

Dal Cardiac Rehabilitation Matters Group rappresentato da A Abreu (PT), M Ambrosetti (IT), A Castro Conde (SP), A Cohen-Solal (FR), R Dalmau (SP), F Edelmann (GE), D Gaita (RO), P Lancellotti (BE), M Mendes (PT), P Meurin (FR), M F Piepoli (IT)

# Meglio riabilitare a casa?




Imram HM J Am Heart Assoc. 2019

# Riabilitazione ibrida o nelle strutture ?



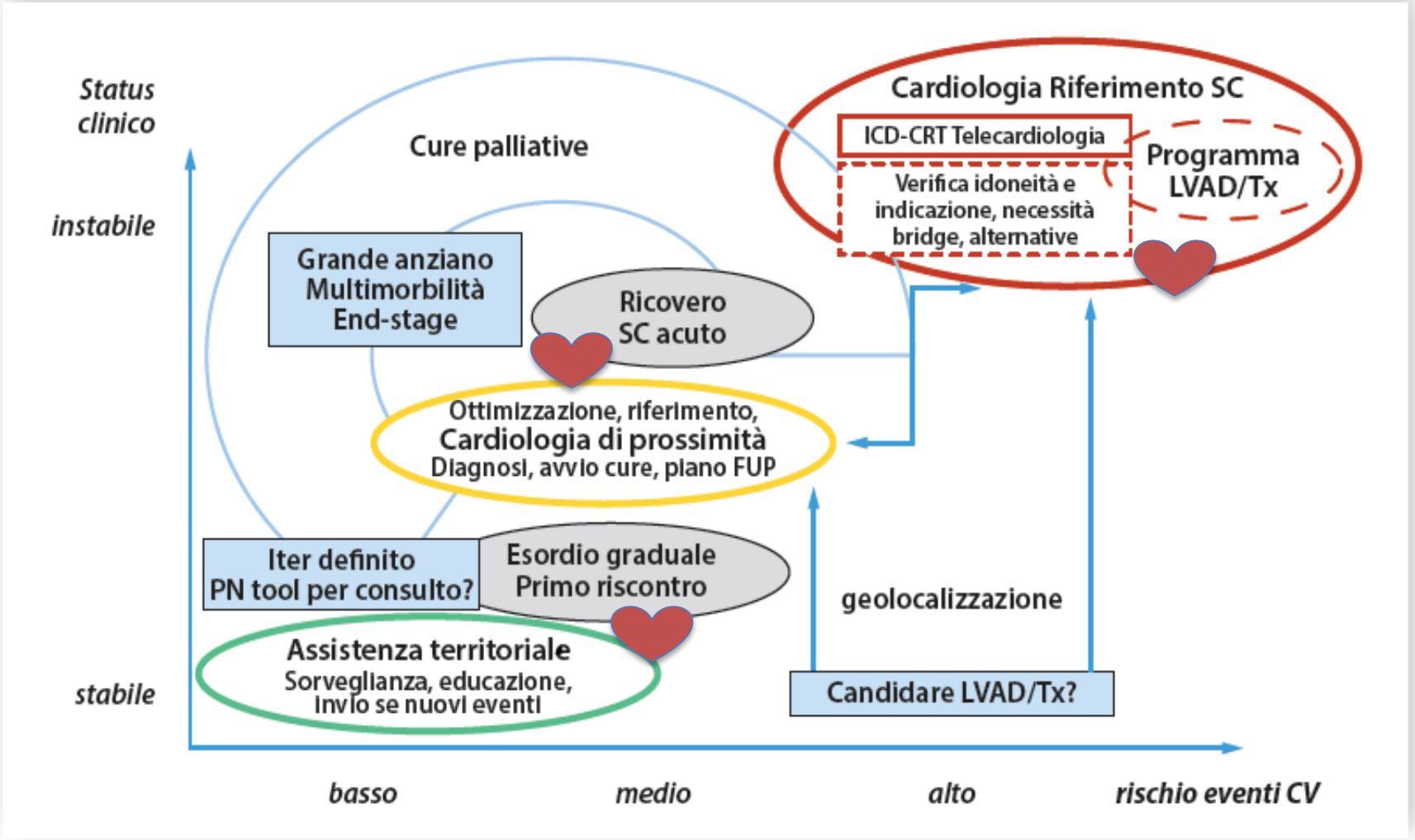

Imram HM J Am Heart Assoc. 2019

# Pro e contro: riabilitazione a domicilio

| Potential Advantages | Potential Disadvantages |
|---|---|
| Reduced enrollment delays | Lack of reimbursement |
| Expanded capacity/access | Less intensive exercise training |
| Individually tailored programs | Less social support |
| Flexible, convenient scheduling | Less patient accountability |
| Minimal travel/transportation barriers | Lack of published standards for HBCR |
| Greater privacy while receiving CR services | Less face-to-face monitoring and communication |
| Integration with regular home routine | Safety concerns for patients at higher risk |

Home based cardiac rehabilitation Circulation. 2019;140:e69–e89.

# Quanto è recepita la riabilitazione nello SC in Italia?




PDTA regione Lombardia, Consensus ANMCO

# Riabilitazione dello SC nel mondo reale?

- < 20% pazienti in Eu
- 16% dei centri di riabilitazione ha programma per SC in UK
- < 10% in USA partecipa ai programmi di riabilitazione SC
- In Italia il 30% dei pazienti vengono avviati a riabilitazione cardiologica

# Come implementare la riabilitazione dello SC ?

- Identificare la tipologia dei pazienti che possono beneficiare della riabilitazione
- Invio ai centri di Riabilitazione post ricovero (fase vulnerabile dello SC)
- Riabilitazione cardiologica come  percorso multidisciplinare (cardiologo, fisioterapista, infermiere, psicologo, dietista, MMG…)
- Identificare dei protocolli unici tra i centri
- Prevedere dei programmi di riabilitazione a domicilio e/o ibridi per ampliare l'offerta