How resources determine pulmonary rehabilitation programs: a survey among Belgian chest physicians.

Supplementary material

Figure S1: Access to rehabilitation in hospital (148/200 physicians). Blue arrows: Convention hospitals, Red arrows: PRH with pulmonologist certified in pulmonary rehabilitation, Green arrows: PRH with regular pulmonologist
**Table S1:** Complete English version of the survey questions that were asked to the Belgian chest physicians.

| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| Who is in charge of the pulmonary rehabilitation program in the hospital? | Physical medicine  
Chest physician with a recognition  
Chest physician  
Other  
No responsible |
| Who refers patients to the pulmonary rehabilitation program?             | Chest physician from your hospital  
Self-referral  
Chest physician from other hospitals  
General practitioner  
Other specialist |
| Which types of patients are considered for a pulmonary rehabilitation program? | COPD (stable)  
COPD (during or after an acute attack)  
Asthma (light)  
Lung cancer (before surgery)  
Lung cancer (post-surgery)  
Thoracic surgery (before surgery)  
Thoracic surgery (post-surgery)  
Interstitial lung disease  
Cystic fibrosis  
Pre- or post-transplantation patient  
Restrictive ventilator troubles  
Other |
| Number of patients who entered the pulmonary rehabilitation program during the last 12 months in your centre | X patients  
No idea |
| Proportion of patients refusing to participate in a rehabilitation program | 0%  
1-10%  
11-25%  
26-50%  
51-75%  
>75%  
No idea |
| What are the reasons for not adhering to the proposed rehabilitation program? | No reimbursement  
No specific program  
Still in activity  
No interest  
No transport means  
Too far from home  
Own physiotherapist  
Too time consuming  
Not convinced of possible effects  
Patient is feeling too sick  
Patient does not feel sufficiently sick  
Other |
| In case of absence of participation in a rehabilitation program, what are your preferred alternatives? | Prescription of a trained physiotherapist  
Prescription of a local physiotherapist  
Letter to the general practitioner  
Referral to another centre  
Rehabilitation expert for an inpatient  
Strengthening of the patient (fitness)  
Standard treatment/medication  
Other  
None |
| Question                                                                 | Options                                                                 |
|------------------------------------------------------------------------|-------------------------------------------------------------------------|
| In case of home rehabilitation, which reimbursement are you generally using? | E listing  
F listing  
Normal prescription  
Responsibility of the general practitioner  
No idea               |
| What are the health care providers who are active in the respiratory rehabilitation team? | Physiotherapist  
Chest therapist  
Occupational therapist  
Social worker  
Psychologist  
Dietician  
Exercise physiologist  
Internist  
Cardiologist  
General practitioner  
Tabaccologist  
Pharmacist  
Nurse  
Speech therapist  
Other |
| What are the interventions included in the respiratory rehabilitation program | Outdoor walking  
Treadmill walking  
Indoor bicycle  
Strengthening with special devices  
Strengthening with weights and elastics  
Education  
Conservation of energy training (ADL)  
Self-management training  
Nutritional support  
Inspiratory muscles training  
Neuromuscular electrical stimulation  
Breathing pursed lips exercise  
Mucus clearance techniques  
Smoking cessation  
Psychological support  
Physical activity coaching  
Home visit  
Other  
No idea |
| How is the interaction between the rehabilitation team and the referral doctor organized? | Informal  
Report at the beginning and at the end  
Team meetings  
Clinical follow-up on site  
Letters  
Other  
No idea  
No interaction |
| What is the standard duration of a respiratory rehabilitation program? | 4 weeks  
8 weeks  
12 weeks  
16 weeks  
20 weeks  
6 months  
>6 months  
No idea |
| What is the mean frequency of rehabilitation sessions per week? | 1  
2  
3 |
| Question                                                                 | Options                                                                 |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| What is the mean duration of a respiratory rehabilitation session?      | 30 minutes, 1 hour, 1.5 hour, 2 hours, No idea                           |
| What are the respiratory rehabilitation program results delivered to the referral physician at the end of the program? | 6-min walking distance, Pulmonary function, Bicycle endurance, Maximum exercise test, EMG, Lower limbs muscular strength, Inspiratory muscular strength, Body composition, Quality of life, Dyspnoea, Fatigue, Depression, Anxiety, Daily activities, Optimal drug treatment, Smoking stop, Physical activity surveillance, Self-management qualities, Other, None |
| What are the 5 results of the rehabilitation program which are the most important for you? | Same proposals as above                                                   |
| How is the follow-up ensured after the end of the rehabilitation program? | Maintenance program in a centre, Re-evaluation after 6 months – 1 year, Reference to a local physiotherapist, Reference to a fitness centre, Physical activity recommended orally, Back to the referring chest physician, Other, No follow-up/Drug only |
| Are you satisfied of the rehabilitation program?                         | Entirely, Yes, It depends, No (and why?), Not at all (and why?)           |
| Could you estimate the proportion of your patients who has significantly improved after following the rehabilitation program? | <20%, 21-50%, 51-80%, >80%, No idea                                     |
| What are the principal improvements to bring, in the future, to rehabilitation programs? | Larger multidisciplinary, Individualized program, Structural involvement of the chest physician, Standardized follow-up, Broader access, Larger referencing, Improved reimbursement, Other, None |
Table S2: Preferred alternative options for rehabilitation in patients who, for whatever reasons, refused to participate in a pulmonary rehabilitation program (PR). The results are shown in % of chest physicians who could choose a maximum of three options

| Option                                              | Total responders (n=200) (%) | CH (n=24) (%) | PRH (n=124) (%) | Non-PRH (n=52) (%) |
|-----------------------------------------------------|-----------------------------|---------------|-----------------|-------------------|
| General prescription for local physiotherapist      | 61                          | 41            | 64              | 64                |
| Specific prescription for experienced physiotherapist| 46                          | 73            | 40              | 46                |
| Just standard care or medication                     | 36                          | 36            | 38              | 27                |
| Empowerment of patient (Fitness)                    | 31                          | 41            | 30              | 27                |
| Recommendation letter for the general practitioner   | 25                          | 32            | 24              | 27                |
| Referral to another expert in a rehabilitation centre| 19                          | 9             | 21              | 18                |
| Expert inpatient rehabilitation                      | 46                          | 32            | 12              | 18                |
| other                                               | 2                           | none          | 3               | none              |
| None                                                | 1                           | none          | 1               | none              |
Table S3: Types of professions active in pulmonary rehabilitation teams. Results are expressed as % of chest physicians responding yes to the item.

| Profession                  | CH (n=24) (%) | PRH (n=124) (%) |
|-----------------------------|---------------|-----------------|
| PHYSIOTHERAPIST             | 96            | 94              |
| CHEST PHYSICIAN            | 92            | 77              |
| DIETICIAN                  | 84            | 52              |
| OCCUPATIONAL THERAPIST      | 72            | 52              |
| SOCIAL WORKER              | 76            | 51              |
| PSYCHOLOGIST               | 76            | 48              |
| TOBACCOLOGIST              | 56            | 35              |
| NURSE                      | 32            | 30              |
| EXERCISE PSYCHOLOGIST      | 40            | 19              |
| CARDIOLOGIST               | 16            | 15              |
| GENERAL PRACTITIONER       | 4             | 5               |
| INTERNIST                  | 12            | 4               |
| OTHERS                     | 8             | 2               |
Table S4: Type of interventions included in the pulmonary rehabilitation programs. Results expressed as percentage of physicians responding yes to the item

| Intervention | CH (n=24) (%) | PRH (n=124) (%) |
|--------------|---------------|-----------------|
| Stationary cycling | 96            | 91              |
| Treadmill walking | 100           | 90              |
| Resistance training using apparatus | 88            | 74              |
| Education | 84            | 66              |
| Smoking cessation | 84            | 62              |
| Breathing exercises/Pursed lips breathing | 76            | 64              |
| Resistance training using handheld weights/elastic bands | 80            | 63              |
| Inspiratory muscle training | 76            | 62              |
| Nutritional support | 76            | 53              |
| Psychosocial support | 72            | 45              |
| Self-management training | 60            | 44              |
| Physical activity coaching | 72            | 34              |
| Energy conservation technique/ADL training | 60            | 34              |
| Mucus clearance techniques | 56            | 32              |
| Neuromuscular electrical stimulation | 48            | 24              |
| Walking outdoor | 32            | 22              |
| Home visit | 12            | 6               |
| No idea | 0             | 7               |
Table S5: Types of outcomes of the pulmonary rehabilitation program provided to the referring physician at the end of the program. Results expressed as percentage of physicians responding yes to the item.

| outcomes                              | CH (n=24) (%) | PRH (n=124) (%) |
|---------------------------------------|---------------|-----------------|
| 6-min walking distance                | 92            | 74              |
| Lung function                         | 96            | 65              |
| Quality of life                       | 80            | 54              |
| Dyspnoea                              | 84            | 53              |
| Cycling endurance                     | 68            | 53              |
| Maximum exercise testing              | 80            | 50              |
| Smoking cessation                     | 60            | 46              |
| Inspiratory muscle strength           | 72            | 43              |
| Lower-limb muscle strength            | 80            | 43              |
| Daily life activities                 | 60            | 46              |
| Fatigue                               | 60            | 38              |
| Optimal drug treatment                | 68            | 39              |
| Physical activity monitoring          | 68            | 37              |
| Body composition                      | 52            | 29              |
| Anxiety                               | 48            | 19              |
| Depression                            | 44            | 19              |
| Self-management skills                | 36            | 16              |
| Electromyography                      | 12            | 18              |
| None                                  | 0             | 8               |
| Other                                 | 0             | 2               |
Table S6: Types of follow-up organised by the pulmonary rehabilitation team at the end of the program. Results are expressed in % of chest physicians responding yes to the item.

| Follow-up Description                                                      | CH (n=24) (%) | PRH (n=124) (%) |
|---------------------------------------------------------------------------|---------------|-----------------|
| Back to referring pulmonologist                                          | 88            | 89              |
| Oral recommendation for physical activity                                | 64            | 51              |
| Maintenance program in center                                           | 44            | 50              |
| Reassessment of rehabilitation outcomes after 6 months- 1 year           | 76            | 37              |
| Referral to local physiotherapist                                       | 56            | 39              |
| Referral to fitness center                                               | 48            | 19              |
| None                                                                      | 0             | 2               |
| No idea                                                                   | 0             | 2               |
**Table S7:** Main targets for future improvements of pulmonary rehabilitation programs. Results are expressed in % of chest physicians responding yes to the item

|                          | Total responders (n=200) (%) | CH (n=24) (%) | PRH (n=124) (%) | Non-PRH (n=52) (%) |
|--------------------------|------------------------------|---------------|-----------------|-------------------|
| Better reimbursement     | 73                           | 76            | 77              | 62                |
| Broader access           | 66                           | 88            | 61              | 65                |
| Broader multidisciplinary| 53                           | 52            | 58              | 42                |
| More individualized program | 51                         | 68            | 52              | 40                |
| Larger referral          | 51                           | 56            | 54              | 39                |
| Structural involvement of the respiratory physician | 41                         | 36            | 44              | 33                |
| Standardized follow-up   | 41                           | 36            | 44              | 37                |
| Other                    | 15                           | 20            | 13              | 15                |
| None                     | 4                            | 0             | 5               | 4                 |