Potential workload in applying clinical-practice guidelines for patients with chronic conditions and multimorbidity

Supplementary File

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Appendices

Appendix 1. Description of the moderate severity of each condition

Hypertension	Stage II (systolic BP ≥ 160 mmHg or diastolic BP ≥ 100 mmHg) Uncomplicated: without damage to target organ (heart, brain, chronic kidney disease, peripheral arterial disease, retinopathy)
Depression	Mild (few, if any, symptoms in excess of those required for the diagnosis and only minor impairment in occupational and/or social functioning) to moderate (symptoms or functional impairment between mild and severe) for 3 months, not associated with anxiety
Osteoarthritis	Symptomatic osteoarthritis of one knees: - without current or past upper gastrointestinal problems, or chronic kidney disease - with adequate response to acetaminophen or oral NSAIDswith topical NSAIDs - overweight
CHD	Stable ischemic heart disease: - benefits from revascularisation longer than 1 year ago - without angina or symptom complex that remained stable for at least 60 days - without change in frequency, duration, precipitating causes or ease of relief of angina for at least 60 days - without evidence of recent myocardial damage - without chronic heart failure - smoking
Diabetes	Stabilized diabetes with antidiabetic medication regimen and oral treatment (non-insulin dependent). Uncomplicated diabetes: without damage to target organ (heart, brain, chronic kidney disease, peripheral arterial disease, retinopathy)
COPD	Group C: high risk, few symptoms, defined by GOLD stage 3¥ or 4 (severe or very severe airflow limitation) and/or ≥2 exacerbations per year *and* mMRC† grade 0-1 or CAT score < 10. Patient smoking.

BP, blood pressure; CHD, coronary heart disease; COPD, chronic obstructive pulmonary disease; CAT, COPD assessment test

¥: **GOLD 3 - Severe** (classification of severity or airflow limitation, based on post-bronchodilator force expiratory volume in 1 sec [FEV1]): in patient with predicted ratio of FEV1 to forced volume capacity <0.70: FEV1 30–50%

†: **mMRCgrade 1** (Modified Medical Research Council for Assessing the severity of breathless): "I get short of breath when hurrying on level ground or walking up a slight hill"

Appendix 2. Selected US guidelines for conditions in adults

Guideline focus	*Title*	*Organization*	*Year*
Hypertension	Hypertension diagnosis and treatment	Institute for Clinical Systems Improvement	2012
Diabetes	Diagnosis and management of type 2 diabetes mellitus in adults	Institute for Clinical Systems Improvement	2012
CHD	Management of stable ischemic heart disease: summary of a clinical-practice guideline	American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery/Preventive Cardiovascular Nurses Association/Society of Thoracic Surgeons.	2012
COPD	Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease	Global Initiative for Chronic Obstructive Lung Disease	2013
Depression	Major depression in adults in primary care	Institute for Clinical Systems Improvement	2012
Osteoarthritis	Recommendations for the use of nonpharmacologic and pharmacologic therapies for osteoarthritis of the hand, hip, and knee	American College of Rheumatology	2012
Smoking cessation	Tobacco treatment	University of Michigan Health System	2012
Overweight	Management of overweight and obesity in adults	Michigan Quality Improvement Consortium	2011
Prevention	Summary of recommendations for clinical prevention	American Academy of Family Physicians	2013
Vaccination	Immunizations	Institute for Clinical Systems Improvement	2012

COPD, chronic obstructive pulmonary disease

Appendix 3. Synthesis of evidence for guidelines and recommendations for comorbid condition

	Strong recommendations	*Moderate recommendations*	*Specific recommendations for patients with one comorbid condition*
Hypertension	7	1	- Chronic kidney disease - Coronary artery disease or left ventricular hypertrophy - Chronic heart failure - Older age (> 60 years) - Diabetes mellitus - Depression - Cardiovascular disease
Diabetes	11	1	- Congestive heart failure - COPD - Obstructive sleep apnea - Hepatic disease - Renal dysfunction - Peripheral vascular disease - Depression, hypertension - Pain - Cardiovascular disease
CHD	13	0	- Hypertension - Women - Older age (>75 years) - Diabetes mellitus - Chronic kidney disease - Obesity - HIV infection - Rheumatoid arthritis - Systemic lupus erythematous - Socioeconomic factors
COPD	5	2	- Ischemic heart disease - Heart failure - Atrial fibrillation - Hypertension - Osteoporosis - Anxiety and Depression - Lung cancer - Infections - Diabetes - Metabolic syndrome - Cardiovascular disease
Depression	3	1	- Psychiatric comorbidity - Cerebrovascular disease - Diabetes - Chronic pain - Cardiovascular disease
Osteoarthritis	6	0	- Upper gastrointestinal problems - Chronic kidney disease - Cardiovascular disease
Prevention services	2	0	
Tobacco use	2	0	
Overweight	2	0	

Appendix 4. Guideline contents, extraction of recommendations, and how health-related activities are considered (part1/5).

	Content of guidelines	Considered as
Hypertension	A thiazide-type diuretic should be considered as initial therapy in most patients with uncomplicated hypertension	**Thiazide-type diuretic** 1 pill/day
	It is strongly recommended that hypertensive patients be initially treated with and periodically reassessed for adherence to healthy lifestyle habits for both prevention and treatment of hypertension. Lifestyle modification is best initiated and sustained through an educational partnership between the patient and a multidisciplinary health care team. Lifestyle modifications should be reviewed and reemphasized at least annually.	**Multidisciplinary team (educator, dietitian)** 1visit/year[1]
	Six lifestyle behaviors – not smoking, limiting the use of alcohol, obtaining adequate physical activity, limiting sodium intake, having a diet that emphasizes fruits and vegetables and maintaining a normal weight.	**Diet** (DASH diet + limiting sodium intake + limiting use of alcohol)
	Physical activity: moderate-intensity aerobic (endurance) a minimum of 30 min on 5 days each week or vigorous intensity aerobic physical activity for a minimum of 20 min on 3 days each week.	**Physical activity**: 3 times per week – 20 min
	On follow-up visits, history and physical examination should be directed toward detection of hypertensive target organ damage. Once blood pressure is at goal and stable, the patient should be seen at a minimum once a year by the clinician to assess patient adherence, patient satisfaction and any changes in target organ status.	**Physician appointment** 1 per year
	In patients with office blood pressure at goal who demonstrate progressive target organ disease, home monitoring may be beneficial. Patientcomorbidities such as heart failure, associated diseases such as diabetes: should monitor blood pressure more frequently by home monitoring or by other allied health professionals. Patient comorbidities such as heart failure, associated diseases such as diabetes, and need for laboratory tests influence the frequency of visits. Lifestyle modifications should be reviewed, reemphasized and documented annually. Patients should monitor blood pressure more frequently by home monitoring or by other allied health professionals.	*Home blood pressure monitoring 1 per day if diabetes*[2]
	Order tests as necessary, especially if not done within past year.	**12-lead ECG** 1 per year
		Blood test 1 per year

Appendix 4. Guideline contents, extraction of recommendations, and how health-related activities are considered (part 2/5).

	Content of guidelines	Considered as
Diabetes	A qualified health professional (which may include a clinician, dietitian, nursing staff and pharmacist) should provide nutrition therapy to a patient diagnosed with type 2 diabetes mellitus (T2DM) as part of a global treatment plan. A qualified healthcare professional (which may include a clinician, nursing staff, pharmacist, and registered dietitian) should counsel a patient diagnosed with T2DM to modify the diet to reduce sodium intake to < 2,300 mg/day. A qualified healthcare professional (which may include a clinician, dietitian, nursing staff and pharmacist) should counsel an overweight patient diagnosed with T2DM about the need to reduce energy intake while maintaining a healthful eating pattern to promote weight loss.	**Counseling** with qualified professional: 1 visit/year **Diet**
	A clinician should advise patients diagnosed with T2DM to complete at least 150 min a week of aerobic physical activity and resistance training at least twice/week.	**Physical activity** at least 150 min 2 per week.
	Diabetes self-management or education by a qualified healthcare professional (which may include a clinician, dietitian, nursing staff and pharmacist) should be offered to patients diagnosed with T2DM. Foot care education. A clinician should advise patients diagnosed with T2DM to complete at least 150 min a week of aerobic physical activity and resistance training at least twice/week.	**Self management**: 1 visit/year[3]
	A clinician should initiate metformin as first-line pharmacotherapy for patients with T2DM, unless medically contraindicated.	**Metformin** 3 pills/day
	A clinician should recommend high-intensity statin therapy for patients diagnosed with T2DM, age 40 to 75 years, with established arteriosclerotic cardiovascular disease. A clinician should recommend moderate- or high-intensity statin therapy for all patients diagnosed with T2DM age 40 to 75 years with low-density lipoprotein level ≥ 70 mg/dL.	**Statin** 1 pill/day
	When hypertension is identified, it should be aggressively treated to achieve a target blood pressure of < 140/90 mm Hg. In many patients with diabetes, 2 or 3 or more antihypertensive agents may be needed to achieve this goal. The use of generic combination tablets (such as angiotensin-converting enzyme [ACE] inhibitor plus calcium-channel blocker, or beta-blocker plus diuretic) can reduce the complexity of the regimen and out-of-pocket costs.	***ACE inhibitors plus calcium-channel antagonist*** *1 pill/day if hypertension*
	Regular follow-up with the health care team (via office visit, e-visit, telephone, labs, etc.) should be scheduled yearly.	**Health care team or physician** 1 visit/year
	A dilated eye examination for diabetic eye disease performed by an ophthalmologist or optometrist is recommended annually for patients with T2DM. Less frequent exams (every 2 to 3 years) may be considered in the setting of a normal eye exam.	**Ophthalmologist** 1 visit/year
	Urinary albumin excretion should be tested annually by a microalbuminuria method. Measure serum creatinine at least annually and more often based on stage of chronic kidney disease.	**Blood/urine test** 1 visit/year
	Influenza vaccine every year	**Influenza vaccine** every year
	Pneumococcal vaccine every 5 years	**Pneumococcal vaccine** every 5 years
	Major clinical trials assessing the impact of glycemic control on diabetes complications have included self-monitoring blood glucose testing as part of multifactorial interventions	**Self monitoring blood glucose** testing 24/month[4]

Appendix 4. Guideline contents, extraction of recommendations, and how health-related activities are considered (part 3/5).

	Content of guidelines	Considered as
CHD	The organizations recommend that patients with stable ischemic heart disease should have **an individualized educationplan** to optimize care and promote wellness. Patients with stable ischemic heart disease should be educated regarding the following lifestyle elements that may influence prognosis: weight control and maintenance, lipid management, blood pressure control, smoking cessation, individualized medical, nutrition, and lifestyle education for patient with diabetes. Encouraging weight maintenance/reduction through an appropriate balance of lifestyle physical activity, structured exercise, caloric intake, and formal behavioral programs when indicated to maintain/achieve a body mass index between 18.5 and 24.9 kg/m2.	**Individualized education plan** 1 visit/year **Diet**
	Patients with stable ischemic heart disease should be encouraged to engage in 30–60 min of moderate-intensity aerobic activity, such as brisk walking, at least 5 days and preferably 7 days of the week, supplemented by an increase in daily activities.	**Physical activity** daily during 30 min
	A moderate or high dose of a statin therapy should be prescribed.	**Statin** 1 pill/day
	Aspirin, 75–162 mg daily.	**Aspirin** 1 pill/day
	Beta-blocker therapy should be initiated and continued for 3 years in all patients with normal left ventricular function following myocardial infarction or acute coronary syndromes.	**Beta-blocker** 1 pill/day
	ACE inhibitors should be prescribed in all patients with stable ischemic heart disease who also have hypertension, diabetes, left ventricular systolic dysfunction (ejection fraction <40%), and/or chronic kidney disease, unless contraindicated.	***ACE inhibitors*** *1 pill/dayif hypertension or diabetes*
	Sublingual nitroglycerin or nitroglycerin spray should be used for immediate relief of angina in patients with stable ischemic heart disease.	Not considered
	Annual influenza vaccine	**Influenza vaccine** 1/year
	Smoking cessation	**Smoking cessation**
	Patients should receive periodic follow-up at least annually that includes all of the following: A. Assessment of symptoms and clinical function. B. Surveillance for complications of stable ischemic heart disease, including heart failure and arrhythmias. C. Monitoring of cardiac risk factors. D. Assessment of the adequacy of and adherence to recommended lifestyle changes and medical therapy	**Physician appointment** 1 visit/year **12-lead ECG** 1/year **Blood test** 1/year
	The organizations recommend that radionuclide myocardial perfusion imaging, echocardiography, or cardiac MRI, with exercise or pharmacologic stress or coronary/cardiac CT angiography, should not be used for follow-up assessment in patients with stable ischemic heart disease, if performed more frequently than at a) 5-year intervals after coronary artery bypass graft or b) 2-year intervals after percutaneous coronary intervention.	1 exam every 2 years

Appendix 4. Guideline contents, extraction of recommendations, and how health-related activities are considered (part 4/5).

	Content of guidelines	Considered as
COPD	Group C patients have few symptoms but a high risk of exacerbations. A first choice of fixed combination of inhaled corticosteroids/long-acting beat 2-agonist or a long acting anticholinergic is recommended.	**Combination of long-acting beta2-agonist and inhaled corticosteroids** twice daily
	Influenza vaccines can reduce serious illness and death in COPD patients.	**Influenza vaccine** 1/year
	Pneumococcal vaccination	**Pneumococcal vaccine** 1 every 5 years
	Smoking cessation is the key intervention for all COPD patients who continue to smoke. Health care providers are important to the delivery of smoking cessation messages and interventions and should encourage all patients who smoke to quit, even when patients visit a healthcare provider for reasons unrelated to COPD or breathing problems.	**Smoking cessation** (details in specific guidelines)
	Routine follow-up is essential in COPD.	**Physician appointment** 1 visit/year
	Physical activity is recommended for all patients with COPD. […] Given the overall population benefits of physical exercise and its role in primary and secondary prevention of cardiovascular disease, it seems intuitively correct to recommend daily physical activity.	**Physical activity** daily
	Decline in lung function is best tracked by spirometry performed at least once a year to identify patients whose lung function is declining quickly.	**Spirometry** 1 visit/year
Depression	A collaborative care approach is recommended for patients with depression in primary care (depression care manager, primary physician, consulting psychiatrist, others). Clinicians should establish and maintain follow-up with patients. If the initial presentation is mild to moderate, either an antidepressant or psychotherapy (or both) is indicated. If the presenting symptoms of depression are severe or chronic, the initial recommendation is to treat with antidepressants and psychotherapy. Initially consider weekly contacts to ensure adequate engagement, then at least monthly.	**Collaborative care approach**: 1 visit to health caregiver/month
	Physical activity at a dose consistent with public health recommendations is a useful tool for easing major depression symptoms. A goal of 30 min of moderate-intensity aerobic exercise, 3 to 5 days a week is recommended for otherwise healthy adults	**Physical activity** 3 times/week for 30 min
	Selective serotonin reuptake inhibitors (SSRIs) — as well as venlafaxine, duloxetine, desvenlafaxine, mirtazapine and bupropion — are frequently recommended as first-line antidepressant treatment options owing to the quality and quantity of published data.	**SSRIs**, 1pill/day

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Appendix 4. Guideline contents, extraction of recommendations, and how health-related activities are considered (part 5/5).

	Content of guidelines	Considered as
Knee osteoarthritis	Participate in cardiovascular (aerobic) and/or resistance land-based exercise OR Aquatic exercise	**Physical activity** 20 min/day, 5 days/week
	Lose weight	**Diet**
	Self-management program (psychosocial intervention)	**Education** 1 visit/year[5]
	Receive manual therapy in combination with supervised intervention + taping	Considered during the physical activity
	Be instructed in the use of thermal agent Use walking aids Participate in tai chi program	Not considered
	Acetaminophen or oral NSAIDs or tramadol	3 pills/day[6]
		Physician appointment 1 visit/year
	Topical NSAIDs	Twice daily
	Intra-articular corticosteroid injections	3 injections/year
Tobacco use	ASSIST: 1. Help the patient with a quit plan. 2. Consider referral to intensive counseling (multi-session, group or individual), frequently defined as a minimum of weekly meetings for the first 4–7 weeks of cessation 3. Encourage pharmacologic therapies as appropriate: nicotine replacement therapies, bupropion hydrochloride, and varenicline have been proven effective.. 4. Give key advice on successful quitting 5. Provide supplementary educational materials ARRANGE: Arrange follow-up at the same visit patient sets quit date.	Nicotine substitute: 2/day Intensive counseling 4 visits/month
Overweight	Help your patient set a goal for reducing calories and adjusting to maintain gradual weight loss.	**Diet**
	Help your patient set a goal for physical activity: at minimum, more activity than present; ideally 30 min of moderate physical activity such as brisk walking most days of the week.	**Physical activity** 30 min/day, 5 days/week

Prevention services	Annual vaccination against influenza is recommended for all persons aged 6 months or older.	**Influenza vaccine** 1/year
	The American Academy of Family Physicians recommends screening for colorectal cancer using fecal occult blood testing, sigmoidoscopy, or colonoscopy, in adults, beginning at age 50 years and continuing until age 75 years.	**Occult blood testing or colonoscopy or sigmoidoscopy** 1 every 5 years

Appendix 5. Time spent on health-related activities by multimorbidity profiles (part 1/3) (HT, hypertension; D, diabetes; CHD, coronary heart disease; COPD, chronic obstructive pulmonary disease; OA, oseoarthritis; Dp, depression)

	Time/month, min										
	Pharmacologic treatment		**Unsupervised behavioural intervention**		**Supervised intervention**		**Monitoring and follow-up**		**Total**	**No. medications/ day**	**No. visits/month**
	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)		
Dp	1.2 (0.9)	10.9	7.9 (8.8)	70.1	0.0 (0.0)	0.0	2.1 (1.8)	19.0	11.3 (8.9)	1	1.1
HT	4.1 (3.2)	12.8	18.8 (19.3)	59.3	8.5 (7.2)	26.7	0.4 (0.2)	1.2	31.8 (20.4)	4	4.3
COPD	1.1 (0.9)	3.3	32.6 (25.6)	94.6	0.2 (0.2)	0.5	0.5 (0.4)	1.6	34.5 (25.6)	1	0.4
D	4.0 (3.5)	10.5	30.9 (26.4)	81.8	0.4 (0.3)	0.9	2.6 (1.2)	6.8	37.8 (26.9)	4	0.5
OA	5.6 (4.2)	12.3	39.6 (30.1)	86.9	0.2 (0.2)	0.4	0.2 (0.2)	0.5	45.6 (30.3)	5	0.5
CHD	5.4 (4.5)	9.2	44.7 (34.4)	75.6	8.3 (7.0)	14.1	0.7 (0.5)	1.1	59.2 (35.5)	5	4.5
Dp + OA	5.1 (4.2)	14.4	19.7 (24.6)	55.5	8.2 (7.4)	23	2.5 (2.2)	7.1	35.6 (25.7)	5	5.3
Dp + COPD	2.2 (1.8)	5.9	32.7 (23.8)	86.7	0.2 (0.2)	0.5	2.7 (2.0)	7.0	37.7 (23.9)	2	1.4
HT + Dp	5.0 (4.5)	11.3	34.2 (27.5)	77.4	0.3 (0.3)	0.8	4.6 (2.3)	10.5	44.2 (28.0)	5	1.5
OA + CODP	6.7 (6.2)	15.0	32.2 (22.4)	71.8	0.5 (0.4)	1.2	5.4 (2.6)	12.0	44.8 (23.2)	6	0.8
Dp + D	6.7 (5.1)	14.2	39.2 (29.0)	83.5	0.4 (0.3)	0.8	0.7 (0.4)	1.5	47.0 (29.3)	6	0.9
HT + D	6.9 (5.8)	14.1	39.6 (28.5)	80.8	0.2 (0.1)	0.4	2.3 (1.8)	4.7	49.0 (29.0)	6	1.5
HT + OA	10.0 (8.2)	18.9	39.4 (33.5)	74.9	0.5 (0.4)	1.0	2.7 (1.1)	5.2	52.6 (34.4)	9	1.0
OA + D	5.0 (3.9)	8.5	45.1 (34.1)	75.8	8.4 (7.2)	14.2	0.9 (0.6)	1.5	59.5 (35.0)	5	4.6
HT + COPD	6.1 (5.1)	10.2	44.2 (34.9)	74.2	8.5 (7.0)	14.2	0.8 (0.5)	1.4	59.6 (35.9)	6	4.6
Dp + CHD	11.0 (8.7)	17.4	42.9 (28.5)	67.9	8.5 (6.7)	13.4	0.8 (0.5)	1.3	63.1 (30.6)	10	4.9
HT +CHD	6.3 (5.3)	10.0	45.9 (34.9)	72.5	8.4 (7.2)	13.3	2.7 (2.0)	4.3	63.3 (36.0)	6	5.5
COPD + D	8.2 (7.5)	13.0	43.9 (31.2)	69.3	8.3 (7.7)	13.1	2.9 (1.2)	4.6	63.4 (33.1)	8	4.7
OA + CHD	7.3 (6.6)	11.5	46.8 (34.7)	73.5	8.6 (7.5)	13.4	1.0 (0.6)	1.6	63.7 (36.1)	7	4.7
CHD + COPD	10.3 (8.4)	15.7	45.9 (33.6)	70.4	8.5 (6.9)	13.0	0.6 (0.4)	0.9	65.2 (35.1)	9	4.7
CHD + D	8.5 (7.4)	12.8	45.8 (33.5)	69.4	8.7 (7.4)	13.3	3.0 (1.4)	4.6	66.0 (35.3)	8	4.8

Data are mean (SD) and percentage of total time. OA is associated with overweight. CHD and COPD are associated with smoking

Appendix 5. Time spent on health-related activities by multimorbidity profile (part 2/3)

	Time/month, min									
	Pharmacologic treatment		**Unsupervised behavioural intervention**		**Supervised intervention**		**Monitoring and follow-up**		**Total**	**No. medications/ day**	**No. visits/month**
	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)		
HT + D + Dp	7.4 (6.5)	14.9	34.2 (26.4)	69.0	0.5 (0.6)	1.1	7.5 (3.4)	15.1	49.6 (27.3)	7	1.8
HT + OA + Dp	7.7 (5.9)	15.1	40.3 (32.5)	78.9	0.3 (0.3)	0.7	2.8 (2.1)	5.4	51.1 (32.9)	7	1.9
D + OA + Dp	11.0 (9.0)	19.5	40.0 (31.6)	70.8	0.5 (0.5)	0.9	5.0 (2.7)	8.8	56.5 (33.7)	10	2.0
HT + D + OA	11.9 (10.2)	21.1	38.5 (26.7)	68.0	0.7 (0.6)	1.2	5.5 (2.4)	9.6	56.6 (29.2)	11	1.2
HT + CHD + COPD	8.5 (7.8)	13.6	44.9 (32.7)	71.5	8.2 (6.7)	13.0	1.2 (0.7)	1.9	62.7 (33.7)	8	4.8
HT + COPD + Dp	6.2 (5.1)	9.7	45.8 (33.7)	72.2	8.5 (7.1)	13.4	2.9 (2.0)	4.6	63.4 (34.8)	6	5.6
CHD + COPD + Dp	7.9 (6.7)	12.4	44.3 (31.5)	69.6	8.5 (7.4)	13.3	3.0 (2.3)	4.7	63.6 (32.9)	8	5.7
HT + CHD + Dp	7.2 (6.2)	11.2	44.8 (32.5)	70.5	8.7 (7.8)	13.7	2.9 (2.1)	4.6	63.6 (33.4)	7	5.6
HT + COPD + OA	10.5 (8.8)	16.2	44.9 (30.9)	68.9	8.7 (7.5)	13.3	1.1 (0.6)	1.6	65.2 (32.5)	10	5.0
HT + CHD + OA	11.8 (9.4)	18.0	43.9 (32.9)	67.1	8.8 (7.8)	13.5	1.0 (0.6)	1.5	65.4 (34.8)	11	5.1
D + CHD + COPD	10.6 (9.8)	15.9	44.4 (31.0)	66.3	8.6 (7.2)	12.8	3.4 (1.6)	5.0	67.0 (33.5)	10	5.0
D + CHD + Dp	9.1 (7.8)	13.5	44.4 (33.1)	66.0	8.7 (7.7)	13.0	5.0 (2.4)	7.4	67.3 (35.3)	9	5.8
D + COPD + Dp	9.2 (8.3)	13.5	45.1 (31.5)	66.4	8.5 (7.6)	12.6	5.1 (2.7)	7.5	67.9 (33.2)	9	5.7
COPD + OA + Dp	11.4 (9.5)	16.6	45.5 (34.6)	66.7	8.7 (7.0)	12.7	2.7 (2.2)	3.9	68.2 (36.7)	10	5.7
CHD + COPD + OA	12.8 (10.5)	18.7	45.5 (31.0)	66.3	9.1 (8.2)	13.3	1.2 (0.7)	1.7	68.7 (34.0)	12	5.1
HT+D + COPD	10.4 (10.3)	14.9	45.2 (32.9)	64.7	8.5 (6.5)	12.1	5.8 (2.5)	8.3	69.8 (34.6)	10	5.0
HT + D + CHD	10.4 (9.4)	14.9	45.1 (30.8)	64.5	8.8 (6.9)	12.6	5.6 (2.6)	8.0	69.9 (33.0)	10	5.0
CHD + OA + Dp	12.0 (10.7)	17.1	46.8 (35.2)	66.9	8.3 (6.9)	11.8	2.9 (2.3)	4.1	70.0 (37.2)	11	5.9
D + CHD + OA	14.1 (12.6)	20.2	43.9 (32.6)	62.6	8.9 (7.9)	12.6	3.2 (1.5)	4.6	70.1 (36.2)	13	5.2
D + COPD + OA	14.1 (14.1)	19.8	44.6 (31.1)	62.7	9.3 (9.0)	13.1	3.1 (1.3)	4.4	71.0 (34.5)	13	5.1
HT + D + OA + Dp	12.5 (9.8)	20.6	39.5 (30.2)	65.4	0.7 (0.6)	1.2	7.7 (3.6)	12.8	60.4 (32.4)	12	2.2
HT + CHD + COPD + Dp	9.2 (9.4)	13.9	44.8 (30.9)	67.7	9.0 (8.2)	13.5	3.2 (2.2)	4.8	66.1 (33.9)	9	5.8
HT + CHD + COPD + OA	14.0 (11.7)	20.8	43.4 (32.7)	64.5	8.6 (7.6)	12.8	1.3 (0.8)	2.0	67.4 (35.1)	13	5.2

Data are mean (SD) and percentage of total time. OA is also associated with overweight. CHD and COPD are associated with smoking

Appendix 5. Time spent on health-related activities by multimorbidity profile (part 3/3)

	Time/month, min									
	Pharmacologic treatment		**Unsupervised behavioural intervention**		**Supervised intervention**		**Monitoring and follow-up**		**Total**	**No. medications/ day**	**No. visits/month**
	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)	%	Mean (SD)		
HT + COPD + OA + Dp	11.9 (10.0)	17.2	44.7 (31.4)	64.9	9.1 (7.3)	13.2	3.2 (2.3)	4.6	68.8 (34.4)	11	6.0
HT + CHD + OA + Dp	12.3 (10.6)	17.7	45.3 (30.5)	65.0	9.0 (8.1)	12.9	3.0 (2.3)	4.4	69.7 (33.2)	12	6.1
CHD + COPD + OA + Dp	14.2 (11.7)	20.3	44.3 (30.8)	63.2	8.3 (7.2)	11.9	3.2 (2.3)	4.6	70.1 (33.8)	13	6.1
D + CHD + COPD + Dp	11.3 (11.0)	16.1	44.8 (32.7)	63.4	9 .0 (7.8)	12.8	5.4 (2.6)	7.7	70.6 (36.1)	11	6.0
HT + D + CHD + Dp	11.3 (9.2)	15.8	43.5 (30.1)	60.9	9.0 (8.2)	12.6	7.7 (3.5)	10.8	71.4 (32.7)	11	6.0
HT + D + CHD + COPD	12.6 (11.6)	17.6	43.8 (31.7)	61.1	9.3 (8.8)	13.0	5.9 (2.6)	8.3	71.6 (34.1)	12	5.2
D + COPD + OA + Dp	15.4 (13.3)	21.1	43.4 (31.6)	59.6	9.0 (7.8)	12.3	5.1 (2.9)	7.0	72.9 (35.3)	14	6.1
D + CHD + COPD + OA	16.9 (15.9)	23.1	43.9 (31.5)	60.0	8.8 (7.1)	12.1	3.5 (1.5)	4.8	73.2 (36.2)	15	5.4
HT + D + COPD + Dp	11.4 (10.5)	15.5	45.2 (32.1)	61.4	9.1 (10.9)	12.4	7.9 (3.5)	10.7	73.7 (35.8)	11	6.0
D + CHD + OA + Dp	15.1 (13.3)	20.4	44.5 (33.0)	60.2	9.2 (7.7)	12.5	5.1 (2.6)	6.9	73.9 (35.7)	14	6.2
HT + D + CHD + OA	16.4 (13.7)	22.0	43.6 (29.3)	58.5	8.8 (7.6)	11.8	5.7 (2.5)	7.6	74.6 (33.5)	15	5.4
HT + D + COPD + OA	16.1 (13.8)	20.9	46.6 (37.0)	60.2	8.7 (7.0)	11.3	6.0 (2.7)	7.7	77.4 (40.3)	15	5.4
HT + CHD + COPD + OA + Dp	14.9 (11.3)	20.9	44.5 (30.5)	62.6	8.4 (6.8)	11.8	3.3 (2.4)	4.7	71.1 (33.3)	14	6.2
HT + D + CHD + COPD + Dp	13.7 (11.6)	18.1	44.5 (32.1)	59.0	9.1 (8.2)	12.1	8.1 (3.4)	10.7	75.3 (35.8)	13	6.2
D + CHD + COPD + OA + Dp	17.1 (14.3)	22.4	44.6 (34.5)	58.4	9.1 (7.9)	11.9	5.7 (3.5)	7.4	76.4 (38.6)	16	6.4
HT + D + COPD + OA + Dp	17.4 (16)	22.4	43.7 (31.9)	56.2	8.8 (8.4)	11.3	7.9 (3.6)	10.1	77.8 (37.3)	16	6.4
HT + D + CHD + COPD + OA	18.4 (18.4)	23.4	44.7 (30.7)	56.8	9.5 (9.9)	12.0	6.2 (2.6)	7.8	78.7 (37.3)	17	5.6
HT + D + CHD + OA + Dp	16.9 (16.4)	21.3	45.4 (35.5)	57.2	9.1 (8.9)	11.5	7.9 (3.6)	10.0	79.4 (40.9)	16	6.4
6 conditions	19.5 (15.9)	24.1	44.2 (30.7)	54.8	9.0 (7.5)	11.1	8.1 (3.4)	10.0	80.7 (35.8)	18	6.6

Data are mean (SD)