

Medidays
5. September 2011
Multimorbidity

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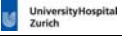


Agenda

- Example
- Prevalence
- Definition
- Evidence
- Interaction
- Further Problems
- Feasibility
- Case management



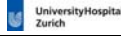


Example : Diagnosis

- SIRS unklarer Ätiologie
 - DD: Cholecystitis, Urosepsis
 - klinisch Druckdolenz Oberbauch rechts, Dysurie, Pollakisurie
 - sonographisch Cholezystolithiasis mit Wandverdickung
- Chronisch erhöhte Cholesteaseparameter mit akutem Transaminasen-Anstieg
 - DD: I.R. Cholezystitis, medikamentös-toxisch
- Bronchoalveoläres Karzinom rechter Lungenunterlappen (E0 10Z010)
 - Tumorstadium pT3 pN0 cM0 G3 R0; UICC-Stadium IIIb
 - St.n. offener Unterlappenresektion rechts mit mediastinalem Lymphknotenstaging am 10.12.10
 - St.n. offener Spätdelikation Ober- und Mittellappen mit Abszessdrainage
 - Mittellappen am 03.02.11 bei Pleuraempyem rechts mit Lungenabszess im Mittellappen
 - Nachweis von Aspergillus species im Gewebe 04.02.2011
 - St.n. rezidivierenden Rethorakotomien (siehe persönliche Anamnese)
- Chronisch-obstruktive Pneumopathie COPD Gold II (FEV1 1,19 L, 53% 30,09.10)
 - St.n. Nikotinabusus (~15 py)
- Tachykardie/Bradikardie-Syndrom
 - wahrscheinlich im Rahmen eines beginnenden Sick-Sinus-Syndroms postoperativ
- Arterielle Hypertonie
- Aneurysma Aorta descendens und Aorta abdominalis
- Substituierte Hypothyreose
- Tubulovillöses Adenom des Sigma
 - Exzision durch Koloskopie am 12/2010
- Vd.a. Adenom Nebenniere rechts
 - grössentypisch zur Voruntersuchung vom 11/2010
- St.n. akutem Nierenversagen eventuell nach Kontrastmittel, DD I.R. SIRS 02/2011
 - aktuell mittelschwere Funktionseinschränkung mit GFR 31ml/min

Example : Medication

Aspirin Cardio 100 (Fintanz 100 mg)	1 - 0 - 0 - 0 5St p.o.	
Cardione (Fald 200 mg) / Amiodon	1 - 0 - 0 - 0 5St p.o.	
Bronchial P (Tabl 0.1 mg) / Lantidone	1 - 5 - 0 - 0 - 0 5St p.o.	
ICL Retard Zyma (Ret Drag 8 min)	1 - 0 - 0 - 0 5St p.o.	Patient
Norvaco (Tabl 5 mg) / Anabipen Sng	1 - 0 - 0 - 0 5St p.o.	
Torsem 10 (Tabl 10 mg) / Farasamed 1	1 - 5 - 0 - 0 - 0 5St p.o.	
Vireal (Fintanz 200 mg) / Virocrom	Indiv. 8St p.o.; Vireal patient. Evaluation	Patient
Zentri (Tabl 5 mg) / Rhothain 1	0 - 0 - 0 - 1 5St p.o.	
Zentri (Tabl 5 mg) / Lantidone Sng	1 - 0 - 0 - 0 5St p.o.	
Zusammenf. Vireal (Fintanz 10 mg)	1 - 0 - 0 - 1 5St p.o.	
Medikatione: syng. parenteral		
Fragmen (Inj. Lsg. 5000 E.U./2ml) Fertige	Alle 24 Std. 9000 U.I. (20.00) s.c.	
Infusionen		
NaCl 0.9%	Alle 8 Std. 100 ml über 45 Min. (00.00, 08.00, ...)	
Piperacillin Taclo: Gendoc (Troch...	Alle 8 Std. 4-5 g über 45 Min. (00.00, 08.00, ...)	
Medikatione: andere		
Fuchthain: (Augen) MÜ Monoklon...		
Lungon (OR Optil 0.3 mg/ml) / Ebnat...	0 - 0 - 1 - 0 Tr. skalar; rechts, auf Nachtschlaf	
Oxycort 2000: Turbuhaler (Im Pro)	2 - 0 - 2 - 0 Dos. Inhalation, 6St	
Medikatione: Injektionen		
Blutprodukte		
Medikatione in Reserve		
Melbum Lingual (Schmelztbl 10 mg)	1. Res. Neurex: max. 1 5St max. 4x/24h subling.	
Parag (Dosis) / Parafinol, Phenol...	1. Res. Oxidation: max. 1 5 Dose max. 2x/2	
Zusammenf. Vireal (Fintanz 10 mg)	1. Res. Schmerz: max. 0 5St max. 2x/24h p.o.	
Novigen (Fintanz 500 mg) / Metabenz	1. Res. Schmerz: max. 2 5St max. 4x/24h p.o.	
Hespan (Inj. Lsg. 500 E.U/ml) s.c.	1. Res. zum Blocken eines abgetesteten V.	

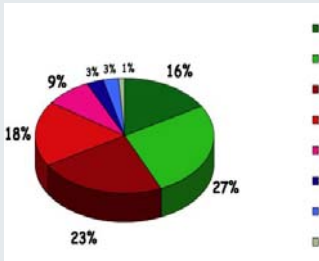
Example : C Süd







Multimorbidity at the University Hospital Zurich

- Inpatients
- Department of Internal Medicine (DIM)
- University Hospital Zurich
- One year sample



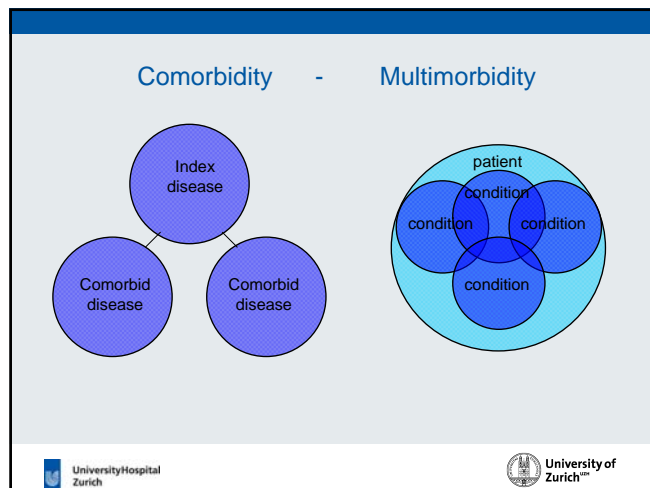
Horschik, Dissertation, Universität Zürich, 1999

Multimorbidity in the Emergence Unit (USZ)

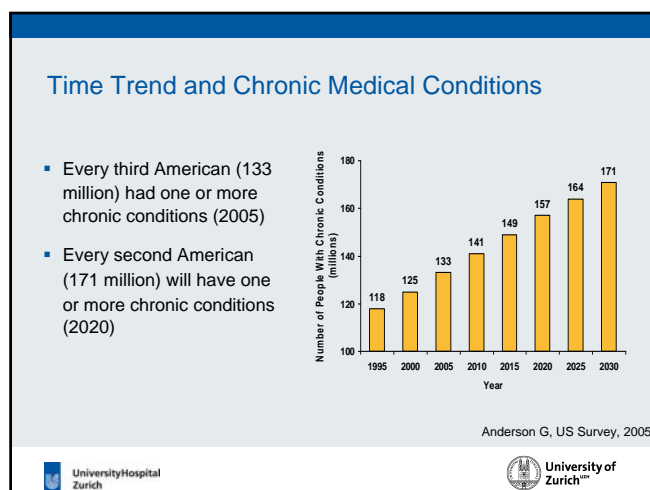
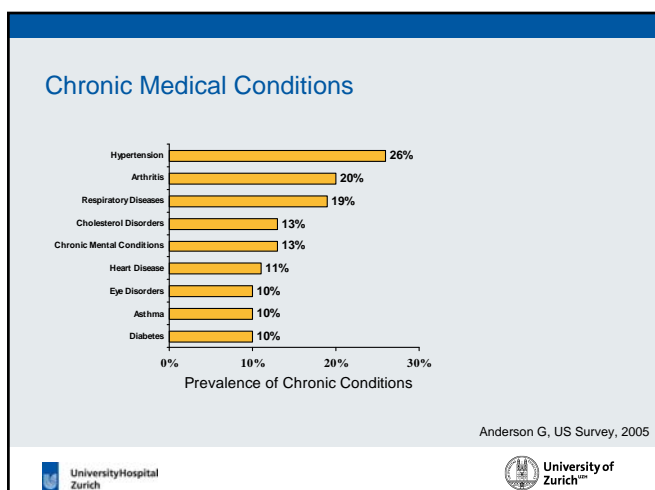
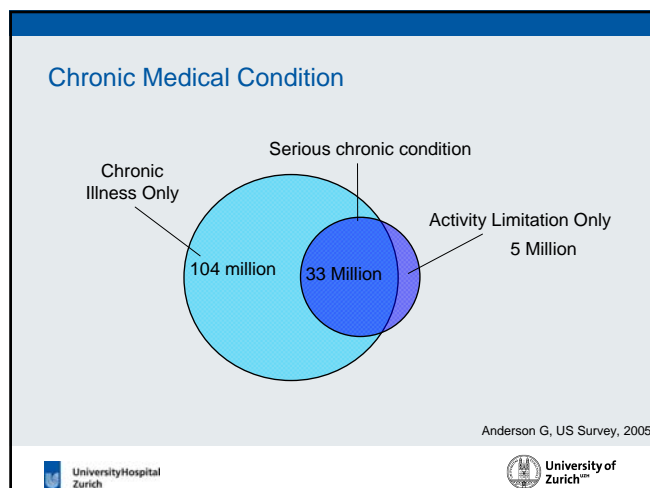
	Patient record	Chart review	Admin. data
≥2 diagnosis from the ICD-10 classification system	92.9%	95.3%	96.5%
≥2 diagnosis from different chapters of the ICD-10 classification system	85.9%	90.0%	86.5%
≥2 chronic medical conditions as defined by Charlson Deyo	68.8%	72.4%	75.9%

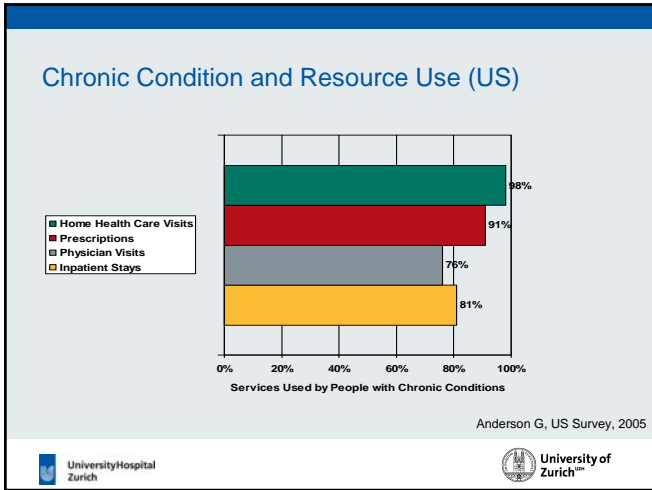
Schneider S. et al., in preparation



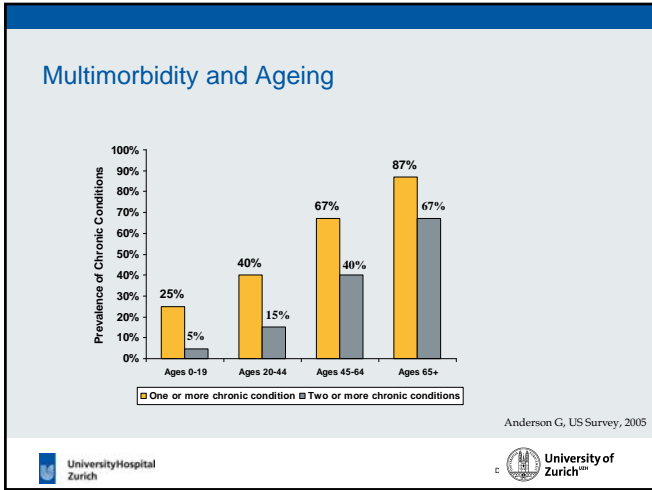
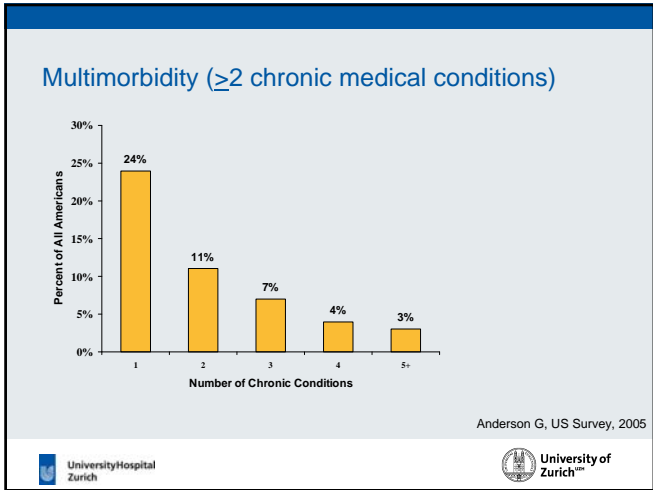
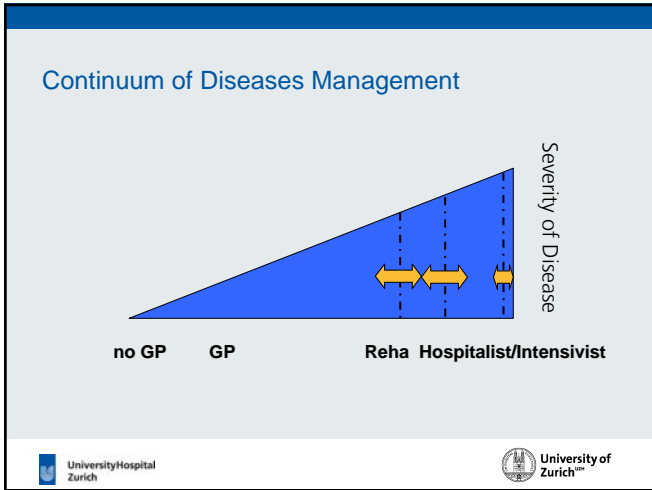
Definition

- Two or more chronic medical conditions
 - Chronic illnesses** are conditions that are expected to last a year or more and require ongoing medical care
 - Activity limitations** are functional limitations and disabilities that restrict a person from performing normal activities
 - Serious chronic conditions** are illnesses which cause functional limitations in daily living





- ### Disease Management
- Focus on common conditions where self-care efforts are important
 - Coordinate of health services and interventions
 - Facilitated transitions
 - Improve quality of life
 - Reduce unnecessary admissions
 - Reduce health care costs



Medicare Spending for Chronic Conditions (US)



Number of Conditions	Beneficiaries (%)	Expenditures (%)
0	18	1
1	19	4
2	21	11
3	18	18
4	12	21
5	7	18
6	3	13
7+	2	14

54% (Beneficiaries with 4 or more conditions)
95% (Expenditures for 4 or more conditions)

Chronic Medical Conditions in Swiss Primary Care



- FIRE
- ICPC-2 coding system
- Chronic condition defined by Family Medicine Research Centre, University of Sydney
- Based on
 - Duration
 - Prognosis
 - Pattern
 - Sequelae
- From the ICPC-2 149 codes in 16 chapters

O'Halloran. Fam Pract. 2004 Aug;21(4):381-6.




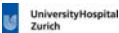
Effects of Multimorbidity

- Multiple encounters with multiple providers in the health care system (Fragmentation of care)
- Exponential increase in complications due to multiple interactions
- Inappropriate hospital admission
- Medication errors
- Adverse drug events
- Drug interactions
- Conflicting recommendations
- More iatrogenic complications and adverse outcomes



Killer Combinations


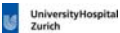
- Combination of behavioral and physical conditions
 - Dementia and end-stage renal disease
 - Bipolar disorder and heart failure



Evidence - Clinical Practice Guidelines (CPG)


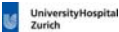
- Focus on single diseases or conditions (disease-oriented)
- Based on efficacy studies excluding patients with multimorbidity (index disease)
- Do not address the real world (generalizability)
- Offer little guidance to clinicians caring for old patients with several chronic conditions (multimorbidity)

Boyd C., JAMA, 2005



Evidence: UpToDate (Heart failure self management)

- Patients with multiple chronic illnesses face additional physical, cognitive and functional challenges to effective care and have more complex therapeutic, self-monitoring and behavioral requirements
- They are more likely to have multiple clinicians and receive confusing or conflicting recommendations (average Medicare patient with HF sees 15 providers a year)
- The presence of one condition may complicate treatment for others – as, for instance, aspirin in a patient with coronary artery disease, a history of gastrointestinal bleeding, and HF (for which the risks and benefits of aspirin are uncertain)
- Evidence from clinical trials provides limited guidance for treatment of patient with multiple chronic conditions



Google


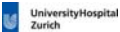
previ Potencial der FIRE-Daten **Multimorbidity**: 8. Dezember 2010 ...
www.icpc.ch/fileadmin/user_upload/...Multimorbidity_FIRE_Kaplan.pdf
File Format: PDF-Adobe Acrobat - Druck View
Multimorbidity: 8. Dezember 2010. Vrabotta, Zurich, Vladimir Kaplan, Leitender Arzt, Klinik und Poliklinik für Innere Medizin ...

Annals of Family Medicine - Collected Resources **Multimorbidity** ...
www.annalsmfm.org/icmp/collections/multimorbidity
1 Mar 2011 - Annals of Family Medicine 2010 Annals Impact Factor is 4.45 ... **Multimorbidity**. Citations 1-10 of 30 total displayed. ...

Multimorbidity Patterns in the Elderly: A New Approach of Disease... ...
www.plosone.org/...info%3Adoi%2F10.1371%2Fjournal.pone.001... - Cached
by Schäfer - 2010 - Cited by 2 - Related articles
(2010) **Multimorbidity Patterns in the Elderly: A New Approach of Disease Clustering Identifies Complex Interactions between Chronic Conditions** ...

Disability, more than multimorbidity, was predictive of mortality ...
www.ncbi.nlm.nih.gov/pubmed/2095387
by P. Landi - 2010 - Cited by 4 - Related articles
1 J Clin Epidemiol. 2010 Jul;63(7):752-9. Epub 2010 Jan 8. ... we evaluate the impact of disability and multimorbidity on the risk of all-cause death in a ...



BioMed Central | Full text | **Multimorbidity - not just an older** ...
www.biomedcentral.com/1471-2458/10/P18 - Cached
by A Taylor - 2010 - Cited by 3 - Related articles
22 Nov 2010 - 2010 Taylor et al licensee BioMed Central Ltd. ... **Multimorbidity**, the simultaneous occurrence of two or more chronic conditions. ...



Clinical Practice Guidelines - Example

- Hypothetical 79-year old woman
- Osteoporosis
- Osteoarthritis
- Diabetes mellitus
- Hypertension
- Chronic obstructive pulmonary disease



Boyd C., JAMA, 2005

Clinical Practice Guidelines and Multimorbidity

	Diabetes Mellitus**	Hypertension**	Osteoarthritis**	Osteoporosis**	COPD**
Guideline addressed treatment for type of patient?	Older: yes Multiple comorbidities: yes/both: yes	Older: yes Multiple comorbidities: no/both: no	Older: yes Multiple comorbidities: yes/both: yes	Older: no Multiple comorbidities: no/both: no	Older: no Multiple comorbidities: no/both: no
Quality of evidence discussed for type of patient?	Older: yes Multiple comorbidities: yes Quality of evidence poor, requires extrapolation for nutrition recommendations	Older: yes Multiple comorbidities: no Quality of evidence good for treating hypertension in older patients	Older: no Multiple comorbidities: no	Older: no Multiple comorbidities: no	Older: no Multiple comorbidities: no
Specific recommendations for patients with comorbid condition?	Yes Diseases: hypercholesterolemia, hypertension, congestive heart failure, chronic kidney disease, cardiovascular disease, peripheral vascular disease, benign prostatic hypertrophy	Yes Diseases: coronary artery disease, diabetes mellitus, metabolic syndrome, sleep apnea, chronic kidney disease, gout, left ventricular hypertrophy, aneurysm, dissection, peripheral vascular disease, congestive heart failure, stroke, dementia,* renal transplantation, renal artery stenosis, urinary outflow obstruction	Yes Diseases: osteoarthritis, osteoporosis, peptic ulcer disease, chronic kidney disease, hyperuricemia, congestive heart failure	No	No
Specific recommendations for patients with several comorbid conditions?	Yes	No	No	No	No
Time needed to treat to benefit from treatment in the context of life expectancy discussed?	Yes	No	No	No	No



Boyd C., JAMA, 2005

Treatment Plan

Time	Medication†	Other
7:00 AM	ipratropium metered dose inhaler 70 mg/wk of albuterol	Check feet Sit upright for 30 min on day when albuterol is taken Check blood sugar
8:00 AM	500 mg of calcium and 200 IU of vitamin D 12.5 mg of hydrochlorothiazide 40 mg of furosemide 10 mg of glimepiride 81 mg of aspirin 850 mg of metformin 250 mg of naproxen 20 mg of omeprazole	Eat breakfast 2.4 g/d of sodium 90 rimol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes† DASH-†
12:00 PM		Eat lunch 2.4 g/d of sodium 90 rimol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes† DASH-†
1:00 PM	ipratropium metered dose inhaler 500 mg of calcium and 200 IU of vitamin D	
7:00 PM	ipratropium metered dose inhaler 850 mg of metformin 500 mg of calcium and 200 IU of vitamin D 40 mg of furosemide 250 mg of naproxen	Eat dinner 2.4 g/d of sodium 90 rimol/d of potassium Low intake of dietary saturated fat and cholesterol Adequate intake of magnesium and calcium Medical nutrition therapy for diabetes† DASH-†
11:00 PM	ipratropium metered dose inhaler As needed Albuterol metered dose inhaler	



Boyd C., JAMA, 2005

Treatment - Example

- 12 unique medications
- 19 doses of medication per day
- 14 non-pharmacological activities
 - Self-monitoring, diet, exercise, healthcare visit, lab tests
- 10 possible interactions
- USD 400.- per month



Boyd C., JAMA, 2005

Interaction (DDI)

- Management targeting one condition may cause undesirable sequelae regarding an other condition
 - Drug-Drug Interaction (DDI-1)
 - Drug-Disease Interaction (DDI-2)
 - Disease-Disease Interaction (DDI-3)



Boyd C., JAMA, 2005

Drug-Drug Interaction (Pharmacology)

- Pharmacokinetics
 - Ciclosporine + Erythromycin
 - Coumarin + Rifampicin
- Pharmacodynamics
 - Methadon + Amiodarone
 - Sympathomimetics + Beta-blocking agents

Boyd C., JAMA, 2005

Drug-Disease Interaction (Contraindication)

- Non steroidal anti-inflammatory drugs for pain relieve in arthritis will aggravate hypertension and renal disease
- Diuretics and ACE Inhibitors for heart failure will cause exacerbation of renal failure
- Steroids for autoimmune disease will cause high glucose level in diabetics
- Aspirin for coronary heart disease with the potential of causing bleeding in patients with ulcer disease

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Disease-Disease Interaction (google no result)

- Revascularization for coronary heart disease in patients with and without diabetes (BARI)
- Statine for patients with ESRD (AURORA)
- Treatment of non-STEMI in patients with metastatic lung cancer in remission (competing risks)

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Conflicting CPG in Multimorbidity (Emergency Unit USZ)

Mean Number of Diagnoses	Relative Contraindication (Grey)	Absolute Contraindication (Black)
2,3,4	~1.0	~0.5
5,6,7	~2.0	~1.0
8,9,10	~3.0	~1.5
>10	~5.0	~2.0

Markun S. et al., in preparation

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Other Problems with CPG in Multimorbidity

- Age
- Feasibility
- Adherence
- Patient priorities
- Shared decision making
- Social context
- Personal values (patient + doctor)
- De-escalation

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Challenges in Patients with Multimorbidity

- Generate research focused on management of a complex of chronic diseases
- Define metrics sensitive to meaningful changes, which matter to the patient
- Generate evidence for management of multimorbidity
- Educate of health care professionals
- Adapt delivery of health services

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Case Management - Patient-centered Care

- Is attentive to patient's psychosocial as well as physical needs
- Explores the patient's concerns and priorities for care
- Conveys a partnership between the patient and physician
- Facilitates active patient involvement in decision making
- Coordinates care across professionals, facilities, and the support system

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Health Care System for Patients with Multimorbidity

- Primary care providers in ambulatory settings
- Interprofessional and interdisciplinary service delivery
 - Staff physician and residents
 - Physiotherapist
 - Nurses
 - Social worker
 - pharmacist
- Integrated health teams
- Focus on common conditions in which self-care efforts are important
- Coordination of health care interventions
- Improve quality of life
- Reduce morbidity and mortality
- Reducing health care costs

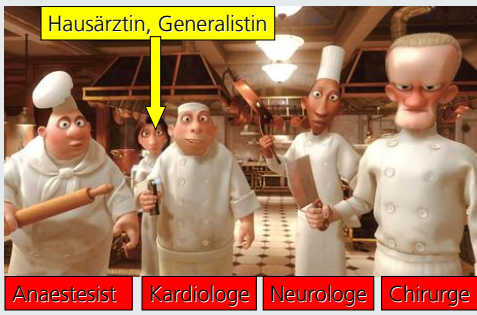



CER Applicability to Patients with Multimorbidity

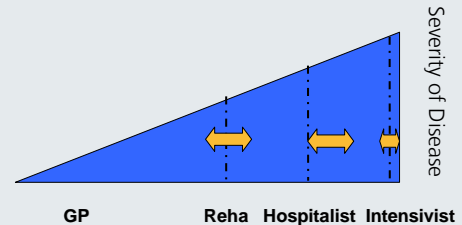

- Include heterogeneous populations with multiple chronic conditions in sufficient numbers to measure benefits and harms of interventions
- Examine universal health outcomes that are relevant across diseases (e.g., function, symptom burden, activity, survival, active life expectancy)
- Develop and implement risk-stratification models and report harms and benefits according to risk strata
- Employ analytical methods that account for biases and confounding
- Evaluate longer-term changes in benefits and harms of treatments as patients age and acquire additional conditions
- Evaluate disease pairs, especially those with potential for therapeutic competition





Coordination of Care

Continuum of Case Management

Multimorbidity and Quality of Life

Summary

- Chronic medical conditions are common, resource intensive, and increase in prevalence with aging
- Multimorbidity is defined as two or more chronic medical conditions within one individual
- Possible interactions increase exponentially with the number of chronic conditions
- Evidence for management of multimorbidity is lacking
- Multiple other psychological and social factors, which are often ignored by medical professionals, interfere with multimorbidity
- Fragmented health services delivery from multiple sources might be contra-productive
- Integrated, patient-centered, health services delivery is crucial in future adaptations of the health systems

