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Multimorbidität – ein Paradigmenwechsel in der Medizin

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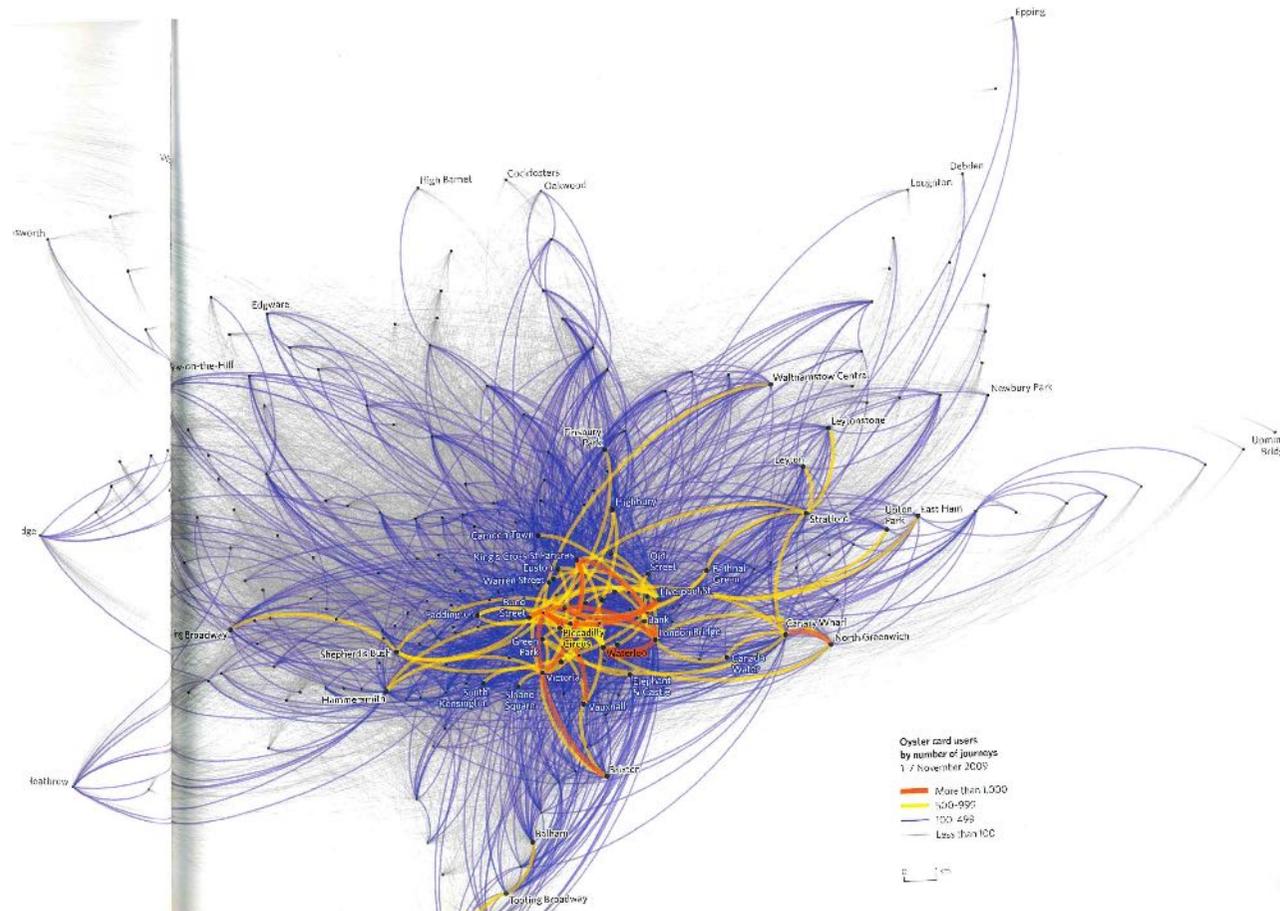


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Potential conflicts of interest

- Board of Directors RehaClinic AG, Switzerland
- Board of Directors different non-governmental Foundations, eg. Zurich Academy of Internal Medicine
- Organization of congresses and symposia, mostly unpaid
- National Advisory Boards during the last 10 years: Anticoagulation, iron-substitution, cholesterol treatment, hypertension treatment, heart failure treatment
- Speakers honoraria from different organisations and companies

Publikumsbewegungen im Londoner öffentlichen Verkehrssystem



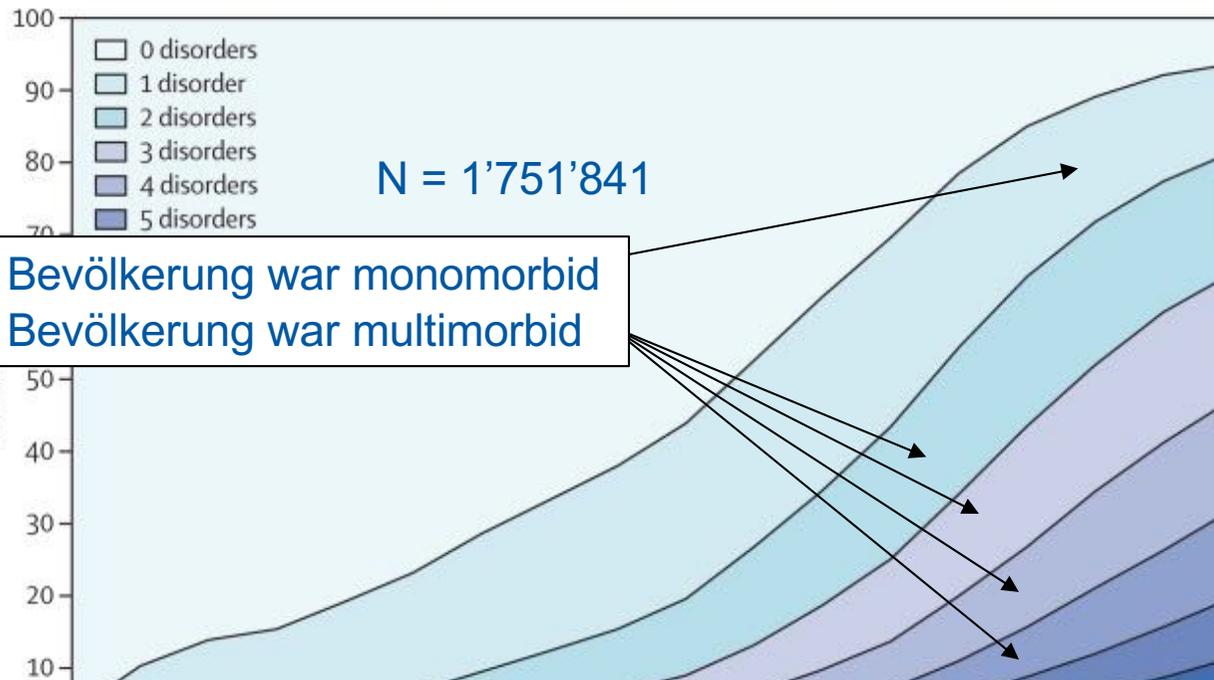
Was sollen Sie mitnehmen?

Ich will bei Ihnen

- Neugier für Multimorbidität, Komplexität und deren Erforschung bzw. Thematisierung in Medizin und im Gesundheitswesen wecken.
- Ein Bewusstsein für therapeutische Konflikte, Disease-Disease Interactions und Dilemmasituationen in der Medizin schaffen.
- Eine Neugier für die Relevanz von Persönlichkeitsaspekten bei medizinischen Entscheidungen wecken.



Multimorbidität ist die häufigste Krankheitskonstellation.



- 19% der Bevölkerung war monomorbid
- 23% der Bevölkerung war multimorbid

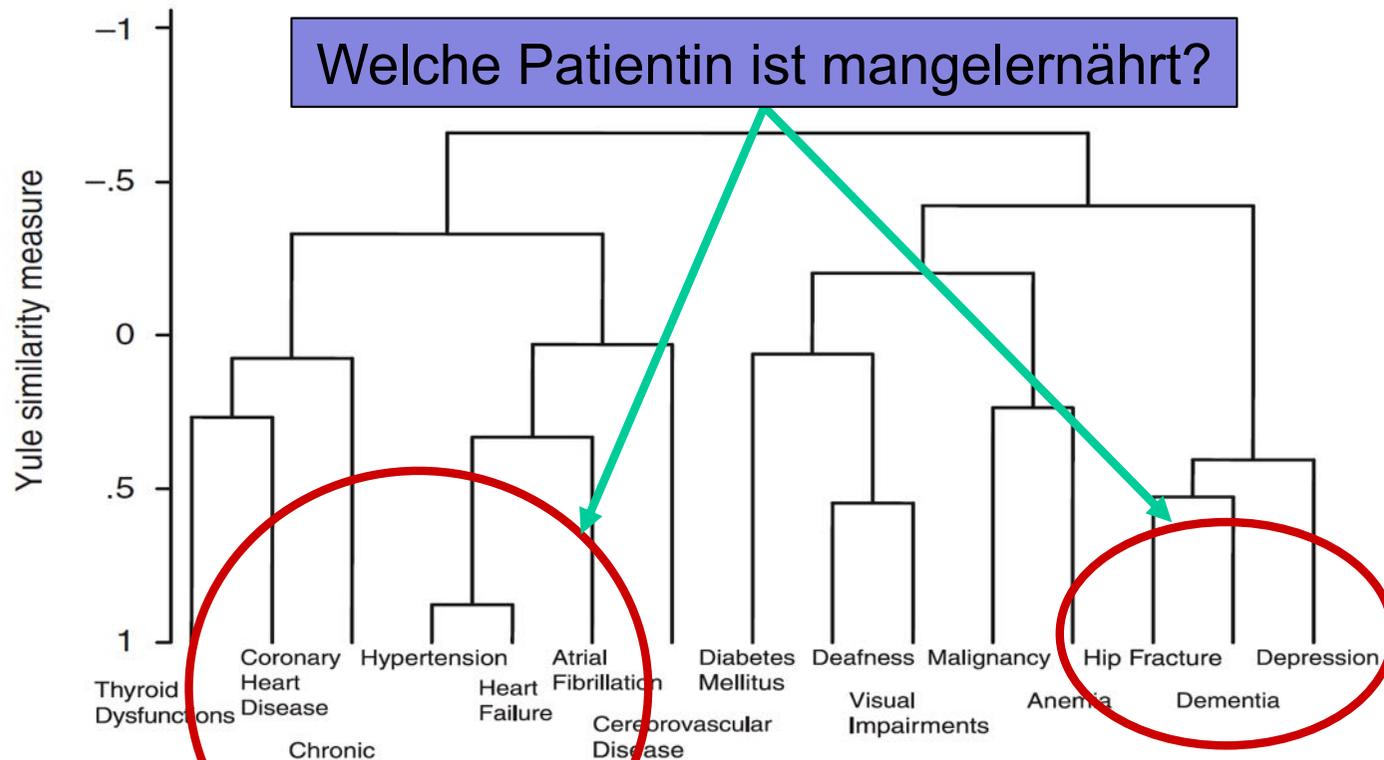
90% der notfallmässig internistisch Hospitalisierten sind teilweise schwer multimorbid

Krankheits-Kombinationen

- 12'161 ICD 10 Codes
- Annahme von drei Diagnosen: 3 Codes = 12'161 x 12'160 x 12'159
- Anzahl potentieller Kombinationen = 1'798'045'683'840
- Verschiedene Ausmasse der Erkrankungen
- In der Realität viel weniger Kombinationen wegen häufigen und typischen Krankheitsclustern von akuten und chronischen Erkrankungen und Krankheiten, die sich gegenseitig ausschliessen



Multimorbidität tritt in Clustern auf.



- Operieren trotz Blutverdünnung?
- SSRIs (Antidepressiva) und Blutstillung?
- Fraktur/Operation und kognitive Funktion/postoperatives Delir (Verwirrung)?
- Medikation bei Spitalaustritt und Demenz?

Neue Pubmed Definition von Multimorbidität

- The complex interactions of several co-existing diseases,
- Introduced 2018
- Herz und Schmerz

Ibuprofen

Eine angemessene Überwachung und Beratung von Patienten mit Hypertonie und/oder leichter bis mittelschwerer dekompensierter Herzinsuffizienz in der Anamnese ist erforderlich, da Flüssigkeitseinlagerungen und Ödeme in Verbindung mit NSAR-Therapie berichtet wurden.



Disease-Disease-Interactions (DDI's) sind in stationärer Innerer Medizin sehr häufig.

- 176 über den Notfall hospitalisierte internistische Patienten
- 166 Patienten analysiert, 8 nur monmorbid, 2 Patienten <18jährig
- 59% Männer, 63 (± 19) Jahre
- Durchschnittliche Anzahl aktiver Diagnosen: 6.6 (± 3.4)
- 239 Therapeutische Konflikte (49% aller Patienten)
 - 29% aller Patienten “*major* therapeutic conflicts”
 - 41% aller Patienten “*minor* therapeutic conflicts”



Patients with non-insulin-dependent Type 2 Diabetes started on systemic glucocorticoids

- We screened 1'966 articles and included eleven. All articles on hospitalized patients, no data on outpatients available.
- Only 4 of 11 identified articles were original research articles.
- Experts prefer anticipatory insulin when starting glucocorticoids.
- They do not consistently recommend a specific insulin treatment strategy except discouraging Sliding Scale Insulin.
- Basis Bolus Insulin with long- or intermediate-acting (NPH) insulin is equally effective with no clear advantage for either, even though similar pharmacodynamics of NPH insulin and glucocorticoid-induced hyperglycemia would support NPH.



Beispiele problematischer DDI's im Alltag

- Gastrointestinale-, zerebrale Blutung oder Akutoperation und Antikoagulation
- Diabetes und hoch dosierte Steroide
- Nierenerkrankung mit Clearance $< 30\text{ml/min}$ oder $< 15\text{ml/min}$ und ...
- Schmerz(behandlung) und Hypertonie, Herzerkrankung, kardiovaskuläres Risiko (und Depression)
- Frailty, cognitiver Abbau, Depression, etc.) und ...
- Krankheit und psychiatrische Erkrankungen
 - Depression
 - Drogenabusus, Alcohol und ...
 - Psychose und ...
 - Manie und Konkordanz der Tabletteneinnahme
 - Borderline und ...
 - etc.



Akut exazerbierte COPD und Depression

- Systematische Review: Artikel mit AECOPD und Depression nach PRISMA statement.
- 1'494 Originalarbeiten gescreened, 35 eingeschlossen.
- Praevalenz von Depression in AECOPD 9.5% bis 85.6%.
- Einige Studien zeigen höhere Mortalitätsraten für depressive AECOPD Patienten.
- Keine Studie schlägt Screening für Depression oder zwingende Behandlung vor ...
- Do we „care“? Outcomes that matter to patients....



Depression is independently associated with increased LOS

Variable	Estimate [days]	95% CI
Depression as comorbidity	2.73	(2.57,2.88)
Age, per additional year	-0.02	(-0.03,-0.02)
Female sex	0.17	(0.09,0.24)
Marital status		
Married/partnered	ref	
Single	0.12	(0.03,0.21)
Widowed/divorced/separated	-0.02	(-0.11,0.07)
Other/unknown	-0.18	(-0.39,0.03)
Patient died in hospital	-2.42	(-2.64,-2.20)
Number of diagnoses, per additional diagnosis	1.23	(1.22,1.24)
Alcohol misuse	-2.20	(-2.40,-2.00)
Atrial fibrillation	-1.38	(-1.60,-1.16)
Cancer (metastatic)	0.37	(0.24,0.50)
Chronic heart failure	-1.79	(-1.94,-1.65)
Chronic pain	0.52	(0.34,0.70)
Decompensated cirrhosis	3.74	(3.47,4.01)
Diabetes	-2.11	(-2.22,-2.00)

Multivariable linear regression adjusted for confounders
Median Number of Diagnosis 5



Multimorbiditäts Guidelines

Multimorbidity: clinical assessment and management

Multimorbidity: assessment, prioritisation and management of care for people with commonly occurring multimorbidity

NICE guideline NG56

Methods, evidence and recommendations

September 2016

Final.

Commissioned by the National Institute for Health and Care Excellence

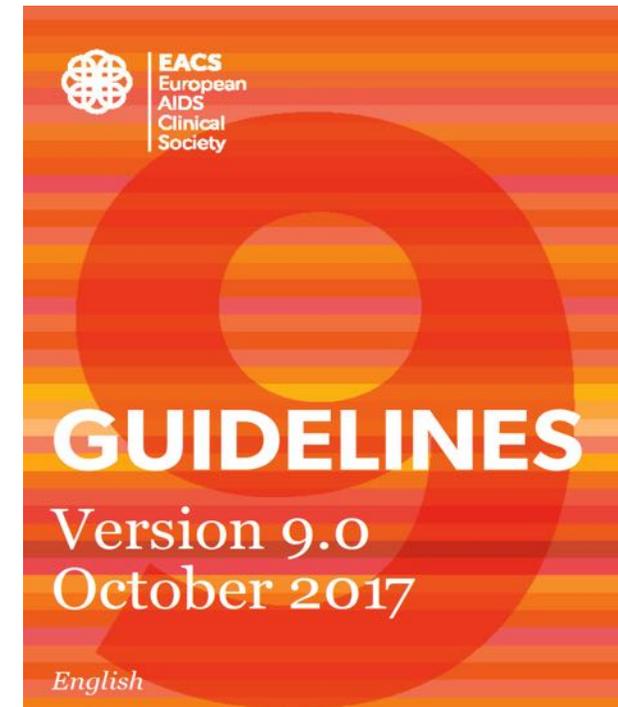
DEGAM

Multimorbidität

S3-Leitlinie

AWMF-Register-Nr. 053-047
DEGAM-Leitlinie Nr. 20

Deutsche Gesellschaft
für Allgemeinmedizin
und Familienmedizin e.V.



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Depression: Screening and Diagnosis

Significance

- Higher prevalence of depression reported in HIV-positive persons (20-40% versus 7% in general population)
- Significant disability and poorer treatment outcomes associated with depression

Screening and diagnosis

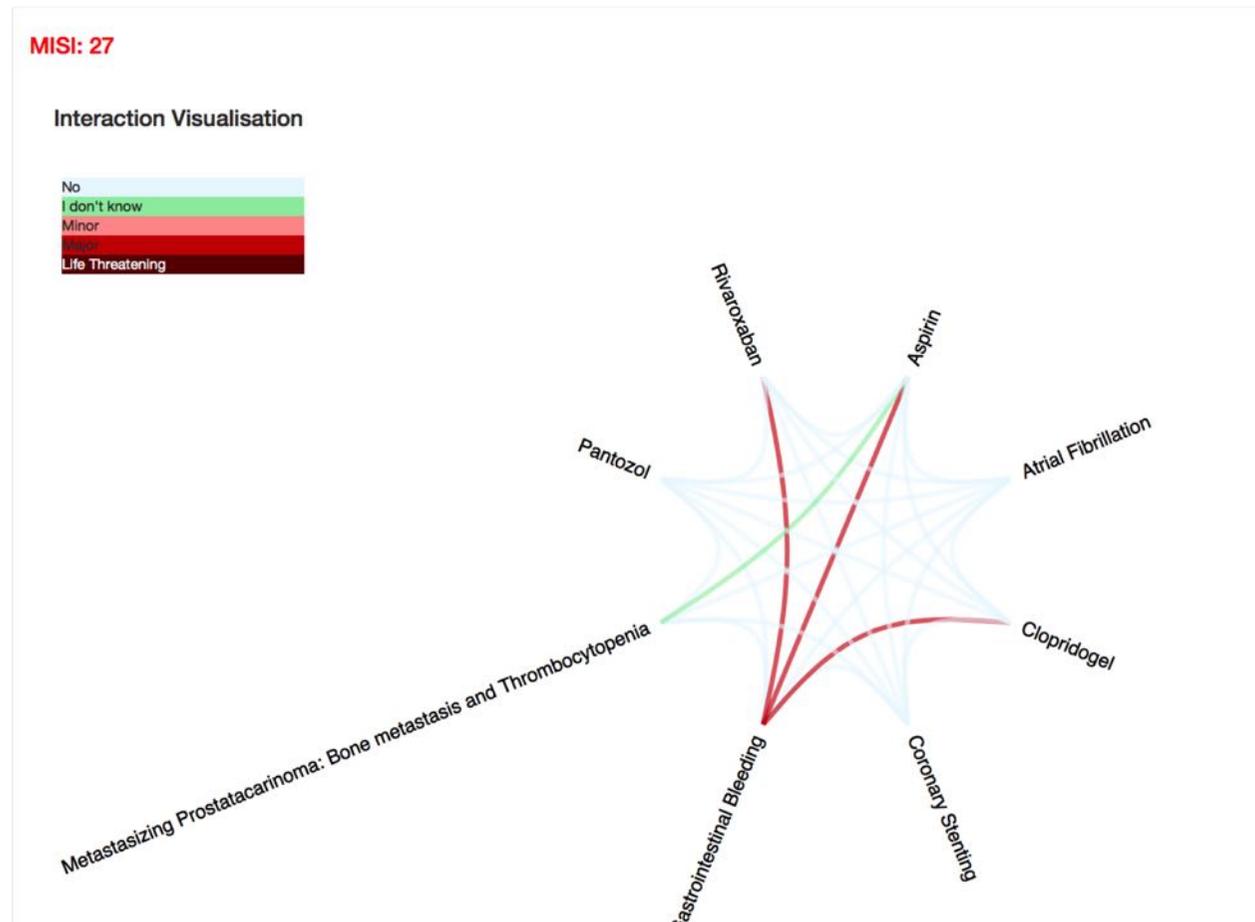
Who?	How to screen?	How to diagnose?
<p>Screening of all HIV-positive persons recommended in view of the high prevalence of depression</p> <p>Populations at particular high risk</p> <ul style="list-style-type: none"> • Positive history of depression in family 	<ul style="list-style-type: none"> • Screen every 1-2 years • Two main questions: <ol style="list-style-type: none"> 1. Have you often felt depressed, sad or without hope in the last few months? 2. Have you lost interest in activities that you usually enjoy? 	<p>Symptoms – evaluate regularly</p> <p>A. At least 2 weeks of depressed mood OR</p> <p>B. Loss of interest OR</p> <p>C. Diminished sense of pleasure</p> <p>PLUS 4 out of 7 of the following:</p>

important. Ask: "Over the last two weeks, how often have you been bothered by any of the following problems? 1. Little interest or pleasure in doing things; 2. Feeling down, depressed or hopeless." Answers: Not at all (0) / Several days (1) / More than half the days (2) / Nearly every day (3). If the person scores 2 or more, seven additional questions, see [5]

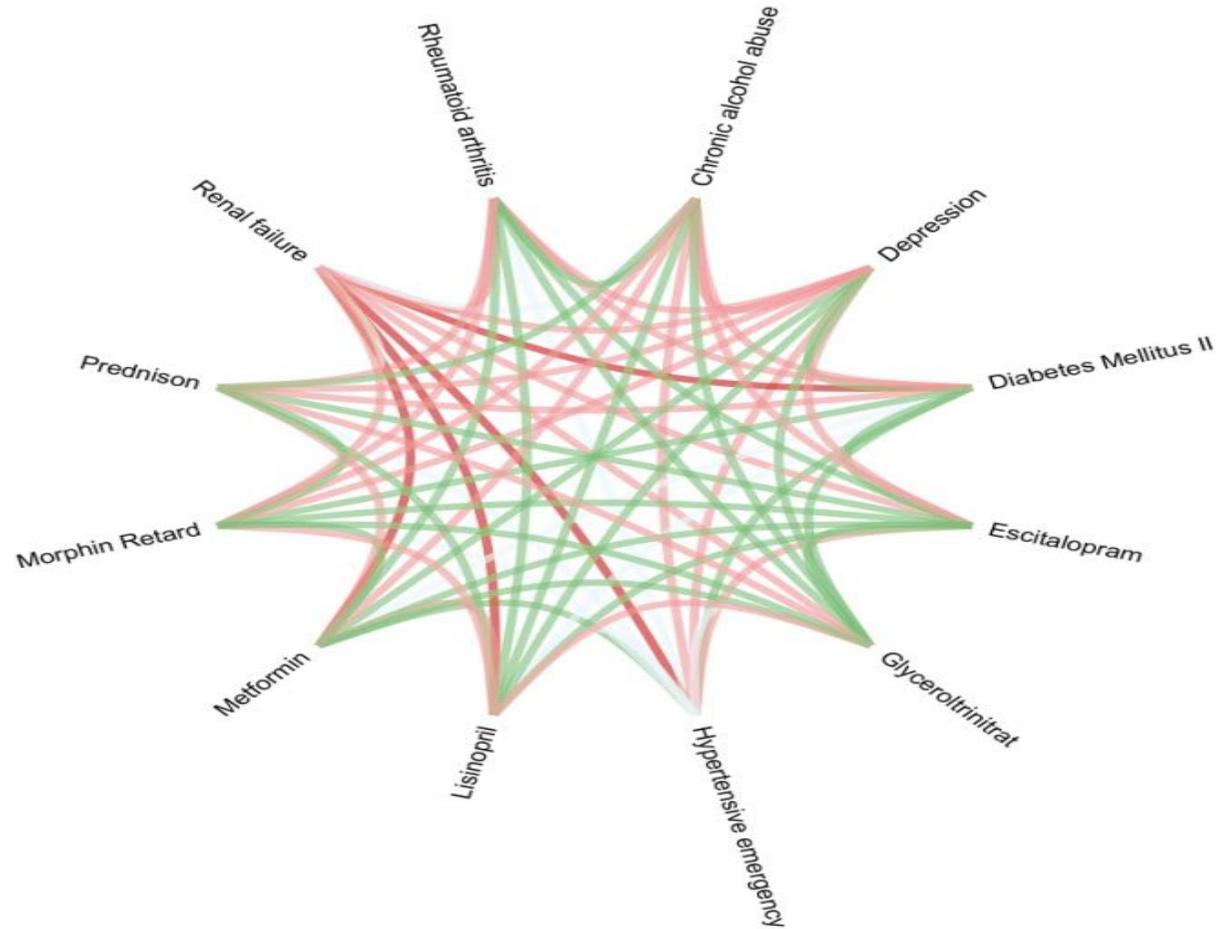
i EFV has been associated with a higher risk of suicidal ideation



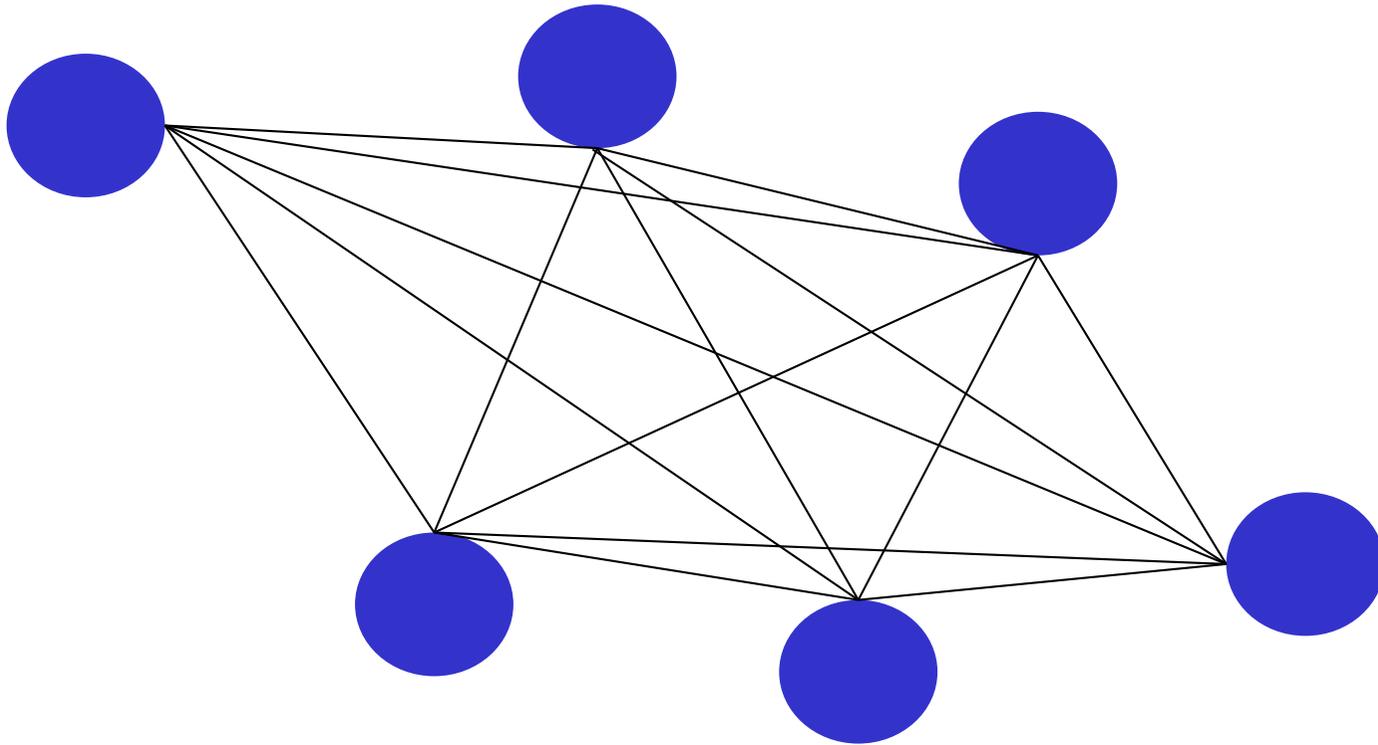
Disease-Disease Interactions mit MISI bei Einzelpatienten graphisch dargestellt



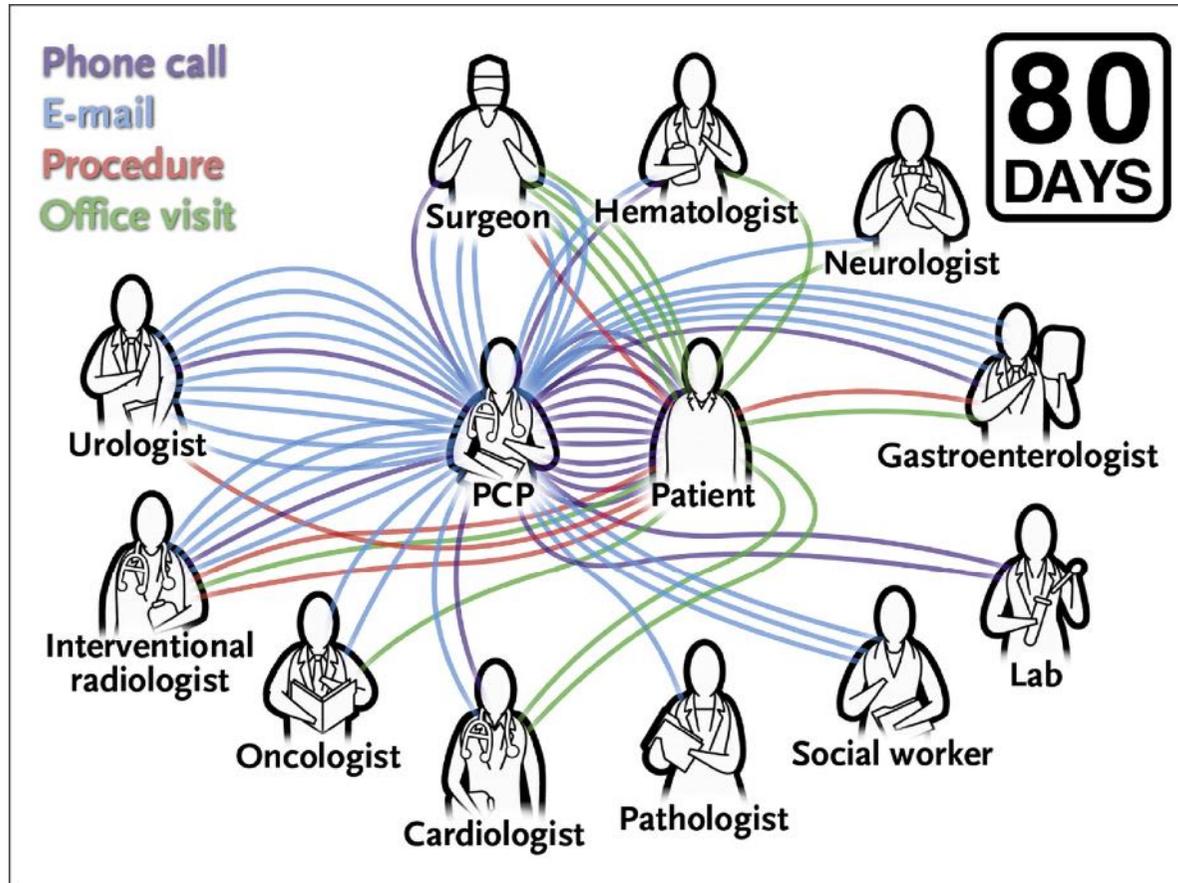
Disease-Disease Interactions mit MISI bei Einzelpatienten graphisch dargestellt



Komplexität entwickelt sich aus
Einzelproblemen überlinear.



A quarterback's view of care coordination



Der klinische Fall – Institutionelle Sicht

- Die Patientin war zum Zeitpunkt der Analyse 44 Tage im Spital
- Es wurden mindestens 70 Blutentnahmen (nur im USZ), mindestens 12 Röntgenbilder, 5 Echokardiographien, 4 Magenspiegelungen, 3 Koronarangiographien, 2 Computertomographien durchgeführt.
- Es waren 3 Spitäler beschäftigt 18 verschiedene Kliniken und Fachabteilungen involviert
- Es finden sich 168 Einträge nur in der ärztlichen Dokumentation
- Zum Zeitpunkt der Analyse (nur USZ) betrugen die Kosten 131'859.90 CHF

Quelle: Kosten und DRG-Berechnung S. Bäcker



Internist??? Operierst Du? Nein, ich sitze am Computer ...

With Patients

Using Computer

70 | * † * † * † † * † * † Time, %

- 11.6 Stunden pro Tag (1.6 Stunden mehr als legal)
- 1.7 Stunden mit dem Patienten
- 5.2 Stunden Verwendung von Computern
- 13 Minuten gleichzeitig Patienten und Computer
- 52.4% der Zeit indirekt auf den Patienten bezogen
- 28.0% der Zeit direkt mit dem Patienten

7:00 a.m.
8:00 a.m.
9:00 a.m.
10:00 a.m.
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Time

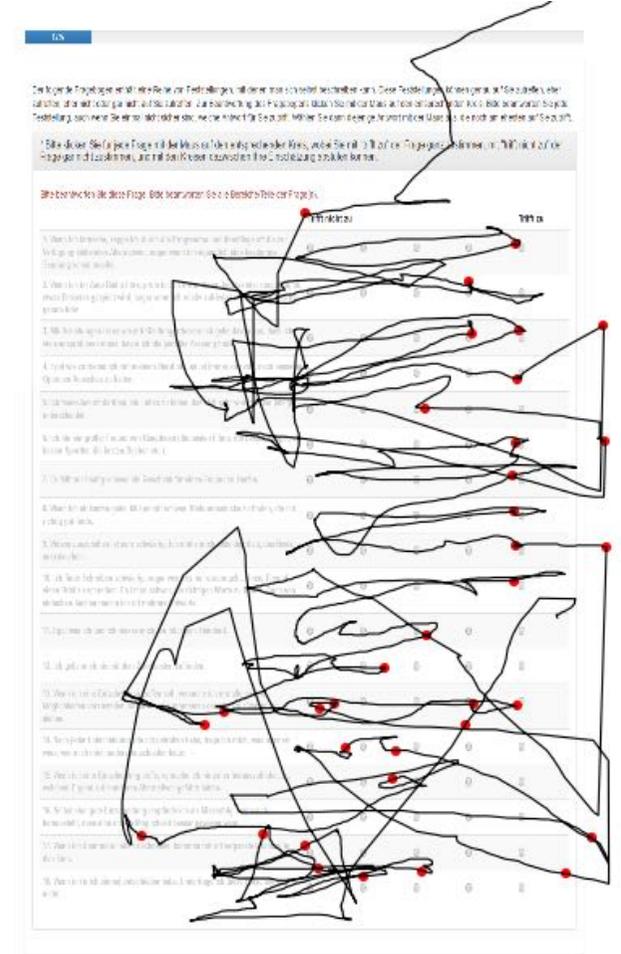
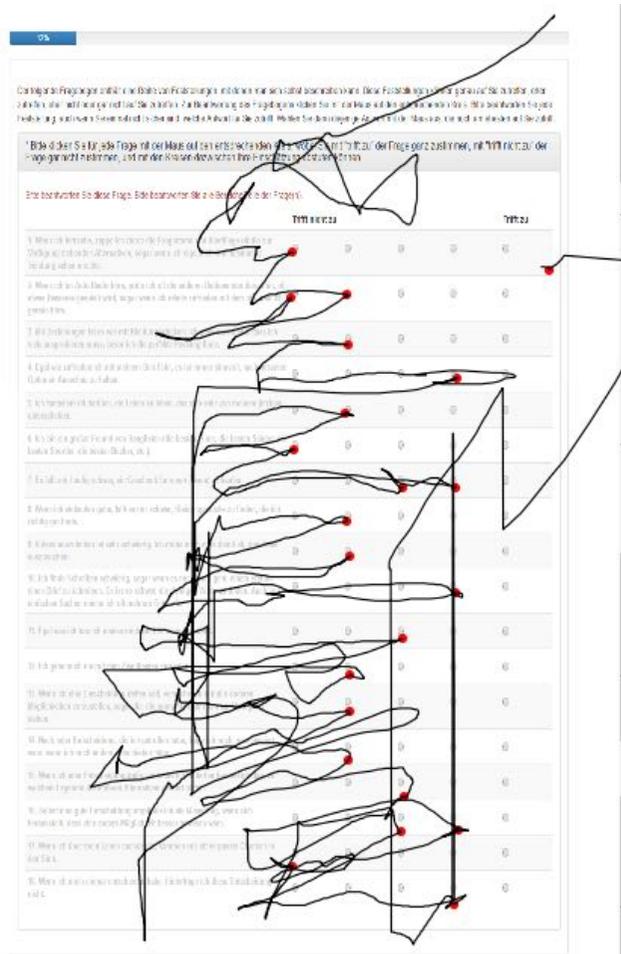


Die Virtuelle Chefvisite und Dilemmasituationen

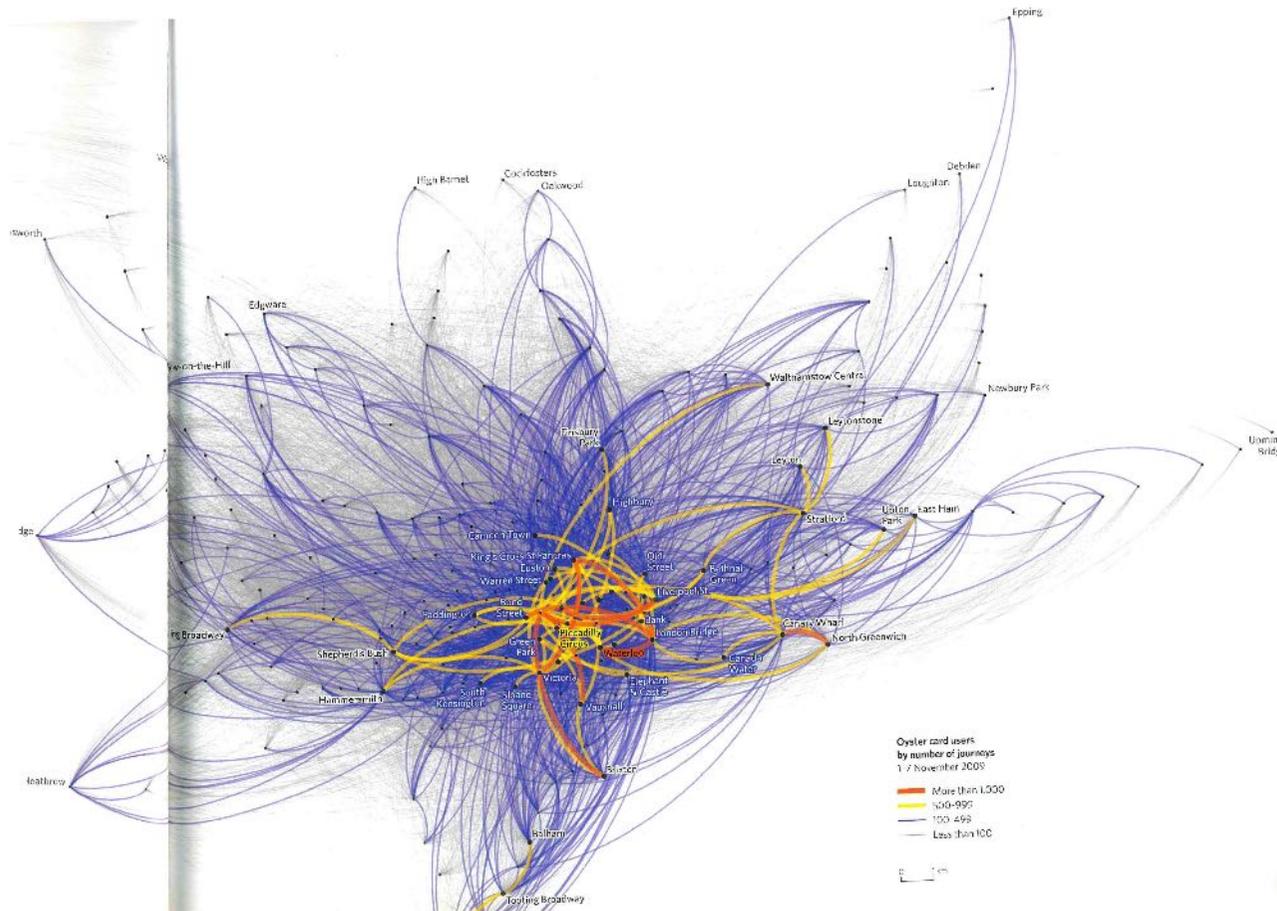


Persönlichkeitsstrukturen werden nicht wahrgenommen...

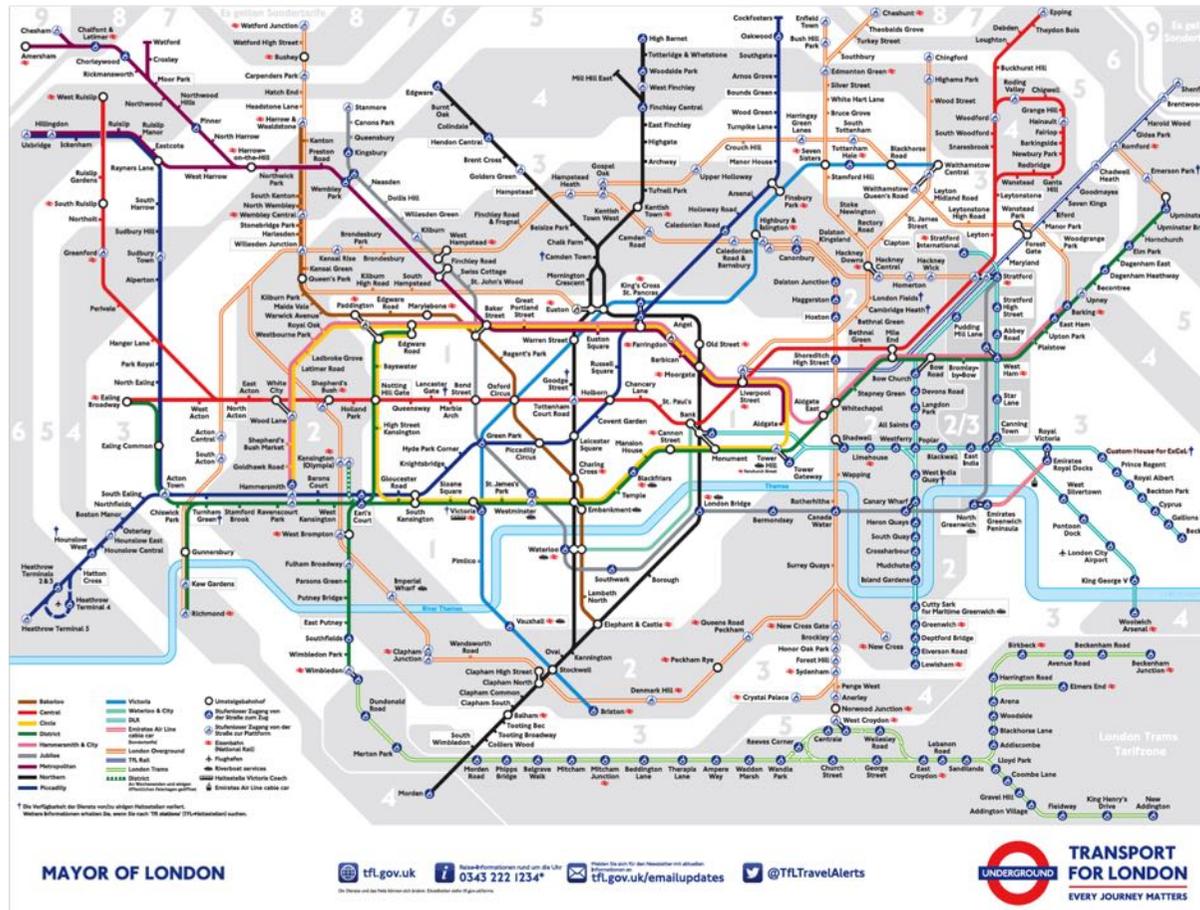
To be or not to be (able to decide): Satisfier versus Maximizer



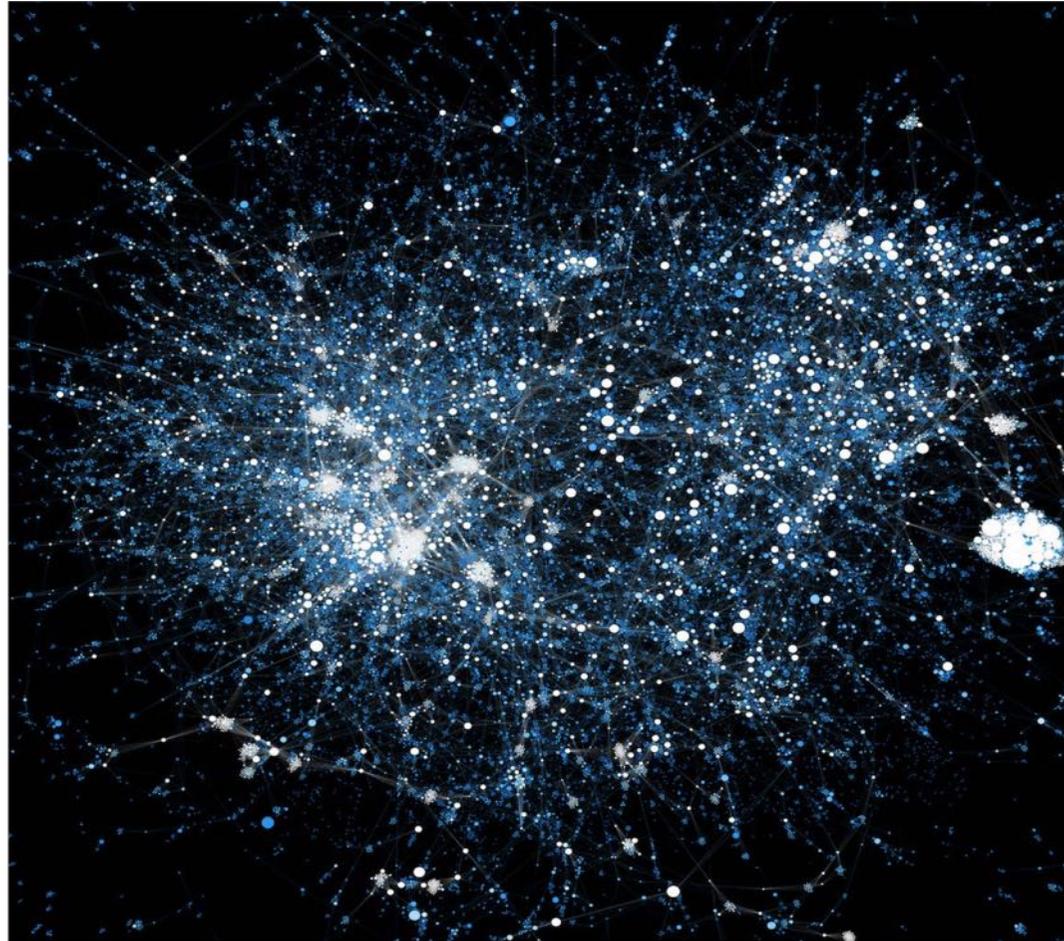
Publikumsbewegungen im Londoner öffentlichen Verkehrssystem



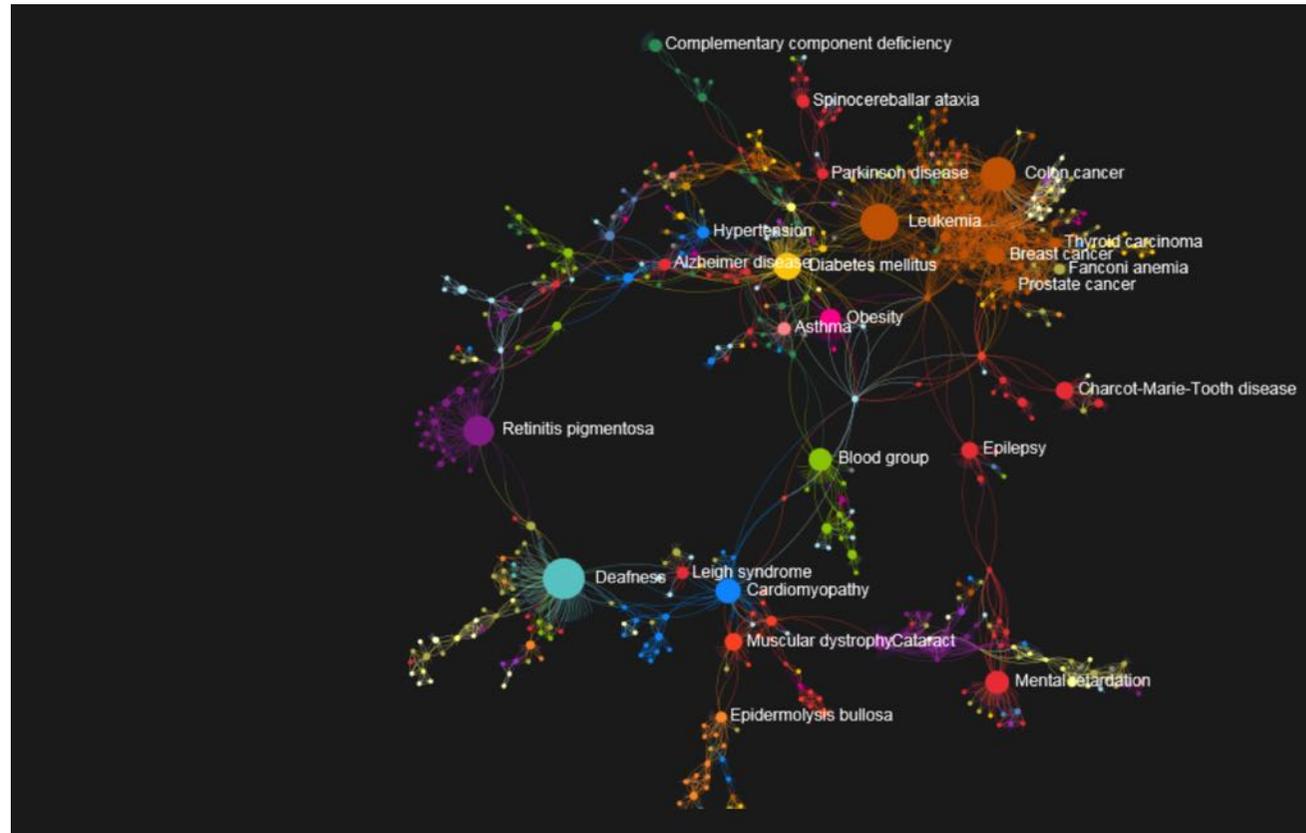
Mapping im Londoner öffentlichen Verkehrssystem



Interdisziplinarität der Forschung des Schweizerischen Nationalfonds 2006 - 2015



Krankheiten und assoziierte Gene im Netzwerk



<http://exploring-data.com/vis/human-disease-network/>

The *Human Disease Network*, Goh K-I, Cusick ME, Valle D, Childs B, Vidal M, Barabási A-L
(2007), Proc Natl Acad Sci USA 104:8685-8690.

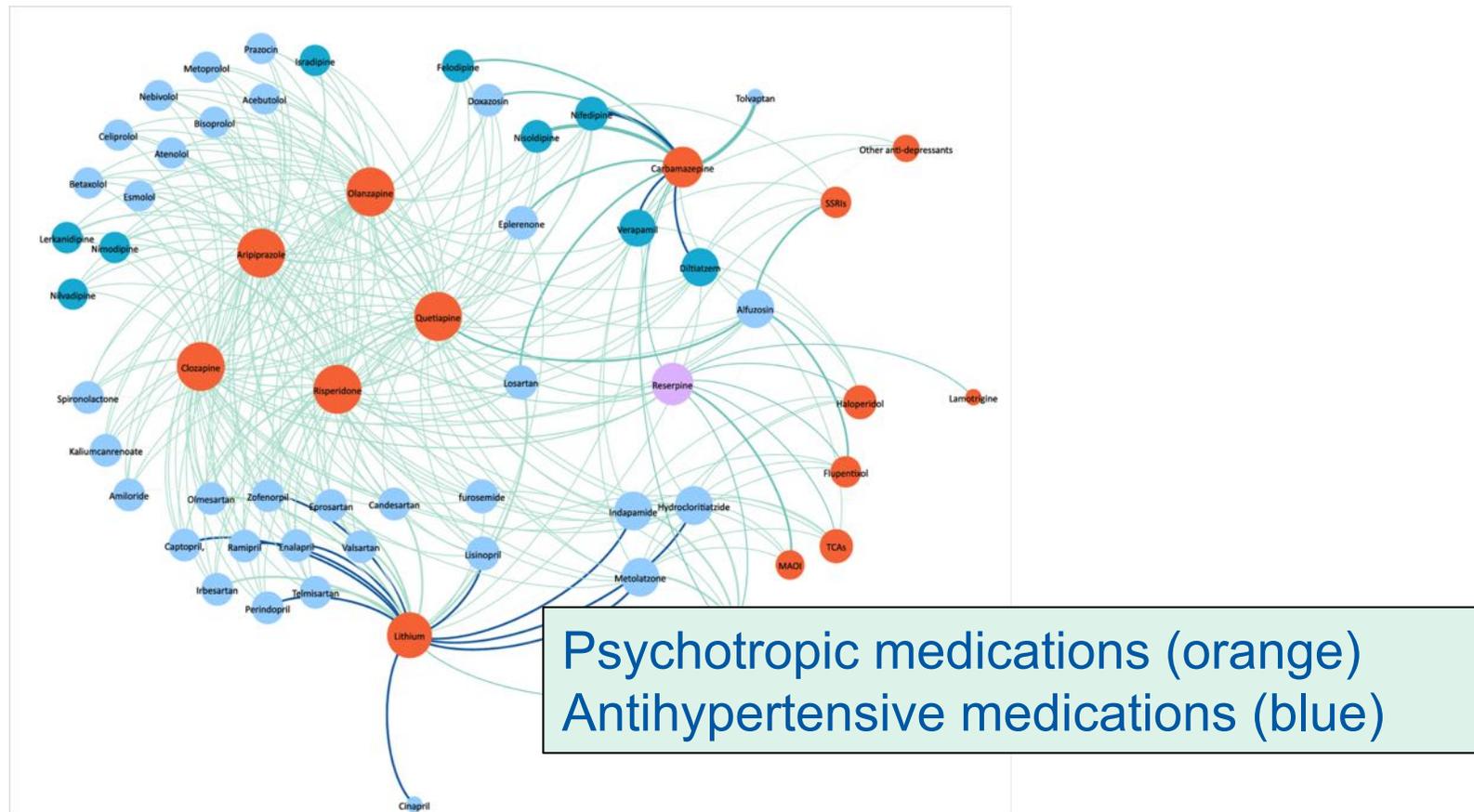


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Potential interactions between psychotropic and antihypertensive medications



Zusammenfassung

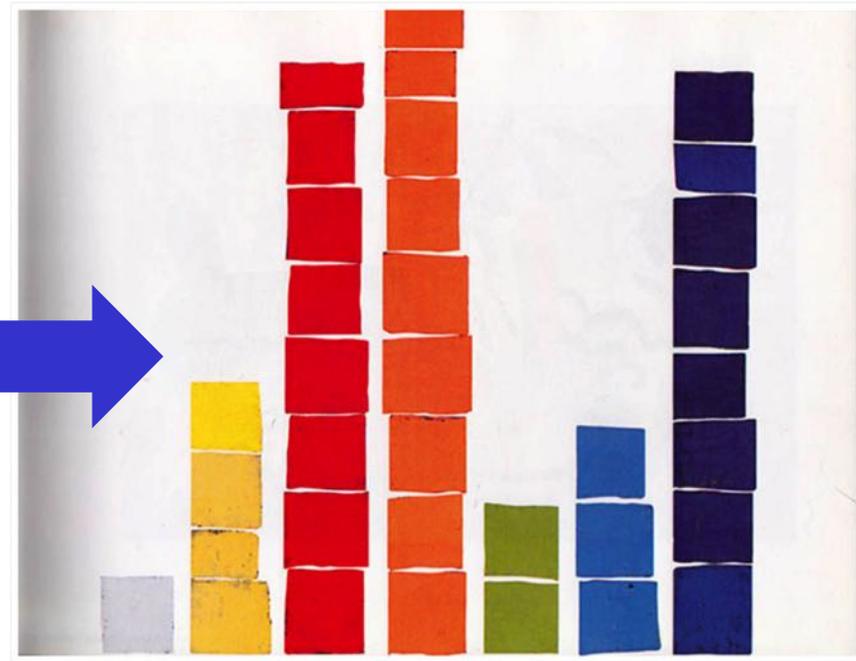
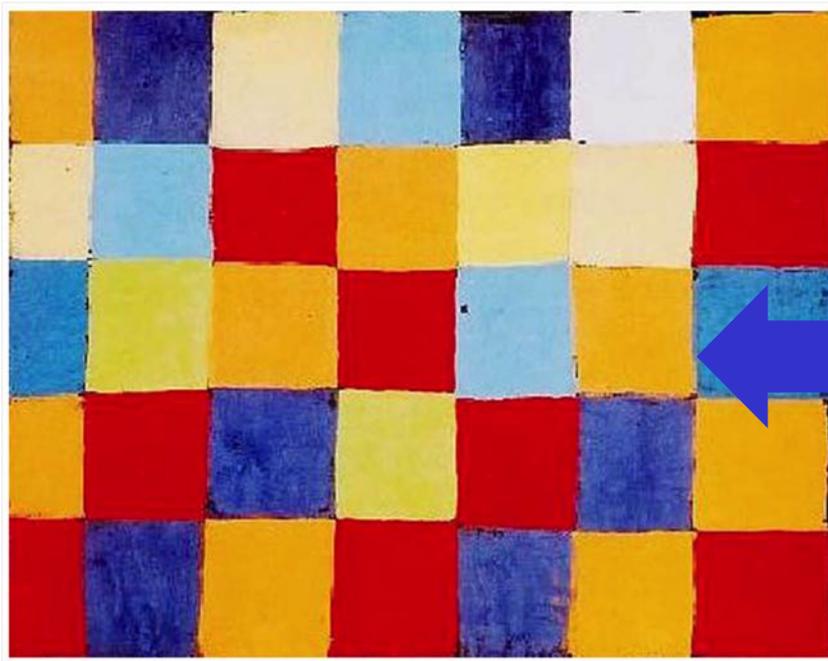
- Multimorbidität ist die häufigste Krankheitskonstellation und Disease-Disease (-Medication) Interactions extrem häufig. Komplexität!
- Multimorbidität tritt in typischen syndromalen Diagnoseansammlungen (Clustern) auf. Cave Care!! Zum Beispiel Depression!
- Disease-Disease (-Medication) Interactions sind extrem häufig. Auch für häufigste und katastrophale Disease-Disease-Medication Interactions gibt es nur wenige Guidelines auf operationellem Niveau.
- Processjob versus Solutionsshop, Cure versus Care
- Wissenschaft, Lehre, Spitäler, Gesundheitssystem und Firmen (?!) gehen von Monomorbidität und entsprechender Prozessoptimierung sowie Organisationsstrukturen und - Kulturen aus. Fehlallokation von Ressourcen.

Care, Cure, Continuity, Comprehensiveness, Coordination (C⁵)

(siehe Medical Home und Advanced Medical Home)



Paul Klee: Art finally tidied up!



*Besten Dank für Ihre
Aufmerksamkeit!*



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Drei Tatsachen

- Die meisten Leute, die Dienstleistungen im Gesundheitssystem in Anspruch nehmen, sind multimorbid oder haben komplexe Probleme.
- Dies ist wichtig für Patienten („Outcomes that matter to patients“).
- Dies ist eine Herausforderung für Patienten, Angehörige und alle Dienstleister im Gesundheitssystem.



NICE Guidelines für häufige Erkrankungen fördern potentielle DDI's bei MM

Ibuprofen

Eine angemessene Überwachung und Beratung von Patienten mit Hypertonie und/oder leichter bis mittelschwerer dekompensierter Herzinsuffizienz in der Anamnese ist erforderlich, da Flüssigkeitseinlagerungen und Ödeme in Verbindung mit NSAR-Therapie berichtet wurden.

Wie vorgehen?

Antikoagulation und Niereninsuffizienz
Diabetes und Corticosteroiden, etc.?

Externalität bei einem Patienten mit Diabetes

- **Aufgaben Arzt gemäss EBM:** Impfungen (Pneumokokken und Influenza), BD Kontrollen in Prävention, HbA1c Selbstkontrolle evaluieren, Konsultationen, Labordiagnostik (HbA1c, Kreatinin, Cholesterin, Lipidprofil), Patientenerziehung in Fusspflege, Arthrose, Osteoporose.
- **Zuweisung an** Physiotherapie, Ernährungsrehabilitation, Osteodensitometrie
- **Ophthalmologen**

Entdeckung Maculadegeneration



Multimorbidity and Chronic Pain

- **General underest patients.** | Chronische Schmerzprobleme
Sie treten bei einer großen Anzahl von Patienten mit Multimorbidität auf, beeinträchtigen das emotionale Wohlbefinden und sind häufig mit depressiven Symptomen verbunden [74-76]. Ältere Patienten und insbesondere Frauen sind besonders häufig betroffen [9, 10, 75]. Es gibt Belege dafür, dass chronische Schmerzprobleme bei mehrfacherkrankten Patienten das Risiko für Stürze, Angststörungen und kognitive Dysfunktion sowie für Einschränkungen der Funktionalität erhöhen [77-79]. Ursächlich liegen häufiger multiple schmerzverursachende Erkrankungen vor, so dass sich ein wirksames Schmerzmanagement oft schwierig gestaltet [76]. Erschwerend kommt hinzu, dass Analgetika insbesondere im Alter (und bei bestimmten Begleiterkrankungen) durch erhöhte Risiken für unerwünschte Effekte problematisch sein können. NSAR erhöhen beispielsweise das Risiko für eine gastrointestinale Blutung, sind Interaktionspartner für eine Reihe von Arzneimittelwechselwirkungen (z.B. bei ACE-Hemmern) und unterliegen Anwendungsbeschränkungen bei Nierenfunktionseinschränkung, Opiode und Opiate erhöhen das Sturzrisiko, Ko-Analgetika wie bspw. Amitriptylin haben anticholinerge Effekte und Pregabalin hat ein hohes Abhängigkeitspotential. [80-84] Aufgrund der komplexen Auswirkungen chronischer Schmerzen auf das Wohlbefinden und alle Bereiche von sozialer, emotionaler, psychischer und physischer Funktionalität ist ein adäquates Schmerzmanagement jedoch unerlässlich. (Haus-)Ärzte unterschätzen die bestehenden Schmerzprobleme ihrer mehrfacherkrankten Patienten oft deutlich [76].
- **Chronic ↑ anxiety and ↓ of functional.** | norbid
sk for falls, decrease
- **Because** | fficult.





Framework of Interactions

Classification		Definition of types of interactions	
Disease-disease interactions (Di-Di-I)		Risk factor	Comorbidity is a risk factor to develop CHF and/or worsens CHF towards an increased mortality
		Functional status, hospitalization	Comorbidity may worsen functional status in CHF and may lead to hospitalization
		Symptom overlap	Comorbidity and CHF may have similar symptoms
		Diagnostic work-up	Comorbidity and CHF may interfere at technical or laboratory tests
Disease-drug interactions (Di-D-I)	CHF & comorbidity treatment	Symptom overlap	Comorbidity treatment may have side effects mimicking CHF symptoms
		Caution, contraindication	Comorbidity treatment may be contraindicated in CHF or should be used with caution
		Safe	Comorbidity treatment is felt to be safe in CHF
	Comorbidity & CHF treatment	Symptom overlap	CHF treatment may have side effects mimicking symptoms of comorbidity
		Caution, contraindication	CHF treatment may be contraindicated in comorbidity or should be used with caution
		Safe	CHF treatment is felt to be safe in comorbidity
Drug-drug interaction (DDI)		Symptom overlap	DDI may mimic CHF symptoms
		Drug-drug interaction	Reacting agents
Synergistic treatment effects		Treatment is indicated / effective in CHF and comorbidity or should be avoided in both diseases	
Uncertain drugs (Dx)		Treatment recommendation for a comorbidity where no further information was identified about safety and effectiveness in CHF	

Uncontrolled hypertension
COPD and CHF
COPD and CHF

Ticagrelor and dyspnea
NSAID

Statins and muscular pain
Diuretics and gout



Examples of problematic DDI's from daily practice

- Gastrointestinal, cerebral bleeding, immediate need for operation and need for anticoagulation
- Diabetes and high Dose Steroids
- Disease and Depression
- Other Psychiatric disorders and ...
 - Drug addiction, Alcohol.
 - Psychosis and ...
 - Mania and any disorder with necessity for regular drug intake
 - Borderline and ...
 - etc.
- Pain and Hypertension, Heart, Cardiovascular risk (and Depression)
- Kidney disorder with clearance $<30\text{ml/min}$ or $<15\text{ml/min}$ and ...
- Aging (frailty, cognitive decline, depression, etc.) and ...

Gastrointestinal Bleeding and Anticoagulation for heart disease

Guideline source	Is long-term use of ASA/NSAID permissible?	Is ASA+PPI preferred to clopidogrel?	Stop anticoagulant and antiplatelet medications during acute bleeding?	Is use of ASA permissible again after bleeding stops?	Is use of clopidogrel permissible again after bleeding stops?
Dan Soc Gastroenterol Hepatol	Yes, but add a PPI	Yes	Yes	Yes, 24 hours after bleeding stops, but add a high-dose PPI	Yes, 3 days after bleeding stops
American College Gastroenterol	Yes, but add a PPI	Not discussed	Yes	Yes, 1–7 days after bleeding stops	Not discussed
International Consensus Guidelines	Yes, but add a PPI	Yes	Yes	Yes, as soon as possible after bleeding stops	Not discussed
British Soc Gastroenterol	Not discussed	Not discussed	Yes	Not discussed	Yes, 5 days after bleeding stops

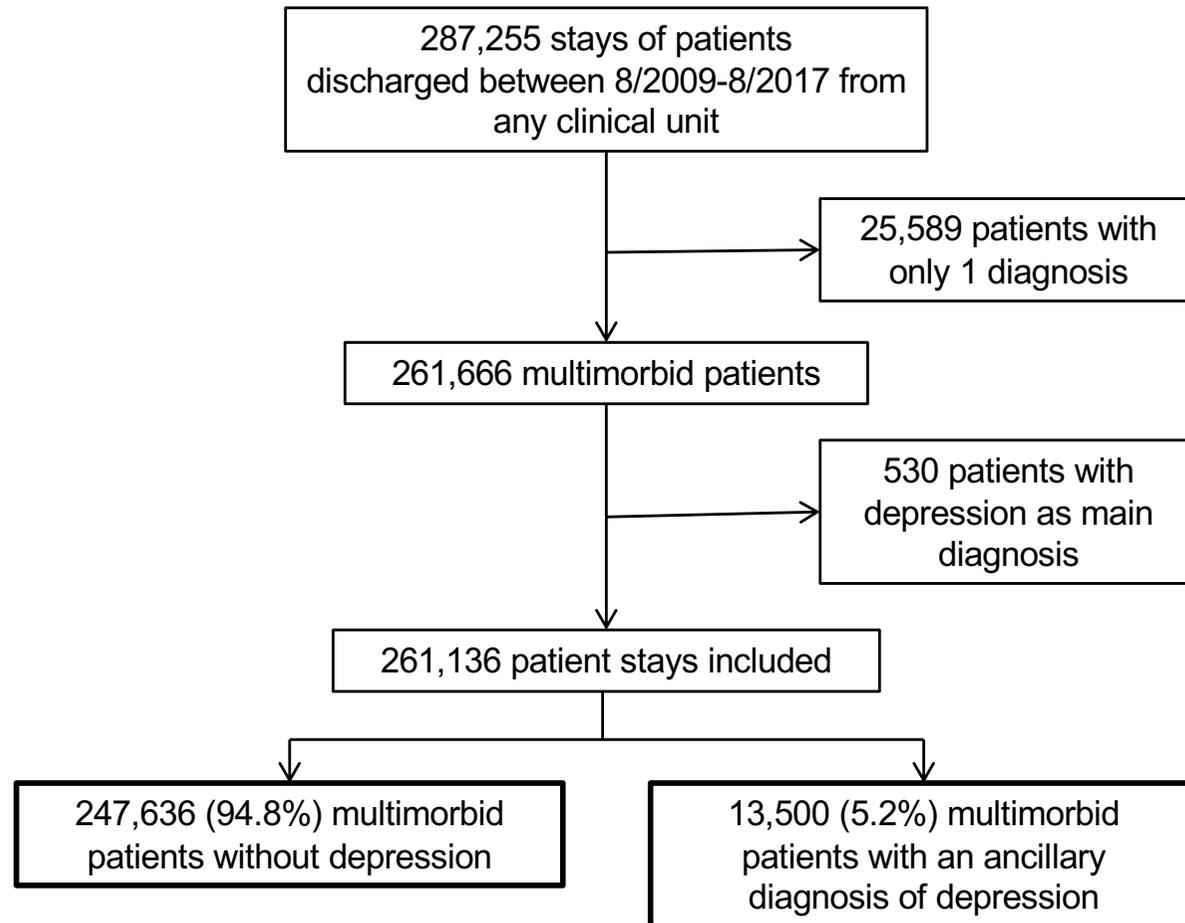


Acutely exacerbated COPD and Depression

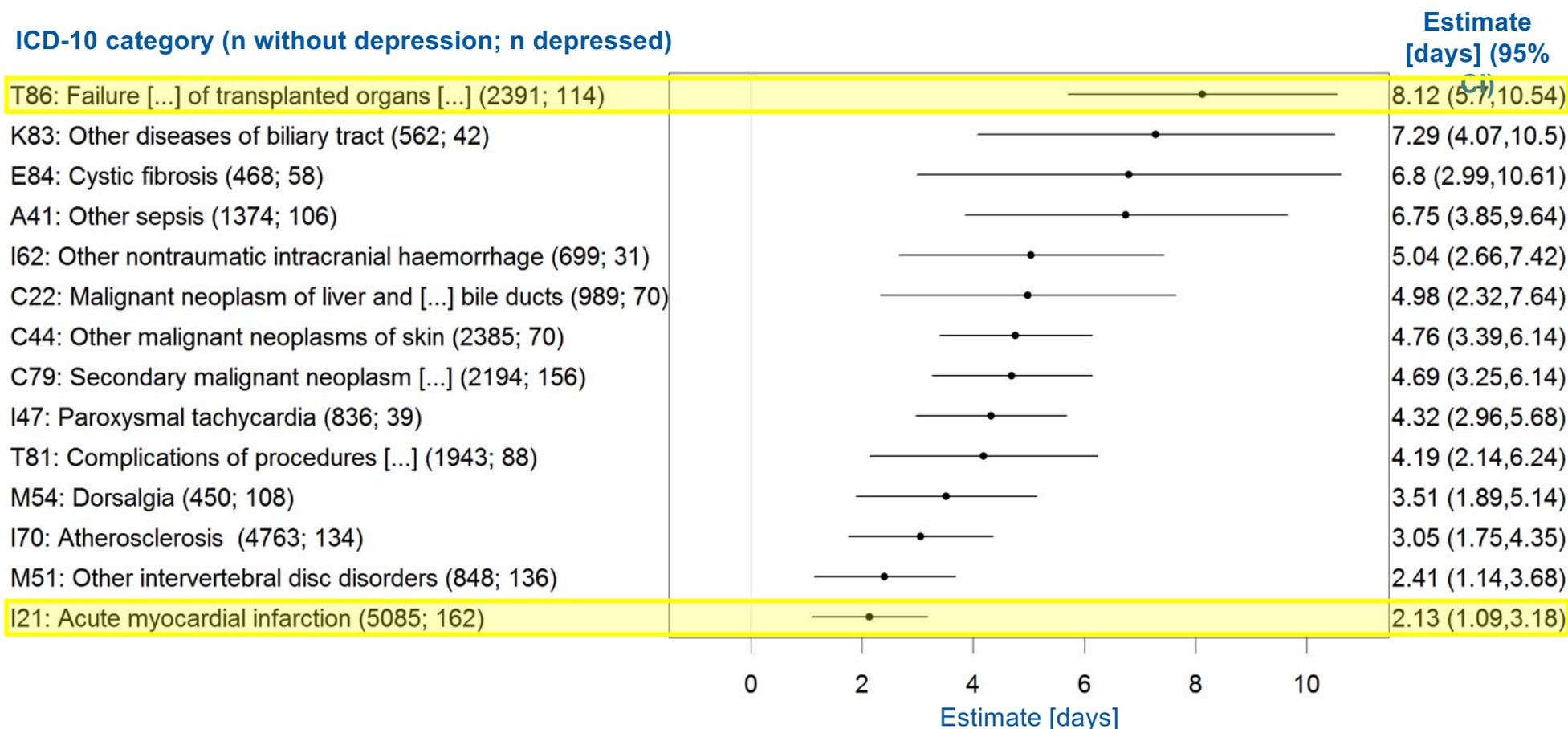
- Systematic Review: Articles with AECOPD and Depression according to PRISMA statement
- 1'494 Original Papers screened, 35 included
- Prevalence of Depression in AECOPD between 9.5% and 85.6%
- Some studies suggest higher mortality for depressive AECOPD patients.
- No Study suggests screening for Depression or treatment ...
- Do we „care“? Outcomes that matter to patients....



Depression is independently associated with increased LOS



Depression is independently associated with increased LOS: Frequent main diagnoses



All p values < 0.0005 (Bonferroni); adjusted for age and number of diagnoses; out of 100 frequent main diagnoses.

Readmissions of multimorbid inpatients with and without Depression

	Multivariable logistic regression			Multivariable Poisson regression		
	Odds ratio (readmission)	95% CI	p value	Relative risk (number of readmissions)	95% CI	p value
1 month	1.09	(1.03,1.15)	0.004	1.08	(1.03,1.14)	<0.001
3-month	1.08	(1.02,1.13)	0.003	1.11	(1.07,1.14)	<0.001
6-month	1.10	(1.05,1.16)	<0.001	1.12	(1.09,1.15)	<0.001
12-month	1.14	(1.09,1.20)	<0.001	1.15	(1.12,1.18)	<0.001
24-month	1.15	(1.08,1.21)	<0.001	1.16	(1.14,1.19)	<0.001

One month readmission rate of multimorbid patients with versus without depression: 17% versus 13%

All p values<0.005 (Bonferroni); adjusted for age, sex, marital status, LOS, number of diagnoses, number of previous stays (2 years), 7 chronic conditions.



Depression: Screening and Diagnosis

Significance

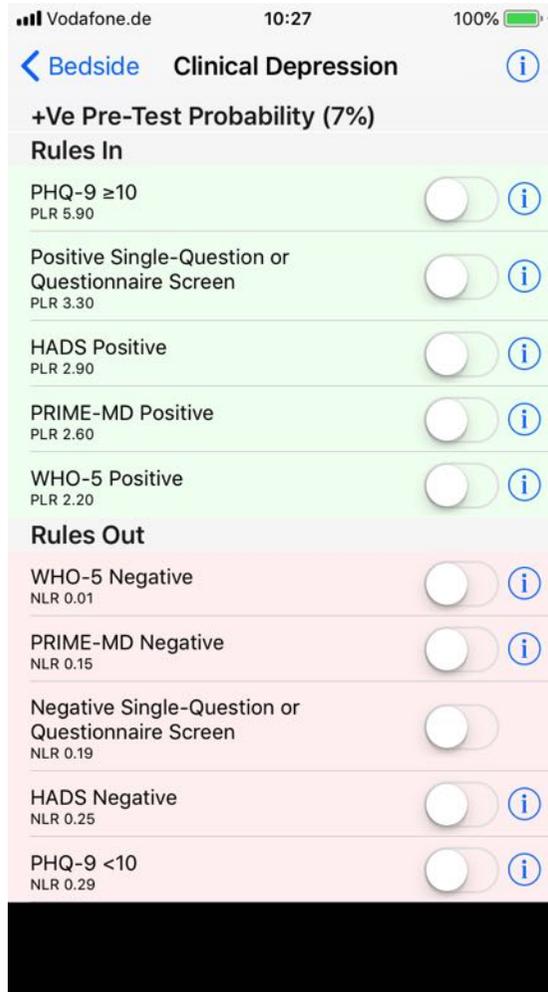
- Higher prevalence of depression reported in HIV-positive persons (20-40% versus 7% in general population)
- Significant disability and poorer treatment outcomes associated with depression

Screening and diagnosis

Who?	How to screen?	How to diagnose?
<p>Screening of all HIV-positive persons recommended in view of the high prevalence of depression</p> <p>Populations at particular high risk</p> <ul style="list-style-type: none"> • Positive history of depression in family • Depressive episode in personal history 	<ul style="list-style-type: none"> • Screen every 1-2 years • Two main questions: <ol style="list-style-type: none"> 1. Have you often felt depressed, sad or without hope in the last few months? 2. Have you lost interest in activities that you usually enjoy? • Specific symptoms in men: <ul style="list-style-type: none"> – Stressed, burn out, angry 	<p>Symptoms – evaluate regularly</p> <p>A. At least 2 weeks of depressed mood OR</p> <p>B. Loss of interest OR</p> <p>C. Diminished sense of pleasure PLUS 4 out of 7 of the following:</p> <ol style="list-style-type: none"> 1. Weight change of $\geq 5\%$ in one month or a persistent change of appetite 2. Insomnia or hypersomnia on most days

important. Ask: "Over the last two weeks, how often have you been bothered by any of the following problems? 1. Little interest or pleasure in doing things; 2. Feeling down, depressed or hopeless." Answers: Not at all (0) / Several days (1) / More than half the days (2) / Nearly every day (3). If the person scores 2 or more, seven additional questions, see [5]

From Pretest Probability to a likely Diagnosis of Depression



Most prevalent Triads in Outpatients

1. Hypertension + Dyslipidemia + Chronic Back Pain
2. Hypertension + Chronic Back Pain + Osteoarthritis
3. Hypertension + Dyslipidemia + Coronary Heart Disease
4. Hypertension + Dyslipidemia + Diabetes mellitus
5. Hypertension + Dyslipidemia + Osteoarthritis
6. Dyslipidemia + Chronic Back Pain + Osteoarthritis
7. Hypertension + Dyslipidemia + Gout
8. Hypertension + Chronic Back Pain + Coronary Heart Disease
9. Hypertension + Chronic Back Pain + Diabetes mellitus
10. Hypertension + Diabetes mellitus + Coronary Heart Disease



Pain Medication in Hypertension

- Probably the most prevalent Disease-Disease-Medication Interaction
- NSAID (also Cox-2 Inhibitors) probably to be avoided (volume retention, decreased vasodilation, increased cardiovascular risk)
- Pain increases blood pressure: Treat pain but how?

Siebenhüner et al., *PLOS one* 2017;12(1): e0168987.

doi:10.1371/journal.pone.0168987

Battegay et al., *Hypertonie: Essenz und Evidenz* Hogrefe, Göttingen



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Hypertension, heart and osteoarthritic pain

- Where paracetamol or topical NSAIDs are ineffective or insufficient for pain relief for people with osteoarthritis, then substitution or addition of an oral NSAID/COX-2 inhibitor should be considered.
- If paracetamol or topical NSAIDs are insufficient for pain relief for people with osteoarthritis, then the addition of opioid analgesics should be considered.
- Risks and benefits should be considered, particularly in older people.



New US hypertension guideline 2017

In patients with Hypertension:

- Avoid systemic NSAIDs when possible
- Consider alternative analgesics (e.g., acetaminophen, tramadol, topical NSAIDs), depending on indication and risk

Whelton PK, et al. 2017



UniversityHospital Zurich High Blood Pressure Clinical Practice Guideline:
ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA



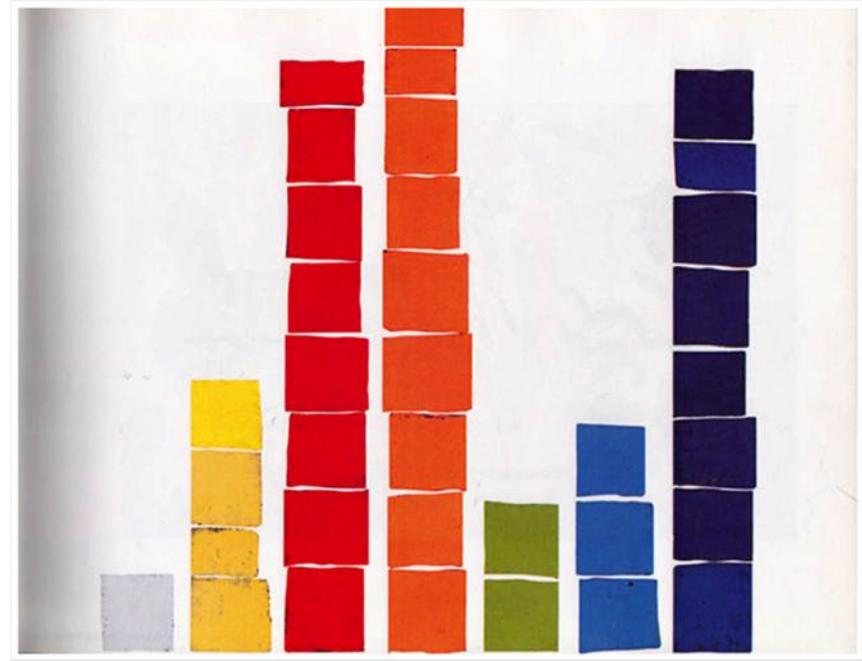
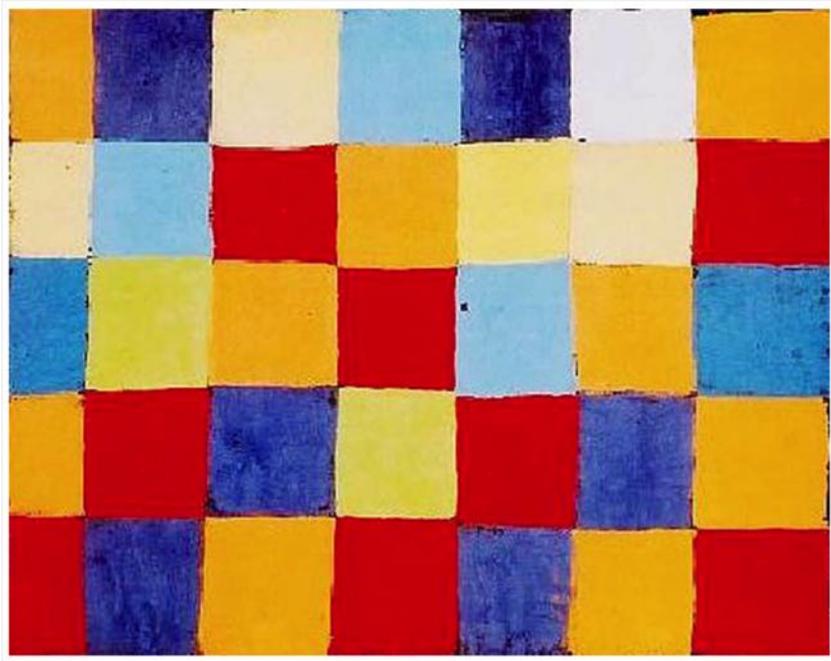
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Pain medications in multimorbid hospitalized patients with chronic pain according WHO analgesia ladder

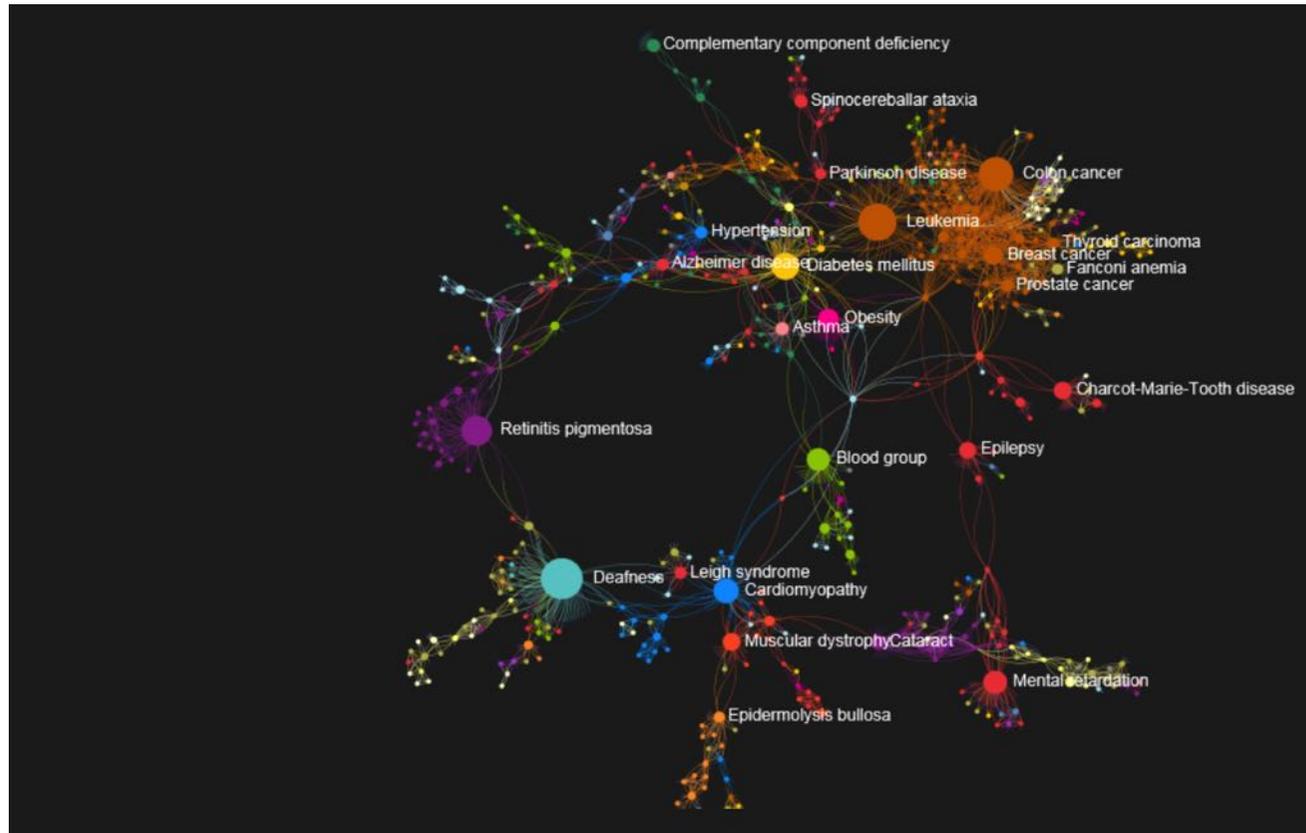
WHO analgesic ladder	No. of cases (n = 433)	No. of cases in %	Most frequently prescribed analgesics
Step I only	125	28.9	paracetamol, metamizole, NSAIDs ^a
Step II only	2	0.5	tramadol*
Step III only	4	0.9	morphine, oxycodone, fentanyl transdermal
Step I + II	66	15.2	step I: paracetamol, metamizole step II: tramadol*
Step I + III	152	35.1	step I: paracetamol, metamizole step III: morphine, oxycodone, fentanyl transdermal, pethidine, oxycodone-naloxone
Step I + II + III ^b	84	19.4	step I: paracetamol, metamizole step II: tramadol* step III: morphine



Paul Klee: Art finally tidied up!



Disease and associated genes Network graph



<http://exploring-data.com/vis/human-disease-network/>



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The Human Disease Network, Goh K-I, Cusick ME, Valle D, Childs B, Vidal M, Barabási AL, et al. (2007), Proc Natl Acad Sci USA 104:8685-8690.



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Conclusions

- Multimorbidity is the most prevalent situation confronting medical doctors. It is very prevalent, especially in aging persons and populations.
- Multimorbidity occurs in specific clusters, cardiovascular, pain-depression, drug addiction, in elderly especially in connection with cognitive decline and frailty.
- Problematic Disease-disease Interactions (DDI's) are a challenge and need to be better investigated.
- We need to better coordinate treatments and to trace and understand the decision-making process of medical doctors and the effect this has on themselves, in dependence of their psychological structures.

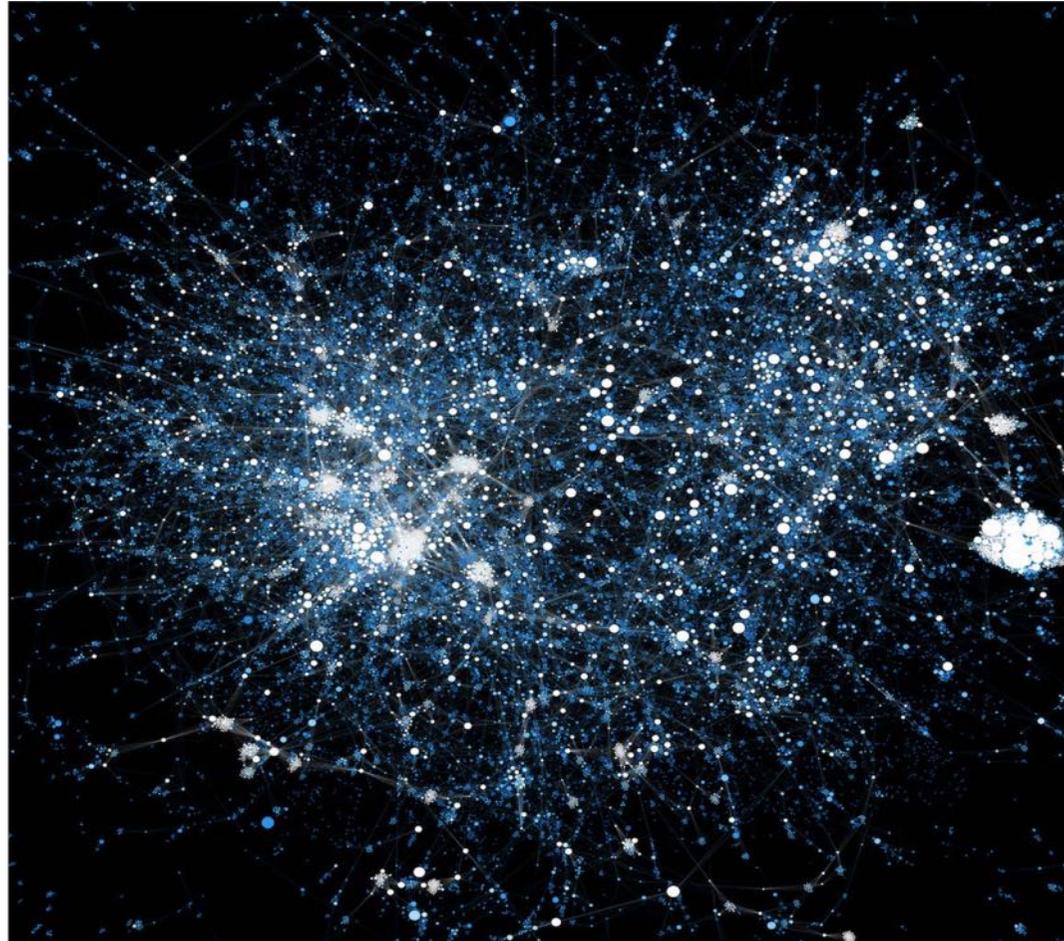


How to go about it

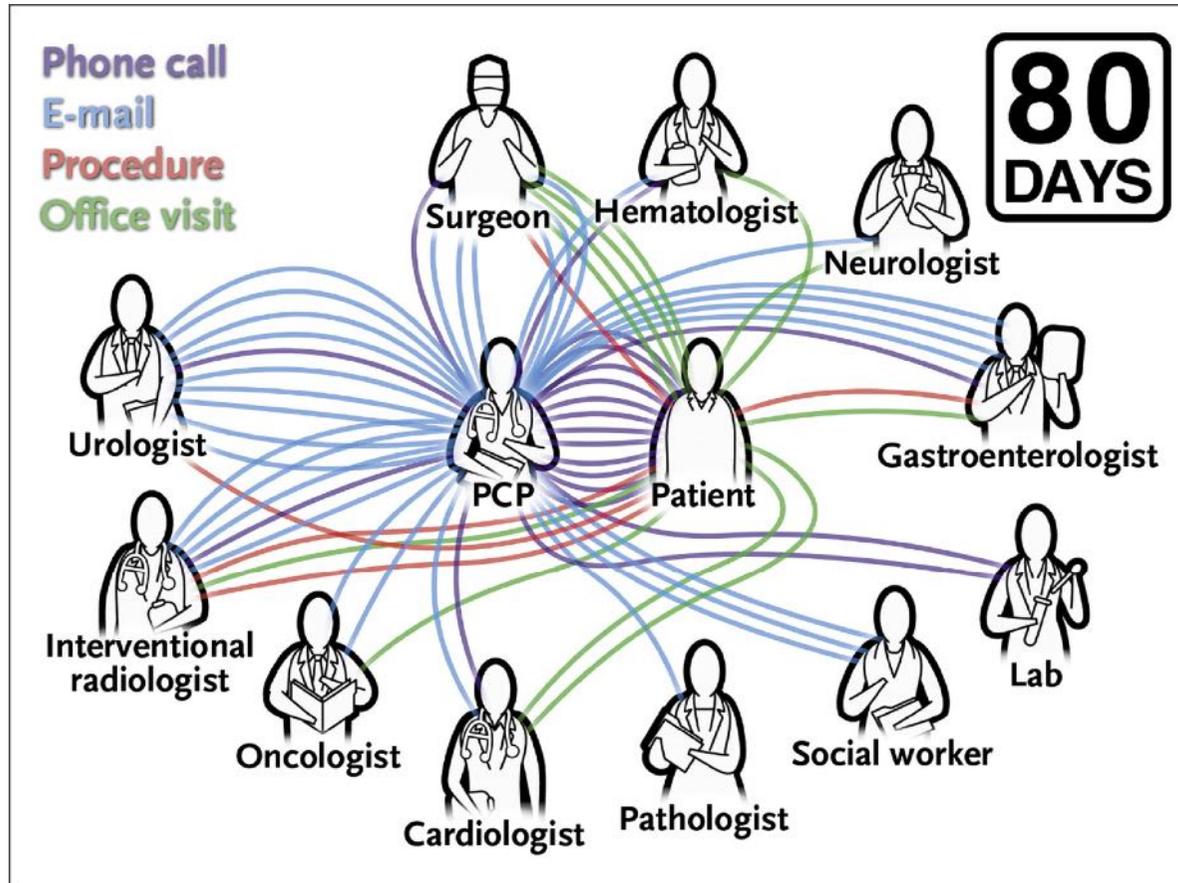
- Describe the pattern of a complex patient.
- Identify medical needs and available knowledge.
- Prioritise.
- Reconcile adverse DDI's: Most suitable, best acceptable therapeutic strategy.
- Communicate medical situation, dilemmas and resolution to the patient in order to allow for shared decision-making.
- Organize.



Interdisziplinarität der Forschung des Schweizerischen Nationalfonds 2006 - 2015



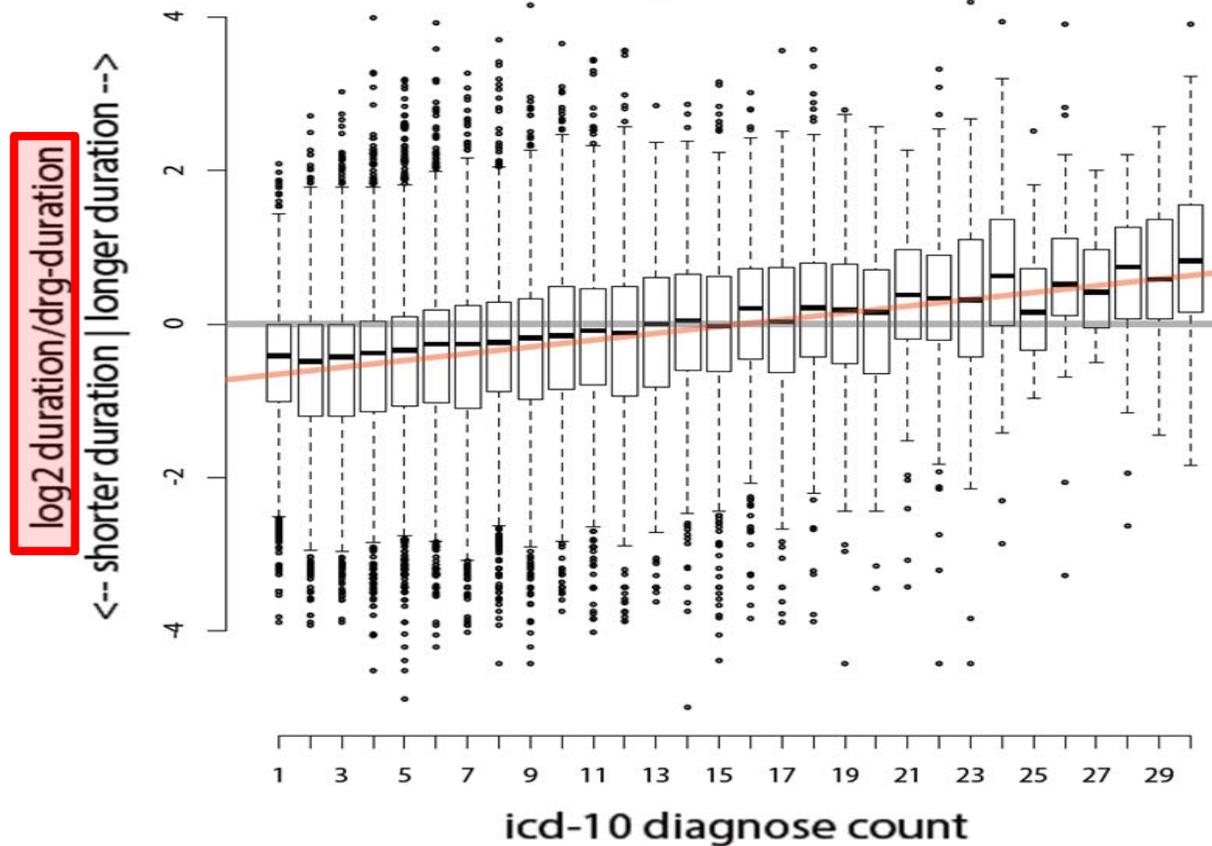
A quarterback's view of care coordination



Press *N Engl J Med* 2014;371:489-491



Duration of hospitalisation and number of diagnoses



Deuel et al., Manuscript in preparation

