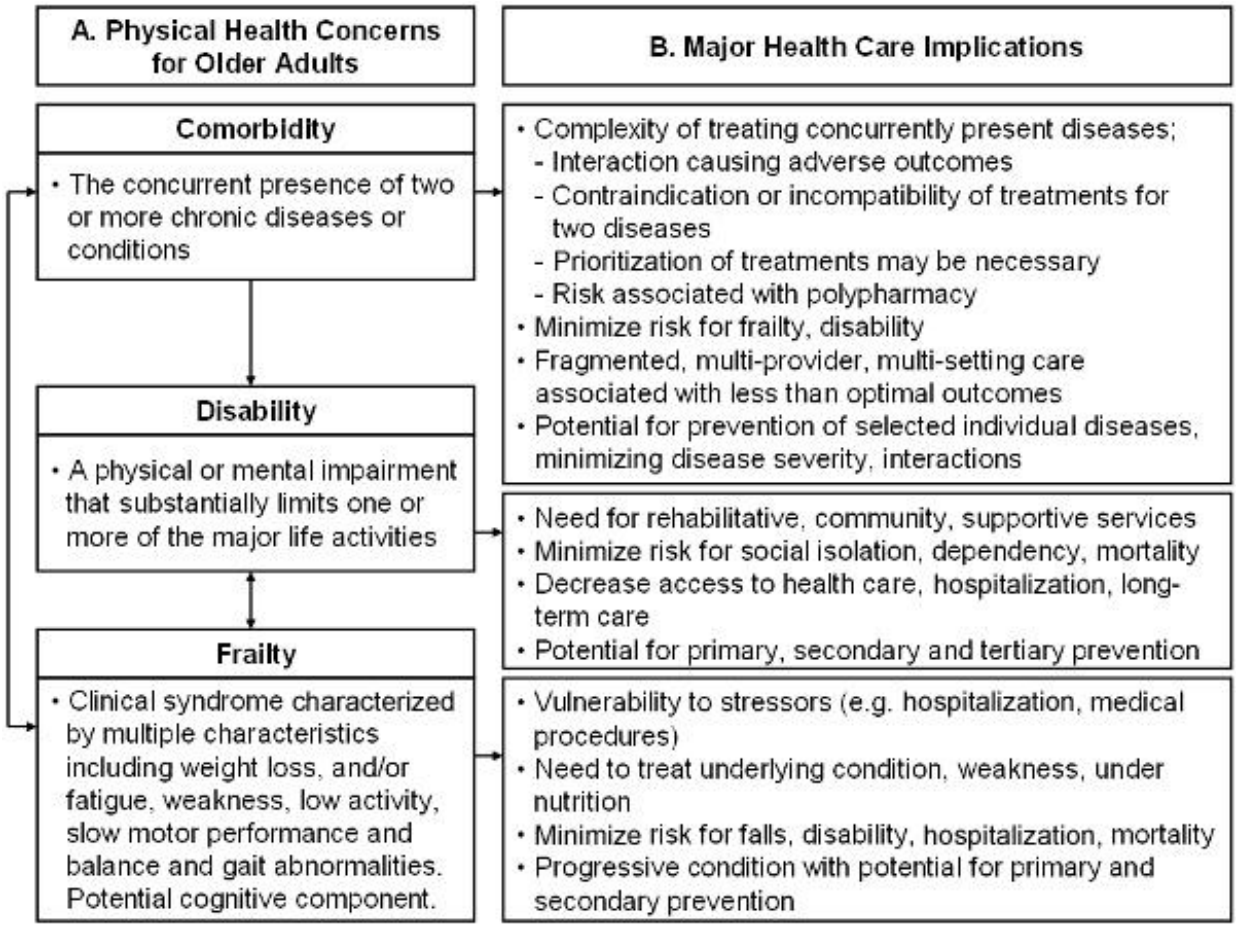
The link between frailty, disability and polypathology

Figure 1: Definitions of frailty, comorbidities (polypathology) and disability, and their major healthcare implications in the general population.[1]



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Polypathology

HIV, polypathology and polypharmacy

- Persons living with HIV have a higher prevalence of hypertension, which is associated with increased risk of heart attack, heart failure, stroke and kidney disease[2]
  - stress management and lifestyle modification can reduce systolic blood pressure in patients aged ≥55 years.[3]

- Obesity is associated with a higher risk of chronic conditions at older ages, such as cardiovascular disease and diabetes, with a higher risk of premature death[2]
  - lifestyle modification (≥150 minutes/week activity and loss of ≥7% body weight) is effective in preventing diabetes in older individuals[4]
  - a lifestyle modification program led to improvement in multiple markers of body composition and cardio-metabolic health in obese individuals[5]
  - lifestyle modifications recommended by the European AIDS Clinical Society (EACS) are shown on the next page
  - the Framingham tool,* and other cardiovascular risk calculators, can be used to assess cardiovascular risk.

- Peak aerobic capacity (VO2peak) is reduced in HIV-infected patients compared with age-matched healthy controls
  - VO2peak is significantly reduced in HIV patients aged ≥50 years compared with patients aged 40–49 years (p=0.01).[6]

- Ageing and HIV have additive effects on brain function
  - functional brain demands in HIV-infected persons are equivalent to HIV-negative individuals aged approximately 15–20 years older, based on studies that used functional magnetic resonance imaging (fMRI).[7]

Table 1: Lifestyle interventions recommended in persons living with HIV.[8]

Smoking cessation	• Brief unambiguous statement about need to stop smoking • If patient is not contemplating, try to motivate and emphasize positive short-term aspects (more money for better things, better taste for food, better skin, less dyspnoea), and long-term benefits (prevention of COPD, IHD, stroke, lung cancer) • If patient is contemplating, try to fix stop date, establish reward system • Use nicotine substitution (patch, chewing gum, spray), varenicline or bupropion (note: both drugs may cause central nervous system side effects including suicide; bupropion may interact with PI and NNRTI) during weaning phase if necessary • Consider referring patient to specialized stop smoking clinics • Anticipate relapses, explain and consider them as part of the weaning process to final nicotine abstinence
Dietary counselling	• Dietary intervention should not interfere with the dietary requirements necessary for appropriate absorption of ART drugs • Keep caloric intake balanced with energy expenditure • Limit intake of saturated fat, cholesterol and refined carbohydrates • Reduce total fat intake to < 30% and dietary cholesterol to < 300 mg/day • Emphasize intake of vegetables, fruit and grain products with fibre • Emphasize consumption of fish, poultry (without skin) and lean meat • Consider referral to dietician, one week food and drink diary to discover 'hidden' calories • Avoid binge eating ('yo-yo dieting') • In patients with HIV-related wasting and dyslipidaemia, address wasting first and consider referral to dietician • Patients who are obviously overweight should be motivated to lose weight. Starvation diets are not recommended (immune defence mechanisms potentially decreased). Malnutrition has to be addressed where observed. Normal BMI range: 18.5-24.9; Overweight: 25.0-29.9, Obesity: > 30.0 kg/m^2 • Intake of alcohol should be restricted to < 20-40 g/d. In particular, patients with hepatic disease, adherence problems, inadequate CD4 T cell increase, tumours, past tuberculosis, diarrhoea and other conditions associated with high alcohol intake should be motivated to decrease or stop alcohol intake.
Exercise promotion	• Promote active lifestyle to prevent and treat obesity, hypertension and diabetes • Encourage self-directed moderate level physical activity (take the stairs, cycle or walk to work, cycling, swimming, hiking etc.) • Emphasize regular moderate-intensity exercise rather than vigorous exercise • Achieve cardiovascular fitness (e.g. 30 minutes brisk walking > 5 days a week) • Maintain muscular strength and joint flexibility

i Based on recommendations by the US Preventive Services Task Force

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Drug metabolism in older patients in the general population

- Hepatic drug clearance can be reduced by up to 30% in older individuals.[9]
- Lipophilic drugs may have an increased volume of distribution with a prolonged half life.[9]
- Renal excretion is decreased up to 50% in approximately two thirds of elderly patients.[9]
- Two approaches are available for dose correction to account for decreased drug elimination in ageing patients: [10]
  - extrarenal elimination fraction (Q_0) and age-dependent changes in creatinine clearance
  - decline in total drug clearance (CL)
- Further information on the above can be found at Pharmacology Corner,* a pharmacology website, which provides information on geriatric pharmacology, pharmacokinetics, polypharmacy and related topics.*

The challenges of polypharmacy in older patients in the general population

- Polypharmacy is very common among older individuals in the general population,[11] and is a known risk factor for morbidity and mortality[12]
  - polypharmacy in ageing patients is a major problem and a challenge that contributes to costs, confusion, compliance issues, and errors in management[13]
  - consequences of polypharmacy include adverse drug effects, drug-drug interactions, disease-drug interactions, food-drug interactions, nutraceutical-drug interactions and medication cascade effects[14]
  - polypharmacy has been shown to be a statistically significant predictor of hospitalisation, nursing home placement, death, hypoglycaemia, fractures, impaired mobility, pneumonia, and malnutrition[15]
- The drug and pill burden faced by patients with HIV is considerable,[16] irrespective of the further challenges faced by older persons living with multiple comorbidities.
- Charts showing known and predicted drug-drug interactions are available from the HIV drug interactions website.*

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