

Current approaches to multi-morbidity: A multidisciplinary task for Precision Medicine

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Multi-morbidity—the coexistence of multiple chronic conditions—poses a major challenge for healthcare systems organized around single diseases. Traditional approaches fail to capture the complex interactions among diseases, resulting in fragmented care and polypharmacy. Evidence shows that multi-morbidity arises from intertwined biological, behavioral, and social mechanisms—including genetic susceptibility, shared inflammatory pathways, and lifestyle factors. Conditions as varied as mental health disorders, inflammatory diseases, and dermatological illnesses exhibit extensive comorbidity, reflecting the networked nature of disease processes. Modifiable factors like smoking, stress, and sedentary behavior contribute substantially to risk, while familial vulnerability highlights shared biological predispositions. Addressing this complexity requires a shift from disease-centered management to patient-centered, mechanism-informed care. My central argument is that precision medicine offers a transformative framework. By integrating multidimensional patient data—genomics, multi-omics, clinical phenotypes, lifestyle, and environment—with advances in artificial intelligence and systems biology, we can achieve three critical goals: First, identify shared disease pathways linking different conditions. Second, predict individual risk trajectories. Third, design individualized treatment strategies targeting the patient's unique disease network. This approach enables a shift from reactive, fragmented care to proactive, coordinated interventions—ultimately improving outcomes and quality of life for people struggling with multi-morbidity.