



**Italian Journal of Medicine**

<https://www.italjmed.org/ijm>

eISSN 1877-9352

**Publisher's Disclaimer.** E-publishing ahead of print is increasingly important for the rapid dissemination of science. The Early Access service lets users access peer-reviewed articles well before print/regular issue publication, significantly reducing the time it takes for critical findings to reach the research community.

These articles are searchable and citable by their DOI (Digital Object Identifier).

The **Italian Journal of Medicine** is, therefore, E-publishing PDF files of an early version of manuscripts that have undergone a regular peer review and have been accepted for publication, but have not been through the copyediting, typesetting, pagination, and proofreading processes, which may lead to differences between this version and the final one.

The final version of the manuscript will then appear in a regular issue of the journal.

The E-publishing of this PDF file has been approved by the authors.

Ital J Med 2026 [Online ahead of print]

***Please cite this article as:***

Para O, Kisuule F, Álvarez-de Arcaya A, et al. **The hospitalist and co-management in multimorbid medical and surgical patients: a position paper from the EFIM multimorbidity working group.** *Ital J Med* doi: 10.4081/itjm.2026.2511

*Submitted: 13-03-2026*

*Accepted: 04-04-2026*

 © the Author(s), 2026  
Licensee PAGEPress, Italy

Note: The publisher is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries should be directed to the corresponding author for the article.

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

**The hospitalist and co-management in multimorbid medical and surgical patients:  
a position paper from the EFIM multimorbidity working group**

Ombretta Para,<sup>1</sup> Flora Kisuule,<sup>2</sup> Arántzazu Álvarez-de Arcaya,<sup>3</sup> Antonio Gonzalez Fernandez,<sup>4</sup>  
Francisco J Rodríguez Gómez,<sup>5,6</sup> Annette Kurrle,<sup>7</sup> Maximo Bernabeu-Wittel<sup>5,6</sup>

<sup>1</sup>Internal Medicine 1, University Hospital of Careggi, Florence, Italy; <sup>2</sup>Division of Hospital Medicine, Johns Hopkins Bayview Medical Center, Johns Hopkins School of Medicine, Baltimore, Maryland, USA; <sup>3</sup>Division of Hospital Medicine, Department of Medicine, Hospital Clínico San Carlos, Universidad Complutense, Madrid, Spain; <sup>4</sup>Division of Hospital Medicine. Department of Internal Medicine, Hospital Universitari Vall d'Hebron, Barcelona, Spain; <sup>5</sup>Internal Medicine Department, Hospital Universitario Virgen del Rocío, Sevilla, Spain; <sup>6</sup>Department of Medicine, University of Sevilla, Spain; <sup>7</sup>Department for Geriatric Medicine, Hochtaunus Hospital, Usingen, Germany

**Correspondence:** Ombretta Para, Internal Medicine 1, University Hospital of Careggi, Florence, Italy. E-mail: [parao@aou-careggi.toscana.it](mailto:parao@aou-careggi.toscana.it)

**Key words:** co-management, hospitalist, comorbidities, multimorbidity.

**Contributions:** the authors contributed equally.

**Conflict of interest:** the authors declare no potential conflict of interest.

**Ethics approval and consent to participate:** not applicable.

**Informed consent:** not applicable.

**Patient consent for publication:** not applicable.

**Availability of data and materials:** all data analysed during this study are included in this published article.

**Acknowledgments:** EFIM (European Federation on Internal Medicine) multimorbidity working group.

## **Abstract**

Multimorbidity represents one of the greatest challenges in modern healthcare. Advances in diagnostics and therapeutics have extended survival but also increased the number of patients presenting with multisystem conditions requiring coordinated inpatient management. This position paper from the EFIM Multimorbidity Working Group explores the evolution, current state, and future of hospitalist co-management models in the United States (US) and Europe. In the US, the emergence of hospitalists in the 1990s revolutionized inpatient medicine. Hospitalist-led co-management, defined as shared responsibility between internists and surgical or subspecialty team, has demonstrated consistent benefits, including reduced complications, shorter hospital stays, fewer readmissions, and enhanced patient and provider satisfaction. Success relies on clear role delineation, effective communication, and structured workflows. Evidence from surgical and oncological co-management highlights significant improvements in outcomes and efficiency, establishing hospitalist co-management as a key component of high-value care. In Europe, where internists traditionally provide comprehensive care, co-management has developed alongside integrated care models addressing multimorbidity. Different integrated and multidisciplinary programs exemplify person-centered frameworks, improving patient experience and quality of care. Although European evidence on co-management remains more limited, its expansion in surgical and medical fields illustrates growing recognition of its value. Yet challenges persist: defining accountability, managing workload, and ensuring cultural acceptance among specialties. The integration of digital health tools and artificial intelligence may further enhance its effectiveness, particularly for high-risk populations. At last, hospitalist co-management stands as a transformative model of inpatient medicine, linking efficiency with holistic, patient-centered care and shaping the future of multidisciplinary hospital practice.

## **Introduction**

The coexistence of multiple chronic conditions, intrinsically associated with aging, represents a formidable challenge for contemporary healthcare systems. Technological innovations in diagnostics, surgical methodologies, and therapeutic options—particularly in oncology—have expanded the population of elderly and middle-aged patients requiring sophisticated medical interventions.<sup>1</sup> These patients frequently manifest pathology across multiple organ systems, demanding integrated management by seasoned clinicians within hospital settings.

During the late twentieth century, medical and surgical sub-specialization resulted in increasingly fragmented care delivery, with multiple specialists independently addressing discrete aspects of individual multimorbid patients. Despite this trend, internists in numerous healthcare systems worldwide maintained their role as comprehensive care providers, supervising hospitalized patients across diverse clinical conditions.

A transformative development emerged in the United States (US) during the 1990s with the establishment of hospitalists—practitioners devoted exclusively to inpatient care.<sup>2</sup> This innovation catalyzed Hospital Medicine, which rapidly became the nation's fastest-growing medical specialty.<sup>3</sup> Recognition soon emerged that collaborative care models, particularly in surgical contexts, were imperative. This fostered co-management development, a practice model demonstrating substantial enhancements in patient outcomes, care quality, safety metrics, and satisfaction indices. In countries such as Spain, co-management frameworks had previously been instituted in selected centers, particularly within orthopedic surgery, neurosurgery, cardiac surgery, and medical specialties, including oncology.

Co-management has matured into an internationally recognized standard of care with continued global expansion. Although practitioners engaged in co-management are frequently identified as hospitalists, in many countries, they remain internists practicing conventional internal medicine. The "hospitalist" designation is experiencing progressive international adoption, and many internal medicine societies now incorporate Hospital Medicine within their formal organizational structures. This review examines the contemporary landscape and prospective evolution of co-management in European and US healthcare systems, emphasizing its expanding contribution to optimizing care delivery for patients with complex, multimorbid conditions.

## **Hospitalist co-management: the United States experience**

The hospitalist model, first described by Wachter and Goldman in the mid-1990s,<sup>2</sup> has become the fastest-growing specialty in the US,<sup>4-6</sup> with current estimates putting the number of hospitalists at over 50,000.<sup>7</sup> This rapid expansion reflects hospitalists' growing role in delivering value: improving quality while optimizing costs.<sup>8</sup> Hospitalists contribute to value through new care models, systems advocacy, and strategic use of health information technology. Among hospitalist innovations, the co-management model—shared responsibility between hospitalists and surgical or subspecialty teams—represents a major evolution in inpatient care, in the US. Initially focused on general medical inpatients, hospitalist practice expanded as hospitalized patients became older, more comorbid, and more medically complex; the hospitalist role correspondingly broadened to include co-management.<sup>9</sup>

### ***Defining co-management in the United States***

Co-management denotes formally shared responsibility for inpatient care, often applied to medically complex or high-risk patients. It is common in surgical services and increasingly used with medical subspecialties (e.g., oncology).<sup>10-13</sup> In co-managed services, hospitalists manage acute medical issues, optimize chronic conditions, and support quality and safety for subspecialty inpatients.

### ***Benefits of co-management***

Improved quality and patient safety evidence demonstrates that hospitalist co-management reduces medical complications, shortens length of stay (LOS), lowers readmissions, decreases rapid-response activations, and can reduce mortality in selected settings.<sup>10-16</sup> A large propensity-score analysis found

that implementation of a surgical co-management program was associated with fewer medical complications, lower odds of prolonged LOS, and reduced 30-day medical readmissions.<sup>10</sup> Fernández-De-Velasco *et al.* reported reduced mortality and treatment failure in a cardiac surgery population managed under a co-management program.<sup>14</sup> The Hospitalist-Oncologist Co-Management (HOME) system likewise demonstrated fewer safety events, rapid response activations, and shorter LOS in oncology inpatients.<sup>13</sup>

### ***Streamlined care pathways and efficiency***

Co-management improves coordination across the episode of care and has resulted in earlier in the day discharge times and reductions in LOS, indicating improved throughput and discharge planning.<sup>11,16</sup>

### ***Evidence-based practice and cost outcomes***

By promoting guideline-concordant care and proactive management of medical issues (*e.g.*, medication interactions, hydration, symptom control), co-management programs increase adherence to evidence-based practices. This frequently translates into shorter stays, fewer preventable readmissions, and reductions in per-patient hospital costs as reported by Rohatgi *et al.*<sup>10</sup>

### ***Key success factors for co-management***

In the US, successful co-management programs typically share several structural and process elements:<sup>9-11</sup>

1. Clear role delineation: explicit, mutually agreed and respect, hospitalist accepted as acute care partners
2. Effective communication: reliable channels, scheduled case discussions, bedside huddles, quick information exchange
3. Predefined workflows: work design elements, protocols, workload balance, interactive quality improvement
4. Appropriate patient selection: targeting high-risk populations, complexity, multimorbidity, geriatric populations, avoid indiscriminate covering

Contemplating the prospective trajectory of this care model in the US, the accelerating integration of technology into healthcare delivery systems may catalyze further proliferation of co-management, potentially establishing this framework as the prevailing standard of care. Clinical prediction algorithms may facilitate the identification of patients most likely to derive benefit from hospitalist engagement.<sup>1,2</sup> Artificial intelligence and virtual care platforms may augment surveillance capabilities in medically complex populations. For instance, machine learning systems have demonstrated the capacity to detect early manifestations of sepsis in neutropenic oncology patients or volume overload in heart failure populations, thereby prompting timely hospitalist intervention.<sup>3</sup> Tele-co-management paradigms may emerge in rural or resource-constrained environments, enabling real-time collaboration between hospitalists and remote specialty consultants.<sup>4,5</sup> Virtual care models have shown promise in reducing hospital LOS and improving care coordination, particularly when structured communication protocols are implemented.<sup>6,7</sup> The US experience demonstrates that when implemented with deliberate attention to workflow integration and role delineation, co-management enhances clinical outcomes and provider satisfaction.<sup>17</sup> As healthcare systems continue their evolution, hospitalist-surgical and subspecialty co-management is strategically positioned to become a fundamental component of contemporary inpatient care delivery.<sup>17</sup>

### ***Co-management initiatives and models in Europe***

The current prevalence of multimorbidity in Europe among adults aged 50 years and older varies substantially across countries, ranging from approximately 24.7% in Switzerland to 51.0% in Hungary, with an overall prevalence estimated between 37.9% and 41.5%.<sup>18-21</sup> This variability is significantly influenced by sex (higher in women: 34.5% vs. men: 28.2%), age, and socioeconomic

status.<sup>18,19</sup> Over the past decade, prevalence has increased significantly in central and western European countries (Austria, Belgium, Czech Republic, France, Germany, Switzerland, and Spain), while remaining relatively stable in northern and eastern European countries.<sup>22</sup> Multimorbidity contributes to a substantial increase in healthcare utilization and poorer clinical outcomes among adults aged 50 years and older in Europe. Each additional chronic condition is associated with greater primary care utilization [regression coefficient = 0.29, 95% confidence interval (CI): 0.27-0.30] and secondary care utilization [adjusted odds ratio (AOR) for hospitalization = 1.49, 95% CI: 1.42-1.55], regardless of country, sex, or socioeconomic status.<sup>20</sup> Multimorbidity is also associated with worse self-reported health status (AOR 2.13 per additional condition), higher prevalence of depression (AOR 1.48), and reduced functional capacity (AOR 2.12).<sup>20,23</sup> These associations are consistent across all European countries and are amplified in individuals with lower educational attainment and socioeconomic disadvantage. Longitudinal analyses confirm that multimorbidity leads to persistent functional limitation and poorer quality of life throughout the life course, with polypharmacy, loneliness, and limitations in daily activities playing an important mediating role.<sup>18,24</sup> Comprehensive care models for patients with multimorbidity were developed in Europe because traditional single-disease approaches led to fragmented, poorly coordinated care that did not meet the complex needs of people with multiple chronic conditions. Integrated, person-centered models were designed to address these gaps by improving care coordination, patient involvement, and outcomes for this growing population.<sup>25,26</sup> Specific types of integrated care models for patients with multimorbidity implemented in Europe include the Integrated Multimorbidity Care Model (IMCM), a multidimensional, person-centered framework designed to improve care organization, patient experience, and continuity for individuals with multiple chronic conditions. The IMCM incorporates comprehensive assessment, individualized care planning, multidisciplinary team (MDT) involvement, care coordination, self-management support, and digital health tools. Pilot implementation in Spain, Italy, and Lithuania has demonstrated significant improvements in patient-reported quality of care and care organization.<sup>27</sup>

Patient-centered complex interventions such as Complex Intervention for Multimorbidity (CIM2) in Denmark specifically target patients with complicated multimorbidity and include professional training, extended consultations, nurse-led care coordination, structured follow-up, and integration across general practice, municipalities, and hospitals. CIM2 is currently being evaluated in a cluster randomized trial, with primary outcomes including patient experience and health-related quality of life.<sup>28</sup>

Adaptations of the Chronic Care Model and Guided Care Model are widely implemented across Europe, emphasizing proactive care, interdisciplinary collaboration, self-management support, and digital health integration. These models serve as the foundation for many integrated care programs and are associated with key elements such as person-centered care, holistic assessment, care coordination, and electronic information systems.<sup>29</sup> Additionally, non-disease-specific integrated care programs target any combination of chronic diseases and emphasize multidisciplinary collaboration and patient involvement, while disease-specific programs focus on a single index disease and its comorbidities. Non-disease-specific models tend to provide broader integration and greater patient-centeredness, whereas disease-specific and combination models are generally less extensive in their scope and level of integration.<sup>29,30</sup> Table 1 summarizes the main care programs for patients with multimorbidity in Europe, as described in recent multicounty mapping, scoping reviews, and systematic reviews.

The evidence highlights the diversity of models, their core components, and the countries/settings where they have been implemented, providing a concise overview for clinical and organizational decision-making. Among the care programs for patients with multimorbidity implemented in Europe, integrated, person-centered, and multidisciplinary models have demonstrated the most consistent benefits. Non-disease-specific programs—particularly the IMCM and complex interventions targeting mental health comorbidity—have shown the strongest evidence of effectiveness.

The IMCM has demonstrated significant improvements in patient-reported quality of care and care organization, with increases in ACIC and PACIC+ scores; notably, 58% of patients perceived better care after implementation.<sup>27</sup> Similarly, patient-centered complex interventions incorporating exercise therapy and self-management support have shown statistically significant improvements in health-related quality of life and self-rated health at 12 months compared to usual care.<sup>31</sup> Evidence from systematic reviews indicates that combined interventions—integrating patient-level, provider-level, and organizational components—produce modest improvements in mental health outcomes (particularly depression) and small improvements in patient-reported outcomes.<sup>32,33</sup> However, effects on physical health outcomes and healthcare utilization remain limited. Programs emphasizing strong patient involvement and broad service integration are associated with more comprehensive and patient-centered care, representing important preconditions for improved health outcomes.<sup>30,34-37</sup> In light of the evidence reviewed, the following conclusions can be drawn. Integrated care models for multimorbidity in Europe demonstrate clear benefits in enhancing patient experience, care coordination, and mental health outcomes. The most successful approaches are those adapted to local contexts, supported by MDTs, and reinforced through digital health tools and self-management strategies. Sustained policy support and alignment across health and social care systems are essential to optimize their long-term effectiveness and scalability, particularly given the increasing burden of multimorbidity in an aging European population.

### **Co-management programs in surgical settings**

Internal medicine co-management has increasingly been integrated into surgical care. The adoption of increasingly complex therapeutic modalities has significantly complicated patient healthcare management. This complexity has particularly impacted sector-specific and specialized fields, including surgical disciplines. Consequently, integrating the role of the medical internist as a support to these specialists has become essential. Such an approach facilitates effective multidisciplinary collaboration, potentially enhancing the quality of patient care.<sup>38</sup> This approach involves hospitalists, advanced practice clinicians, or comprehensive MDTs.<sup>39,40</sup> Such models contribute to the stabilization of patients prior to surgery, the reduction of complications, and the enhancement of collaborative efforts among care providers. They are particularly beneficial in managing high-risk or complex cases. Internal medicine teams are responsible for optimizing medical conditions preoperatively and ensuring patient readiness for surgery. However, most investigations do not consolidate patients across diverse surgical specialties—such as thoracic surgery, neurosurgery, vascular surgery, and trauma surgery—within a single analysis. A recent systematic review aims to assess the clinical outcomes associated with internal medicine co-management in multisystem trauma patients, with particular emphasis on the influence of co-management on surgical timing and patient outcomes across various surgical disciplines.<sup>41</sup> By evaluating studies encompassing orthopedic, neurosurgical, vascular, thoracic, and general surgical care, this review seeks to determine whether the integration of medical optimization via internal medicine teams facilitates earlier and safer surgical interventions, ultimately improving key outcomes, including LOS, complication rates, mortality, and healthcare resource utilization.

The prevalence of surgical patient co-management by internists has increased significantly, with an annual growth rate exceeding 11% between 2001 and 2006. This trend reflects multiple factors, including advances in surgical techniques and a growing population of elderly patients with multiple comorbidities undergoing surgery.<sup>39</sup> Medical-surgical co-management can manifest in various models, wherein primary responsibility may be assumed either by the surgeon or the internist. Effective co-management relies upon formal written agreements negotiated between the surgeon and co-managing internist prior to patient care initiation, incorporating established protocols and guidelines. These agreements extend to include the entire surgical and medical teams as well as hospital administration. Unlike traditional consultative services, co-management is characterized by a more structured relationship, necessitating clearly defined roles and responsibilities between the internist and the surgeon.<sup>39-42</sup> In well-structured co-management frameworks, all stakeholders

collaborate equitably according to predefined rules of engagement, jointly aiming to enhance patient care and share responsibility. Nonetheless, the relationship may become imbalanced, with one consultant perceived as subordinate within the care team. The involvement of a co-managing physician can sometimes result in the surgeon's disengagement from perioperative management, limiting their role to intraoperative duties only.<sup>43</sup> Additionally, the inclusion of an extra physician in surgical patient care introduces greater complexity to the care process, heightening the risk of miscommunication and potential errors. To mitigate these risks, it is imperative to clearly delineate responsibilities and set mutual expectations for all parties involved. A patient-centered care model requires a generalist approach.<sup>38,40-42,44,45</sup> Internists, with their broad expertise across multiple medical specialties, are well-positioned to provide medical consultation both independently and within co-management frameworks. A recent study demonstrated that the implementation of daytime surgical hospitalists is correlated with a reduction in the workload of night shift physicians.<sup>46</sup> Internists can thus facilitate the efficient and effective provision of integrated care. In this structure, patient-centered care delivered by a multidisciplinary team is optimized when organized around a general internal medicine foundation, in accordance with established guidelines. This approach ensures high-quality healthcare delivery, even for the most medically complex surgical patients. The first systematic review and meta-analysis examining hospitalist participation in surgical care among adults revealed that the overall quality of available evidence remains limited, even though numerous healthcare facilities have implemented internal medicine physician co-management models for surgical cases.<sup>10</sup> At the institutional level, they can also contribute to the development of evidence-based protocols and algorithms for medical management, ensure coordinated care and discharge planning with the multidisciplinary team, facilitate additional specialist consultations, and participate in quality improvement efforts across departments.<sup>10,47</sup> This broader scope suggests a role length that extends beyond mere clinical advice, potentially explaining why these multi-faceted interventions tend to demonstrate greater promise compared to consultation alone as a singular approach.<sup>10,47</sup> Outcomes measurement should encompass not only economic costs and direct medical outcomes but also broader factors such as team dynamics and functioning, and patient-centered results of particular importance.<sup>10,47</sup>

### ***Orthopedic surgery***

Early studies in co-management of orthopedic patients demonstrated improved outcomes and reduced LOS, without increased costs. For example, Huddleston *et al.* reported decreased post-operative complications among elective hip and knee surgeries,<sup>48</sup> and Phy *et al.* demonstrated that older adults with hip fractures managed by a hospitalist had a reduced LOS without death or 30-day readmission rates.<sup>49</sup> More recently, the co-management model has been expanded to include neurosurgery and vascular surgery patients, with similar reductions in complications, LOS, readmissions, and cost.<sup>4,11,49,50</sup> The co-management model in the surgical setting was also associated with better satisfaction among surgeons and nurses, who prefer co-management over traditional care delivery models.<sup>4,10,51-53</sup> Ghanem *et al.* developed a detailed stepwise protocol for establishing a co-management framework between orthopedic and hospitalist services at a tertiary care center, delineating explicit protocols and workflows for patient management and interdepartmental transfer processes, especially in emergency and postoperative contexts.<sup>53</sup>

### ***Neurosurgery***

The impact of co-management on clinical outcomes in neurosurgical patients is uncertain.<sup>10,11,54</sup> Literature evidence showed that co-management in the neurosurgical setting was linked to a decreased incidence of medical complications, medical consultations and shortened LOS in neurosurgical patients, while no significant difference was observed in in-hospital mortality.<sup>10,11</sup>

### ***Obstetrics and Gynecologic***

The obstetric hospitalist and the combined obstetric-gynecologic hospitalist roles have emerged in response to various factors in healthcare, including the demand for dedicated leadership within delivery units, heightened focus on quality and safety in obstetrics and gynecology, shifts in the workforce demographics, and escalating malpractice-related expenses. The leadership of the Society of Obstetric and Gynecologic Hospitalists recommends adopting standardized terminology for obstetric hospitalists, obstetric-gynecologic hospitalists, and hospital medicine practices within these specialties to improve communication consistency and support program development and investigative studies. Research on obstetric and gynecologic hospitalist models should characterize inpatient coverage frameworks according to these standardized definitions to enable valid comparisons and interpretations across different practices.<sup>55,56</sup> Obstetric and gynecologic hospitalists are integral to advancing perinatal care by delivering on-site, dependable, and high-quality clinical management. Their presence contributes to enhanced patient safety and is associated with reductions in non-indicated caesarean sections and an increase in vaginal delivery rates.<sup>56</sup>

### **Co-management programs in non-surgical settings**

Healthcare complexity requires structural change at three levels: health systems, increasingly super-specialized physicians, and socially complex patients. Patients are older, frailer, and more multimorbid than ever. Many live with multiple chronic diseases, receive polypharmacy, and face social vulnerability that complicates care. The traditional specialty-based model, centered on single organs or diseases, no longer meets these needs. Co-management addresses this gap. Specialists and internist hospitalists share responsibility and jointly optimize outcomes. This model prevents, detects early, and actively manages medical complications.<sup>57,58</sup> It promotes proactive, continuous care and improves outcomes, particularly in older, frail, and multimorbid patients.<sup>59,60</sup> Studies from the US and Europe—mainly in surgical settings—report fewer intensive care unit (ICU) transfers, medical complications, mortality, LOS, 30-day readmissions, specialist consultations, and costs.<sup>38,15,59-61</sup> Although surgical co-management is well established, non-surgical applications remain limited. However, cardiology, neurology, respiratory medicine, oncology, psychiatry, and critical care combine high specialization with heavy comorbidity burdens, making them suitable contexts for structured shared-care models.

### **Settings where co-management is an opportunity**

Internists routinely manage complex older adults, who face high risks of complications, disability, and unplanned readmissions.<sup>62</sup> Co-management mitigates functional decline and reduces adverse events through proactive and continuous care.

### ***Cardiology***

Older cardiac patients are particularly vulnerable. Between 55% and 98% of adults aged  $\geq 60$  years have at least two chronic diseases.<sup>63</sup> Older adults with cardiovascular disease (CVD) plus  $\geq 2$  additional conditions are twice as likely to develop geriatric syndromes as those with CVD alone.<sup>63</sup> Systematic frailty assessment, early detection of functional decline, and multimorbidity management reduce delirium, nosocomial infections, falls, and readmissions.<sup>64-66</sup> A quasi-experimental study showed that geriatric co-management in cardiology significantly improved functional status and quality of life at six months,<sup>67</sup> supporting structured internist integration into cardiac units.

### ***Neurology***

Patients admitted with acute stroke, epilepsy or neurodegenerative disorders often worsen due to systemic complications rather than primary neurological injury. Aspiration pneumonia, venous thrombosis, metabolic disorders, and infections strongly influence prognosis. Shared care models between neurologists and internists in US centers improved physician support, reduced provided

costs, enhanced efficiency, and achieved long-term economic sustainability.<sup>68,69</sup> Internists prevent systemic complications without replacing neurological expertise and improve resident supervision.<sup>69</sup>

### ***Co-management in intermediate and intensive care units***

Hospitalists increasingly support critical care organizations. At Emory University Hospital, a hybrid ICU model assigns hospitalists to lower-acuity patients while intensivists manage complex cases.<sup>12</sup> This structure preserves ICU capacity without increasing mortality or LOS. In Spain, authors evaluated patients admitted to an intermediate care unit (ImCU) requiring non-invasive ventilation (NIV).<sup>70</sup> The most frequent diagnoses were hypoxemic acute respiratory failure, COPD exacerbation, and acute pulmonary edema. The ImCU provided advanced monitoring and ventilatory support and frequently prevented ICU admission. The study emphasized adapting mortality prediction models to NIV-treated IMCU patients to improve decision-making and resource allocation.<sup>70</sup>

### ***Oncology***

Oncology illustrates the clinical value of co-management. Advances in chemotherapy and immunotherapy prolonged survival but increased complexity. Patients commonly develop infections, cardiotoxicity, acute kidney injury, and metabolic disturbances. Programs at Smilow Cancer Hospital in Connecticut, Anderson Cancer Centre in Texas, and the HOME in South Korea showed that hospitalist-oncologist collaboration improves safety, efficiency, service quality, and physician and patient satisfaction.<sup>71-73</sup> Oncologists direct tumor-specific therapy, while internists manage acute medical complications and preserve continuity.

### ***Psychiatry***

Patients with severe mental illness often present with diabetes, CVD, infections, substance use disorders, and polypharmacy-related complications. Internist-psychiatrist shared-care units improve detection and management of medical comorbidities. A Spanish study reported shorter hospital stays, lower costs, and improved clinical parameters under this model.<sup>74</sup> In US programs where psychiatrists joined general medical teams, hospitals reduced LOS, psychiatric transfers, while improving non-psychiatric staff training,<sup>75,76</sup> enhancing safety and efficiency.

### **Opportunities and challenges**

Co-management improves clinical outcomes and resource use. It reduces duplicate testing, streamlines patient flow, lowers readmissions, and allows specialists to focus on advanced procedures while internists oversee systemic care. Internists move from consultants to accountable partners and assume leadership in quality, safety, and patient experience. However, institutions must clearly define authority and accountability. Shared responsibility may generate conflict if teams fail to agree on final decisions in critical situations. Hospitalists should establish formal agreements and provide multidisciplinary training. Hospitalists also play a central role in quality, safety, and patient experience and must lead organizational strategy. Workforce shortages limit expansion. Implementing co-management without adequate staffing is unsustainable. Cultural resistance may emerge if specialists perceive loss of autonomy. Institutions must build trust, define protocols, and ensure transparent communication. Evidence in non-surgical settings remains largely observational. Operational barriers—joint rounds, interdisciplinary meetings, shared electronic records—require time and investment. Poor implementation may confuse patients who perceive “too many doctors,” fragmented responsibility, and undermining trust. Co-management in non-surgical specialties provides substantial clinical and organizational benefits. It improves outcomes in frail and multimorbid patients, optimizes resource use, and promotes shared accountability. Hospitalists should implement structured programs, rigorously evaluate clinical and economic outcomes, and train physicians in leadership and communication.

## Conclusions

Hospitalist co-management represents a model of success in modern inpatient care, bridging medical and surgical approaches to improve patient outcomes, safety, and efficiency. Hospital medicine has established itself as the fastest-growing specialty in the US by consistently delivering value through innovative care delivery models. Originally focused on surgical services, hospitalist co-management has successfully expanded to diverse subspecialty populations. This evolution is supported by robust evidence demonstrating significant improvements in quality metrics, patient safety, and cost-effectiveness. The future trajectory of this model points toward its establishment as the prevailing standard of care, catalyzed by the accelerating integration of digital health technologies. We anticipate several key developments:

- precision patient selection: advanced clinical prediction algorithms will shift co-management from a generalized service to a targeted intervention, identifying high-risk patients who would derive the greatest benefit from hospitalist engagement;
- artificial intelligence-enhanced surveillance: artificial intelligence and machine learning systems are poised to augment monitoring for medically complex populations. For instance, predictive analytics can detect subclinical manifestations of sepsis in neutropenic oncology patients or fluid overload in heart failure populations, prompting immediate hospitalist intervention;<sup>17</sup>
- expansion through virtual care: tele-co-management paradigms offer a scalable solution for rural or resource-constrained environments, enabling real-time, high-quality collaboration between hospitalists and remote specialty consultants. The US experience confirms that when co-management is implemented with deliberate attention to role delineation and workflow integration, it enhances both clinical outcomes and provider satisfaction. As healthcare systems continue to prioritize value-based care, hospitalist-led co-management is strategically positioned to remain a central pillar of modern inpatient medicine.

## References

1. Bernabeu-Wittel M, Holecki M, Tuttolomondo A, et al. Perspectives of European internists on multimorbidity. A multinational survey. *Eur J Intern Med* 2022;100:130-2.
2. Wachter RM, Goldman L. The emerging role of “hospitalists” in the American health care system. *N Engl J Med* 1996;335:514-7.
3. Wachter RM, Goldman L. Zero to 50,000- The 20<sup>th</sup> anniversary of the hospitalist. *N Engl J Med* 2016;375:1009-11.
4. Rohatgi N, Loftus P, Grujic O, et al. Surgical comanagement by hospitalists improves patient outcomes: a propensity score analysis. *Ann Surg* 2016;264:275-82.
5. Kisuule F, Howell EE. Hospitalists and their impact on quality, patient safety and satisfaction. *Obstet Gynecol Clin N Am* 2015;42:433-46.
6. Lapps J, Flansbaum B, Leykum LK, et al. Growth trends of the adult hospitalist workforce between 2012 and 2019. *J Hosp Med* 2022;17:888-92.
7. Harden M. What are hospitalists? And what value do they bring to health care? 2024. Available from: <https://news.cuanschutz.edu/department-of-medicine/hospitalists-workload-burden>
8. White HL, Glazier RH. Do hospitalist physicians improve the quality of inpatient care delivery? A systematic review of process, efficiency and outcome measures. *BMC Med* 2011;9:58.
9. Sharma G, Kuo YF, Freeman J, et al. Comanagement of hospitalized surgical patients by medicine physicians in the United States. *Arch Intern Med* 2010;170:363-8.
10. Shaw M, Pelecanos AM, Mudge AM. Evaluation of internal medicine physician or multidisciplinary team comanagement of surgical patients and clinical outcomes: a systematic review and meta-analysis. *JAMA Netw Open* 2020;3:e204088.

11. Rohatgi N, Weng Y, Ahuja N. Surgical comanagement by hospitalists: continued improvement over 5 years. *J Hosp Med* 2020;15:232-5.
12. Morris JC, Gould Rothberg BE, Prsic E, et al. Outcomes on an inpatient oncology service after the introduction of hospitalist comanagement. *J Hosp Med* 2023;18:391-7.
13. Kim SW, Ohn JH, Kim NH, et al. The Hospitalist-Oncologist co-Management (HOME) system improves hospitalization outcomes of patients with cancer. *BMC Health Serv Res* 2023;23:1367.
14. Stephens JR, Chang JW, Liles EA, et al. Impact of hospitalist vs non-hospitalist services on length of stay and 30-day readmission rate in hip fracture patients. *Hosp Pract* 2019;47:24-7.
15. Fernández-De-Velasco D, Villamor-Jiménez C, Carnero-Alcázar M, et al. Co-management reduces mortality in post-sternotomy mediastinitis. *Surg Infect* 2022;23:873-9.
16. Koo DJ, Goring TN, Saltz LB, et al. Hospitalists on an inpatient tertiary care oncology teaching service. *J Oncol Pract* 2015;11:e114-9.
17. Society of Hospital Medicine. Building and sustaining co-management programs in hospital medicine: a technical report and operational guide. Philadelphia, PA, USA: Society of Hospital Medicine; 2016.
18. Bezerra de Souza DL, Oliveras-Fabregas A, Espelt A, et al. Multimorbidity and its associated factors among adults aged 50 and over: a cross-sectional study in 17 European countries. *PLoS One* 2021;16:e0246623.
19. Gomes Dantas AA, Wingerter Barros AP, da Câmara Melo Freire G, et al. Multimorbidity among adults aged 50 and over in Europe and Israel: prevalence and associated factors from SHARE Wave 9. *J Am Med Dir Assoc* 2026;27:106138.
20. Palladino R, Tayu Lee J, Ashworth M, et al. Associations between multimorbidity, healthcare utilisation and health status: evidence from 16 European countries. *Age Ageing* 2016;45:431-5.
21. Palladino R, Pennino F, Finbarr M, et al. Multimorbidity and health outcomes in older adults in ten European health systems, 2006-15. *Health Aff* 2019;38:613-23.
22. Souza DLB, Oliveras-Fabregas A, Minobes-Molina E, et al. Trends of multimorbidity in 15 European countries: a population-based study in community-dwelling adults aged 50 and over. *BMC Public Health* 2021;21:76.
23. Chen YH, Karimi M, Rutten-van Mölken MPMH. The disease burden of multimorbidity and its interaction with educational level. *PLoS One* 2020;15:e0243275.
24. Wilk P, Ruiz-Castell M, Stranges S, et al. Relationship between multimorbidity, functional limitation, and quality of life among middle-aged and older adults: findings from the longitudinal analysis of the 2013-2020 Survey of Health, Ageing, and Retirement in Europe (SHARE). *Qual Life Res* 2024;33:169-81.
25. Makovski TT, Le Coroller G, Putrik P, et al. Role of clinical, functional and social factors in the association between multimorbidity and quality of life: findings from the Survey of Health, Ageing and Retirement in Europe (SHARE). *PLoS One* 2020;15:e0240024.
26. Palmer K, Marengoni A, Forjaz MJ, et al. Multimorbidity care model: recommendations from the consensus meeting of the Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS). *Health Policy* 2018;122:4-11.
27. Rodriguez-Blazquez C, João Forjaz M, Gimeno-Miguel A, et al. Assessing the pilot implementation of the integrated multimorbidity care model in five European settings: results from the Joint Action CHRODIS-PLUS. *Int J Environ Res Public Health* 2020;17:5268.
28. Lundstrøm SL, Kamstrup-Larsen N, Barrett BA, et al. A patient-centred care model for patients with complicated multimorbidity: protocol for a pilot cluster randomised trial in general practice, municipalities, and hospitals. *PLoS One* 2024;19:e0310697.
29. Struckmann V, Leijten FRM, van Ginneken E, et al. Relevant models and elements of integrated care for multi-morbidity: results of a scoping review. *Health Policy* 2018;122:23-35.

30. Rijken M, Hujala A, van Ginneken E, et al. Managing multimorbidity: Profiles of integrated care approaches targeting people with multiple chronic conditions in Europe. *Health Policy* 2018;122:44-52.
31. Skou ST, Nyberg M, Dideriksen M, et al. Exercise therapy and self-management support for individuals with multimorbidity: a randomized and controlled trial. *Nat Med* 2025;31:3176-82.
32. Smith SM, Wallace E, O'Dowd T, Fortin M. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2021;1:CD006560.
33. Zhou Y, Dai X, Ni Y, et al. Interventions and management on multimorbidity: an overview of systematic reviews. *Ageing Res Rev* 2023;87:101901.
34. Van der Heide I, Snoeijs S, Quattrini S, et al. Patient-centeredness of integrated care programs for people with multimorbidity. Results from the European ICARE4EU project. *Health Policy* 2018;122:36-43.
35. Melchiorre MG, Papa R, Quattrini S, et al. Integrated care programs for people with multimorbidity in European countries: eHealth adoption in health systems. *Biomed Res Int* 2020;2020:9025326.
36. Raaijmakers LHA, Schermer TR, Wijnen M, et al. Development of a person-centred integrated care approach for chronic disease management in Dutch primary care: a mixed-method study. *Int J Environ Res Public Health* 2023;20:3824.
37. Salisbury C, Man MS, Bower P, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomized trial of the 3D approach. *Lancet* 2018;392:41-50.
38. Para O, Caruso L, Fedi G, et al. Medical and surgical co-management: is time ripe? *Intern Emerg Med* 2022;17:935-6.
39. Fierbințeanu-Braticevici C, Raspe M, Preda AL, et al. Medical and surgical co-management - a strategy of improving the quality and outcomes of perioperative care. *Eur J Intern Med* 2019;61:44-7.
40. Para O, Tomaiuolo M, Raza A, et al. Internal-surgical co-management in emergency surgery: proposal of an organizational model, *Italian Journal of Medicine* 2025;19:1886.
41. Sahnou Abaker Sahnou A, Taha M, Osman Y, et al. Timing of surgery and medical optimization in multisystem trauma: a systematic review of outcomes based on internal medicine co-management with orthopedic, neurosurgical, vascular, thoracic, and general surgical emergencies. *Cureus* 2025;17:e87262.
42. Para O, Valuparampil JB, Parenti A, et al. Co-management hospitalist services for neurosurgery. Where are we? *Eur J Intern Med* 2025;132:148-9.
43. Mendelson DA, Friedman SM. Principles of comanagement and the geriatric fracture center. *Clin Geriatr Med* 2014;30:183-9.
44. Siegal EM. Just because you can, doesn't mean that you should: a call for the rational application of hospitalist comanagement. *J Hosp Med* 2008;3:398-402.
45. Kramer MHH, Bauer W, Dicker D, et al. The changing face of internal medicine: patient centred care *Eur J Intern Med* 2014;25:125-7.
46. Jung YB, Lee KY. The effect of daytime surgical hospitalists on reducing night shift physicians' workload. *J Patient Saf* 2023;19:346-51.
47. McDonald SR, Heflin MT, Whitson HE, et al. Association of integrated care coordination with postsurgical outcomes in high-risk older adults: the Perioperative Optimization of Senior Health (POSH) Initiative. *JAMA Surg* 2018;153:454-62
48. Huddleston JM, Long KH, Naessens JM, et al. Medical and surgical comanagement after elective hip and knee arthroplasty: a randomized, controlled trial. *Ann Intern Med* 2004;141:28-38.
49. Phy MP, Vanness DJ, Melton LJ 3rd, et al. Effects of a hospitalist model on elderly patients with hip fracture. *Arch Intern Med* 2005;165:796-801.

50. Auerbach AD, Wachter RM, Cheng HQ, et al. Comanagement of surgical patients between neurosurgeons and hospitalists. *Arch Intern Med* 2010;170:2004-10.
51. Tadros RO, Faries PL, Malik R, et al. The effect of a hospitalist comanagement service on vascular surgery inpatients. *J Vasc Surg* 2015;61:1550-5.
52. Para O, Valuparampil JB, Merrill I, et al. Comanagement of surgical patients between neurosurgeons and internal-medicine clinicians: observational cohort study. *Intern Emerg Med* 2025;20:751-60.
53. Ghanem D, Kagabo W, Engels R, et al. Implementing a hospitalist comanagement service in orthopaedic surgery. *J Bone Joint Surg Am* 2024;106:823-30.
54. Marchán-López Á, Lora-Tamayo J, de la Calle C, et al. Impact of a hospitalist co-management program on medical complications and length of stay in neurosurgical patients. *Jt Comm J Qual Patient Saf* 2024;50:318-25.
55. McCue B, Fagnant R, Townsend A, et al. Definitions of obstetric and gynecologic hospitalists. *Obstet Gynecol* 2016;127:393.
56. Gonzalez AK, Butler JR. Obstetrics and gynecologic hospitalists and their focus: impact on safety and quality metrics. *Obstet Gynecol Clin North Am* 2024;51:453-61.
57. Rohatgi N, Schulman K, Ahuja N. Comanagement by hospitalists: why it makes clinical and fiscal sense. *Am J Med* 2020;133:257-8.
58. Johnson SA, Whipple M, Kendrick DR, et al. Clinical outcomes of orthopedic surgery co-management by internal medicine advanced practice clinicians: a cohort study. *Am J Med* 2024;137:1097-103.e3.
59. Daniel R, Mei N, Evans J, et al. Perioperative management of neurosurgical patients by hospitalists: time for specialized training. *J Brown Hosp Med* 2024;3:120383.
60. Goodwin JS, Li S, Kuo YF. Association of the Work Schedules of Hospitalists With Patient Outcomes of Hospitalization. *JAMA* 2020;180:215-22.
61. Van Grootven B, Flamaing J, Dierckx de Casterlé B, et al. Effectiveness of in-hospital geriatric co-management: a systematic review and meta-analysis. *Age Ageing* 2017;46:903-10.
62. Aïdoud A, Gana W, Poitau F, et al. High prevalence of geriatric conditions among older adults with cardiovascular disease. *J Am Heart Assoc* 2023;11:e026850.
63. Alotaibi F, Alshibani A, Banerjee J, Manktelow B. The association between frailty and hospital-related adverse events in older hospitalised patients: a systematic literature review. *Eur Geriatr Med* 2025;16:1303-18.
64. Van Grootven B, Jeuris A, Jonckers M, et al. How to implement geriatric co-management in your hospital? Insights from the G-COACH feasibility study. *BMC Geriatr* 2022;22:386.
65. Van Grootven B, Jeuris A, Jonckers M, et al. Geriatric co-management for cardiology patients in the hospital: a quasi-experimental study. *J Am Geriatr Soc* 2021;69:1377-87.
66. Amin A, Likosky D. The role of hospitalists in the acute care of stroke patients. *Curr Treat Options Cardio Med* 2010;12:240-9.
67. Green JG. Collaborative comanagement between neurohospitalists and internal medicine hospitalists decreases provider costs and enhances satisfaction with neurology care at an academic medical center. *Neurohospitalist* 2018;8:74-81.
68. Wise KR, Akopov VA, Williams Jr BR, et al. Hospitalists and intensivists in the medical ICU: a prospective observational study comparing mortality and length of stay between two staffing models. *J Hosp Med* 2012;7:183-9.
69. Martinez-Urbistondo D, Alegre F, Carmona-Torre F, et al. Mortality prediction in patients undergoing non-invasive ventilation in intermediate care. *PLoS One* 2015;10:e0139702.
70. Lucena JF, Alegre F, Rodil R, et al. Results of a retrospective observational study of intermediate care staffed by hospitalists: impact on mortality, co-management, and teaching. *J Hosp Med* 2012;7:411-5.

71. Manzano JG, Park A, Lin H, et al. Demonstrating value: association of cost and quality outcomes with implementation of a value-driven oncology-hospitalist inpatient collaboration for patients with lung cancer. *BMJ Open Qual* 2019;8:e000381.
72. Montero Ruiz E, Rebollar A, Blanco Prieto M, Culebras Lopez A. Mejora de parámetros asistenciales y económicos mediante asistencia compartida con medicina interna en pacientes psiquiátricos ingresados. *Rev Clin Esp* 2017;217:306-8. [Article in Spanish].
73. Muskin PR, Skomorowsky A, Shah RN. Co-managed care for medical inpatients, C-L vs C/L psychiatry. *Psychosomatics* 2016;57:258-63.
74. Polevoi SK, Shim JJ, McCulloch CE, et al. Marked reduction in length of stay for patients with psychiatric emergencies after implementation of a comanagement model. *Acad Emerg Med* 2013;20:338-43.
75. Triplett P, Carroll CP, Gerstenblith TA, Bienvenu OJ. An evaluation of proactive psychiatric consults on general medical units. *Gen Hosp Psychiatry* 2019;60:57-64.
76. Oldham MA, Walsh P, Maeng DD, et al. Integration of a proactive, multidisciplinary mental health team on hospital medicine improves provider and nursing satisfaction. *J Psychosom Res* 2020;134:110112.

**Table 1. Specific types of integrated care models for multimorbidity in Europe.**

Model / Program	Type / Focus	Key Components	Countries / Settings	References
Integrated Multimorbidity Care Model (IMCM, CHRODIS-PLUS)	Non-disease-specific, person-centered	Comprehensive assessment, individualized care plans, multidisciplinary team, care coordination, self-management support, eHealth, regular follow-up	Spain, Italy, Lithuania	Palmer <i>et al.</i> (2018) <sup>26</sup> ; Rodriguez-Blazquez <i>et al.</i> (2020) <sup>27</sup>
Disease-Specific Integrated Care	Index disease + comorbidities	Tailored protocols, multidisciplinary teams, care coordination, regular assessment	Multiple European countries	Rijken <i>et al.</i> (2018) <sup>30</sup> ; Struckmann <i>et al.</i> (2018) <sup>29</sup>
Non-Disease-Specific Integrated Care (ICARE4EU)	Any combination of chronic diseases	Multidisciplinary collaboration, patient involvement, holistic assessment, care coordination, eHealth	24 European countries	Rijken <i>et al.</i> (2018) <sup>30</sup> ; van der Heide <i>et al.</i> (2018) <sup>34</sup>
Patient-Centered Complex Intervention (CIM2)	Complicated multimorbidity	Professional training, extended consultations, nurse-led coordination, structured follow-up, cross-sector integration	Denmark	Lundstrøm <i>et al.</i> (2024) <sup>28</sup>
Chronic Care Model (CCM, adapted)	General chronic disease management	Proactive care, interdisciplinary teams, self-management support, digital health tools	Netherlands, other EU countries	Melchiorre <i>et al.</i> (2020) <sup>35</sup> ; Zhou <i>et al.</i> (2022) <sup>33</sup>
Guided Care Model (GCM, adapted)	Nurse-led case management	Holistic assessment, care planning, multidisciplinary collaboration	Multiple European countries	Melchiorre <i>et al.</i> (2020) <sup>35</sup> ; Zhou <i>et al.</i> (2023) <sup>33</sup>
Person-Centered Integrated Care (PC-IC)	Holistic, person-centered	Comprehensive assessment, shared decision-making, self-management, care coordination	Netherlands	Raaijmakers <i>et al.</i> (2023) <sup>36</sup>
eHealth-Enhanced Integrated Care	Technology-enabled integration	Shared electronic health records, telemedicine, digital communication	Multiple European countries	Van der Heide <i>et al.</i> (2018) <sup>34</sup> ; Melchiorre <i>et al.</i> (2020) <sup>35</sup>
Individualized Care Planning	Patient goals and resources	Joint goal-setting, motivational interviewing, narrative counseling, individualized care plans	Multiple European countries	Palmer <i>et al.</i> (2018) <sup>26</sup> ; Salisbury <i>et al.</i> (2018) <sup>37</sup>