The importance of the cardiology observation unit in the management of patients with cardiovascular diseases: a pilot project

Manuel Monti,[1] Simone Cappannelli,[2] Marco Cardile,[2] Deborah Cosmi,[2] Tania Di Pasquale,[2] Mariana Cappannelli,[3] Jacopo Fagotti,[1] Pietro Quadalti,[1] Michele Marvardi,[1] Roberto Marchetti,[4] Euro Capponi[2]

[1]Emergency Department, Gubbio Gualdo Tadino Hospital, Gubbio (PG); [2]Department of Cardiology, Gubbio Gualdo Tadino Hospital, Gubbio (PG); [3]Quality Service Department, Usl Umbria 1, Perugia; [4]Villa Maraini Foundation, Rome, Italy

ABSTRACT

The intensive short observation (OBI) unit provides rapid diagnostic and therapeutic evaluations for patients in emergency-urgent conditions. Due to emergency department (ED) overcrowding, dedicated OBIs have been developed to improve care. As a pilot project, a cardiological OBI was established where specialist physicians manage patients, supported by nursing staff from the assigned unit. After observation, patients are discharged, hospitalized in cardiology, or transferred to other departments based on diagnostic needs. In 6 months, 107 patients were admitted to the cardiology OBI, with 85 (76%) discharged. Most admissions were for high-risk chest pain (55%), palpitations (30%), or suspected early-stage heart failure (15%). Notably, three patients were diagnosed with acute coronary syndrome after specialized evaluations for initially unclear symptoms. Preliminary results highlight the cardiological OBI's effectiveness in reducing inappropriate hospitalizations, identifying complex cases early, and easing ED overcrowding. It met all performance goals, demonstrating the potential to optimize patient pathways and enhance diagnostic accuracy in challenging cases. Strengthening the cardiological OBI appears essential for addressing ED pressures and improving specialized patient care.

Correspondence: Manuel Monti, Emergency Department, Gubbio Gualdo Tadino Hospital, Largo Unità d'Italia, Loc. Branca, 06024 Gubbio (PG), Italy.
E-mail: montimanuel@tiscali.it

Key words: appropriateness, cardiology observation unit, widen OBI, hospital overcrowding.

Contributions: all the authors made a substantial intellectual contribution, read and approved the final version of the manuscript, and agreed to be accountable for all aspects of the work.

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

Ethics approval and consent to participate: not applicable.

Patient consent for publication: not applicable.

Funding: none.

Availability of data and materials: data and materials are available from the corresponding author upon request.

Received: 24 October 2024.
Accepted: 25 October 2024.

Publisher's note: 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.

Licensee PAGEPress, Italy
Italian Journal of Medicine 2024; 18:1840
doi:10.4081/itjm.2024.1840

Introduction

The changes in the healthcare sector in recent years have led to a reassessment of emergency department (ED) structures, which are no longer seen as mere "transit" areas but as places for diagnosis and treatment.[1] The advent of new technologies in radiology and laboratory testing has enabled the ED to become a place for diagnosis and therapy during the initial phase of acute illness. At the end of the ED process, the physician can decide either to admit the patient or discharge them with follow-up by the general practitioner. The short-stay observation unit (OBI - *Osservazione Breve Intensiva*) provides an option for emergency physicians when the goal is to reduce unnecessary hospital admissions and ensure safe discharges from the ED.[2]

The cardiological OBI activity allows for observation, monitoring, diagnostic evaluation, and, if necessary, treatment of patients for whom, after the initial assessment in the ED (usually within the first 6 hours), it is not possible to determine the most appropriate pathway (discharge with follow-up by the general practitioner *versus* hospital admission).[3]

The cardiological OBI organizational model is characterized by:[4] i) high-intensity care; ii) rapid execution of diagnostic tests; iii) clinical monitoring; iv) planning of therapeutic strategies.

Purpose of the project

This organization aims to: i) evaluate and treat patients with minor symptoms or conditions, allowing their discharge at the end of the diagnostic process with symptoms resolved

and a certain or highly probable diagnosis; ii) appropriately assess patients with conditions of non-specific competence (*i.e.*, patients presenting symptoms clearly attributable to multiple diagnostic hypotheses) to better define their condition and place them in the most appropriate care setting; iii) reduce the number of hospital admissions by improving care appropriateness; iv) provide a service that combines comfort with greater competence and professionalism, thereby supporting the psychological aspect of patient care.

The cardiology OBI at our hospital involves three possible distinct pathways for the patient: i) admission to the SC of UTIC Cardiology at the Gubbio Gualdo Tadino Hospital; ii) transfer to another appropriate unit (short-stay observation, emergency medicine, and other operational units); iii) discharge to home with possible follow-up at the hospital's cardiology outpatient clinics.

In the UTIC-cardiology ward at Gubbio Gualdo Tadino Hospital, if needed, the same beds assigned to the unit are used. The "clinical-care evaluation" adopted here represents an organizational working methodology for healthcare professionals, deemed essential to ensuring appropriateness in the care pathways. The goal is to ensure not only proper diagnostic/therapeutic classification in a short time but also to improve the quality of care and patient safety.[5]

To be admitted to the cardiology OBI, patients must meet certain conditions and criteria outlined in Table 1.

The cardiological short-stay observation unit pathway

The decision to activate the cardiological OBI is a procedure agreed upon by the emergency physician and the cardiologist on duty. After performing first-level diagnostic tests and assessing the patient clinically, the most appropriate pathway is determined.

Patients eligible for the cardiological OBI may present with three distinct types of conditions: arrhythmias, chest pain with negative troponin and electrocardiogram for acute events but with a high risk for ischemic diseases (using the HEART SCORE to stratify sudden cardiac arrest risk), and mild heart failure (New York Heart Association class I and II).[6]

A "suspected cardiological diagnosis" after consultation with the cardiologist will trigger the patient's admission to the cardiological OBI, where, through observation and appropriate clinical and instrumental tests, the most appropriate care pathway will be defined, from admission to the cardiological OBI to discharge or subsequent hospital admission.

Materials and Methods

The admission of the patient to the cardiological OBI occurs when healthcare professionals (cardiologists and cardiology nursing staff) register the patient using a dedicated computerized procedure and complete the required fields. The cardiologist will specify, in the patient's clinical diary, the instructions for monitoring, diagnostic evaluation, and possible therapeutic prescriptions.

During the patient's stay, the following must be recorded in the computerized system: i) the results of clinical reassessments (to be noted at every shift in the "clinical diary" section); ii) any reasons for extending the OBI stay; iii) any reasons for hospital admission; iv) clear discharge instructions (informative notes) with subsequent follow-up where applicable ("notes and prescriptions").

Quality and performance indicators for monitoring and measuring the effectiveness of cardiological OBI services are available in Table 2.

Results

During the 6-month trial period, 107 patients were admitted to the cardiological OBI, with 85 patients (representing 79.44% of admissions) being discharged after an average stay of 1.28 days. Table 3 shows patient data, reasons for admission, diagnoses at admission to the cardiological OBI, and admissions to other departments. About 80% of patients admitted to the cardiological OBI were discharged, which otherwise would have resulted in inappropriate admissions to the cardiology department or occupied beds in the general OBI, reducing the overall length of stay.

It is also worth noting that among the 22 patients admitted after observation in cardiology, three were diagnosed with

Table 1. Criteria for admission to the cardiological short-stay observation unit.

Pathology	Rationale description	Inclusion criteria	Exclusion criteria
Unstable angina	To monitor and stabilize patients with non-acute chest pain but at cardiovascular risk	Persistent chest pain, abnormal ECG, high cardiovascular risk factors	Confirmed acute myocardial infarction, hemodynamic instability
Acute heart failure	To stabilize patients with worsening heart function	Dyspnea, peripheral edema, respiratory failure due to heart failure	Cardiogenic shock, respiratory failure due to non-cardiac causes
Deep vein thrombosis	Initial management of patients with suspected thrombosis	Initial management of patients with suspected thrombosis	Patients with massive pulmonary embolism or severe respiratory Failure
Syncope of cardiac origin	Monitoring and identifying potentially life-threatening causes	Unexplained syncope, history of heart disease, abnormal ECG	Syncope of non-cardiac origin, predominant neurological Conditions
Pulmonary embolism	Diagnosis and initial treatment of submassive pulmonary embolism	Sudden dyspnea, chest pain, positive D-dimer, risk factors for thromboembolism	Massive embolism, patients in shock or cardiac arrest

ECG, electrocardiogram.

acute coronary syndrome (ACS), even though they initially arrived at the ED with an unclear diagnosis of ischemic heart disease. Only the thorough diagnostic process carried out in the cardiological observation unit allowed for the diagnosis of ACS. All patients with chest pain underwent two blood tests for high-sensitivity troponin before admission, both of which were negative.

Discussion

According to the OBI Service Section of the American College of Emergency Physicians, the use of specialist OBIs, particularly the cardiological OBI,[6] i) allows for early risk stratification with a reduction in inappropriate admissions, as immediate admission would include a group of patients with a low post-test probability (*e.g.*, in cases of chest pain), whereas observation distinguishes between high and low risk without requiring hospitalization; ii) reduces risk by managing patients with suspected cardiac conditions through dedicated and specialized healthcare staff; iii) improves the flow and process of care while reducing resource use. By expanding diagnostic evaluation and having shared protocols with specialists, the margin for medical error decreases, enhancing both physician performance and patient satisfaction.

The emergency physician's dilemma always involves assessing potentially dangerous conditions that should not be underestimated in patients too ill to be discharged but not ill enough to be hospitalized, as well as addressing emerging psychosocial needs. The development of OBI, and subsequently specialist OBIs, also stems from the need for alternatives to hospital admission due to a sharp reduction in medical beds while maintaining diagnostic accuracy and treatment outcomes.[7,8] Specialist observation areas, in conjunction with ED OBIs, aim to prevent inappropriate admissions by reducing both length of stay through the use of "accelerated pathways" and hospitalization costs by minimizing unnecessary medical intervention duplication, ultimately improving both physician and patient satisfaction.[9,10]

The results of the CHEPER study on myocardial infarction, in which 27% of patients with chest pain were observed, show a significant reduction (from 4.5% to 0.5%) in inappropriate discharges of patients with ACS.[11] As previously mentioned, this also occurred in some cases in our project, where patients who might have been discharged were instead admitted to the cardiological OBI after clinical evaluation and risk stratification and subsequently diagnosed with ACS.

A retrospective cohort study comparing the length of stay for the same diagnosis-related group (DRG) (in particular, chest pain, abdominal pain, and asthma) in 5000 patients admitted to an observation unit with an average stay of 15 hours

Table 2. Performance objectives.

Performance objectives	Description	Measurement indicators
Reduction of hospitalization time	Optimization of hospitalization times without compromising the quality of care	Average stay duration in OBI, number of short-term readmissions
Increase in diagnostic accuracy	Esuring precise diagnoses to minimize errors	Percentage of correct diagnoses on the first intervention, number of revised diagnoses
Reduction of post-hospitalization complications	Minimizing adverse events and complications during monitoring	Percentage of observed complications, number of adverse events in OBI
Improvement in patient satisfaction	Ensuring a positive care environment and effective communication	Patient satisfaction survey results, number of complaints or negative feedback
Increase in resource management efficiency	Optimizing the use of human and material resources in the department	Average costs per patient, time of use of diagnostic resources

OBI, short-stay observation unit.

Table 3. Clinical characteristics of patients admitted to the cardiology observation unit, divided between discharged and hospitalized patients.

Cardiology department patients	Patients discharged
Average age: 67.25	Average age: 65.33
Gender: M 15; F 7	Gender: M 50; F 35
Average length of stay: 1.25 days	Average length of stay: 1.32 days
Admission diagnosis High-risk chest pain: 10 Heart failure: 6 Atrial fibrillation: 3 Coronaric acute syndrome: 3	Admission diagnosis: Chest pain: 49 Dyspnea: 4 Palpitations: 20 ICD discharge: 4 Syncope: 3 Hypertensive crisis: 5
Admission to other departments: General medicine department: Gender: M 3; F 2	

M, male; F, female; ICD, implantable cardioverter defibrillator.

and in 5000 patients with an average stay of 2.41 to 5 days, with an overall average of 3.3 days for the same DRGs, showed that the observation unit saved approximately 2-3 beds per patient.[12] In our pilot study, this is confirmed by the significantly reduced length of stay, especially for patients discharged at the end of the diagnostic-therapeutic process.

It is important for the patient within the cardiological OBI pathway to pursue some key objectives, including:[13] i) diagnostic evaluation of critical syndromes in patients whose initial diagnostic tests are inadequate (*e.g.*, chest pain) or in cases where the physician's initial assessment of the symptom is poor (*e.g.*, atypical ischemic cardiac pain); ii) short-term therapy in conditions where there is a high probability of success with an additional 10-15 hours of treatment, such as newly onset atrial fibrillation; iii) heart failure.

Conclusions

The results of this project demonstrate how a dedicated area like the cardiological OBI can progressively allow for changes in the treatment of patients with chronic or low-intensity cardiac conditions, with the aim of avoiding hospital admission and instead studying and treating the patient in an appropriate setting, thus increasing the appropriateness of admissions.[14] Furthermore, the opening of the cardiological OBI plays a fundamental role in reducing overcrowding in EDs, in line with the Ministry of Health's guidelines for reducing patient stay times in the ED.[15,16] All performance objectives set at the beginning of the project were achieved, particularly with a significant reduction in inappropriate admissions or admissions to the general OBI. This has increased the appropriateness of admissions and freed up beds in the ED's OBI for patients with other conditions. It will be important to verify if these results are confirmed after at least one year from the start of the pilot project when the project is fully operational.

References

1. Sartini M, Carbone A, Demartini A, et al. Overcrowding in emergency department: causes, consequences, and solutions-a narrative review. Healthcare 2022;10:1625.
2. Chan SSW, Cheung NK, Graham CA, Rainer TH. Strategies and solutions to alleviate access block and overcrowding in emergency departments. Hong Kong Med J 2015;21:345-352.
3. Wallins JS, Cajiao KM, McCarthy KJ, et al. Impact of an outpatient cardiology-managed urgent access and observation unit on hospital admissions. Crit Pathw Cardiol 2019;18:113-20.
4. Gaddy JD, Davenport KTP, Hiestand BC. Cardiovascular conditions in the observation unit: beyond chest pain. Emerg Med Clin North Am 2017;35:549-69.
5. Hess EP, Nestler DM. Transforming the emergency department observation unit: a look into the future. Cardiol Clin 2012;30:501-21.
6. Di Somma S, Ianni A, Bongiovanni C. Italy. In: Mace SE, ed. Observation medicine: principles and protocols. Cambridge, UK: Cambridge University Press; 2017. pp 417-20.
7. Trecartin KW, Wolfe RE. Emergency department observation implementation guide. J Am Coll Emerg Physicians Open 2023;4:e13013.
8. Monti M, L'Angiocola PD, Marchetti R, et al. Strategies for prevention of SARS-CoV-2 infection in a rural emergency department. Hong Kong J Emerg Med 2021;28:114-6.
9. Sabbatini AK, Wright B, Hall MK, Basu A. The cost of observation care for commercially insured patients visiting the emergency department. Am J Emerg Med 2018;36:1591-6.
10. Baugh CW, Suri P, Caspers CG, et al. Financial viability of emergency department observation unit billing models. Acad Emerg Med 2019;26:31-40.
11. Graff LG, Dallara J, Ross MA, et al. Impact on the care of the emergency department chest pain patient from the chest pain evaluation registry (CHEPER) study. Am J Cardiol 1997;80:563-8.
12. Ross MA, Graff LG 4th. Principles of observation medicine. Emerg Med Clin North Am 2001;19:1-17.
13 Paccamonti E, Marchetti R, Monti M. The management of overcrowding in the emergency room: analysis of the phenomenon and operational strategies. Ital J Prev Diagn Ther Med 2023;6:35-9.
14. Mortara A, Gabrielli D, Pugliese FR, et al. Documento di consenso ANMCO/FADOI/SIAARTI/SIC/SIMG/SIMI/SIMEU: Il percorso clinico-diagnostico e terapeutico del paziente con scompenso cardiaco acuto dal domicilio alla dimissione dal pronto soccorso/dipartimento di emergenza-accettazione. G Ital Cardiol 2019;20:289-334.
15. Paciullo F, Borgognoni F, L'Angiocola PD, Monti M. The response of the emergency system in the Umbria Region (Italy) during the COVID-19 pandemic. G Ital Cardiol 2020;21:758. [Article in Italian].
16. Busti C, Marchetti R, Monti M. Overcrowding in emergency departments: strategies and solutions for an effective reorganization. Ital J Med 2024;18:1714.