

Integrated chronic disease management to avoid emergency departments: the MACVIA-LR[®] approach

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Abbreviations

ED	Emergency department
EIP	European innovation partnerships
AHA	Active and healthy aging
MACVIA-LR [®]	MAladies Chroniques pour un Vieillissement Actif en Languedoc Roussillon
NCDs	Non-communicable diseases

Chronic diseases are diseases of long duration and generally slow progression. They include the four major Non-Communicable Diseases (NCDs) listed by WHO [1]: cardiovascular disease, cancer, chronic respiratory diseases and diabetes, and other NCDs such as mental disorders and skeletal muscular diseases [2]. As survival rates and duration of life have improved, chronic diseases also include communicable diseases (HIV/AIDS) and genetic disorders (cystic fibrosis). Aging increases the likelihood of NCDs

and comorbidities, thereby confounding their effects on health and well-being [3]. The novel trend for NCDs management evolves toward integrative approaches in which emergency medicine should be considered as an integral part of the disease management.

European innovation partnerships (EIP) attempt to enhance EU competitiveness, and tackle societal challenges by fostering innovation. Active and healthy aging (AHA) is a major societal challenge common to all countries and to all populations [4]. The EIP on AHA is deployed in three areas and six action plans including scaling up and replication of successful innovative integrated care models for chronic diseases amongst older patients [5].

The Région Languedoc-Roussillon is the umbrella organization for an interconnected and integrated project on AHA covering the three pillars of the EIP on AHA [6]. All sub-activities (A1: electronic pharmaceutical file, A2: falls prevention initiative, A3: frailty, B3: chronic respiratory diseases, chronic diseases with comorbidities, oral health and hepatitis virus C chronic infection, C2 and D4 active and independent living and handicap) are included in MACVIA-LR[®] (MAladies Chroniques pour un Vieillissement Actif en Languedoc-Roussillon) that has a strong political commitment and includes all stakeholders (public, private, patients, policy makers). It is a Reference Site of the EIP on AHA built around chronic diseases, aging and handicap. MACVIA-LR[®] framework has the vision that NCDs prevention and management is essential for AHA promotion and reduction of handicap. MACVIA-LR[®] main objective is to develop innovative solutions to improve the care of patients affected by NCDs, reduce avoidable hospitalization, and scale up the innovation to regions of Europe. The MACVIA-LR[®] project also aims to reduce the overuse of emergency department (ED) by NCDs patients.

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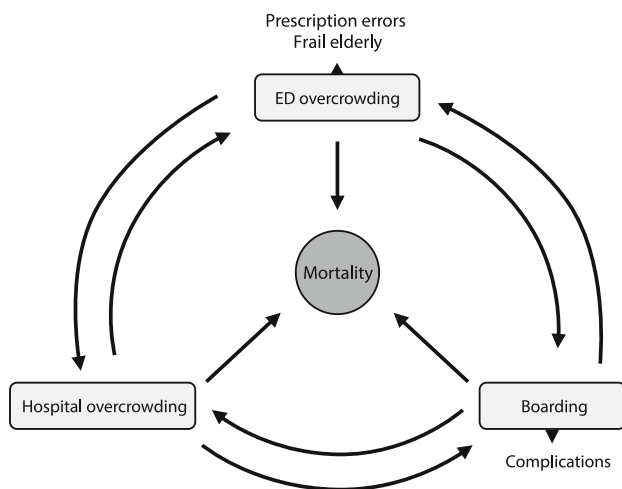


Fig. 1 vicious circle of overcrowding

People in Europe are frequent emergency department (ED) users, seeking care for a variety of problems, ranging from those requiring ED resources to complaints that could be treated in primary care settings, or non-emergent care. This is particularly the case for underserved populations or people with limited health literacy [7]. Many NCDs patients suffer from acute exacerbations that are not necessarily severe, although the term “acute” may often be confusing to the general public, and taken to mean “severe,” leading to an increased admission rate to the ED. For example, many acute upper respiratory infections and acute gastroenteritis cases in adults are mild, and resolve rapidly. On the other hand, acute exacerbations of COPD are often severe, and require an ED visit, in particular for patients with low socioeconomic status [8]. It is therefore important to characterize the severity of acute NCDs exacerbations to avoid ED overcrowding while maintaining an efficient health system. Increasing trend in ED visits for avoidable conditions requires attention and careful evaluation, as these visits place an undue organizational and financial burden on hospitals [9]. ED overuse is a growing and increasingly costly problem that results in overcrowding, long waits, overly stressed health professionals, and compromised care for people with true emergencies [10]. Overcrowded EDs have also been associated with several negative clinical outcomes, including higher complication rates and mortality, especially for frail patients with NCDs [11] (Fig. 1). There is an urgent need to improve service quality by understanding ED flow [12]. Creative solutions should improve the quality of ED care delivered to elderly patients by addressing their complex physical, social, cognitive, and situational needs [13].

Patients with an acute exacerbation of their NCS have an increased ED use when their personal general practitioner is not available, especially at night or during

Table 1 Solutions for non-communicable diseases (NCDs) patients at emergency department (ED)

Avoid the ED entrance	Improve ED healthcare	Improve hospitalization after the ED consultation
Facilitate the access to the specialty physicians	Enhance ED and specialty physicians collaboration	Increase hospital capacity
Facilitate the access to technical support of the hospital	Fast-track for NCDs patients	Have a clear bed allocation policy
Schedule a rapid hospitalization in a ward	Protocol based care	Promote medico-administrative bed-management
Hospital-level care to NCDs patients at home	Limit unnecessary investigations	Shorten length of stay of NCDs inpatients
Patient education	Discuss the use of point-of-care test	Have more beds for rapid exploration
Health information technology	Follow dashboard indicators	Refuse unnecessary demands of the wards
Telemedicine organization	Increase the medical and paramedical staff	
Coordination between medical center and primary care physicians		
NCDs management by the patient's treating physicians and nurses		

weekends, or in underserved areas. They then may encounter major difficulties when trying to reach any physician able to manage their problem, and they finally end up in some overcrowded ED. This is very time consuming and disturbing for these patients, and puts an additional burden on the ED while their referring general practitioner or another, duly mandated, physician could have, in most cases, made the appropriate decisions without the need for carrying the patients away from their homes.

MACVIA-LR[®] is promoting a multidisciplinary action to avoid unnecessary ED overuse based on the concepts recently published, and summarizing current knowledge [10] (Table 1). Three major actions are already implemented.

1. Assessment and control of comorbidities in NCDs. Exacerbations of NCDs are often, but not always, associated with under-recognition of disease or lack of control. Most NCDs patients do not have a full evaluation of comorbidities that induce a large percentage of ED visits

and hospitalizations. MACVIA-LR[®] has developed a comorbidity clinic in which patients with one NCD (cardiovascular, COPD or metabolic/diabetes) are tested for all other NCDs. This clinic is operative in a hospital setting (Montpellier University hospital), as well as in remote areas of the region (mobile clinic) [14]. It is also used in patients with an inflammatory rheumatic disease in whom up to 7 % of the tested patients suffer from a severe NCDs, which may rapidly exacerbate (e.g. high risk for acute myocardial infarction (Daïen, unpublished observation)).

2. Redesigning the triage process in the ED. increases the efficiency and timeliness of initial patient contact with a licensed medical provider, increases patient satisfaction, and decreases the number of patients who leave without being seen [15]. In France, the “SAMU Center 15” (medical emergency help services) has a key role for avoiding unnecessary ED visits. The French Emergency System Network has been using telemedicine for years, and is described by a specific 1986 Law (Loi n°86-11 du 06 janvier 1986 relative à l’aide médicale urgente et aux transports sanitaires) that establishes and organizes the SAMU Center 15. “15” is thus the one and unique telephone number to dial for any medical emergency in France. Medical dispatching is performed by emergency physicians in the case of an emergency, and by GPs in the case of any specific non-emergency call. The medical decision may be one of the following:

1. To provide simple medical advice, allowing the patient to stay at home;
2. To send a GP for a visit or consultation;
3. To send a standard ambulance to fetch the patient, and for transport to the hospital;
4. If there is a high degree of emergency, to send a “SMUR” (Mobile Intensive Care Unit) to provide emergency care, and then transport the patient directly to the appropriate hospital unit (e.g.: Cath-lab for STEMI) or stroke.

To be efficient, the organization of telemedicine for NCDs patients should be available 24/24 h, 7/7day, all year round, and must be directly connected with the SAMU system. Each SAMU medical dispatching center is permanently connected with the other regional centers and emergency units, and has special and direct access to all the intensive care and medical units in the hospitals. Telephone calls, internet or video conferencing can be used to facilitate contact and discussion between the patient and a physician with the appropriate background and skill:

1. Patient calling for a potentially life-threatening situation, such as chest pain in a diabetic patient, acute stroke, dyspnea etc.: the problem is directly and immediately managed by the emergency physician.

Such an immediate answer lowers the morbidity and mortality rate;

2. Patient calling for a sudden but not life-threatening change in disease: the appropriate specialist is either present in the SAMU dispatching center, or may be called immediately for audio or video conferencing. Adequate management can then be organized from the call center;
3. Information and communication techniques can be used at any time to ensure access to the patient’s medical records, biological data, medical imaging, and treatment history. Additional tools may be used when appropriate for diagnosis, using, for instance, ECG transmitters or any other monitoring device with data transmission or remote control capability;

3. Prevention of readmissions. Too many patients attending an ED are only treated for the acute exacerbation, whereas the underlying chronic disease should be better controlled and managed. Moreover, noncompliance to treatment is a major cause of uncontrolled disease [16]. Every effort should be done to educate the patients who attend an ED, and to initiate a controller treatment to avoid readmission.

Reducing the overuse of the ED for NCDs patients requires multidisciplinary policy actions that involve policy-makers, providers, payers, and patients. A pathway for promising models of chronic care management should reduce ED overuse. It is clear that while some conditions will require substantial investment, many interventions demand only small expenditures to achieve large effects. Patients have to receive integrated quality care from the right provider in the right setting at the right time with a clear benefit on clinical outcomes and quality of life.

Conflict of interest None.

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