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Study Section
Resource Management and Health Economics in Radiology

**Guidelines for the
Establishment of Community
Diagnostic Imaging Units
in Public Healthcare Organizations**
*Structural, Technological, Organizational Features,
Professional Competencies and Distribution*

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FOREWORD

The Italian Ministry of Health estimates admissions to the Emergency Room as being 23 million approximately every year; according to recent data provided by the Italian National Agency for Regional Health Services (AGENAS), 15% to 20% of admissions are inappropriate. This way, the potential for response of the National and Regional Health Services is weakened.

The possibility for hospital emergency-urgency facilities to respond to citizens' needs requires greater patient information and awareness to prevent inappropriate admissions, as well as a community healthcare network capable of providing an alternative to the Emergency Room, and greater involvement of primary care physicians. This process of dehospitalization could involve a redefinition of the hospital as a high-technology healthcare facility, intended for the treatment of patients in need of high- and intermediate-intensity levels of care.

As concerns Diagnostic Imaging (DI), new organizational models are needed in healthcare organizations to improve quality and access to DI services, with the ultimate aim of providing high standards of quality in patient services. In this perspective, the "National plan for waiting list management 2010–2012", approved by the State–Regions Conference, includes provision for the dehospitalization of DI services.

With this document, the SIRM intends to propose a practical reference model capable of responding to the current needs of DI service management and to political and executive indications through the creation of Community Diagnostic Imaging Units (CDIU). The purpose is that of preventing inappropriate access to healthcare facilities intended for emergency and elective hospital activities, so as to guarantee adequate supply of DI services, in full respect of temporal priorities and preventing improper use of economic resources.

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INTRODUCTION

The evolution of the Italian National Health Service (SSN) is moving towards a more efficient and effective patient management in order to provide an appropriate response to patient needs, in terms of type and timing of response, and taking into consideration the increasingly demanding budgetary constraints. Organizational models must necessarily be predisposed for healthcare organizations that aim to improve quality and accessibility of Diagnostic Imaging (DI) services, so as to guarantee high quality standards for all patients. In order to support this process and to allow for appropriate access to hospital facilities and to the emergency room, it is of paramount importance to provide an appropriate response to the citizen. Furthermore, DI services, which are an essential diagnostic step in several fields of modern medicine, must follow strict criteria for appropriate provision. With this document, we intend to outline a management model to improve citizens' access to DI services by reducing or decreasing improper access to hospital facilities, through the creation of functional structures, even as a guarantee for homogeneous access to the services. To this end, the consolidation or creation of Community Diagnostic Imaging Units (CDIU) entails:

- limitation of improper hospitalizations;
- a response to citizens' needs without crowding hospital wards, but enhancing the hospital's ability to respond to real emergency situations and to critical cases;
- directing hospital resources towards high-complexity services.

Any model aiming to become a standard of reference for regional healthcare systems must be based on the following principles:

- to guarantee high quality levels for DI services;
- to homogeneously distribute CDIU across the Region;
- to regain effectiveness in territorial management by improving the appropriateness of requests for these services;
- to improve the potential for response within the community, in terms of prevention and care, so as to bring the supply of healthcare services as close as possible to everyday life and work settings;
- to integrate the public-to-public and the public-to-private supply;
- to plan a smoother and more compact organizational structure;

- to seek multidisciplinary integration in diagnostic and therapeutic healthcare processes so as to facilitate access to the higher diagnostic level, which takes place in the hospital setting. This pathway for hospital–community integration must be well-planned and with definite timing of access to the higher diagnostic levels, through selection of patients in actual need;
- to optimize connections with hospital facilities so as to support conventional hospital activities, in favor of the patients, under emergency and election conditions;
- to rationalize healthcare spending through the identification of decision-making sequences characterized by competence and responsibility criteria;
- to implement and promote connections with Family Physicians (GP) and Primary Care Pediatricians (PCP).

The Community Diagnostic Imaging Unit may represent, in this setting, the main hub in a complex system in which the needs perfectly combine with the organization of the qualitative and quantitative response to the demand for radiologic services.

The CDIU Mission

To provide 12-h DI services to patients from the community with the purpose of encouraging dehospitalization of out-patient services and to guarantee more effective resource management, as indicated in the “National plan for waiting list management 2010–2012”, approved by the State–Regions Conference on 28.10.2010.

Access

Access to the service is ensured by the hospital-based or province-based Single Booking Center (*Centro Unificato di Prenotazione*, CUP) following request from the FP, PCP, or specialist of the SSN.

Organizational Structure:

The CDIU is the preferential operational instrument through which the health authorities administer the supply of out-patient DI services to the citizen. It represents an essential component of DI Departments or, where the latter have not been set up, of the Department incorporating diagnostic imaging. This Department must be organized as a cross-sectional entity with respect to the hospital and community components of the health authority.

Sizing of a Community Radiology Unit must take into account the

local needs and must be organized accordingly.

Relations between Facilities

Department/CDIU Relations:

- The CDIU operates within the Department or Interdepartment organization of reference which determines its budget and functional guidelines.

The duties of the Department include:

- Analysis of requests for DI services in the population of reference, through an assessment of the type and number of services provided by public and private facilities of that district, and by usage of services in neighbouring districts.
- Redefinition of the types of examinations to be performed in the community and those that are better done in hospital, considering the human and technological resources available.
- Integration between hospital and community service supply, with continuous monitoring of waiting lists according to the “National plan for waiting list management”. This guarantees the possibility of immediate and targeted remedial measures in the case of deviation from pre-set standards.
- Quality assurance (personnel, technologies, processes and products) of private and public out-of-hospital facilities.
- Development of diagnostic pathways aimed at improving appropriateness of requests, through continuing education of all healthcare professional (radiologists, FP, external specialists, etc.) and constant monitoring of improvement indicators.

The duties of the CDIU include:

- Providing the support of its institutional duties in order to create a set of indicators allowing the Heads of Department to steer the strategic course of the hospital–community integration.
- Providing DI services as primary and secondary prevention programs (screening campaigns, follow-up assessment strategies, etc.).
- Providing specialist health care through effective human and technological resource management of out-of-hospital facilities providing DI services.
- Cooperation in drafting and implementing diagnostic protocols that

involve in-hospital facilities by defining routes for preferential access to a second diagnostic level for selected patients.

- Contributing to decision-making on qualitative-quantitative dimensioning of public supply in relation to the number of services to be provided, taking into account past out-patient services provided by type to the population of reference and the cases of unmet demand for services which produces access to facilities in neighboring districts.

- ***Relations with the Central Booking Center:***

The Department, on the basis of data provided by the CDIU, indicates to the CUP all facilities available for providing out-of-hospital radiology services, with indications on the route of access. Availability must be differentiated according to priority levels (U, B, D and P) considering what has been indicated in the “National plan for waiting list management 2010–2012” with regard to maximum waiting times in areas considered critical. Furthermore, lists dedicated to complying with emergency room requests indicated as White or Green Codes will also have to be taken into consideration, as advocated by the Ministry of Health.

Lines of Conduct:

Examinations to be Performed in Community Radiology Centers

Conventional Radiology

- Plain X-Ray Examinations
- Contrast-enhanced Examinations
- Orthopantomography
- Mammography
- Bone mineral density (BMD)

Ultrasound (US)

- Abdominal, pelvic, neck, soft-tissue and musculoskeletal US
- Arterial and venous color-Doppler US
- Endocavitary US
- Screening for hip dysplasia in neonates

Breast Imaging

- Breast screening (if activated)
- Mammography
- US

CT

Examinations without contrast material
Examinations with contrast material*

Magnetic Resonance
Osteoarticular

1st-level Interventional Radiology
FNAB
Imaging-guided superficial biopsies **

* At facilities where a resuscitation specialist is present.

** At facilities where operators having specific and recognized professional skills and support nurses are present.

PROFESSIONAL, STRUCTURAL, TECHNOLOGICAL AND OPERATIONAL REQUIREMENTS

To implement all stages presented in the introduction for Community DI activity, the following may be identified:

- a. Community Complex Operational Units (UOC), when services have to be provided to a large number of patients (extending to the Province of reference, in large metropolitan or high-density areas) or where the facilities belonging to the Operational Unit are particularly complex (due to equipment, personnel or services provided, within single or multiple facilities) according to community needs;
- b. Simple Operational Units with Departmental features (UOSD), which represent the lowest organizational level of community facility, when the conditions above are not present or due to particular organizational needs of each healthcare organization.

A) Professional Requirements

CDIU Staff and Service Volumes

The UOC and UOSD staffing must be in line with criteria adopted in facilities having similar organizational importance. Physicians may be either full-time or fixed-term staff members, or internal contracted specialists.

Staffing must be commensurate to the following:

- technological resources available;
- the need to be work on 12-h shifts five days a week and for at least six hours on Saturdays, or according to the organization most suitable to meets the institutional needs;
- the demand for healthcare services to be provided to the population of reference, considering the workloads defined by SIRM, without differentiating between staff members and internal contracted specialists, operational conditions being equal.

In addition, with the same modalities as used for the medical staff and only as concerns equipment present in the facility, technologist staffing must also be considered.

Conversely, the nursing, auxiliary and administrative staff is shared with the overall community healthcare service, within which the CDIU activities take place.

Furthermore, when warranted by the size of the facility and staff, Technician and Nurse Coordinators may be identified.

Training and Continuing Education:

In order to improve the overall quality of the services provided, to maintain clinical competence, and to effectively integrate in-hospital with out-of-hospital services, particular attention must be paid to personnel training. For this reason, in addition to the necessary continuing education and refreshers courses, sharing experience appears essential, through the cross-over of in-hospital and out-of-hospital staff, for at least 10% of the activity carried out.

B) MINIMUM STRUCTURAL REQUIREMENTS

1	waiting area	equipped with an adequate number of seats and a dedicated area for disabled patients
2	areas for reception, collection of medical reports and administrative activities	may be a single area within the facility
3	separate toilet facilities for healthcare providers and patients with and without disabilities	may be shared within the facility
4	area for storing and processing sensitive data	if needed
5	technical area for image processing	rigorously restricted to operators, physicians and technicians
6	area for medical reporting	adequately equipped
7	area for storage of consumables, equipment and instruments	may be shared with other units within the facility
8	area for separate refuse disposal according to the different activities	may be shared with other units within the facility
9	separate areas for diagnostic equipment, with dedicated toilet facilities	the rooms must be arranged so as to allow for management of patient emergencies
10	presence of a room equipped for patient emergency management even outside the examination phase	to provide the best possible care without interfering with diagnostic activities
11	room for patient preparation	for CT and MR examinations

The electrical, lighting and air-conditioning systems must comply with regulations governing out-of-hospital diagnostic centers.

C) TECHNICAL REQUIREMENTS

Equipment Features

RIS and PACS systems are essential to promote departmental integration, to share access to all the services previously delivered to the patient, hospital medical records and images of previous diagnostic examinations.

For a more effective integration of public and private accredited facilities, we suggest adopting a single standard of reference, at least within the same

province, for all operators, to be considered a compulsory condition for accreditation.

Through this integrated system, adequate flexibility may be guaranteed in supplying the services, as well as a correct distribution of workloads on the basis of the human and technological resources available.

Minimum Instrumental Equipment

1	Teleradiography system
2	Remote control
3	Color-Doppler US scanner
4	Orthopantomographer
5	Mammography system
6	Digital radiography equipment (CR)

Optimal Instrumental Equipment

1	Direct digital radiography equipment (DR)
2	Teleradiography system
3	Remote control
4	Color-Doppler US scanner
5	Multislice CT scanner
6	MR scanner capable of satisfying the demand for osteoarticular out-of-hospital services
7	Digital orthopantomographer
8	Digital mammography system
9	BMD
10	Anesthesia trolley (in the case of contrast-enhanced examinations)





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