

The progressive aging of the Spanish population is accompanied by a high prevalence of people, some of them frail and suffering from two or more chronic conditions. These patients require high rates of healthcare resources, and it is necessary to improve the quality of the care they receive and the efficiency in the management of the available resources. At hospitals, the criteria that apply to identify highly complex patients with multiple chronic conditions allow identifying a population advanced in years, with higher functional limitations, higher mortality levels and who need more resources.

The unit for highly complex patients with multiple chronic conditions is an organization of healthcare professionals which provides multi-disciplinary care by means of a wide range of caring services to frail, highly complex patients with multiple chronic conditions, at a set of premises with the necessary facilities and equipment fitted out for the foreseen activity and that ensure efficient, high quality and a safe environment.

This document includes recommendations on patient's rights and safety, on organization and management criteria of the Unit for Highly Complex Patients with Multiple Chronic Conditions, settled by the Quality Agency of the Spanish National Health Service with the support of a group of experts closely related to scientific institutions and to the Spanish National Health Service. These recommendations are not a legal document and their main objective is to provide public health administrators, managers of both public and private centres and healthcare professionals with in-depth knowledge of all those elements that contribute to the improvement of the quality and safety conditions of the care provided to complex patients with multiple chronic conditions.

Unit for Highly Complex Patients with Multiple Chronic Conditions

MINISTRY OF HEALTH AND SOCIAL POLICY



Unit for Highly Complex Patients with Multiple Chronic Conditions

Standards and Recommendations

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Standards and Recommendations



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0. Executive Summary of the Document on Standards and Recommendations of the Unit for Highly Complex Patients with Multiple Chronic Conditions.

Introduction

1. The progressive ageing of the Spanish population is accompanied by the high prevalence of people, some of them frail and suffering from two or more chronic conditions. These patients require high rates of healthcare resources and a systematic management of their caring process in order to improve the quality of the attention they receive and the efficiency in the management of the healthcare and welfare resources available.
2. Hospital attendance multiplies by ten for those patients over 85 in relation to the age range of 15 to 34. Moreover, the average duration of each hospital stay tends to be longer for those people advanced in years.
3. Higher hospital frequentation rates of older people are accompanied by a higher usage rate of the consultations, A&E services and of day hospitals, and by a higher medication intake.
4. The higher need of healthcare resources corresponds to the fact that it is a group that has worse subjective health and a higher level of disability. Each person of an age range of 65 to 74 has an average of 2.8 problems or chronic diseases, raising to 3.23 in those people over 75.
5. To comply with this healthcare needs, different management and organization models have been developed. Healthcare services of the different autonomous regions have provided different solutions which respond to the social and demographic needs, to the availability of their healthcare resources and to the relation the former have with the social services in terms of integration and coordination.
6. At hospitals, the criteria that apply to identify highly complex patients

with multiple chronic conditions allow identifying a range of population advanced in years, with higher functional limitations, higher mortality levels and that need more resources. Identifying a patient as affected from multiple chronic conditions is a determining factor for developing a systematic strategy on his/her healthcare plan. Ollero *et al.* have proposed gathering chronic diseases of these patients according to their clinical categories, to the damage caused on the target organ and to its functional aftermaths, and identifying as a patient affected by multiple chronic conditions any patient that has conditions included in two or more of the proposed categories.

7. At primary healthcare services, up to 40% of highly complex patients with multiple chronic conditions have three or more chronic diseases, 94% is under polymedication and 37% shows some type of cognitive impairment. The rate of this type of patients at primary healthcare can be settled in 1.38% of the total population or in 5% of people over 65.
8. The United Kingdom Health Department estimates that 5% of their patients (generally suffering from chronic diseases) cause 42% of hospital stays and thus it has designed a healthcare and welfare programme to provide care to these chronic patients. For the development of this model, those management experiences for chronic patients that have had positive results have been identified; among them, the systematic care attention developed by Kaiser Permanente (United States).
9. A unit for highly complex patients with multiple chronic conditions responds to a management system and can be defined as an organization of healthcare professionals which provides multidisciplinary care by means of a wide range of caring services to frail, highly complex patients with multiple chronic conditions and which complies with specific structural and functional means and resources to ensure efficiency, high quality and a safe environment to perform this activity.

Rights and Guarantees of Patients and Carers.

10. The involvement of patients in their caring process is a key element in the caring strategies of highly complex patients with multiple chronic conditions.
11. The patient should receive general information about the unit, detailed information about the process, the diagnosis, the treatment and the care he/she will undergo at the unit; informed consent; detailed information about the coordination of the unit and the healthcare resources of primary healthcare. The information has to be clear, concise and sufficient.
12. It is recommended that the welcoming information that is to be

handled to the patient or the carer (leaflet, booklet) on his/her first contact with the unit will include a description of the different resources related with the healthcare systems under which he/she may be taken care of at the unit. It shall also include warnings and special advices about its access and usage. Pictures of the unit may help patients to understand how the unit works.

13. Diagnostic and invasive therapeutic procedures as well as the administration of any treatment that may imply any risk or inconvenience and that may have clear negative effects over the patient's health require his/her informed consent.
14. The main carer of chronic and disabled patients is the person who generally provides care to a sick person or a physically or psychically disabled person which hinders him/her from being autonomous. The care plan for a patient suffering from multiple chronic conditions, mainly for those patients with serious functional or cognitive impairment, must include the attention of the carer.

Patient's Safety

Safety culture

15. Healthcare centres must promote the creation and maintenance of a safety culture. Creating a safety culture is a determining step towards achieving an improvement in patient's safety and it implies the first safe practice recommended by the European Health Committee and other organizations.
16. It is recommended that the work team of the unit for highly complex patients with multiple chronic conditions should meet on a periodic basis to analyze systemically the safety events that may have occurred in the unit and to settle the appropriate preventive measures.
17. It is recommended a regular update of the information on patient's safety and on the practices based in scientific evidence which may have been efficient to prevent mistakes so as to estimate the introduction of new measures which may be useful to establish continuous improvements in the safety of those patients cared at the unit for highly complex patients with multiple chronic conditions.

Communication during patient transfer

18. Communication between professionals from different shifts or in the transfers between the different caring units should be standardized.

19. It is recommended that the discharge process of the patient suffering from multiple chronic conditions should be standardized so as to guarantee the availability of the key information referring to the diagnosis when discharged, to the results of the tests performed, to care and treatment plan and to medication.

Medicine handling safety

20. Prescription for highly complex patients with multiple chronic conditions should be standardized and thus the unit should have the updated, evidence based treatment protocols and/or usage guides of those medicines of the main diseases dealt with at the unit, which would allow making a follow up of their efficiency and safety.
21. Medication conciliation techniques should be implemented in the unit for highly complex patients with multiple chronic conditions so that in healthcare transfers of patients this standardized procedure may be used. This technique compares the previous medication of the patient with the new medication prescribed at the unit, identifying, solving and registering any unjustified difference (omission, duplicities, interactions, etc.). Medication mistakes cause up to 20% of the adverse events of hospitals and an important percentage of the readmissions into hospital. An large amount of these mistakes occur during healthcare transfer processes.
22. A complete pharmacotherapeutic profile of the patient should be made when the patient is admitted (or in the consultation room). A comprehensive review of the home medication should be carried out before prescribing new medication.
23. Treatments should be simplified as much as possible. Doses adjustments will be systematically made according to age, and the kidney and liver function of the patient.
24. A complete (and agreed) medication list should be provided for professionals who would be responsible for the care continuity once the patient is discharged (or at the consultation) and he/she is transferred to primary healthcare services. All the changes made in the previous medication of the patient should be written down.
25. The prescription of medication considered inappropriate for people advanced in years should be avoided as there is a relation of risk / adverse benefit in these patients and there are other therapeutic possibilities.
26. The use of new IT and communication systems, mainly the availability of computerized clinical records and of systems of electronic assisted

prescription included in the patient record, may increase safety in medication.

27. Alerts of the electronic assisted prescription system should include the medication inappropriate for the elderly.
28. Medication administration should be scheduled with the patient and/or carer taking into account his/her life style and reducing, when possible, the number of intakes.
29. It is advisable that when discharged the patient should be provided with finite doses, i.e., with the necessary doses of the finite treatments (antibiotics, corticosteroids, etc.) until the treatment prescribed by the hospital is completed.
30. It is recommended to assess the adherence to the treatment of the patient in the unit.
31. It is recommended to establish in accordance with the primary health-care service a periodic reassessment of the patients' medication.

Pressure ulcer prevention

32. Patients at risk of suffering pressure ulcers should be identified and their skin condition assessed.
33. The individualized care plan for the patient suffering from multiple chronic conditions should include, among other measures, local care of the skin, specific prevention measures for patients suffering from incontinence and postural moves for those changes suffering from limited mobility.

Fall prevention and pain reduction

34. Nearly 30% of people over 65 falls down once a year and at least a 50% of them falls again during that year. The level of falls is higher in people advanced in years that are institutionalized. Some studies suggest that 20% of falls need medical care, 10% of patients show up serious wounds while 40 to 50% suffer from minor wounds as injuries, bruises and contusions.
35. A unit for highly complex patients with multiple chronic conditions should develop and implement a programme for the prevention of falls that would include the identification of those patients who risk suffering falls, a multidimensional assessment of the risk and a multifactorial strategy to reduce the risk of falls.

Nosocomial infection prevention

36. The unit will have a control and prevention programme of the nosocomial infection adapted to its characteristics and activities and which would guarantee the identification of those patients that are at risk. The unit for patients with multiple chronic conditions should have and use the protocol for hand hygiene, use of alcohol-based solutions, utilization of antiseptics, antibiotic prophylaxis and a protocol for the risk of infection at invasive procedures.

Patient identification

37. The unit would have a system which would allow identifying patients unmistakably.

Management

38. The unit for highly complex patients with multiple chronic conditions may be included within any other healthcare service with a broader service portfolio which, at times, may include diseases at advanced stages (palliative care) or services such as internal medicine or geriatrics. A unit for highly complex patients with multiple chronic conditions may be considered as such if it obeys the following requirements:
 - Close cooperation between the manager specialist doctor of the unit and the doctors from the primary healthcare attention systems for the systematic attention of the patients.
 - Availability at the unit of a whole range of healthcare systems that guarantee patients' attention in the most appropriate time and place.
39. The primary healthcare system and the unit should define a cooperative care system which implies setting some selection and identification criteria of the patient and a continuous healthcare programme.
40. Patient identification both at the IT system of the hospital and at the clinical record is a determining factor for the coordination of any action of the unit with other units of hospital (mainly A&E services).
41. The continuous healthcare programme would be activated when the person in charge of the patient at primary healthcare and the manager of the unit will considered, upon mutual agreement, that the patient needs of their cooperative participation for his/her clinical control.

42. Patients cared of at the unit should be under the close coordination of their doctor/nurse from the primary healthcare. Follow-up, once the continuous healthcare programme has been activated, will have the following characteristics:
- Admissions would be scheduled through the primary healthcare doctor in coordination with the reference manager of the unit, trying to prevent the patient from turning to the A&E services of the hospital.
 - The doctor responsible for the patient will assess any possible hospitalization in a bed not allotted to the unit, regardless the reason for the admittance.
 - Highly complex patients with multiple chronic conditions admitted into hospital will undergo an early planning of discharge. Therefore an assessment of the caring needs of the patient, relatives and environment will be performed. The participation of a social worked would be considered according to the identified needs.
 - When discharged, a report for the care continuity of all patients included in the continuous healthcare programmes will be completed. It will include the level of dependence and the active problems.
 - For those patients under a continuous healthcare programme, all the consultations at the different units or medical services or the activation of any hospital support devices (home hospitalization, for example) will be made through the manager of the unit.
43. An episode at a unit for highly complex patients with multiple chronic conditions comprises the time in which the clinical management of the patient is performed by the unit in cooperation with the people responsible for the patient at the primary healthcare level, and it may include one or several caring processes in any of the healthcare possibilities of the unit.
44. Irrespective of the compulsory nature of the discharge report, the manager of the unit will issue a discharge report of the unit once the joint management of the patient is considered finished (once the patient being stabilized), a fact that sends back the responsibility of the clinical management of the patient to the primary healthcare specific area. The discharge report will be accompanied by a care plan drawn up by a reference nurse of the unit.
45. Any unit for highly complex patients with multiple chronic conditions must offer healthcare to its patients at conventional hospitalization units, in an outpatient basis and at day hospitals (DH).

46. The unit should be coordinated with the home hospitalization unit, the palliative care unit and the A&E services.
 - The aim of the relation of the unit for highly complex patients with multiple chronic conditions and/or the palliative care unit is to guarantee the caring continuity of the patients with multiple chronic conditions.
 - The aim of the relation of the unit for highly complex patients with multiple chronic conditions with the A&E service or unit is to avoid its being inappropriately used by chronic patients, when possible, and to reduce the number of caring episodes in that service when patient suffers from flares.
47. Care circuits should be defined to guarantee specialized urgent or preferential care without having to go through the A&E services, within a specific time frame settled by the clinical managers of the patient.
48. The unit may have the support of other public health or welfare resources, mainly of medium term care units or of recovery units, or from other support devices, such as assisted homes and in-home therapy.
 - Coordination between the unit and the public health and welfare resources has a key importance in the early planning of the discharge when the patient is at hospital. It is also important to offer the patient the necessary support to prevent him/her from abandoning care and the carer from being overburdened, and to avoid the patient being inappropriately admitted at acute care hospitals.
49. The manager of the unit for highly complex patients with multiple chronic conditions must be clearly identified, easily held of via telephone by the people responsible of the patient at primary healthcare in order to guarantee the coordination and the scheduling of admissions, consultations, tests or any joint procedure. Mobile phones are considered basic for the appropriate operation of the unit.
50. The unit will have the necessary professional staff (liaison community nurse / case manager and/or social worker) that would ease the coordination of the healthcare, public health and welfare resources as well as the caring continuity.
51. It is advisable the creation of some sort of structure, such as a clinical management unit, service, etc., which would add additional value to the set of basic units for highly complex patients with multiple chronic conditions of the hospital, for example, as far as its coordination is concerned.

Functional Programme and Resources

52. The following areas may be differentiated at the unit for highly complex patients with multiple chronic conditions:
 - Conventional hospitalization, which includes the nurse station and the utility rooms.
 - Day Hospital Unit, which includes the healthcare areas necessary for the examination, treatment and recovery (DH) and the examination rooms.
 - Entrance and reception, which includes the waiting rooms and the patient registry areas.
 - Offices and staff utility rooms.
53. The document offers in the annexes a sample of the functional programme and a resource sizing for a unit for highly complex patients with multiple chronic conditions.
54. Whenever compatible with the sizing obtained from the expected activity of the unit, it is recommended to consider the structural integration of all the healthcare possibilities in the service portfolio of the unit.

Human Resources

55. The necessary staff at a unit for highly complex patients with multiple chronic conditions includes:
 - Manager of the unit for highly complex patients with multiple chronic conditions. Doctor, if possible specialist in internal medicine, geriatrics or in community and family medicine.
 - Coordinator (if there is a structure which gathers the units); if possible, one of the doctors in charge of the unit.
 - Nurse coordinator.
 - Graduate nurses who will be in charge of the care procedures related with the administration of treatments and the recovery of patients as well as of the coordination and continuity of the care (liaison community nurse/case manager).
 - Social worker.
 - Nurse assistant.
 - Administrative staff.
 - Orderlies.
56. The unit for highly complex patients with multiple chronic conditions needs full time or part time staff such as:

- Therapist
 - Physiotherapist.
 - Dietist.
 - Chemist.
57. The medical staff requirements for the unit for highly complex patients with multiple chronic conditions could be settled in a specialist every 8.000 ± 1.500 people over 65 in the reference area. The service portfolio and the terms in the relation with the primary healthcare may adjust the ratio.

Quality

58. The document proposes a set of indicators which refer to the different healthcare systems integrated within the unit for highly complex patients with multiple chronic conditions: conventional hospitalization, day hospitalization, consultations and interconsultation.
59. The following global quality and efficiency indicators of the unit for highly complex patients with multiple chronic conditions are proposed:
- % reduction of hospital admittance for people advanced in years.
 - % reduction of the average hospital stay of people advanced in years.
 - % reduction in the number of hospital stays/year of people advanced in years.
 - % reduction of hospital urgent procedures of people advanced in years.
 - Satisfaction index.

Criteria for the Reviewing and Monitoring the Standards and Recommendations of the Unit for Highly Complex Patients with Multiple Chronic Conditions.

60. The unit for highly complex patients with multiple chronic conditions has recently developed in Spain and has had a limited penetration in the Spanish Health System, but for the Health Service of Andalusia. The probable development of these units as wells as the changes they involve in the organization and management of the health system make it advisable to monitor the development and operation of these units in

the systems as well as to review and to update this document within five years at the most.

61. Some lacunae have been identified, mainly in relation with the availability of the information and the monitored experience on the operation of these units in the Spanish health system. To obtain a better information as a basis over which evidence-based recommendations could be based, it is recommend that the review of this document should include the following:
 - An analysis of the quality indicators proposed for the unit for highly complex patients with multiple chronic conditions
 - Studies of the care evaluation and life quality of patients with multiple chronic conditions cared at the units Vs the care they received before the development of the abovementioned units.
62. The boost to the unit for highly complex patients with multiple chronic conditions implies important changes in the organization and management of their care, including the management structure of hospitals and its relation with primary healthcare and its need to adapt the healthcare information systems in order to register the activity of these units. The development and the operation of the unit should be accompanied by a concurrent assessment process of the results and a comparison of all the experiences undergone which may allow offering excellence in the care process to this sub-group of patients.

1. Introduction

The progressive ageing of the Spanish population is accompanied by the high prevalence of people, some of them frail and suffering from two or more chronic diseases. These patients require high rates of healthcare resources and, in order to improve the quality of the attention they receive and the efficiency in the management of the healthcare and welfare resources available, they need a systematic management of their caring process. From the scientific societies¹ and several healthcare services of the autonomous regions, several proposals have spread to create a methodical and comprehensive healthcare system for these highly complex patients with multiple chronic conditions. In that respect a unit, for this type of patients is one of the most interesting ideas.

The original characteristics of this service, the several possible arrangements (management, structural and functioning, etc.) which it may develop, as well as the effects as far as quality and patient's safety is concerned make this unit one of the most favourable to draw a set of quality and safety criteria of its own. This is the objective of this document which is written down within the frame of actions observed by the Quality Plan of the Spanish National Health Service².

Act 16/2003, May 28th, on Cohesion and Quality of the Spanish National Health Service, sections 27 to 29, settles the requirement to draw safety and quality needs which would be required by autonomous regions, within their own regional area, for the regulation and authorization in order to open and set into operation healthcare centres and services.

The Spanish Royal Decree 1277/2003, (October 10th), “por el que se establecen las bases generales sobre autorización de centros, servicios y establecimientos sanitarios” (establishing the general basis for the authorization of healthcare centres, services and institutions) defines and relates the healthcare centres and services which must obey the requirements which will guarantee their safety and quality. The classification of healthcare centres and services was modified by the Ministerial Order 1741/2006. Some centres and units that are annexed in the Royal Decree 1277/2003 would have to follow the standards and recommendations that appear in this document on the units for highly complex patients with multiple chronic conditions. The following should be pointed out:

Table 1.1 Centres and units included in the Royal Decree 1277/2003 and which should follow the standards and recommendations published in this document.
Type of healthcare
U.1. General practitioner/family doctor
U.2. Nursing
U.12. Geriatrics
U.13. Internal medicine
U. 65. Day hospital
U. 66. Home care
U. 67. Palliative care
U. 68. A&E services
C. 1. 3. Medium and long term hospitals

The establishment of a unit for highly complex patients with multiple chronic conditions affects many of the other units and services of the hospitals. Medical specialities would be affected whenever the unit takes the clinical control of the patient with multiple chronic conditions during his/her stay at hospital and the specialities have, under the coordination of the unit, a supporting role in the diagnosis and on the therapeutic decision taking. There would be a similar process in relation with surgery specialities as, once the patient is under the care of the unit, the unit will coordinate the surgery attention he/she will receive and mainly the possible decompensation of the chronic condition during surgery. In fact, it should be reached a situation similar to the patient management that is already carried out in several hospitals that have patients under follow up situation by several specialities (nephrology, haematology, etc.) where, irrespective the reason of the patient's admission, the specialities are alerted from the A&E service or from the unit to which the patient has been admitted. Some units important for patients with multiple chronic conditions, such as rehabilitation and physiotherapy and which have a determining role in the functional recovery of the patient, will also be affected.

The aim of the “Strategy 7” of the Quality Plan of the Spanish National Health Service SNS “*Acreditar y auditar centros, servicios y unidades asistenciales*” (To authorize and audit healthcare centres, services and units) is to settle the common basic requirements and the safety and quality guarantees that have to be observed before the opening and operation of healthcare centres which belong to the Spanish National Health Service.

Within the development framework of the Quality Plan of the Spanish National Health Service, the Ministry of Health and Social Policy took up the drawing of the safety and quality standards and recommendations for several units, reviewing and updating the documents dealing with DS units^{3, 4} writing afterwards the references for medical and onco-haematologic DH units⁵, which serve as an example to similar proposals to this one on the standards and recommendations for a unit for highly complex patients with multiple chronic conditions.

This document on standards and recommendations for a unit for highly complex patients with multiple chronic conditions is not a legal document and thus it does not settle the minimum requirements or standards for the opening, working conditions and accreditation of the unit.

The aim of this guide is to provide public health administrators, managers of both public and private centres, and healthcare professionals with in-depth knowledge for the management, organization, design and resource sizing of the unit. This would allow improving safety and quality conditions at service provision. The document includes aspects relating to:

- a) Patient's rights and guarantees.
- b) Patient's safety
- c) Organization and management criteria of the unit.
- d) Physical structure and material resources of the unit.
- e) Human resources.
- f) Aspects relating to healthcare quality.
- g) Reviewing and monitoring the standards and recommendations for a unit for highly complex patients with multiple chronic conditions.

The Planning and Quality Directorate of the Quality Agency of the Spanish National Health Service of the Spanish Ministry of Health and Social Policy has monitored the setting up of these standards and recommendations within the frame settled by the Quality Plan of the Spanish National Health Service.

This document has been written by a group of experts selected by the Quality Agency on the basis of their experience and knowledge of the

aspects covered in this Guide. They have also been appointed -under the same criteria- by Scientific Societies and Professional Associations.

The scientific coordinator of the project appointed by the Quality Agency of the Spanish National Health Service was Dr. Jesús Medina Asensio.

Furthermore a technical support Group has assisted the experts in the development of the project, making follow-ups, providing technical assistance at meetings, conducting analysis of current situation, proofreading the documents written by the experts and analyzed evidence and collaborating with the Quality Agency on the successive drafts and on the final document.

This document on standards and recommendations for a unit for highly complex patients with multiple chronic conditions is based on a broad national and international experience, gathered in the several bibliographic references which appear in Annex 14. Among them there should be pointed out pioneering experiences in Spain of Manuel Ollero (Hospital Virgen del Rocío, Sevilla)⁶ and Jesús Medina⁷ (Hospital 12 de Octubre, Madrid).

Moreover some “strong” recommendations are highlighted, either because they are supported by legal requirements or because they are based, according to the group of experts involved on this document, on sufficiently sound evidence. These cases will be introduced by the word “recommendation” and highlighted in bold.

2. Current Situation

The use of healthcare resources is not distributed homogeneously among the Spanish population. There is a limited number of patients that use healthcare resources to a large extent. These patients are basically people advanced in years. According to the data provided by the survey of hospital morbidity carried out by the Spanish Institute of Statistics (INE, in its Spanish acronym) in 2006, the rates of hospital attendances (discharges every 100.000 people) rise considerably according to age (Table 2.1. and Figure 2.1.). Hospital attendance of males over 85 increases by more than 10 in relation to the age group between 15 to 34⁽¹⁾:

Age group	Both	Male	Female
Total	107,24	100,96	113,35
< 1 year	378,62	411,99	343,14
1-4	72,71	81,92	61,83
5-14	32,93	37,22	28,39
15-24	52,72	40,23	65,86
25-34	91,08	41,49	144,07
35-44	76,21	56,63	96,47
45-54	79,05	85,12	73,05
55-64	120,18	143,30	98,36
65-74	188,78	232,83	151,30
75-84	274,33	341,94	227,81
85-89	342,32	412,51	307,62
90-94	375,78	445,21	349,09
> 95	352,73	426,09	328,64

Source: Survey of Hospital Morbidity 2006. Spanish Institute of Statistics

⁽¹⁾ Women do not share the rates, as it would be necessary to exclude the admissions related to pregnancy and delivery.

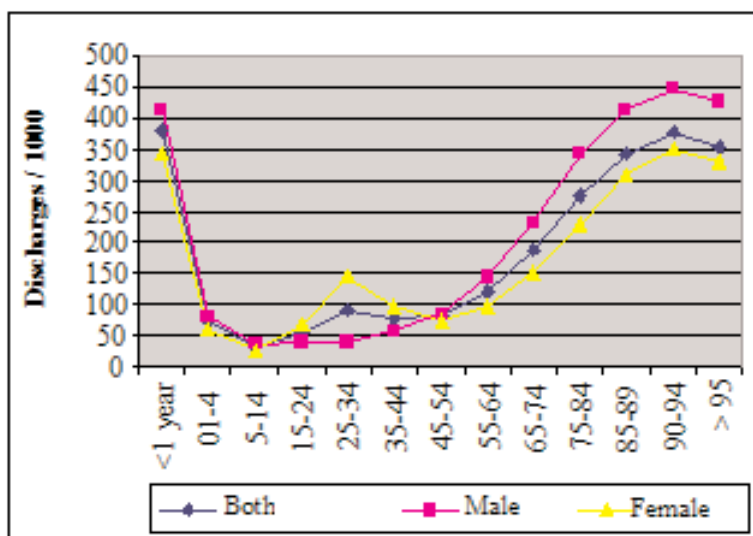


Figure 2.1. Hospital attendance according to age and gender in Spain (2006)

Not only hospital attendance is considerably higher in people advance in years; the average stay of each admission tends to be longer in these age groups (see Table 2.2.):

Age group	Total	Male	Female
Total	7	8	6
< 1 year	7	7	7
1-4	4	4	4
5-14	4	4	4
15-24	5	5	4
25-34	4	6	4
35-44	5	7	5
45-54	7	7	6
55-64	7	8	7
65-74	9	9	8
75-84	10	9	10
85-89	10	10	11
90-94	11	11	11
> 95	12	10	12

Source: Survey of Hospital Morbidity 2006. Spanish Institute of Statistics

The highest hospital attendance rates of people advanced in years is accompanied by a higher use of the medical examination (Figure 2.2.), A&E services (Figure 2.3.), day hospitals (Figure 2.4.) and the intake of drugs (Table 2.3.)⁸.(2)

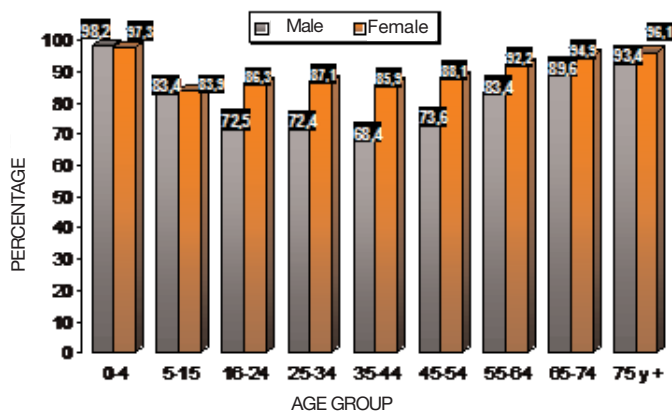


Figure 2.2. Medical examination attendance according to age and gender, in the last 12 months (Spanish National Health Survey 2006)

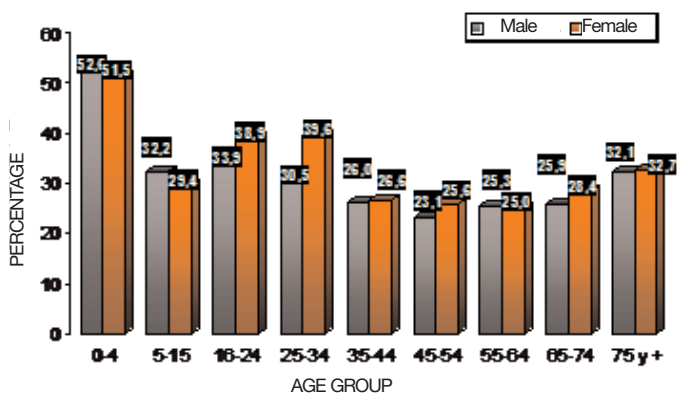


Figure 2.3 A&E services attendance according to sex and gender, in the last 12 months (Spanish National Health Survey, 2006)

(2) National Health Survey (ENS, in its Spanish Acronym) 2006 (www.ine.es; www.msc.es). The figures that provide the percentage of people who have attended examination in the last 12 months are taken from the mentioned publication. .

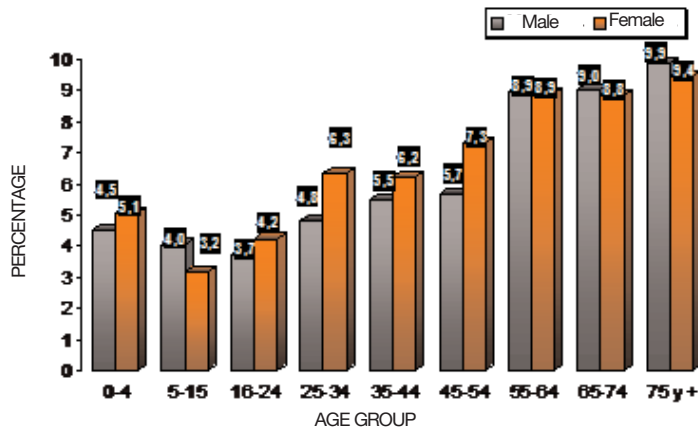


Figure 2.4. Day Hospital attendance according to age and gender in the last 12 months. (Spanish National Health Survey, 2006)

Age group	Total	Male	Female
Total	61,8%	54,5%	68,8%
0-4	47,9%	48,8%	47,0%
5-15	35,5%	33,5%	37,7%
16-24	47,6%	39,1%	56,4%
25-34	53,4%	44,4%	63,0%
35-44	56,8%	49,0%	65,0%
45-54	65,3%	56,8%	73,7%
55-64	80,1%	74,3%	85,5%
65-74	88,9%	85,0%	91,8%
> 75	93,4%	90,8%	95,3%

Source: Spanish National Health Survey (www.ine.es)

The higher request of healthcare resources that people advanced in years require goes with the fact that it is group that has, in an exponentially and progressive way, a worse subjective health (see table 2.4. and figure 2.5.), a higher level of disability and a higher prevalence of chronic diseases, which generally appear simultaneously in the same person.

AGE GROUPS	Total	Very good	Good	Average	Bad	Very bad
Total	100	21,39	48,6	22,46	5,52	2,04
0-4	100	39,73	46,14	11,68	1,57	0,88
5-15	100	40	50,02	8,98	0,72	0,29
16-24	100	33,65	53,64	11,35	0,96	0,4
25-34	100	26,25	54,81	15,51	2,42	1,01
35-44	100	20,54	55,04	19,13	3,47	1,81
45-54	100	12,68	52,27	26,43	6,25	2,37
55-64	100	9,68	42,26	33,84	10,93	3,3
65-74	100	6,98	37,48	39,63	11,6	4,3
> 75	100	5,62	28,73	43,71	16,56	5,39

Source: Spanish National Health Survey 2006 (www.ine.es)

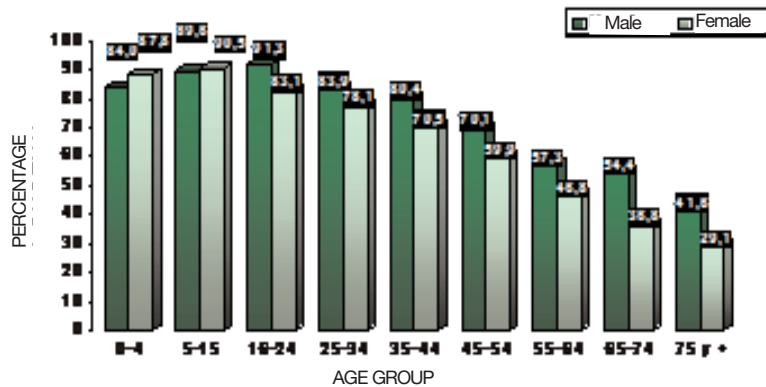


Figure 2.5 Percentage of people who consider their health as good or very good, according to age groups. Spanish National Health Survey 2006.

14% of people over 75 has some type of serious limitation to perform everyday life activities, while 49% has a less conditioning limitation. (Table 2.5)

Age group	Serious limitation	Not serious limitation	Prevalence of serious limitation	Prevalence of limitation
Total	1.1765,40	7.512,70	3,98%	20,93%
0-4	17,6	156,5	0,81%	7,99%
5-15	30,4	391,8	0,64%	8,93%
16-24	29	437,9	0,62%	10,02%
25-34	171,6	1.015,90	2,25%	15,60%
35-44	252,3	1018,40	3,48%	17,52%
45-54	237,4	1.133,60	4,02%	23,20%
55-64	286,9	1.133	6,06%	30%
65-74	254,8	1.042,90	6,62%	33,72%
> 75	485,3	1.182,80	14,22%	48,88%

Source: Spanish National Health Survey 2006 (www.ine.es)

According to the information provided by the Spanish National Health Survey, a person between 65 to 74 has an average of 2.8 health problems or chronic diseases, raising up to 3.23 in people over 75 (Table 2.6).

Age group	Prevalence
Total	1,40
16-24	0,37
25-34	0,57
35-44	0,87
45-54	1,37
55-64	2,15
65-74	2,80
> 75	3,23

Source: Spanish National Health Survey (www.ine.es). Own writing⁽³⁾

⁽³⁾ The following chronic problems and conditions have been taken into account: arterial hypertension, myocardial infarction, other heart conditions, arthrosis, arthritis or rheumatism; chronic back pain (cervical and lumbar); chronic bronchitis; diabetes; urinary incontinence; cataracts; depression, anxiety and other mental disorders; embolism; malign tumours; osteoporosis; anaemia and prostate problems.

Within the risk group of people advanced in years, attention to those patients suffering from chronic conditions is an important management and organization challenge in which not only healthcare service but also welfare services should take part.

2.1. Definitions: Multiple Chronic Conditions, Comorbidity, Frailty, Disability and Dependence

In order to provide an appropriate characterization of the concept of patient with multiple chronic conditions which is used throughout this document, it is important to distinguish what can be considered as comorbidity and what may be understood as multiple chronic condition^{9,10,11,12,13,14}.

Comorbidity is generally considered as the association of any condition to a main nosologic entity, either acute or chronic, which affects the diagnosis and the treatment.

A **multiple chronic condition** is characterized by the coexistence of two or more chronic diseases which imply flares and interrelated conditions which bring up a special clinical frailty that causes a progressive retrogression in the patient, as well as a gradual reduction of the patient's autonomy and functional capacity and which will provoke a frequent request for attention to different caring services (primary healthcare, specialized care, welfare); this request will be, in most of the cases, impossible to schedule.

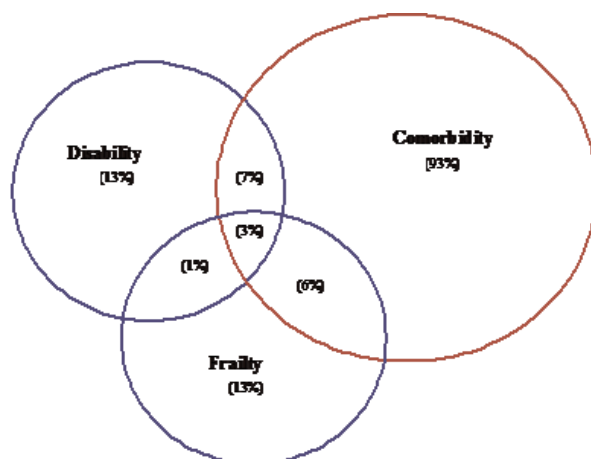
Other relevant concepts are frailty and disability. They must be defined in order to make a difference among them and from the comorbidity. **Frailty** is a physiopathologic and clinic concept which tries to define the difference between satisfactory aging and pathologic aging and it can be defined as the generalized decline of several systems (mainly the osteomuscular, cardiovascular, metabolic and immunologic) and which final aftermath is an extenuation of the functional reserve of the patient and a higher level of vulnerability towards the development of multiple adverse events such as disability, hospitalization, institutionalization and death. Not all frail patients develop comorbidity conditions as, in the same way that comorbidity implies a suite of diagnosed conditions frailty would really imply a suite of subclinical impairments.

Disability, on the other hand, is defined as the incapacity to perform activities which are essential to carry out an independent life, i.e., it is the term used to make reference to the activity deficits of a person and the restrictions for his/her involvement in the environment in which he/she lives. Obviously, in some occasions, mainly in people advanced in years,

disability takes them relentlessly to **dependence** if no actions are taken within the healthcare setting, by means of secondary or tertiary prevention, concise diagnostic procedure, and appropriate medical and therapeutic treatment. It is important to point out that dependence may be prevented, minimized and delayed if the appropriate hygiene, prevention and healthcare measures are taken¹⁵.

Obviously, neither all people affected by frailty or all subjects with comorbidity will suffer from disability at some point, even though they are clear factors that show a tendency towards it and, on the other way round, they both may be enhanced by it. Figure 2.6, adapted from Freid⁹, shows the relations among frailty, comorbidity and disability for people over 65 in the community⁽⁴⁾.

It should be pointed out that **in many occasions, dependence may be reversible and it may be the result of inappropriate healthcare actions such as lengthy stays in hospital, rest in bed, sedatives, etc... which may cause disuse atrophy, disorientation, etc. There are frequent circumstances at old age (which are not unavoidable causes of aging) that could be reverted or at least minimized with the appropriate healthcare approach.** The introduction of physiotherapist and therapist in the group of professionals who must assess and care these patients contributes to reach this aim.



Adapted from: Freid. Disability, Frailty and Comorbidity: Implications for Improved Targeting and Care. *Journal of Gerontology* 2004; 59:255-263

Figure 2.6. Relation between frailty, comorbidity and disability⁹

⁽⁴⁾ Percentages are based in a population of 2.762 people suffering from comorbidity and/or frailty and/or disability. From 368 people who responded to the frailty criteria, 46% suffered from comorbidity, 5.7% had disability; 22% suffered from both comorbidity and disability and 27% did not have neither comorbidity nor disability⁹.

2.2. Management and Organization Background

It has been known for years the usefulness of the tools provided by geriatrics for the management of frail old people¹⁶, as the comprehensive geriatric assessment (CGA). In 1984 Rubesten proved, in a randomized¹⁷ trial how for those patients admitted in a geriatrics unit the functional condition improved, the number of patients institutionalized decreased and the mortality was lower than in the control group. In Spain, there are many publications that prove the benefits of the geriatric assessment, not only for the patient (reduction of the mortality and on the number of institutionalized patients) but also for the healthcare system (reduction of the average stay and lower costs)¹⁸. They are particularly interesting those documents that show how the geriatric intervention performed in highly complex patients with multiple chronic conditions during their stay in hospital may reduce the functional damage both in patients admitted in units or at geriatric services¹⁹, and in people advanced in years admitted in other services²⁰.

To provide a solution to the challenge of providing care to highly complex patients with multiple chronic conditions, countries have brought in different management and organization patterns in the last decades. In Spain the response has been varied; the central administration and the different healthcare services of the autonomous regions have adopted different solutions adapted to their social and demographic environment, the healthcare resources and their relation (as far as integration and coordination is concerned) with the social services.

Thus, in 1989 the Ministry of Health and Social Policy supported the *Jornada de asistencia a domicilio en el área de salud* (I Conference on Home Care within the Healthcare Area) and from whose conclusions it could be extracted the need to structure HH effectively. Through an agreement signed by the Dirección General de Planificación Sanitaria (General Directorate for Healthcare Planning) and the INSALUD (National Health Institute, former Spanish public health institution) the minimum resource, organization and operation requirements for a HH unit are settled. In 1981 the first unit had been created at the Hospital Provincial de Madrid (current Hospital Gregorio Marañón) and nowadays there are over a hundred in Spain, which have developed according to the healthcare policy²¹ of each of the autonomous regions.

The set up of geriatric units at acute care hospitals and at public health hospitals is a care response to this challenge.

Catalonia opted for the creation of a specific system of specialized public health care (UFISS - Unitats funcionals interdisciplinàries socioàni-

taries [public health interdisciplinary functional units], PADES - Programes d'atenció domiciliària - equips de support [home care programmes, support team], ETODA - Equips de teràpia en observació directa ambulatoria [therapeutic team at direct day control]²²), to care this type of patients.

Andalusia, on the other hand, after an agreement between the primary healthcare and internal medicine regional societies started at the beginning of this decade the first unit for highly complex patients with multiple chronic conditions, a management and organization care model for this type of patients which has proved very good results. These units have had different names and different integration levels within the units or services of internal medicine as “unit of healthcare continuity” and “clinical unit for comprehensive healthcare” which share the same mission, service portfolio and structure than the unit for highly complex patients with multiple chronic conditions.

Ollero *et al.*⁶ realized that the Spanish term “pluripatològic” (highly complex patient with multiple chronic conditions) was indiscriminately used to name a frail old person, a sick person under a polymedication regime, a patient with higher level of attendance to the A&E services, or the patient who had a pattern of multiple admissions, etc. even though neither of them was not a synonym of either of these concepts and there is not a universally accepted definition of it. However, all caring staff accepted as the determining characteristics of those patients:

- Conditions that the healthcare system cannot take care of.
- Conditions that last for a long time and which bring about a progressive worsening in the patients' condition.
- Progressive reduction of the patient's autonomy and functional capacity.
- Important professional, economic and social aftermaths.
- Multiple risks, secondary to related pathologies.

Therefore, in order to identify patients with multiple chronic conditions, both at primary care attention and a at hospital attention, Ollero *et al.* proposed to gather chronic diseases according to clinic categories, not including the most dominant risk factors but the damage caused over the target organ and the functional aftermaths it causes, using the adjective “pluripatològic” (highly complex patient suffering from multiple chronic conditions) for those patients that suffer from conditions included in two or more of the proposed categories. The different publications and papers which have, since then, used the definition settled by Ollero *et al.* prove that in a hospital environment, the criteria used for highly complex patients with multiple chronic conditions allow identifying a set of older people, with

higher functional limitations, higher mortality and which consume higher healthcare resources²³.

Prevalence of patients with multiple chronic conditions has proved over 30% in those units and services of internal medicine and over 60% in units and services oriented towards chronic patients. A research which included 24 internal medicine services of Andalusia found out that 42% of admitted patients were considered as “pluripatológicos” (highly complex patients with multiple chronic conditions)²⁴.

In 1994 Mayoral et al. had already found that 2% of patients of internal medicine not only caused 15% of the admittances but they also summed annually an average of 3.5 of visits to consultation and 4.5 to A&E services²⁵. In each of the consultations, patients were seen by different professionals, without coordination or uniformity in the criteria which implied an additional complication for their control. The settlement of a programme for chronic patients who showed readmission pattern allowed a reduction of 45% of hospital admittances, of 26% of hospital stays and 50% in A&E services consultations²⁶.

At a internal medicine service of a university tertiary hospital it was found out that 38.9% of admittances were brought up by patients with multiple chronic conditions and that, when compared with other patients admitted in that unit, those patients were older, had higher mortality levels, their functional limitations when admitted and discharged were higher, they had higher levels of functional damage and required more resources in terms of urgent care (3.6 cases per year) and hospital admissions (1.9 admissions per year)²⁷.

Another research made over the total number of discharges in a hospital of similar characteristics estimated that 17% of admissions were caused by highly complex patients with multiple chronic conditions. These patients, with an age range over the average, were admitted more frequently on a urgent basis, generally under a specific service, and were not sent home for care as much as other patients and their average stay was clearly over the other patients²⁸. They were distributed in nearly all hospital services, even though medical specialities discharged more than 75% of them. Internal medicine was in charge of 31% of patients while other specialities cared more patients. According to the information obtained from that same research, mortality of patients with multiple chronic conditions was close to 60% 4 years after being discharged, taking place nearly the whole of the 60% of demises during the first admittance or in the first year after being discharged⁽⁵⁾.

(5) Data from the Marques de Valdecilla Hospital, still not issued but made public at the national conference of the Spanish Society of Internal Medicine (SEMI, in its Spanish acronym) (A Coruña, 19-22, November, 2008).

At units and services specially allotted to geriatric patients, as the units for acute patients of the geriatric services, the average age of patients is higher (around 85 years) and the cases of multiple chronic conditions, obviously, higher too (close to 90%)²⁹.

At primary healthcare up to 40% of patients with multiple chronic conditions suffer from three or more chronic diseases, 94% are under poly-medication regimes³⁰, 34% have a Barthel score index under 60 and 37% suffer from cognitive impairment³¹. Prevalence at primary healthcare can be estimated at 1.38% of the general population which means a 5% in people over 65³².

For highly complex patients with multiple chronic conditions the repeated admission episodes determine a worsening of their functional situation bringing up deterioration which turns into a progressive state and which causes functional disability and even death. It is necessary, therefore, to have a set of scales not only for diagnosis but also, and very important from the point of view of the prognosis, for identifying the groups that show higher mortality risks in short and medium term follow up. Those scales may be used as a complement to the clinical judgement and thus ease the decisions on the caring procedures that allow providing the patient quality care according to his/her global condition avoiding, thus, procedures that may be aggressive and which may imply negative cost-benefit relation.

There have been proposed different diagnostic scales for patients advanced in years and with multiple chronic conditions which include, among other aspects, the functional situation, the comorbidity, the nutritional status, etc. and which have been validated by the clinical practice^{33, 34, 35}. In this respect, the work team for highly complex patients with multiple chronic conditions and for patients advanced in years of the Spanish Society of Internal Medicine is developing a functionality and mortality prognosis index (PROFUND) for these patients and which will be published in 2009 and which will probably turn out to be a very useful tool.

The data provided allow proving the importance of this problem in Spain. Cots³⁶ claims that once the whole group (4%) has been defined, showing its profound effects over the use of resources (18-20% of the total cost of the hospitalization) the challenge lies in taking part so as to reduce progressively its impact.

The frequent reciprocity between frailty and disability as well as the natural evolution of these patients make it necessary to consider fundamental the relation between the healthcare services allotted to this type of patients with other type of services such as public health services (palliative care, units for functional recovery, medium stay units, long term stay units) and social services.

2.3. Standards and Recommendations for the Units for Highly Complex Patients with Multiple Chronic Conditions in the Spanish National Health Service

2.3.1. Authorization and accreditation of centres.

Both the State and all the regional governments have issued legislation on the authorization and registration of healthcare centres. Regulations may be divided into two types: those on authorization and registration, which assess healthcare centres before they come into operation, and those on accreditation, for the evaluation of operational centres.

2.3.1.1. Authorization

All regional governments have issued legislation on the authorization of healthcare centres. Since the publication of the RD 1277/2003, 10 regional governments have modified their legislation in order to adapt it to the new regulations while 7 governments have not updated theirs. In the standards for the authorization of healthcare centres and services set up by the autonomous regions there are no specific references to the units for highly complex patients with multiple chronic conditions.

2.3.1.2. Accreditation

Accreditation is a voluntary process by which a healthcare centre undergoes external assessment which establishes its level in accordance to a set of standards previously settled and agreed by a group of experts and adequate to the reference area.

Experiences of accreditation of healthcare centres and services in Spain are still very limited. Two regions have developed and put into centre practice accreditation patterns after the RD 1277/2003. In some cases there are accreditation programmes for specific types of centres, services or activities (organ extraction and transplant, assisted reproduction, haemotherapy, etc.). There are four regions that have legislation and official programmes for the accreditation of healthcare centres based on voluntary external assessment: Andalusia, Catalonia, Galicia and Extremadura.

Andalusia bases its accreditation system on the “Programme for the accreditation of centres belonging to the Andalusian⁽⁶⁾ Health Service” The programme is based in a reference criterion which includes a series of characteristic standards of the Andalusian Public Health Service. On the set of indicators there is not any which refers specifically to the unit for highly complex patients with multiple chronic conditions.

Catalonia was the first autonomous region to develop an official procedure for the accreditation of healthcare centres. The current system is the third⁽⁷⁾ one and it rules the accreditation of acute healthcare centres and the authorizing procedures for the evaluation bodies. It additionally provides two accreditation guides which include the settled standards^{37, 38} though which do not make any reference to units for highly complex patients with multiple chronic conditions.

The autonomous region of Galicia settled in 2001 an accreditation system for hospitals, ruled by Decree⁽⁸⁾, which may be applied to all hospitals which belong to the healthcare systems of the Galician Health Service and to any other which may have subscribed or want to subscribe and agreement with them, for which they must obtain the accreditation settled by the decree. They do not make any reference to units for highly complex patients with multiple chronic conditions.

In a similar way to the models suggested by Andalusia and Galicia, the system of centre accreditation of Extremadura is focused on inpatient and outpatient general centres though it does not make a reference to units for highly complex patients with multiple chronic conditions. It is ruled by Decree and by a subsequent order which develops it⁽⁹⁾.

2.3.1.3. Unit guides

Both the Ministry of Health and Social Politics and the regional departments have published guides for some units which, though they are not legal documents, they try to settle the standards and recommendations. The Andalusian Health Department published in 2002 “*Proceso asistencial integrado de la atención al paciente pluripatológico*”³⁹ (Comprehensive health-care process for highly complex patients with multiple chronic conditions) which makes important management and organization references to this type of units.

⁽⁶⁾ Andalusia, Resolution July, 24th, 2003, of the General Directorate for Processes and Training Organization.

⁽⁷⁾ Generalitat de Catalonia, Decree 5/2006, January 17th.

⁽⁸⁾ Galicia, Decree 52/2001, February 22nd.

⁽⁹⁾ Extremadura, Decree 227/2005, September 27th and Order July 18th 2006.

2.4. Experience in Spain and Abroad

Care of patients with multiple chronic conditions is a challenge that health-care systems of western developed countries must face. In the EU⁴⁰,⁽¹⁰⁾ demographic aging shows two different factors:

- Since 1970, a raise in life expectancy of 5.5 years in women and nearly 5 years in men. This evolution also means a rise of life expectancy in good health condition or without any disability.
- A rise in the number of people advanced in years. In the European population the percentage of people over 65 will rise from 16.1% in 2000 to 27.5% in 2050, and while people over 80 were 3.6% of the population by 2000, rates would rise to 10% in 2050.

The European Commission considers that if the Eurostat calculations are confirmed, the public expenditure in healthcare could suffer, during 2000-2050 an increase in the Gross Domestic Product from 0.7 to 2.3.

Table 2.7. EU estimations
<ul style="list-style-type: none">• Life expectancy in 2000: 74,7 for men and 81,1 for women.• Life expectancy in 2050 (Eurostat forecast): 79.7 for men and 85.1 for women.• European population over 65 in 2000: 16,1 %• European population over 65 in 2050: 27,5 %• European population over 80 in 2000: 3,6 %• European population over 80 in 2050: 10 %
Source: EU (http://europa.eu/scadplus/leg/es/cha/c11310.htm)

The European Observatory of the WHO on Health Systems and Policies points out⁽¹¹⁾ that several countries are testing with new service supplying models to respond to the profound changes brought up by the increasing load of chronic diseases, redesigning systems which allow a better service integration and care continuity. However, even though integration and continuity of the care supplies may have positive effects over the

⁽¹⁰⁾ <http://europa.eu/scadplus/leg/es/cha/c11310.htm>

⁽¹¹⁾ <http://www.euro.who.int/observatory/Studies>

care quality, the available evidence of the efficiency of the current patterns is limited .

A research project performed by the OECD presented among its conclusions the following :

- The programmes aimed at specific problems (such as “disease management”) seem to improve quality even though it is not conclusive the information on its cost-effectiveness.
- Care coordination may be easier with a better transfer of the information between the different care areas and with IT.
- Outpatient care patterns must adapt to the new requirements brought up by patients with chronic pathologies⁽¹²⁾.
- Care coordination may benefit from a better integration of the healthcare system either by sharing care and welfare resources or by developing integrated care models.

The United Kingdom Health Department estimates that 5% of its patients, generally suffer from chronic conditions, bring up 42% of hospital stays and thus it has designed a healthcare and social pattern to care patients with chronic conditions⁴³. Tackling systemically care to patients with chronic conditions is one of the 10 strategies selected by the Modernization Agency of the British National Health Service to improve service⁴⁴. For the creation of this model, the Health Department of the United Kingdom has identified some chronic patients management experiences which have obtained positive^{45,46} results; some are the following:

1) Castlefields Health Centre (UK)⁴⁷

The achievements of this scheme are:

- 15% reduction of hospital admission for people advanced in years.
- 31% reduction of the average stay (6.2 to 4.3 days).
- 41% reduction in the number of beds used by this group.
- Better coordination between the unit and other agencies in the community which allowed more adequate transfers to other services and a quicker response in the availability of social services.

⁽¹²⁾ Moreover, it points out that:

- While there are some beliefs about the better skills of primary healthcare staff to assume the management of patients with multiple chronic conditions, multidisciplinary teams, which may include healthcare and non-healthcare staff, may be better positioned to provide a more complete care.
- The systems controlled by supplies who work in isolated consultation rooms, paid after examinations, are in a worse position to satisfy the care requirements of patients suffering from chronic conditions.

2) Evercare plan for the management of people advance in years in the United States^{48, 49}:

Being its main results:

- 50% reduction in unscheduled admittances without negative effects over the health condition.
- Important reduction in the intake of medicines, with positive effects over health conditions.
- 97% satisfaction of relatives and carers and high satisfaction rates of professionals.

3) Veterans Administration (United States) approach, for the improvement in the management of chronic conditions:

Being its main results:

- 50% reduction in the stay rates since 1994 to 1998.
- 35% reduction in the emergency consultation rates.
- Slight increase in the medical consultation, laboratory test, and service consultations.

4) Kaiser Permanente

There are great differences in the use of the stays between the Kaiser Permanente (and other providers in the United States) and the British National Health Service⁵⁰. These differences are due to some extent to the management that this HMO makes of a chronic condition, made easier by a better integration between primary healthcare and specialized care⁵¹. Some authors have pointed out the importance of aspects such as governance of the HMO (including Kaiser Permanente's) which encourage implementation and efficiency of this type of integration patterns as competitive pressure, the determining managing role of doctors in this kind of organizations: the incentives to improve care settled over the objective base settled by the staff and the managers; the identification of those patients at high risk situations who are allotted to a intensive care plan to minimize hospital admissions, the implementation of disease management programmes, where self-care and patient's education⁵² are fundamental.

As it may be seen through the number of initiatives identified by the United Kingdom Health Department, there are several experiences stemming from the HMO of the United States that are trying to adapt to a

healthcare system with serious differences, as the British National Health Service. The King's Fund has developed a research line on the management improvement of chronic diseases based, partly, in the comparison of the British-American^{53, 54} experiences.

In Spain, Catalonia developed a pioneer programme: *Vida a los Años* settled by the Departament de Sanitat i Seguretat Social (Catalonian Health Department) in 1986⁵⁵, which created a specific net of public health and welfare centres. In spite of the clear benefits of this initiative, there is a lack of integration of the functional circuits between the different care spheres, with a system that is too fragmented²².

In 1995 the INSALUD published the *Bases para la ordenación de servicios de atención sanitaria para las personas mayores* (Basis for the arrangement of healthcare services for people advanced in years)^{56, 57}, basing its working strategy in the set up of the public health care and welfare commissions for the health department, dependent from the primary healthcare management department; at acute hospitals there were created what they called teams for the assessment of geriatric care (*equipos de valoración de cuidados geriátricos*). As a result of this strategy, the INSALUD launched in 1999 the *Programa de atención domiciliaria con equipo de soporte*, ESAP (Programme for home care with support teams)⁵⁸.

The *Programa de integración y coordinación asistencial*, S-PICA (Care integration and coordination programme) between primary healthcare, hospitals and social services has been promoted since 2000 by the Health Department of the Canary Islands, the family and community medicine teaching department of La Laguna and the Canarias⁵⁹ university Hospital, deals mainly with highly complex patients with multiple chronic conditions, being the main aspects of the program, and as the basic formal services that it must guarantee, the planning of discharge, the research of family based care alternatives, as the natural care unit, and the family care units of the primary healthcare teams.

In 2002 the Health Department of the Andalusia regional government issued the *Proceso asistencial integrado de atención al paciente pluripatológico* (Integrated care process for patients with multiple chronic conditions)³⁹, based in the experience of the unit for highly complex patients with multiple chronic conditions developed by the Hospital de Valme (Seville) and the Hospital Virgen del Rocío. It has been reedited in 2007⁶. These experiences, as well as the continuous care model of the Hospital de San Juan de Dios del Aljarafe⁶⁰ (Seville), develop collaboration programmes between the specialist in internal medicine and the family doctors; these programmes were proposed in 1998 by the SEMI (Spanish Society for Internal Medicine) and the SEMFYC³ (Spanish Society for Family and Community Medicine).

A key contribution for the care integration in these experiences in the fundamental role provided in the case management to the personalized relationship between the specialist in internal medicine and the family doctor at primary healthcare services. Similar experiences have been developed in other hospitals of the Spanish National Healthcare Service⁷. Healthcare services from other regional governments have developed their own care system for patients with multiple chronic conditions^{61, 62, (13)}.

2.5. Definition for a Unit for Highly Complex

Patients with Multiple Chronic Conditions

A unit for highly complex patients with multiple chronic conditions is a management concept and may be defined as an **organization of healthcare professionals which provides multidisciplinary care by means of a wide range of caring services to highly complex patients with multiple chronic conditions⁽¹⁴⁾ and which complies with specific structural and functional means and resources to ensure efficiency, high quality and a safe environment to perform this activity.**

Even though chapter 5 deals with this aspect, it seems appropriate to refer, since the beginning of the document, the **management characteristics** that define these types of units.

1. The relationship between the **hospital specialist doctor**, in charge of the unit, and the doctors from the **primary healthcare service**, within the **reference and population area, for the systematic attention to patients with multiple chronic conditions**. Thus, there must be a sustained relationship between the specialist, the primary care doctors and the population considered as patient with multiple chronic conditions.
2. The unit must have a **broad range of healthcare possibilities** which should guarantee attention to multiple chronic patients in the most adequate time and place.

A basic unit for patients suffering from multiple chronic conditions includes a hospital specialist (generally a specialist in internal medicine) and the nursing and assistant staff who cares these patients at hospitals

⁽¹³⁾ The Health department of the Andalusia autonomous region provides comprehensive information on the initiatives of other regional governments through the Observatorio de prácticas innovadoras en el manejo de enfermedades crónicas (Observatory for innovative practices in the management of chronic conditions) (<http://www.opimec.com/practicas/practicas-en-espana>).

⁽¹⁴⁾ See definition section 5.3

(hospitalization and day unit). The link and team work with primary healthcare staff is a basic requirement for its operation.

Both criteria are graphically defined in figures 2.7 and 2.8. Chapter 5 provides the compulsory minimum organization requirements for a unit for highly complex patients with multiple chronic conditions as well as the most usual variables in the management pattern and in the service portfolio of these units.

Another key aspect that should be pointed out is that once management conditions are obeyed, these units should **flexibly** adapt to the management criteria of each healthcare organization.

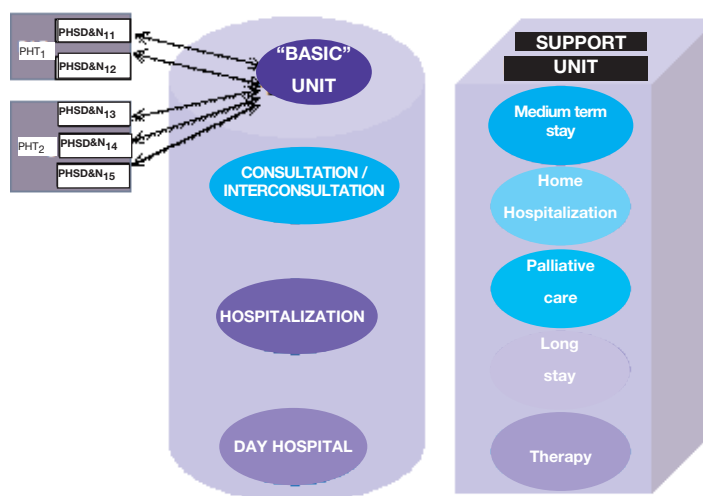


Figure 2.7. Healthcare possibilities of the unit for patients with multiple chronic conditions, support units and relation with primary healthcare staff¹⁵

(15) PHT: Primary Healthcare team.
PHSD&N: Primary Healthcare Service Doctor and Nurse

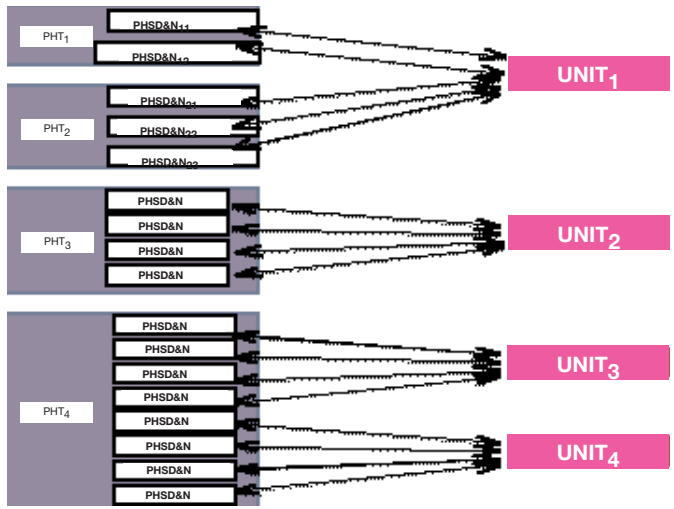


Figure 2.8. Relation between primary healthcare staff and the unit for patients with multiple chronic conditions in a hypothetical health reference area.

3. Patient's and Carer's Rights and Guarantees

Healthcare centres must observe and respect all the rights granted to patients in the existing healthcare legislation.

Relatives or escorts acquire additional importance in their role as carers. For the longitudinal evolution of many patients cared of at these units for patients with multiple chronic conditions, it is fundamental the active and informed participation of the carer, which implies training and information. The carer is a resource for the patient and a client himself/herself of the unit.

This chapter deals in detail with aspects related to the information that has to be provided to patients and carers in this type of units and, in general, with other legislative aspects to be taken into account in these units and, where appropriate, in the corresponding healthcare centres to which they belong to.

3.1 Information to Patients and Carers.

The implication of patients in their own care is a key factor in all care strategies for patients with multiple chronic conditions. Therefore, and as a general rule, information should be clear, comprehensive and concise.

The information that should be handed to all patients cared at units for highly complex patients with multiple chronic conditions should include the following:

- Information about the general characteristics of the unit.
- Detailed information about the pathologic conditions, diagnoses, treatments and care in the unit.
- Informed consent, which would be in writing in those cases included in the legislation.
- Instructions and recommendations: attention would be focused in the fact that the patient and the carer would understand the close relation between the unit, responsible doctor and nurse from the primary healthcare service and, when necessary, the liaison community nurse or case manager⁽¹⁶⁾.

⁽¹⁶⁾ Service foreseen by some health services as a coordinating device of the health and welfare services.

3.1.1. Information about the general characteristics of the unit.

It is highly recommended that welcoming information (leaflet, booklet) should include, at least, a description of the different resources related to the types of healthcare at which the patient may be taken care of at the unit as well as a list of special recommendations and warnings. Inclusion of pictures of the units and its resources may help patients understand how the unit works.

It should be provided broad and organized information on the conditions relating the stay of the patient in the different services of the unit: timetable and access, communication with the unit, rules for escorts, use of the waiting rooms, use of telephones, menu possibilities, lunch times and use of the TV, etc.

3.1.2. Information about the pathologic condition, its diagnosis, treatment and care possibilities at the unit.

Regardless the type of healthcare in which the patient with multiple chronic conditions is cared of at the unit, it is recommended that the information provided to the patient would include the following information:

- Basic information about the diseases the patient is suffering and which may bring up his admission in the unit.
- Basic information about the diagnostic procedures, treatment and type of care performed at the unit.
- Professional staff will inform patient and carer about the measures that have to be adopted as a result of the care and treatment plan.

3.1.3. Informed consent

The performance of any diagnostic or therapeutic invasive procedure, as well as the administration of any treatment that may imply risks or inconveniences which may have a clear and predictable negative effect on the patient's health, will need its informed consent in writing⁽¹⁷⁾.

It is recommended that the centre would have an specific informed consent with detailed information for each procedure and speciality included in the service portfolio of the unit.

Any therapeutic procedure that implies any risk, must be accompanied with the necessary information so that the patient and his/her relatives/carers may be aware of the risks and consequences of not taking them.

The informed consent is ruled in Spain by Act 41/2002⁽¹⁸⁾, November 14th, ruling patient autonomy, rights and obligations regarding clinical documentation and information (Official State Gazette 274, November 15th, 2002). The act defines it at the *free, voluntary and conscious patient's consent, issued in full possession of his/her faculties and in possession of all relevant facts so that a procedure affecting his/her health may be performed.*

The informed consent will include specifically information related to the procedure that is to be performed and the healthcare modality (inpatient/outpatient).

The document shall include some minimums:

- Patient identity; identity of the doctor who recommends and asks for the informed consent and identification of the services that will be performed.
- Name, description and aims of the diagnostic or therapeutic procedure.
- General and specific risks.
- Expected benefits and possible diagnostic/therapeutic options.
- The patient has to be informed that he/she has the right to accept or reject any suggested option or to withdraw the informed consent. He/she also has to be informed of the right to settle the limits that

⁽¹⁷⁾ It will be provided in writing for the following procedures: surgery, invasive diagnostic or therapeutic procedures and, in general, for those procedures that may have some predictable effects over the patient's health.

⁽¹⁸⁾ Official State Gazette. n° 274, November, 15th, 2002.

he/she may consider appropriate.

- Confidentiality and data management.
- Date of the consent.
- Specific section for the legal representative consent.
- Declarations and signatures (patient and doctor).

The document will be provided in duplicate (a copy for the patient/guardian and a copy for the clinical record). The patient will have at his/her disposal a doctor or a member of the staff to clear any doubts and to broaden the information.

Procedures implying anaesthetic treatment require a specific informed consent about the anaesthetic technique once the anaesthetic risk has been assessed and the patient informed, comprehensively, about the anaesthetic procedure.

3.2 Attention to Carers⁽¹⁹⁾

The main carer of chronic or disabled patients is the person who generally takes care of a sick person or of a person with any disability, either physical or psychological, which prevents him/her from being autonomous. It thus distinguishes from other carers who take part, occasionally or sporadically, in the care process.

The care plans for the patient with chronic conditions, especially for those which show serious functional or cognitive impairment, must include attention to carer.

Work with carers should not only be limited to informative or training activities on the care procedures for the patient with multiple chronic conditions, it should also include aspects related to the carer attention, tackling his/her problems and foreseen possible pathologic situations.

Attention to carer does not end with the death of the patient, it should extend over aiming to prevent, to early identify and to treat pathological mourning or mental disorders.

All professionals who work with patients with multiple chronic conditions (doctors, nurses, social workers, administrative staff and others) should collaborate in the attention to the carer.

Attention to the carer should adapt to the organization of each unit. The following activities should be identified within:

⁽¹⁹⁾ From Ollero M (Coord.), Cabrera JM, Osorne M et al. Proceso Asistencial Integrado. Atención al Paciente Pluripatológico. Health Department. Andalusia. 2002³⁹.

- Identification of the main carer of the patient.
- Assessment of the social and family situation and registry, including those aspects relating to the carer.
- Attention to the carer included in the caring strategy of the patient and making accountable the staff of the unit.

Each unit should settle its methodology to perform them and the person in charge of them should mark *where* (home, healthcare centre,...) *how* (personal interview, group interview, interview at consultation,...) and *when* are they carried out; in many occasions they will be performed in coordination with the primary healthcare unit.

Some caring criteria for the carer are the following:

- To inform the carer clearly and specifically about the disease of the patient, possible evolution, diagnosis and consequences.
- To train the carer in the basic caring and in the necessary techniques to tend the sick person, in such a way that the carer gets the lesser work load as possible.
- To make easier the appropriate time management of the carer.
- To promote that the needs of the carer are satisfied in relation to:
 - Physical and psychic relax, stimulating gratifying activities and social relationships.
 - Family support, improving communication, contributing to the distribution of caring tasks, facing decision taking between all members of the family, etc.
 - Paying attention to the any health problems, such as the appearance of any claudication signs related to effort (chronic mechanical pain, arthralgia, migraine, asthenia...) or of any psychical signs (insomnia, depression, anxiety...)
 - Support to face and adapt to the process of the disease.
- To make the carer think things over and promote his/her not having inappropriate thoughts (guilt, inefficiency or shame)
- To propose realist aims in relation to the sick person.
- To reinforce achievements, so as to enhance carer's self-esteem.
- To be ahead any situation that may cause stress in the carer as any possible complication, accidents or even the sickness of the carer by offering alternatives.
- To inform and get the carer in touch with the available social services (as volunteers, home assistance, day centres and technical aids) making always a rational use of them and introducing them progressively and whenever necessary.

- In case of terminal patients or with unfavourable prognosis, to detect in the carer any risks of pathologic mourning so as to control it and to provide support before (preparing the carer for the loss) and after the death of the patient.
- When necessary, to provide the necessary instrumental support:
 - Additional facilities (orthopaedic material, disposable material and other).
 - Welfare aid, carers support programs.
- To provide carer access to other services (schedules, home visits, contact telephones and other measures that make communication easier).

3.3 Patients' Rights and Guarantees

Healthcare centres with units for highly complex patients with multiple chronic conditions should keep the following documentation and procedures, in addition to the more specific aspects included in section 3.1:

- a) Service portfolio.
- b) Reception programme.
- c) Code of ethics.
- d) Clinical practice guides, pathways or protocols.
- e) Written clinical trial procedures.
- f) Clinical records.
- g) Advance directive.
- h) Medical and nurse discharge reports.
- i) Protocols ensuring safety, confidentiality and legal access to patient data.
- j) Complaint and suggestions forms.
- k) Liability insurance policy.

Patients, or relatives related to family or fact ties, should have granted access to these documents in accordance to the corresponding legislation, except for those indicated in points d), e) and j).

Below there is more detailed information, making special reference to the unit for patients with multiple chronic conditions, to some aspects of these rights. Sections referring to service portfolio, clinical record and discharge report are included in chapter 5 of this document.

3.3.1. Reception programme

Hospitals should have in the reception programme aimed at inpatients, information about the unit for highly complex patients with multiple chronic conditions. This information should include a document for patients with multiple chronic conditions, regardless the type of healthcare which relates them to the unit and which would include the information provided in sections 3.1.1 and 3.1.2 as well as the above provided date on patient's rights and duties.

3.3.2. Code of ethics

Healthcare centres should have a specific code of ethics that will include the rules and principles to guide their activity in line with professional deontology.

3.3.3. Clinical practice guides, pathways and protocols

In the same way as other hospital units and services, the unit for highly complex patients with multiple chronic conditions will have demonstrable documented record of the clinical practice guides, pathways and protocols that are used in any of the services included in its service portfolio, together with the evaluations and, when appropriate, modifications and adaptations.

3.3.4. Clinical trial procedures

All clinical trials must comply with the conditions and guarantees established in their correspondent legislation.

3.3.5. Price list

Healthcare centres must have a price list available to users which shall also be notified to the competent authorities in accordance with the applicable legislation on this matter.

3.3.6. Complaints and suggestions

Healthcare centres will have complaints and suggestions forms available to allow users to record any complaints, claims, initiatives or suggestions they may wish to communicate.

The existence of these forms will be clearly signalled and the forms will be easily available to allow their identification and use.

Users of units for highly complex patients with multiple chronic conditions are entitled to receive written replies from the manager or any other authorized person to the complaints posted, besides their referral to the competent authority in accordance with the provisions of regional applicable legislation.

Complaints, claims, initiatives and suggestions should be periodically reviewed.

3.3.7. Liability insurance policy

All healthcare professionals working in the private sector and all private bodies or corporate persons providing healthcare services of any kind must have the mandatory liability insurance or financial guarantee to meet any compensation claims that may derive from eventual harm caused to persons as a result of these services.

Private healthcare centres with units for highly complex patients with multiple chronic conditions must have the necessary liability insurance policy to cover any possible compensation to harm caused to patients.

3.3.8. Policies and certificates archive

Centres and, where appropriate, independent healthcare professionals should keep a copy of the documents which certify the mandatory liability guarantees.

4. Patient's Safety

Advances in medicine have utterly modified diagnosis and treatment of many conditions. However, this evolution has been accompanied by many factors, including specially an increase in the healthcare complexity, specialization and segmentation which have brought up a raise in the risk and in the damages that patients may undergo⁶³. It is considered that nowadays care implies unacceptable risks if compared with other activities, even with activities considered to have a certain extent of risk. Except for mortality derived from anaesthetic procedures, both hospitalization and medicine exposure in hospitals are linked to higher mortality levels than those attributed to weapons or road accidents⁶⁴.

Healthcare mistakes have serious consequences for patients and families, they bring up very high caring and economic costs, weaken patients' trust in the system and harm healthcare institutions and staff who are, undoubtedly, their second victim. Thus, patients' safety is nowadays a priority for the main health organizations such as the WHO⁶⁵, and international institutions such as the European Union⁶⁶ and the Council of Europe⁶⁷, healthcare authorities, professional associations and patient organization.

In Spain, the Ministry of Health and Social Policy, as responsible for improving the quality of the health system as a health in accordance with the Act 16/2003 on Cohesion and Quality of the National Health Service⁶⁸ considers patient's safety as a determining factor of quality and has placed it in the centre on all healthcare policies. The strategy number eight of the Quality Plan of the National Health Service² reflects so, which main objective is to improve safety of patients care at healthcare centres of the National Health Services by means of different procedures, which include: promoting and developing the awareness and culture of patients' safety among staff and patients; designing and setting IT systems and communication systems of adverse events for training and introducing safe practices recommended in centres of the National Health Service. This strategy is based in the recommendations of the World Alliance for Patient Safety of the WHO and other international institutions⁶⁹.

This chapter includes some guidance and practices aimed at improving patients' safety during their stay at the unit for highly complex patients with multiple chronic conditions and when they are transferred to other services or units within the hospital or at primary healthcare services.

Some of the practices hereby included are at an initial stage of implementation in Spain. They are state-of-the-art practices, proposed in relation

to a broader knowledge in the area of patients' safety. It is a slow implementation as they imply a deep change in the organization culture and they imply a technologic, personal and training⁷⁰ investment.

It should be pointed out that the implementation of some of these basic practices for patients' safety, as the availability of electronic clinical record or the electronic prescription, depend on the policies of regional governments or of specific healthcare centres and are not specific for the units for highly complex patients with multiple chronic conditions, and thus they are not dealt with in this chapter.

4.1. Culture of Safety

Setting a culture of safety is considered as a determining step to reach an improvement in patient's safety and is the first safety practice recommended by the Health Department of the Council of Europe, the *National Quality Forum* and other institutions^{67, 71, 72}. According to the *US Department of Veterans Affairs* a culture of safety could be understood as "all the characteristics of a organization, as values, philosophy, traditions and customs that lead to individual and team continuous improvement behaviour in the quest for reducing to its higher extent the risks and damages that may arise during the different healthcare provision services"⁷³.

A culture of safety is a culture in which the organization, the working processes and procedures are aimed at improving safety. All staff members are constantly and active aware of the risk of mistakes or, in other words, of the fact that "things can go wrong"; and that they have a key role and they contribute to patient's safety. It is an open culture, in which staff are aware that they may and must communicate mistakes, that they learn from mistakes and of the measures introduced to prevent mistakes from taking place again (culture of learning)⁷¹.

The creation and maintenance of a culture of safety should be encouraged at healthcare centres with units for highly complex patients with multiple chronic conditions. This implies that the following actions⁷² should be implemented:

- Setting and keeping a leader who will promote a culture of safety.
- Assessing periodically the culture of safety, making public the results and taking the necessary measures to improve it.
- Training staff in team work techniques and in the principles for mistake reduction.
- Setting communication and training programmes to identify and

analyze the adverse events and risk situations that may occur and applying and assessing improving actions in relation to them.

The unit for highly complex patients with multiple chronic conditions should analyze all safety adverse events that may have taken place in the unit so as to settle the relevant precautionary measures. The Institute for Healthcare Improvement recommends 5 minute long daily safety briefings, at the beginning or the end of the day, to talk about any problem or safety situation, as they increase the awareness among staff and promote a culture of safety⁷⁴.

There should be performed a proactive risk analysis (by means of an FMEA or similar) **of those procedures which may imply higher risks at the unit**, so as to identify possible mistakes that may exist and to introduce measures to solve them. It is recommended to make at least a proactive analysis once a year and whenever a new technique or a risk procedure is introduced.

From the unit for highly complex patients with multiple chronic conditions there should be encouraged the communication flow with the primary healthcare services regarding patient safety aspects, including regularly the discussion of any safety registered incidences and the review of topics relating to patient's safety in the meetings and joint sessions.

Training of staff of the unit for patients with multiple chronic conditions should be encouraged as regards safety and including safety in the reception programmes and in the continuous training.

There should be regularly updated information on patients' safety and on practices based on scientific evidence which might have been useful in the reduction in the number of mistakes so as to value the introduction of new measures which may be useful and to establish continuous improvement in the safety of patients cared at the unit.

4.2. Communication during Patients' Transfer

A patient with multiple chronic conditions may be taken care of by several professionals at multiple units (i.e. primary healthcare, specialized day surgery, emergency care, hospital care) and at any of it may be cared by specialized staff under shift basis. Communication between units when the patient is transferred or between the staff of the different shifts might be incomplete or might lead to mistaken interpretations which bring up a risk in the patient's safety. Moreover, the complexity of these patients makes them more vulnerable to communication mistakes⁷⁵.

Communication on patient transfer is related to the process of passing from a provider to another one or from a patient or his/her relatives, the information specific of a patient with multiple chronic conditions so as to guarantee care continuity and safety. **Increasing communication efficiency between staff implied in the care process of the patient during his/her transfer is a priority safety aim** for leading safety groups such as the OMS⁷⁶, the Joint Commission⁷⁷ and the National Quality Forum⁷².

There should be standardized the communication between staff in the shift changes, when they change service within the unit or when the patient is transferred between different care units. It is recommended:

- The use of the SBAR⁷⁸, technique, a common language model to pass key information, divided in four different sections:
 - S = Situation
 - B = Background
 - A = Assessment
 - R = Recommendation
- The allotment of enough time to pass key information and to make and answer questions without being interrupted.
- A standardization of the discharge to guarantee that the patient and the following healthcare provider may have in due time key information regarding tests results, diagnosis, treatment, care plan and medicines. The use of a checklist^{75, 79} allows the efficient transfer of key information both to the patient and to the next healthcare provider.

4.3. Safety in the Use of Medicines.

Medicines are the most frequent healthcare intervention and thus it is one of the main reasons for adverse events at healthcare, both at hospitals and at primary healthcare centres. In Spain, the ENEAS (Spanish acronym for National Research of Adverse Events) and APEAS (Spanish acronym for Primary Healthcare - Adverse Events) research have proved that medicines caused 37.4% of the adverse events detected in inpatients and 47.8% in outpatients^{80,81}.

Aging implies a series of changes, mainly in the pharmacokinetic and pharmacodynamics characteristics of medicines, which make people advanced in years more vulnerable to the effects of medication and to show a higher degree of adverse events due to medication than other age groups.

Using several medicines to treat patients with multiple chronic conditions is rather common and it increases the risk of adverse events due to the effect of medication.

Even if some of these adverse events are unavoidable, many can be foreseen as they are caused by medication mistakes. Medication adverse events that may be prevented affect 4.4 to 43% of patients over 65 depending on the method used and on the area of study (inpatients, outpatients or institutionalized patients at residential homes)^{82,83}. The reduction of the medication mistakes of the unit for highly complex patients with multiple chronic conditions improves quality and safety of the care provided.

The types of mistakes more frequently associated to the adverse events which may be prevented in people advanced in years are the inappropriate prescription (mainly high doses or inadequate medicines for the age or the disease), the inadequate follow-up of the treatment and the lack of adherence to the treatment⁸⁴.

Some of the medication mistakes occur during the care transfer processes and they are mainly due to information communication problems on the medication between healthcare staff or even between staff and patients. These mistakes bring up even 20% of the adverse events in hospitals and a great percentage cause patients being readmitted^{85, 86}. Thus, it is nowadays **recommended that the implementation of medication conciliation techniques in care transfers^{72, 76, 77, 82, 83, 87} should be promoted.**

The unit for high complex patients with multiple chronic conditions offers patients several care possibilities. Taking into account the processes that make up the system for medicine use both in hospitals and in health-care centres (figures 4.1 and 4.2) and the processes in which mistakes are most common for these patients, there are below provided some practices which should be implemented, when possible, in the unit.

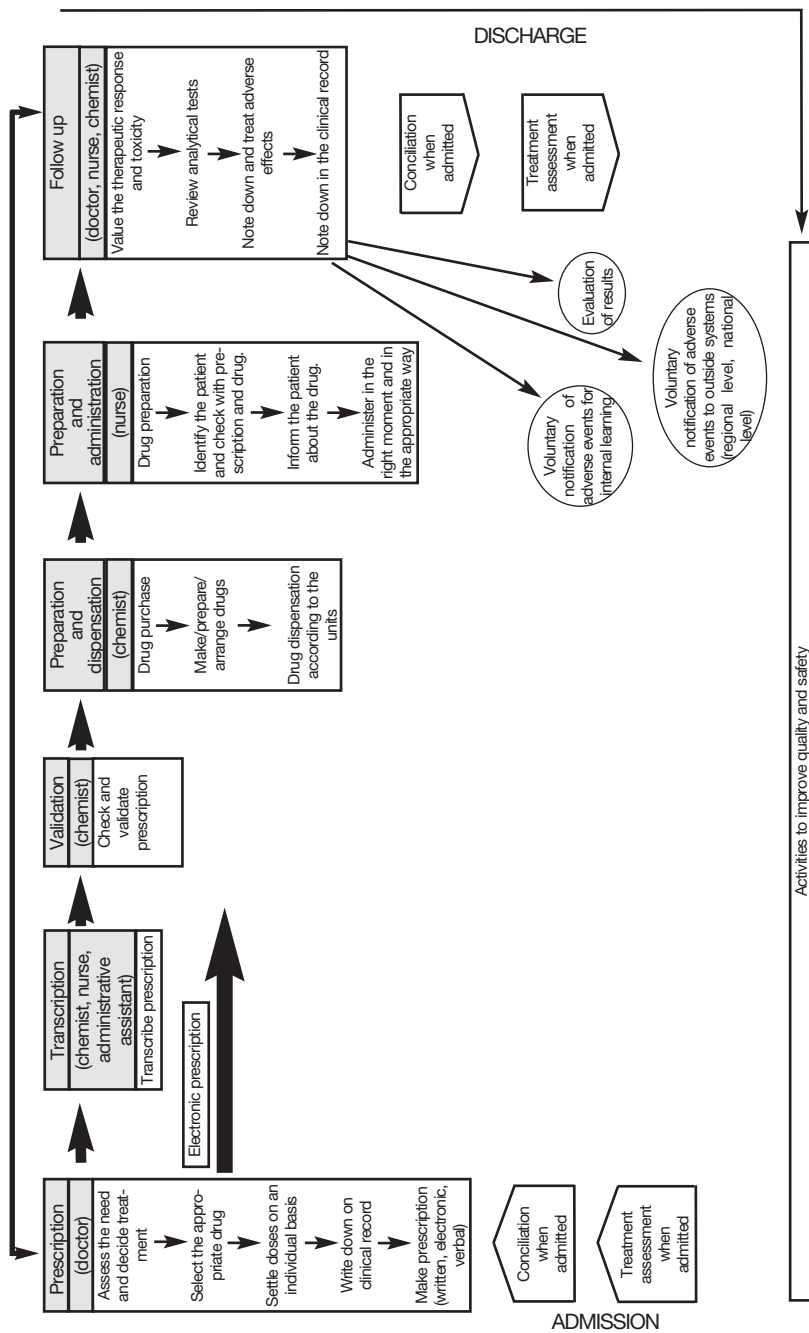


Figure 4.1. Processes which made up the system for medicine use at hospitals (Modified from Aspden⁸⁴)

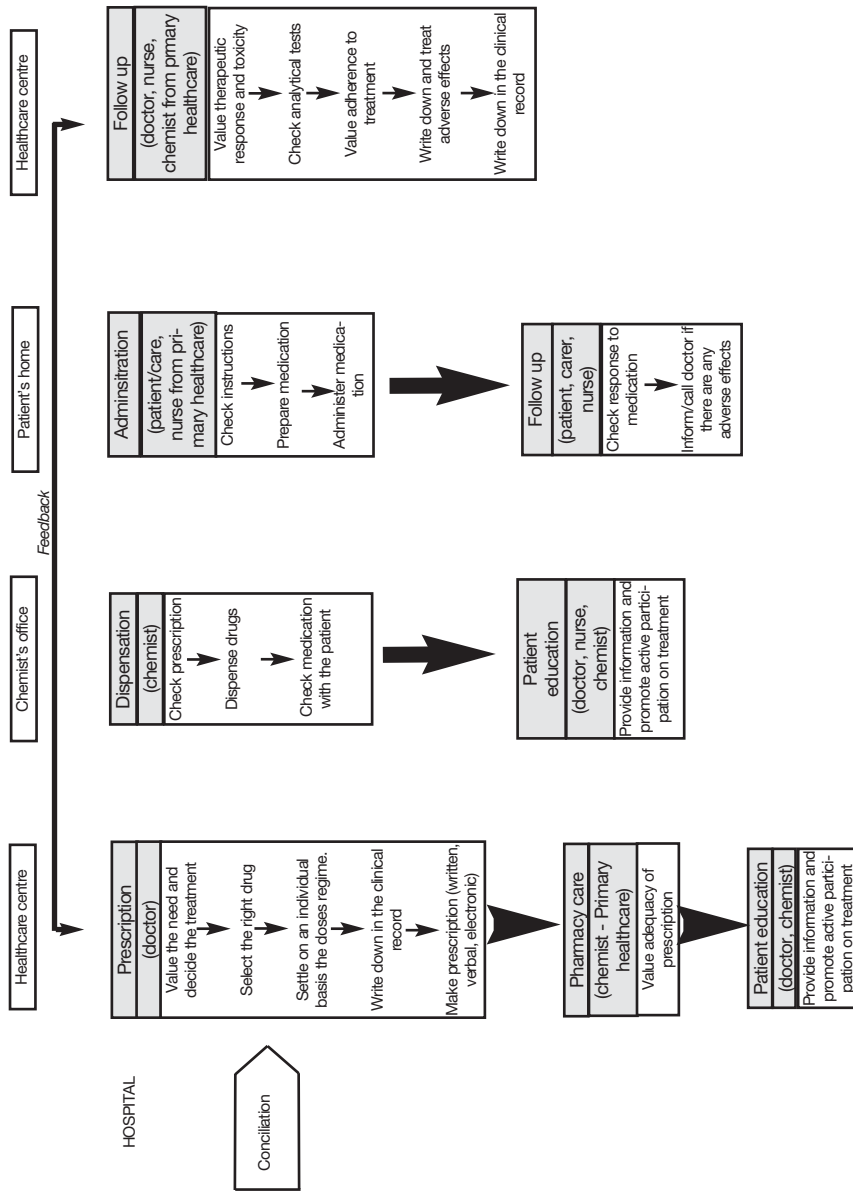


Figure 4.2. Processes which made up the system for medicine use at primary healthcare (Modified from Aspden⁸² and Galt⁸⁸)

4.3.1. General recommendations

The unit will follow the general procedures settled in the centre to guarantee the safety in the medicine prescription storage, preparation and administration processes.

Special attention will be provided to high risk medicines which will be handled at the unit. The storage conditions for these medicines will be reviewed and there would be established the guidelines for the standardization in the preparation and administration processes (concentrations of the perfusion solutions, administration rates, criteria for the use of the perfusion pumps, etc.) These guidelines will be reviewed and updated annually.

4.3.2. Prescription improvement practices

From the unit there should be encouraged the implementation of new IT and communication technologies, mainly the availability of the computerized clinical record and of the assisted electronic prescription systems. To improve patient safety it is recommended to implement a system of electronic prescription integrated in the patient's record and connected with the laboratory so that it may give an alert when adjustments in the medicine doses are necessary. It should include alerts on allergies, maximum doses, inappropriate medicines for people advanced in years, interactions medicine-medicine and medicine-disease.

There would be updated protocols in evidence based treatments and/or use guides of medicines of the main conditions cared at the unit so as to standard the prescriptions, the follow-up of efficiency and the safety of the treatment. These protocols will include the appropriateness of the doses to patients advanced in years.

Prescription of medicines (annex 1) considered inappropriate for patients advanced in years would be avoid as they have a negative risk/benefit relation for these patients and there are other therapeutic possibilities^{89, 90, 91}. When possible, these medicines will be included in the system of alerts of the assisted electronic prescription system.

During prescription there would be systematically performed an adjustment of the medicine doses considering age and kidney and liver function of the patient.

Treatments will be simplified at the most when possible, by means of formulations, medicines under weekly, monthly... basis, etc. as well as by adapting the pharmaceutical formulae to the characteristics of the patient, as the use of effervescent formulae for patients with deglutition problems.

When the patient is discharged (or in the consultation) and the prescription is provided, the patient will be given official prescriptions (electronic or hand-written), mainly if there are some changes in the treatment. In this respect, it would be appropriate if the unit would have in all its examination rooms, and for discharges, IT systems for issuing prescriptions connected to the health service or to the hospital health service. This service could also be delegated to the pharmacy units or services of the hospital that perform this provision.

4.3.3. Admission medicine conciliation and review

When patient is admitted (or in the consultation) a complete pharmacotherapeutic profile of the patient should be obtained and it should include all the medicines he/she takes (prescribed or not) as well as the medicinal plants and alternative or complementary treatments. Thus, it is necessary to interview the patient (or carer) to verify the real treatment of the patient. Once the profile is made, **there would be made a comprehensive review of the home medication before new medication is prescribed, to assess whether the medication⁹² is adequate or not** (appropriateness, efficiency, adequate doses, etc.).

A standardized procedure will be used to compare and conceal patient's medication before admission (or in the consultation) with the medication prescribed when admitted (or in the consultation) (Annex 2). Any unjustified difference that may be observed (omissions, double treatments, interactions, etc.) would be solved and written down.

It is recommended that the units or services of hospital pharmacy would collaborate and participate in these education procedures and to conceal treatment when admitted^{72,84}.

4.3.4. Conciliation when discharged and patient's education

When a patient is discharged (or in consultation) and when transferred to primary healthcare services a complete (and concealed) list of the medication will be provided to the healthcare staff who will be in charge of the continuity of the care process. Those changes on the previous patient's medication will be written down.

Patients (or carers) will be provided with oral and written information of the medication prescribed when discharged (or in the consultation) and they will be trained so that they may solve or find out any doubt regarding medication. The information provided will be clear and easy to understand.

The patient and/or the carer will receive explanations about any changes in the medication prior to admission (or outpatient consultation) in the unit.

Written information will include a list for the home treatment of the patient when discharged (or pharmacotherapeutic plan) which would specify; generic name and, when not prescribed under the drug's chemical structure, trademark; posology; administration time, symptoms; length of the treatment; possible adverse event and relevant remarks. It is recommended the use of software that makes treatment time planning easy and which issues a clear and attractive format, including pictograms, pictures of the containers, general usage recommendations and additional helpful tools. They avoid administration mistakes and improve the patient's adherence to the treatment.

When possible, **administration times would be scheduled with the patient and/or carer taking into account his/her life style and reducing the number of intakes at the most.**

Special attention will be provided to those medicines that have special administration techniques (e.g. inhalators) or which are identified as high risk medication (e.g. anticoagulants, oral anti-diabetic drugs); in these cases the educative support of the nurse is fundamental to improve the adherence to the treatment and to reduce the number of mistakes.

It is recommended the contribution of units or services of hospital pharmacy to carry out the treatment training and conciliation procedures when the patient is discharged, to prevent adverse events after hospitalization⁹³.

It is recommended that, when discharge, the patient should be given finite medication, i.e., the necessary doses for the finite treatments (antibiotics, corticoids, etc.) to finish the treatment began at hospital.

4.3.5. Treatment follow-up and adherence assessment

During the patients' follow up at consultation, it is recommended to include an evaluation of the adherence to the treatment (Annex 3) so as to detect the lack of adherence and identify those factors that may cause it. This information will be used to try to settle individual strategies to improve it.

It is recommended to coordinate with primary healthcare the settlement of a procedure of periodic re-evaluation of patients' medication so as to verify the adequacy of treatment, the need to continue with it, etc.

4.4. Pressure Ulcers Prevention

Pressure ulcers are a frequent complication, mainly in patients with mobility problems and advanced in years, in whichever healthcare area. Pressure ulcers delay functional recovery and may complicate with infection/pain, sap life quality of the people who suffer from them, contribute to lengthen hospital stay and they increase the cost of healthcare.

The *Grupo nacional para el estudio y asesoramiento en úlceras por presión y heridas crónicas* (National group for the study and advice in pressure ulcers and chronic wounds) estimates⁽²⁰⁾ that in Spain 80.000 people are daily looked after due to pressure ulcers at different healthcare systems.

Prevention is fundamental for avoiding pressure ulcers. The implementation of evidence-based procedures for the prevention of pressure ulcers is a priority for patient's safety at international level, being one of the 30 safety strategic aims of the NQF⁹⁴, one of the 16 National Patient Safety Goals proposed by the Joint Commission for 2009 and one of the 12 selected strategies by the Institute of Healthcare Improvement for its international campaign to protect patients from adverse events at the 5 Million Lives Campaign⁹⁵.

Prevention of pressure ulcers in patients at risk is one of the 8 specific areas of safe practices promoted by the Spanish Ministry of Health and Social Policy by means of agreements with the autonomous regions within the strategy n° 8 of the National Health Service Quality Plan.

Care programmes for highly complex patients with multiple chronic conditions must include prevention of pressure ulcers with the following measures:

- **Identify patients at risk of developing pressure ulcers and assessment of the skin condition:**
 - **When admitted, make a study of the skin's integrity and then make a daily skin control.**
 - **To value risks, combine clinical judgement and standardized instruments (Braden, Norton, EMINA scores)**
 - **Make re-assessments of patients with certain regularity and write down the findings in the clinical record.**
- **Keep and improve textile tolerance to pressure to prevent wounds by identifying and treating those factors which affect textile tolerance (age, vascular competence, glycaemic control for diabetics, nutrition).**

⁽²⁰⁾ <http://www.gneaupp.org/>

- **An individual care plan for a highly complex patient with multiple chronic conditions must include:**
 - **Local skin care**
 - **Specific prevention for patients suffering from incontinence**
 - **Postural changes for patients with limited mobility**
 - **Use of special support surfaces for pressure management in the bed or seat of the patient**
 - **Local protection at bone prominences**
 - **Skin protection from friction and shearing by means of appropriate techniques when the patient is seated, transferred or moved.**

Continuous training for staff related to the unit for highly complex patients with multiple chronic conditions must include prevention and treatment of pressure ulcers.

4.5. Fall Prevention and Pain Reduction

Falls in patients in any healthcare scenario (hospital, primary healthcare, day surgery, home hospitalization) are an important health problem, mainly in patients advanced in years. Injuries due to falls in people over 65 may imply a considerable life quality loss, a load over carers and an impact over morbidity and mortality.

Nearly 30% of people over 65 falls once a year and a 50% of them falls again during that year⁹⁶.

Falls are most common in institutionalized people advanced in years because they are frailer and their morbidity and dependence⁹⁷ is higher. Research suggest that 20% of falls require medical care, 10% suffer serious injuries (4-6% of people advanced in years suffer fractures as a consequence of a fall, being a fourth of them femur fractures) and 40 to 50% suffer minor injuries such as wounds, bruises and contusions⁹⁶.

Population progressive aging implies a predictable increase of this health problem.

Spain, according to the calculation of the ProFaNE (Prevention of Falls Network Europe), is a country with rising low fall rates that has low levels of implementation of precautionary measures⁽²¹⁾.

Primary (prevent falls from taking place) and secondary prevention

⁽²¹⁾ ProFaNE (Prevention of Falls Network Europe).

(prevent harm once they occur) of falls are one of the strategic basic international lines for patient's safety for the main leading institutions in 2009: Institute of Healthcare Improvement⁹⁸, Joint Commission^{99, 100} and the National Quality Forum¹⁰¹ or the CDC National Centre for Injury Prevention and Control¹⁰².

Even though there is a broad knowledge on falls in people advanced in years and there are several clinical practice guides for its prevention^{(8), 103, 104, 105, 106}, there is little evidence of the impact of the different actions. In this respect, the most recent meta-analysis show a small reduction in the rates of falls of inpatients when multiple actions are taken, and there is no evidence of the efficiency of the actions aimed at modifying a single risk factor¹⁰⁷ and there is not an important reduction in the number of falls of older adults when multi-factorial actions are performed either in primary health-care or in A&E units or services¹⁰⁸.

The unit for highly complex patients with multiple chronic conditions should develop and implement a programme for the prevention of falls which would include:

- **Identification of patients with higher risks of falls.**
- **Use of a proved instrument as the Morse Fall Risk Assessment or the Heindrich Fall Risk Assessment for the multidimensional assessment of the risk.**
- **An assessment of the different risk factors of falls for older people should include the following: a comprehensive anamnesis, record of falls, medication review, comprehensive geriatric assessment, general physical examination, senses examination, gait and balance assessment, evaluation of the environment and additional assessments.**
- **An evaluation when the patient is admitted and study the risk of fall of the patient in several moments during his/her stay, writing down all the information in the clinical record.**
- **Implementation of multifactor prevention strategies to reduce the risk of falls in patients.**
- **Follow up and assessment of the programme to check its effectiveness. Suggested result indicators: reduction in the number of falls, reduction in the number and the serious conditions of injuries related to falls.**

4.6. Prevention of Nosocomial Infections

The unit for highly complex patients with multiple chronic conditions will include an infection control and prevention programme adapted to its specific characteristics and activities. The programme will guarantee that patients at risk and risky procedures will be identified and that the necessary information will be provided to the corresponding authorities in accordance with the applicable legislation.

To such effects, a protocol would be set up which would include aspects related to **hand hygiene and alcohol based solutions**, used of antiseptics, antibiotic prophylaxis, prevention and management of accidents related to blood exposure, different possibilities and types of patient isolation, and risk of infection at invasive procedures.

4.7. Patient's Identification

Healthcare centres would have a reliable, unequivocal, universal and unique patient identification system.

The system should allow checking the patient's identity before performing any risk procedure or administering any medication or blood products, and before any diagnostic procedure is carried out.

The system would allow identifying all patients with an activated continuous healthcare programme in any hospital service.

4.8. Blood Products Management

Management and safety of blood products is competence of the blood bank of the centre and it must have the corresponding accreditation for it⁽²²⁾.

Blood product management must guarantee the unequivocal identification of the receptor before samples are taken and, again, before the transfusion of blood and of blood products is made.

⁽²²⁾ RD 1.088/2005, September 16th, which settles the "requisitos técnicos y condiciones mínimas de la hemodonación y de los centros y servicios de transfusión" (technical requirements and minimum conditions for haemodonation and for the transfusion centres and services) and RD 1.301/2006, November 10th, which settles "normas de calidad y seguridad para la donación, la obtención, la evaluación, el procesamiento, la preservación, el almacenamiento y la distribución de células y tejidos humanos" (quality and safety standards for the donation, obtaining, evaluation, management, store and distribution of cells and human tissues)

Blood products management should guarantee the traceability of the transfusion process and must limit the blood products perfusion responsibilities to the blood bank and the unit.

4.9. Epidemiological Alerts

Healthcare centres with units for highly complex patients with multiple chronic conditions will have an epidemiological alert system connected to the adequate health authorities, in accordance with present legislation.

4.10. Self-Protection Plan

Healthcare centres with units for highly complex patients with multiple chronic conditions must have a self protection plan which will determine the organization of human and material resources available for fire risk prevention and of other equivalent risk and which will guarantee the evacuation and immediate intervention in any possible catastrophe, either internal or external.

The self-protection plan will include risk assessment, protection standards, emergency plan and implementation and update measures.

5. Organization and Management

The unit for highly complex patients with multiple chronic conditions is defined as an organization of medical professionals providing multidisciplinary healthcare via a wide spectrum of healthcare services to highly complex patients with multiple chronic conditions, in accordance with a series of functional, structural and organizational requisites that ensures the quality, efficiency and safety conditions needed to carry out this activity.

The unit for highly complex patients with multiple chronic conditions may be integrated in another healthcare system with a wider service portfolio which sometimes includes late-stage diseases (palliative care) or a more global service such as internal medicine or geriatrics. For a unit to be considered as a unit for highly complex patients with multiple chronic conditions it has to fulfil the requirements indicated in section 2.5.:

1. In order to provide systematic attention to patients with multiple chronic conditions there has to be a connexion between the specialist in charge of the unit (generally a specialist in internal medicine) and the primary care doctors, within a determined geographical and demographical reference frame. There must be a constant relationship between the specialist, the primary care doctors, and a determined population of patients with multiple chronic conditions.
2. The unit for highly complex patients with multiple chronic conditions must provide a wide variety of healthcare services that guarantee assistance to the patient with multiple chronic conditions at the right time and place.

The unit for highly complex patients with multiple chronic conditions is formed by a specialist (generally a specialist in internal medicine or geriatrics) and the nursing and surgery staff in charge of the patients with multiple chronic conditions within the hospital. For the unit for highly complex patients with multiple chronic conditions to succeed, connexion and cooperation with primary care doctors is required.

This chapter is dedicated to the criteria and guidance related to the different characteristics of the unit for highly complex patients with multi-

ple chronic conditions considered as an organization: patient inclusion criteria, continuous healthcare plan, service portfolio, relation of the unit with other hospital units and services, organization and management of the unit for highly complex patients with multiple chronic conditions, and aspects relating to patient management.

5.1. Patient Inclusion Criteria

The Kaiser Permanente approach, which has been adopted by the Health Department of the United Kingdom, identifies three groups of chronic patients in relation to their degree of complexity. As can be seen in figure 5.1., adapted from the United Kingdom Department of Health, the population with chronic conditions can be classified according to three levels of complexity:

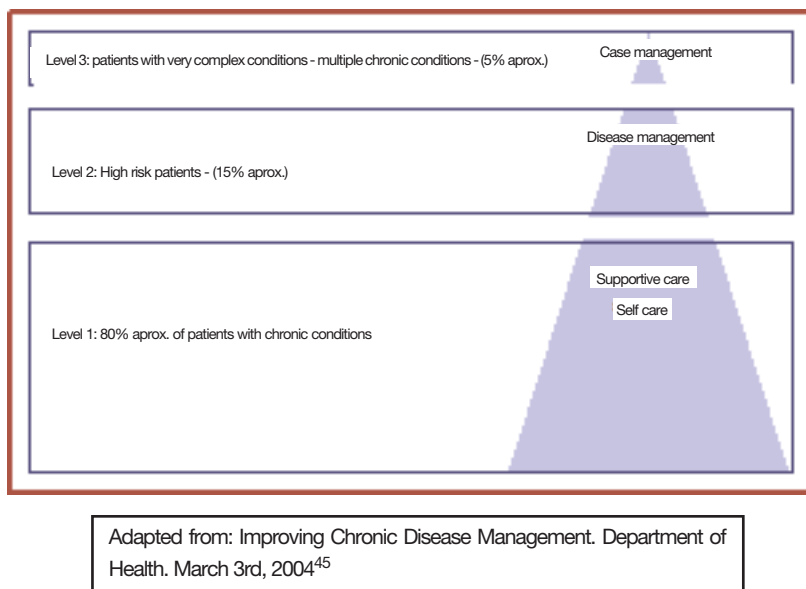


Figure 5.1. Classification of chronic patients.

Level 1 includes most of the population with chronic diseases, who may benefit from caring programmes focusing on health education and promoting self-care carried out by primary care services.

Level 2 includes chronic patients with a main disease affecting a specific organ, which may benefit from “disease management”¹⁰⁹ programs.

Level 3 includes those patients with multiple chronic conditions with complex needs requiring a specific organizational infrastructure which would offer them highly personalized service.

This last level is the aim of the unit for highly complex patients with multiple chronic conditions, which (following Ollero *et al.*⁶ functional definition) identifies a **patient with multiple chronic conditions**, both within the hospital and the primary care health services, **as a patient suffering from chronic diseases of two or more of the following clinical categories**⁶:

- Category A:
 - Heart failure, which has been categorized as class II of the NYHA classification in a stable clinical situation⁽²³⁾.
 - Ischaemic cardiopathy
- Category B:
 - Vasculitis and systemic autoimmune conditions.
 - Chronic renal diseases characterised by a high increase of creatinine (>1.4 mg/dl in men or >1.3 mg/dl in women) or proteinuria⁽²⁴⁾ during three consecutive months.
- Category C:
 - Chronic respiratory condition which has presented a case of second degree dyspnoea according to the MRC⁽²⁵⁾ scale, or FEV1<65%, or SaO2 ≤ 90% in a stable clinical situation.
- Category D:
 - Chronic inflammatory bowel disease.
 - Chronic liver disease with history of hepatocellular⁽²⁶⁾ insufficiency or portal⁽²⁷⁾ hypertension.
- Category E:
 - Cerebrovascular accident.
 - Neurological disorder with permanent motor deficit which limits basic daily activities (score in the Barthel index below 60) ⁽²⁸⁾.

⁽²³⁾ Slight limitation of physical activity. Habitual physical activity produces dyspnoea, angina, tiredness or palpitations

⁽²⁴⁾ 2 index albumin/creatinine > 300mg/g, microalbumin > 3 mg/dl in urine sample or albumin > 300mg/day in 24-hour urine.

⁽²⁵⁾ 3 Inability to keep the pace of a person of the same age, walking on a levelled surface, due to breathing difficulty or having to stop to walk at his/her own pace on a levelled surface.

⁽²⁶⁾ 4 INR >1,7, albumin <3,5 g/dl, bilirubin >2 mg/dl.

⁽²⁷⁾ Defined by the existence of clinical, analytic, ultrasonic or endoscopic data.

⁽²⁸⁾ Annex 4. Barthel index.

- Neurological disorder with permanent cognitive impairment, at least moderate (5 or more errors in the Pfeiffer⁽²⁹⁾ questionnaire)
- Category F:
 - Symptomatic peripheral arteriopathy.
 - Mellitus diabetes with proliferative retinopathy or symptomatic neuropathy.
- Category G:
 - Chronic anaemia due to blood loss in the digestive system or acquired blood disease without treatment which presents Hb < 10 mg/dl in two different tests taken with at least a three month interval.
 - Active solid or haematologic neoplasia without curative treatment.
- Category H:
 - Chronic osteoarticular disease limiting the capacity to complete basic daily activities (score in the Barthel index below 60)⁽³⁰⁾.

In close collaboration with the primary care professional⁽³¹⁾, the unit for highly complex patients with multiple chronic conditions cares for patients in level 3 of complexity (according to the Kaiser Permanente) when they are destabilized.

5.2. Continuous Care Plan⁶

The model of cooperative care between the primary care service and the unit for highly complex patients with multiple chronic conditions of the patient with multiple chronic conditions is known as continuous care plan.

The identification of the patient with multiple chronic conditions both within the IT system of the hospital and the clinical records is essential for the unit for highly complex patients with multiple chronic conditions to coordinate its activities with other hospital units.

The continuous care plan will be activated when the professional in charge of the patient in the primary care services and the manager in the unit for highly complex patients with multiple chronic conditions agree that

⁽²⁹⁾ Annex 5. Pfeiffer Questionnaire.

⁽³⁰⁾ Annex 4. Barthel index.

⁽³¹⁾ In addition to the cited Barthel and Pfeiffer indexes, scales that measure the risk of functional decline are also used, such as the well-known and highly evaluated measure designed by Sager et al., usually known as the HARP index (Hospital Admission Risk Profile)¹³.

the patient with multiple chronic conditions needs the collaborative assistance of both for his/her clinical control:

- **It is considered as an objective criterion to activate the continuous care plan the fact that one of the chronic conditions that justifies the consideration of the patient as a patient with multiple chronic conditions causes hospitalization or the need of outpatient evaluation by more than two different specialties simultaneously.**
- **Activation of the continuous care plan will be formalized by an in-person consultation in the day hospital unit of the unit for highly complex patients with multiple chronic conditions or through hospitalization.**
- Activation of the continuous care plan will be registered by the General Practitioner in the primary care IT system and by the professional in charge of the unit for highly complex patients with multiple chronic conditions in the hospital IT system.
- The continuous care plan will be kept active even during periods of time when clinical care will be exclusively received through the primary care services or hospital care⁽³²⁾.
- When the primary care doctor in charge of the patient is responsible for the coordination with the doctor in the unit for patients with multiple chronic conditions of the activation of the continuous care plan, it will be the primary care doctor who will complete for the first time or update, when appropriate, the comprehensive geriatric assessment of the patient with multiple chronic conditions, issuing a clinical report which would include the nursing caring plan before sending the patient to consultation or to admission into hospital.
- When the initiative to activate the continuous care plan originates from the professional in charge of the unit for highly complex patients with multiple chronic conditions, it will be this one who will issue the mentioned report for the primary care doctor, who shall include an update of the comprehensive geriatric assessment of the patient.
- During the length of the cooperative care process through the continuous care plan the primary care doctor in charge of the patient and the doctor in the unit will closely collaborate in order to unify the therapeutic plans and to facilitate the completion of the recommendations coming from both primary and hospital care.

⁽³²⁾ The experience obtained by the unit of clinical management of the internal medicine / unit for continuous care of the Hospital Virgen del Rocío (Seville, Spain) has led to setting that once the continuous care plan has been activated (and as this document recommends), it is never deactivated irrespective of the admissions and discharges due to any caring episode at the unit.

It is important to highlight again that patients cared in the unit for highly complex patients with multiple chronic conditions must be assisted in close collaboration with their primary care doctor / nurse who keep the guardianship of the patient at all times. For that reason, once the continuous care plan has been activated, the follow-up will have these characteristics:

- **Hospitalizations will be planned through the primary care doctor who will personally contact the professional in charge of the designated unit for highly complex patients with multiple chronic conditions to communicate the need for hospitalization, avoiding as far as possible that the patient would resort at any time to the A&E services of the hospital.**
- **During hospitalization in beds which are not assigned to the unit for highly complex patients with multiple chronic conditions, the professional in charge of this unit will be summoned to evaluate the patient** irrespective of the reason and unit or service where it will be performed. After the evaluation, it will be decided, in collaboration with the appropriate specialist of the unit where the patient has been hospitalized, whether follow-up examinations during hospitalization will be possible.
- **Early planning of discharge¹¹⁰ from hospital will be carried out for hospitalized patients with multiple chronic conditions.** To facilitate this, the care needs of the patient, family and environment will be assessed. The intervention for a social worker will be considered according to the identified needs.
- **At the time of discharge from hospital, a continuity report will be completed of all patients with multiple chronic conditions included in the continuous care plan containing the dependence level and the active problems.** The report will include the telephone and name of the designated reference nurse of the unit. This report will be given to the patient and it will be addressed to the primary care nurse and, when appropriate, to the liaison community nurse or case manager.
- **For patients with an active continuous care plan, all consultations to different units or medical services or the activation of hospital support services (home hospitalization, for example) will be carried out through the professional in charge of the unit for highly complex patients with multiple chronic conditions.**
- The doctor in charge and designated nurse of the unit for highly complex patients with multiple chronic conditions will be available to discuss the treatment and changes in care with the doctor and

- nurse in charge from the primary care services.
- Activation of the different home support services will be carried out by agreement between the primary doctor in charge of the patient and the doctor in charge of the unit for highly complex patients with multiple chronic conditions.

Chronicity and progression of the conditions make patients with multiple chronic conditions be included in other health services (dialysis or palliative care), which can create duplicated care situations. In the event of these health services assume the total care of the patient, the continuous care plan will be deactivated from the unit for highly complex patients with multiple chronic conditions.

5.3. Episode in a Unit for Highly Complex Patients with Multiple Chronic Conditions

Experience, based on the clinical characteristics and evolution of patients with multiple chronic conditions, has modified the initial criterion for activation and deactivation of the continuous care plan, in order to maintain it once it has been initiated. Nevertheless, from the management point of view, it is appropriate to define those periods of time during which the management of the patient with multiple chronic conditions is shared between the unit for highly complex patients with multiple chronic conditions and the primary care professionals, in comparison with those periods of time when the responsibility of management mainly rests with the primary care professionals.

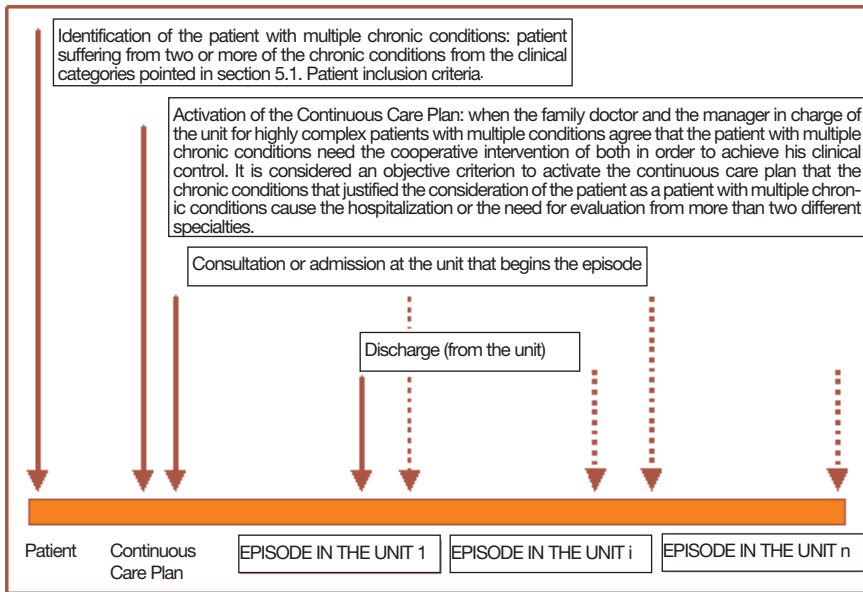


Figure 5.2. Identification of the highly complex patient with multiple chronic conditions, continuous care plan and the episode in the unit for highly complex patients with multiple chronic conditions.

An episode in a unit for highly complex patients with multiple chronic conditions extends from the time the clinical management of the patient with multiple chronic conditions is cooperatively carried out between the unit for highly complex patients with multiple chronic conditions and the primary care professionals in charge of the patient, and it may include one or more specific processes of the healthcare services provided by the unit: hospitalization/discharge from hospital (including, where appropriate, HH); sessions in the DHU; or consultation. Aside from the requirement for a discharge report after each hospitalization, the professional in charge of the unit for highly complex patients with multiple chronic conditions will submit a discharge report when, once the patient is stable and his healthcare is taken back to the primary care services; the cooperation between the services concludes until the occurrence of a new episode. Attached to the discharge report must be the care plan created by the designated reference nurse of the unit.

5.4. Service Portfolio⁷

The unit for highly complex patients with multiple chronic conditions portfolio shows two different levels. Level 1 comprises the healthcare services offered by the unit for highly complex patients with multiple chronic conditions and level 2 the procedures that are carried out in the unit, some of them specific to certain healthcare service.

Every unit for highly complex patients with multiple chronic conditions must offer healthcare to the patients with multiple chronic conditions in the conventional hospitalization units as well as in outpatient healthcare and day hospital services. All these resources are essential for the operation of the unit for highly complex patients with multiple chronic conditions. The day hospital resources may be integrated, depending upon circumstances, within a polyvalent DH⁵ unit which must guarantee to the unit for highly complex patients with multiple chronic conditions the availability of a specific number of beds for the patients with multiple chronic conditions.

It is recommended that the unit for highly complex patients with multiple chronic conditions owns or is in close coordination with home hospitalization services and palliative care.

The unit for highly complex patients with multiple chronic conditions must offer medical interconsultation activities to other units in its field of activity.

In addition to home hospitalization services and palliative care, the unit for highly complex patients with multiple chronic conditions may be supported by other types of resources, specifically by the intermediate-term and post-recovery units, or other public health support services such as assisted homes and home physiotherapy, for the care of patients with multiple chronic conditions.

The structure of the unit for highly complex patients with multiple chronic conditions will adjust to the respective hospital organization and Regional Health Authority.

The service offer scope and conditions will depend on the organization of each hospital, the size of the unit for highly complex patients with multiple chronic conditions and the available resources, their organization and management, and the population of reference.

It is recommended that the unit for highly complex patients with multiple chronic conditions be organized to provide healthcare coverage both during working days and bank holidays, which will allow reducing the use of the A&E services and improving the management of admissions and discharges of the patients with multiple chronic conditions in the conventional

hospitalization unit. **The unit for highly complex patients with multiple chronic conditions must defined the caring hours for patients with multiple chronic conditions**, identifying the specific hours at bank holidays inasmuch as the day unit outpatient healthcare program, as to the time accessibility of the staff of the unit for its own patients, for the A&E services and for the primary care professionals related to the unit.

5.4.1. Conventional hospitalization

The unit for highly complex patients with multiple chronic conditions must hold beds in conventional hospitalization. The modality of conventional hospitalization cares for those patients that require continuous evaluation, healthcare, control and treatment 24 hours a day. It is organized according to the following criteria:

- All patients with multiple chronic conditions will be assigned to a designated reference nurse, responsible for:
 - Carrying out an assessment⁽³³⁾,¹¹¹ intended to explore the possibility of self-care, to discover non-covered care needs, and to identify problems in the cooperation and active nurse diagnosis in the patient, pointing out those of high priority.
 - Establishing an individualized care plan where it will be determined which objectives, interventions and actions will be initiated for cooperation and/or for solving those problems identified. Healthcare plans for most frequent procedures must be standardized.
 - Informing and tutoring the patient and carer about the healthcare the patient will need during hospitalization and at home after discharge.
 - Supporting the caregiver from a bio-psycho-social perspective during the stay of the patient in the unit for highly complex patients with multiple chronic conditions.
 - Assuring the continuity of healthcare after discharge from hospital, fulfilling the healthcare continuity report, (report provided after nursing discharge) assessing the need for support material and activating the healthcare support services needed.
- **All patients with multiple chronic conditions must receive a nursing**

⁽³³⁾ For example, according to M. Gordon's¹¹⁴ functional standards or V.Henderson's⁶ basic needs.

report when discharged from hospital which will contain the comprehensive geriatric assessment, functional, psychological and socio-familial evaluation of the patient with multiple chronic conditions.

- The discharge report must include a complete and agreed list of medications and must be provided to the patient with multiple chronic diseases and the designated primary care professionals.
- The need to activate resources through coordination with primary care and public health⁽³⁴⁾ and social services will be considered during discharge planning.
- The professional in charge of the unit for highly complex patients with multiple chronic conditions must be informed of the hospitalization of the patient for assessment in surgical services, after which it will be decided whether it is necessary or not to undergo a follow up procedure.

5.4.2. Interconsultation

The unit for highly complex patients with multiple chronic conditions must care for its patients when these are hospitalized in other hospital unit or service and it must carry out an active search of patients with chronic conditions hospitalized in other units or services.

The unit for highly complex patients with multiple chronic conditions must offer to other units in its field of action interconsultation activities. Interconsultation with primary care services may be in-person or virtual (through telephone, videoconference, etc.) and it is an essential part of the activity of this unit. Interconsultation with other hospital units or services is needed to identify patients with multiple chronic conditions, to follow and/or decide on early discharge of already identified patients. It turns out to be a support service for the A&E services, surgical services and other medical services.

This multidisciplinary healthcare approach has proved to be beneficial for patients hospitalized in other specialties, specifically in surgical services such as trauma²⁰.

⁽³⁴⁾ The public health services portfolio of the Spanish National Health Service has not yet been developed. The public health devices offered by the Regional Health Services vary in typology and endowment. Public health resources may include medium-term units, long-term units, day hospitalization, as well as palliative care teams and units. Stays in acute hospitals convey high risk for senior patients with multiple chronic conditions. An option is to have available “public health support” beds for the patients with multiple chronic conditions who need hospitalization without having to be cared of in high technology enhancement acute hospitals. These units, in close contact with the unit for highly complex patients with multiple conditions for hospitalizations, transfers, etc., might be an adequate place to complete treatments or to control evolution, and also to provide rehabilitation to prevent dependence.

5.4.3. Day Hospital Unit

Throughout the document Day Hospital Unit is used to refer to the resources in the outpatient healthcare services that the unit for highly complex patients with multiple chronic conditions uses to care patients with multiple chronic conditions: outpatient consultation and day hospital.

The unit for highly complex patients with multiple chronic conditions, besides relying on outpatient consultation, must hold beds in the day hospital or have access to a DH doctor⁽³⁵⁾ which allows completing the examination or treatments without the need for hospitalization (for example, parenteral treatment administration, transfusions and invasive diagnostics and therapeutic evaluation).

Integration of the outpatient healthcare of the unit for highly complex patients with multiple chronic conditions within the day hospital unit requires that:

- Patients with multiple chronic conditions must be identified as such in the record.
- The manager of the unit would have the ability to control the agendas to mark appointments scheduled through primary care services.

Once the day hospital unit episode has finished, a discharge report will be issued. This report will contain the information of the type of care performed, disclosing the condition of the patient with multiple chronic conditions and making special reference to the clinical, functional, psychological and socio-familiar areas (comprehensive geriatric assessment), especially if the need for intervention on these areas has been identified.

The treatment section of the discharge report from the day hospital unit will contain instructions in reference to treatment, life style, routines, diet and other advised measures for the better control of the chronic conditions of the patient.

All discharge reports from the hospital day unit must include an action plan with reference to the therapeutic objectives and clinical follow-up, especially in situations in which comorbidity or diagnosis recommend individualizing the therapeutic objectives for the chronic conditions suffered by the patient.

⁽³⁵⁾ Polyvalent medical DHU or DH beds physically integrated in the Unit for highly complex patients with multiple chronic conditions.

5.4.3.1. Day Hospitalization

The unit for highly complex patients with multiple chronic conditions must hold day hospitalization beds. Day hospitalization is a healthcare modality whose objective is to treat or care for patients that must be subjected to diagnosis or treatment procedures that require continuous medical or nurse care, but not hospitalization.

The day hospital unit portfolio gathers the procedures and care offered to patients with multiple chronic conditions in this healthcare modality at the unit for highly complex patients with multiple chronic conditions. Annex 7 contains a list of these procedures.

The day hospital may correspond with a polyvalent DHU (an autonomous unit that provides its resources to the unit for highly complex patients with multiple chronic conditions and to other hospital services and units) or, preferably, it may be composed of various DH beds/chairs integrated in the unit for patients with multiple chronic conditions, under the functional and hierarchical dependence of its manager and located in the same environment than the high performance or immediate care consultation. Thus, consultation room and DH create a day unit which allows a response adapted to the needs of the patient while the continuous care plan is active.

The configuration adopted by each hospital will be subjected to the expected work load of the unit, which will depend on the population of reference of the unit for highly complex patients with multiple chronic conditions, the space availability, and the way in which the hospital is organized and managed, which is the most relevant variable, especially in relation to the human resources management.

5.4.3.2. High performance or immediate care consultation

The inclusion of the high performance or immediate care consultation in the unit for highly complex patients with multiple chronic conditions service portfolio is intended to provide:

- Care for clinically unstable patients.
- Prompt assessment diagnoses.
- Early discharge follow-ups (continuing the diagnosis review and/or follow up of response to treatment until the patient is stable)
- Frequent control of patients with an active condition, who will be hospitalized if necessary, with an early discharge and new controls

through immediate care consultation or primary care.

The patient and his/her primary care doctor must receive a report from the outpatient consultation of the unit for highly complex patients with multiple chronic conditions, whenever there is a relevant event (for example, a therapeutic change). The report will include, if needed, nursing information.

5.5 Relation of the Unit for Highly Complex Patients with Multiple Chronic Conditions with other Units and Services

The unit for highly complex patients with multiple chronic conditions maintains an especial relation with the following units: primary care teams or primary care system of the corresponding health subsystem; units or services of the hospital (especially medical specialties, therapy, A&E services); and public health services of the hospital or of the local health department.

5.5.1. Home hospitalization

Home hospitalization (HH) is defined as a health modality which allows providing at home diagnostic and therapeutic procedures and care similar to those provided at hospital and for a limited period of time.

HH may be an alternative offered in the service portfolio of the unit for highly complex patients with multiple chronic conditions¹¹², or it may be included in the hospital service portfolio, outside the unit.

Attention to patients with multiple chronic conditions through the HH may have similar results to conventional hospitalization for certain patient subgroups^{113, 114}; however, there is not enough evidence about its effectiveness in relation to its costs¹¹⁵.

The patient with multiple chronic conditions will be cared for at his home when, while satisfying the criteria for staying in an acute hospital, fulfils the requirements of this health system (see Table 5.1):

Table 5.1. Requirements for inclusion in HH
DEPENDING ON THE PATIENT
<ul style="list-style-type: none"> • Clinical situation points out to hospital care. • Lack of evidence of future instability. • Alleged transitory condition “<i>a priori</i>”. • Adequate type of patient for the HH. • Informed consent.
DEPENDING ON THE SOCIO-FAMILIAR ENVIRONMENT
<ul style="list-style-type: none"> • Residence in the DH area of coverage. • Hygienic house and with enough space. • House with phone connection. • Assurance of family collaboration.
DEPENDNG ON THE DOCTOR IN CHARGE
<ul style="list-style-type: none"> • Patient application for inclusion in the DHU. • Subsequent advice. • Re-admission guaranteed. • Outpatient follow-up when discharged.

Depending on each hospital there is the option to treat specific conditions of the patient with multiple chronic conditions under HH, offering a wide variety of diagnosis and therapeutic methods which ensure the same efficiency, quality and safety in the results as those obtained if the patient had been hospitalized in a conventional hospitalization unit.

For a better development of the HH activity it is recommended to strengthen the systems that allow access to the clinical information of the digital health record from the residence of the patient with multiple chronic conditions and that at the same time facilitate registering new information on it.

5.5.2. Relation of the unit for highly complex patients with multiple chronic conditions with primary care services

Adequate relation between the unit for highly complex patients with multiple chronic conditions and primary care services is a requirement for the efficient functioning of the unit. The relation protocol established between them when the continuous care plan is activated is included in sections 5.2.

and 5.3.

The standard that must lead at every moment the relation between the manager of the unit for highly complex patients with multiple chronic conditions and the primary care doctor of the patient is that any decision must be based in their previous agreement, managing thus between them patient's trust.

The professional in charge of the unit for highly complex patients with multiple chronic conditions must be clearly identified and accessible by phone for every primary care professional in charge of the patient with multiple chronic conditions, with the objective to ensure coordination and programming of hospitalizations, consultations, examinations or other cooperative activities from the hospital.

The relations between the unit and primary care may employ the following means:

5.5.2.1. Clinical meetings

It is necessary to carry out combined clinical meetings of the manager of unit for highly complex patients with multiple chronic conditions and the primary care professionals. It is recommended that meetings take place on a monthly basis. In the meetings it is necessary to discuss the clinical problems of outpatients and transferred patients.

Clinical meetings will be multidisciplinary, with the attendance of all health and social professionals intervening in the healthcare process of the patient with multiple chronic conditions.

5.5.2.2. Arrangements

In collaboration with the primary care services, it is necessary to elaborate arrangements to plan scheduled and urgent direct hospitalizations, as well as to plan procedures after discharge from hospital. Especially it must be taken into consideration:

- **To define arrangements in order to ensure the possibility of specialized urgent or preferential care, without needing to go through A&E services,** and with a waiting time agreed between the doctors in charge of the patient.
- To facilitate hospital visits of the General Practitioner and primary care nurse to the patients who require long hospitalizations.
- To avoid transfers and merely bureaucratic appointments and check-ups, such as check-ups during stable situations and

appointments to schedule examinations, to hang reports or to fulfil prescriptions. Sharing clinical information can solve most of these formalities.

- Once a patient has been discharged from the unit for highly complex patients with multiple chronic conditions his/her primary care doctor and nurse are in charge of his/her follow up; the patient could only return to the unit through the instructions of his/her doctor, following the arrangements that were established for that purpose.

5.5.2.3. Creating connexions that contribute to unify the health and comprehensive image concept of the patient

- Facilitating primary care doctors and nurses with re-training periods related to collaboration programs in the unit for highly complex patients with multiple chronic conditions with the option of studying together patients referred from primary care services.
- Developing clinical research topics and especially those related to clinical problems managed together. These topics should contribute to evaluate the general life quality of the patient and not only specific physiopathological and clinical aspects.
- Collaborating in the elaboration of clinical practice handbooks based on evidence. In this respect, the unit of clinical epidemiology and the professionals in the unit for highly complex patients with multiple chronic conditions and primary care services should coordinate their efforts to elaborate clinical guides and joint seminars.
- Proposing teaching activities including joint doctorate courses, seminars and workshops with intervention of professionals in charge of the unit for highly complex patients with multiple chronic conditions and primary care doctors and nurses.
- Spreading the collaboration experiences and showing the obtained results in the caring of patients with multiple chronic conditions going deeply into health and healthcare concepts in order to move forward in the development of an integral and continuous model.
- Creating collaborative work teams of specific topics such as teaching, investigation, registration and information, pharmaceutical expenses, formulary of the area, etc.

5.5.3. Relation of the unit for highly complex patients with multiple chronic conditions with other hospital units or services

The manager of the unit for highly complex patients with multiple chronic conditions will be called to evaluate the patient with multiple chronic conditions, during hospitalization, irrespective of the reason and service (medical or surgical) where he/she has been admitted. After the evaluation, it will be decided whether the unit for highly complex patients with multiple chronic conditions shall be in charge of the follow up of the case during hospitalization.

Reciprocally, the medical and surgical specialties must develop a supportive role in the diagnosis and therapeutic decision making for the patient with multiple chronic conditions cared for at the unit, under the supervision and control of this specific unit.

The units of therapy and physiotherapy must collaborate closely in the functional recovery of the patient with the unit for highly complex patients with multiple chronic conditions, mainly in the outpatient healthcare field.

Likewise, the relation with the pharmacy unit or service has a key importance in the introduction of measures for the safe use of medication.

5.5.4. Relation of the unit for highly complex patients with multiple chronic conditions with the A&E services

The main objective of the relation of the unit for highly complex patients with multiple chronic conditions with the A&E services is to avoid an inadequate use of these services by the patients with multiple chronic conditions and, as far as possible, to minimize care episodes in such services when patients suffer flares. For that purpose, the following networks could be considered:

- Patients referred to the unit for highly complex patients with multiple chronic conditions by the A&E services for preferential examination and strict control (first visit). The main characteristic of these patients will be that under any other circumstances these patients would be hospitalized.
- Chronically symptomatic patients, possibly patients with multiple chronic conditions, with partial improvement in the A&E services but who need continuous controls to avoid revisiting the episode.

- Gathering patients who need certain procedures periodically, such as for example, blood products transfusion (not controlled by the haematology services) or large volume paracentesis (not controlled by the digestive specialist).

Patients with an active continuous care plan will be cared for in the A&E services or unit during non-coverage hours of the day unit of the unit for highly complex patients with multiple chronic conditions (see section 5.2.1), where it will be decided whether the patient is discharged, is cared at day hospitalization or is admitted in any of the beds for conventional hospitalization allotted to the unit for highly complex patients with multiple chronic conditions. In this case, it should be taken into account to:

- Avoid inappropriate hospitalization in acute hospital beds.
- Give preference to hospitalization in the unit for highly complex patients with multiple chronic conditions to patients cared by primary care doctors collaborating with the unit.

The relation between the unit for highly complex patients with multiple chronic conditions and the A&E services of the hospital must tend, as with primary care services, towards generating connexions that contribute to unify the health concept and comprehensive image of the patient, by means of:

- Periodical sessions for sharing information regarding the transferred patients and obtained results (diagnostic and therapeutic).
- Proposing collaborative work to improve the attention to the patient (avoiding non necessary admissions to speed up explorations, avoiding consultation to the A&E services for strict clinical-analytical controls) by means of cooperative activity protocols.

5.5.5. Relation of the unit for highly complex patients with multiple chronic conditions and social and public health services

Coordination of the unit for highly complex patients with multiple chronic conditions with primary care services must be completed by the development of coordination systems with the available social and public health services. This need is motivated by the close relation, mentioned in chapter 2, between frailty and dependence, as well as to the evolution of these patients. Figure 5.2. shows the different trajectories, taken from the clinical

practice guide on palliative care elaborated by the Ministry of Health and Social Policy, followed by people over 65 with a terminal non-malignant^{116, 117} disease until their death. Graphic C in figure 5.2. shows the most typical trajectory for a patient with multiple chronic conditions.

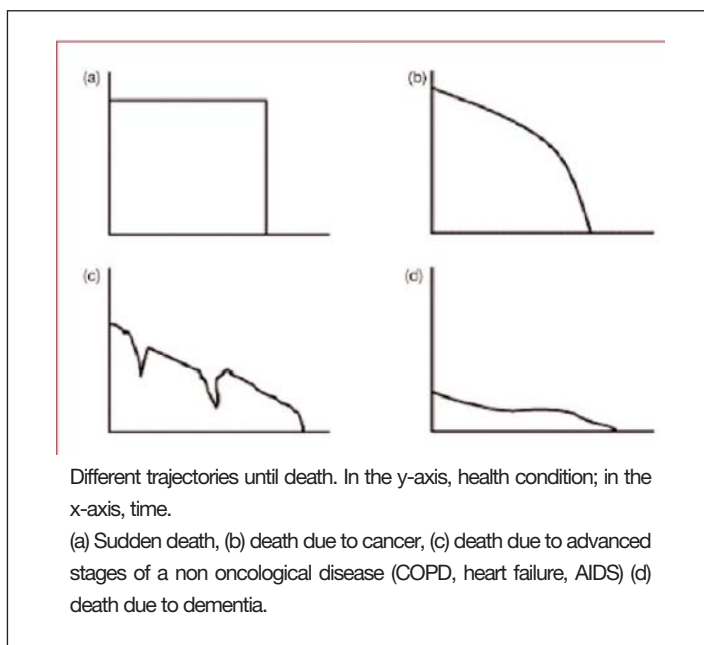


Figure 5.2. Trajectories until their death followed by people over 65 with a terminal non-malignant disease

The coordination between the unit for highly complex patients with multiple chronic conditions and public health and social resources has special relevance for early discharge planning when the patient is hospitalized¹¹⁸. Furthermore, it can offer the patient the needed support that avoids, among other benefits, **inadequate hospitalizations in general acute hospitals, situations of overload for the carer** and even therapeutic abandonment.

In the *1ª Conferencia de prevención y promoción de la salud en la práctica clínica en España (1st Conference for Prevention and Promotion of Health in Clinical Practice in Spain)*, for prevention of dependence in people advanced in years¹⁰ it is recommended the establishment of subacute units (medium-term / recovery unit) for patients with ictus, hip fracture and senior patients who show, once the acute phase of their condition has stabilized, functional impairment of their baseline clinical situation subsidiary of

recovery. It is recommended **the relation between the unit for highly complex patients with multiple chronic conditions and the units for subacute, so as to guarantee the patient with multiple chronic conditions an early therapeutic care, with the objective to reduce dependence.** These units may be in the same acute hospital where the unit for highly complex patients with multiple chronic conditions is located or close to it.

According to the **Guía de práctica clínica sobre cuidados paliativos**¹¹⁶ (Clinical Practice Handbook on Palliative Care) which recommends that “the health organizations and care services should ensure coordination among the different services and areas, and care continuity for 24 hours 365 days a year”, the unit for highly complex patients with multiple chronic conditions may carry out this function when it is integrated under other health-care systems with a wider portfolio which includes other chronic conditions in advanced stages (palliative care) or coordinated with palliative care resources of the corresponding health organization.

The coordination with social services will be based on an evaluation of the needs showed by the patient and the familiar environment, from the most basic to others such as relationships or leisure, and may include from support to personal hygiene and home cleaning, day centres, telephone assistance services, to room and board, in boarding or day care regime, training on personal autonomy and psychological and socio-labour inclusion therapy. Social services also offer services for family support, community rehabilitation, and socio-cultural workshops. Some regional governments have experience in this field based on liaison community nurse or case manager who serves as element of reference, coordination and management of the needed healthcare, or by means of the support of social workers.

The unit for highly complex patients with multiple chronic conditions must have available professionals (liaison community nurse/case manager and/or social worker) who facilitate the coordination of health, public health and social resources and care continuation.

5.6 Organization and Operation of the Unit for Highly Complex Patients with Multiple Chronic Conditions

The description of the organization of the unit for highly complex patients with multiple chronic conditions may be articulated in relation to the process of attention to patients: access to the unit, stay, and discharge from

the unit.

Throughout the follow up of management of the patient in the environment and within the unit for highly complex patients with multiple chronic conditions there are different organizational and management options. Each health organization must give priority to the most adequate options to their organizational and management systems.

- **Access must be facilitated to all patients with multiple chronic conditions fulfilling inclusion criteria to the unit for highly complex patients with multiple conditions who might benefit from this healthcare organization.**
- It should be avoided that the environmental conditions may prevent patients that fulfil the rest of the requirements from taking advantage of this caring system.
- **Primary care services play a determining role, both in the recruiting and follow-up of patients with multiple chronic conditions.**
- **Unnecessary hospitalization of these patients in conventional hospitalization units must be avoided. It is necessary that the unit for highly complex patients with multiple conditions should be in straight coordination with the A&E services of the hospital to reduce this unnecessary hospitalization.**

5.6.1. Admission to the unit for highly complex patients with multiple chronic conditions

Activation of the continuous care plan, through a cooperative decision made by the professional in charge of the patient in primary care unit and the manager of the unit for highly complex patients with multiple chronic conditions, allows access to the patient to the unit. Starting from the continuous care plan activation, the different methods to access this unit (from primary care, or the A&E services, or from other hospital units and services) have been described in section 5.5.

Admission must be as quick as possible to prevent the patient being cared at less adequate units and services, and the management of the admission must also be prompt. Thus it is recommended to decentralize the management of the admission of the patients to the unit.

5.6.2. Stay in the unit for highly complex patients with multiple chronic conditions

The patient with multiple chronic conditions uses the resources managed by the unit for highly complex patients with multiple chronic conditions or those with which the unit is combined in a flexible way, avoiding as much as possible unnecessary hospitalizations or the necessity to use A&E Services.

5.6.3. Discharge from the unit for highly complex patients with multiple chronic conditions

Deactivation of the episode of the unit for highly complex patients with multiple chronic conditions marks the discharge of the patient from the unit, restoring him to the exclusive control of primary care health services, or to the unit or service which will become responsible the patient's integral clinical management (palliative care, for example)⁽³⁶⁾, in close collaboration with the doctor responsible for the patient in primary care.

5.6.4. Essential organizational requisites

According to the needs resulting from the integral process of patient care included in the program of the unit for highly complex patients with multiple chronic conditions, the following requisites are considered essential:

- **Coordination of the unit for highly complex patients with multiple conditions with primary care services and the public health and social resources available.**
- **Design of a working schedule and procedures program of the resources of the day hospital unit which should avoid to the maximum the admission in conventional hospitals.**
- **Availability of beds in conventional hospitalization, resources in day hospital unit and examination rooms.**

(36) For example, with especially complex cases or if the unit for highly complex patients with multiple conditions does not hold support mechanisms.

- Availability or possibility of coordination with resources of the HH, palliative care and medium-term / recovery unit, as well as with social resources. The home of the patient must be considered as a recovery / therapy environment.
- It is necessary to develop and use new information technologies both to support coordination between primary care / A&E services and the unit for highly complex patients with multiple conditions, as well as to prevent unnecessary trips for patients (agenda management), or repetition of additional tests (shared clinical record), etc.
- **Mobile phone for the manager of the basic unit for highly complex patients with multiple conditions.**
- It is utterly advisable to have available computer networks that allow sharing clinical information, clinical messages, calendars and alerts in specific situations.
- Discharge reports of the unit for highly complex patients with multiple conditions must include an action plan with references to the therapeutic objectives and clinical follow-up, especially in those cases in which comorbidity or prognosis recommend individualizing the therapeutic objectives for the chronic conditions of the patient.

5.7. Management Structure of the Unit

In case that a hospital holds more than one unit for highly complex patients with multiple chronic conditions it is recommended the creation of some kind of structure, such as clinical management unit, service, etc. that provides value to the set of basic units for highly complex patients with multiple chronic conditions of the hospital, for example with regard to their coordination. This organizational structure may improve aspects such as the development and unifications of care protocols, coordination with other units (A&E Services, primary care, HH, palliative care, medium-term units) and improve the use of resources linked to the unit for highly complex patients with multiple chronic conditions. This structure may also promote the continued training of the staff of the unit and the development of teaching and investigation activities. This structure must work on the management of care quality and safety of the patient.

The essential element of the management of the unit for highly complex patients with multiple chronic conditions is the direct relation of the doctor of this unit with the doctors responsible for these patients in primary care. Under no circumstances the management structure must interfere in the direct cooperation between the manager of the basic unit for patients with multiple chronic conditions and those in primary care.

In the management structure there should be identified the following professionals:

- A manager (among the doctors assigned to the unit for highly complex patients with multiple chronic conditions) with partial or total dedication, depending on the work load estimated for the managing tasks. The manager is the ultimate responsible of the unit for highly complex patients with multiple chronic conditions management, and therefore, of the human and material resources assigned to the unit.
- A nursing manager (from among the nursing professionals assigned to the unit for highly complex patients with multiple chronic conditions) with part time or full time dedication, depending on the work load estimated for the nursing management of the unit.
- A person responsible for the case managers/ liaison community nurses or of the social workers bound to the unit for highly complex patients with multiple chronic conditions.
- It can be considered the identification of a manager, it can be part-time, for every horizontal hospital service (economic-finance, personal, general services, etc.) which may provide support to the unit⁽³⁷⁾.

5.8 Organizational and Operational Manual

The unit for highly complex patients with multiple chronic conditions should have an organization and operation manual including a description of the healthcare offered, the care process, the protocols, as well as every reporting chains. It will include the following documentation:

- a) Organizational chart of the unit.
- b) Healthcare modalities and service portfolio.
- c) Location and unit resources.
- d) Procedures, activities and protocols:
 - Continuous care plan
 - Other coordination tools with primary care and other hospital units or services, public health or social, including

(37) The service of internal medicine from the Nuestra Señora del Rocío Hospital has been organized in relation to a unit for highly complex patients with multiple conditions.

continuing care services (integrated care plans¹¹⁹, or similar).

- Description of the activities of the care process.
- The necessary protocols and the situations in which these protocols should be introduced in the care network.
- Staff involved and reporting chains.

The manual must respect the general management requirements described above.

The manual should be open and subject to update, incorporating any changes made in the service portfolio or when required by any structural or functional changes.

A. Organizational chart

There has to be a clinical manager and a nursing manager.

Responsibilities, hierarchies, tasks and competences of each member of the unit for highly complex patients with multiple chronic conditions must be clearly defined.

B. Healthcare modalities and service portfolio

The service portfolio of unit for highly complex patients with multiple chronic conditions has two different levels.

- Level 1: healthcare possibilities offered in the unit (section 5.2.)
- Level 2: processes and procedures performed by each healthcare system (for example, annex 7 for procedures carried out in day hospitalization)

C. Location and unit resources

The operational and organizational manual must include:

- Location of the unit for highly complex patients with multiple chronic conditions and connexions with other hospital areas.
- Description of structural resources available for the unit for highly complex patients with multiple chronic conditions.
- Description of available equipment.

D. Regulations manual

The structural and organizational requisites as well as the protocols that take part on the care process are summarized below, following the circulation flow of patients described in section 5.4.:

Type of healthcare	Actions	Structural requisites	Protocols	Staff ⁽³⁸⁾
Consultation	<ul style="list-style-type: none"> - Care to clinically unstable patients. - Diagnostic assessment of prompt resolution. - Follow up of early discharges. - Follow-up of patients with multiple chronic conditions with an active condition in need of frequent controls. 	<ul style="list-style-type: none"> • Specific room for consultation. • IT systems, computer networks. Allowing clinical reports. Helping diagnosis with programs of functional scores. • Direct phone line. • Mobile telephone. • Fax. 	<ul style="list-style-type: none"> - Continuous care plan. - Care process integrated to the patient with multiple chronic conditions (or instruments used by the health services or health organization for the continuous care management of these patients) - Other clinical management instruments (clinical practice handbook, etc.). 	<ul style="list-style-type: none"> • Medical staff • Nursing staff • Auxiliary staff
Day Hospitalization	<ul style="list-style-type: none"> - Specific procedures. - Blood products transfusions. - Intravenous perfusion of more than 15 min. <ul style="list-style-type: none"> Gamma globulins Iron Antibiotics Immunosuppressive and high-dose corticoid therapy Analgesics, etc. - Large volume paracentesis - Large volume thoracentesis. - Specific minor surgeries. - Other (Annex 7) 	<ul style="list-style-type: none"> • Polyvalent medical³ DHUs, or • DHU beds/chairs integrated in the unit for highly complex patients with multiple chronic conditions (see section 5.1. and annex 11 Functional Program) 	<ul style="list-style-type: none"> - Patient identification. - Standard care plan. - Procedures for specific protocols. - Transfusion of blood products. - I.V. perfusion. - Paracentesis. - Thoracentesis. - Evaluation and discharge from DHU. 	<ul style="list-style-type: none"> • Medical staff • Chemist. • Other specialists (blood bank). • Nursing staff. • Auxiliary nursing staff. • Administrative staff. • Additional auxiliary staff.

⁽³⁸⁾ The carer does not belong to the staff of the unit but he/she takes part actively and thus his/her specific needs (training, support, etc.) should be taken care of.

Type of healthcare	Action	Structural requisites	Protocols	Staff
Conventional hospitalization	<ul style="list-style-type: none"> - Continuous care and monitoring. 	<ul style="list-style-type: none"> • Rooms / conventional hospitalization beds allotted to the unit for highly complex patients with multiple chronic conditions. 	<ul style="list-style-type: none"> - Patient identification. - Discharge planning. - Care plan. - Protocols for specific processes and procedures. - Assessment. - Discharge report. - Continuous care report. 	<ul style="list-style-type: none"> • Medical staff. • Nursing staff from the unit for highly complex patients with multiple chronic conditions. • Liaison community nurse or case manager and/or social worker. • Staff from other hospital services and units.

5.9 Patient Management

5.9.1. Admission

Admission will be part of the general admission procedures of the centre. However, activities and functions related to it should be, ideally, performed by the administrative support service of the unit for highly complex patients with multiple chronic conditions. All aspects relating to the clinical records, patient records, discharge report, and data protection belong to the general hospital to which the unit is related to.

5.9.2 Documentation and clinical record

Clinical documentation refers to the documents resultant from the care process, regardless their format or medium.

Clinical documentation will be handled by the admission and clinical documentation unit or equivalent. Handling will involve creation, safekeeping, lending, copying, follow-up, and processing of any clinical document.

Clinical documentation must be kept so as to ensure a correct and safe condition for an appropriate period of time, and at least for five years from the date of completion of the corresponding care process.

5.9.2.1. Clinical records

All patients must have individual clinical records which will be shared between medical staff, centres and healthcare units. Moreover, they should meet the technical compatibility requirements established by each Regional Health Authority.

Clinical records may be in paper, digital, electronic or telematic format; and they must guarantee complete access to all information at all times. As far as the design, minimum content, requisites, guarantees and uses of clinical records are concerned, the provision of the Act 41/2002 (November 14th) on “Autonomía del Paciente y de Derechos y Obligaciones en Materia de Información y Documentación Clínica” (Patient Autonomy Rights and Obligations regarding Clinical Documentation and Information) shall apply.

Each healthcare centre must have a unique clinical record register which will centralize all the data of the activities conducted in that centre. This register will be managed in accordance with a protocol that guarantees that the information can be traced and located and that it includes written criteria on document filing, safekeeping and access.

In some cases⁽³⁹⁾, healthcare episode repetitions on a short period of time may complicate clinical record management, causing frequent and little functional record transfers. A possible exclusively logistic solution could be the provisional storage at the unit for highly complex patients with multiple chronic conditions of the clinical records of those patients under these circumstances provided that the unity of the clinical record is respected; its management is centralized under the responsibility of the central archive; and the record is available for any other hospital service or unit that may need it on the same conditions of other records.

5.9.2.2. Identification of patients with active continuous care plan and register of cared of patients

The IT system of the hospital must allow other hospital services and units (such as the A&E services) to identify the situation of patients with an active continuous care plan in order to allow immediate interconsultation

⁽³⁹⁾ For example in hospitals with conventional clinical records (in paper), as the computerization of the record provides a complete solution to this problem, among many other advantages.

with the unit for highly complex patients with multiple chronic conditions.

The patient register shall contain all the necessary data to ensure the correct identification of the patient, the corresponding care process and the insurance information. At least, these minimum data should be recorded:

- Identification of hospital or health care centre.
- Identification of patient (full name).
- Date of birth.
- Sex.
- Address.
- Insurance and, when appropriate, medical card number.
- Date of admission and care provision.
- Circumstances of admission or of care provision.
- Process/es.
- Procedure/s.
- Date and, when appropriate, destination of transfer.
- Date of medical discharge.
- When appropriate, discharge from continuous care plan.
- Comprehensive assessment report (under the circumstances summarized in section 5.1.1.).
- Circumstances of discharge.
- Identification of the doctor signing discharge report.
- Identification of designated reference hospital nurse, as well as primary care professional in charge of the patient and, when appropriate, liaison community nurse, case manager or similar resource.

5.9.2.3. Discharge report

Upon completion of the care process or transfer to another healthcare centre, patients or, when appropriate, carer or relative, are entitled to receive from the unit for highly complex patients with multiple chronic conditions the medical discharge report contemplated in the “Ley Reguladora de la Autonomía del Paciente y de derechos y obligaciones en materia de información y documentación clínica” (Act on Patient Autonomy Rights and Obligations regarding Clinical Documentation and Information)⁽⁴⁰⁾. Moreover, the nursing discharge report will be attached to ensure care continuity.

⁽⁴⁰⁾ Single transitory provision. Discharge report. “Discharge report shall be governed by the provisions of the Ministerial Order of the Ministry of Health of September 6th 1984, until the provisions of article 20 of this present law are developed”

5.9.3. Health data protection

5.9.3.1. Obligations and rights

Personal data related to patient health are classified as special protected data in observance of the Organic Law 15/1999, December 13th, on “Protección de Datos de Carácter Personal” (Personal Data Protection).

Healthcare centres shall take all the organizational, procedural and technical measures necessary to guarantee the safety, confidentiality and integrity of all data regarding patient health, and to facilitate the exercise of the right of access, rectification and cancellation of such information.

5.9.3.2. File manager

All centres and institutions shall ensure that all files, automated or not, are kept safely and in good condition.

Healthcare centres shall designate a file manager to be in charge of automated files, appointment which will be notified to the corresponding authorities. The file manager as well as all those involved at any point with the processing of patient data shall comply with the professional secrecy rule.

5.9.3.3. Data confidentiality

All patients are entitled to confidentiality about their health state, according to the provisions of the “Ley Reguladora de la Autonomía del Paciente y de Derechos y Obligaciones en Materia de Información y Documentación Clínica” (Act on Patient Autonomy Rights and Obligations regarding Clinical Documentation and Information).

5.9.3.4. Data transfer

Any transfer of patient data needs the express consent of the people involved with the exemptions contained in the health and data protection legislation.

5.9.4. IT System

IT system will be part of the hospital general IT system and it should meet the unit for highly complex patients with multiple chronic conditions requirements: patient management, clinic workstation, and economic and administrative general services management.

- Patient management:
 - Personal details.
 - Appointment.
 - Admission.
 - Discharge and coding.

The IT system must allow: identification of the patient with multiple chronic conditions; identification of those patients with multiple chronic conditions with active continuous care plan; and the delimitation of the episodes of the unit for highly complex patients with multiple chronic conditions and the processes (conventional hospitalization, HH, DHU session, consultation) integrated in each episode.

Unlike conventional hospitalization activity or day surgery, there is not, at the Spanish National Healthcare System, a universal coding system for the processes conducted at DHU. The Health Service of Andalusia codifies DH activities under a Minimum Data Set⁽⁴¹⁾. Therefore, in the document of standards and recommendations for DHU elaborated by the Quality Agency of the Ministry of Health and Consumer Affairs, it is recommended “the development of a unique DH⁽⁵⁾ activity codifying and registry database system for the Spanish National Health Service, including private hospitals”. This same recommendation should be extended to other health-care modalities which may be included in the unit for highly complex patients with multiple chronic conditions portfolio, such as HH.

- Clinical record management
- Clinic workstation:
 - Electronic patient record.
 - Departmental applications (Laboratory, Medical Image diagnosis...)

⁽⁴¹⁾ Andalusian Health Service. General Directorate for Health Assistance. E.A. Section. Health System Management. “Manual de Instrucciones del CMBD Hospitalización, Hospital de día quirúrgico y Hospital de día médico” (Instructions manual of the Minimum Data Set Hospitalization, Day Surgery and Medical Day Hospital). Andalusia, 2007.

- Economic and administrative general services management⁽⁴²⁾:
 - Storeroom (supply agreements, inventory management, purchase orders, etc.)
 - Pharmacy (electronic prescription system; unit-doses; medication conciliation system)
 - Accounting.
 - Sterilization.
 - HR management (short-term disabilities, incidents, leaves, substitutions, etc.).

- Assessment (management):
 - Costs per procedure (cost accounting).
 - Satisfaction surveys.
 - Activity indicators.
 - Quality indicators.
 - Performance indicators.

⁽⁴²⁾ Economic and administrative management will be centralized, being some of the proceedings performed at the unit for highly complex patients with multiple chronic conditions.

6. Physical Structure and Material Resources.

This chapter deals with the criteria and recommendations related to the structural and functional condition of the unit for highly complex patients with multiple chronic conditions: its functional design programme, its equipment and facilities.

Annexes 10 and 11 provide information in direct relation with this chapter: resource sizing criteria (annex 10) and a sample of a functional design programme for four units for highly complex patients with multiple chronic conditions (annex 11)

6.1. Functional Design Programme

The set up of a unit for highly complex patients with multiple chronic conditions needs a previous configuration of the functional design programme which spreads from the analysis of the aspects provided below which would allow identifying the target population for such units, setting the service portfolio, quantifying the resources which correspond to each healthcare unit, defining their relations and adapting them to the management and organization structure described in chapter 5 of this document.

- Demographic analysis and identification of the surrounding area of the unit.
- Analysis of the primary healthcare resources related to the hospital and the unit.
- Patient selection criteria.
- Estimation of the theoretical demand of each of the healthcare possibilities of the unit. The unit's possible penetration in the area once it is fully operative should be taken into account.
- Analysis of the architectonic support where the activities of the units will be developed (either a new infrastructure or the adaptation of a former one).
- Analysis of the production capacity, according to scenarios of higher and lower efficiency.
- Analysis and definition of the service portfolio of the unit.
- Analysis and definition of the relations of the unit with other units.
- Study of the staff and equipment requirements depending on

demand, the estimated volume of activity and the service portfolio of the hospital in which the unit is located.

- Set up of the functioning criteria with reference to the standards manual and specifying the circulations flows of patients, staff, carers and supplies.
- Set up of the caring circuit (patients access, administrative procedures of the patient's admission, transfers within the unit, possibilities when discharged, etc.), the types of medical care after being discharged and the functional relations with the other structures of their environment (central services, A&E services, primary health-care, etc).
- Functional programme.
- Economic study which will include the budget considered for infrastructure and equipment as well as an estimation of the expenditure for staff, supplies and maintenance of everyday activities, and the economic and caring impact of its operation in the institution from which it depends.

6.1.1. General remarks

The aim of the functional design programme is setting up a specific environment appropriate for the characteristics of highly complex patients with multiple chronic conditions which will be cared at the unit and for the treatments that they have to undergo for which it will be necessary facilities and equipment appropriate to the service portfolio and to the level of activity expected from the unit.

The structural characteristics of the unit are determined by its health-care purposes. Therefore, it should be taken into account that it is a unit that provides multidisciplinary care by means of a broad set of healthcare possibilities appropriate to the requirements of the patient, under a functional scheme characterized by the need of cooperation with the primary health-care, by the use of different hospital services such as conventional hospitalization or day services (day hospital or outpatient consultation), by the deep coordination with other hospital units through the interconsultations or with the patient transfer/care criteria at the A&E services or therapy and by the integration or coordination with home hospitalization or public health services.

Integration may be settled at different levels, depending in the level of activity and in the resource sizing of the unit, or in the available resources of the unit and the hospital in which it is placed. It is fundamental, at a

management level, and advisable at a structural level, as the proximity of the available means contributes to its optimization and allows that the attention paid to the patient be adequate to his/her need at each specific time.

Therefore, and whenever compatible with the resulting sizing based on the calculation of the estimation of the demand and whenever there are no architectonic deciding factors, it is recommended to use as reference for the set up of a unit for highly complex patients with multiple chronic conditions the structural integration of all the healthcare services included in its service portfolio. In any case, the unit would have at least:

- Conventional hospitalization, to treat patients who need assessment, care, follow up and treatment 24 hours a day.
- Day hospital beds/chairs for the administration of treatments or to carry out diagnostic tests to those patients who may require for a few hours, medical or nurse care, including recovery prior to discharge without the need of being admitted into hospital.
- Outpatient consultation for the diagnosis, treatment or follow up of patients.

The functional design programme of the unit should be drawn up from the model of the hospital or service in which it is integrated, once its service portfolio is set up and its volume of activity calculated, analyzing any structural deciding factor and once the relations with other units (palliative care, home hospitalization are established).

There are below identified some criteria that may guide in the structural definition of the different resources that have any relation with the unit.

- The healthcare areas, mainly the day hospital unit, which patients and carers must access easily from the outside.
- Minimize patient and staff circulation within the hospital and at the different services of the unit, reducing its impact in other areas of the centre.
- Identify undesirable crossing between patients, staff or supplies flows so as to avoid them.
- Make mobility of healthcare staff of the unit easier between the different resources of the unit and thus reducing the time devoted to it.

Physical areas should be identified and distributed taking into account the programme of activities and allotting, whenever possible, specific

resources, which will contribute to improve healthcare quality, patient's safety and caring control.

Two caring areas should be distinguished: one allotted to conventional hospitalization, being the bed its main resource, and the other one, allotted to outpatients and day unit which would include outpatient consultation and day hospitalization and whose basic resources are the examination room and the bed/chair of the day hospital.

The development of the unit's activities require, apart from above mentioned caring areas, an access and reception area in connection with the day unit and an administration and support area for staff which should have an easy access from conventional hospitalization and day hospitalization.

Thus, the unit for highly complex patients with multiple chronic conditions will include the following four areas:

- Conventional hospitalization, which includes the nurse station and the nurse utility rooms.
- Day unit, and the necessary caring areas for the examination, treatment, recovery (DH) and consultation.
- Access and reception, including the waiting rooms and the admission area.
- Offices and staff utility rooms.

Physical support areas necessary for the appropriate operation of the healthcare areas will be shared, whenever it will imply an advantage derived from the economy of scale.

The functional programme of the unit will consider the conditions of the premises which will guarantee the patients' right of intimacy and dignity.

6.1.2. Structural aspects of the unit

The structural and equipment resources of the unit will be in direct relation with the characteristics of the clinical activity and the degree of autonomy that it needs in relation with the existent resources of other hospital units.

This section includes the general criteria for the functional programme of the unit while annex 11 of this document provides an example of a functional programme for a conventional hospitalization unit with 33 beds (22 rooms, where 50% are allotted for individual use), 6 day hospital beds/chairs and 2 outpatient consultations⁽⁴³⁾.

There are provided below a description of the main structural and

functional characteristics of the different areas that set up the unit:

- Admittance and reception.
- Day hospital.
- Conventional hospitalization:
 - Patients and carers.
 - Nurse station.

6.1.2.1 Entrance, hall, reception and resting / waiting room

It is used for patients and escorts' entrance and for the activities related with their reception and admission (including, when necessary, the proceedings for the administrative discharge at the end of the episode), the waiting times for patients until they are taken care of and, when necessary, for escorts, during treatment and recovery until the patient is discharged.

This area would have the following characteristics and premises:

- Entrance:

- The day unit of the unit for highly complex patients with multiple chronic conditions should have the appropriate signing which would allow identifying easily its entrance from the outside.
- The signing of the unit should include the name of the manager of the unit and activities of its service portfolio.
It is important to difference the entrance of outpatients (those taken care of at the day unit) from those who are hospitalized.
- It is advisable that access from the outside to the day unit of the unit for highly complex patients with multiple chronic conditions should be made by means of automatic doors which would permit vision in both senses.
- It is advisable to difference the access of staff to the unit and the entrance point of equipment and materials (supplies, food, pharmacy, linen, waste, etc.) from the access of the patients and their escorts.
- Users and patients of the unit should have general information of the unit in its entrance point(s).

⁽⁴³⁾ Resource sizing of the unit depends on the healthcare organization in which it is included the service portfolio, the organization of the primary healthcare, etc... For a basic unit with an allotted population of 40.000 people ($\cong 8.000 \pm 1.500$ of people over 64) and a service portfolio aimed for patients with multiple chronic conditions which implies $\cong 8$ beds in conventional hospitalization; 1,5 beds/cubicles at day hospital; $y \frac{1}{2}$ outpatient consultation /day. The functional programme and the resource sizing of annexes 10 and 11 correspond, therefore, to a functional group of 4 units for highly complex patients with multiple chronic conditions.

- Hall and reception:

- Entrance hall will be wide and would allow the easy flow of patients and escorts.
- It is advisable the existence of a specific reception, admission and information area of the unit for highly complex patients with multiple chronic conditions, placed at the day unit.
- The day unit of the unit for patients with multiple chronic conditions would have a reception desk, placed so that it is easily located and accessed from the main entrance, for patients and escorts. Reception staff must control the desk of the main entrance and the flow of the members of the public.
- It is recommended that all administrative proceedings related with the care attention of the patients of the unit (insurance, admission, scheduling, discharge, etc.) should be carried out, whenever possible, at the admissions desk, guaranteeing a certain degree of privacy.
- The administrative area will have the necessary equipment for the effective performance of its activity (office automation, computers, e-mail, telephones, fax, and answering machine for out-of-office service) and will foresee the enough area to storage specific documentations: protocols, booklets, etc.
- Receptions and hall should have furniture to store and provide patients, when necessary, with the general or specific documentation of the unit: protocols, booklets, etc.

- Resting room/waiting room:

- There should be a specific area for resting and waiting for patients and staff, by the reception area. This resting and waiting room will be access, preferably, from the entrance hall, it would have direct eye contact with the reception desk and would allow access to the healthcare services of the day unit (day hospital and examination rooms).
- The resting room/waiting room will be comfortable. It will have a telephone, a television and an automatic cold water fountain.
- The resource sizing of the waiting area will be based on the estimation of the daily activity of the unit, with a preview of 1.5 comfortable seats (waiting times might be lengthy) per patient cared at any area of the unit, including hospitalized patients when the resting room/waiting room is a shared area by the day unit and

the conventional hospitalization unit of the unit for highly complex patients with multiple chronic conditions.

- Toilets:

- Access to public toilets will be guaranteed from the waiting room/resting room allotted for patients and escorts.
- The number of toilets would be in direct proportion with the capacity of the waiting room.
- The toilet area must be disabled friendly.

Area	Purposes	Characteristics
ACCESS	Allows access to admission and waiting areas	<ul style="list-style-type: none"> • Appropriate signposting. • At street level, if possible. • Short distances if accesses are shared. • Easy access for disabled. • Different circulation flow for supplies and equipment.
HALL / RECEPTION	Patients and escorts' attention during admission and reception proceedings.	<ul style="list-style-type: none"> • Appropriate sizing. • Should guarantee a certain degree of privacy. • Appropriate equipment: office automation, telephones, Computers, answering machines, fax, etc. • Easily located. • It should allow reception staff see, while seated, the unit entrance and the waiting room.
RESTING / WAITING ROOM	Allows patients and escorts be in the better comfort conditions.	<ul style="list-style-type: none"> • Comfortable (possible lengthy waits). • 1.5 comfortable seats per patient cared at the unit. • Public phone. • Television. • Cold water fountain.
TOILET	For patients and escorts during waiting times.	<ul style="list-style-type: none"> • With basin and toilet. • Disabled friendly. • In a proportionate number with the size of the waiting room.

6.1.2.2. Day unit

It includes the areas in which day surgery care to highly complex patients with multiple chronic conditions is carried out.

It is an area which should always have a good communication with the conventional hospitalization unit. The level of connection or integration between the hospitalization unit and the day hospital unit will be settled once the total activity of the unit and of each of its services is estimated and once its sizing is valued. The integration of the day surgery unit and the hospitalization unit should be considered, mainly when its global activity is reduced because the location of the beds/chairs of the day surgery unit and the examination rooms and beds of the hospital unit integrated in the same area make staff and patient circulation flows easier, as well as the management of the resources of the unit for highly complex patient with multiple chronic conditions.

A flexible design is recommended to allow its adaptation to the different requirements of the treatments.

The day hospital unit will have the following characteristic and premises:

- Examination room:

- The care process of highly complex patients suffering from multiple chronic conditions implies consultations, mainly high resolution consultations, which include examination, diagnosis and the establishment of therapeutic treatments as well as the performance of diagnostic and/or therapeutic procedures. Moreover, it is necessary to provide the patient with the necessary information and obtain his/her consent.
- All these processes are performed in the examination room. The number of premises devoted for examination rooms are related to the volume of activity and to the working hours.
- The examination room should allow all these processes to be performed. A unique door provides optimal intimacy conditions and allows a better versatility in an area which is more flexible functionally speaking.
- The examination room must have the appropriate size to include the doctor, the nursing staff for the necessary diagnostic and therapeutic procedures, the patient and, when necessary, an escort.
- It must have office furniture (desk, armchair and chairs) a couch accessible from both sides and isolated by means of curtains or

folding screens and the necessary hospital furniture to hold disposable material and the equipment to be used during consultation.

- For bigger units, there should be considered the possibility of a circulation system between adjacent examination rooms to allow the circulation of healthcare staff. Communication makes patient's privacy more difficult and requires more space.

- Cubicle for blood tests:

- Fitting out a cubicle for blood test is recommended; it should have the appropriate conditions for obtaining biological samples and for sending them to the laboratory.

- Day hospital beds/chairs:

- Day hospital bed/chairs are specialized spaces (beds or armchairs) allotted to hospital care that lasts for a few hours, either for diagnosis, clinical investigation and/or multiple examination as well as for treatments that cannot be performed at outpatient consultation but which do not require a full stay in hospital.
- The patient may access directly a bed/chair of the day hospital unit from the waiting room without having to go through consultation before.
- Recovery generally takes place in the same service where treatment is administered.
- In some occasions, once the bed/chair of the day hospital unit has been left free even though the patient cannot be discharged yet and whenever the patient conditions allow it, patients may wait at the common waiting rooms (e.g. until they attend consultation or they receive a certain clinical information) and they leave the day hospital bed/chair free so that it may be used by another patient.
 - Beds/chairs at day hospital may be fitted out at common wards or at individual rooms, according to the characteristics of the treatment.
 - In common wards, the area allotted for the bed/chair should take up, at least, an area of 3x2.5m.
 - The bed/chair at day hospital must allow healthcare staff reach patients in the easiest way as possible.
 - Day hospital bed/chair will have oxygen and vacuum intakes, beds or armchairs for treatment, according to the different necessities, should be adjustable and there should be a table with enough space to keep personal belongings

with an overbed frame to lay trays. There should be enough additional space for a chair (for an escort, if necessary).

- Each will have all the necessary electric systems both for lighting and for the medical-electric equipment which treatments, or the recovery from them, may require.
- All areas should have a control to call nursing staff, to regulate lights and, when necessary, a TV remote control.
- Standard procedures may require negatoscopes (in newly built facilities working stations with the appropriate software for looking up clinical records and radiographic images), exploration lamps and CPR equipments (for eventual complications).
- All beds/chairs should have accessible and clearly marked units for hand cleaning with alcohol-based solutions.
- Cubicles should be conveniently isolated by means of curtains, folding screens or fixed partitions. When possible, patients should have natural lights and views to the outside, though always with the guarantee of privacy when treatment may require son.
- Availability of TV sets in all cubicles will be an asset.

- Changing rooms:

- The day hospital unit will have changing rooms placed by the cubicles used for treatments.
- They will be separated by sexes and they will have enough room for lockers to storage clothes and personal belongings.

- Toilets for patients:

- The day hospital unit will have toilets for the only use of patients, placed by the changing rooms, with similar characteristics to the public toilets and a size proportionate to the size of the unit.

Table 6.2 Structural and functional characteristics of the day hospital unit		
Area	Purpose	Structural characteristics
EXAMINATION ROOM	Exploration, diagnosis, patient selection after clinical evaluation and explanation of therapeutic guidelines. Information and support.	<ul style="list-style-type: none"> • Number of examination rooms according to the performance. • With the necessary equipment and facilities to assure its operation with the adequate private conditions. • Flexible structure appropriate to the needs of the different specialities performed at the unit. • Surgery consultation rooms, minor surgery rooms and information offices could be fitted out according to necessities.
CUBICLE FOR BLOOD TESTS	Utility room for the nurse consultation room or as the place to obtain biological samples. Appropriate to obtain samples and to prepare them before sending them to the central laboratory.	
DAY HOSPITAL UNIT BED/CHAIR	Treatment administration and when necessary, patient recovery.	<ul style="list-style-type: none"> • It may undergo different shapes using as main support treatment chairs and beds, according to the characteristics of the procedure. • In common wards (equipped to guarantee privacy and dignity) or in individual rooms. • With the necessary equipment and facilities for its operation, with flexible structure, adequate to give support to the broad range of procedures, according to their functional requirements
CHANGING ROOMS	For patients to get changed and for keeping belongings safe while treatments are performed.	<ul style="list-style-type: none"> • By the treatment units and the consultation rooms. • Independent (men and women). • With lockers for personal belongings.
TOILETS FOR PATIENTS	For patients and escorts during waiting times.	<ul style="list-style-type: none"> • Placed by the changing rooms. • With WC and basin. • They must include a toilet for disabled. • Proportionate number to the number of consultation rooms and places at the DHU.

6.2.1.3 Conventional hospitalization

The role allotted to hospitalization during the healthcare process at acute care hospitals has changed considerably during the last decades. The appearance of new healthcare possibilities, as day surgery, day hospitalization, or of high resolution consultation, parallel to the technologic evolution and to the resulting source of new diagnostic or therapeutic techniques, has allowed the setting up of episodes more intense in time and, progressively, less invasive for patients.

Units for conventional hospitalization are out of the scope of this document on standards and recommendations. Thus, there have been included in this chapter a set of appropriate areas for care and for the utility rooms more common in conventional hospitalization, arranged within a unit for highly complex patients with multiple chronic conditions so that the proposed design is compatible with any of the management solutions that may be put into practice.

The basic resource for conventional hospitalization is the bed, so that the establishment of the caring activities to be performed around it will determine the physical characteristics of the areas allotted to the treatment of patients and the performance of procedures that implies this type of healthcare.

The area of hospitalization has the following general characteristics:

- The nurse station must be close to the users access from the outside (patients and escorts) while the entrance corresponding to the internal circulation (staff and patients) can be placed a little further from the nurse station.
- Flows. There are two types of flows: external (visits of relatives and escorts) and internal (patients in bed, staff, supplies and support services). Both circulations should be independent. Circulations passing through other units should not go through the unit.
- Orientation. Whenever possible, rooms aimed at inpatients as well as caring staff work areas should have the better orientation and natural lighting.
- Views. Patient rooms must look to the outside, which allows reducing anxiety. Whenever possible view to the outside from the head of the bed should be provided (size of open areas in the façade).
- Noises. The location of the unit will depend on the level of existent

noises which might be foreseen in the different areas of the allotted space.

2.a. Area for patients and escorts:

- Room for patients:

It is getting higher the volume of caring activities performed at the patient's room while he/she is at hospital, a period of time which should be as shorter as possible. Moreover, the level of comorbidity, frailty and disability of the patient with multiple chronic conditions that is at hospitals is, as a general rule, high and thus it will demand a high level of attention and care, which will imply and intensive use of human and equipment resources.

On the other hand, it should be taken into account the presence of the relatives and carers who are getting more trained and are more involved to collaborate in the caring process of patients with healthcare staff.

The activities that take place in the patient's room may be gathered under the following categories:

- Patient care and treatment; training:
 - Consultation and examination
 - Medical procedures, nurse care and observation.
 - Therapy
 - Patient and carers teaching and training
- Personal care:
 - Catering
 - Cleanliness
 - Leisure and entertainment
 - Visits
- Support activities:
 - Diagnostic and/or therapeutic procedures.
 - Clinical registries
 - Communications
 - Care staff training

To perform these activities the room must have enough space to take care of the patient from both sides of the bed, the necessary area for circulation and the use of medical equipment, gurneys and chairs for carrying patients.

The room should have a resting area for patients and escorts and/or carers.

Rooms may be single or double. Single rooms offer more intimacy conditions for the patient and, as a general rule, the free area around the bed is bigger than in the double room, so that the staff work is easier and habitability conditions for escorts, carers and visitors are better.

However the necessary total area for hospitalization units with single rooms, with the same number of beds and, proportionally, with the same building and maintenance costs, is considerably higher than in hospitalization units with double rooms.

The solution taken will depend on the specific conditions of each project, either if it is newly built or if it implies the refurbishing of existing facilities. However, it is recommended the adoption of modular solutions, the more flexible the better, considering the quick evolution of technology and the changing nature of the needs.

An example of this type of solutions, which maintains the physical structure of other hospitalization units, even though in some case the inside distribution and some premises may differ and which allows an easy adaptation of the volume of the equipped resources to the evolution of the caring demand is included in annex 11 of this document, which offers a functional design programme, with a hospitalization area with double beds, some of which are allotted for single use.

The patient's room will have the following equipment:

- Bed, with wheels, articulated and adjustable, preferably electric or pneumatic.
- Wardrobe.
- Table with overbed frame.
- Reclining chair for the patient.
- Armchair for the carer or escort (appropriate for lengthy stays).
- Table for the patient with enough room to store personal belongings.
- Light in the headboard
- Integrated call and communication system which should include:
 - Electric intakes for electromedical equipment.
 - Light control.
 - Nurse call communication system with light.
 - Audiovisual aids control systems (radio, TV, video, earphones...)
 - Voice and data network intake (telephone, internet... appropriate both for staff at a clinical unit as for patients and/or escorts).
- Oxygen and vacuum intakes with flowmeter and vacuumeter.

This equipment should be double at double rooms. In this case there should be placed curtains that may allow the visual separation of patients and which may provide the intimacy necessary during examination, care and the performance of diagnostic and therapeutic procedures. It is advisable that curtains should be washable, waterproof, and fireproof, and if they hang from the ceiling they must provide the necessary lighting and ventilation to keep an adequate atmosphere in each bed.

Rooms will have, under all circumstances, fire safety systems in accordance with the current legislation.

All rooms for patients, either single or double, will include a toilet adapted for disabled patients in wheelchairs with the help of staff. They will have a shower (low entry shower tray, wide and non-slip), basin, toilet and a bedpan cleaner. Noise created by these elements will be taken into consideration.

Toilets would have utility ducts that would provide independence within the unit and which would be easily accessed from the outside to make maintenance easier.

- Information office:

For healthcare staff to provide patient's relatives and escorts detailed information of the care process with the adequate privacy conditions.

- Resting room for inpatients:

With the necessary equipment to provide rest and comfort during lengthy stays.

Depending on the sizing of the unit and of the structural possibilities, the information office and the resting room for inpatients could be specific for the hospitalization area or shared with the day hospital unit. In this case, there should be avoided possible circulation crosses between outpatients and the internal flows of healthcare staff and support activities of hospitalization.

2.b. Nurse station and utility rooms:

It includes the set of material resources allotted to the observation of patients while they are hospitalized and/or they receive care and recover from them, to the care planning and to other nurse administrative tasks, as well as the necessary utility rooms (management and, when needed, storing of drugs, materials, equipments, linen and food).

- Nurse station:

The hospitalization area will have a control for the nursing staff work which will be placed close to the outer access to the unit and will include the necessary areas for the development of support activities placed around the station.

The station will have a desk to write and will have the necessary installation for the communications equipment, including the reception unit for nurse calls system. It should have enough space to store work material. It must have a working area for staff and will have a clinical station with access to the IT system of the hospital, and when available, to the computerized clinical record working software.

- Nurse resting room, by the station, so that it allows staff resting compatible with the follow up of the unit and with quick access to the patients' room if necessary.
- Minor surgery and procedures room, with the necessary equipment to care patients.
- Assisted toilet.
- Supplies store room, for the preparation and handling of medicines, waste and for classifying it, for handling food and for storing cleaning material.
- Utility rooms for linen, disposable material, equipment and with enough space for wheelchairs.

It is recommended that the utility rooms should be provided with all available advances in logistics (e.g. pneumatic tubes, double-box multi-storage system, automatic medicine dispensers or, failing those, unit-doses devices), in cooking (e.g. isotherm trays or rethermalisation units for food prepared on cook-chill units) and waste disposal.

Table 6.3 Structural and physical characteristics of the hospitalization area.		
Area	Purpose	Structural characteristics
PATIENT'S ROOM	For stays of patients with a high level of dependence, during hospitalization through which there will be performed clinical treatment and care activities, personal care and support to the medical care.	<ul style="list-style-type: none"> • With enough space to reach the patient from both sides of the bed, including the necessary space for circulations and the use of medical equipment, gurneys and chairs to transfer patients. • With an resting area allotted for patients and escorts and/or carers in which there will be resting armchairs.

Area	Purpose	Structural characteristics
		<ul style="list-style-type: none"> • With the necessary equipment to care the inpatient. • If the room is double, there would be curtains that will allow visual separation of patients and which will provide the necessary intimacy for exploration, care and diagnostic or therapeutic procedures. • With toilets which will allow the access of disabled patients with wheelchairs helped by the staff. It will have a shower (low entry shower tray, wide and non-slip), with basin, toilet and bedpan cleaner.
O T H E R F A C I L I T I E S F O R P A T I E N T S A N D C A R E R S	For patients and escorts outside the hospitalization rooms.	<ul style="list-style-type: none"> • Information office. • Resting room for inpatients.
NURSE S T A T I O N	Nurse staff patient observation during treatment and recovery; care plan and other administrative nursing tasks.	<ul style="list-style-type: none"> • In the centre of the hospitalization area. To reduce distances. • Desk with area to write and installation of communication equipments, including the reception unit of nurse calls, and with enough space to store work. • With working station and access to patient management and clinical station software.
U T I L I T Y R O O M S	For minor surgery and other procedures. Medicine preparation, kitchen or food preparation unit, cleaning and waste disposal manager and storage.	<ul style="list-style-type: none"> • With the adequate facilities for its operation and, when possible, with the available technical advances.

6.1.2.4 Administrative area and staff utility rooms

There are included in this area all the necessary premises for offices and unit staff meeting rooms so that the healthcare, teaching and resting activities may be adequately carried out.

The area will have the following characteristics and premises:

- Offices:

The number of offices will be in proportion with the staff of the unit, mainly with the number of professionals whose activities require an office, either individual (e.g. offices for the manager of the unit or of the nursing staff) or common (work rooms, library).

Offices will have ergonomic furniture which will guarantee privacy and will make team work easy. There will be telephone communication and access to the network as well as working units with access to the software of the clinical station, taking mainly into account the coordination and communication needs with the primary healthcare area and with the home hospital system.

- Resting area:

Resting room with a size appropriate to the sizing of the unit and with specific toilets, as well as with enough room for changing rooms according to the adapted organization systems and with the existence, or not, of a nearby area provided with that resource.

6.1.2.5 Functional design programme

The functional design programme will include the following⁽⁴⁴⁾ (a specific sample with a DHU is included in annex 11):

Area	Premises	N°	Floor surface	Total surface
RECEPTION	1. Main waiting room. 2. Public toilet. 3. Toilet for disabled. 4. Reception.			

⁽⁴⁴⁾ There are provided in this functional design, only, the areas and premises, as the number and its size should be specified for a particular sizing of the DHU. For an example of functional programme of a unit for highly complex patients with multiple chronic conditions see Annex 10.

Area	Premises	N°	Floor surface	Total surface
HOSPITALIZATION	5. Rooms for patients and facilities for relatives and escorts: 5.1. Patient's room. 5.2. Toilet at patient's room. 5.3. Information office. 5.4. Resting room for inpatients. 6. Nurse station and utility rooms: 6.1. Counter and staff work area. 6.2. Resting room for nurse staff. 6.3. Minor surgery and procedures room. 6.4. Assisted toilet. 6.5. Supplies store room. 6.6. Kitchen. 6.7. Clean utility room. 6.8. Dirty utility room and waste disposal unit. 6.9. Material and equipment store room. 6.10. Supplies store room. 6.11. Linen store room. 6.12. Area for wheel chairs.			
DAY HOSPITAL UNIT	7. Examination room. 8. Cubicle for blood tests. 9. Day hospital ward. 10. Toilet for outpatients. 11. Changing rooms for outpatients.			
ADMINISTRATIVE AREA AND STAFF UTILITY ROOMS	12. Office of the medical manager. 13. Office of the supervisor. 14. Office for doctors. 15. Office for administrative work. 16. Meeting room / work room / library. 17. Staff toilets and changing rooms			

6.2. Equipment and Facilities.

Annex 10 of this document includes the resource sizing criteria and annex 11, the functional programme of a unit for highly complex patients with multiple chronic conditions with 33 beds allotted for conventional hospitalization (22 double rooms, 50% of which are reserved for individual use), two examination rooms and six DH beds/chairs (50% with beds and 50% with chairs for treatment).

The criteria and recommendations included in both annexes together with the main technical characteristics and the list of the necessary equipment in each of them provided in the functional design programme below, may be considered as help to plan the equipment of a unit for highly complex patients with multiple chronic conditions⁽⁴⁵⁾.

Table 6.5. Relation equipment/premise	
Premise	Equipment
RECEPTION	
<p>Main waiting room <i>Fitted out for lengthy stays and with an adequate capacity related to the size of the unit.</i> <i>Phone connections and background music.</i> <i>Cold food and drinks vending machines.</i></p>	<ul style="list-style-type: none"> • 3 seat benches. • Chairs/ armchairs. • Coat stands. • Cold water fountain. • Low tables. • Pictures.
<p>Reception <i>Reception of patients and carers. Administrative proceedings: registration and discharge.</i> <i>With a counter with the appropriate height to be accessed with wheelchair.</i> <i>Computer and telephones.</i></p>	<ul style="list-style-type: none"> • Counter. • Drawers. • Ergonomic office chairs. • Fax. • Laser printer. • Shelves. • Telephone. • Work stations / computers.
<p>Public toilet <i>With basin and WC.</i></p>	<ul style="list-style-type: none"> • 25l swing lid waste bin. • Coat stand. • Mirrors. • Paper dispensers. • Paper towel dispensers. • Soap dispenser. • Toilet brushes.
<p>Disabled toilet <i>With basin and WC.</i></p>	<ul style="list-style-type: none"> • 25l swing lid waste bin. • Coat stand. • Mirrors. • Paper dispensers. • Paper towel dispensers. • Soap dispenser. • Toilet brushes.

⁽⁴⁵⁾ Specific data are not provided, as they depend on the number of cubicles/beds and in the sizing of the proposed areas.

Premise	Equipment
HOSPITALIZATION	
Room for patients and facilities for relatives / escorts	
<p>Patient's room <i>The room should be designed (light, colour, view) taking into account that the patient's common position is horizontal.</i> <i>There should be a device to regulate light's intensity in the room.</i> <i>Air condition system adjustable and adapted to any type of disability in each room.</i> <i>Adjustable windows, which may be controlled by the unit's staff.</i> <i>Acoustic control by means of the appropriate furniture and soundproof boards in the walls.</i> <i>Headboard with the appropriate power points for the use of electromedical equipment, light remote control, nurse call system with light.</i> <i>Audiovisual aids control (radio, TV; video, earphones), voice and data intakes (telephone, Internet) appropriate for the unit staff at a clinical station and for the patient and/or the escort.</i></p>	<ul style="list-style-type: none"> • Armchair for escort. • Chair. • Decoration. • Electric bed with accessories. • Flowmeter. • Nurse call system. • Portable digital sphygmomanometer. • Reclining armchair for patient. • Table with overbed frame for eating. • Table. • TV. • Vacuumeter. • Wardrobe.
<p>Toilet at patient's room <i>With basin, bedpan cleaner, WC and shower, shelf, towel rail, coat stands, toilet roll holder and bedpan hanger.</i> <i>Showers will have low entry shower trays to allow access to all patients. It must be disabled friendly.</i> <i>With mixer taps and low noise level toilet flushes.</i> <i>Fluorescent lighting is inadvisable.</i></p>	<ul style="list-style-type: none"> • 25l swing lid waste bin. • Coat stand. • Mirrors. • Paper dispensers. • Paper towel dispensers. • Soap dispenser. • Toilet brushes.
<p>Information office <i>For patients and relatives information.</i> <i>With computers and telephones.</i></p>	<ul style="list-style-type: none"> • Chair • Ergonomic office chair. • Modular work desk with drawers. • Picture. • Telephone. • Work station / computer.
<p>Resting room for inpatients. <i>For relatives and escorts of inpatients to rest.</i> <i>Designed to provide comfort and to reduce noises as much as possible.</i></p>	<ul style="list-style-type: none"> • Chair / armchair. • Low table. • Picture. • TV table. • TV.

Premise	Equipment
NURSE STATION AND UTILITY ROOMS	
<p>Counter and staff working area (nurse station). <i>It must allow direct visual control of all cubicles in the common ward.</i> <i>Adequate for command and control, with an area accessible to wheelchair users. Fitted with nurse call system via warning lights and buzzers.</i> <i>Pneumatic tube installation.</i> <i>Safety and fire alarm control panel, gas detector control panel.</i> <i>Computer and telephones.</i></p>	<ul style="list-style-type: none"> • Cabinet with shelves. • Chair. • Coat stand. • Counter. • Ergonomic office chairs. • Filing cabinet. • Healthcare management PDA. • Laser printer. • Metal shelves. • Modular desk with drawers. • Picture. • Tel DECT communication system. • Telephone. • Waste bin. • Workstations / computers.
<p>Nurse resting room. <i>For staff resting.</i> <i>Sink.</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Central table. • Chairs. • Coat stand. • Floor and wall cupboards. • Paper towel dispenser. • Pictures. • Reclining chairs. • Telephone. • Worktop with sink, microwave and refrigerator.
<p>Minor surgery and procedure rooms. <i>For minor surgery procedures performed outside the patient's room.</i> <i>Stainless steel worktop with basin and elbow mixer taps with thermostat. Individual lighting in exploration bed.</i> <i>Oxygen and vacuum intakes.</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Aspirator. • Auxiliary table. • Cabinet for sterile equipment. • Exploration bed. • Exploration lamp. • Flowmeter. • Instruments for minor surgery. • Minor surgery cart. • Multi-box storage system for disposable material. • Paper towel dispenser. • Soap dispenser. • Stainless worktop with sink and accessories. • Stand for intravenous drip. • Vacuumeter.

Premises	Equipment
NURSE STATION AND UTILITY ROOMS	
<p>Assisted toilet <i>For toilet needs of patients with mobility problems.</i> <i>With the necessary means for personal cleanliness.</i></p>	<ul style="list-style-type: none"> • 25 l. swing lid waste bin. • Coat stand. • Crane for moving patients. • Mirror. • Paper dispenser. • Paper towel dispenser. • Soap dispenser.
<p>Clean utility room <i>Storage of clean equipment and medicine preparation.</i> <i>Water outlet for double sink unit.</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Clinical unit with double sink and above storage space. • Fixed 60 cm stool. • Paper towel dispenser. • Refrigerator. • Soap dispenser. • Wall-mounted glass case (80 x 90 x 35 cm).
<p>Kitchen <i>Arrival of carts with dished up food and food preparation.</i> <i>Adapted to the cooking and hospital distribution of food technologies. Double sink with draining board, fridge and microwave. Area for storage of food charts.</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Double sink, draining board and waste disposal unit. • Kitchenware cupboard. • Microwave. • Paper towel dispenser. • Refrigerator.
<p>Cleaning equipment store room. <i>For cleaning products and equipment.</i></p>	<ul style="list-style-type: none"> • Metal shelves.
<p>Dirty utility room and waste disposal room. <i>For dirty linen and waste disposal.</i> <i>Water outlet.</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Double sink and waste disposal unit. • Paper towel dispenser.
<p>Equipment store room <i>For equipment and supplies.</i></p>	<ul style="list-style-type: none"> • Metal shelves.
<p>Supply store room <i>For small regular equipment.</i> <i>Area for supply carts with cyclic replacement system.</i> <i>Modular shelves higher than carts.</i> <i>Adequate area for the storage of saline solutions.</i></p>	<ul style="list-style-type: none"> • Double-box storage system. • Metal shelves.

Premise	Equipment
NURSE STATION AND UTILITY ROOMS	
Linen store room <i>For clean linen.</i>	<ul style="list-style-type: none"> • Carts for clean linen. • Metal shelves.
Area for wheelchairs and cranes to move patients in bed. <i>Out of the unit circulation flow.</i>	
DAY HOSPITAL UNIT	
Examination room <i>It includes an exploration area - office.</i> <i>Stainless steel worktop, washbasin and elbow mixer tap with thermostat control. Individual lighting in exploration bed.</i> <i>Computers and telephones.</i> <i>Oxygen and vacuum connections.</i>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Chair. • Consultation room cabinet. • Ergonomic office chairs. • Exploration bed. • Exploration lamp. • Flowmeter. • Front lamp. • Laser printer. • Metallic display cabinet with sliding doors. • Miscellaneous consultation room instrument, according to specialities. • Modular desk with drawers. • Negatoscope⁽⁴⁶⁾. • Paper towel dispenser. • Pen torch. • Phonendoscope. • Picture. • Portable digital sphygmomanometer. • Soap dispenser. • Telephone. • Vacuumeter. • Work station / computers.
Day hospital beds/chairs (common ward) <i>Area for treatment administration and, if necessary, for patient recovery.</i> <i>Open-plan area, distributed guaranteeing direct visual control from the nurse station, with the possibility of closing off for privacy (and never compromising patient's safety)</i> <i>With chair or bed for treatment.</i>	<ul style="list-style-type: none"> • Aspirator with filter for inhaled medication. • Blood pressure monitor with different wrist models. • Chair. • Couch. • Crash cart.

⁽⁴⁶⁾ Only in those cases in which a digitalised radiologic image accessible from the clinical unit is not available.

Premise	Equipment
DAY HOSPITAL UNIT	
<p><i>Windows with blocking devices and cleaning and airing positions.</i></p> <p><i>Headboards with power points and oxygen and vacuum connections.</i></p> <p><i>Integrated nurse call communication system.</i></p> <p><i>TV and music pre-installation.</i></p> <p><i>Computer connections.</i></p>	<ul style="list-style-type: none"> • Defibrillator with paddles for adults and newly born. • Electric beds with accessories. • Emergency cart. • Equipment (stands for drips, ceiling hooks, etc.). • Flowmeter. • Multi-parameter monitor. • Oximeter • Perfusion pump. • Reclining chairs. • Self-inflatable resuscitation bag. • Table with overbed frame. • Transport ventilator. • Vacuumeter. • Work stations / computers.
<p>Cubicle for blood tests</p> <p><i>With worktop for material preparation and water intake.</i></p>	<ul style="list-style-type: none"> • Chair for extractions. • Exploration bed • Metal shelf • Stool. • Table • Wall sphygmomanometer. • Weight and height platform. • Worktop
<p>Toilet for outpatients</p> <p><i>With basin and WC (it includes toilet for disabled patients).</i></p>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Coat stand. • Mirrors. • Paper dispensers. • Paper towel dispensers. • Soap dispenser. • Toilet brushes.
<p>Changing room for outpatients</p> <p><i>Changing room and lockers for personal belongings.</i></p>	<ul style="list-style-type: none"> • Benches. • Individual lockers.

Premise	Equipment
ADMINISTRATIVE AREA AND STAFF UTILITY ROOMS	
<p>Medical manager office <i>Computer and telephone connections.</i></p>	<ul style="list-style-type: none"> • Cabinet with shelves. • Chair. • Coat stand. • Ergonomic office chair. • Filing cabinet. • Ink jet printer. • L-shaped executive desk with drawer. • Negatoscope⁽⁵¹⁾. • Picture. • Round conference table. • Telephone. • Wall-mounted blackboard. • Waste bin. • Work station / Computer.
<p>Nurse manager office <i>Computer and telephone connections.</i></p>	<ul style="list-style-type: none"> • Cabinet with shelves. • Chair. • Coat stand. • Ergonomic office chair. • Filing cabinet. • Ink jet printer / laser. • L shaped executive desk with drawer. • Picture. • Round conference table. • Telephone. • Wall-mounted blackboard. • Waste bin. • Work station / Computer.
<p>Doctor's office <i>Voice and data network access.</i></p>	<ul style="list-style-type: none"> • Cabinet with shelves. • Chair. • Coat stand. • Ergonomic office chair. • Filing cabinet. • Ink jet printer / laser printer. • L-shaped executive desk with drawer. • Picture. • Wall-mounted blackboard. • Waste bin. • Work stations / computers.

Premise	Equipment
ADMINISTRATIVE AREA AND STAFF UTILITY ROOMS	
Administrative proceedings office <i>Voice and data network access.</i>	<ul style="list-style-type: none"> • Cabinet with shelves. • Chair. • Coat stand. • Ergonomic office chair. • Fax. • Filing cabinet. • Ink jet printer / laser printer. • L-shaped executive desk with drawer. • Picture. • Telephone. • Wall-mounted blackboard. • Waste bin. • Work stations / computers.
Meeting room <i>With computer and telephone connections.</i>	<ul style="list-style-type: none"> • Chair. • Coat stand. • Filing cabinets. • Ink jet printer / laser printer. • Negatoscope⁽⁵¹⁾. • Overhead projector. • Pictures. • Round conference table. • Telephone. • Wall-mounted blackboard. • Waste bin. • Wooden shelves. • Work stations / computers.
Staff toilets and changing rooms <i>With similar characteristics to the toilets for relatives.</i>	<ul style="list-style-type: none"> • 25 l swing lid waste bin. • Coat stand. • Mirrors. • Paper dispensers. • Paper towel dispensers. • Soap dispenser. • Toilet brushes.

6.3. Medical Supplies. Sterilization

Healthcare centres should exercise strict control over the storage and distribution of medical supplies and equipment, with special attention to expiry dates.

Moreover, healthcare centres should have safe areas for the correct storage of medical supplies and equipment, with the adequate capacity in accordance with its needs and which may allow its classification and control. What is more, they should guarantee, by means of adequate distribution systems, the availability of all the necessary material for all the activities performed at the unit. When possible, the use of periodic replacement systems (i.e. double-box) is highly recommended.

Healthcare centres should guarantee the appropriate use of sterile material. Single-use equipment should be disposed after being used, and, under no circumstances, there could be a possibility of its being re-used. Sterile equipment package should provide the sterilization date and the use-by date.

All non-disposable material or instruments that may penetrate the skin or the mucous membranes or that may be in contact with the mucous membranes, mucus or other organic body fluids have to be cleaned and sterilized before each use, by means of an efficient and adequate system. Whenever necessary, staff and patients will be equipped with the appropriate personal protection.

6.4. Prevention and Control of Nosocomial

Diseases

Healthcare centres should establish the adequate procedures to prevent and control nosocomial diseases. Those procedures should analyse the healthcare processes specifically conducted on the unit and define the appropriate guidelines.

In general, the unit for highly complex with multiple chronic conditions has specific requirements against nosocomial diseases similar to those applied in hospitalization wards, consultation rooms or units for diagnostic or therapeutic procedures. As in those places, both patients and staff may run the risk of acquiring an infection or of transmitting it both sides. Therefore, the so called “universal precautions” and hospital policies on infection control should be carefully observed.

6.5. Hygiene Protocols

The unit for highly complex patients with multiple chronic conditions should keep optimum hygiene and cleanliness in all areas, premises, equipment, apparatus and medical supplies.

There should be a hygiene, disinfection and pest control protocol, in accordance with their specific needs. This protocol will be accompanied by an outsource contract that guarantees its fulfilment, unless it is performed by the unit staff.

There should also be a cleaning, disinfection and, where appropriate, sterilization protocol for equipment and non disposable apparatus and instruments.

6.6. Hospital Waste Management

Healthcare centres with units for highly complex patients with multiple chronic conditions are obliged to identify and classify hospital waste, ensuring that it is correctly removed and disposed of.

Therefore, they should have a protocol for identifying, classifying and handling hospital waste in accordance with the provisions of the current legislation which will be known and followed by the staff.

7. Human Resources

7.1. Registry of Medical Staff

Healthcare centres with units for highly complex patients with multiple chronic conditions should have an updated register of personnel, whichever their contractual relationship with the centre, the way or the place in which they render their services.

This registry will include the following information: registration number, full name, qualifications, professional category, speciality, function, nature of relationship with the centre or organization and, where appropriate, date of leaving, dismissal or retirement and, all the additional information required to comply with the general principles established by the Spanish National Health System Inter-regional Board pursuant to all legislation on the medical profession.

The personnel register will be updated whenever there is any change on the staff and it will be reviewed at least once every three years, checking that all staff meets the necessary criteria for the exercise of their profession.

The register will include the unit to which each professional is related to, especially if they work at the unit for highly complex patients with multiple chronic conditions.

7.2. Personal File

Healthcare centres will keep a personal file on each worker, retired employees too, including all documents relating to the qualification, specialized training, professional experience and work life.

The people concerned will be entitled to access these files. Safety and confidentiality of all personal data will be guaranteed.

7.3. Qualifications

All personnel will work under the principles, the conditions and the requisites established in the medical professional law and in other legal and deontological ethic code applicable⁽⁴⁷⁾.

⁽⁴⁷⁾ Act 44/2003, November 21st, de ordenación de las profesiones sanitarias “on Medical Profession”

The staff for the unit for highly complex patients with multiple chronic conditions should have the following qualifications:

- **Unit manager.** He/she would be a doctor in internal medicine, geriatrics or a family or community doctor. His/her activities will be developed in closed relation with the primary healthcare area and he/she will be responsible for the organization and management of the unit, as described in chapter 5.
- **Coordinator**⁽⁴⁸⁾ He/she will be one of doctors that are, at the same time, managers of each of the unit for highly complex patients with multiple chronic conditions. His/her main tasks as coordinator would be:
 - Arrange and manage a set of healthcare staff, from different specialities and professional categories, within a protocol and with the consensus of all, and with the appropriate use of the allotted resources.
 - To programme the adapting the demand to the available resources and
 - Guaranteeing quality.
 - Developing in collaboration with the other managers and staff of the unit and of the primary healthcare area, instruments for clinical management (healthcare processes, protocols, guides and clinical pathways) as well as the quality plans, the continuous training and the research.

The unit manager and the person responsible on his/her absence should be of public knowledge and, therefore, it must be indicated in the unit regulations.

- **Nurse manager.** He/she would be a registered nurse. The nurse manager will be responsible for:
 - Coordinating the care planning that corresponds to the service portfolio of the unit for highly complex patients with multiple chronic conditions.
 - Programming the activities for the nurses and the nursing assistants.
 - Controlling the availability of material resources.
 - Collaborating with the coordinator in the setting up of

⁽⁴⁸⁾ For structures (service; unit for clinical management; etc.) that gather and coordinate several units for highly complex patients with multiple chronic conditions (home hospitalization; palliative care unit; medium-term stay/recovery unit).

clinical management tools as well as in quality plans, continuous training and research.

- **Nurses.** They would be registered nurses, and would be in charge of the care related to treatment administration and patient recovery. Moreover, they may be in charge of the coordination and continuity of care (community liaison nurse /case manager)

The role of nurses within the unit is very important, and thus it is below provided in detail:

- Geriatric assessment: they take part in the geriatric assessment of the patients that are being cared of at the unit for highly complex patients with multiple chronic conditions and which includes an analysis of their functional, social and mental situation. To do so they use scores assessment tools validated by international publications such as the Katz score, the FAC (Functional Ambulation Categories), the mini-mental test, the Geriatric Depression Scale (GDS). At times it is necessary the help of relatives, carers of caring staff who took care of the patient before being admitted.
- They take part in the diagnosis and follow up: functional damage, dementia, depression, confusion, malnutrition, incontinency, pressure ulcers, etc.
- Healthcare training aimed at patients and escorts and development of self-caring techniques. It is necessary to obtain the patients and relatives' collaboration in the care plan settled while the patient is at hospital. Teach how to administer insulin, to use gavage feeding, to work on mobility to prevent dependence, how to clean a patient in bed, how to treat patients with dementia and behaviour disorders without drugs, etc.
- Follow up of the evolution and continuity of care. In some specific conditions (hip fracture, functional damage, acute confusional state, and pressure ulcers) the nurse makes a telephonic follow up of the situation.
- Coordination with other caring staff at different healthcare levels:
 - Coordination with community care. With the primary healthcare team (doctor and nurse) and with the staff of the residential home where the patient lives to compile information regarding the clinical record, or to prepare discharge and inform about the care plan and to solve any

doubts reading the management of hospital discharge of some conditions. When the patient is going to be transferred to a convalescence home or to a medium stay centre, the nurse of the unit should be in coordination with this level of healthcare to prepare discharge.

- Hospital coordination. Coordination with other caring staff of the hospital in charge of specific care of the patient. Dietist, physiotherapist, social worker, etc.
- Coordination with carer. The family should have information regarding the care plan (plan when discharged, aim, etc.).
- Discharge reports. Nursing reports for the discharge, specifying the care plan.
- Registry.
- Training. Participation in the training and teaching activities of the unit: clinical and bibliography meetings, teaching to nurses and assistants about patients with multiple chronic conditions, as well as teaching activities within and outside the centre where the unit is located.
- Research. Nurses should participate in the setting up of registry sheet and protocols for the management of the patients with multiple chronic conditions, gathering and management of the information of the different data bases used at the units, design and carry out nurse research, prepare papers for congresses and investigation meeting about the unit for highly complex patients with multiple chronic conditions. Promotion of evidence based nursing.
- **Social worker.** Discharge planning. Assessment of social risk. Coordination of public health and social resources.
- **Nurse assistant.** Certified nurse assistant.
- **Secretary** (administrative assistant). Certified with the corresponding qualifications.
- **Auxiliary staff.** Orderly.

It is advisable the work at the unit, either full time or part time, of:

- **Therapist**
- **Physiotherapist**
- **Dietist**
- **Chemist**

The staff ascribed to the unit for highly complex patients with multiple chronic conditions will perform the duties attached to their professional status according to the work protocols and procedures included in the regulations of the centre and under the directions of the person in charge.

7.4. Identification and Discrimination of Staff

Members

Healthcare centres with units for highly complex patients with multiple chronic conditions will take the necessary measures to guarantee that patients and escorts can identify staff and can distinguish the qualifications and the professional category of the person/s that are caring them.

Healthcare staff professional categories will be distinguished by the uniform and identified by means of a personal ID tag which will clearly show his/her full name and category.

Healthcare staff are obliged to identify themselves when required, indicating their full name, professional qualifications, speciality, category and role, whenever it is not clearly comprehended by the patient.

7.5. Documentation

Healthcare centres will provide to the staff of the unit for highly complex patients with multiple chronic conditions, for the correct exercise of their profession and always according to their category, the following:

- a) Patients' clinical records.
- b) Healthcare and clinical practice guides, pathways and protocols.
- c) Internal regulations, as well as the general objectives and functions of the unit.
- d) Healthcare, informative and statistical documents set by the centre.
- e) The procedures, reports, joint protocols or indicators that may help to guarantee continued patient care.

7.6. Undergraduate and Postgraduate Training

In the upcoming years, teaching of medicine and specialist training should include not only new healthcare modalities as day surgery, day hospitaliza-

tion or home hospitalization, but also current trends in medicine, cost-effective use of technological advances, quality control, competence of service providers, elaboration of clinical pathways and guides. Namely, it should adapt to clinical management techniques.

As for the unit for highly complex patients with multiple chronic conditions, the following aims should be met:

1. To take advantage of a large number of patients with multiple chronic conditions so as to include this healthcare modality on the practical experience of medical students.
2. To train medical interns on the different functional elements of the unit for highly complex patients with multiple chronic conditions.
3. To contribute in the promotion of the basic principles of managed healthcare, through the two previous aims.

Medical students in general, and in particular, medical interns of the specialities that may be treated at the unit, should be aware of the specific characteristics of this healthcare modality.

7.7. Continued Training

The unit for highly complex patients with multiple chronic conditions will take the necessary measures to allow staff to receive continued training and to undergo research and training activities.

Training programmes to keep staff up to date on the patients' safety and quality should be provided, according to the unit characteristics.

Health Services and other healthcare organizations should lead the promotion of the unit as an option to the care that is generally provided to patients with multiple chronic conditions at hospitals.

For this purpose, when requested, there should be provided:

- Specific training for specialist staff and for other healthcare professionals, not only on the techniques related to the treatments included in the service portfolio of the unit, but also on the management and functional criteria necessary for its development and implementation, as well as on the advantages that these techniques imply for patients.
- Opportunities to attend to and practice in a unit of reference.
- Local incentives.

7.8. Criteria for the Calculation of the Necessary Resources

The necessary human resources may vary according to the kind of population cared, the timing and the service portfolio of the unit.

For its operation, the unit for highly complex patients with multiple chronic conditions should be provided with the necessary medical and nurse staff who, apart from the appropriate qualifications, they should have caring experience in convention hospitalization at other medical units, at day hospital and they must know the special characteristics of working in coordination with other healthcare resources, mainly with primary healthcare.

Doctors are in charge of controlling the evolution of patients, of taking the appropriate decisions on diagnostic procedures and of providing the adequate treatment. It is necessary to have a doctor specifically ascribed to the unit, though he/she may combine within the unit different activities that belong to the different healthcare possibilities included in its service portfolio.

In order to estimate the necessary human resources, the following criteria should be taken into account:

- Specialized doctors: the number of necessary doctors provided by a hospital which has already developed this type of units⁽⁴⁹⁾ results from applying an estimation of a doctor every 8.000 ± 1.500 people over 65, even though the communication between the manager of the unit with the managers of the corresponding primary healthcare services may adjust this proportion.

The number of full time doctors may be drawn from the following formula:

$$SD = \frac{(C \times CAT) + (S \times AST) + (TAOA \times AWH)}{DWH \times AWH \times 60 \times CA}$$

⁽⁴⁹⁾ Hospital 12 de Octubre (Madrid, Spain). 1 manager every 40.000 people (general population). Population depends on the management structure adopted and in the service portfolio it includes. The resource sizing criteria for the internal medicine services arranged for a unit for highly complex patients with multiple chronic conditions is 1 manager for every 25.000 people ($\cong 5.000 + 1.000 > 64$ years) -M. Ollero-

Where:

- SD** is the number of full time specialized doctors for the unit.
- C** is the number of annual expected consultations.
- CAT** is the average duration of consultations at the unit, in minutes.
- S** is the number of annual expected stays at conventional hospitalization at the unit.
- AST** is the average time per stay, in minutes, that a specialist devotes to each patient admitted at the unit.
- TAOA** is the average time, in minutes, that specialists devote daily to other activities of the unit apart from the attention to patients in the ward or consultation (as procedures at day hospital, home hospitalization, interconsultation, coordination with the person responsible for primary health-care, etc.).
- DWH** is the number of daily work hours of a specialist.
- AWH** is the number of annual work hours of a specialist.
- CA** is the care achievement of specialist, in percentage.

- Nurse staff: the calculation procedure is similar.
- Non medical support staff: depending on the computerization level of the unit, for a group of 3-4 units, as the one included in the functional design programme of annex 11, there will be necessary one or two administrative assistants and a full time orderly.

⁽⁴⁹⁾ Hospital 12 de Octubre. 1 responsable por 40.000 habitantes -población general-. La población depende de la estructura de gestión adoptada y de la cartera de servicios que asume. El dimensionado para servicios de medicina interna organizados en base a UPP es de 1 responsable por 25.000 habitantes ($\cong 5.000 \pm 1.000 > 64$ años) -M. Ollero-.

8. Quality

8.1. Authorization and Registry

The unit for highly complex patients with multiple chronic conditions is organized in terms of integration of the different healthcare modalities and of coordination with primary care services; therefore, from the administrative point of view, its authorization depends on the healthcare centre it belongs to.

8.2. Accreditation and Audit

In Spain, there are not criteria for the accreditation of this type of units. Given that they are clinically managed units, they might be subjected, depending on circumstances, to the accreditation process for these units that some regional governments have initiated.

8.3. Quality Indicators

The *Proceso asistencial integrado de atención a Pacientes Pluripatológicos* (Integrated Healthcare Process of Assistance to Patients with Multiple Chronic Conditions), published by the Health Ministry for the Regional Government of Andalusia, includes a group of process indicators.

Likewise, specific indicators may be applied to each healthcare system incorporated to the service portfolio of the unit for highly complex patients with multiple chronic conditions⁽⁵⁰⁾, 120.

Conventional hospitalization. At the expense of the standards and recommendations applied to conventional hospitalization units, the quality indicators most frequently used, and proposed for the unit for highly complex patients with multiple chronic conditions, are the following:

⁽⁵⁰⁾ Adapted from the Spanish National Health Services Key indicators. Technical specifications of the Spanish National Health Services Key indicators. December 2007. Ministry of Health and Consumer Affairs. Effectiveness indicators may be compared: 1. in a population, delimited geographically and residentially, before and after the establishment of the unit for highly complex patients with multiple conditions; 2. Comparing, for a specific hospital, indicators between geographical and population areas covered by the unit for highly complex patients with multiple conditions with other areas without coverage; and 3. Comparing the units for highly complex patients with multiple conditions between them.

- Average stay adjusted by case-mix index <1
 Average stay adjusted by case-mix= $\text{Sum (DRG to DRG) (Standard patient discharges* Average stay in a unit) / Total of standard patient discharges}$
 It is the average stay of a specific considered unit if it will care, with the average stay for each of the DRG, to the standard patients (Standard patient discharges), i.e., the range of population for comparison. Extreme cases are excluded for calculation purposes. It is recommended to compare with the lowest standard from within the whole Spanish National Health Service or the corresponding range of hospitals where the unit for highly complex patients with multiple chronic conditions is located⁽⁵¹⁾.
- Average stay performance adjusted <1.
 Average stay performance adjusted = $\text{Sum (DRG to DRG) (Unit patient discharges*Standard of average stay) / Total of unit patient discharges}$
 It is the average stay of a specific considered unit if it would have taken care of its own cases with the average stay that the standard has used for each DRG. Extreme cases are excluded for calculation purposes. It is recommended to compare with the lowest standard from within the whole Spanish National Health Service or the corresponding cluster of hospitals where the unit for highly complex patients with multiple chronic conditions is located.
- Percentage of readmissions:
 $[a / b] * 100$
 a Number of hospital discharges with readmission.
 b Total number of discharges due to that reason during the studied period of time.
 Readmission is defined as all unexpected hospital admission (urgent hospitalization) after a discharge from the same hospital. For establishing the rate of one-year sequence, the study is made considering the hospitalization indexes of the first 11 months of the year, excluding discharges due to death.
- Notification rate of adverse reaction to medication.
 $[a / b] * 1.000$

⁽⁵¹⁾ http://www.msc.es/estadEstudios/estadisticas/docs/NORMA_GRD_2006_Cluster.xls

a Number of suspected adverse reaction notifications completed in a specific period of time.

b Discharges from hospital during that period of time.

It includes all notifications carried out by healthcare staff to the Spanish Society of Pharmacovigilance (SEFV, in its Spanish acronym) and included in the FEDRA database (Adverse reactions database of the Spanish Society of Pharmacovigilance).

- Rate of nosocomial infection:

$[a / b] * 1.000$

a Number of hospital discharges with nosocomial infection diagnosis in a year.

b Discharges from hospital in that year.

The numerator includes all those hospital discharges in which appear, in any secondary diagnosis position, the codes 999.3, 996.6x, or 519.01. Exclusions and / or exceptions: in the original definition (Agency for Healthcare Research and Quality) cases with a hospital stay of less than two days are excluded, as well as any code indicating that the patient is in an immunosuppressed or cancer situation.

- Rate of transfusion reaction:

$[a / b] * 1.000$

a Total number of hospital discharges with transfusion reactions in a year.

b Total number of discharges from hospital in that year.

The numerator includes, in any secondary diagnosis position, the codes 999.5 to 999.8 or E876.0 from the CIE-9 classification in its MC version. Cases in which the transfusion reaction appears with a main diagnoses code are excluded. The Health Care Quality Indicators Project (OECD) includes the following codes: 9996 ABO Incompatibility Reaction, 9997 RH Incompatibility Reaction, E8760 Mismatched Blood In Transfusion and the exception of discharges of patients over 18 or from the major diagnostic category 14 (pregnancy, delivery and puerperium)

- Rate of pressure ulcers at hospital discharge:

$[a / b] * 1.000$

a Number of hospital discharges, of more than 4 days of stay, with pressure ulcers diagnosis in a year.

b Total number of discharges, of more than 4 days of stay, in that

year.

The numerator includes all those hospital discharges in which appears, in any secondary diagnosis position, the code 707.0 from the ICD-9 CM. Exclusions: Discharges with 4 or less days of stay. Decubitus ulcer as main diagnosis. Major diagnosis categories (MDC) 9 (skin and subcutaneous tissue), 14 (pregnancy delivery and puerperium), patients with diagnosis of hemiplegia or paraplegia, spina bifida or brain damage due to anoxia (definition by the Agency for Healthcare Research and Quality).

- Rate of falls:
 $[a / b] * 1.000$
 a Number of hospital discharges, after more than 4 days of stay, with report of fall during the stay in the unit for highly complex patients with multiple chronic conditions, in a year.
 b Total number of discharges, of more than 4 days of stay, in that year.

- Rate of global in-hospital mortality:
 $[a / b] * 1000$
 a Number of hospital discharges due to death, total and for each one of the selected processes.
 b Total discharges.

Day hospital. The specific indicators for this healthcare system suggested in the document of this same collection which suggests the standards and recommendation for day hospital unit, are the following⁵:

Quality dimension	Indicator		Calculation
Scientific-technical quality and efficiency of the DHU	1. Cancellation of procedure.		% [(cancellations / scheduled patients)]
	2. Adverse events	2.1. Rate of transfusion reaction	% [(transfusion reaction/ procedure in which blood or blood products transfusions have been performed)]
System efficiency	3. Day Hospitalization Index		% (DHU procedures / stays in conventional hospitalization) (DH stays for surgery are not included)

Consultation and interconsultation in the primary care services. There is not consensus on the specific quality indicators for this healthcare modality; therefore it is recommended its elaboration and incorporation in the update of the current document of standards and recommendations. It is advised the use of a process indicator, in relation to the coordination primary care / specialized cared:

Number of meetings between the manager of the unit for highly complex patients with multiple chronic conditions and the primary care professionals / year⁽⁵²⁾.

Based on the objectives for the development of units for highly complex patients with multiple chronic conditions, the indicators below are proposed as global functional indicators of these units:

- % Reduction in hospitalizations among seniors:
[(Rate of hospital visits in year X of patients over 65 in a specific geographical and population area)⁽⁵³⁾ / (Rate of hospital attendance in year 0 –year right before the unit started operating- of patients over 65 in the same area)*%].
- % Reduction of average hospital stay among seniors:
[(Average hospital stay in year X of patients over 65) / (Average hospital stay in year 0 –year right before the unit started operating- of patients over 65) *%].
- % Reduction of number of hospital stays / year among seniors:
[(Number of days stayed in conventional hospitalization in a year X of patients over 65 in a specific geographical and population area) / (Number of days stayed in a conventional hospitalization in year 0 –year right before the unit started operating- of patients over 65 in the same area)].
- % Reduction of hospital emergencies among seniors:
[(Rate of visits to the A&E services in year X of patients over 65 in a specific geographical and population area) / (Rate of visits to the A&E services in year 0 –year right before the unit started operating- of patients over 65 in the same area) *%].

Finally, satisfaction surveys should be performed, in order to value the apparent quality or the quality felt by the user. In order to be able to compare the surveys of the units for highly complex patients with multiple chronic conditions, the following methodology, which responds to the

⁽⁵²⁾ Primary care teams or corresponding, in the Spanish National Health Service.

⁽⁵³⁾ Basic health areas linked to the unit for highly complex patients with multiple chronic conditions, in the Spanish National Health Service.

“Health Barometer” could be used, with all surveys including the same questions about global satisfaction:

- Overall, the care you have received in the unit for highly complex patients with multiple chronic conditions has been...?
- Very good.
- Good.
- Average
- Poor
- Very poor.
- Don't know / No answer.

With: $[a] / [b] * 100$, being:

- a - Patients interviewed who have attended the unit for highly complex patients with multiple chronic conditions in the last year and declare to have received a good or very good assistance.
- b - Patients interviewed who have used the service in the last year.

Therefore, a group of indicators could be developed, summarized in the table below:

Table 8.2. Quality indicators of the unit for highly complex patients with multiple chronic conditions		
Quality dimension	Indicator	Calculation
Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Global	1. % Reduction in hospital admissions among seniors.	$[(\text{Rate of hospital visits in year X of patients over 65 in a specific geographical and population area})^{(54)} / (\text{Rate of hospital attendance in year 0 –year right before the unit started operating- of patients over 65 in the same area}) * \%]$.
	2. % Reduction of average hospital stay among seniors.	$[(\text{Average hospital stay in year X of patients over 65}) / (\text{Average hospital stay in year 0 –year right before the unit started operating- of patients over 65}) * \%]$.
	3. % Reduction of number of hospital stays / year among seniors	$[(\text{Number of days stayed in conventional hospitalization in a year X of patients over 65 in a specific geographical and population area}) / (\text{Number of days stayed in a conventional hospitalization in year 0 –year right before the unit started operating- of patients over 65 in the same area})]$.

⁽⁵⁴⁾ Basic Health Areas in relation in with unit for highly complex patients with multiple chronic conditions of the Spanish National Health Service.

Quality dimension	Indicator	Calculation
5. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Conventional hospitalization	5.1. Average stay case-mix index adjusted.	Average stay case-mix adjusted = $\frac{\text{Sum (DRG to DRG) (Standard patient discharges * Averaged stay)}}{\text{Total of standard patient discharges}}$
	5.2. Average stay performance adjusted.	Average stay performance adjusted = $\frac{\text{Sum (DRG to DRG) (Unit patient discharges * Standard)}}{\text{Total of unit patient discharges}}$
	5.3. Readmission percentage	$[a / b] * 1.000$ a) Number of hospital discharges with readmission. b) Total number of discharges due to that reason during the period.
	5.4. Notification rate of adverse reaction to medication.	$[a / b] * 1.000$ a) Number of suspected adverse reaction notifications completed in a specific period of time. b) Discharges from hospital during that period of time.
	5.5. Rate of nosocomial infection	$[a / b] * 100$ a) Number of hospital discharges with nosocomial infection diagnosis in a year. b) Discharges from hospital in that year
	5.6. Rate of transfusion reaction	$[a / b] * 100$ a) Total number of hospital discharges with transfusion reactions in a year. b) Total number of discharges from hospital in that year.
	5.7. Rate of pressure ulcers at hospital discharge	$[a / b] * 1.000.$ a) Number of hospital discharges, of more than 4 days of stay, with pressure ulcers diagnosis in a year. b) Total number of discharges, of more than 4 days of stay, in that year.
	5.8. Rate of falls	$[a / b] * 1.00.$ a) Number of hospital discharges, of more than 4 days of stay, with report of fall during the stay in the unit for highly complex patients with multiple chronic conditions in a year. b) Total number of discharges, of more than 4 days of stay, in that year.
	5.9. Rate of global in-hospital mortality	$[a / b] * 100$ a) Number of hospital discharges due to death, total and for each one of the selected processes. b) Total discharges.

Quality dimension	Indicator	Calculation
6. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. DH	6.1. Cancellation of procedure	% [(cancellations / scheduled patients)]
	6.2. Rate of transfusion reaction	% [(transfusion reaction / procedure in which blood or blood product transfusions have been performed)]
	6.3. DH index	% (DH sessions / medical stays in conventional hospitalization) (DH and stays for surgery are not included).
7. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. HH	To be determined	
8. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Out-patient consultation.	To be determined	
9. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Interconsultation.		Number of meetings between the manager of the unit for highly complex patients with multiple chronic conditions and the primary care professionals / year.
10. Quality perceived by the unit users	10.1 Satisfaction index.	[a / b] *100 a Patients interviewed who have attended to the unit for highly complex patients with multiple chronic conditions and declare to have received a good or very good assistance. b Patients interviewed who have used the service in the last year.

8.4. Quality Management Objectives

Based on the quality indicators selected and in the international experience in systemic management of the patient with multiple chronic conditions (see section 2.2), the following quality management objectives are proposed in order to facilitate the effectiveness of the unit for highly complex patients with multiple chronic conditions. In parentheses there is an attempt and provisional proposal of minimum objectives to be applied to the population covered by this unit:

Quality dimension	Indicator	Calculation
Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Global	1. % Reduction in hospitalizations among seniors	Reducing the rate of hospitalization among patients ≥ 65 and older ($\geq 15\%$).
	2. % Reduction of average hospital stay among seniors.	Reducing the average stay (hospitalization in an acute hospital) among patients ≥ 65 and older ($\geq 20\%$).
	3. % Reduction of number of hospital stays / year among seniors	Reducing the number of stay / year (hospitalization in an acute hospital) among patients ≥ 65 and older ($\geq 30\%$).
	4. % Reduction of hospital emergencies among seniors.	Reducing the number of hospital emergencies among patients ≥ 65 and older ($\geq 30\%$).
5. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Conventional hospitalization.	5.1. Average stay case-mix index adjusted.	Reducing the average stay case-mix index adjusted among patients 65 and older ($\geq 20\%$).
	5.2. Average stay performance adjusted.	Reducing the average stay performance adjusted (hospitalization in an acute hospital) among patients 65 and older ($\geq 20\%$).
	5.4. Notification rate of adverse reaction to medication.	Reducing $\geq 20\%$.

Quality dimension	Indicator	Calculation
6. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. DH	6.3. Outpatient index	($\geq 20\%$).
8. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Outpatient consultation.	Notification rate of adverse reaction to medication.	Reducing $\geq 20\%$.
9. Scientific-technical quality and efficiency of the unit for highly complex patients with multiple chronic conditions. Interconsultation.		≥ 10 meetings between the manager of the unit for highly complex patients with multiple chronic conditions and the primary care professionals / year.
10. Quality perceived by the unit users	10.1. Satisfaction index.	($\geq 90\%$).

9. Criteria for the Reviewing and Monitoring the Standards and Recommendations for a Unit for Highly Complex Patients with Multiple Chronic Conditions.

The units for highly complex patients with multiple chronic conditions have a rather short life in Spain, and its adherence in the Spanish healthcare system is, with the experience of the Health Service of Andalusia, reduced. The possible outbreak of these units as well as the probable changes in the organization and management of the healthcare system make it advisable that the development and operation of these units in the system should be monitored and that **a review and an update of this report should be made within five years at the most.**

Throughout the setting up process of this report, some lacunae have been identified, particularly on the availability of information and on the proven experience about how these units work on the Spanish health system. In order to improve this knowledge as the source for setting up recommendations based on evidence, or at least, in experience, it is highly recommended that the next review should include, apart from the topics included in this document, the following items:

- A systematic analysis of the **quality indicators** of the unit for highly complex patients with multiple chronic conditions which will comprise the set of indicators recommended in chapter 8 and will include those that have not yet been developed.
- Research should be performed which will allow to study and analyse the results of the unit and the comparison of those results

with the care procedures to patients with chronic conditions under the traditional care system.

The development of the unit for highly complex patients with multiple chronic conditions is one of the most important challenges for the Spanish healthcare system. The characteristics of these patients make the traditional care system inadequate to their needs and so the units that these units have to experiment require consistent adaptations in the way care is managed and organized, including the responsibility structure of hospitals and its relation with the area of primary healthcare and the need to adapt the systems of caring information to register independently the activity of these units. The development and operation of the units for highly complex patients with multiple chronic conditions should be accompanied by a process of result assessment and experience evaluation that would allow reaching excellence in the care to this subgroup of patients.

Annex 1. Potentially Inappropriate Medication for the Elderly According to the Revised Beers Criteria (Adapted⁽⁵⁵⁾ from reference 92).

A. Potentially inappropriate medication for elderly patients independent of diagnosis or condition

Drug	Concern	Severity rating (high/low)
All barbiturates (except phenobarbital)	Are highly addictive and cause more adverse effects than most sedative or hypnotic drugs in elderly patients. Should only be used in elderly patients to treat epilepsy.	High
Amiodarone	Associated with QT interval problems. Lack of efficiency in older adults.	High
Amniriptryline, either used as unique treatment or in combination with other antidepressants.	Because of its strong anticholinergic and sedation properties, it is rarely the antidepressant of choice for elderly patients.	High
Amphetamines and anorexic agents	Amphetamines and anorexic agents	High
Anticholinergics and antihistaminas: (chlorpheniramine, diphenhydramine, hydroxyzine, cyproheptadine, promethazine, dexchlorpheniramine, etc.)	They have potent anticholinergic properties. In elderly patients there should be used nonanticholinergic antihistaminas.	High

⁽⁵⁵⁾ By M^a José Otero for the Document on Standards and Recommendations for the unit for highly complex patients with multiple chronic conditions.

Drug	Concern	Severity rating (high/low)
Chlorpropamide	It has a prolonged half-life in elderly patients and could cause prolonged hypoglycaemia. It is the only oral hypoglycemic agent that causes SIADH.	High
Cimetidine	CNS adverse effects including confusion.	Low
Clonidine	Potential for orthostatic hypotension and CNS adverse effects.	Low
Daily fluoxetine	Long half-life drug with risk of producing excessive CNS stimulation, sleep disturbances and increasing agitation. Safer alternatives exist.	High
Dextropropoxyphene	Few advantages as oral analgesic against paracetamol and has many disadvantages as to other narcotic drugs.	Low
Digoxin (should not exceed > 0,125 mg except when treating atrial arrhythmias)	Decreased renal clearance may lead to increased risk of toxic effects.	High
Dihydroergotoxine	Lack of efficacy in the studied doses.	Low
Diphenhydramine	May cause confusion and sedation. Should not be used as hypnotic. When used to treat emergency allergic reactions, it should be used in the smallest possible dose	High
Disopyramide	Antiarrhythmic drug with potent negative inotrope action. It is also strongly anticholinergic. Other antiarrhythmic drugs should be used.	High
Doses of short-acting benzodiazepines to doses greater than: alprazolam 2 mg lorazepam 3 mg oxazepam 60 mg triazolam 0,25 mg	Because of increased sensitivity to benzodiazepines in elderly patients, smaller doses may be effective as well as safer. Total daily doses should rarely exceed the suggested maximums.	High
Doxazosin	Potential for hypotension, dry mouth and urinary problems.	Low
Doxepin	Because of its strong anticholinergic sedating properties, doxepin is rarely the antidepressant of choice for elderly patients.	High

Drug	Concern	Severity rating (high/low)
Estrogens only (oral)	Evidence of carcinogenic (breast and endometrial cancer) potential of these agents and lack of cardioprotective effect in older women.	Low
Ferrous sulfate >325 mg/day	Doses >325 mg/day do not dramatically increase the amount absorbed but greatly increase the incidence of constipation.	Low
Flurazepam	Long half-life benzodiazepine (often days). It produces prolonged sedation and increases the incidence of falls and fractures. Medium or short-acting benzodiazepines are preferable.	High
Gastrointestinal anti-spasmodic drugs (dicyclomine, belladonna alkaloids, etc.)	They are highly anticholinergic and have uncertain effectiveness. These drugs should be avoided (especially for long-term use).	High
Indomethacin	Of all available nonsteroidal anti-inflammatory drugs, this drug produces the most CNS adverse effects.	High
Ketorolac	It should be avoided in older person since a significant number have asymptomatic GI pathologic conditions.	High
Long-acting benzodiazepines (chlorziazepoxide, diazepam, quazepam, halazepam, chlorazepate, etc.)	These drugs have a long half life in elderly patients (often several days), producing prolonged sedation and increasing the risk of falls and fractures. Short and intermediate acting benzodiazepines are preferred.	High
Long-term use of full-dosage, longer half-life, non-COX selective NSAIDs (piroxicam, etc.)	Have the potential to produce GI bleeding, renal failure, high blood pressure and heart failure.	High
Long-term use of stimulant laxatives (bisacodyl, etc.) (except in the presence of opiate analgesic use)	May exacerbate bowel dysfunction.	High
Meperidine (pethidine)	May cause confusion and has many disadvantages to other narcotic drugs.	High
Meprobamate	Highly addictive and sedating. Its use for prolonged periods may need its being withdrawn slowly.	High

Drug	Concern	Severity rating (high/low)
Methyldopa	May cause bradycardia and exacerbate depression.	High
Methyltestosterone	Potential for prostatic hypertrophy and cardiac problems.	High
Mineral oil (liquid paraffin)	Potential for aspiration and adverse effect. Safer alternatives available.	High
Muscle relaxants and antispasmodics: carisoprodol, cyclobenzaprine, methocarbamol, oxybutynin (except extended-release formulae), etc.	Most of these drugs are poorly tolerated by elderly patients, since these cause anticholinergic adverse effects, sedation and weakness. Additionally, their effectiveness at doses tolerated by elderly patients is questionable.	High
Nitrofurantoin	Potential for renal impairment. Safer alternatives available.	High
Pentazocine	Narcotic analgesic that causes more CNS adverse events, including confusion and hallucinations. Additionally, it is a mixed agonist and antagonist.	High
Short acting nifedipine	Potential for hypotension and constipation.	High
Short-acting dipyridamole, except with patients with artificial heart valves.	May cause orthostatic hypotension.	Low
Ticlopidine	Has been shown to be no better than aspirin in preventing clotting and may be considerably more toxic. Safer and more effective alternatives exist.	High

NSAIDs: Nonsteroidal Anti-inflammatory Drugs; COX-2: cyclooxygenase-2; SIADH. Syndrome of Inappropriate Antidiuretic Hormone Secretion; CNS: Central Nervous System.

B. Potentially inappropriate medication for elderly patients known to have specific medical conditions.

Disease or condition	Drug	Concern	Severity rating (high/low)
Anorexia and malnutrition	CNS stimulants (amphetamines, methylphenidate) and fluoxetine.	Appetite-suppressing effects.	High
Arrhythmias	Tricyclic antidepressants (imipramine, doxepin, amitriptyline)	Proarrhythmic effects and ability to produce QT interval changes.	High
Bladder outflow obstruction	Anticholinergics, antihistaminas, gastrointestinal antispasmodics, muscle relaxants, oxybutynin, flavoxate, antidepressants, decongestants and tolterodine.	May decrease urinary flow, leading to urinary retention.	High
Blood clotting disorders or receiving anticoagulant therapy	Acetylsalicylic acid, NSAIDs, dipyridamole, ticlopidine and clopidogrel.	May prolong clotting time and elevate INR values or inhibit platelet aggregation, resulting in an increased potential for bleeding.	High
Chronic constipation	Calcium channel blockers, anticholinergics and tricyclic antidepressant.	May exacerbate constipation.	Low
Cognitive impairment	Barbiturates, anticholinergics, antispasmodics, muscle relaxants and CNS stimulants.	CNS altering effects.	High

Disease or condition	Drug	Concern	Severity rating (high/low)
COPD	Long-acting benzodiazepines (chlor-diazepoxide, diazepam, quazepam, halazepam, chlorazepate, etc) and beta-blockers (propranolol).	CNS adverse effects. May exacerbate or cause respiratory depression.	High
Depression	Long-term benzodiazepine use, sympatholytic agents (methyldopa)	May produce or exacerbate depression.	High
Epilepsy or convulsive seizure	Bupropion, clozapine, chlorpromazine and thioridazine.	May lower seizure thresholds	High
Gastric or duodenal ulcers	NSAIDs and acetylsalicylic acid (>325 mg).	May exacerbate existing ulcers or produce new/additional ulcers.	High
Heart failure	Disopyramide and high sodium content drugs (sodium salts as bicarbonate, phosphate, biphosphate, citrate, salicylate and sulfate).	Negative inotropic effect. Potential to promote fluid retention.	High
Hypertension	Pseudoephedrine, "diet pills" and amphetamines.	May produce elevation of blood pressure secondary to sympathomimetic activity.	High
Insomnia	Decongestants, theophylline, methylphenidate, MAOI and amphetamines.	CNS stimulant effects.	High
Obesity	Olanzapine.	May stimulate appetite and increase weight gain.	Low

Disease or condition	Drug	Concern	Severity rating (high/low)
Parkinson disease	Metoclopramide, conventional antipsychotics and tacrine.	Pueden reducir el flujo urinario, ocasionando retención urinaria.	High
SIADH/hyponatremia	SSRIs (fluoxetine, citalopram, fluvoxamine, paroxetine, sertraline).	May exacerbate or cause SIADH	Low
Stress incontinence	Alfa-blockers (doxazosin, prazosin and terazosin), anticholinergics, tricyclic antidepressants and long acting benzodiazepines.	May produce polyuria and worsening of incontinence.	High
Syncope or falls	Short to intermediate acting benzodiazepine and tricyclic antidepressants.	May produce ataxia, impaired psychomotor function, syncope and additional falls.	High

NSAID: nonsteroidal anti-inflammatory drugs; COPD: chronic obstructive pulmonary disease; MAOI: monoamine oxidase inhibitor; SSRI: selective serotonin reuptake inhibitor; SIADH: syndrome of inappropriate antidiuretic hormone secretion; CNS: central nervous system.

Annex 2. Conciliation Form Model (Adapted from the Admission Conciliation Form of Hospital Son Dureta¹²¹, with permission)

TREATMENT CONCILIATION

Chronic medication of the patient to be assess by the doctor

Med. allergies: No Yes _____
 Intolerances: No Yes _____

PATIENT CLINICAL RECORD: BED: SPECIALITY:
--

THIS SHEET CANNOT BE USED AS MEDICAL PRESCRIPTION

CONTINUE (C) , INTERRUPT (I) O THERAPEUTIC CHANGE (TC)
 ACCORDING TO THE MEDICATION ASSESSMENT, THE SITUATION OF THE PATIENT AND THE HOSPITAL GUIDE

Information: CR Interview patient/carer Report from PA Report from visiting Drs. Other _____

MEDICATION	DOSES	PATTERN	INTRA- VENOUS	L A S T DOSES	RECOMMENDATION			COMMENTS
1.					C	I	TC	
2.					C	I	TC	
3.					C	I	TC	
4.					C	I	TC	
5.					C	I	TC	
6.					C	I	TC	
7.					C	I	TC	
8.					C	I	TC	
9.					C	I	TC	
10.					C	I	TC	
11.					C	I	TC	
12.					C	I	TC	

NON PRESCRIBED MEDICATION / SELF-MEDICATION	
Antihistamine: <input type="checkbox"/> No <input type="checkbox"/> Yes	Eye drops: <input type="checkbox"/> No <input type="checkbox"/> Yes
Aspirine/NSAID/headache/tempt.: <input type="checkbox"/> No <input type="checkbox"/> Yes	Cough/cold: <input type="checkbox"/> No <input type="checkbox"/> Yes
Antacid/laxative: <input type="checkbox"/> No <input type="checkbox"/> Yes	Sleeping pills: <input type="checkbox"/> No <input type="checkbox"/> Yes
MEDICINAL HERBS <input type="checkbox"/> No <input type="checkbox"/> Yes	Birth control: <input type="checkbox"/> No <input type="checkbox"/> Yes

Person who gathers the information: _____

Date: _____

Prescribing doctor: _____

Signature: _____

Date: _____

Annex 3. Assessment of Treatment Adherence

The rate of adherence of a patient to a specific treatment is academically defined as the number of doses taken correctly in relation to the total number of prescribed doses for a period of time which may range from two days to several weeks. Taking into account that the calculation is difficult, if not impossible, there are used more holistic and subjective definitions of adherence, based in several analysis methods, as stated below.

There are several methods for the assessment of adherence: the so called direct methods, which imply identifying the medication in organic fluids and the indirect methods, which are the rest.

Among the indirect methods there are included:

- 1 - Count of the remaining medication.
- 2 - Personal interview.
- 3 - Control of the drug distribution.
- 4 - Self-questionnaire.
- 5 - Bottles with electric tap.
- 6 - Evolution of the disease and/or clinical parameters.

None is 100% safe. Therefore it is recommended the combination of some of the methods and to make comparison among them to detect any possible incongruence in the results.

It should be pointed out the huge range of possibilities in the control of the distribution with the implementation of the electronic prescription systems. In some autonomous regions, as in Andalusia, the family doctor may follow from the consultation the date where a patient withdrew a product from a chemist and in which amount.

The simple characteristics of the methods based in the interview with the patient or in the self-questionnaire may seem that they would be the most appropriate for the clinical environment. In all of them detecting when a patient does not follow the programme is a very sensitive aspect, and it is quite easy to obtain a false positive (a patient may seem to be following the treatment when he/she is not).

There is not a specific inquiry or self-assessment for highly complex patients with multiple chronic conditions. For the publication of the docu-

ment, there have been used several inquiries aimed at chronic patients of different conditions.

Below there are provided three additional scores, being the first one (Morisky) proposed for customary clinical care, and the other for specific programmes or for investigation.

	Morisky Scale	General Adherence Survey	Brief Medication Questionnaire
Origin	Designed for hypertension and other cardiovascular diseases.	It was first published based on the MOS (Medical Outcomes Study) carried out by the RAND group, for assessing the adherence in patients with diabetes, hypertension, acute myocardial infarction or congestive heart failure.	Originally published by Svarstad in 1999.
Aim	To assess the appropriate attitudes in relation to the pharmacologic treatment.	To value the general trend of the patient towards complying with something, and not specifically towards complying with the current treatment.	To assess the adherence to any of the drugs individually.
Web	Not found.	http://www.rand.org/health/surveys_tools/mos/mos_adherence.html	Not found.
Validation	Good co-relation for blood pressure results for patients with hypertension (Morinsky 2008 ¹²³) Bad internal co-relation between the different questions in a research performed for cardiovascular diseases ¹²⁴ .	It has been validated in the MOS itself and in several following publications. It has a good internal concordance (inter-observer).	Validated for a MEMS, MUAH and other conditions such as diabetes, hypertension, etc. Widely used for breathing conditions.

	Morisky Scale	General Adherence Survey	Brief Medication Questionnaire
Validation in highly complex patients with multiple chronic conditions	Could not be found.	Could not be found.	Could not be found.
Type of score	Clinical interview Four questions with dichotomous answers (yes/no).	Self-questionnaire Five questions to be answered in five minutes. Each question has a score on a Likert score. The average of the answers is worked out and taken to a linear scale of 1-100.	Self-questionnaire It includes a first part with 7 questions about each prescribed medicine. Two additional parts with general questions.
Length	Not assessed	5 minutes	Not provided
Strengths	<ul style="list-style-type: none"> Validated for many chronic conditions. Very simple. Provides information about the reasons why the treatment is not being followed. 	<ul style="list-style-type: none"> Developed for patients with chronic procedures. Widely validated and used. It allows pointing out patients that have usual problems at complying with obligations. 	<ul style="list-style-type: none"> Assesses adherence to each drug. Deeply validated.
Weaknesses	<ul style="list-style-type: none"> Not found a version in Spanish. It is not specific to assess the pharmacologic fulfillment. It is not specific for highly complex patients with multiple chronic conditions. 	<ul style="list-style-type: none"> Not found a version in Spanish. It is not specific to assess the pharmacologic fulfillment. It is not specific for highly complex patients with multiple chronic conditions. 	<ul style="list-style-type: none"> It is lengthy and bothersome and requires a lot of time from the patient. Not found a version in Spanish. Difficult assessment procedure.
At what time	When admitted (by the reference doctor in internal medicine). Annually or a month after key changes in the pharmacologic treatment (family doctor).	In the initial assessment of highly complex patients with multiple chronic conditions. At research projects.	At research projects.

1. Morisky score (modified)

Values patient's attitude towards therapeutic adherence.

Do you sometimes forget to take your pills?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Do you forget to take your pills at due time?	Yes <input type="checkbox"/> No <input type="checkbox"/>
When you feel your health concern is under control, do you sometimes stop taking your medicines?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If you ever feel worse when you take your medication, have you ever cut back or stopped taking it?	Yes <input type="checkbox"/> No <input type="checkbox"/>

2. General Adherence Survey

Table 1: Medical Outcomes Study General Adherence Items

How often was <u>each</u> of the following statements true for you during the <u>past 4 weeks</u> ?						
(Circle One Number on Each Line)						
	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
1. I had a hard time doing what the doctor suggested I do . . .	1	2	3	4	5	6
2. I followed my doctor's suggestions exactly . . .	1	2	3	4	5	6
3. I was unable to do what was necessary to follow my doctor's treatment plans . . .	1	2	3	4	5	6
4. I found it easy to do the things my doctor suggested I do . . .	1	2	3	4	5	6
5. Generally speaking, how often during the <u>past 4 weeks</u> were you able to do what the doctor told you?						
(Circle One)						
	None of the time.....	1				
	A little of the time.....	2				
	Some of the time.....	3				
	A good bit of the time.....	4				
	Most of the time.....	5				
	All of the time.....	6				

3. Brief Medication Questionnaire

APPENDIX A

SAMPLE ITEMS FROM BRIEF MEDICATION QUESTIONNAIRE (**)

1. Please list below all of the medications you took in the PAST WEEK. For each medication you list, please answer each of the questions in the box below.

IN THE PAST WEEK:						
a. Medication name and strength	b. How many days did you take it?	c. How many times per day did you take it?	d. How many pills did you take each time?	e. How many times did you miss taking a pill?	f. For what reason were you taking it?	g. How well does the medicine work for you? 1 = well 2 = okay 3 = not well
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

APPENDIX A (CONT.)

2. Do any of your medications bother you in any way? YES ___ NO ___

a. IF YES, please name the medication and check below how much it bothers you.

Medication name	How much did it bother you?				In what way did it bother you?
	At all	Some	A little	Never	
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

3. Below is a list of problems that people sometimes have with their medicines. Please check how hard it is for you to do each of the following:

	Very hard	Somewhat hard	Not hard at all	COMMENT (Which medicine)
a. <u>Open or close</u> the medication bottle	_____	_____	_____	_____
b. <u>Read the crit</u> on the bottle	_____	_____	_____	_____
c. <u>Remember</u> to take all the pills	_____	_____	_____	_____
d. <u>Get</u> your refills in time	_____	_____	_____	_____
e. <u>Take so many pills</u> at the same time	_____	_____	_____	_____

(**) The original copyrighted instrument is available from the first author.

SCORING PROCEDURES FOR BMQ SCREENS

Screen	Scoring
Regimen Screen (Questions 1a-1e)	
Did R fail to list the prescribed drug in the initial (spontaneous) report?	1= yes 0= no
Did R stop or interrupt therapy due to a late refill or other reason?	1= yes 0= no
Did R report any missed days or doses?	1= yes 0= no
Did R reduce or cut down the prescribed amount per dose?	1= yes 0= no
Did R take any extra doses or more medication than prescribed?	1= yes 0= no
Did R report "don't know" in response to any questions?	1= yes 0= no
Did R refuse to answer any questions?	1= yes 0= no
NOTE: Score of ≥ 1 indicates positive screen for potential nonadherence.	
Belief Screen (Questions 1g and 2-2a)	
Did R report "not well" or "don't know" in response to Q 1g?	1= yes 0= no
Did R name the prescribed drug as a drug that bothers him/her?	1= yes 0= no
NOTE: Score of ≥ 1 indicates positive screen for belief barriers	
Recall Screen (Question 1c and 3c)	
Did R receive a multiple dose regimen (2 or more times/day)?	1= yes 0= no
Did R report "very hard" or "somewhat hard" in response to Q 3c?	1= yes 0= no
NOTE: Score of ≥ 1 indicates positive screen for recall barriers	

R= respondent

Annex 4. Barthel Index

DESCRIPTION	
<p>■ It assesses 10 daily basic activities and according to the scores patients are classified as:</p> <p>1- Independent: 100 points (95 if on wheelchair). 2- Slightly dependent: >60 points 3- Fairly dependent: 40-55 points 4- Seriously dependent: 20-35 points 5- Utterly dependent: <20 points</p> <p>■ Information gathering: It may be self-completed, by direct observation or by asking the patient and his/her carer</p> <p>■ Approximate time: 5 minutes.</p>	
ACTIVITY	SCORE
FEEDING	<p>10 Independent. The patient eats on his/her own in a reasonable time. He/She is able to use cutlery when needed, to cut food, to use salt and to spread butter, etc.</p> <p>5 Needs help. The patient needs help for any of the previous activities.</p> <p>0 Dependent. Needs to be fed.</p>
BATHING	<p>5 Independent. The patient is able to take a bath or a shower, including getting in and out of the bath tube, and drying out.</p> <p>0 Dependent. Needs some help.</p>
DRESSING	<p>10 Independent. The patient is able to put on, take off and hang up clothes, lace up shoes, do up button and do zips (or truss or corset). It is not considered the use of bra.</p> <p>5 Needs help. Needs help for at least half of some of the activities. The patient should get dressed in a reasonable time.</p> <p>0 Dependent</p>
GROOMING	<p>5 Independent. The patient is able to wash his/her hands and face, to comb his/her hair, to make up, to wash teeth and to shave.</p> <p>0 Dependent. Needs some help</p>
BOWELS	<p>10 Continent. Is able to control bowel movement. Is able to use a suppository or an enema.</p> <p>5 Occasional accident. The patient has occasional accidents and needs help to use a suppository or an enema.</p> <p>0 Incontinent.</p>

ACTIVITY	SCORE
BLADDER (Make assessment the previous week)	10 Continent. No accidents. The patient is able to manage alone. 5 Occasional accidents. An accident every 24 hours at the most. Needs help for catheters and other devices. 0 Incontinent.
TOILET USE	10 Independent. Gets in and out on his/her own and does not need any help. 5 Needs help. The patient can manage with a little help: he/she is able to use the bathroom. Can wipe himself/herself. 0 Dependent. Unable to manage without help.
TRANSFERS BED TO CHAIR (AND BACK)	15 Independent. Does not need help. 10 Minor help. Needs verbal supervision or little physical help. 5 Major help. Needs the help of a strong and trained person. 0 Dependent. Needs a crane or being hold by two people. No sitting balance.
MOBILITY	15 Independent. May walk 50m or equivalent at his/her home without help or supervision. May need some aid (walking stick, crutches) though does not need a walker. If the patient wears prosthesis, he/she is able to put it on and take it off on his/her own. 10 Needs help. Needs supervision and some help from another person. Needs a walker. 5 Independent. (Wheelchair) in 50m. Does not need help or supervision. 0 Dependent.
STAIRS	10 Independent. Able to go up and go down a floor without the help or supervision of another person. 5 Needs help. Needs help or supervision. 0 Dependent. Unable to climb the stairs.

Annex 5. Pfeiffer Questionnaire

DESCRIPTION

- It was specifically set up to detect cognitive impairment in elderly patients (useful, therefore, for initial selection). It may also be used for illiterate people or with people with severe sensory impairment. It assesses a slight number of slightly basic functions (short term and long term memory, attention, orientation, information about every day situations, mathematic ability).
- It is one of the scores most used in primary healthcare as it is brief and easy to carry out. It is quick to fulfil as it requires five minutes, approximately.
- Target population: any person who may require an assessment of his/her mental capacity.
- Main flaw: it does not detect any slight disorders or slight changes in the evolution of the patient. Corrections are introduced according to the level of education, an additional mistake is allowed if the patient has not received primary education and a mistake less if the patient has received higher education.

1. Which day is today? (day, month, year).
2. Which day of the week?
3. Where are we now?
4. Which is your phone number? or... Which is your address? (if the person does not have a telephone).
5. How old are you?
6. Which is your date of birth? (day, month, year)
7. Who is the current President of the State?
8. Who was the former President of the State?
9. Which are your mother's surnames?
10. Can you count backwards from 20 by 3s until you get to 0?

Total score.....

ASSESSMENT

- If scores reach the extremes there should not be any doubts. Intermediate scores may bring up doubts and require confirmation.
- For inpatients, the questionnaire should be performed in the first 72

hours after the patient is admitted and discharged.

- Sensibility reaches 70% and specificity is very high (95%).
- For interpretation, the following the scheme is used:

Mistakes give points, each mistakes provides one point.

- 0-2 mistakes: average.
- 3-4 mistakes: slight cognitive impairment.
- 5-7 mistakes: moderate cognitive impairment, condition.
- 8-10 mistakes: important cognitive impairment.

An additional mistake is allowed if the patient has not completed primary education.

One less mistake is allowed if the patient has undergone higher education.

Annex 6. Hospital Admission Risk Profile (HARP)¹³

It allows identifying the risk of older patients of functional decline or the risk of losing autonomy in some everyday life basic activities following acute medical illness hospitalization.

It takes into account three possibilities: age, cognitive impairment (screened by means of a abbreviated Mini-mental examination*) and the level of dependence for seven daily living instrumental activities**.

	Score
Age (years)	
< 75	0
75-84	1
> 85	2
ABBREVIATED MMSE*	
15 - 21 scores	0
0 - 14 score	1
IADL**	
Independent for 6 -7	0
Independent for 0 -5	2

Score	RFD
0-1	Low
2-3	Intermediate
4-5	High

* **Abbreviated Mini-Mental State Examination:** is carried out when the patient is admitted. The Folstein version of the MMSE does not include the language area and the original construction of the test (naming, repetition, orders, reading, writing and copying). The score obtained reaches from 0 to 21. The examination includes the following areas:

1. **ORIENTATION** (10 items): ask the patient about the season of the year, the year, month, day of the month, day of the week, city or town in which we are, region or autonomous region, country, if the patient is at home or at hospital, the name of the street or the floor of the hospital.
2. **RETENTION** (3 items): ask the patient to repeat 3 words we will tell him/her before, all at once (house, tree, dog).
3. **ATTENTION** (5 items): ask the patient to spell the word “world” backwards or to count backwards from 100 by 7s.
4. **RECALL**: the patient is asked to repeat the three words said before.

**** Instrumental Activities of Daily Living:** The patient (or his/her main carer) is inquired about the capacity of the patient two weeks before being admitted to perform seven instrumental activities of daily living. Patients are classified as dependant if they do not carry out the activity or if they need help to perform such activity. The screened activities are:

- Ability to use the phone.
- Shopping
- Food preparation
- Housekeeping
- Mode of transportation - use of public transport
- Responsibility for own medication.
- Ability to handle finances.

Annex 7. Service Portfolio of a DH Integrated in a Unit for Highly Complex Patients with Multiple Chronic Conditions⁽⁵⁶⁾

- Aspiration.
- Biopsies (hepatic, muscle, bone, pleural, kidney,...).
- Subcutaneous pump.
- Post diagnostic-therapeutic procedure care.
- Blood extraction.
- Venous central catheter and subcutaneous reservoirs care.
- Minor surgery.
- Drainage.
- Intravenous perfusion (chemotherapy).
- Intravenous perfusion (other).
- Nasogastric intubation.
- Shots.
- Nebulization.
- Paracentesis.
- Bone marrow puncture-biopsy.
- Lumbar puncture.
- Chemotherapy⁽⁵⁷⁾.
- Thoracentesis.
- Arthrocentesis.
- Blood transfusion.

⁽⁵⁶⁾ Quality Agency of the National Health System. Day Hospital Unit. Madrid, Ministry of Health and Social Policy, 2008.

⁽⁵⁷⁾ The G category used to identify highly complex patients with multiple chronic conditions (Chapter 5, section 1) which includes “Active solid or haematologic neoplasm without curative treatment”. There are patients which undergo chemotherapy as a palliative treatment, and they may undergo the treatment either at day hospital and/or at home hospitalization, paying individual attention to any of the situations and guaranteeing the safety of the patient, the carer, the environment and the staff.

Annex 8 Resource Sizing Criteria

Setting the basic dimensions of the healthcare resources of a unit for highly complex patients with multiple chronic conditions depends on demography (structure of the population), epidemiology (morbidity), on clinical factors (criteria for the set up of the different services that make up its service portfolio) and on management (use of available productive capacity).

In any case, it implies setting the healthcare needs by making an estimate of the expected request and adequate them to the resource sizing of the unit (beds for conventional hospitalization, consultation, day hospital beds/chairs) adjusted to a previously established profile of productivity.

1. To calculate the **number of necessary beds at conventional hospitalization (B)** to cope with all the caring needs of a unit for highly complex patients with multiple chronic conditions, there would be analyzed the number of expected admissions in a year (**A**), the average stay (**AS**) and the expected occupancy (**O**):

$$B = \frac{A \times AS}{365 \times O}$$

Where:

- **The number of expected admissions in a year (A)** is calculated in a formula where A_t is the conventional hospitalization attendance rate at the unit for highly complex patients with multiple chronic condition.

$$A = \text{Population} \times \frac{A_t}{1.000}$$

- **The expected occupancy (O)**, is expressed in parts per 1 (0,85 for an occupation of 85%)

2. To calculate **the number of premises devoted for consultation (C)** at the unit for highly complex patients with multiple chronic conditions, it would be taken into account the total number of consultations carried out in a year, the average time used in each consultation, the annual time devoted to consultation in the premises and the consultation occupancy, obtaining the results by means of the following formula:

$$C = \left(\frac{AC \times ACT}{AVCT \times CO} \right)$$

- The total number of annual consultations (AC) is obtained from the estimation of the number of patients and the average number of consultations per patient with the following formula:

$$AC = C/P \times P$$

Where:

C/P is the average number of consultation per patient with multiple chronic conditions at the unit.

P is the number of patients with multiple chronic conditions at the unit, per year.

- The **average consultation time (ACT)** in minutes.
- The **available consultation time**, obtained by the expression:

$$AVCT = N^{\circ} \text{ of days/year} \times N^{\circ} \text{ cons hours / day} \times 60$$

Where

N° of days/year is the number of consultation days at the unit in a year.

N° of cons hours/day is the number of daily consultation hours in the unit.

- The **occupancy of the consultations of the unit (CO)**, determined in percentage, reflects the real use of the premises.

3. To calculate **the number of day hospital beds/chairs (B/Ch)** it should be taken into account the necessary time to perform the treatments and the available time of each bed/chair corrected by the occupancy rate:

$$B/Ch = \left(\frac{TrTDH}{AvTDH \times DHO} \right)$$

- The expected **necessary time to perform treatments** at the DH (**TrTDH**), in hours:

$$TrTDH = DH.T \times TrATDH$$

Where:

TrATDH, is the average time for treatment procedure, in hours.

- The **available DH time (AvDHT)**, in hours, will be:

$$AvDHT = N^{\circ} \text{ hours/day.} \times N^{\circ} \text{ days / week} \times N^{\circ} \text{ weeks / year}$$

Where:

N° hours/day is the number of working daily hours.

N° days/week is the number of expected working days per week at the DH.

N° weeks/year is the number of expected weeks that the unit will work throughout the year.

- **Day hospital occupancy (DHO)**, as a percentage of the AvTDH, will be:

$$DHO = \left(\frac{TrTDH}{AvTDH} \right) \times 100$$

4. The estimation of the need of available resources related to the unit for highly complex patients with multiple chronic conditions will be obtained from the available information (see sample at table A5.1).

Table A5.1. Example 1. Resource sizing for a unit for highly complex patients with multiple chronic conditions

- The **estimation in the n° of beds** necessary for conventional hospitalization may be calculated as follows.

Attendance to a unit for highly complex patients with multiple chronic conditions can be estimated from the data that points out that 17% of hospital admissions (or either 31% to 42% of admissions at internal medicine) in an acute care hospital correspond to highly complex patients with multiple chronic conditions.

Taking into account an attendance rate of 100 admission per 1000 people, the annual number of estimated admissions for a population of 40.000 people (similar to the rate used to establish the sizing if some units for highly complex patients with multiple chronic conditions⁽⁵⁸⁾) is 680:

$$680 \text{ admissions / year } (= 17 * 40)$$

If 50% of the admissions was treated in a unit for highly complex patients with multiple chronic conditions⁽⁵⁹⁾, for an average stay of 7 days and an occupancy rate of 85%, the number of necessary beds is 8:

$$8 \cong 7,67 (= (340*7)/(365*0,85))$$

- The **estimation of premises for consultation rooms** at a unit for highly complex patients with multiple chronic conditions may be obtained from the attendance rate of outpatient consultation.

Considering that 1% of the population is a patient with multiple chronic conditions whose situations may worsen throughout the year and thus require an average of consultations at the unit thrice the general attendance (1.7 consultations/year) at specialized consultation ($5 \cong 5,1 = 1,7 \text{ specialized consultation / year } *3$), it might be estimated that the annual number of consultations at the unit is 2000.

$$\text{N° of outpatient consultation} = (40000*0,01)*(1,7*3) = 400*5,1 \cong 2.000$$

Taking into account that the outpatient consultation of the unit works 250 days a year, the daily average of consultations for a population of 40.000 people is 7.

$$\text{Average of daily outpatient consultation} = 2.000 / 250 = 7$$

Considering half an hour the average length of the consultation, thus it could be obtained 3.5 hours as the average daily use of a room, so a single room will respond to the needs of 80.000 people.

$$1 \text{ room for outpatient consultation every } 80.000 \text{ people}$$

⁽⁵⁸⁾ Hospital 12 de Octubre de Madrid. See comment 31, at 5.5.

⁽⁵⁹⁾ The additional 50% will be included in other programmes (haemodialysis, onco-haematologic or similar) or in other services.

The **estimation of the DH beds/chairs** could be obtained from the frequentation rate of this healthcare system.

Considering that 1% of the population is a patient with multiple chronic conditions whose situations may worsen throughout the year and may require care at DH twice during that same period, it could be calculated that the number of DH procedures at the unit will be 800.

$$\text{DH procedures} = (4000 \cdot 0,01) \cdot 2 = 400 \cdot 2 \cong 800$$

Taking into account that the DH is operative 250 days a year, the average activity of the DH is 3.2 procedures per day.

$$\text{Average daily activity at DH} = 800 / 250 = 3,2$$

Keeping the same population parameters (40.000 people, of which 1% would need DH treatment throughout a year), and considering an average of two procedures per patient, and an DH operation of 250 days per year, it will be obtained an average of 3 procedures/day ($\cong 3,2 = 800 / 250$)

If the average treatment length is 3 hours, the daily use of the DH bed/chair would be 9 hours. If the operation hour of every bed/chair of the unit is 6 hours, with 1.5 bed/chairs the needs of a population of 40.000 would be covered.

Annex 9. Functional Design Programme

It is included hereby an example of a functional programme which gathers four “basic” units for highly complex patients with multiple chronic conditions, where there can be found three healthcare areas (conventional hospitalization, consultation and DH) and the utility rooms.

If 50% of the rooms of the hospitalization unit are used in an individual basis, the unit could satisfy the needs of a population of reference of 160.000 people, and there would still be the possibility of adapting the individual/double basis to the seasonal variations or to any other type of demand.

The two premises for the consultations and the six DH beds/chairs (50% beds, 50% treatment chairs), would allow caring patients from, approximately, 32.000 ± 4.000 people over 65, at a general acute hospital with an allotted area of reference of 160.000⁽⁶⁰⁾ inhabitants and with the necessary margin to increase activity in these resources.

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
RECEPTION	1. Common waiting room	20	1	20	For 10 people and by the unit reception. Equipped taking into account lengthy session and with an appropriate capacity directly related with the size of the unit. Telephones and background music. Cold food and drink vending machine
	2. Reception	18	1	18	Reception of patients and carers. Administrative proceedings of registration and discharge. Counter with the appropriate height so that it does not represent a barrier and may be accessible to wheelchair users. Computers and telephones.

⁽⁶⁰⁾ See Annex 8.

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
	3. Public toilet	8	2	16	According to the general organization of the outpatient area. Toilets for visitors and patients. With wash basin and WC.
	4. Disabled toilet	4	1	4	Integrated within the public toilet block. Disabled toilets for visitors and patients. With wash basin and WC.
TOTAL RECEPTION AREA				58	
HOSPITALIZATION	5. 5. Rooms for patients and other facilities for relatives and escorts.				
	5.1. Patient's room	22	22	484	22 double rooms, 50% of which will be generally used on individual basis. The room will be designed (lights, colour, views) taking into account that the normal position of the patient is lying down (horizontal). Thus the height of the window should allow viewing the outside from the patient's bed. There should be a device for regulating light intensity. Switchers should be easily accessible for users (90cm from the floor) so that they may be operated by wheelchair users. Room with private wardrobe and with 2.80m bed headboard. Adjustable air conditioning system, adapted to all types of disabilities in each room. Wall protections for bed impacts. Windows with adjustable opening system which may be controlled by the staff unit. Acoustic control by means of the appropriate furniture and soundproofing boards in walls.

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
					<p>Paint colour will depend on the type of patient and the disposition of the room will depend on the position of the patient.</p> <p>With enough space to reach the patient from both sides of the bed, including the necessary space for circulations and the use of medical equipment, gurneys and chairs to transfer patients.</p> <p>With a resting area allotted for patients and escorts and/or carers in which there will be resting armchairs.</p> <p>With the necessary equipment to care the inpatient.</p> <p>If the room is double, there would be curtains which would allow visual separation of patients and which will allow the necessary intimacy for exploration, care and diagnostic and/or care procedures.</p> <p>With a headboard with the necessary power points for the use of electromedical equipment, with the light control device, the nurse call system with emergency light, with the audiovisual aid control (radio, TV, video, earphones), with intakes for voice and data network (telephone, internet...) appropriate both for staff work at a clinical station and for the patient and/or the escort.</p>

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
	5.2. Toilet at patient's room	4	22	88	<p>With basin, bedpan cleaner, WC and shower, with shelf, towel rail, coat stands, toilet roll holder and bedpan hanger.</p> <p>Showers will have low entry shower trays to allow access to all patients. It must work as assisted shower.</p> <p>Grab rails with the appropriate height for patients in wheelchairs.</p> <p>Mirrors with the appropriate height and inclination for patients in wheelchairs.</p> <p>With mixer taps and low noise level toilet flushes. Steam shower lights.</p> <p>Fluorescent lighting is undesirable.</p>
	5.3. Information desk	12	1	12	For patients and carers information. Computers and telephones.
	5.4. Inpatients resting room	20	1	20	<p>For inpatient carers and escorts rest.</p> <p>Designed to offer comfort and to reduce noises as much as possible.</p>
	6. Nurse station and general utility rooms				
	6.1. Counter and staff working area	25	1	25	<p>It must allow direct visual control of all cubicles in the common wards.</p> <p>Adequate for command and control, with an area accessible to wheelchair users. Fitted with patient/nurse communication systems by means of warning lights and buzzers.</p> <p>Pneumatic tube terminal installation. Safety and fire alarm control panel, gas detectors control panel. Computers and telephone.</p>

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
	6.2. Nurse resting room	10	1	10	For staff to rest. Close to the station. With water outlet.
	6.3. Minor surgery and procedures room	20	1	20	For minor surgery out of the patient's room. Consultation room unit, stainless steel worktop, washbasin with elbow mixer taps with thermostat control. Individual lighting in exploration bed. Oxygen and vacuum connections.
	6.4. Assisted toilet	15	1	15	For daily toilet of patients with mobility problems. Equipped with the necessary means for bathing and toilet.
	6.5. Clean utility room	10	1	10	For storing clean supplies and preparing medication. Double sink unit with water outlet.
	6.6. Kitchen	8	1	8	Arrival of food carts and preparation of food. Adapted to the hospital food cooking and distribution technologies. With double sink and draining board and an area for storing carts.
	6.7. Cleaning equipment room	4	1	4	For cleaning products and equipment.
	6.8. Dirty utility and waste disposal room	12	1	12	For dirty linen and waste disposal. Water outlet.
	6.9. Equipment storeroom	8	1	8	For equipment and apparatus.

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
	6.10 Supplies store room	8	1	8	For small regular equipment. Area for supply carts with cyclic replacement system. Surfaces should be washable. Modular shelves higher than carts. Adequate area for the storage of salines.
	6.11 Linen storeroom	6	1	6	For clean linen
	6.12. Area for wheelchairs	2	1	2	Outside of the circulation of the unit
TOTAL HOSPITALIZATION UNIT				732	
DAY UNIT	7. Consultation	18	2	36	It includes an exploration area and an office-examination room area. Consultation room unit, stainless steel worktop, washbasin and elbow mixer taps with thermostat control. Individual lighting in exploration bed. Computers and telephones. Oxygen and vacuum connections.
	8. Day hospital patient's wards	60	1	60	6 beds/chairs for treatment administration and, when necessary, for recovery. Open plan area, distributed guaranteeing direct visual control from the nurse station, with the possibility of closing off for privacy (but never compromising patient's safety). With a bed or a chair for treatment. Windows with blocking devices and cleaning and airing positions. Power points and oxygen and vacuum connections at headboards. Integrated nurse call and communication system. TV and music pre-installation. Computer connections.

Area	Premises	Floor surf.	Num.	Total surf.	Observations: functional and technical characteristics
	9. Cubicle for blood tests	8	1	8	For taking biological samples, prior to treatment administration at day hospital. With worktop for preparing equipment and water outlet.
	10. Toilets for outpatients.	8	2	16	Toilets for patients. With wash-basin and WC
	11. Patient changing rooms.	6	2	12	By the toilet for patients or integrated within the same block. For changing clothes and with lockers for personal belongings.
DAY HOSPITAL TOTAL SURFACE				132	
ADMINISTRATIVE AREA AND STAFF UTILITY ROOMS	12. Manager office	12	1	12	Computer and telephone connections.
	13. Nurse manager office	12	1	12	Computer and telephone connections.
	14. Office for doctors	12	3	36	Work area for doctors of the unit. With access to the voice and data network.
	15. Office for administrative work	16	1	16	Administrative staff working area (two work stations) With access to the voice and data network.
	16. Meeting room	30	1	30	Staff working area, computer and telephone connections.
	17. Staff toilets and changing rooms.	10	2	20	For the unit staff. With similar characteristics to the toilets for visitors.
TOTAL ADMINISTRATIVE AREA AND STAFF UTILITY ROOMS				126	
TOTAL AREA OF THE UNIT				1.048	

General characteristics of the unit

The unit for highly complex patients with multiple chronic conditions has two caring areas. One area is allotted to conventional hospitalization and the other one is for outpatient and settled as a day hospital unit, which includes an examination room and a hospitalization ward.

The physical utility areas necessary for the operation of these healthcare areas may be shared, whenever the proximity allows it and if there are economic scale advantages.

In any case, the characteristic activities of the unit require four main areas:

- Reception, which includes the waiting areas and the area for registration of patients.
- Healthcare area, which includes:
 - Conventional hospitalization area.
 - Day hospital unit, made up of the beds/chairs and including the necessary areas for examination, treatment, recovery and consultation.
- Nurse station and utility rooms.
- Administrative area and staff utility rooms.

A functional design programme should provide, whichever the type of healthcare, an easy circulation between the different caring areas of the unit. Patients would be able to walk, to go on wheelchair or in gurney, accompanied or not by healthcare staff, depending on their conditions. Moreover, it should be facilitated the circulation between the unit and the other caring areas (medical specialities, therapeutic units, A&E services) and the central services and general utility rooms of the hospital, in accordance with the level of relations that exist among them.

The smooth movement capacity of the unit is also necessary for staff and supplies distribution and thus the main circulation flows should be planned to minimize circulations trying to avoid, when possible, unwanted crosses and time losses.

Location requirements of a unit for highly complex patients with multiple chronic conditions within a general and acute hospital rely on the need to make easier the access to patients and escorts, to staff and for the supplies required for the unit operation. Its location is conditioned for the conventional hospitalization services it renders. However, and in spite of that, efforts should be made to grant that patients and escorts may access the unit without difficulties from the outside.

Annex 10. Definitions and Reference Terms

Accreditation: “Authorization to allow a data or net system to process sensitive information and to settle the degree in which both design and the characteristics of the system meet the pre-established technical safety requirements”. Accreditation is a voluntary process by which a healthcare centre undergoes an external assessment which established its level in accordance to a set of settled standards.

Authorization / Certification: Healthcare authorization: administrative resolution authorizing a healthcare, service or institution, according to the specific regulations, its installation, operation, modification of its healthcare activities and, where appropriate, its closure.

Authorization terms: Qualitative and quantitative requirements that healthcare centres, services and institutions must observe in order to be authorized by the medical administration, aimed at guaranteeing that they have the appropriate technical and human resources and facilities to provide adequate healthcare services.

Clinical documentation: All data, of whichever form, class or type, which may allow providing or amplifying knowledge on a person’s physical and health condition, or on the form of maintaining, caring for, improving or recovering it. (Art. 3 of Act 41/2002 on “Ley básica reguladora de la autonomía del paciente y de derechos y obligaciones en materia de información y documentación clínica” -Patient Autonomy Rights and Obligations regarding Clinical Documentation and Information-).

Clinical record: Set of documents which include the data, the assessment and all kinds of information regarding the situation and the clinical evolution of a patient through the care process. It includes the identification of the doctors and other staff which have participated on the healthcare process. (Art. 3 of Act 41/2002 on “Ley básica reguladora de la autonomía del paciente y de derechos y obligaciones en materia de información y documentación clínica” -Patient Autonomy Rights and Obligations regarding

Clinical Documentation and Information-).

Code of ethics: Set of moral rules governing professional conduct regarding patient care services of healthcare centres.

Comorbidity: Association of any disease to a main nosologic condition, either acute or chronic, which affects diagnosis or treatment

Comprehensive Geriatric Assessment: Clinical, functional and psychological and social assessment of the highly complex patient with multiple chronic conditions.

Continuous Care Plan: Set of actions performed at the unit for highly complex patients with multiple chronic conditions and the primary healthcare area activated by the joint decision of the general practitioner the family doctor in charge of the patient and the manager of the unit for those patients with chronic condition which may begin to require hospital assistance.

Source: Adapted from “Ollero M (Coord.). Proceso Asistencial Integrado. Atención al Paciente Pluripatológico. Health Department. Andalusia. 2007”

Conventional hospitalization: Admission of a patient with an acute condition or with a flare chronic condition at an organized nurse unit fitted out to provide attention and intermediate, non critical, care 24 hours a day and in which the patient stays more than 24 hours.

Day Hospital (DH): Healthcare modality intended to treat and care patients who have to undergo diagnostic and therapeutic procedures which require medical or nurse attention but do not imply hospitalization.

Day Hospital (of the unit for highly complex patients with multiple chronic conditions): Consultation and day hospital make up the “day hospital unit” of a unit for highly complex patients with multiple chronic conditions. This set up of day surgery resources allows a response adapted to the needs of the patient while the Continuous Care Plan is activated.

Day hospital chair/bed: Specific chairs/beds allotted for hospitalization for a few hours, either for diagnosis, clinical investigation and/or multiple explorations as well as for those treatments that cannot be performed at outpatient consultation but which do not require hospitalization. A&E service

boxes are not included.

Source: Indicadores clave del SNS. Instituto de Información Sanitaria. December 2007.

Day Hospital Unit (DHU): Healthcare unit dedicated, under the supervision or instructions of a specialized doctor, to the treatment and care of patients who must undergo therapeutic or diagnostic treatment that require short post operative medical and nursing care, but do not require hospitalization. From a management point of view, DHU are independent within the healthcare centre to which they belong to. The unit main activity is to provide healthcare to patients treated under this type of health service, it has specific resources and an independent coordinator for its management, being thus different from integrated DHUs.

Day surgery procedure: Procedure performed at an examination room or at a cabinet for treatment or diagnosis of a hospital, either public or private, and which does not require overnight stay.

Dependence: Situation in which people are due to reasons related to the lack or the loss of physical, psychical or intellectual autonomy and which require assistance and/or help to perform everyday activities, and specifically, those relating to personal care and attention.

Source: Council of Europe. At: Ministry of Labour (ed.) Libro Blanco. Atención a las personas en situación de dependencia en España. Capítulo 1: Bases demográficas: estimación, características y perfiles de las personas en situación de dependencia. Madrid: Ministry of Labour; 2005. p.19-92.

DH index: % [(DHU sessions/total number of stays)] (DH and stays for surgery are not included). It evaluates the global impact of DHU on the conventional hospitalization activity of a hospital.

DH patient: Patient that has to undergo diagnostic and therapeutic procedures which require medical or nurse attention but which do not imply hospitalization. DHUs are intermediate units that carry out their activity for final health services. The DHU is different from the day hospital beds/chairs integrated in other units, as for example, those integrated in a unit for highly complex patients with multiple chronic conditions⁵.

Disability: The condition of being unable to perform fundamental activities to carry out an independent life, i.e., it is a term used to mention a lack in

the activity of a person and the limitations for his/her involvement in the environment in which he/she lives.

Discharge report: Report issued by the manager doctor of a healthcare centre upon completion of the patient healthcare procedures or his/her referral to other healthcare centre which specifies the patient's details, a summary of his/her clinical record, a description of the healthcare provided, the diagnosis and the therapeutic recommendations. Other similar terms used as synonyms are: Clinical discharge report, Report of medical discharge.

(Art. 3 of Act 41/2002 on “Ley básica reguladora de la autonomía del paciente y de derechos y obligaciones en materia de información y documentación clínica” -Patient Autonomy Rights and Obligations regarding Clinical Documentation and Information-; Ministerial Order of the Ministry of Health of September 6, 1984).

Episode in a unit for highly complex patients with multiple chronic conditions: Comprises the time while the clinical management of the patient with multiple chronic conditions is carried out both by the clinic and by the people in charge of the patient at primary healthcare and which may include one or several the specific healthcare processes performed at the unit: admission/discharge (including home hospitalization), DH procedure, or consultation.

Frailty: It is a physical, pathologic and clinical concept which tries to explain the difference between satisfactory aging and pathologic aging and which may be defined as a general decline of several systems (mainly osteomuscular, cardiovascular, metabolic and immunologic) and which final aftermath is the exhaustion of the functional reserve of the person and a higher level of vulnerability which bring up the development of several adverse results as disability, dependence, hospitalization, institutionalization and death.

Healthcare centre: Set of technical resources and premises where qualified staff provide healthcare services designed to improve patients' health.

Healthcare centres and institutions register: Record of all authorizations for operation, modification and, when needed, installation and closure of healthcare centres, services and institutions granted by the corresponding healthcare authorities.

Highly complex patient with multiple chronic conditions (paciente pluripatológico): Patient that suffers from chronic conditions which are included in

two or more of the clinical categories mentioned in section 5.1 of this document.

Source: Ollero M (Coord.). Proceso Asistencial Integrado. Atención al Paciente Pluripatológico. Health Department. Andalusia. 2007.

Home Hospitalization (HH): Healthcare system which allows performing at home diagnostic, therapeutic and caring procedures similar to those performed in a hospital and for a limited period of time. Home care: multi-disciplinary care which, under the supervision or the recommendation of a doctor, performs activities to provide care services to sick people in their own home.

(RD 1277/2003, October 10th, por el que se establecen las bases generales sobre autorización de centros, servicios y establecimientos sanitarios - which settles the general basis for the authorization of healthcare centres, services and institutions).

Informed consent: Voluntary, conscious and free conformity statement of a patient, made in full possession of his/her faculties, after receiving the appropriate information, which allows an operation or a procedure to be performed which would have a clear effect over his/her health condition.

Inpatient: Patient that has to be admitted and requires a stay (overnight stay) in a hospital bed.

IT system: Set of related processes, automatic or not, which allow the administration and provide support to the different activities performed at healthcare centres, services and institutions, as well as the treatment and the exploitation of the data that these processes may bring out.

Multiple chronic condition (pluripatología): The coexistence of two or more chronic conditions which imply flares or interrelated diseases which bring up special clinical frailty which provokes progressive impairment and a gradual reduction of the autonomy and functional capacity of the patient and which leads to a frequent request of care at different caring levels (primary healthcare, specialized, social services). It is a request that it is generally impossible to schedule (“urgent”).

Outpatient consultation: Examination room in a healthcare centre devoted to the diagnosis, treatment of follow-up of outpatients who do not require continuous medical or nurse care.

Outpatient procedure: Procedure performed in an examination room which has the adequate design, equipment and safety conditions.

Outpatient: Patient cared only at outpatient consultation, including ambulatory procedures, interventional radiology, radiotherapy, oncology, renal dialysis, etc.

Patient record: Selected data on patients and their relation with the healthcare centre as a result of a healthcare process.

Quality audit- Audit: “Process in which the books, the accounts and the records of a company are examined to verify its financial statements and in which receipts are duly submitted”. Methodical and independent examination conducted to determine if quality related activities and results meet the pre-established regulations and to check that these regulations are efficiently fulfilled and are adequate to meet the set of objectives.

Rate of cancellations: % [(cancellations / scheduled patients)].

Service portfolio: Set of techniques, Technologies and procedures implying any of the methods, activities and resources based on knowledge and scientific experience, by which a healthcare centre, service or institution provide healthcare services.

Short stay: Stay at conventional hospitalization that lasts 24 to 72 hours.

Unit for highly complex patients with multiple chronic conditions. “Basic” unit. (Unidad de pacientes pluripatológicos - UPP): Organization of healthcare staff which provides multi-disciplinary care to vulnerable, highly complex patients with multiple chronic conditions and which complies with specific structural and functional means and resources to ensure efficiency, high quality and a safe environment to perform this activity. The “basic” unit is made up by a specialist (internal medicine specialist, geriatrist) and the nursing staff who cares this type of patients at a hospital (hospitalization, day hospital). The close relation and the work combined with the primary healthcare specialist is a basic requirement for its operation.

Annex 11. Abbreviations

AIDL: Instrumental Activities of Daily Living
DH: Day Hospital.
DRG: Diagnostic Related Groups
DS: Day Surgery
FMEA: Failure Modes and Effects Analysis
HARP: Hospital Admission Risk Profile
HH: Home Hospitalization.
HMO: Health Maintenance Organization.
ICD: International Classification of Diseases
INE (Spanish National Institute of Statistics) (www.ine.es)
INSALUD (National Health Institute, former Spanish public health institution)
IT: Information Technology
MDS: Minimum Data Set
MRC: Medical Research Council
NHS: National Health Service (United Kingdom)
NICE: National Institute for Clinical Excellence (United Kingdom)
NQF: National Quality Forum
NYHA: New York Heart Association
OECD: Organization for Economic Co-Operation and Development (www.ocde.org)
RD: Royal Decree
SEGG (Spanish Society for Geriatrics and Gerontology) (www.segg.es)
SEMFYC (Spanish Society of Family and Community Medicine) (www.semfyc.es)
SEMI (Spanish Society of Internal Medicine) (www.fesemi.org)
UN: United Nations (www.un.org)
WHO: World Health Organization (www.who.int)

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