Clinical Practice Guideline for the Management of Stroke Patients in Primary Health Care

NOTE:

More than 5 years have passed since the publication of this Clinical Practice Guideline, and **its validity has not been reviewed**.

Therefore, **it is unclear whether its recommendations remain valid**; they should therefore be treated with caution and applied in accordance with **clinical judgement and the individual circumstances of each patient**.

CLINICAL PRACTICE GUIDELINES IN THE SPANISH NATIONAL HEALTHCARE SYSTEM
MINISTRY OF HEALTH, SOCIAL POLICY, AND EQUALITY

MINISTERIO DE CIENCIA E INNOVACIÓN
MINISTERIO DE SANIDAD Y POLÍTICA SOCIAL
Plan de Calidad para el Sistema Nacional de Salud
SaludMadrid
Agencia Laín Entralgo para la Formación, Investigación y Estudios Sanitarios
Comunidad de Madrid

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CLINICAL PRACTICE GUIDELINES IN THE SPANISH NHS
MINISTRY OF HEALTH AND SOCIAL POLICIES

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This CPG is a health care decision aid. It is not mandatory and it is not a substitute for the clinical judgement of health care personnel.

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This guideline must be quoted:

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Presentation

Health care practice is becoming more and more complicated due to many different factors. One of the most relevant factors is the increase of scientific information available to us. Science is permanently changing so the knowledge to be able to cover the health care needs and the illness needs effectively and safely must be constantly refreshed.

In 2003, the Inter-territorial Board of the National Health System (SNS) created the GuíaSalud project. Its ultimate purpose is to improve clinical decision-making. A record of Clinical Practice Guidelines (CPG), prepared according to explicit criteria generated by its scientific committee, has been created in the National Health System.

At the beginning of 2006, the Directorate General of the Quality Agency of the National Health System prepared the Quality Plan for the National Health System, which was divided into 12 strategies. The purpose of this Plan is to increase the cohesion of the System and help guarantee maximum quality health care for all citizens regardless of their place of residence. As part of the Plan, different agencies and groups of experts in prevalent pathologies related to health strategies were entrusted with the preparation of the CPGs. This guideline has been prepared within this framework.

Over the last few years we have been seeing a progressive increase in awareness of our citizens, agents and scientific community of the human and social health repercussion that cerebrovascular disease represents as a health problem.

The knowledge about the different aspects of disease –social and economic impact, causes, mechanisms, diagnosis, prevention and treatment- is advancing at such a speed that a constant effort to keep up to date is necessary to provide each patient with the best care.

On the other hand, patients who suffer strokes are cared for in our health system by more and more diverse professional groups, general practitioners and different specialities, nurses, physiotherapists, psychologists, nutritionists and others, who offer the best of their knowledge, in the most coordinated manner possible, as a multidisciplinary team.

It is important to have common guidelines, both for the diagnosis and for the treatment, which are based on the best available scientific knowledge. This is what has given rise to this Clinical Practice Guideline, designed and prepared for its specific use in Primary Health Care.

PABLO RIVERO CORTE
Directorate General of the Quality Agency of the NHS

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This CPG has the backing of the following societies:

Spanish Society of Neurology (SEN)

Spanish Society of Primary Health Care Physicians (SEMERGEN)

Spanish Society of Family and Community medicine (SEMFYC)

Spanish Society of General and Family Physicians (SEMG)

Madrid Primary Health Care Nursing Society (SEMAP)

Spanish Society of Neurological Nursing (SEDENE)

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Declaration of interest: All the members of the Development Group have made the declarations of interest that are presented in Appendix 10.

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Questions to be answered

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DEFINITION AND CLASSIFICATIONS

1. What is the definition and nomenclature of cerebrovascular diseases?
2. What is the classification of cerebrovascular diseases?

CLINICAL DIAGNOSIS OF STROKE

3. What are the suspicion criteria for stroke?
4. What data must be included in the clinical records? What data must be sent to specialised health care?
5. What examinations must be performed if stroke is suspected?
6. What differential diagnoses must be taken into account?
7. Are the prehospital scales in the Primary Health Care (PHC) environment useful (face-to-face and telephone consultation)?

PRE-HOSPITAL MANAGEMENT OF ACUTE STROKE

8. What priority measures must be taken initially in a patient when a stroke is suspected? Must the stroke code be activated? Where must patients be transferred to?
9. How must the blood pressure (BP) be managed in a patient when a stroke is suspected? As from what levels must high blood pressure (HBP) be treated? What drugs must be used?
10. Does glycaemia control improve morbimortality? As from what levels must hyperglycaemia be treated?
11. Must supplementary O2 be administered to patients when acute stroke is suspected? With what saturation?
12. Must antiplatelets be administered to patients when acute stroke is suspected?
13. Must IV fluids be administered? What type of fluids?

MANAGEMENT OF "COMMUNICATED STROKE"

14. Must a patient with suspicion of TIA or stable stroke who refers to an acute episode more than 48 hours earlier be evaluated urgently in Specialised Health Care?

STROKE MANAGEMENT AFTER HOSPITAL DISCHARGE

15. How must the monitoring of patients who have suffered a stroke be planned after hospital discharge?
16. What general measures referring to rehabilitation must be taken into account after a stroke?
17. What are the most frequent sequelae and complications in patients who have suffered a stroke?

18. What deficits and physical alterations must be evaluated?
19. Is the treatment of spasticity with oral drugs effective? What drugs can be used?
20. How must shoulder pain be managed?
21. What drugs are efficient in the treatment of central post stroke pain?
22. How must dysphagia be managed in patients who have suffered a stroke? What must the diet of a patient with dysphagia fed orally be like? What type of probe (nasogastric or by gastrostomy) is most appropriate for dysphagic patients who require enteral nutrition?
23. What strategies and measures must be adopted to prevent falls and consequences of the latter in patients who have suffered a stroke?
24. Must a screening of mood alterations be carried out in patients who have suffered a stroke? Are psychotherapy and/or antidepressants efficient in the prevention and treatment of depression, anxiety and emotionalism?
25. Must a screening of cognitive impairment be carried out in patients who have suffered a stroke? Is cognitive rehabilitation efficient as a therapy in patients who have suffered a stroke and have cognitive impairment?
26. Must an evaluation of independence be carried out for Activities of Daily Living in those patients who have suffered a stroke? Is occupational therapy efficient to improve independence for activities of daily living in patients who have suffered a stroke?
27. What advice about sexuality, driving and return to work must be provided to patients who have suffered a stroke?
28. What are the nursing diagnoses related to stroke? What nursing interventions are required and how are the results measured?

INFORMATION AND COMMUNICATION TO PATIENT

29. What basic information must be given to stroke patients?
30. How must the information be given to patients and carers?

DIAGNOSTIC AND THERAPEUTIC STRATEGIES

31. Which steps must be followed when stroke is suspected?
32. What are the stroke referral criteria (acute/communicated stroke)?

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Recommendations

Clinical diagnosis of stroke

Suspicion criteria

C	A stroke must be suspected in patients with focal neurological deficits, with sudden appearance of the symptoms, especially if the patient has acute facial palsy, language alteration or fall or sudden loss of strength in the arm, and does not refer to a previous history of cranial traumatism.
√	TIA must only be suspected when the symptomatology described in the previous recommendation is not present at the time of the consultation and the symptoms have lasted for less than 24 hours (normally less than one hour).
D	TIA must not be considered in the first place when the following symptoms appear in an isolated manner: confusion, vertigo, dizziness, amnesia, dysphagia, dysarthria, scintillating scotoma, urinary or faecal incontinence, loss of sight plus alteration of consciousness, focal symptoms associated with migraine, loss of consciousness including syncope, tonic and/or clonic activity, gradual progression of symptoms (in particular sensorial ones) affecting several parts of the body.
√	The presence of vascular risk factors must be taken into account when diagnosing suspicion of stroke, above all stroke or any other previous vascular disease, nicotine addiction, HBP and DM.

Anamnesis

√	The anamnesis of a patient with suspicion of stroke must include the onset time of the symptoms, comorbilities, previous strokes, current medication and Rankin scale.
√	If there is sufficient time and so long as this does not delay the transfer, the anamnesis can be completed by including the duration of the symptoms, vascular risk factors, triggering circumstances, previous episodes of migraines, convulsions, infections, trauma, consumption of anovulatory products/hormonal therapy, pregnancy/puerperium and drug abuse.
√	The clinical data of the patient with suspicion of stroke in PHC must be sent to specialised care (appendix 3).

Examination

√	The initial physical examination of a patient with suspicion of stroke must include the evaluation of the respiratory function, heart beat, BP, temperature, glycaemia and oxygen saturation, if feasible.
√	It is recommended for the neurological examination of a patient with suspicion of stroke to include the evaluation of mental functions, language, mengingeal signs, cranial pairs, oculocephalic deviation, motor and sensory deficits, and cerebellar alterations.
√	The execution of an ECG will be considered so long as this does not delay the transfer of the patient.

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Differential diagnosis

D	The differential diagnosis of acute stroke must include comitial crises/convulsions, migraines with aura, hypoglycaemia, hypertensive encephalopathy and conversion disorder/simulation, among others.
√	If it is not clear that the cause of the symptoms is a stroke, proceed as if it were, in order not to delay the treatment.

Use of prehospital scales as diagnosis aid

C	The use of scales, when possible validated, is recommended to help diagnose stroke at prehospital level, in those persons with acute onset of neurological symptoms.
D	For people who consult over the telephone due to acute onset of neurological symptoms, an evaluation of the symptoms is recommended via CPSS scale (appendix 4).
√	In primary care practice, the use of the MASS scale is recommended as an aid for diagnostic guidance in patients with suspicion of stroke.

Pre-hospital management of acute stroke

Priority measures/transfer of patients/stroke code

√	When there is a suspicion of acute stroke in a patient, the cardiorespiratory functions must be guaranteed, taking measures to avoid bronchoaspirations and, if necessary, take a peripheral route in the non-paretic arm. Neither food nor liquid will be administered orally unless drugs have to be administered by this route.
C	Stroke is a medical emergency that requires urgent neurological care so patients who are suspected of having an acute stroke must be sent to hospital in the least possible time.
B	The activation of the emergency services is recommended when acute stroke is suspected, giving priority to the transfer of patients.
C	The activation of the extra-hospital stroke code is recommended when a patient with a suspicion of stroke, who satisfies the criteria foreseen, is detected.
A	It is preferable and recommended to refer patients to hospitals that have stroke units.

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Management of Blood Pressure

√	In patients with suspicion of acute stroke, the treatment of high blood pressure is not recommended in the extra-hospital environment, if <220 (PAS) or <120 mmHg (DBP) is maintained, with the exception of certain urgent situations (founded clinical suspicion of left cardiac insufficiency, acute coronary syndrome or aortic dissection).
B	If the decision is taken to treat it, sudden and intense decreases of the BP will be avoided (more than 20% in < 24 hours).
B	Fast acting sublingual drugs will be avoided.
√	If the BP has to be reduced, the intravenous route and when this is not possible, oral route, will preferably be used.
D	In those cases where there is low blood pressure, the presence of another serious concomitant disease will be ruled out and it will be treated according to the etiology.

Management of glycaemia

D	Patients with Diabetes Mellitus and with a suspicion of acute stroke who present hyperglycaemia must be treated in agreement with the protocols for managing diabetic patients.
√	Glycaemia must be corrected in those patients with suspicion of acute stroke when glucose figures of over 200 mg/dL are detected.
D	Hypoglycaemia must be ruled out as a cause of the symptoms and the glycaemia level must be corrected if the former exists.

Supplementary Oxygen

B	The routine use of supplemental oxygen is not recommended in people with suspected acute stroke.
D	Patients with suspicion of acute stroke must receive supplementary oxygen if there are clinical signs of hypoxia or to maintain an oxygen saturation of 94-98%, except in those patients with risks of hypercapnic respiratory failure, in whom a saturation of 88 to 92% will be maintained.

Antiplatelets therapy

√	Starting treatment with antiplatelets is not recommended in the extrahospital environment in those patients in which stroke is suspected, before carrying out a CT or MRI.

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Fluid replacement therapy

C	The administration of intravenous fluids containing glucose will be avoided in patients with suspicion of non-hypoglycaemic acute stroke.
√	The use of isotonic saline solution is recommended, avoiding volume overload, if it is necessary to administer fluids.

Management of "communicated" stroke

Management of the TIA or stable stroke of more than 48 hours' evolution

√	Patients with suspicion of stable stroke of more than 48 hours' evolution must be urgently transferred to a hospital if the symptoms started within 7 days.
B	Patients with suspicion of TIA that occurred within 7 days must be urgently evaluated by the specialist (in less than 24 hours).
D	Patients with suspicion of TIA or stable stroke of at least 48 hours' evolution, and with past history of recurrent episodes of TIA (2 or more TIA in one week) or with anti-coagulant treatment, must be urgently evaluated by a specialist (in less than 24 hours).
√	Patients with suspicion of TIA or stable stroke of at least 48 hours' evolution who come 7 days following the onset of the symptoms, must be evaluated by a specialist in less than one week.

Management of stroke after hospital discharge

Programming the Monitoring

√	When discharged from hospital, health care continuity by the Primary Health care teams must be guaranteed, scheduling the required visits depending on the patient's clinical situation, and in coordination with all the other specialists involved, to guarantee the gains obtained.
√	The post-stroke functional limitation must be evaluated after hospital discharge and at the end of the rehabilitation, to thus determine the functional status obtained. Scales, such as the Barthel Index, Rankin Scale or the FIM motor subscale (appendix 7) can be used.
√	A neurological evaluation by a specialist is recommended three months after hospital discharge.
√	The Primary and Secondary Stroke Prevention Guideline must be consulted to provide criteria for the appropriate secondary prevention measures in each case.

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General rehabilitation measures

B	A rehabilitation programme carried out by a multidisciplinary professional team with the active participation of patients and family members is recommended. This team will include the Rehabilitation and Physical Medicine specialist as the coordinator of the rehabilitation process in the phase following the hospital discharge and for one year after the stroke episode.
A	After discharge from the hospital, it is advisable for the general practitioner to check that patients are complying with or have complied with the rehabilitation treatment indicated in each case. It must be ascertained that the relevant rehabilitation treatment is being carried out according to the patient's deficits.
D	Providing training in the necessary care is recommended for carers or family members of patients with considerable functional impairment who are not candidates for rehabilitation.
√	When the patient experiences a functional impairment due to depression, fractures, falls, spasticity, pain or any other cause, it is recommended to refer again to rehabilitation in order to try to recover the previous functional level, as well as to treat possible triggering causes.

Deficits and alterations to be evaluated

D	It is recommended to examine the motor, sensory and visual skills, as well as language skills in all patients who have suffered a stroke, using validated scales, whenever these are available.
√	If a new deficit or alteration is detected that had not been previously recognised, the patient will be referred to the relative specialist.

Treatment of spasticity with oral drugs

D	It is not recommended to treat light spasticity with oral drugs if this impairment does not interfere with the patient's recovery.
√	Those patients whose spasticity interferes with their daily lives must be sent to the neurologist and/or rehabilitator for them to assess the most appropriate treatment.
B	Oral drugs, such as baclofen can be used to treat generalised spasticity

Management of shoulder pain

D	It is advisable to move the plegic shoulder during the first year after having suffered a stroke, in order to detect the presence of episodes of shoulder pain.
D	During the acute pain episodes, it is recommended to offer the patient simple analgesics such as paracetamol or NSAIDs.
A	Intraarticular steroid infiltrations are not recommended to treat acute episodes of shoulder pain in hemiplegic patients.
√	It is recommended to refer patients with persistent shoulder pain to a rehabilitation specialist.

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Pharmacological treatment of central post-stroke pain

D	The etiology of the pain must be evaluated, describing its location, duration, intensity and circumstances when it becomes worse or is relieved. The use of scales from 0 to 10 is recommended to determine the degree of pain.
B	The use of amitriptyline as a first-line drug is recommended, always bearing in mind the side effects associated with its use and establishing the risk/benefit balance in each case.
B	Anticonvulsant drugs (lamotrigine) can also be considered as an alternative to antidepressants (amitriptyline), although the possible appearance of side effects must be taken into account.
√	It is advisable to refer patients with uncontrolled central post-stroke pain in Primary Care to specialised pain management care.

Management of dysphagia

D	It must be verified if the presence of dysphagia has been evaluated before hospital discharge, also verifying if there are associated nutritional problems.
D	It is advisable to rule out the presence of dysphagia as soon as possible and in any case before starting oral feeding.
D	Patients in whom swallowing difficulties are detected for the first time (general, during or after swallow) must be assessed by the respective specialist.
D	It is recommended to provide training for patients whose swallowing difficulties persist and/or for their carers in identifying and managing swallow problems.
D	Patients with persistent dysphagia after a stroke must be regularly monitored when discharged, weighing them regularly, ensuring that they are not undernourished, to evaluate the need for changes in diet and/or in the feeding route.
Feeding by oral route	
D	It is advisable for patients with dysphagia fed by oral route to receive a diet that adapts to their status (hypercaloric diet based on thick liquids and semi-solid food with homogeneous texture, food bolus with heightened sensory qualities such as temperature, flavour and density, avoiding cold food in those patients with hypertonic reflexes).
Feeding by enteral route	
A	The use of a nasogastric probe is recommended in patients with dysphagia who require enteral nutrition during the first month after a stroke.
B	It is recommended to evaluate food administration via Percutaneous Endoscopic Gastrostomy in those patients with dysphagia who need long-term enteral feeding (more than 4 weeks).

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Fall Prevention

√	It is recommended to evaluate the risk of falls in all those patients who have suffered a stroke.
B	The following strategies are recommended to reduce falls in elderly patients in the community: multiple component exercises (group, Tai Chi, personalised home exercise), individual component exercises (walking, equilibrium or function), gradual withdrawal of psychotropic drugs, educational programme on modification of the prescription for primary health care physicians, cardiac stimulation with pacemakers in people with hypersensitivity of the carotid sinus, cataract surgery on the first eye, nonslip device for footwear on frozen floors, multiple and multifactoral interventions.
B	Vitamin D is not recommended in elderly people in the community to reduce the risk of falls, unless they have a deficit of vitamin D.
B	Safety-related interventions in the home are not recommended to reduce falls in the elderly in the community, except for those patients with serious sight impairment or high risk of falls.
B	Physiotherapy is not recommended one year after the stroke as a measure to prevent falls in patients whose mobility problems persist.
B	Hip protectors are not recommended to prevent fractures associated with falls in elderly people who live in the community.

Management of mood alterations

Depression	
B	Lacking consistent evidence about the efficiency of antidepressants or psychotherapy to prevent post-stroke depression, their use is not recommended for preventive purposes.
D	Screening for depression, using simple tests, is recommended in those patients who have suffered a stroke.
B	The use of antidepressants is recommended to treat post-stroke depression, but individually evaluating the risk of adverse effects in each patient.
Anxiety	
D	The presence of anxiety should be evaluated in those patients who present some other form of mood alteration.
D	Normal treatment of anxiety is recommended in patients who have suffered a stroke (psychotherapy, pharmacotherapy).
Emotionalism	
B	Considering treatment with antidepressants is recommended in those patients who, after a stroke, present persistent emotionalism, with frequent and serious episodes, evaluating the adverse effects of these drugs, above all in people of an advanced age.

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Management of cognitive impairment

D	An assessment of cognitive functions is recommended in all patients who have suffered a stroke.
√	The evaluation by a specialist is recommended when cognitive impairment that interferes with the patient's rehabilitation or daily life is detected.

Activities of daily living/return to work/driving/sexuality

Activity of daily living/occupational therapy	
D	An evaluation of the (personal and instrumental) ADL is recommended using validated tools such as the Barthel Index.
A	If difficulties for ADL are detected, it is advisable for the patient to be treated by an occupational therapist.
Return to work	
√	Evaluating the possibility of starting work or requesting permanent disability is recommended.
D	Encouraging patients who worked beforehand to return to work is recommended, if the conditions permit this.
Driving	
√	A recommendation will be made to those patients who, after a stroke, have sequelae that might interfere with driving, to avoid driving and to inform the General Directorate for Traffic of their status.
√	It is advisable for those patients who wish to drive again to be assessed at an accredited psychotechnical centre.
√	Patients wishing to obtain or extend their driving licence will be informed about the regulation that requires demonstrating at least six months free from neurological symptomatology and the need to present a favourable report from the specialist in the event of sequelae. They will also be informed that the validity period will be limited to one year at the most. Patients who have suffered recurrent TIAs will be informed that they cannot obtain or extend their driving licence according to the legislation in force.
Sexuality	
√	It is advisable to maintain an attitude of availability to be able to discuss with the patient and his or her partner the problems and concerns related to sexuality, when they consider this appropriate, providing the necessary information and support.
D	If sexual dysfunction exists, the existence of treatable causes must be evaluated.
D	The use of sildenafil or other phosphodiesterase inhibitors (vardenafil, tadalafil) is not recommended for patients with erectile dysfunction who have suffered a recent ischaemic stroke.

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Nursing diagnoses for stroke

√	The basic nursing diagnoses (NANDA) that must be evaluated in primary health care in all patients after a stroke are: - Impairment of physical mobility - Risk of impaired skin integrity - Unilateral neglect (normally in patients with lesions in right hemisphere) - Verbal communication impairment (normally in patients with lesions in left hemisphere) - Swallow impairment - Risk of lesion (normally in patients with lesions in right hemisphere and unilateral neglect) - Functional urinary incontinency - Low situational self-esteem - Anxiety - Self-care deficit: Feeding/Bathing/Hygiene/Dressing and Grooming - Ineffective coping - Sexual dysfunction - Effective/ineffective management of the therapeutic regime - Willingness to improve family coping

Information / communication to patient

Basic information: Characteristics and content

A	To provide patients/carers with information after a stroke, strategies are recommended which they can actively participate in and which include scheduled monitoring for explanation and reinforcement.
D	The information must be adequate for the education level of the patients/carers, and include aspects related to the prevention of new episodes, resources where more information can be obtained, and cognitive effects of the stroke.

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1. Introduction

This document is the complete version of the CPG for the Management of Stroke Patients in Primary Health care. The CPG is organised into chapters, where answers are given to the questions that appear at the beginning. A summary of the evidence and recommendations are presented at the end of each section. The type of study and bias possibility of the reviewed literature is given in the right-hand margin, throughout the text.

The material where the information about the methodological process of the CPG is presented in detail (search strategy, selection criteria, guide tables) is available both on the GuiaSalud website and on the website of the Health Technology Assessment Unit of the Lain Entralgo Agency. The Methodological Manual for the Preparation of the CPG can also be consulted on these websites, which include the general methodology used[1]. There is also an abridged version of the CPG, shorter in length and with the main appendices of the complete version, a quick guideline with the main recommendations and algorithms as well as an information leaflet for patients. These versions can be found on the aforementioned websites. The abridged version and quick guideline have also been published on hard support.

Epidemiology of cerebrovascular diseases and associated burdens.

The figures of incidence, prevalence, mortality, disability and health expenditure associated with strokes have converted this pathology into one of the priorities of our health system. This is reflected in the development of the Stroke Strategy of the National Health System, aimed at improving and homogenising stroke care in our country[2].

According to the World Health Organisation, cerebrovascular diseases (CVD) affect 15 million people a year, a third of whom die and another third are left permanently disabled[3]. In Spain, mortality due to CVD has experienced a constant downward trend for the last 30 years[4] (figure 1), probably thanks to the advances in primary prevention, diagnosis and treatment in the acute phase[5], but it is still the primary cause of death among women and the third among men[6] (table 1).

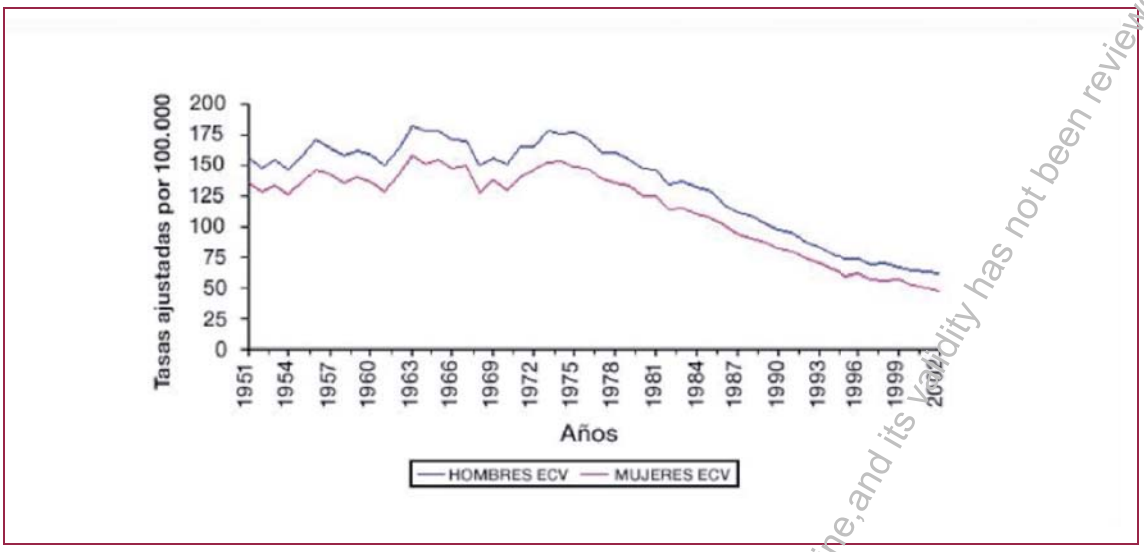
Table 1. Deaths due to CVD in Spain, 2006

	N	% of total deaths
Total	32,900	8.9%
Men	13,853	7.1%
Women	19,047	10.7%

Source: National Statistics Institute (www.ine.es) 8/09/2008

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Figure 1. Mortality due to CVD by gender. Spain 1951-2002



Source: CNE National Epidemiology Centre[7]

There is no accurate knowledge of the current incidence of CVD in our context although it does seem that on the contrary to mortality, it increases each year. According to data from the hospital morbility survey, 114,807 hospital discharges whose main diagnosis was CVD took place in 2006, 32% more than in 1997[8]. Population ageing seems to be the cause, as if the incidence rates in our country are around 132-174 stroke cases for every 100,000 inhabitants a year (table 2), in the over 85s, the incidence rate can even reach 3,000 cases for every 100,000 inhabitants[9]. The preliminary results of the IBERICTUS study, the study with the largest population base to date in our country, show some gross incidence rates of 155 cases per 100,000 inhabitants/year for the total population, but when the rates per age are separated, it can be seen that for the age groups of 18 to 64 years old, the stroke incidence rates amount to 39 cases per 100,000 inhabitants per year whilst for the over 64s the rate reaches 591 cases per 100,000 inhabitants per year[10]. If we take into account the demographic projections of the WHO, between 2000 and 2025 the incidence of stroke will increase by 27% in European countries[11].

The incidence rate of transient ischaemic attacks (TIA) is much more variable (table 2). The studies based on hospital registers and primary health care (PHC)[12] registers determine a lower incidence than those studies that are done door-to-door[13] (interviews of a randomly selected population sample), as many patients with transient symptoms do not consult their physician.

Table 2 shows the incidence of (ischaemic and haemorrhagic) stroke, exclusive incidence of ischaemic stroke and incidence of transient ischaemic attacks in different studies conducted in our country.

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Table 2. Incidence of cerebrovascular disease in Spain

Author	Year	Place	Population of reference	Annual incidence rate (cases /100000)
Stroke incidence (ischaemic and haemorrhagic)				
Leno[14]	1986-88	Cantabria	11-50 years	139
Caicoya[15]	1990-91	Asturias	The entire population	132
López Pousa[16]	1990	Girona	The entire population	174
Marrugat[9]	2002	Catalonia	>24 years	206
Díaz-Guzmán[10]	2006	Multicentre	>17 years	155
Incidence of ischaemic ictus				
Alzamora[17]	2003	Santa Coloma	The entire population	137
Incidence of TIA				
López Pousa[16]	1990	Girona	The entire population	64
Sempere[12]	1992-94	Segovia	The entire population	35
Matías Guiu[13]	1989	Alcoy	> 20 years	280
Díaz-Guzmán[10]	2006	Multicentre	> 17 years	34

With respect to prevalence, Spain has figures of between 3.8% and 11.8% in the over 65s, being more frequent in men and in urban areas[18,19].

Apart from the high incidence and prevalence, acute stroke is a serious episode which, in a high percentage of patients, leaves permanent sequelae; in fact it is the primary cause of acute disability in people over 65 and the second cause of dementia after Alzheimer[20]. In Europe, strokes occupy the second place with respect to disease burden (6.3% of the Disability Adjusted Life Years DALYs) and in Spain, fourth (3.9% of the DALYs) behind ischaemic cardiopathies, unipolar depressive disorder and Alzheimer and other dementias (data from 2004)[21].

The sequelae derived from strokes vary depending on the severity of the episode, monitoring and care received. In a study conducted in our country, up to 45% of the patients who are still alive after three months presented a moderate or severe disability[17]. Among the dependent stroke population it is commonplace (45%) for there to have been both physical and mental impairment, according to the ISEDIC report (social impact of dependent stroke patients). 57.4% of the dependent patients studies suffered from mental sequelae after the episode and 79.1% physical sequelae[20]. It is estimated that there are up to 350,000 stroke disabled people in Spain.

Stroke costs are important as it is a disease that has great impact at all levels. individual, family and social. They also represent an enormous economic burden for health systems all over the world[22,23]. In our country, they consume around 4% of the total health expenditure[24], with approximate direct health costs of 5,000 to 5,800 euro per patient during the first year after the episode[25-27]. The informal care costs must not be forgotten, which are higher than the direct health costs[27], or the decrease in the quality of life of both the patient and the carer. In the case of strokes, the work of the family is equal to the work of five carers in a home[20], and in many cases, the main carer must give up his or her job and leisure time to attend to the patient, so it is not surprising

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that carers suffer from health problems, such as tiredness, pains, insomnia and depression, among others[20].

Role of the primary health care teams

One of the most important aspects of stroke health care is its multidisciplinary nature. The integration and coordination of the PHC services, extra- and intra-hospital emergency services, neurology, rehabilitation, nursing and social work services is essential to guarantee efficient and quality care for the patient.

The role of the PHC teams is extremely important when caring for patients who suffer chronic diseases. Their work in both primary and secondary prevention is indisputable in the case of CVD, but also in acute stroke episodes. The PHC physician is often the first doctor to see the patient, too. He or she must, therefore be able to recognise the symptoms, apply the initial therapeutic measures and be aware of the emergency referral criteria, to avoid delays that might affect the possibility of receiving the right treatment. Observational studies of hospitalised stroke and TIA patients show that both in Spain and in other European countries, the PHC physician is the first health professional contacted in a high percentage of cases (table 3). This contact is often by telephone[28] and in rural areas, the percentage can even exceed 70% of the cases[29]. However, a study conducted in our country disclosed that a significant percentage of PHC physicians were not familiar with some of the aspects related to emergency stroke care. 32.8% were not familiar with the PHC figures based on which antihypertensive treatment should be started during the acute stroke phase, and 57.1% did not know which antihypertensive treatment was the recommended treatment. In addition, in 80% of the cases, they were not aware of the glycaemia figures where the use of insulin is required and in 28.6% of the physicians interviewed, their knowledge about the administration of anti-aggregants was erroneous[30].

Table 3. Percentage of patients who consulted the PHC physician first in the acute stroke phase.

Country	Year	% of patients
France[31]	1998-1999	24%
Germany[28]	2000-2001	25%
United Kingdom and Ireland[32]	2002	50%
Spain -Murcia[33]	2003	18.5%
Spain-Las Palmas de Gran Canaria[34]	2002-2003	59.8%
Spain -multicentre	1994	46.9%

Variability in clinical practice

A study conducted in the United Kingdom showed the variability in clinical practice that exists among PHC physicians, both in referrals to Specialised Health Care and in therapeutic management[36].

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After the hospital phase, once the patient has been discharged, the tasks defined for the PHC physician are the management of the secondary prevention of CVD, collaboration with the stroke teams, integration of the impact of the disease on the patient's global context and offering access to specialised rehabilitation services, among others[37].

In several studies, patients have expressed the need for psychological and social rehabilitation and not just physical rehabilitation, and they highlight the role of the PHC physician as a first point of contact to receive information or consult health problems[38,39]. Some patients feel a lack of medical supervision and lack of interest and knowledge about the disease by the PHC physicians[40].

There are many national and international guidelines and protocols about stroke management, but despite the main role of the PHC teams, very few address this group. The responsibilities of each of the health professionals that take part in stroke health care are not clearly defined and although the prevention and acute hospital treatment have been extensively documented, the same cannot be said about pre-hospital management and long-term monitoring of patients after the acute episode. It is advisable, therefore, to develop a guideline aimed especially at the PHC area, which includes the best available evidence about both acute and long-term management, which health professionals may encounter in their daily practice.

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2. Scope and objectives

The objective of the guideline is to guide health professionals from the PHC area in clinical diagnosis and pre-hospital stroke management in adult patients, as well as in the monitoring and clinical management of their complications and sequelae after hospital discharge, addressable from the PHC viewpoint. By achieving these objectives, the aim is to reduce morbimortality and improve the quality of life of stroke patients attended in PHC.

The guideline is, therefore, aimed at PHC health professionals involved in managing stroke patients, and all patients who come to this first health care level. For the latter, it is a tool that will enable them to discover the therapeutic possibilities and strategies available for their disease, so that they can avoid treatment patterns that are not backed up by scientific evidence.

The guideline does not include recommendations about primary or secondary prevention, which has already been addressed in another recent guideline within this same framework[41]. It does not address the diagnosis, treatment or rehabilitation in the field of specialised health care, either.

As this guideline has been studied with a national focus, organisational topics are not dealt with, although an attempt is made to establish some basic recommendations about criteria of referral to specialised health care, so the guideline will also be disseminated among all professionals related to stroke health care, an essential aspect in its implementation.

Currently available resources in PHC have been taken into account when formulating these recommendations.

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3. Methodology

The methodology used is included in the CPG preparation methodological manual in the National Health System1.

The steps below have been followed:

- Constitution of the guideline development group, integrated by professionals from: Primary Health Care (General practitioners, DUEs [diploma in nursing]). Specialised health care (neurologists) and technicians from the Health Technology Evaluation Unit (UETS); a representative of stroke patients has also participated in the actual development group to develop this guideline, right from the initial work phases.

- Definition of the scope and objectives of the guideline. Several PHC health professionals were contacted and with the aid of a questionnaire, information was collected about the most useful aspects concerning stroke management within the field of PHC. Later, the definition of the scope and objectives was agreed by the entire development group.

- Formulation of clinical questions using the Patient/Intervention/Comparison/Outcome (PICO) format.

- Bibliographic search in: Medline, Embase, Pascal Biomed, CINAHL, Cochrane Plus, DARE, Clinical Evidence, INHBPA, NHS EED, CRD, CINDOC. Languages: Spanish and English. Study population: adults who have suffered a stroke. Publication year limitation: only for primary studies. Firstly, a search was made to locate CPGs; apart from the aforementioned databases, specific databases and resources were used to locate both national and international CPGs (websites of organisations that develop and compile CPGs The quality of the guidelines was evaluated using the AGREE instrument. Four CPGs on acute management and four on management after the acute phase (Appendix) have been included as a secondary source of evidence, to respond to specific sections of the guideline. In a second phase, a search for systematic reviews (SR), meta-analyses and evaluation reports has been made in the aforementioned databases and in health technology assessment agencies. An extensive search for primary studies (clinical trials, observational studies, diagnostic and prognosis test studies) has been carried out in a third stage. The search was completed by recovering and critically reviewing the most relevant studies that were included in the reviews.

- Assessment of the quality of the studies and evidence summary for each question, following the SIGN (Scottish Intercollegiate Guidelines Network) recommendations and the NICE adaptation (National Institute for Health and Clinical Excellence) of the evidence levels of the Oxford Centre for Evidence-based Medicine and of the Centre for Reviews and Dissemination, for diagnostic tests (Appendix 1).

- Formulation of recommendations based on the "formal assessment" or "reasonable judgement" of SIGN. Any controversial recommendations or with a lack of evidence have been solved by consensus of the development group.

- An external review of the guideline was carried out by a group of professionals selected for their knowledge about guideline development methodology, the pathology address and the field of application.

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– Different Scientific Societies have collaborated in the preparation of the guideline: Spanish Society of Family and Community Medicine (SEMFYC), Spanish Society of Primary Health Care Physicians (SEMERGEN), Spanish Society of General Practitioners and Family Doctors (SEMG), Spanish Neurology Society (SEN), Spanish Society of Neurological Nursing (SEDENE), Spanish Society of Rehabilitation and Physical Medicine (SERMEF), Spanish Society of Geriatrics and Gerontology (SEGG) and Madrid Primary Health Care Nursing Society (SEMAP). The Spanish Stroke Federation (FEI) has also been taken into account regarding the participation of patients. All the societies are represented by one or more members of the development group or external reviewers.

– The material that includes information regarding the methodological process of the CPG (questions in PICO format, search strategy for each clinical question, guideline tables) is available at www.guiasalud.es.

Update of the CPG

The UETS, responsible for publishing the Guideline will also be responsible for updating it in 3 to 5 years time, or earlier, depending on any new available evidence. This update will be carried out by the incorporation of updated bibliographic searches, and above all it will focus on those aspects where the recommendations may be substantially modified, following the methodology described in the Update Manual[42].

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4. Definition and Classifications

Question to be answered

- What is the definition and nomenclature of cerebrovascular diseases?
- What is the classification of cerebrovascular diseases?

4.1. Definition and nomenclature

Asymptomatic Cerebrovascular Disease

This category includes those patients in whom neuroimage studies show that there is evidence of infarcts without any previous brain or retinal neurological clinical history[43].

Stroke

Acute cerebrovascular diseases or strokes are the consequence of an alteration of blood flow in the brain, which causes a transient or permanent deficit of the functioning of one or several areas of the brain.

Two main types of stroke are distinguished depending on the nature of the brain lesion: Ischaemic (85% of the cases) and haemorrhagic (15%). The former is due to a lack of blood intake to a certain area of the brain parenchyma, and the latter, to the breakage of a blood vessel in the brain with blood effusion outside the vascular flow.

A) Ischaemic stroke. This is an episode of focal Neurologic deficit that appears as a result of an alteration in the blood flow in an area of the brain parenchyma. The alteration may be quantitative: amount of blood that flows to the brain (thrombosis, embolism, low cardiac output); or qualitative: quality of blood (anaemia, thrombythemia, polycythemia). Depending on how it evolves during the first few hours, two main types of ischaemic strokes can be distinguished[44]:

1. *Transient ischaemic attack (TIA)*

TIAs were traditionally defined as ischaemic strokes that appear as brief episodes of focal or retinal neurological dysfunction that last for less than 24 hours and take place as a result of a deficit in the blood intake in the territory irrigated by a brain vascular system. Typically, it is reversible and there is no permanent neurological deficit once it ends. The duration limit of less than 24 hours is an arbitrary limit and currently, as the majority of the TIAs last for less than one hour, the Transient Ischaemic Attack (TIA) development group redefines TIA as a brief episode of neurological dysfunction, caused by focal brain or retinal ischemia, with clinical symptoms that typically last for less than one hour, with no evidence of acute infarct[45]. The AHA/ASA on its part affirms that the existing data in literature support the key elements of the new definition proposed by the TIA Development group, although it considers that making reference again to a time limit

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is not appropriate, as the limit of one hour does not differentiate between episodes with or without tissue infarct, so the AHA/ASA proposes a new definition based on the criterion of damage in the brain tissue more than on the time criterion: *transient episode of neurological dysfunction caused by a focal brain ischemia, of the spinal cord or of the retina, without acute infarction*[46].

2. Cerebral infarction

Due to the importance in the prognosis and its therapeutic implications, progressive cerebral infarction must be distinguished from stable cerebral infarction[44].

a) Progressive cerebral infarction: An infarction whose initial clinical manifestations become worse, either due to accentuation or because there are new symptoms or signs. This worsening must take place after the first hour and no later than 72 hours after the start of the symptoms. It is important to identify it as otherwise the prognosis will be worse with an increase of morbimortality. When the clinical deterioration is due to systemic complications that are concomitant to the stroke, the term deteriorating stroke[47] would be adequate.

b) Stable cerebral infarction: When there are no changes in the symptomatology for at least 24 hours in the carotid system and 72 hours in the vertebrobasilar system.

B) Haemorrhagic stroke. Haemorrhagic strokes or intracranial haemorrhage are due to the blood effusion outside the vascular stream. Depending on where the effused blood is located, observed in the different neuro-image techniques, the intracranial haemorrhage is divided into: intra-axial haemorrhage, subarachnoid haemorrhage, subdural haematoma and epidural haematoma[48] (Table 4).

Table 4. Classification of haemorrhagic strokes or intracranial haemorrhage

1. Intra-axial haemorrhage
   - a) Primary
     - i. Haemorrhage
     - ii. Microhaemorrhage
   - b) Secondary
     - i. Tumours
     - ii. Vascular malformations
     - iii. Aneurysms
     - iv. Haemorrhagiparous diseases. Coagulopathies
     - v. Anti-thrombotics
     - vi. Fibrinolytics
     - vii. Sympaticomimetics
     - viii. Infections
     - ix. Vasculitis
     - x. Retarded postraumatics
     - xi. Vein or sinus thrombosis
2. Subarachnoid haemorrhage
   - a. Aneurismatic
   - b. Non-aneurismatic
3. Subdural haematoma
4. Epidural haematoma

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1. *Intra-cerebral haemorrhage (ICH)*

This is the haematic collection within the brain parenchyma, produced by the breakage of an artery of a brain arteriolae, with or without ventricular communication and/or at subarachnoid spaces.

It represents 10 to 15% of all strokes. According to its topography, the ICH can be classified into:

a) Supratentorial

I. Hemispheric or lobar

II. Deep

b) Infratentorial

I. Tronco-encephalic

II. Cerebellous

2. *Subarachnoid haemorrhage (SAH)*

This may or may not have a traumatic origin (spontaneous SAH), the former being the most frequent.

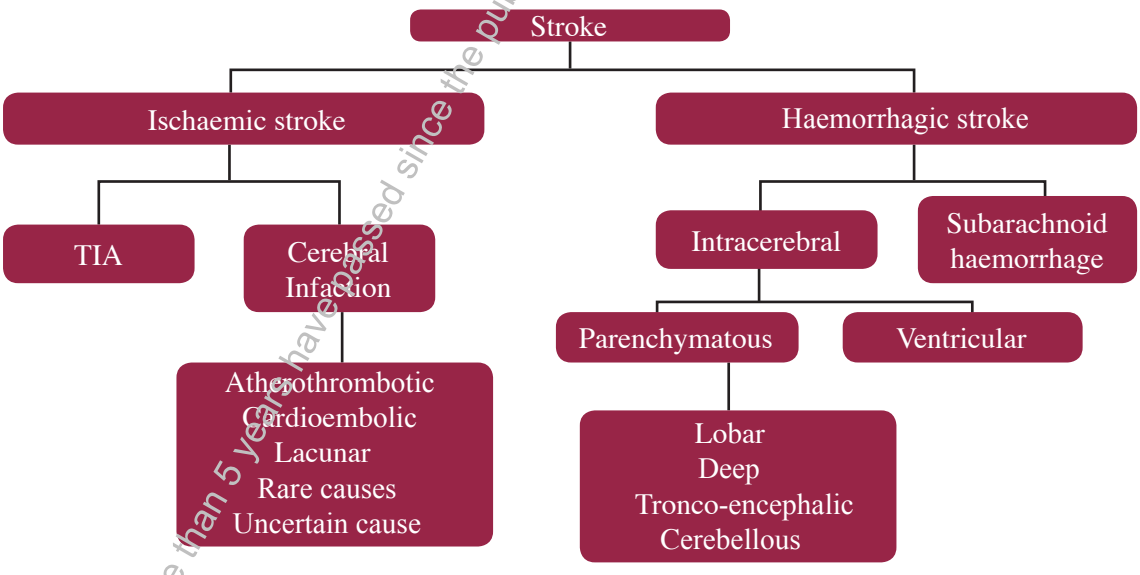
3. *Subdural and epidural haematoma*

These are secondary, in the majority of the cases, to cranial traumatism.

4.2. Stroke classification

There are many different classifications of cerebrovascular diseases depending on the nature of the lesion, ethnology, size, morphology, topography, onset and subsequent evolution. A classification is given below with a more clinical approach (figure 2).

Figure 2. Clinical classification of stroke[49]



Source: Modified by Díez Tejedor et al.[49]

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4.2.1. Etiologic classification of ischaemic stroke[49]

Atherothrombotic Infarction. Large artery atherosclerosis

Generally a medium or large infarction of cortical or subcortical topography and with a carotid or vertebrobasilar location, where either of the two criteria below are satisfied:

a) Atherosclerosis with stenosis: 50% stenosis of the luminal diameter or occlusion of the relative extracranial artery or of the large-calibre intracranial artery (middle cerebral, posterior cerebral or troncobasilar), in absence of any other etiology.

b) Atherosclerosis without stenosis: Presence of plaques or stenosis of <50% in the middle cerebral, posterior cerebral or basilar artery, in absence of any other etiology and in presence of more than two of the following cerebral vascular risk factors: Age >50 years, HBP, diabetes mellitus, nicotine addiction or hypercholesterolemia.

Cardioembolic infarction

Generally medium or large infarction, of cortical topography, where, in the absence of any other etiology, some of the following emboligenic cardiopathies appear: Thrombus or intracardiac tumour, rheumatic mitral stenosis, aortic or mitral prosthesis, endocarditis, auricular fibrillation, sinus node disease, left ventricular aneurysm or akinesia after an acute myocardial infarction, acute myocardial infarction (less than three months) or global cardiac hypokinesia or dyskinesia.

Lacunar infarct

Small infarct (<1.5 cm. diameter) in the territory of a cerebral perforating artery, which usually clinically gives rise to a lacunar syndrome (pure motor hemiparesis, pure sensitivity syndrome, motor sensitivity syndrome, ataxic hemiparesis and clumsy hand dysarthria.

Rare cause cerebral infarction

Small, medium or large infarction, of cortical or subcortical location, in the carotid or vertebrobasilar territory in a patient in whom atherothrombotic, cardioembolic or lacunar origin has been ruled out. This usually occurs due to systemic disorders (connectivopathy, infection, neoplasia, myeloproliferative syndrome, metabolic alterations, coagulation, etc.) or due to other diseases, such as arterial dissection, fibromuscular dysplasia, saccular aneurysm, arteriovenous malformation, venous cerebral thrombosis, angeitis, migraine, etc.

Cerebral infarction of indeterminate origin

Medium or large infarction, of cortical or subcortical location, in the carotid or vertebrobasilar territory where, after a thorough diagnostic study, the atherothrombotic, cardioembolic, lacunar and rare cause subtypes have been ruled out, or there was more than one possible etiology. Within this indeterminate etiology, some subdivisions could be put forward that would clarify this section better; incomplete study, more than one etiology and unknown.

4.2.2. Etiologic classification of haemorrhagic stroke

Intra-cerebral haemorrhage (ICH)

Depending on the subjacent cause of the haemorrhage, the ICH is classified as primary or secondary.

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Primary ICH
When the haemorrhage originates as a result of the rupture of small arteries or damaged arteriolae due to chronic high blood pressure or amyloid angiopathy[48].

Secondary ICH
IHC can also be secondary to a large number of subjacent pathologies, such as: rupture of vascular malformations, blood dyscrasias, anticoagulant and fibrinolytic treatment, brain tumours, vasculitis, etc.

Subarachnoid haemorrhage (SAH)
Spontaneous SAH is due in the majority of the cases to rupture of an aneurysm, which is why they are classified into aneurismatic and non-aneurismatic SAH. Among the latter, the most frequent causes are rupture of an arteriovenous malformation, intracranial arterial dissection, vasculitis, reversible cerebral segmental vasoconstriction.

4.3. International Classification of Diseases and International Classification of Primary Care

The internationally used classifications and their equivalents are listed below. The International Classification of Primary Care "ICPC-2" of WONCA[50] (table 5) is based on three-digit alphanumerical codes, which can be extended if necessary. The first digit is a letter that represents an organic system or apparatus and they constitute the 17 chapters of this classification. The aspects related to CVD are represented in the "K-Circulatory Apparatus" of the abbreviated codes of the ICPC-2. The second and third digits are numbers, called components, which are associated specifically or non-specifically with: Signs or symptoms, administrative, diagnostic, preventive or therapeutic procedures; results of supplementary tests; referrals, monitoring and other consultation reasons; or health diseases and problems. The equivalence with the codes of the International Classification of Diseases ICD-10[51] is expressed in table 5.

Table 5. Abbreviated codes of the ICPC-2 for cerebrovascular disease and correspondences with ICD-10

ICPC-2 K. Circulatory apparatus	Equivalence with ICD-10
K89 Transient cerebral ischemia	G45
K90 ACV/stroke/apoplexy	G46, I60, I61, I62, I63, I64
K91 Cerebrovascular disease	I65, I66, I67.0, I67.1, I67.2, I67.7, I67.8, I67.9, I68, I69,I67.3,I67.5,I67.6,

The classification of cerebrovascular diseases according to ICE-9CM (clinical modification)52 and ICD-1051 are presented in table 6.

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Table 6. Incidence of cerebrovascular disease in Spain

ICD 9MC		ICD 10	
430	Subarachnoid haemorrhage	I60	Subarachnoid haemorrhage
431	Intra-axial haemorrhage	I61	Intra-axial haemorrhage
432	Other intracranial haemorrhage and non-specific	I62	Other non traumatic intracranial haemorrhage
433	Occlusion and stenosis of precerebral arteries	I63	Cerebral infarction
434	Occlusion of brain arteries	I64	Stroke, not specifying if infarct or haemorrhage
435	Transient brain ischemia	I65	Occlusion and stenosis of precerebral arteries
436	Cerebrovascular acute disease but badly defined	I66	Occlusion and stenosis of precerebral arteries
437	Other cerebrovascular diseases and badly defined	I67	Other cerebrovascular diseases
438	Late effects of cerebrovascular disease	I68	Cerebrovascular disorders in diseases already classified in other sections
		I69	Sequelae of cerebrovascular disease
		G45	Transient brain ischemia

* In the ICD-10 classification, transient cerebral ischemia does not appear in the same section as CVD. Instead it appears in the "episodic and paroxistic disorders of the nervous system" section.

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5. Clinical diagnosis of stroke

Question to be answered

- What are the suspicion criteria for stroke?
- What data must be included in the clinical records? What data must be sent to specialised health care?
- What examinations must be performed if stroke is suspected?
- What differential diagnoses must be taken into account?
- Are the prehospital scales in the Primary Health Care (PHC) environment useful (face-to-face and telephone consultation)?

5.1. Suspicion criteria for stroke

The American National Institute of Neurological Disorders and Stroke (NINDS) establishes five signs/symptoms that must warn us of the presence of stroke[53]:

- **Sudden numbness, weakness or paralysis** of the face, arm or leg, especially on one side of the body.
- **Sudden** confusion or **trouble talking** or **understanding** speech,
- **Sudden trouble seeing** in one or both eyes
- **Sudden trouble walking**, or **loss of balance** or coordination.
- **Sudden** severe **headache**, with no known cause.

Australia's National Stroke Foundation adds a sixth symptom[54]:

- **Trouble swallowing**

The Spanish Neurology Society (SEN)[55] adds another sign to the five signs proposed by the NINDS:

- **Sensitivity disorder**, feeling of "prickling, numbness or tingling " of the face, arm and/or leg on one side of the body, which **starts suddenly**.

The reliability of these alert signals to detect stroke has been examined in certain works.

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A SR, 2005, included the precision and reliability of symptoms and findings in the physical examination of patients with suspicion for established stroke or transient ischaemic attack[56]. With respect to precision, one of the studies concluded that the presence of some of the following symptoms within the prehospital field: acute facial palsy, language alteration or drop of the arm (inability to keep it high up or move one of the extended arms) identified patients with stroke with 100% sensitivity (95% CI: 95% to 100%) and 88% specificity (95% CI: 82% to 91), although the sensitivity decreased to 66% in the hospital environment. In agreement with another of the studies included in the review, the presence of one of the three symptoms mentioned above shows a Verisimilitude Ratio (VR) of 5.5 (95% CI: 3.3 to 9.1), whilst if none of the three symptoms is present the VR is 0.39 (95% CI: 0.25 to 0.61).

SR diagnostic test studies II and III

In the hospital environment, considering as stroke cases those patients with a persistent focal neurological deficit, on acute onset, during the previous week and without a history of cranial traumatism, permits the correct identification of 86% the patients, in other words, the presence of these four findings provides a sensitivity of 86% (95% CI: 81% to 91%), a specificity of 98% (95% CI: 97% to 99%) and a VR = 40 (95% CI: 29 to 55).

In another of the studies included, the reliability of an algorithm aimed at identifying stroke patients was assessed. The key symptoms of the algorithm (sudden change in language, sight loss, diplopia, paralysis or weakness, non-ortostatic dizziness and loss of sensitivity or pins and needles) shows a good interobserver concordance (kappa=0.60; 95% IC: 0.52 to 0.68) to diagnose established stroke and TIA with respect to a panel of experts. Comparing the diagnosis of stroke with other non-vascular episodes, 86% agreement between the algorithm and the panel of experts was obtained.

Motor deficits were among the most prevalent symptoms during the acute episode, as seen from different observational studies. The stroke event registration project, coordinated by the WHO, with the participation of 17 centres from 12 countries, collected 8754 stroke cases between 1971 and 1974. Among other data, the register contained information about the symptoms in stroke presentation. Motor deficits were observed in up to 79% of the patients (table 7), the most frequent being hemiplegia[57].

Descriptive studies 3

In 1978 and 1980 a prospective study was conducted on the epidemiology of stroke in the town of Tilburg (Holland)[58]. The most frequent symptoms during acute stroke were, once again, motor deficits (80%), with hemiplegia being the most prevalent (78%). 62% of the patients presented language alteration together with motor deficit, and up to 92% of the patients presented at least one of the these two symptoms.

Descriptive studies 3

According to the analysis of the first thousand cases of stroke included in the Lausanne registry (Switzerland), the most frequent clinical manifestations are also motor deficits following by sensorial deficits and language alterations[59] (table 7).

Descriptive studies 3

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In a study published in 2007, the symptoms present in 505 cases of incident ischaemic stroke (first episodes) were collected, to see if there were differences between men and women. The most frequent symptoms were weakness and language alteration. In addition, 30.3% of the patients suffered sensorial alterations such as numbness or prickliness of the limbs. No differences were found between men and women except for weakness, more frequent in women[60].

Descriptive studies 3

Table 7. Prevalence of frequent symptoms in acute stroke

Prevalence of symptoms in acute stroke	WHO Collaborative Study[57] N=8.754	Epidemiology of Stroke in Tilburg[58] N=526	The Lausanne Stroke Registry[59] N=1.000	Sex Differences in Stroke[60] N=505
Consciousness level	50% conscious 20% comatose	60% conscious 14% comatose	Coma or somnolence in 16.3%	
Motor deficit	79%	80%	83.2%	63.8%
Language alteration		66%	46%	39.4%
Headache			23%	
Sensorial deficit			46.4%	
Visual alteration	4.48% (only visual alteration)			19.6%
Numbness of limbs (sensorial)				30.3%
Language alteration + motor deficit		62% 92% at least one of the two symptoms		
Motor +sensorial alteration			37.4%	

In the case of TIA, it must be pointed out that if the patient is seen within 24 hours after the onset of symptoms and these are still present, it is not clinically possible to distinguish a TIA from an established stroke, so all the cases will be considered as possible acute stroke [45].

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Furthermore, it must be born in mind that the following clinical manifestations, when presented in an isolated fashion, are not suggestive of a TIA[43]. Experts' opinion (4)

- Confusion
- Vertigo
- Dizziness
- Amnesia
- Dysphagia
- Dysarthria
- Scintillating scotoma
- Urinary or faecal incontinence
- Loss of vision plus alteration of consciousness
- Focal symptoms associated with migraine
- Loss of consciousness
- Tonic and/or clonic activity
- Gradual progression of symptoms (especially sensorial) affecting several parts of the body

Together with the symptoms, the presence or absence of risk factors may help orientate the stroke diagnosis.

- The main risk factors for suffering a stroke episode have been included in the Guide for Primary and Secondary Prevention of Stroke [41], and are shown below (table 8). CPG (several Studies) 1++/2++/2+/3/4

Table 8. Stroke risk factors

Non-modifiable risk factors	
Age	The incidence of stroke doubles every 10 years from the age of 55 onwards.
Gender	More frequent in women (probably due to the larger number of older women).
Family background	Family history is associated with a greater risk of stroke.
Modifiable risk factors	
Prior stroke	The risk of presenting a recurrent ischaemic stroke and a new vascular event is especially high the first year after having suffered a TAI.
Alcohol, tobacco, drugs	A high consumption of alcohol, consumption of tobacco or drugs increases the risks of suffering a stroke.
Sedentary	Practicing physical exercise is associated with a lower risk of vascular episodes, including stroke.
Obesity	Both general obesity and abdominal obesity are associated with an increase in the risk of stroke.

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HBP, Diabetes Mellitus (DM), Metabolic Syndrome, Dyslipidemia	HBP is the most important risk factor together with age. DM and metabolic syndrome also increase the vascular risk and the plasmatic cholesterol figures are associated with vascular risk although the relationship with stroke is more controversial.
Oral contraceptives, Hormone Therapy	Both oral contraceptives and hormone therapy increase the risk of suffering a stroke.
Hyperhomocysteinemia, increase of Lipoprotein Ag, migraine, falciform cell diseases	The high levels of homocistein and lipoprotein A in plasma have been associated with an increase in the risk of stroke. Patients who suffer migraine episodes, especially with aura, show an increase of stroke. Stroke is also a frequent complication of falciform cell disease.
Emboligenic cardiopathies	Auricular fibrillation is a stroke risk factor, especially in people over 75, with HBP, cardiac insufficiency, DM or prior ischaemic stroke. In patients with no other risk factors, the probability of store is 2% a year. In AMI, stroke is presented as a complication in 0.75%-1.2%. Pathologies with left ventricular ejection fraction below 30% also present a higher stroke risk. Mechanical heart valve prostheses present a high risk of thrombosis, whilst the biological ones present a lower risk. The presence of other valvulopathies (mitral stenosis or rheumatic origin) are also associated with a greater risk.
Asymptomatic stenosis of the carotid artery	The risk of stroke is situated at 2-3% per year and 5% for the most serious stenoses.

Summary of evidence

Diagnostic Tests II/III	Within the prehospital environment, the presence of any of the following signs. Acute facial palsy, language alteration or dropping of the arm identifies patients with stroke with 100% sensitivity (95% CI: 95% to 100%) and specificity of 88% (95% CI: 82% to 91%) and increases the probability of stroke diagnosis (VR = 5.5), whilst an absence decreases the probability of stroke (VR=0.39)[56]
Diagnostic Tests II/III	The presence of a persistent focal neurological deficit, of acute onset, during the previous week and with no previous history of cranial traumatism permits identifying patients with stroke with 86% sensitivity at hospital level[56]
3	Motor deficits are usually the most prevalent symptoms during the acute episode, followed by language alterations and sensorial deficits[57-60]
4	TIA episodes usually last for less than one hour and cannot be distinguished from stroke if the symptoms are present at the time of the consultation[45]

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4	The presence of the following symptoms in an isolated manner. confusion, vertigo, dizziness, amnesia, dysphagia, dysarthria, scintillating scotoma, urinary or faecal incontinence, loss of sight plus alteration of consciousness, focal symptoms associated with migraine, loss of consciousness including syncope, tonic and/or clonic activity, gradual progression of symptoms (in particular sensorial ones) affecting several parts of the body.
1++/2++/2+/3/4	The presence of risk factors increases the probability of suffering a stroke (see table 8)[41]

Recommendations

C	A stroke must be suspected in patients with focal neurological deficits, with sudden appearance of the symptoms, especially if the patient has acute facial palsy, language alteration or fall or sudden loss of strength in the arm, and does not refer to a previous history of cranial traumatism.
√	TIA must only be suspected when the symptomatology described in the previous recommendation is not present at the time of the consultation and the symptoms have lasted for less than 24 hours (normally less than one hour).
D	TIA must not be considered in the first place when the following symptoms appear in an isolated manner: confusion, vertigo, dizziness, amnesia, dysphagia, dysarthria, scintillating scotoma, urinary or faecal incontinence, loss of sight plus alteration of consciousness, focal symptoms associated with migraine, loss of consciousness including syncope, tonic and/or clonic activity, gradual progression of symptoms (in particular sensorial ones) affecting several parts of the body.
√	The presence of vascular risk factors must be taken into account when diagnosing a suspicion of stroke, above all stroke or any other previous vascular disease, nicotine addiction, HBP and DM.

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5.2. Anamnesis

The following[61] key components must be included in the clinical history of patients with suspicion of stroke that has to be sent together with patients referred to the hospital, according to the American Heart Association / American Stroke Association (AHA/ASA): CPG (Experts' opinion) 4

- Onset of symptoms
- Recent episodes
  - AMI
  - Traumatism
  - Surgery
  - Bleeding
- Comorbilities
  - HBP
  - DM
- Medication or Insulin
  - Antihypertensive
  - Anticoagulant

The development group considered it equally important to include in the history: Experts' opinion (4)

- Prior strokes
- Comorbility/risk factors
  - Arrhythmias
  - Nicotine addiction
  - Alcoholism
  - Dyslipidemia
  - Past history of dementia or cognitive deterioration
- Medication
  - Antiplatelets
- Score on the Rankin scale

The modified Rankin scale (appendix 7) provides a simple way of assessing the disability[62,63]. The decision to include it among the initial data to be collected is based on the influence that the basal situation of the patient has on subsequent treatments. In this sense, the Ranking scale score may be an inclusion criterion for an extrahospital stroke code, as will be seen below (6.1.3. Prehospital stroke code).

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It is very important to take note as accurately as possible of the **moment when the symptoms started**. If the patient is not able to provide this information or if he or she has woken up with the symptoms, the symptom onset time is defined as the last time that the patient was awake and symptom-free[61].

Experts' opinion (4)

The guideline development group agreed to ask, if there were sufficient time, about the duration of the symptoms, accompanying symptoms and circumstances that triggered the episode that may advise towards other possible causes of the symptoms (see point 5.4 differential diagnosis), risk factors for ECV, arteriosclerosis and cardiac pathologies, as well as ask about migraine episodes, convulsions, infections, trauma, consumption of anovulatories / hormone therapy, pregnancy / puerperium or drug abuse. Even the telephone numbers of witnesses or relations may be useful later on, to clarify the history or obtain the informed consent if necessary. It was considered important to refer the information of the episode together with the patient when transferred to specialised care.

Table 9 contains a summary of the components of the clinical history of the stroke patient, and a data collection sheet form can be consulted in appendix 3.

Table 9. Components of the clinical history of stroke patients

Essential components		
Onset of symptoms		
Previous stroke/TIA		
Recent episodes	• AMI • Traumatism • Surgery • Bleeding	
Comorbilities / risk factors	• HTA • Alcoholism • Nicotine addiction • Dyslipidemia	• Arrhythmias • DM • Past history of dementia or Cognitive impairment
Medication	• Insulin • Antihypertensive • Anticoagulant/antiaggregant	
Rankin Scale		
Additional components		
Duration of the symptoms	Cardiac pathology	
Accompanying systems	Episodes of migraine, convulsions, infections	
Triggering circumstances	Pregnancy or puerperium	

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Risk factors for CV/arteriosclerosis	Consumption of anovulatories and/or hormone therapy
Drug abuse	
Telephone numbers of witness or relations	

Summary of evidence

4	The key components of the clinical history of a patient with suspicion of stroke include the time the symptoms begin, past history of stroke, comorbilities, current medication 61 and Rankin scale.
4	If there is sufficient time it is useful to include in the clinical history the duration of the symptoms, vascular risk factors, triggering circumstances, previous episodes of migraines, convulsions, infections, trauma, consumption of anovulatory products/hormonal therapy, pregnancy/puerperium and drug abuse.

Recommendations

√	The anamnesis of a patient with suspicion of stroke must include the starting time of the symptoms, comorbilities, previous strokes, current medication and Rankin scale.
√	If there is sufficient time and so long as this does not delay the transfer, the anamnesis can be completed by including the duration of the symptoms, vascular risk factors, triggering circumstances, previous episodes of migraines, convulsions, infections, trauma, consumption of anovulatory products/hormonal therapy, pregnancy/puerperium and drug abuse.
√	The clinical data of the patient with suspicion of stroke in PHC must be sent to specialised care (appendix 3).

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5.3. Physical exploration and biological parameters

The initial physical examination must include an evaluation of the vital functions: Respiratory function, heart beat, BP, temperature, and if feasible, glycaemia and oxygen saturation[61]. CPG Experts' opinion (4)

Neurological examination. Brief but rigorous assessment of the neurological functions, evaluating the following aspects[64]: Experts' opinion (4)

Mental functions:

- Level of consciousness (the Glasgow scale can be used).
- Orientation in space and time.

Language: Comprehension as well as answers to simple orders and expression will be evaluated. The patient will be asked to name objects such as a pencil or match and then say what they are used for.

Cranial pairs: Their alteration is frequent in trunk lesion.

Oculocephalic deviation: This is a localising sign. In hemispheric lesions, the patient looks to the side of the encephalic lesion whilst in trunk lesions, the deviation is towards the hemiplegic side, that is, contrary to the encephalic lesion. Experts' opinion (4)

Motor deficit: Generally uni- and contra-lateral to the brain lesion. It can be complete (plegia) or incomplete (paresis) It is characterised by lack of strength, tone alteration and Babinski sign.

Sensitive deficit: normally contralateral to the encephalic lesion.

Cerebellar alterations: Such as ataxia, lack of coordination and hypotony.

The development group also considered it important to include the search for **meningeal signs**. Experts' opinion (4)

This first examination must be completed with: Experts' opinion (4)

Examination of head and neck: Lacerations, contusions and deformities might suggest a traumatic etiology of the symptoms. The carotid must be examined, looking for signs of congestive heart failure (jugular distension).

Cardiological examination: Identify myocardial ischemia, valvular pathology, rhythm alterations and aortic dissection.

Abdominal and respiratory examination: Search for comorbilities.

Inspection of the skin: Search for signs of systemic alterations such as hepatic dysfunction, coagulopathies or platelet alterations (jaundice, purpura, petechiae).

The execution of an ECG can be considered so long as this does not delay the transfer of the patient.

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Summary of evidence

4	The initial physical examination of a patient with suspicion of stroke is comprised of an evaluation of the vital functions: Respiratory function, heart beat, BP, temperature, glycaemia and oxygen saturation, if feasible[61].
4	The neurological examination of a patient with suspicion of stroke includes the evaluation of mental functions, language, mengingeal signs, cranial pairs, oculocephalic deviation, motor and sensory deficits, meningeal signs and cerebellar alterations[64].
4	The execution of an ECG is one of the supplementary tests that can be carried out in Primary Health.

Recommendations

√	The initial physical examination of a patient with suspicion of stroke must include the evaluation of the respiratory function, heart beat, BP, temperature, glycaemia and oxygen saturation, if feasible.
√	It is recommended for the neurological examination of a patient with suspicion of stroke to include the evaluation of mental functions, language, mengingeal signs, cranial pairs, oculocephalic deviation, motor and sensory deficits, and cerebellar alterations.
√	The execution of an ECG will be considered so long as this does not delay the transfer of the patient.

5.4. Differential diagnosis

The differential diagnosis includes a series of pathologies that are generally easy to distinguish with the clinical history, physical examination, analyses and image testing. However, in health centres, the diagnosis, although basically clinical, may be quite complicated. One study showed that up to 30% of the patients sent to the emergency service with suspicion of stroke finally presented another pathology[65]. In another study about non-hospital patients, only 8% of non-comatose patients, without cranial trauma and with relevant neurological symptoms (alteration of consciousness, focal neurological signs, convulsions, syncope, headache or a mixture of weakness/dizziness/sickness) finally presented a stroke diagnosis[66].

The aim of this section is not to provide a detailed tool to distinguish between stroke and pathologies with similar symptoms. If there is any doubt about the cause of the symptoms, the procedure must be as if it were a stroke, so as not to delay the treatment in the event that this is necessary.

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The AHA/ASA mentions the following pathologies that may simulate a stroke and some clues to identify them[61].

Experts' opinion (4)

- Convulsions: History of convulsions, witnessed comitial crisis, post-stroke period.
- Migraine: Similar previous episodes, preceded by aura, headache.
- Hypoglycaemia: History of DM, low seric glycaemia, reduced level of consciousness.
- Hypertensive encephalopathy: Headache, delirium, significant hypertension, brain oedema.
- Conversion disorder: Lack of findings in cranial pairs, neurological findings without vascular distribution, inconsistent physical examination.

Comitial crises / convulsions

Descriptive studies 3

Immediate post-stroke deficit is similar to the clinical picture caused by primary stroke. Commonly, this deficit corresponds to a hemiparesis, although it can occur as aphasia, hemianopsia or other focal deficits. In a study that evaluated the precision of the clinical diagnosis of stroke by Primary Health care doctors[67], it was determined that the post-stroke stage after non-witnessed or acknowledged convulsions, was the most frequent pathology among the erroneous stroke diagnoses (5% of all the patients)

In similar studies carried out among emergency crews[68,69], and interns[65], comitial crises also figured among the pathologies that were most frequently confused with the diagnosis of stroke.

Migraine with aura

Descriptive studies 3

The neurological symptoms are usually more gradual at the onset although at times the migraine aura may appear acutely and accompanied by both a sensorial and motor neurological deficit[70].

Hypoglycaemia

CPG (Experts' opinion) 4

The NICE guideline recommends that hypoglycaemia as a cause of these symptoms must be ruled out in all those patients with a focal neurological deficit[71].

Descriptive studies 3

Hypoglycaemia may produce a similar picture to acute stroke with hemiplegia and aplasia[72] and although the motor deficit can be immediately solved by administering glucose, the resolution of the picture may also take several hours.

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Hypertensive encephalopathy

Descriptive studies 3

Hypertensive encephalopathy is characterised by high BP figures sometimes accompanied by neurological focality. The presence of hypertensive retinopathy may orientate the diagnosis, although it often cannot be distinguished from acute stroke[73]. When there are focal neurological symptoms, hypertensive encephalopathy is an exclusion diagnosis, after ruling out a stroke clinically and by neuro-imaging.

Conversion disorder

Descriptive studies 3

This is a neurological disorder where unconsciously, due to a traumatic or stressful event, the patient develops physical, normally neurological, symptoms. One study showed that of 699 patients diagnosed for stroke, 2% really had a conversion disorder[74]. Cases of patients have also been described that simulate the symptoms of acute stroke[75].

Others

Descriptive studies 3

Other pathologies that may produce similar clinical pictures to acute stroke are space occupying lesions (subdural haematomas, brain abscesses, primary tumours of the central nervous system and brain metastasis), traumatism, drugs and alcohol, systematic infections or multiple sclerosis, among others[65, 67,68, 76,77]

Summary of evidence

3	Comitial crises/convulsions, migraines with aura, hypoglycaemia, hypertensive encephalopathy, conversion disorder /simulation and space occupying lesions among others, may produce similar clinical pictures to acute stroke[65,67-77]

Recommendations

D	The differential diagnosis of acute stroke must include comitial crises/convulsions, migraines with aura, hypoglycaemia, hypertensive encephalopathy and conversion disorder/simulation, among others.
√	If it is not clear that the cause of the symptoms is a stroke, proceed as if it were, in order not to delay the treatment.

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5.5. Pre-hospital scales

Several tools have been developed by way of scales to help recognise acute stroke within the extrahospital environment and emergency services, although there are no validation studies in our country.

The selected guidelines recommend their use[61,71,78,79]. The NICE[71] indicates that the use of validated scales increases the accuracy of the diagnosis. SING[79] adds that it also speeds up the diagnosis, the consideration of the treatment and referral to specialised services and the AHA/ASA[61] states that these scales are suitable for urgent situations thanks to the speed with which they can be completed, in some cases in less than one minute.

Experts' opinion (A)

The most commonly used scales as diagnosis guidance for stroke are given below.

Face Arm Speech Test (FAST)

This scale evaluates weakness in arms and face, and language alterations.

In a prospective study, the characteristics of patients who had been referred to a stroke unit through three different channels were compared: Emergency service, Primary Care and ambulant services; the latter used the FAST scale to identify stroke patients[80]. The Positive Predictive Value (PPV) of the FAST scale applied to patients with a potential stroke was 78% (95% CI: 72% to 84%) with a calculated sensitivity of around 79%. The percentage of false positives sent to the stroke unit by ambulant services using the scale was similar to that observed for emergency services and Primary Care.

Diagnostic test study II

Another study, whose aim was to determine the interobserver concordance between ambulance technicians (using FAST) and neurologists, found a high degree of interobserver agreement for the symptoms: Language alterations (kappa=0.69; 95% CI: 0.56 to 0.82) and weakness in arms (kappa=0.77; 95% CI; 0.55 to 0.99), whilst facial weakness showed a moderate interobserver concordance degree (kappa=0.49; 95% CI: 0.36 to 0.62)[81].

Descriptive studies 3

The Cincinnati Prehospital Stroke Scale (CPSS)

The presence of one or several of the following symptoms is evaluated: Facial asymmetry, loss of strength in arms and dysarthria (see appendix 4). It is based on a simplification of the stroke scale of the National Institute of Health (NIHSS) and its aim is to identify stroke patients who may be candidates for receiving thrombolysis.

The Cincinnati scale was validated through the observational study of a prospective cohort[82] which showed the high reproducibility of the scale among prehospital personnel. The presence of some anomalies in one of the three parameters to be evaluated showed a sensitivity to diagnose stroke of 66% and a specificity of 87% when it was administered by doctors, and a sensitivity of 59% and specificity of 89% when administered by prehospital personnel (paramedics).

Diagnostic test study III

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People not familiarised with stroke may recognise the symptoms included in the scale via telephone-guided instructions[83]. It was observed that the participants of a study were able to follow the instructions to administer the scale 98% of the times. For each one of the symptoms included, sensitivity (S) and specificity (E) with which they were detected were as follows:

Diagnostic test study III

Facial asymmetry: S=74%; E=72%

Loss of strength in arms: S= 97%; E=72%

Language alterations: S=96%; E=96%

The most frequent error committed by the participants when evaluating facial asymmetry was to ask the patient to smile instead of asking them to smile showing their teeth.

Los Angeles Prehospital Stroke Scale (LAPSS)

Elements of the clinical history were evaluated to rule out other diagnosis and to measure glycaemia, together with the existence of symptoms and signs.

The accuracy of stroke diagnosis by paramedics using this scale was compared with that of the emergency services and final diagnosis on discharge.

Diagnostic test study II

The sensitivity of the scale applied to non-comatose patients, without traumatisms and with neurological alterations was 91% (95% CI: 76% to 98%); the specificity was 97% (95% CI: 93% to 99%), PPV=97% (95% CI: 84% to 99%), NPV=98% (95% CI: 95% to 99%)[66].

Melbourne Ambulance Stroke Screen (MASS)

This scale is a combination of two validated prehospital scales, LAPSS and CPSS (appendix 5).

In a study aimed at validating the use of the MASS scale by paramedics, it was observed that the scale showed sensitivity levels similar to the CPSS (p=0.45) but significantly higher than the LAPSS (p=0.008) With reference to the MASS and LAPSS specificity, they showed an equivalent specificity (p=0.25), but the specificity of the MASS was higher than that of the CPSS (p=.0007) (Table 10). The overall precision of the MASS scale was higher than that presented by the LAPSS and CPSS[84].

Diagnostic test study II

Table 10. Individual analysis of LAPSS, CPSS and MASS (n=100) 84

	LAPSS	CPSS	MASS
Sensitivity (95% CI)	78 (67-87)	95 (86-98)	90 (81-96)
Specificity (95% CI)	85 (65-95)	56 (36-74)	74 (53-88)
Positive Predictive Value	93 (83-98)	85 (75-92)	90 (81-96)
Negative predictive Value	59 (42-74)	79 (54-93)	74 (53-88)

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Positive VR (95% CI)	5.27 (2.16-13.13)	2.13 (1.39-3,25)	3.49 (1.83-6.63)
Negative VR (95% CI)	0.26 (0.16-0.40)	0.1 (0.04-0.27)	0.13 (0.06-0.27)
Overall precision %	80	84	86

In another study it was observed that the use of the MASS scale by paramedics together with education sessions, increased the sensitivity for the diagnosis of stroke from 78% (95% CI: 63% to 88%) to 94 (95% CI: 86% to 98%)[85].

Recognition of Stroke in the Emergency Room (ROSIER)

This scale has been designed to be administered in emergency services. Apart from evaluating signs and symptoms, it also takes into account data from the physical examination and anamnesis of the patient.

In a study, performed in hospital environment (emergency) this scale is compared with some of the those mentioned above (table 11). For higher scores than 1 on the scale, the sensitivity is 93% with 10% of the patients diagnosed erroneously[86].

Table 11. Precision of the ROSIER scale compared with CPSS, FAST and LAPSS[86]

	ROSIER	CPSS	FAST	LAPSS
Sensitivity (95% CI)	93 (89-97)	85 (80-90)	82 (76-88)	59 (52-66)
Specificity (95% CI)	83 (77-89)	79 (73-85)	83 (77-89)	85 (80-90)
PPV (95% CI)	90 (85-95)	88 (83-93)	89 (84-94)	87 (82-92)
NPV (95% CI)	88 (83-93)	75 (68-82)	73 (66-80)	55 (48-62)

Summary of evidence

4	The use of validated tools to identify symptoms and signs of stroke increases the accuracy of diagnosis, speeds up diagnosis, the treatment consideration and referral to specialised services, without it taking up too much time to administer them[61, 71,78,79]
Diagnostic tests II	The FAST instrument presents a high predictive value for the diagnosis of stroke when used by ambulance technicians[60]
Diagnostic tests III	The Cincinnati scale can be administered by untrained adults guided over the telephone[83]
Diagnostic tests II/III	The MASS scale shows a higher overall diagnostic accuracy than the LAPSS and CPSS scales[84]
Diagnostic tests II	The ROSER scale is more sensitive than the FAST and LAPPS scales, and presents a higher negative predictive value than the other scales mentioned, in the hospital environment[86]

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Recommendations

C	The use of scales, when possible validated, is recommended to help diagnose stroke at prehospital level, in those persons with acute onset of neurological symptoms.
D	For people who consult over the telephone due to acute onset neurological symptoms, an evaluation of the symptoms is recommended via CPSS scale (appendix 4).
√	In primary care practice, the use of the MASS scale is recommended as an aid for diagnostic guidance in patients with suspicion of stroke.

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6. Pre-hospital management of acute stroke

Question to be answered

- What priority measures must be taken initially in a patient when a stroke is suspected? Must the stroke code be activated? Where must patients be transferred to?
- How must BP be managed in a patient when a stroke is suspected? As from what levels must HBP be treated? What drugs must be used?
- Does glycaemia control improve morbimortality? As from what levels must hyperglycaemia be treated?
- Must supplementary O2 be administered to patients when acute stroke is suspected? With what saturation?
- Must antiplatelets be administered to patients when acute stroke is suspected?
- Must IV fluids be administered? What type of fluids?

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6.1. Priority measures

6.1.1. Initial measures

The first measure to be taken is to verify the correct working of the cardiorespiratory functions (ABC): guarantee a permeable airway and maintain adequate ventilation and circulation. Measures must also be taken to avoid bronchial aspirations. Experts' opinion (4)

If necessary, a peripheral way will be taken in the non-paretic arm. No liquids or solids will be administrated orally except for those situations where drugs have to be administered.

6.1.2. Urgent detection/care

Stroke is a medical emergency so it is necessary for the patent to go to the emergency department and be seen by a specialists as soon as possible, as it has been verified that patients seen by a neurologist within six hours after the onset of symptoms, have better results (RR of a worse result = 5.6; 95% IC: 2.4 to 9.2 for those with more than six hours' delay). The beneficial results of urgent care can also be seen in other variables such as the time admission lasts. In this study, patients seen by a neurologist within six hours after the onset of symptoms, were admitted for an average of 7 days less than those seen later on ($p<0.001$)[35]. Cohort study 2+

The use of emergency services seems to be the channel that guarantees a shorter delay between the onset of the symptoms and the arrival at hospital. In a cohorts study it was observed that those patients who used the emergency services took, on average, 2 hours and 3 minutes to reach the hospital, whilst those patients who were referred to the hospital by their general physicians took on average 7 hours and 12 minutes ($p<0.001$)[32]. We have found similar results in other studies and in all of them, patients who used the emergency services, take less to reach the hospital than those that arrive by other means[87-89].

Cohort study
2++/2+

In general, as a measure to accelerate the attention of stroke patients, the prioritisation of the urgent transfer of patients with acute stroke is recommended[61,78,79], although the SR results on interventions aimed at speeding up the diagnosis and treatment of patients with acute stroke do not show clear evidence of the isolated effect of any of them. The interventions studied are variable, complex and sometimes impossible to apply in all the health centres. Included are: Educational programmes to recognise symptoms and signs, aimed at the public at large, training of ambulance technicians, transport in helicopter and re-organisation of the hospital systems. The results have shown that the interventions seem to have more impact on intra-hospital delays than on pre-hospital delays[79,90].

Cohort study
2+/2+/4

The Australian Guideline of the National Stroke Foundation (NSF)[78] also recognised the difficulty to show the efficiency of the preferential transport of patients, as this forms part of a broader strategy included in local protocols that contain other actions[91,92].

The AHA/ASA[61] on its part, states that the activation of emergency services by patients or general population reduce the times used in the diagnosis and accelerate treatment.

6.1.3. Pre-hospital stroke code

A pre-hospital stroke code is a pre-hospital action procedure based on the early recognition of the signs and symptoms of a stroke, with the subsequent prioritisation of care and immediate transfer to an empowered centre.

The aim of activating the stroke code is to try to maintain the time that elapses between the onset of the symptoms and start of treatment, to a minimum. By way of example, the inclusion and exclusion criteria of the out-of-hospital stroke code in the Community of Madrid[93] (appendix 6).

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In our country several studies have set out the advantages of activating the stroke code when attending to patients. In one of these studies, the clinical records of patients diagnosed with stroke and admitted into the emergency service of the centre within the first six hours after the onset of symptoms were reviewed. 108 patients were included, and the stroke code was activated for 29 of them. The other patients came to the hospital by their own means. Of the 29, 25 had been correctly identified as stroke and after the brain CAT scan, it was verified that 7 were haemorrhagic strokes. Of the remaining 18 patients, 5 did not satisfy the reperfusion criteria. In other words, it was possible to start the reperfusion treatment in 35% of the patients for whom the stroke code had been activated. In the case of patients for whom the stroke code had been activated, the arrival at the hospital after the onset of symptoms was 30.4 minutes less (average time) than those for whom it was not activated (p=0.002), the average time from the arrival at emergency services until they received neurological care was 40 minutes less (p<0.004) and the total average time between the onset of symptoms and start of treatment, 74.4 minutes less (p=0.013)[94]. Cohort study 2-

In another study performed at the same centre, an assessment was carried out on 48 patients with stroke in the area of the middle cerebral artery to whom rt-PA was administered within the first 3 hours after the onset of symptoms. The stroke code was activated in 21 of these and 27 came to the hospital via their own initiative. The average lapse of time between the onset of symptoms and the arrival at the emergency services was 21.19 minutes less in patients for whom the stroke code was activated (p=0.013) and the total average time elapsed between the onset of the symptoms and start of treatment in these patients was 20.56 minutes less (p=0.049). No differences were observed between the time elapsed from the arrival of the patient at the emergency services and the start of treatment. Early recanalisation (< 6 hours) was observed in 76% of the patients for whom the stroke code was activated and in 44% of those where it was not activated (p=0.027). The authors add that both the early recanalisation and the shortening of the time until the start of the fibrinolysis were translated into differences in the neurological evolution during the first 48 hours. The activation of the stroke code was associated with a significant decrease (p=0.036) in the score of the NIHSS scale after 48 hours compared with the non-activation[95]. Cohort study 2-

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To demonstrate whether the implementation of an out-of-hospital stroke code could reduce intra-hospital delays and increase the number of patients treated with thrombolitics, the results of all those patients with suggestive symptoms of stroke that came to the emergency service of a hospital within three hours following the onset of symptoms, were analysed prospectively. 218 patients were included, for 39 of whom the stroke code had been activated; in 2 of the cases mistakenly, only studying the remaining 37. The arrival time at hospital after the onset of symptoms was similar in both groups; however the other intra-hospital times were less in the group for whom the stroke code had been activated. In these patients, the average time elapsed from their arrival to the execution of the CAT scan was 35 minutes, compared with the 120 minutes that elapsed for patients for whom the system had not been activated (p=0.001). On the other hand, thrombolysis was applied to 27% of the patients with ischaemic stroke for whom the stroke code was activated compared with 7% for whom it was not activated (p=0.005) Furthermore, in those patients who received thrombolysis, the time elapsed from their arrival at the hospital until the start of treatment was less (88.1 minutes compared with 117.8 minutes), although the differences were not significant (p=0.915)[96]. Cohort study 2+

Finally, in a recently published study, the results of patients with acute ischaemic stroke treated with rt-PA at a third-tier university hospital were compared, in agreement with the neurologist's experience and the activation of the stroke code. 72 patients suffered a stroke outside hospital of whom 24 were transferred to the hospital with activation of the out-of-hospital stroke code and 48 without activation. There were no differences in the arrival time at the hospital between the two groups (76 minutes with activation compared with 77 without activation), although there was a significant reduction in the action times. The time from the arrival at hospital until the CAT scan was 21 minutes with stroke code and 29 without stroke code (p=0.032) and the time from the arrival at the hospital until receipt of treatment was 53 minutes with stroke code and 65 minutes without stroke code (p=0.016). The total time from the onset of symptoms to the start of treatment was 129 minutes for the group with activation of the stroke code and 140 for the group without activation, although the differences were not significant (p=0.13). There were no differences between the groups insofar as clinical evolution, haemorrhagic complications or mortality were concerned[97]. Cohort study 2-

6.1.4. Stroke units

The decision about which hospital patients are transferred to may affect their later evolution, so the hospitals they are referred to must have minimum services to guarantee access to brain image tests and specialised care by a multi-disciplinary team.

More and more hospitals have "Stroke units" understood as a hospital organisation situated within a well-defined geographic area, engaged in non-intensive or semi-critical care of stroke patients. It is comprised of a coordinated and trained multidisciplinary team, which is fully engaged in caring for patients with CVD, and which look after patients in the acute phase, based on the best available evidence 2.

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One of the objectives for 2015, which is included in the Helsingborg declaration, is that all patients in Europe should have access to care in organised stroke units.

One of the basic requirements needed to achieve this objective is to identify those hospitals that can provide care during the acute stroke phase and to establish transport routes to these hospitals. Patients, according to the Helsingborg declaration, should only be referred to hospitals that lack organised care for stroke if they require resuscitation and/or intensive care[98].

In general, the consulted guidelines recommend the admission of patients with acute stroke in stroke units, even though they do not agree on the evaluation of the evidence that supports these recommendations. Whilst the NSF[78], AHA/ASA[61] and the SIGN[79] express that the effectiveness of the stroke units has been amply demonstrated in numerous studies, the NICE[71] states that there is no quality evidence that proves that admission into stroke units reduces the patients' mortality and disability.

The SIGN[79] comments the results of an extensive systematic review that indicates that stroke patients have better results in survival terms, return home and independence if treated in stroke units, compared with those admitted into a general ward or those that remain at home. The studies included in the review presented results of patients both with ischaemic and haemorrhagic stroke, although a small number of studies excluded patients with transitory symptoms[99].

CPG (systematic review) 1+

According to the NSF and AHA/ASA, the positive effect of admission in stroke units, apart from being demonstrated in numerous studies, may persist for years. The benefits achieved by the stroke units are comparable with the effects obtained by intravenous rtPA administration and these are the best care models for patients with acute stroke[61,78,100-110].

CPG (several types of studies) 1++/1+/2++/3

The NICE guideline[71] addresses the results of reviews and studies that compare stroke units that focus on the diagnosis and monitoring of the patient, more than on early rehabilitation, with alternative care. Studies show that patients admitted into stroke units receive more appropriate and quicker therapeutic and diagnostic interventions compared with patients admitted into a general ward[111-114]; but the NICE concludes that the quality of the studies evaluated do not permit reaching conclusions about the impact of the stroke units on mortality and disability, although it must be highlighted that this group did not take into account the global results of the meta-analysis performed by Cochrane[115] in these statements, as they just evaluated the analysis of the subgroup that compared mortality among different types of organised care for stroke (stroke units), not bearing in mind the comparison among other subgroups.

CPG (several types of studies) 2++/ 2+/3

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The objective of the Cochrane review mentioned was to compare the effect of stroke units with other alternative forms of care. The review included 31 studies and a total of 6,936 patients[115]. Meta-analysis 1++

The mortality at the end of the follow-up for those patients admitted into a stroke unit was less than with other care OR=0.82 (95% CI: 0.73 to 0.92). The mortality was also less when compared only with care on a general ward OR=0.86 (95% CI: 0.76 to 0.98).

When the result evaluated was death or institutionalisation of the patient an OR=0.81 (95% CI:0.74 to 0.90) was obtained compared with any alternative care and OR=0.82 (95% CI: 0.73 to 0.92) when compared exclusively with admission on general ward. Finally, when the studied result was death or dependence at the end of the follow-up an OR = 0.79 (95% CI: 0.71 to 0.88) was obtained compared with all the alternative cares and an OR = 0.82 (95% CI: 0.73 to 0.92) compared with care on general ward. The beneficial effect of admission into stroke units was maintained in time, observing less mortality, institutionalisation and dependence five and ten years after the episode.

With respect to the time of the hospital stay, those patients admitted into stroke units were not seen to have a longer admission, rather the opposite, a reduction in the number of days (approximately four days) they were admitted for ($p = 0.02$) was observed.

The analysis by subgroups did not show any heterogeneity in the effects between groups, however, due to the loss of statistical power, the reduction of the mortality risk in patients with light stroke, admitted into stroke units, was not significant.

Results were also compared in this review between different types of stroke units and better results were observed (statistically significant) for stroke wards compared with mobile stroke units.

Only three of the review studies recorded results referring to the patient's quality of life and satisfaction. In two of them, patients admitted into stroke units showed better results with respect to patients' quality of life and satisfaction compared with other alternative care, although no differences were observed in the third study.

In another non-randomised clinical trial, the quality of life related to health was assessed by means of form SF-36 in patients admitted into stroke units compared with patients admitted into a general ward. EC 1-

No significant differences were found between the two groups after six months' follow-up, or when mortality was integrated into the comparison scale[116].

With respect to financial studies, stroke units represent the most effective type of care but also the most expensive. One study concludes that stroke units are not cost-effective compared with home care although it warns of deficiencies in the study that may have caused an underestimation of the QUALYS won with the stroke units'[117]. CPG (financial estudies)

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However, when stroke units are compared with care on a general ward, these do seem to be cost effective according to recent financial assessments[118] carried out in the United Kingdom. The results of different admission and discharge strategies in stroke management are shown in this study. Among the different options contemplated, stroke units are compared with admission on general ward through a cost-effectiveness study, with a time horizon of 10 years and from a social perspective, excluding extra-hospital transport costs. The incremental cost effectiveness ratio was 10,661 pounds per QUALY won, which is within the limit of 30,000 pounds established by the NICE.

Cost effectiveness study

Summary of evidence

2+	The delay of more than 6 hours to be seen by a neurologist is associated with a worse prognosis[35]
2++/2+	The activation of emergency services is associated with less prehospital delay[32, 87-89]
2+/2-	The activation of an extra-hospital stroke code decreases the waiting time until start of treatment, it increases the percentage of patients treated with reperfusion therapy and improves the neurological results of patients after 48 hours[94-9]
1++	Admission into stroke units decreases mortality, disability and institutionalisation of stroke patients and decreases the hospital stay[115]
3	Patients admitted into stroke units receive more appropriate and quicker therapeutic and diagnostic interventions[111-113]
Economic assessment	Economic assessment Stroke units have proved to be cost effective compared with care on a general ward[118]

Recommendations

√	When there is a suspicion of acute stroke in a patient, the cardiorespiratory functions must be guaranteed, taking measures to avoid bronchoaspirations and, if necessary, take a peripheral route in the non-paretic arm. Neither food nor liquid will be administered orally unless drugs have to be administered by this route.
C	Stroke is a medical emergency that requires urgent neurological care so patients who are suspected of having an acute stroke must be sent to hospital in the least possible time.
B	The activation of the emergency services is recommended when acute stroke is suspected, giving priority to the transfer of patients.
C	The activation of the extra-hospital stroke code is recommended when a patient with a suspicion of stroke, who satisfies the criteria foreseen, is detected.
A	It is preferable and recommended to refer patients to hospitals that have stroke units.

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6.2. Management of blood pressure

High blood pressure is frequent during acute stroke. Almost 54% of the patients in the International Stroke Trial (IST)[119] had a systolic blood pressure (SBP) above 160mmHg, which, in the majority of the cases decreases spontaneously 4 to 10 days after the stroke. In the Chinese Acute Stroke Trial (CAST)[120], up to 48% of the patients had a SBP above 160mmHg, whilst the SBP was under 140 mmHg. in just 25% of the patients. Low blood pressure is less frequent; in the IST just 4.2% of the patients presented SBP figures below 120 mmHg[119].

Patients with very high and very low blood pressure levels after an acute stroke present a worse prognosis. According to an observational study, for every 10mmHg below 180 mmHg in SBP, the risk of mortality, early neurological impairment and neurological deficit increase after 3 months by 7%, 6% and 25%, respectively. For every 10 mmHg above 180 mmHg, the risk of early neurological impairment and neurological deficit after 3 months increases by 40% and 23% respectively, without any consequences on mortality. The effect is similar for diastolic blood pressure (DBP), with worse results for DBP above and below 100 mmHg[61,79, 121]. CPG (cohorts study) 2+

In another study, the possibility of patients with SBP figures of between 140 and 179 mmHg presenting an unfavourable result was less frequent. For every 10 mmHg above and below 150 mmHg, the risk of early death (within the next 14 days) increased by 3.8% (p=0.016) and by 17.9% (p<0.0001), respectively. The risk of death or dependence after six months increased by 3.6% (p=0.55) for every 10 mmHg of SBP below 150 mmH, without any significant increases of these outcomes for SBP figures above 150 mmHg[119]. Cohorts study 2+

On a hospital level, the effect of the active reduction of high blood pressure during the first hours after the onset of symptoms in patients with acute stroke has been investigated in several studies. The SR indicates that, for the moment, there is no evidence to show that the decrease of the BP via calcium antagonists, nitric oxide donors and angiotensin converting enzyme inhibitors (ACEI), improves mortality, dependence or recurrence in patients with acute stroke[61,71,79,122-126]. CPG (meta-analysis/SR)

Sudden drops in BP, on the other hand, are related to worse results. In one RCT, a greater risk of death and dependence associated with a reduction of the DBP, to 20%, was observed after administering nimodipine[71,127]. CPG (RCT) 1+

On the other hand, bendroflumethiazide is not efficient in reducing BP in patients with moderate HBP after acute stroke[79, 128]. Cohorts study 2+

The last update of the SR on the management of BP during the acute stroke phase of the Cochrane indicates that, although reduction of BP figures have been observed when different antihypertensives (calcium antagonist, ACEI, ARA-II, nitric oxide donors) are used, as well as a non-significant increase of SBP associated with the use of phenylephrine, there is not sufficient evidence to assess the effect that these interventions have on the evolution of patients with acute stroke[129]. CPG (RCTA)

Meta-analysis

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In a recent RCT, the efficiency of lisinopril and labetalol has been compared with placebo, administered within 36 hours following the onset of symptoms, in patients with acute stroke and BP > 160 mmHg. The reduction of the SBP was on average 14mmHg greater and the reduction of DBP 7 mmHg on average greater for the group treated with lisinopril compared with the group that received placebo (p=0.001 and p=0.019, respectively). The group treated with labetalol showed a non-significant average reduction of 7 mmHg more than with placebo in the SBP, although the reduction of the DBP was similar in both groups. Two weeks later, the reduction in SBP continued to be greater in the treated groups (lisinopril/labetalol), although there were no differences for the DBP. With respect to the clinical results, there were no differences in mortality and dependence after two weeks (p=0.97) or in neurological impairment after 72 hours (p=0.76) between the three groups. However, the mortality after 90 days was less in the group that received treatment (10%) compared with the group that received placebo (20%) (p=0.05). Given the relative lack of results, the differences in mortality must be taken with care. There were no differences between the serious adverse effects notified by the three groups[130]. RCT 1+

With respect to the BP figures after which treatment is recommended, the AHA/ASA[61] differentiates those candidate patients to receive thrombolysis, in which case treatment is recommended if the SBP>185 mmHg or the DBP>110 mmHg, as higher figures than those indicated are contraindications for the intravenous rtPA administration[131]. There are other clinical situations that may accompany acute stroke and require urgent anti-hypertensive therapy such as hypertensive encephalopathy, aortic dissection, acute renal failure, acute lung oedema and acute myocardial infarction[132], to which the NICE[71] adds hypertensive nephropathy, hypertensive cardiac failure, pre-eclampsia/eclampsia and intracerebral haemorrhage with SBP<200 mmHg. CPG (experts' opinion) 4

For all other patients, both the AHA/ASA[61] and the HSF[78] recommend treating with SBP>220 mmHg or the DBP>120 mmHg, reducing the BP cautiously (not more than 10%-20% in the first 24 hours). CPG (experts' opinion) 4

We have not found any studies that evaluate the reduction of BP at prehospital level. The AHA/ASA[61] states that it is better to treat high blood pressure after arriving at hospital.

In this same sense, the consensus document of the Catalan High Blood Pressure and Neurology Societies states that within the extra-hospital field or before the etiological diagnosis, anti-hypertensive treatment must not be administered to patients with acute stroke, unless it is impossible to transfer the patient to a hospital[133]. Experts' opinion 4

Low blood pressure associated with acute stroke is less frequent and if it does appear, it should make us consider other concomitant pathologies such as cardiac ischemia, cardiac failure or sepsis. To increase the BP both pharmacological and non-pharmacological measures can be used[134]. Experts' opinion 4

Some studies suggest that the pharmacological increase of the BP with phenylephrine or dexamphetamine may reduce the size of the infarcted area [79,135,136] and the increase of the BP with dexamphetamine may improve the patients' results[79,135]. CPG (RCT) 1-

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Among the non-pharmacological measures, raising the legs may increase the BP temporarily; saline solutions may also be used as in some cases dehydration precedes high blood pressure[134]. Experts' opinion 4

The AHA/ASA[61] recommends looking for the cause and correcting the hypovolemia with saline solution, and also correcting cardiac arrhythmias if there were any. CPG (experts' opinion) 4

Summary of evidence

2+	Patients with acute stroke and both high and low BP present a worse prognosis[119,121]
1++/1+	There is no evidence that the modification of the BP via calcium antagonists, beta-blockers, nitric oxide donors, angiotensin receiving antagonists II (ARA II) and angiotensin converting enzyme inhibitors (ACEI) improve mortality, dependence or recurrence in patients with acute stroke[122-126, 129, 130]
1+	The decrease of the DBP above 20% after treatment with nimodipin is associated with a greater risk of death or dependence in patients with acute stroke[127]
2+	A reduction in the SBP of more than 20 mmHg during the first 24 hours after admission into hospital is related to a worse prognosis[121]
4	On a hospital level, high blood pressure must be treated when SBP>220 mmHg or DBP>120 mmHg is observed. If the patient is a candidate for thrombolysis, treatment must be started if SP>185 mmHg or DBP110 mmHg[61]
4	Hypertensive encephalopathy, aortic dissection, acute renal failure, acute lung oedema, acute myocardial infarction, hypertensive nephropathy, hypertensive cardiac failure, pre-eclampsia/eclampsia and intracerebral haemorrhage with SBP>200 mmHg require urgent antihypertensive therapy[132]
4	On an extrahospital level, experts do not consider it advisable to administer antihypertensive treatment unless it is impossible to transfer the patient to a hospital[61,133]
4	Low blood pressure associated with stroke is not very frequent and is generally associated with another concomitant pathology. To solve this, saline solutions can be used[61,134]

Recommendations

√	In patients with suspicion of acute stroke, the treatment of high blood pressure is not recommended in the extra-hospital environment, if <220 (PAS) or <120 mmHg (DBP) is maintained, with the exception of certain urgent situations (founded clinical suspicion of left cardiac insufficiency, acute coronary syndrome or aortic dissection).
B	If the decision is taken to treat it, sudden and intense decreases of the BP will be avoided (more than 20% in < 24 hours)
B	Fast acting sublingual drugs will be avoided.

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√	If the BP has to be reduced, the intravenous route and when this is not possible, oral route, will preferably be used.
D	In those cases where there is low blood pressure, the presence of another serious concomitant disease will be ruled out and it will be treated according to the etiology.

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6.3. Management of glycaemia

Hyperglycaemia is quite common during the acute stroke phase both in diabetic and non-diabetic patients 137 and it is clearly seen to have a deleterious effect on the brain tissue in animal models of cerebral ischemia, increasing the area of the infarcted area and the oedema area 138,19. What is not clear is if hyperglycaemia is a "normal" physiological response to stress and therefore, the increase in glucose could be taken as a biomarker of the seriousness of the stroke or if hyperglycaemia per se increases brain damage.

One meta-analysis indicated that the relative risk of death in hyperglycaemic patients with acute stroke is multiplied by 3.3 (95% CI: 2.3 to 4.6) in non-diabetics and 1.3 (95% CI: 0.49 to 3.43) in diabetics. The authors recognise that the lack of signification in the increase of diabetic patients with hyperglycaemia may be due to the small sample size of this subgroup[79,140]. Although few studies have explored the relationship between hyperglycaemia at the moment of admission and the prognosis in diabetic patients, hyperglycaemia has seen to be an independent factor of bad prognosis in both ischaemic and haemorrhagic stroke [141,142].

CPG (meta-analysis) 2+

Cohorts studies 2++/2+

The optimal cut-off points to predict poor results in patients with acute stroke after three months would be established at a capillary glycaemia ≥155 mg/dL at the time of admission or at any time during the first 48 hours, according to the results of one study[143].

Diagnostic test study II

With respect to addressing hypoglycaemia in patients with acute stroke, the intensive treatment protocols with insulin in "critical" patients have proved to be efficient, achieving a reduction in mortality and complications 144. It has therefore been suggested that patients with acute stroke should be treated in the same way 61, although no evidence has been found to sustain a close control of glucose in blood in patients with acute stroke and a moderate increase in glycaemia.

CPG (meta-analysis) 1+

The GIST-UK study published in 2007 shows that the administration of a glucose, insulin and potassium infusion (GKI) for at least 24h, maintaining glucose levels between 72 and 129 mg/dL, does not reduce mortality and disability among those patients with moderate hyperglycaemia on admission (129-162 mg/dL). In the study, 15% of the patients who received the intervention presented secondary hypoglycaemia to the treatment. This clinical trial ended early due to a slow incorporation of patients and it was not possible to reach the minimum sample size to achieve an adequate power (a size of N=933 patients was reached compared with the 2,355 required)[71,145].

CPG (RCT) 1+

Another randomised clinical trial published in 2005 determined the efficiency and safety of administering an infusion of insulin-potassium-saline-magnesium (IPSM) within the first 24 hours after onset of symptoms in 128 patients with acute ischaemic stroke. Patients were included who, at the time of admission, presented glucose in blood above 129 mg/dL, both diabetics (type II) and non-diabetics. The efficiency of the treatment was evaluated by reducing glucose in plasma and via the score of the NIHSS scale. The results showed that in those patients with DM-type II, the neurological deficit improved both in treated and in non-treated patients. However, in hyperglycaemic patients without DM-type II, the neurological deficit only improved in the group of patients that received the infusion[146]. RCT 1-

In a cohort study published in 2006, the records and analytics of 960 patients discharged with a diagnosis of thromboembolic stroke were evaluated retrospectively. It was observed that hyperglycaemia (glucose > 130 mg/dL) at the time of admission was associated with a higher rate of mortality when compared with normoglycaemic patients (OR=3.15; 95% CI: 1.45 to 6.85). Patients with persistent hyperglycaemia 48 hours after admission presented an even higher mortality rate (OR=6.554; 95% CI: 2.41 to 17.87) whilst the control of glycaemia (spontaneously or intentionally) was associated with a reduction of the risk of mortality and constituted an independent predictor of survival (OR=5.95; 95% CI: 1.24 to 28.6)[147]. Retrospective cohorts study 2-

Hyperglycaemia on admission, in patients with acute ischaemic stroke, is also a risk factor of symptomatic haemorrhagic transformation after administration of rtPA[148,149], and in those patients with acute ischaemic stroke treated with reperfusion therapy; previous hyperglycaemia (>140 mg/dL) may counteract, at least partly, the beneficial effect of the rtPA[150]. Greater impairment, associated with hyperglycaemia, has been observed in patients treated with thrombolytics in whom recanalisation took place early on, although not in those patients in whom the recanalisation was not achieved. It was also observed that the earlier the recanalisation the greater the negative effect of hyperglycaemia[150-152]. Cohorts study 2+

All the guidelines conclude by consensus to treat hyperglycaemia, especially in diabetic patients[78]. The SIGN[79] recommends that they should be treated in agreement with local protocols, whilst the AHA/ASA considers it reasonable to treat those patients who have glucose figures of over 140- 185 mg/dL[61]. The NICE[71], on its part, proposes treating higher glycaemia figures than 199 mg/dL and maintaining the glycaemia between 72 and 200 mg/dL. CPG (experts' opinion) 4

No studies have been found that evaluate the reduction of glucose in patients with acute stroke in a pre-hospital manner. There are currently several ongoing clinical trials that evaluate different aspects of the treatment of hyperglycaemia in acute stroke, such as the safety and efficiency of insulin infusions, comparison of the efficiency of different treatments or different in results between diabetic and non-diabetic patients.

Hypoglycaemia, on the other hand, can produce similar symptoms to acute stroke so it must be ruled out as a cause of the symptoms 71 and be treated in agreement with local protocols[61]. CPG (experts' opinion) 4

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Summary of evidence

2+	Hyperglycaemia on admission is associated with a higher risk of mortality in patients with acute stroke who are not diabetics[140]
1+	There is no evidence that sustains a close control of glucose in blood via continuous insulin infusions. In those patients with acute stroke and moderate increase of glycaemia[145]
4	Hypoglycaemia can cause similar symptoms to those produced by a stroke and it must be treated if it is present[61,71]

Recommendations

D	Patients with Diabetes Mellitus and with a suspicion of acute stroke who present hyperglycaemia must be treated in agreement with the protocols for managing diabetic patients.
√	Glycaemia must be corrected in those patients with suspicion of acute stroke when glucose figures of over 200 mg/dL are detected.
D	Hypoglycaemia must be ruled out as a cause of the symptoms and the glycaemia level must be corrected if the former exists.

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6.4. Supplementary oxygen therapy

Hypoxemia during the acute stroke phase seems to be associated with an increase of the risk of death[153], so the administration of supplementary oxygen to hypoxic patients is recommended. This is a recommended practice based on clinical experience and consensus, as there is no evidence in this regard[61,71,78].

CPG (Experts' opinion (4)

According to the British Thoracic Society, supplementary oxygen in emergency situations should be prescribed to reach saturation objectives of 94-98% for the majority of acute patients or 88-92% for those with risk of hypercapnic respiratory failure (CO2 retainers). Some healthy individuals, especially those aged 70 years and older, may have O2 saturation measurements below 94% and not require therapy with O2 when they are clinically stable. For the majority of patients with EPOC or other risk factors for respiratory failure, morbid obesity or neuromuscular diseases, a saturation objective of 88-92% would be adequate[154].

Experts' opinion (4)

More controversial is the use of supplementary oxygen in normoxemic patients with acute stroke. The increase of oxygenation of the brain tissue has been considered as a logical option in the management of acute stroke for more than 40 years[155].

The administration of normobaric oxygen (NBO) is easy to apply, non-invasive and can be used in extra-hospital environments during the initial phases of acute stroke. Studies in animals suggest that hyperoxia could slow down the cerebral infarction process and therefore increase the time frame during which reperfusion treatment can be applied[156,157].

On the other hand, the application of oxygen is not risk-free: the formation of toxic free radicals 158, a possible increase in the risk of infections and a delay in the mobilisation of the patient, are some of the potential adverse effects associated with its use.

No benefits have been identified in the administration of supplementary oxygen in non-hypoxemic patients with acute strokes in a SR published in 2003159. 18 studies were recuperated of which only one responded to the objectives set out in the review. It is a quasi-randomised clinical trial (N=550) in which mortality and disability were compared among patients who received 100% oxygen (3L/min.) for the first 24 hours after an acute stroke with a control group that did not receive supplementary oxygen. There were no differences between the two groups regarding mortality after one year or in terms of disability or neurological deficits evaluated after 7 months. In the analysis by subgroups it was observed that mortality in patients with light and moderate stroke was greater in the group that received supplementary oxygen. The results for patients with serious stroke were not conclusive[160].

RCT 1+

The NSF[78] makes no recommendations about the use of oxygen in normoxemic patients, although it comments the results of a pilot study[161], with small sample size, which seems to show a transitory improvement, documented via magnetic resonance, in those patients with acute stroke who were administered supplementary oxygen.

CPG (RCT) 1-

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Summary of evidence

4	In emergency situations 94-98% oxygen saturation must be maintained for the majority of acute patients or 88-92% for those with risk of hypercapnic respiratory failure[154].
1+	There is no evidence that supplementary oxygen improves mortality or disability in non-hypoxic patients with light or moderate stroke and it even seems to increase the mortality[160].
1+	There is no evidence, either, that supplementary oxygen improves mortality or disability in non-hypoxic patients with serious stroke[160].

Recommendations

B	The routine use of supplemental oxygen is not recommended in people with suspected acute stroke.
D	Patients with suspicion of acute stroke must receive supplementary oxygen if there are clinical signs of hypoxia or to maintain an oxygen saturation of 94-98%, except in those patients with risks of hypercapnic respiratory failure, in whom a saturation of 88 to 92% will be maintained.

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6.5. Antiplatelet treatment

Antiplatelets can reduce the volume of brain damage causes the ischemia, so early administration could reduce mortality and sequelae caused by the stroke, and also the risk of recurrence.

A SR was published in 2007 with a meta-analysis about the safety and efficiency of antiplatelets in the treatment of acute stroke[162]. Studies were excluded from the review about treatment with antiplatelets in patients with primary intracranial haemorrhage or known subarachnoid haemorrhage, although those studies that did not appropriately differentiate ischaemic or haemorrhagic stroke before the randomisation, are included. It included a sample of 43,041 patients originating from 12 studies. Two of these, the CAST and the IST (administration of aspirin, started within 48 hours after the establishment of the stroke in doses of 160 to 300 mg a day), contributed to 94% of the data. The results of the review showed that there was a significant reduction of the risk of death or dependence at the end of the follow up in the group treated with antiplatelets (OR=0.95; 95% CI: 0.91 to 0.99). For every 1000 patients treated with aspirin, 13 negative results were avoided. Meta-analysis 1++

The use of antiplatelets was also related to a lower incidence of lung embolism (OR=0.71; 95% CI: 0.52 to 0.95) and a lower recurrence of stroke (OR=0.77; 95% CI: 0.68 to 0.86). On the other hand, the use of antiplatelets was associated with a significant increase of the probability of suffering a serious extra-cranial haemorrhage (OR=1.67; 95% CI: 1.34 to 2.09) and symptomatic intracranial haemorrhage (OR=1.33; 95% CI: 1.10 to 1.60). In absolute terms, an excess of 2 intracranial haemorrhages was observed for every 1000 patients treated and 4 serious extracranial haemorrhages for every 1000 patients treated.

When the data of the subgroup of randomised patients were analysed separately, despite presenting intracerebral haemorrhage (IST and CAST patients), a reduction of the odds of death or dependence was also observed for the group that received aspirin (OR=0.68; 95% CI: 0.49 to 0.94).

The authors of the SR conclude that the administration of aspirin in doses of 160 to 300 mg a day, when started within 48 hours after the onset of acute stroke, is clearly beneficial. They add that, in all likelihood, although the evidence in this regard is very limited, this beneficial effect may also be observed if the therapy is started later on.

Another meta-analysis that only combines the results of the IST and CAST studies, adds that approximately 22% of the patients in these studies were randomised to receive treatment or not before the CAT scan was carried out and similar results were observed for this group as for the randomised patients after the image test[163]. Meta-analysis 1+

It is also observed in this study that the subsequent incidence of other strokes was less in patients with intracerebral haemorrhage to whom aspirin had been administered: 0.3% in the treated group and 1.1% in the control group (p=0.04)[163].

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To conclude, despite the fact that the studies have not shown a negative effect of the use of aspirin in patients with haemorrhagic stroke, it is advisable to be cautious at this point. As the studies indicate the beneficial effect of administering antiplatelets up to 48 hours after the onset of the symptoms, and in our environment it is feasible for stroke patients to access image tests early on, it seems reasonable to wait until a haemorrhage can be ruled out via CAT scan / MRI, or to decide if fibrinolysis should be applied or not, before administering antiplatelets in the extrahospital environment.

Experts' opinion 4

Summary of evidence

1++	The administration of 160-300 mg aspirin each day, started within 48 hours after the onset of symptoms in patients presumed to suffer from acute ischaemic stroke, reduces the risk of mortality and early recurrent stroke[162]
1++	The administration of 160-300 mg aspirin each day, started within 48 hours after the onset of symptoms in patients presumed to suffer from acute ischaemic stroke, increases the number of serious extracranial and symptomatic intracranial haemorrhage episodes[162]
1++	The administration of 160-300 mg aspirin a day, started within 48 hours after the onset of symptoms in patients with intracerebral haemorrhage does not increase the risk of dependence or intrahospital death[162]
4	There is a beneficial effect of administering antiplatelets up to 48 hours after the onset of symptoms. Given that in our environment, it is feasible for patients with stroke to access image tests early on it seems reasonable to wait until a haemorrhage can be ruled out by CAT scan / MRI or to decide if to apply fibrinolysis or not, before administering antiplatelets

Recommendations

√	Starting treatment with antiplatelets is not recommended in the extrahospital environment in those patients in which stroke is suspected, before carrying out a CT or MRI.

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6.6. Fluid replacement therapy

Many patients with acute stroke are dehydrated on admission, which could be related to a worse prognosis. In fact, the high plasma osmolality on admission is associated with an increase in mortality and morbility after three months in patients with acute stroke[164]. — Study 2+

The administration of intravenous fluids is routine practice in patients admitted for stroke, especially those who have a higher risk of dehydration, such as patients with low level of consciousness or swallowing difficulties[71,78,79]. A suboptimal intake of liquids has negative results 78 and slower recovery[61]. — CPG (experts' opinion) 4

There is little evidence about the use of intravenous fluids in acute stroke. The extrapolated data of patients with hyperglycaemia support the recommendation to avoid solutions with glucose during the initial phases of stroke instead of saline solutions, to avoid iatrogenic hyperglycaemia[140]. An excessive administration of intravenous fluids must also be avoided[61]. — Meta-analysis; CPG (experts' opinion) 4

Another type of measures, such as haemodilution, using plasma expanders, has not shown greater benefits than the normal fluid administration regimes[79,165]. — CPG (meta-analysis) 1++

Summary of evidence

2+	High plasma osmolality on admission, in patients with acute stroke, is associated with greater mortality and morbility after 3 months[164]
2+	Extrapolated data of patients with hyperglycaemia suggest avoiding the use of glucose solutions to avoid iatrogenic hyperglycaemia[140]
1++	Haemodilution via plasma expanders does not offer benefits with respect to normal practices[165]
4	It is considered important not to administer excessive intravenous fluids[61]

Recommendations

C	The administration of intravenous fluids containing glucose will be avoided in patients with suspicion of non-hypoglycaemic acute stroke.
√	The use of isotonic saline solution is recommended, avoiding volume overload, if it is necessary to administer fluids.

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7. Management of "communicated" stroke

Question to be answered

- Must a patient with suspicion of TIA or stable stroke who refers to an acute episode more than 48 hours earlier be evaluated urgently in Specialised Health Care?

Not all stroke patients come to a health centre in the acute phase, some come later on. This is what some professionals call *"communicated"* or *"referred"* stroke.

From a practical viewpoint, the development group of this guideline has defined this concept as *"possible TIA or stable stroke with at least 48 hours' evolution"*. This term would include patients who come with resolved symptomatology and this has lasted for less than 24 hours (suspicion of TIA) and patients, who are stable but come to the health centre 48 hours after the onset of symptoms.

Meta-analysis 2+

One of the problems associated with these patients, who are suspected of having had a stroke or TIA, is the possibility of recurrence. In fact, the risk of suffering an ischaemic stroke is especially high after a TIA. One SR showed that 3.5% of patients suffered a stroke during the first two days of a TIA, 8% during the first month and up to 9.2% during the first 90 days. These percentages could be reduced if, after suspecting a TIA, an active assessment of the episodes were carried out 166. According to another meta-analysis of observational studies, the risk of suffering a stroke during the first two days after a TIA is 3.1% (95% CI: 2.0 to 4.1) and 5.2% (95% CI: 3.9 to 6.5) during the seven days following the TIA[167].

CPG, observational studies 2++, 3

Two observational studies (EXPRESS and SOS-TIA) bear witness to the benefits of an urgent assessment and immediate treatment of patients with TIA, showing a significant reduction of the stroke recurrence percentage[71,168,169], a decrease in mortality or disability, reduction of the hospital stay and reduction of associated costs[170].

Observational studies 2++

To stratify the stroke recurrence risk in individuals who have suffered a previous TIA, some scales have been proposed, based on clinical features. The most outstanding are: The California scale[171], the ABCD[172] and the ABCD2 scale[173].

Diagnostic test study III

For patients considered to be high risk, according to the scores of the ABCD2 scale, the risk of having an ischaemic stroke after a TIA is 18% after the first 90 days (Table 12)[173].

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Table 12. Risk of stroke 2, 7 and 90 days after a TIA (ABCD2 risk table) [173]

Risk score	2 days	7 days	90 days
Low risk (0-3)	1%	1.2%	3.1%
Moderate risk (4-5)	4.1%	5.9%	9.8%
High risk (6-7)	8.1%	11.7%	17.8%

The ABCD2 scale presents a total score range from 0 to 7 for the following components or independent risk predictors[173]:

Age: >60 years (1 point)

Blood pressure: SBP >140 mmHg or DBP >90 mmHg (1 point)

Clinical features: Focal weakness (2 points) or speech alterations without focal weakness (1 point)

Duration of symptoms: 60 minutes (2 points), 59-10 minutes (1 point)

Diabetes mellitus: (1 point)

Another study 174 finds that out of the recurrent strokes in the 7 days following a first TIA, 52% occur in the first 24 hours; if we consider the first 30 days, they represent 42%. Of the 59 cases of recurrent stroke after a first TIA, 48 cases (81.4%) occurred within the first 7 days. Furthermore, the stroke risks in the first 12 and 24 hours were strongly related to the ABCD2 scale (p=0.2 and p=0.0003). In this sense, it concludes that the fact that the ABCD2 scale is reliable in the acute assessment shows that an appropriate urgent triage and treatment are possible after a TIA.

Observational studies 2++

The risk stratification scales exclude certain populations that may have a particularly high risk of recurrence, such as those patients with recurrent episodes (2 or more TIA in one week) and those with anticoagulant treatment, who would also need immediate specialised assessment. Furthermore, these scales may not be relevant in those patients who go to the doctor when the episode has occurred some time ago (more than 7 days)[71].

CPG (Experts' opinion (4)

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These scales have been validated[173,175-178], although not in our context. The validation study of the ABCD scale in Spanish population showed that the scale, when a score on the scale of five or more is used as a risk criterion, is not useful to differentiate patients with a greater stroke recurrence risk during the first seven days after a TIA[179]. In other studies conducted in our country, the only factor that was related to a greater recurrence risk was the subjacent etiology (greater risk recurrence in those patients with intracranial stenosis or atherothrombotic etiology). High scores on the ABCD2 scale (>5), were not related to a higher recurrence risk after one week or 90 days' follow-up[180,181]. The authors argue that these scales were developed based on population data where the patient was not always evaluated by a specialist. However, in the studies mentioned, a neurologist evaluated each one of the patients, excluding those with transitory neurological record that was probably not due to a TIA. Hence, they do not find that relationship with the higher recurrence risk. In this sense, another study pointed out that part of the recurrence risk prediction ability of the ABCD2 scale could be due to the ability of the scale to distinguish between TIA, light strokes and non-cerebrovascular episodes. Patients were included in this study in whom TIA was suspected and who were referred by a non-specialist stroke physician to a specific clinic for TIAs and light strokes. The results of the study showed that scores on the scale 4 increased the probability of a final diagnosis of TIA or confirmed light stroke. The average score on the scale was 4.8 points for patients with a final diagnosis of light stroke, 3.9 for patients with final diagnosis of TIA and 2.9 for those who were finally diagnosed with a non-cerebrovascular episode ($p<0.00001$)[182].

Observational studies 2++/2+

In a financial assessment developed by NICE, two alternatives were compared for managing patients with suspicion of TIA seen by a primary health care physician:

CPG (financial assessment)

- Immediate assessment by a specialist in a stroke unit.

- Assessment within seven days by a specialist.

The cost-effectiveness of the two strategies was evaluated for all the patients, but also for each one of the groups depending on the scores on the ABDC2 scale.

The cost-effectiveness analysis showed that the immediate assessment by a specialist is a cost-effective option, even for groups with lower scores on the ABCD2 scale[71].

Summary of evidence

2+	The risk of suffering an ischaemic stroke is especially high after a TIA (3.1-3.5% during the first two days after a TIA, 5.2% during the first week, 8% during the first month and up to 9.2% during the first 90 days)[166,167]
2++/3	Urgent assessment and immediate treatment of patients with TIA reduces the stroke recurrence percentage, the mortality or disability, the hospital stay and the associated costs[168-170]

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2++/2+	There are scales, not validated in our medium, to calculate the recurrence risks after a transitory ischaemic attack: The ABCD, ABCD2 scales and the California scale[171-173, 175-181]
4	The recurrence risk assessment scales exclude certain populations at particularly high recurrence risk: Patients with recurrent episodes (2 or more TIA in one week) or with anticoagulation. Furthermore, they may not be relevant for patients who come 7 days after the episode[71]
2++	81.4% of the total recurrent strokes occurred during the first 7 days after the first TIA. Of the recurrent strokes in the 7 days after a first TIA, 52% occur during the first 24 hours; during the first 30 days, those occurred in the first 24 hours represent 42% Furthermore, the stroke risks in the first 12 and 24 hours were strongly related to the ABCD2 scale (p=0.2 and p=0.0003)[174]
2+	Part of the recurrence risk prediction ability of the ABCD2 scale could be due to the ability of the scale to distinguish between TIA, light strokes and non-cerebrovascular episodes[182]
Economic assessment	The immediate assessment by a specialist is a cost-effective option when compared with the assessment within seven days, even for groups with lower scores on the ABCD scale

Recommendations

√	Patients with suspicion of stable stroke of more than 48 hours' evolution must be urgently transferred to a hospital if the symptoms started within 7 days.
B	Patients with suspicion of TIA that occurred within 7 days must be urgently assessed by the specialist (in less than 24 hours).
D	Patients with suspicion of TIA or stable stroke of at least 48 hours' evolution, and with past history of recurrent episodes of TIA (2 or more TIA in one week) or with anti-coagulant treatment, must be urgently assessed by a specialist (in less than 24 hours).
√	Patients with suspicion of TIA or stable stroke of at least 48 hours' evolution who come 7 days following the onset of the symptoms, must be assessed by a specialist in less than one week.

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8. Management of stroke after hospital discharge

Question to be answered

- How must the monitoring of patients who have suffered a stroke be planned after hospital discharge?
- What general measures referring to rehabilitation must be taken into account after a stroke?
- What are the most frequent sequelae and complications in patients who have suffered a stroke?
- What deficits and physical alterations must be evaluated?
- Is the treatment of spasticity with oral drugs effective? What drugs can be used?
- How must shoulder pain be managed?
- What drugs are efficient in the treatment of central post stroke pain?
- How must dysphagia be managed in patients who have suffered a stroke? What must the diet of a patient with dysphagia fed orally be like? What type of probe (nasogastric or by gastrostomy) is most appropriate for dysphagic patients who require enteral nutrition?
- What strategies and measures must be adopted to prevent falls and consequences of the latter in patients who have suffered a stroke?
- Must a screening of mood alterations be carried out in patients who have suffered a stroke? Are psychotherapy and/or antidepressants efficient in the prevention and treatment of depression, anxiety and emotionalism?
- Must a screening of cognitive impairment be carried out in patients who have suffered a stroke? Is cognitive rehabilitation efficient as a therapy in patients who have suffered a stroke and have cognitive impairment?
- Must an evaluation of independence for Activities of Daily Living be carried out in those patients who have suffered a stroke? Is occupational therapy efficient to improve independence for activities of daily living in patients who have suffered a stroke?
- What tips about sexuality, driving and return to work must be provided to patients who have suffered a stroke?
- What are the nursing diagnoses related to stroke? What nursing interventions are required and how are the results measured?

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8.1. Monitoring the patient after discharge

Experts' opinion (4)

Although people who have suffered a stroke have been examined by specialists, at Primary Health care level they can be evaluated again in an opportunistic manner and thus detect problems that had not been previously recognised or that might require changes in management. In this sense, one of the specific objectives included in the Stroke Strategy of the National Health System is that the Primary Health care teams should perform a holistic evaluation of discharged patients and of their carers[2].

The Primary Health care physician must know the concepts of deficiency, disability and handicap, to facilitate the patient's access, through the multidisciplinary rehabilitation team, to the adequate social coverage and guarantee the best state of health. The disability evaluation teams of each Autonomous Community will be responsible for determining the degree of handicap presented by the individual.

No specific follow-up outline has been defined in Primary Health care for patients who have suffered a stroke and the frequency of visits must be programmed in agreement with individual clinical needs.

The appropriate secondary prevention measures must be established in all patients who have suffered a stroke, so we recommend consulting the *Primary and Secondary Stroke Prevention Guideline*[41].

Recommendations

√	When discharged from hospital, the health care continuity by the Primary Health care teams must be guaranteed, scheduling the required visits depending on the patient's clinical situation and in coordination with all the other specialists involved, to guarantee the gains obtained.
√	The post-stroke functional limitation must be assessed after hospital discharge and at the end of the rehabilitation, to thus determine the functional status obtained. Scales, such as the Barthel Index, Rankin Scale or the FIM motor subscale (appendix 7) can be used.
√	A neurological assessment by a specialist is recommended three months after hospital discharge.
√	The Primary and Secondary Stroke Prevention Guideline must be consulted to provide criteria for the appropriate secondary prevention measures in each case.

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8.2. General rehabilitation measures after a stroke

Rehabilitation is a process that is limited in time and guided by objectives, aimed at permitting disabled people to achieve an optimal mental, physical and social functional level, and provide them with the tools to change their own lives.

The main aim of rehabilitating stroke patients is to treat their disability to achieve the maximum functional capacity possible in each case and facilitate independence and reintegration into the family, social and labour environment. This objective is achieved via the coordination of a multidisciplinary team by the Specialist Physician in Rehabilitation and Physical Medicine.

This process should begin as soon as possible during hospital admission, once the patient is stable. There is evidence in literature that an early start to rehabilitation is associated with better results[183]. — RS 1+

Patients who start rehabilitation with the first week after admission present Cohort better long-term results than those who start rehabilitation later on (OR=2.12; 95% CI: 1.35 to 3.34)[184]. — study 2++

The rehabilitation team must be multidisciplinary and include physicians, nurses, physiotherapists, speech therapists, occupational therapists and social workers[99,185]. Patients and family members or carers must be actively involved in this team, if possible, right from the start and during the entire rehabilitation process[99,185,186]. — CPG (SR) 1+

Once patients have been discharged they can continue benefiting from the rehabilitation treatment if they so wish. The rehabilitation services that offer therapies (physiotherapy, occupational therapy and other multidisciplinary interventions) are efficient when reducing the probability of a bad prognosis (OR=0.72; 95% CI: 0.57 to 0.92) and improving the independence of Activities for Daily Living (ADL) (p=0.02) in ambulant patients who have had a stroke, or have been discharged after a stroke, at least one year earlier[158,17]. — CPG (meta-analysis) 1++

Something that must also be taken into account is that not all patients are candidates for a rehabilitation programme. Patients who have no sequelae do not require rehabilitation and those that have suffered a serious stroke with major functional impairment or are very dependent for ADL, with an unfavourable recovery prognosis are not candidates for rehabilitation. In these cases, family members and carers must be educated and instructed to care for them[186]. — CPG (Experts' opinion (4)

On an outpatient level, the patient can continue or start rehabilitation in any of the following environments:[37]

Long-stay centre: Resource for individuals with similar conditions to convalescence/medium-stay centres, with insufficient social family support to foresee a return home in the mid term.

Rehabilitation day hospital: in the case of medically stable individuals with sufficient social family support to avoid full-time institutionalisation but insufficient to be attended to at home during the day time.

Outpatients' rehabilitation: for medically stable individuals with no significant cognitive deficits, with light/moderate disabilities in one or two functional areas, with adequate social family support and possibility of travelling to the rehabilitation service.

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Home rehabilitation care: indicated for individuals with moderate/serious disability and sufficient social family support to be at home, with difficulties to travel to the primary care rehabilitation service.

However, it must be taken into account that the environment where the rehabilitation is provided may change throughout the rehabilitation process, depending on each patient's specific needs, without losing coordination or continuity.

Most of the recovery that patients will experience takes place in the first three months after the stroke. Recovery continues, in a much slower manner up to at least six months and 5% of the patients continue recovering up to one year. Not all patients recover entirely. It is indicated that perhaps only 10% of the patients who have suffered a serious or moderate stroke recover completely.[188]

Rehabilitation must last until no functional objectives to be reached are identified[189]. CPC (expert's opinion) 4

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Summary of evidence

1+/2++	An early start of rehabilitation is associated with better results.[183,184].
1+	The rehabilitation team must be multidisciplinary and include physicians, nurses, physiotherapists, speech therapists, occupational therapists and social workers[99].
1++	Ambulant patients who have suffered a stroke or have been discharged after a stroke less than one year previously, and receive care by rehabilitation services, are less likely to have a bad prognosis and greater independence for activities for daily living[187].
4	Patients who have no sequelae do not require rehabilitation, and those who have suffered a serious stroke with major functional impairment or very dependent for ADL with an unfavourable recovery prognosis are not candidates for rehabilitation.
4	The rehabilitation must last until no functional to be achieved are identified[189].

Recommendations

B	A rehabilitation programme carried out by a multidisciplinary professional team with the active participation of patients and family members is recommended. This team will include the Rehabilitation and Physical Medicine specialist as the coordinator of the rehabilitation process in the phase following the hospital discharge and for one year after the stroke episode.
A	After discharge from the hospital, it is advisable for the general practitioner to check that patients are complying with or have complied with the rehabilitation treatment indicated in each case. It must be ascertained that the relevant rehabilitation treatment is being carried out according to the patient's deficits.
D	Providing training in the necessary care is recommended for carers or family members of patients with considerable functional impairment who are not candidates for rehabilitation.
√	When the patient experiences a functional impairment due to depression, fractures, falls, spasticity, pain or any other cause, it is recommended to refer again to rehabilitation in order to try to recuperate the previous functional level, as well as to treat possible triggering causes.

8.3. Sequelae and common complications after a stroke

Patients who have suffered a stroke may experience a large variety of limitations and complications that may perhaps hinder their optimal recovery. Some of them are set out in table 13.[185,190-204]

Table 13. Sequelae and common complications in the follow-up after a strok

Sequelae and physical complications	
Most frequent	**Less frequent**
• Total or partial motor deficits	• Sight alterations
• Sensory alterations	• Epilepsy
• Language alterations	• Central post stroke pain
• Fatigue	• Deep venous thrombosis
• Osteoporosis	• Faecal incontinency
• Shoulder pain	• Pressure ulcers
• Falls / fractures	• Urinary infections
• Spasticity	• Lung infections
• Urinary incontinence	• Constipation
• Contractions	• Dysphagia
• Hemiplegic shoulder subluxation	
• Sexual dysfunction	
Mood alterations	
Most frequent	**Less frequent**
• Depression	• Emotionalism
• Anxiety	
Cognitive alterations	
Most frequent	**Less frequent**
• Dementia	• Apraxia
• Attention deficits	• Alteration of upper executive functions
• Memory alteration	• Spatial neglect
	• Agnosia (visual and anosognosia)
Alterations for activities of daily living	
Difficulties to:	
• Go up stairs	• Wash themselves
• Get dressed	• Feed themselves
• Go to the bathroom	• Walk

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The management of some of the sequelae and complications mentioned in the table are set out below.

8.3.1. Physical problems

8.3.1.1. Impairments and limitations assessment

Motor alterations

Some of the motor alterations that occur after a stroke include sequelae such as lack of coordination, selective loss of movements, loss of motor control and/or weakness. The latter is probably the most incapacitating factor in terms of mobility limitation. The guideline of the Royal College of Physicians (RCP) recommends describing and quantifying the motor disability, using validated tools[189].

CPG (experts' opinion) 4

Sensory alterations

Patients may suffer sensory alterations in sense of touch, sense of position and others. The seriousness is probably associated with the motor deficit, so the importance of this deficit on its own is unknown. It is necessary to evaluate if there is a sensorial alteration or loss of the side affected, so a formal instrument such as the Nottingham Sensory Assessment can be used if necessary[189].

CPG (experts' opinion) 4

Patients with a marked sensorial loss, and who preserve a good motor function, must be instructed in how to care for the limb affected and avoid accidental injuries[189].

Sight alterations

Sometimes, patients who have suffered a stroke have sight alterations, so the sight capacity of patients should be examined with the patient using the appropriate glasses. If sight alterations are detected, the patient must be informed of the risks and consequences, especially if the patient drives. The presence of hemianopsia must also be evaluated[189].

CPG (experts' opinion) 4

Language alterations

Language alterations must be examined and treated by specialists (speech therapists)[185,186,189,205].

CPG (experts' opinion) 4

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

Summary of evidence

4	Patients who have suffered a stroke may present motor, sensory, sight and language impairments, so the presence of these impairments must be evaluated using validated scales[185,186,189,205]

Recommendations

D	It is recommended to examine the motor, sensory and visual skills, as well as language skills in all patients who have suffered a stroke, using validated scales, whenever these are available.
√	If a new deficit or alteration is detected that had not been previously recognised, the patient will be referred to the relative specialist.

8.3.1.2. Spasticity

Spasticity is one of the most frequent problems after a stroke (19-38% of the patients)[199,206]. It develops gradually, and is generally expressed during the first months. Although it does not always cause problems, it may interfere with the rehabilitation and activities of daily living (eating, getting dressed, washing) and cause other complications, such as pain and contractions[207]. Up to 17% of the patients who have suffered a stroke present spasticity one year after the episode and 4% present a disabilitating spasticity[208].

Descriptive studies 3

Not all the cases of spasticity must be treated; a light spasticity may not require treatment, whilst the most serious cases do not respond to it[207].

Experts' opinion4

Some oral drugs can be used if the spasticity interferes with the daily activity or personal care of the patient 186,189. In one SR of 2004, the efficiency of oral anti-spastic drugs was studied in non-progressive neurological diseases, including cerebrovascular diseases. The results showed that central action muscle relaxation agents (baclofen and tizanidine) improve spasticity measured according to the Ashworth scale in patients who have suffered a stroke, compared with placebo ($p<0.001$ and $p<0.0001$ respectively). Dantrolene did not show significant differences compared with placebo regarding the muscular tone, activities of daily living (ADL) and motor function scales, in one of the studies included in the SR., although in another study an improvement of the spasticity was observed in patients treated with dantrolene. This latter study contained serious methodological deficiencies, as the blindness of the study was removed and the patients assigned to the control group decided to take the drug, so it was not possible to compare the results with placebo. No significant differences were found in those studies that compared different drugs among each other (tizanidine versus diazepam and tizanidine versus baclofen)[209].

CPG (RS) 1+

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

According to one RCT, tizanidine was less efficient than injections of botulinum toxin in the treatment of spasticity of the wrist flexor, and it also presented a higher percentage of side effects. Tizanidine did not prove to be better than the placebo, either, when reducing the flexor tone of the wrist or finger, in any of the evaluations carried out (p>0.09)210.The incidence of adverse effects in the groups treated with oral anti-spastic drugs is high. For tizanidine, up to 60-88% of the patients treated suffered adverse effects, the most common being dry mouth and drowsiness, and less frequently an increase of hepatic enzymes. With dantrolene between 64 and 91% of the patients treated suffered adverse effects, mainly drowsiness, fatigue and muscular weakness, whilst between 25 and 27% of the patients treated with baclofen suffered adverse effects, the most frequent being sedation, dizziness and muscular weakness. The neurological effects were dose-dependent and tended to decrease when the dose was reduced[209].

RCT 1+

RS 1+

The NSF acknowledges the marginal effect of these drugs and of their numerous side effects and does not recommend their use to treat spasticity following a stroke[205,209].

CPG (SR) 1+

Another muscle relaxation agent that has been used to treat spasticity after a stroke is tolperisone. In another SR, evidence was found that tolperisone reduced the spasticity associated both with the upper and lower limbs, when administered at a rate of 300 to 900 mg per day. Spasticity was reduced in 78.3% of the patients to whom tolperisone was administered by at least one point on the Ashworth scale compared with 45% of the patients who were administered placebo (p<0.0001). The average reduction of the score on the Ashworth scale for those patients who received tolperisone was 1.03 points compared with a reduction of 0.47 points for those who received placebo (p<0.0001). The adverse effects were similar in both groups. In this review, it was also observed that diazepam and ketazolam are efficient to reduce symptoms in patients with spasticity, evaluated both clinically and with electromyography. No differences are found between the two drugs[211,212].

SR 1+

However, the use of diazepam and other benzodiazepines may interfere in the patient's recovery[186,213,214].

CPG (cohort studies) 2-

Neither dantrolene nor tolperisone are sold in Spain so these drugs have not been considered when making recommendations.

Other therapies, in principle not applicable in PC, have also proved to be quite efficient in reducing spasticity after a stroke:

- Type A botulinum toxin injections, alone or combined with physiotherapy or electric stimulation[215-217].
- Nervous impulse blockage[211,212].
- Intrathecal baclofen[211,218].
- Electrical stimulation[211].
- Therapy with ultrasound[211].

More than 5 years have passed since the publication of this clinical practice guideline and its validity has not been reviewed

Summary of evidence

3	Spasticity is frequent after a stroke (19-38%) and may even cause disability (4%)[199,206,208]
4	Light spasticity may not require treatment whilst the most serious cases often do not respond to it[207].
1+	Evidence about the effectiveness of tizanidine compared with placebo is contradictory. It has not proved to be more efficient than other drugs (diazepam and oral baclofen)[209-211].
1+	Tizanidine seems to be less efficient than botulinum toxin injections in the treatment of spasticity of the wrist flexors in patients who have suffered a stroke[210].
1+	Oral baclofen reduces post-stroke spasticity[209].
1+	Dantrolene does not seem to reduce spasticity after a stroke compared with placebo[209].
1+	The adverse effects associated with some oral anti-spastic drugs are frequent: 60.88% of patients treated with tizanidine (dry mouth, drowsiness), 64-91% of those treated with dantrolene (drowsiness, fatigue, muscular weakness) and 25-27% of those treated with oral baclofen (sedation, dizziness, muscular weakness)[209].
1+	Tolperisone reduces spasticity of the upper and lower limbs compared with placebo, the frequency of adverse effects being similar, although it is not sold in Spain[211,121].
1+	Dizepam and ketazolam reduce the symptoms of patients with spasticity[211].
2-	The use of diazepam or other bencidiazepines may affect the patient's recovery[213,124].

Recommendations

D	It is not recommended to treat light spasticity with oral drugs if this impairment does not interfere with the patient's recovery.
√	Those patients whose spasticity interferes with their daily lives must be referred to the neurologist and/or rehabilitator for them to assess the most appropriate treatment.
B	Oral drugs, such as baclofen can be used to treat generalised spasticity.

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8.3.1.3. Shoulder pain

Shoulder pain in hemiplegic patients is a common problem after suffering a stroke. Up to 72% of patients will experience at least one episode of shoulder pain during the first year, which may delay rehabilitation and functional recovery[198]. In a study about the natural history of stroke, it showed that 39% of the patients when discharged, complained about shoulder pain, 59% after 8 weeks and 36% after 26 weeks[219]. It is normally associated with spasticity and may also be caused by subluxation of the shoulder of the plegic limb[201].

Descriptive studies 3

Once the pain has set in, it is difficult to manage. Due to the uncertainty about what causes it, it has not been possible to establish the ideal management, so preventive action is considered to be the best approach to managing shoulder pain[220].

Experts' opinion4

Slings and other support measures are usually used in the initial phases after a stroke, to hold the flaccid arm until the muscular tone of the shoulder has been recovered, and thus prevent subluxations and contractions 201. According to the results of one SR, evidence about the efficiency of the use of support means to prevent subluxation of the shoulder in hemiplegic patients is insufficient. The support means do not seem to improve the function, although they do not increase contractions, either. On the other hand, functional bandages with adhesive tape (strapping), as a support measure for the shoulder, seem to delay the appearance of pain, but do not prevent it[221].

RS 1+

In another RCT, later than this SR, the efficiency of strapping was assessed during rehabilitation in patients who, following a stroke, presented a high risk of developing shoulder pain (those with poor muscular function around the shoulder or a total lack of this function). The patients were randomised into three groups: One with strapping undergoing study, another with placebo strapping and another control group without placebo. The strapping was maintained for 4 weeks. A significant difference was observed in the average of pain-free days between the intervention group and the control group, but not with the placebo strapping, perhaps due to the small sample size of the study[222].

RCT 1+

In the active treatment of shoulder pain, the relationship with spasticity and other associated alterations such as frozen shoulder suggest that the management must be aimed at improving the mobility of the plegic limb. Current evidence does not go in favour of any of the available therapies, such as functional electrical stimulation, physiotherapy, ultrasounds or strapping and supports[185,186,189,205,223-231].

CPG (several types of studies)

SR 1+

The usefulness of botulinum toxin injections is not clear either[201].

One SR includes the result of two RCTs that evaluated the use of intra-articular steroid infiltrations in patients with shoulder pain. None of the trials found significant evidence of the steroids (triamcinolone acetate) improving either the pain or the mobility of the joint, or compared with placebo or with botulinum toxin injections[201].

SR (1++)

More than 5 years have passed since the publication of this Clinical Practice Guideline and its validity has not been reviewed

This same SR mentions another study which observed that the administration of NSAIDs in patients with shoulder pain, for 30 to 60 minutes before being subject to occupational therapy, produced a relief of the pain and an improvement in the recovery[232]. Cohort study 2-

The RCP guideline recommends evaluating and monitoring the shoulder pain, establishing preventive measures and offering simple analgesics (paracetamol, NSAIDs) during the acute pain episodes[189]. CPG (Experts' opinion (4)

Summary of evidence

3	UP to 72% of the patients who have suffered a stroke will experience at least one episode of shoulder pain during the first year[198].
3	Shoulder pain in hemiplegic patients is normally associated with spasticity and can also be caused by subluxation of the shoulder[201].
1+	There is not sufficient information about the use of slings or other support means to prevent subluxation of the plegic shoulder[221].
1+	Functional bandages with adhesive tape (strapping) as a support for the plegic arm delay the appearance of pain, but there is not sufficient evidence about its usefulness in its prevention[221,222].
1+/2+	The evidence currently available does not permit choosing any other available therapies such as functional electrical stimulation, physiotherapy, ultrasounds, botulinum toxin injections or strapping and supports in the treatment of shoulder pain after a stroke[201,223-231].
1++	Intraarticular corticoid infiltrations (triamcinolone acetate) do not improve either the pain or the mobility of hemiplegic patients with shoulder pain after a stroke[201].
2-	The administration of NSAIDs before occupational therapy produces a relief of the symptoms and a greater recovery in patients with shoulder pain after a stroke[232].
4	Simple analgesia (paracetamol, NSAIDs) may be useful during the acute episodes of pain in patients with painful hemiplegic shoulder[189].
4	Evaluating the monitoring the shoulder pain is considered necessary[189].

Recommendations

D	It is advisable to monitor the plegic shoulder during the first year after having suffered a stroke, in order to detect the presence of episodes of shoulder pain.
D	During the acute pain episodes, it is recommended to offer the patient simple analgesics such as paracetamol or NSAIDs.
A	Intraarticular steroid infiltrations are not recommended to treat acute episodes of shoulder pain in hemiplegic patients.
√	It is recommended to refer patients with persistent shoulder pain to a rehabilitation specialist.

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8.3.1.4. Central post stroke pain

Patients with stroke are more prone to developing a form of central superficial, burning or lacerating pain that gets worse when touched, with water or movements. In the majority of the cases this is associated with dysaesthesias and allodynia and occurs in approximately 2 to 8% of the patients[233]. Studies descriptive 3

The symptoms frequently express themselves one month after the stroke, which may give rise to a delay in its diagnosis and treatment[234].

The VA/DoD[186] recommends evaluating the most likely etiology (neuropathic or musculoskeletal pain), as well as location, duration, intensity and circumstances when it gets worse or better, and using scales from 0 to 10 to determine the degree of pain. CPG (experts' opinion) 4

Amitriptyline must be considered initially to treat central post stroke CPC pain[185,235]. CPC (RCT) 1+

A Cochrane SR found evidence of the effectiveness of the use of tricyclic antidepressants to control neuropathic pain. In the specific case of central post stroke pain, pain in 10 out of 15 patients treated with amitriptyline was relieved either totally or partially compared with 1 out of 15 in the control group (placebo). The review also informs of the withdrawal of the treatment in 20% of the participants who received antidepressants in the studies included, due to adverse effects[236]. On the other hand, amitriptyline did not prove to be efficient in preventing central post stroke pain[236]. SR 1+

Anticonvulsants have also been considered as another option in the treatment of neuropathic pain. Carbamazepine seems to relieve pain, at least moderately, in patients with chronic neuropathic pain secondary to other pathologiess[237], although in the case of patients with central post stroke pain, carbamazepine has proved to just have a slight effect, which is not significant compared with placebo, causing more side effects than amitriptyline[185,205,235]. RS 1+ CPG (RCT) 1+

Although it has not been possible to demonstrate the efficiency of SR 1+ lamotrigine in the treatment of neurogenic pain caused by other pathologies238, the administration of 200 mg/day of lamotrigine (another anticonvulsant) reduces average pain in patients with central post stroke pain (score of 5 on visual scales) compared with placebo (score of 7) and it can be considered as an alternative to tricyclic antidepressants[200]. The adverse effects associated with its use include skin rash, with an approximate incidence of 7%. Apart from the adverse effects, when selecting the treatment, the difficulties in adjusting doses must also be taken into account[238]. SR 1+

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

The efficiency of pregabalin, another anticonvulsant, to treat central neuropathic pain was investigated in a RCT, which included, among others, patients who presented central post stroke pain. After four weeks' treatment, the group that received pregabalin reduced the average pain intensity (measured on analogical visual scale) from 7.6 (±0.8) to 5.1 (±2.9), whilst the group that received placebo went from an average score of 7.4 (±1.0) to 7.3 (±2.0), the differences being significant (p=0.01). Although the specific results for the group of patients with central post stroke pain are not presented separately, it is clear that there were no differences with respect to the pain relief after the administration of pregabalin between patients with central pain caused by brain lesion or bone marrow lesion. The state of health perceived by patients, measured according to EQ-5D, was significantly better in the group that received pregabalin. The adverse effects for the group treatment were light and well-tolerated in general and no significant differences were found with the control group. These consisted above all in nausea, sleepiness, reduction of intellectual activity and dizziness[239]. RCT 1+

Recently, another multi-centre RCT has been concluded where the efficiency, tolerance and safety of pregabalin in treating central post stroke pain has been evaluated242. The test included 219 adult patients who were randomised to receive pregabalin (from 150 mg to 600 mg a day) or placebo for 13 weeks. The pain relief (in the 24 previous hours) logged each day by numerical scales from 0 to 10 was not significantly higher in the group treated. No significant differences were obtained either between patients who received pregabalin and the group assigned to placebo in the following measures: RCT 1+

Reduction in the scores of other scales to measure pain (difference = -0.2; 95% CI: - 0.7 to 0.4)

– percentage of patients with a reduction in scores of pain of 30% or more
– reduction in the interference of pain in sleep
– reduction in the scores for anxiety and depression
– improvement in quality of life

With respect to sleep (measured by the sleep scale of the Medical Outcomes Study), compared with placebo, pregabalin improved the quantity and appropriateness of the sleep, snoring and the global index of the scale, although no differences were seen for sleep alterations, dyspnoea/headache or sleepiness.

With respect to safety, in the treated group, adverse effects were recorded in 70% of the patients whilst in the group that received placebo 55% of the patients suffered some kind of adverse effect. The most frequent were sleepiness, dizziness and peripheral oedema. Eight patients suffered serious adverse effects, six of whom received pregabalin and two from the control group. The adverse effect (peripheral oedema) was only considered to be related to the treatment in one of these patients[240].

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

Other intravenous and oral drugs have also been used to treat central post stroke pain. Intravenous lidocaine relieves pain in the short term, although the effect does not last for more than six hours after administration. On the other hand, intravenous naloxone does not reduce central post stroke pain and intravenous morphine presents analgesic effects in some of the components of the central pain (induced allodynia by friction with brushes), although in others there is no significant difference with the placebo and it seems that only a minority of patients will benefit from long-term treatment. The opioid agonist, levorphanol, at high doses (0.75 mg) significantly reduces pain compared with low doses (0.15 mg) (36% of the patients compared with 21%, p=0.02)[200]. SR 1+

Finally, drugs such as gabapentin, serotonin and mexiletine reuptake inhibitors, seem to relieve pain in some patients[200]. Cases have also been described of patients with untreatable pain who have responded to weak opioids (tramadol)[241] and antiepileptics (zonisamide)[242]. Case series 3

More than 4 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

Summary of evidence

4	When managing central pain it is useful to rule out other types of pain (musculoskeletal), as well as evaluate the location, duration, intensity and circumstances where the pain gets worse or better, using scales from 0 to 10 to determine the degree of pain[186].
1+	Amitriptyline is efficient in the treatment of central post stroke pain compared with placebo although not in prevention[235,236].
1+	Tricyclic antidepressants present side effects that may cause the withdrawal of the treatment in up to 20% of the patients[236].
1+	Carbamazepine does not significantly improve central post stroke pain compared with placebo[235].
1+	The administration of 200 mg/day of malotrigine reduces pain in patients with central post stroke pain[200].
1+	Skin rash associated with the use of lamotrigine occurs in 7% of the treated patients[238].
1+	Pregabaline does not significantly relieve central neurogenic pain after a stroke compared with placebo. Neither does it improve anxiety, depression or quality of life of the patients[240].
1+	Intravenous lidocaine is efficient in relieving central post stroke pain early on although the effect does not last for more than 6 hours[200].
1+	Intravenous naloxone does not reduce central post stroke pain[200].
1+	Intravenous morphine presents analgesic effects in some components of central pain (induced allodynia by friction with brushes), although in other it does not significantly differ from the placebo[200].
1+	Levorphanol at dose of 0.75 mg is more efficient reducing pain than at low doses (0.25 mg)[200].
3	Gabapentine, the SSRIs and mexyletine can produce some relief of central post stroke pain[200].
3	Some cases of untreatable pain have responded to tramadol and to zonisamide[241,242].

Recommendations

D	The etiology of the pain must be evaluated, describing its location, duration, intensity and circumstances when it becomes worse or is relieved. The use of scales from 0 to 10 is recommended to determine the degree of pain.
B	The use of amitriptyline as a first-line drug is recommended, always bearing in mind the side effects associated with its use and establishing the risk/benefit balance in each case.
B	Anticonvulsant drugs (lamotrigine) can also be considered as an alternative to antidepressants (amitriptyline), although the possible appearance of side effects must be taken into account.
√	It is advisable to refer patients with uncontrolled central post stroke pain in Primary Care to specialised pain management care.

8.3.1.5. Dysphagia

Between 27 and 69% of the patients with acute stroke present dysphagia[202]. Almost half either die or recover within the following 14 days, and the rest are left with a certain degree of alteration in swallowing[203]. The complications associated with dysphagia include aspiration pneumonia, malnutrition or dehydration due to a reduction in food and fluid intake. In another setting, it can also affect the patient's social life[189].

The symptoms and signs that might lead to the suspicion of a patient presenting dysphagia are described in table 14[243]. Expert's opinion 4

Table 14. Signs and symptoms of dysphagia[243]

General	
• Difficulty managing oral secretions or drooling • Absence or weakness of a voluntary cough or swallow • Changes in voice quality / tone (hoarseness/moist sounding) • Decreased mouth and tongue movements • Tongue thrust / primitive oral reflexes	• Frequent throat clearing • Poor oral hygiene • Changes in eating patterns • Raised temperature • Weight loss and/or dehydration • Frequent chest infections
When eating or drinking	
• Slow to initiate a swallow and/or delay in swallow (over five seconds) • Uncoordinated chewing or swallowing • Multiple swallows for each mouthful	• Pocketing of food in the cheeks • Oral or nasal regurgitation of food / liquids • Extended time to eat / drink • Coughing or sneezing during/following eating

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Following the consumption of food or drink	
• A wet or hoarse sounding voice	• Changes in respiratory pattern
• Fatigue	

There are some simple, non-instrumental, methods that can be used to evaluate dysphagia after a stroke. The most commonly studies are variations of the glass of water test, consisting in giving the patient different amounts of water to drink (between 30 and 90 ml) and observing if symptoms such as choking, coughing or voice changes appear. Some of these tests combined the "glass of water test" with monitoring oxygen saturation, considering desaturation a positive sign of dysphagia. The majority also include a preliminary examination together with a questionnaire about the patient's clinical data. These tests are usually applied as screening tests during hospital admission on all patients who have suffered a stroke[202].

The guidelines consulted agree about the need to rule out the presence of dysphagia in patients with acute stroke as soon as possible and in any case before starting oral intake. When difficulties are detected in swallowing, these will assessed by the relative specialist, checking, too, if there are associated nutritional problems, so, in principle, all patients should have been evaluated before being discharged from hospital[78,186,189,244]. CPG (experts' opinion) 4

The RCP also recommends that those patients who continue to have problems in swallowing either solids or liquids or their carers, be trained in identifying and managing swallowing problems[189]. CPG (experts' opinion) 4

Feeding by oral route

Although there is no exclusive diet for dysphagic patients, it is common to include modifications in the texture and viscosity of liquids and solids. These modifications may reduce the nutritional content of the diet and the food may not look so appetising, thus causing a reduction in the oral intake. Therefore, it is advisable to enrich the food so that the patients' nutritional requirements are met, presenting it in an appetising and varied manner. The patients' food must be monitored and if necessary, refer to a nutritionist[244]. CPG (experts' opinion) 4

Some of the food and modifications of the textures recommended are given below[245]:

- Food in the form of purée, not leaving it too liquid or with lumps.

- Minced or ground food, referring to soft food with which a homogeneous and easy to chew bolus can be formed.

- Thickened liquids.

- Avoid foods containing mixed textures, such as a combination of solid and liquid, food that can cause gastro-oesophageal reflux, bread and buns, liquids and food in small dry pieces (rice, cereals, corn, peanuts).

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Although it has not been proven in any RCT that the diet modifications reduce the risk of aspiration, in general a diet based on thick liquids and semisolid food with a homogeneous texture is recommended (food that maintains its bolus shape easily and does not scatter in the oral cavity). It is also sometimes recommended to form a food bolus with heightened sensory qualities, such as, temperature, flavour and heaviness to stimulate an improved swallow. Cold food must be avoided in those patients with hypertonic reflexes, due to the risks of triggering muscle spasms. Experts' opinion 4

On the other hand, it is also advisable for the diet to be high calorie, to compensate for reduced intake and the additional physical effort needed to eat and drink[243]. Descriptive studies 3

Although in general it is advisable to avoid not very dense liquids due to the risk of aspiration, the absolute restriction of these liquids may lead to an insufficient intake of liquids and increase the risk of dehydration[246].

However, in one RCT, no differences were shown between patients who received not very thick liquids and those that did not. The study included 20 patients with dysphagia after a stroke, who were assigned to two groups. The control group received food based on a diet that included thick liquids and the comparison group added the freedom to have an unlimited amount of water to the aforementioned diet. No patient in either of the groups presented aspiration pneumonia or dehydration[247]. RCT 1-

On the other hand, in another RCT, two diets were compared in 56 patients with chronic dysphagia. The patients were randomised to receive a soft diet and thickened liquids or a diet based on food in the form of purée and not very thick liquids. Over the next six weeks there were 5 aspiration pneumonias in the group that received soft diet and thickened liquids compared with 28 in the group that received purée and not very thick liquids ($p<0.05$) [248]. RCT 1-

Feeding by enteral route

When the patient presents high risk dysphagia or is not able to satisfy the nutritional needs by oral route, he or she can be fed by enteral route. The two existing modalities are nasogastric probe (NGP) and percutaneous endoscopic gastrostomy (PEG) Both methods have advantages and disadvantages. On the one hand, the placement of a NGP is a quick, simple and non-invasive procedure that does not require training and has practically no associated mortality[249]. However, the PE, is tolerated worse by patients and needs to be frequently replaced. The PEG requires surgical insertion that can be complicated by bleeding, perforations or infections[250]. Less serious complications such as minor skin infections, obstructions, leaks or movement of the tube are relatively frequent (13-62%). Gastric haemorrhages, serious infections of the abdominal wall, peritonitis or gastric fistulas occur in 3 to 19%. Mortality associated with the procedure is around 0-2.5%[244,251,252].

Gastric intolerance can occur with both types of tubes and therefore limit the adequate nutritional intake. Both the gastro-oesophageal reflux and aspiration are frequent and the risk of aspiration is not reduced with either of the tubes[244,253].

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

According to one SR, feeding by PEG reduces mortality (OR=0.28; 95% CI: 0.09 to 0.89), treatment failures (OR=0.10; 95% CI: 0.02 to 0.052) and improves the nutritional state of patients when compared with feeding by NGP. This review only includes two small RCTs[250]. SR 1+

In another later larger sample sized RCT, it suggests that during the during the first month after the stroke, feeding through NGP leads to better functional results than feeding by PEG (p=0.05). The differences regarding mortality were not statistically significant (p=0.9). After the test, the authors conducted a SR and a meta-analysis of previous studies where they compared feeding by NGP and PEG. They did not find any significant differences either with respect to the mortality between the two feeding methods[254]. RCT 1++

However, when enteral nutrition is required for long periods of time, there is a consensus opinion that admits that if the dysphagia is serious and the enteral feeding is expected to last for more than 4 to 6 weeks PEG is indicated[185,189,202,205]. CPG (experts' opinion) 4

In one study, the efficiency of enteral feeding was assessed in 40 hospitalised patients (18 with stroke) with persistent neurogenic dysphagia (more than 4 weeks) who required prolonged enteral nutrition. They were randomised to receive enteral nutrition via NGP or PEG for 28 days. The results showed that the treatment failed in 18 of the 19 patients fed with NGP, whilst it did not fail in any of the 19 patients fed with PEG. In addition, the patients fed with NGP received less volume of food compared with those fed with PEG (55% versus 93%)[255]. RCT 1+

In another cohort study in patients aged 65 and over with indication of prolonged enteral nutrition (among them, patients with dysphagia after a stroke), it was observed that survival in those fed with PEG was significantly higher than those fed with NGP (p=0.006). There were also a smaller number of aspirations and probe removals per patient, although there were no significant differences with respect to other complications (gastric haemorrhage, vomiting or diarrhoea). 34% of the patients with PEG suffered a slight skin irritation around the area where the probe was inserted. In general, there were no differences in the nutritional state between the two groups. The patients were monitored for at least 6 months and during the study 33.3% of the patients fed by NGP changed the type of enteral nutrition to PEG, whilst only 6.3% of the patients with PEG required a different enteral nutrition method[256]. Cohorts' study 2+

In any case, those patients with persistent dysphagia after a stroke must continue to be regularly monitored after being discharged, as they may require changes in their dietetic recommendations and even in the feeding route. CPG (experts' opinion) 4

Patients must also be weighed on a regular basis, checking that they are not undernourished. A non-intentional loss of more than 6 kg. in weight in patients of advanced age, after discharge, indicates a risk of undernourishment[244,246].

More than 5 years have passed since the publication of this Clinical Practice Guideline, and its validity has not been reviewed

Summary of evidence

4	It is necessary to rule out the presence of dysphagia in patients with acute stroke as soon as possible and in any case before starting oral consumption. When there are difficulties in swallowing, these will be assessed by the relative specialist, who will also check if there are associated nutritional problems[76, 186,189,244].
4	There are symptoms and signs of suspicion of dysphagia: General (difficulty managing drooling, hoarseness/moist sounding, throat voice, poor oral hygiene, changes in eating patterns, weight loss and/or dehydration), whilst eating or drinking (slow and uncoordinated swallowing, swallowing many times for one single mouthful, oral or nasal regurgitation, coughing or sneezing) and/or following the consumption of food and drink (a wet or hoarse sounding voice, fatigue, changes in respiratory pattern)[243].
4	Those patients who continue to have problems in swallowing either solids or liquids, or their care-givers, must be trained in identifying and managing swallowing problems[189].
4	In those patients with dysphagia who can receive food by oral route 243: – A diet based on thick liquids and semisolid food with homogeneous texture is adequate (food that maintains its bolus shape easily and does not scatter in the oral cavity). – The use of a bolus with heightened sensory qualities such as temperature, flavour and heaviness may stimulate and improve swallowing. – Cold food in those patients with hypertonic reflexes may trigger muscle spasms. – A high calorie diet may compensate for reduced intake and the additional physical effort needed to eat and drink.
1-/3	Although it is generally advisable to avoid not very thick liquids due to aspiration risk 248, the absolute restriction of these liquids may lead to an insufficient intake of liquids and increase the risk of dehydration 246, although there are studies that show that there is no difference when adding not very thick liquids to the diet or not[247].
1++	Feeding by NGP during the first month after a stroke is associated with better functional results than the PEG; although there are no differences regarding the patients' mortality[254].
1+/2+	The PEG offers better results (with respect to survival, failure of treatment and volume of food received) than the nasogastric probe in those patients with persistent neurogenic dysphagia or patients older than 65 years of age, who require enteral feeding for prolonged periods of time[255,256].
4	Monitoring patients with persistent dysphagia after a stroke and once discharged, on a regular basis, helps programme changes in dietetic recommendations and even in the feeding rout[244].
4	A non-intentional loss of more than 6 kg. in weight in patients of advanced age, after discharge, indicates a risk of undernourishment[244,246].

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Recommendations

D	It must be verified if the presence of dysphagia has been evaluated before hospital discharge, also verifying if there are associated nutritional problems.
D	It is advisable to rule out the presence of dysphagia as soon as possible and in any case before starting oral feeding.
D	Patients in whom swallowing difficulties are detected for the first time (general, during or after swallow) must be assessed by the respective specialist.
D	It is recommended to provide training for patients whose swallowing difficulties persist and/or for their carers in identifying and managing swallow problems.
D	Patients with persistent dysphagia after a stroke must be regularly monitored when discharged, weighing them regularly, ensuring that they are not undernourished, to evaluate the need for changes in diet and/or in the feeding route.
D	It is advisable for patients with dysphagia fed by oral route to receive a diet that adapts to their status (hypercaloric diet based on thick liquids and semi-solid food with homogeneous texture, food bolus with heightened sensory qualities such as temperature, flavour and density, avoiding cold food in those patients with hypertonic reflexes).
A	The use of a nasogastric probe is recommended in patients with dysphagia who require enteral nutrition during the first month after a stroke.
B	It is recommended to evaluate food administration via Percutaneous Endoscopic Gastrostomy in those patients with dysphagia who need long-term enteral feeding (more than 4 weeks).

8.3.1.6. Falls

Falls, both in hospital and in the community, are normal in patients who have suffered a stroke 257-260. It is estimated that up to 73% suffer at least one fall during the first six months after discharge 204. Apart from the high incidence of falls, there is a greater loss of bone mineral density, especially in the hemiparetic side 200, so, apart from the interventions required to reduce the incidence of falls, interventions are also required to limit their consequences. Moreover, it must not be forgotten that some of the patients may be receiving anti-thrombotic therapy and falls are one of the risk factors of bleeding.

In one SR with meta-analysis different strategies were evaluated to reduce falls in older people living in the community. The results are presented as a fall rate quotient – RQ (based on the number of total falls in a certain period) and/or as risk quotient –RQ (based on the number of participants who suffered at least one fall during the follow-up). The following interventions reduce the risk and/or rate of falls[261]:

Meta-analysis 1++

Intervention	RQ (95% CI)	RQ (95% CI)
1. Multiple component exercises (when focused on 2 or more of the following categories: strength, equilibrium, flexibility or resistance)		
- Group exercises	0.78 (0.71 to 0.86)	0.83 (0.72 to 0.97)

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- Tai Chi	0.63 (0.52 to 0.78)	0. 65 (0.51 to 0.82)
- Personalised home exercises	0.66 (0.53 to 0.82)	0.77 (0.61 to 0.97)
2. Individual component exercises (gait, equilibrium or function)	0.73 (0.54 to 0.98)	0.77 (0.58 to 1.03)
3. Pharmacological treatment		
- Gradual withdrawal of psychotropic drugs	0.34 (0.16 to 0.73)	0.61 (0.32 to 1.17)
- Educational programme on prescription practices for family physicians: Visits, feedback and financial rewards	-	0.61 (0.41 to 0.91)
4. Surgery		
- Cardiac stimulation with pacemaker in people with carotid sinus hypersensitivity	0.42 (0.23 to 0.75)	-
- Cataract surgery for the first eye	0.66 (0.45 to 0.95)	0.95 (0.68 to 1.33)
5. Care / environmental technology (safety in the home and aid devices for personal mobility)		
- Non-slip device for footwear on frozen ground	0.42 (0.22 to 0.78)	-
6. Multiple interventions (combination of two or more of the previous categories administered to all participants)		
- Exercises + education + safety at home	0.69 (0.50 to 0.96)	-
- Exercises + nutritional supplement in women with vit. D and Calcium deficit	0.19 (0.05 to 0.68)	-
- Exercises +safety at home	-	0.76 (0.60 to 0.97)
- Exercises + sight assessment	-	0.73 (0.59 to 0.91)
- Exercises + sight assessment + safety at home	-	0.67 (0.51 to 0.88)
- Educational intervention + free access to geriatric consultant	-	0.77 (0.63 to 0.94)
7. Multifactor interventions (combination of two or more of the previous categories. The participants receive different combinations of interventions depending on the individual assessment)	0.75 (0.65 to 0.68)	0.95 (0.88 to 1.02)

None of the other interventions reduced either the risk or the rate: - other types of exercises

- vitamin D (does not reduce the risks of falls in general, but it could do so in people with vitamin D deficits)
- similar to vitamin D

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– Cataract surgery for the first eye
– oral administration of nutritional supplements
– cognitive behavioural intervention
– Safety at home interventions (they did not reduce the falls
– in general, although they were effective for people with serious
– sight impairment and other people with high risk of falls)
– interventions to improve sight
– educational intervention to increase knowledge

The interventions to prevent falls seem to reduce the costs. The variations in the methods used make it difficult to compare them in terms of cost-effectiveness. The results indicate that, to take maximum advantage of the resources, the effective strategies must be aimed at individual subgroups of people of advanced age.

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Other studies have focused on interventions to prevent falls aimed specifically at patients who have suffered a stroke. In these patients, both the training in the capacity of the individual to move the centre of gravity voluntarily, following a visual stimulus, and training in the skill to stand up from a sitting position, via specific devices, is associated with a reduction in the frequency of falls (p=9.059 and p<0.05 respectively)[205,262,263]. CPG (RCT) 1-

On the other hand, it has not been proven that physiotherapy reduces the number of falls in patients who still have mobility problems more than one year after stroke[205,264]. CPG (RCT) 1+

Hip protectors have proven to significantly reduce hip fractures associated with falls in older people living in the community (RR=1.16; 95% CI: 0.85 to 1.59). In older people in institutions a marginally significant effectiveness was observed (RR: 0.77; 95% CI: 0.62 to 0.97). Due to the discomfort that they cause, a low adherence to their use has been objectified, especially in the long run[265]. Meta-analysis 1+

In an ongoing RCT, the FLASSH study, the effectiveness of a multifactor strategy (exercises for the home together with strategies to prevent and minimise harm based on an individual evaluation of the risks) is being evaluated to prevent falls in patients who have suffered a stroke, once they return home[266].

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Summary of evidence

1++	The following interventions can be beneficial to reduce falls in older people living in the community. Multiple component exercises (group, Tai Chi, personalised home exercises), individual component exercises (gait, equilibrium or function), gradual withdrawal of psychotropic drugs, educational programme on modification of prescription for PC physicians, cardiac stimulation with pacemakers in people with carotid sinus hypersensitivity, cataract surgery of the first eye, non-slip device for footwear on frozen ground, multiple and multifactor interventions[261].
1++	Vitamin D does not reduce the risks of falls, but it could do so in people with vitamin D deficits[261].
1++	Safety at home interventions do not reduce the falls in general, although they are effective for people with serious sight impairment and other people with high risk of falls[261].
1-	In patients who have suffered a stroke, both training in the individual's capacity to move the centre of gravity voluntarily following a visual stimulation, and training in the skill to stand up from a sitting position, are associated with a reduction in the fall incidence[262,263].
1+	Physiotherapy one year after the stroke does not reduce the frequency of falls in patients who still have mobility problems[264].
1+	Hip protectors are not effective to reduce hip fractures associated with falls in older people living in the community. They are not very well tolerated by patients, either[265].

Recommendations

√	It is recommended to evaluate the risk of falls in all those patients who have suffered a stroke.
B	The following strategies are recommended to reduce falls in elderly patients in the community: multiple component exercises (group, Tai Chi, personalised home exercise), individual component exercises (walking, equilibrium or function), gradual withdrawal of psychotropic drugs, educational programme on modification of the prescription for primary health care physicians, cardiac stimulation with pacemakers in people with hypersensitivity of the carotid sinus, cataract surgery on the first eye, nonslip device for footwear on frozen floors, multiple and multifactoral interventions.
B	Vitamin D is not recommended in elderly people in the community to reduce the risk of falls, unless they have a deficit of vitamin D.
B	Safety-related interventions in the home are not recommended to reduce falls in the elderly in the community, except for those patients with serious sight impairment or high risk of falls.
B	Physiotherapy is not recommended one year after the stroke as a measure to prevent falls in patients whose mobility problems persist.
B	Hip protectors are not recommended to prevent fractures associated with falls in elderly people who live in the community.

8.3.2. Psychological problems

Patients who have suffered a stroke frequently present some type of mood alteration, especially depression. They can also present anxiety or emotionalism, alone or accompanying depression.

8.3.2.1. Depression

Patients who have suffered a stroke should be considered as people with a high risk of suffering depression. It is a quite common after-effect that can affect up to 33% (95% CI: 29% to 36%) of the patients[267].

The seriousness of the stroke, physical disability and cognitive impairment are some of the risk factors associated with post stroke depression. It is more frequent in women, in those who have already presented depression or another psychiatric disorder and in people with social isolation[267-270]. Although it can be suffered at any time, the first few months after returning home seem to be the most critical time[271].

In the majority of the cases they are light depressions[272]. Even so, depression can affect social activities and it is disastrous for the patient's recovery and rehabilitation. It is also associated with an increase in mortality[271]. Thus, many research studies have focused on establishing treatments early one after the stroke in order to avoid depression episodes.

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Prevention

A Cochrane SR concludes that for the moment, there is not sufficient evidence about the usefulness of drugs, either antidepressants or psychostimulants, in the prevention of post stroke depression. There is no evidence, either, that these drugs improve the cognitive functions, the activity of daily living or reduce disability, and there is no significant difference with the placebo insofar as the frequency of appearance of adverse effects is concerned. In some of the studies included, a small preventive effect was observed with the use of antidepressant drugs compared with placebo but in the majority of the studies there were no significant differences. The heterogeneity in the variables measured, in the scales to diagnose depression and in the methodology of the studies prevent the authors of the SR from conducting a meta-analysis of the results[273]. RS 1+

On the contrary, in this same SR, a small but significant benefit of psychotherapy was observed in the prevention of depression after a stroke (OR=0.64; 95% CI: 0.42 to 0.98). The authors of the review point out, however, that the inclusion criteria of the studies that assessed the effectiveness of psychotherapy were very restrictive, which limits the generability of these results to the total population[273].

Another RCT that followed the SR described, compared the efficiency of escitalopram, a selective serotonin reuptake inhibitor (SSRI), and problem-solving therapy with placebo. Escitalopram (10 mg/day in under 65s and 5 mg/day in those aged 65 or older), placebo (all the tablets were identical) or problem-solving therapy (12 sessions in all) were administered for one year to each group. During that year the risk of developing depression in the group that received placebo was 4.5 times greater than the group that received escitalopram (95% CI: 2.4 to 8.2) and 2.2 times greater compared with the group assigned to the problem-solving therapy (95% CI: 1.4 to 3.5). No significant differences were found in the frequency of appearance of adverse effects among the three groups. When an analysis was conducted with the intention of treating, the group treated with escitalopram continued to show a lower risk of presenting depression than the group assigned to placebo (p=0.007); not so the group assigned to the problem-solving therapy (p=0.051)[274]. RCT 1+

Another SR with meta-analysis supports the effective of antidepressants in the prevention of post stroke depression. However, combining the results statistically does not seem that appropriate, given the variability in the methodology used in the different studies [271]. Metaanalysis 1-

As seen above, the evidence about the efficiency of different strategies to prevent post stroke depression is contradictory. In the case of studies with antidepressants, the patient selection criteria are usually very strict, often leaving patients with cognitive, communication problems and previous psychiatric diseases, among others, outside the studies. The fact that up to half the survivors after a stroke do not satisfy the selection criteria of some of these studies may limit their external validity[273].

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Apart from confirming the efficiency of the SSRI or other drugs in RCT 1+ the prevention of post stroke depression, other questions still have to be answered, such as the right time to start the therapy, the dose and the most appropriate drugs, the duration of the treatment and the consequences of its withdrawal. One of the studies included in the SR did not show any differences between the preventive treatment for three months with nortriptyline or fluoxetine and placebo. However, when the treatment was withdrawn, those patients who had received nortiptyline presented a greater risk of developing depression in the following six months and with more serious symptoms than patients from the other two groups. 9 months later, the patients treated with nortriptyline or fluoxetine presented a greater risk of developing depression, although no differences were found between groups at 12 and 24 months[275]. RCT 1+

Screening

Despite the high frequency and influence on the patient's recovery and prognosis, post stroke depression is not adequately diagnosed and/or treated in many of the patients[267,276,277].

The guidelines consulted agree about the need to carry out screening for depression in all those patients who have suffered a stroke[186,189]. CPG (experts' opinion) 4

However, the efficiency of this screening has not been determined, or the right moment to carry it out, either. Neither is it clear if all patients who have suffered a stroke should be screened or on the contrary this should only be limited to those patients who present risk factors associated with post stroke depression[278]. Furthermore, the diagnosis of depression in these patients may be more complicated. Cognitive impairments can mean that the patient is unable to recognise or refer depression symptoms and the normal diagnostic instruments or scales may not be useful in patients with communication problems.

The VA/DoD[186] does not determine any preference when choosing a specific diagnostic tool. On its part the RCP[189] considers that simple screen scales must be used and it even states that it would be sufficient to just ask the patient if he or she is depressed. It is considered useful to simply the questionnaires to a Yes/No format in those patients with communication difficulties[279,280]. The RCP also recommends that those patients in whom the depression interferes with the rehabilitation should be evaluated by a specialist (psychologist or psychiatrist)[189]. CPG (experts' opinion) 4

Table 15 contains some of the tools that do not have to be applied by trained personnel, used as a depression evaluation method in patients who have suffered a stroke[278].

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Table 15. Tools to evaluate post stroke depression[278]

Tool	Points	Score interpretation	Execution time	Advantages	Disadvantages
Beck depression inventory	0-63	Depression → 10 10-18: light 19-29: moderate 30-63: serious	5-10 minutes	Short and simple test. Little emphasis on somatic symptoms.	Difficult for some patients to complete. False positives above all in women.
Depression scale of the Epidemiological Study Centre	0-60	Depression → 16	7-12 minutes	One of the best studied instruments.	Difficult for some patients to complete.
Geriatric Scale For Depression	0-30	Depression → 11 11-20: leve 20-30: moderada a grave	8-10 minutes	Little emphasis on somatic symptoms. There are short versions, more appropriate for PC.	The sensitivity can be influenced both by the gender and by the cognitive problems.
Hospital Anxiety and Depression Scale	0-42	Depression → 8/9	2-6 minutes	Simple to administer.	Problems with somatic type itmes.
Zung's self-assessment Depression Scale	25-100	Depression → 55 (for over 60s)s	10-15 minutes	Suitable for preliminary investigations	May not be appropriate for all ages.
Stroke Aphasic Depression Questionnaire	30	Depression → 15	3-4 minutes	Suitable for patients with light to moderate communication problems.	Has not been appropriate validated.

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Treatment

Meta-analysis 1+

The conclusions of a Cochrane SR suggest a beneficial effect of antidepressants in the treatment of depression in patients who have suffered a stroke, compared with the administration of placebo (OR=0.47; 95% CI: 0.22 to 0.98). The patients treated presented an improvement in mood, although not in cognitive function, activities of daily living, or a reduction of the disability, either. An increase in adverse effects was observed in the group treated, especially of the nervous system (OR=1.96; 95% CI: 1.19 to 3.24) and gastrointestinal effects (OR=0.237; 95% CI: 1.38 to 4.06). The studies frequently excluded patients with cognitive difficulties or other concomitant disorders, which hinders the generability of the results. The authors of the review conclude that antidepressants may produce a remission of the mood alterations, but they also cause an increase of adverse effects. They must be used with care in those patients with persistent depression disorder after a stroke, as there is not much information about the adverse associated effects, especially convulsions, falls and delirium, mainly in patients of advanced age or in those with concomitant medication. On the other hand, there is no evidence that psychotherapy produces any benefit in patients with depression after a stroke[281].

RS /Meta-analysis 1+

In another SR which also describes the efficiency of tricyclic antidepressants in patients who have suffered a stroke, it emphasises the importance of adverse effects, above all in patients of advanced age. For the SSRI, the authors performed a meta-analysis, obtaining an OR=2.35 (95% CI: 1.35 to 4.10) in favour of the treatment. Apparently, the adverse effects associated with the SSRI were transient and slighter than those associated with tricyclic antidepressants, although the authors recognise that more studies are necessary with an adequate blinding and an optimal dose, in order to clarify the methodological differences between the studies. In one of the studies included in the review, reboxetine, (selective noradrenaline reuptake inhibitor) proved to be efficient in those patients who presented delayed depression, characterised by lethargy, slowness in starting an action, hypokinesia and hyponymy, not observing serious adverse effects. A study is also included about the efficiency of nefiracetam, (gamma aminobutyric compound), not finding any significant differences in the improvement of depression with respect to the placebo[271].

Psychostimulant drugs are also studied in this SR as another alternative for treating post stroke depression. Methylphenidate proved to be more efficient than placebo, reaching statistical significance when the depression was measured with one of the scales (p=0.028), but not with the rest (p=0.55). It must be taken into account that methylphenidate must be administered with care to patients with cardiac alterations.

On the other hand, patients treated with cognitive-behavioural therapy did not show any improvement compared with those treated with placebo[271].

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Summary of evidence

1+/1-	The evidence about the efficiency of antidepressants or psychotherapy to prevent post stroke depression is contradictory, and there are other outstanding questions such as the right time to start the therapy, the most appropriate dose and drugs, the duration of the treatment and the consequences of its withdrawal[271,273,274].
4	Given the high frequency of post stroke depression and its influence on the patient's recovery and prognosis, a depression screening is considered adequate in these patients, although the right time as well as the test to be used still have to be determined[185,186,189].
1+	Antidepressants in patients who suffer post stroke depression, produce an improvement in mood, although not in cognitive function, activities of daily living, or a reduction of the disability, either[271,281].
1+	Antidepressant drugs, in patients who present post stroke depression, cause a significant increase in adverse effects above all of the nervous system and gastrointestinal effects[271, 281].
1+	There is no evidence that psychotherapy in patients who suffer post stroke depression produces any benefit[211,281].

Recommendations

B	Lacking consistent evidence about the efficiency of antidepressants or psychotherapy to prevent post-stroke depression, their use is not recommended for preventive purposes.
D	Screening for depression, using simple tests, is recommended in those patients who have suffered a stroke.
B	The use of antidepressants is recommended to treat post-stroke depression, but individually evaluating the risk of adverse effects in each patient.

8.3.2.2. Anxiety

Anxiety is almost just as common as depression, often related to the fear of falls or a repetition of the stroke[189].

It normally occurs concomitantly with depression, so the guidelines recommend that, in the event of any type of mood alteration, the presence of other alterations should be evaluated[186,189]. — CPG (Experts' opinion (4)

In a study of cohorts on the efficiency of nortriptyline in the treatment of generalised anxiety together with depression, the nortriptyline produces significant improvements both for the depression and for the anxiety in the patients treated[282]. — Cohort study 2-

We have not found any other RCT focused exclusively on the treatment of anxiety in patients after a stroke. The guidelines consulted recommend considering normal therapies (both psychological and pharmacological) in managing anxiety after a stroke[189,205]. — CPG (Experts' opinion (4)

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Summary of evidence

4	Anxiety frequently occurs concomitantly with depression so it is considered advisable to evaluate its presence when any other form of mood alteration is detected, treating it in the normal way[186,189,205].

Recommendations

D	The presence of anxiety should be evaluated in those patients who present some other form of mood alteration.
D	Normal treatment of anxiety is recommended in patients who have suffered a stroke (psychotherapy, pharmacotherapy).

8.3.2.3. Emotionalism

Patients who have suffered a stroke may go through periods of emotionalism (phenomena of disproportionate laughing or crying or with minimal stimulation). These symptoms tend to disappear without requiring medication or therapeutic interventions 186. However, in some cases, the crying can be persistent or interfere with the patient's rehabilitation or in his or her relationship with family members. In these cases, pharmacological treatment can be considered[186].

Antidepressants have proved to be beneficial in patients with emotionalism after a stroke. The studies included in one SR compared the use of different antidepressants (tricyclic, MAOI SSRI) with placebo. The antidepressants studied significantly reduced the frequency and seriousness of the crying or laughing episodes; however, the confidence intervals obtained in the studies were very broad, which implies that the effect of the antidepressants was perhaps small. No differences were observed between the groups with respect to the incidence of adverse effects, although a high rate of abandonment was noticed between the randomised participants and the treatment group. The authors of the SR conclude that it would be reasonable to try antidepressants on those patients with persistent emotionalism, with frequent and serious episodes, which might justify assuming all the risks implied by prescribing these drugs, above all in patients of advanced age[283]. SR 1+

In another additional RCT that assessed the efficiency of fluoxetine (SSRI) in the treatment of emotionalism, it was seen that both for crying and excessive or inappropriate laughing, patients treated with fluoxetine improved in the assessments carried out during the follow-up (1, 3 and 6 months), although the results were only significant in patients with pathological crying. In the assessment that the actual patients carried out of their status, both in patients treated for crying and for laughing, the proportion of patients who referred to an improvement was significantly greater in the group treated with fluoxetine in all the assessments[284]. RCT 1+

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Summary of evidence

1+	Antidepressants (SSRI, tricyclic, MAOI) reduce the frequency and seriousness of episodes of crying or laughing in patients with emotionalism after a stroke[283, 284].
1+	The adverse effects in patients with emotionalism treated with antidepressant drugs are not more frequent than with placebo, although a higher rate of abandonment is noticed among participants who receive the treatmen[t283].

Recommendations

B	Considering treatment with antidepressants is recommended in those patients who, after a stroke, present persistent emotionalism, with frequent and serious episodes, evaluating the adverse effects of these drugs, above all in people of advanced age.

8.3.3. Cognitive affectation

It is very probable that all patients who have suffered a stroke will undergo certain changes in cognitive functions, to a certain extent. These changes may be general (slowing down in processing information), or specific of some areas (orientation, attention, memory, mental flexibility, planning and organisation)[185,189].

Cognitive impairment and vascular dementia are ever-evolving concepts, which pose many problems related to terminology. The current tendency is to consider the term vascular cognitive impairment as a category that includes all syndromes and diseases characterised by cerebrovascular etiology cognitive impairment. This term would encompass the following[285]:

- Vascular cognitive deficit, without dementia
- Vascular dementia
- Alzheimer's Disease together with a cerebrovascular disease (prior Alzheimer worsened by a stroke)

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) defines dementia as a loss of intellectual capacity that causes a significant deterioration of the occupational or social activity, and represents an important reduction of the previous activity level, always accompanied by impairment of the memory and at least one of the following: aphasia, apraxia, agnosia or alteration of the constructive activity (planning, organisation, sequencing and abstraction)[286]. There are many authors who consider that this definition is not appropriate, given the importance given to memory impairment and new definitions are proposed that place more emphasis on functional loss and alteration of the constructive activity[285].

On the other hand, although there are no consensus criteria to define the vascular cognitive deficits without dementia in a simple manner, all the vascular origin cognitive deficits that do not satisfy the dementia criteria can be considered under this category[287].

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Descriptive studies 3

Due to the great differences in the defining criteria among studies it is difficult to know what is the real incidence and prevalence of cognitive impairment. In one descriptive study, the prevalence of cognitive impairment after a stroke, defined as a score in the Mini Mental State Examination (MMSE) of below 24, was 39% after three months and between 32 and 35% in successive evaluations up to 3 years[288]. Other authors have found cognitive impairment prevalence of over 50%[289,290]. In general, it is admitted that can be an under-estimation of cognitive impairment as in many studies it is compared with dementia, when cognitive impairment without dementia seems to be more prevalent[291]. It is possible that up to two thirds of the patients who have suffered a stroke will have cognitive alterations, and that approximately one third will develop dementia[292]. Whilst, in some patient the cognitive impairment will progress gradually, it is considered that between 16 and 20% of the patients will experience an improvement above all during the first months after the stroke[292].

CPG (experts' opinion) 4

Given the high prevalence of cognitive impairment, it is advisable to make a routine evaluation of the cognitive functions on all patients who have suffered a stroke[185,186,189,205]. Simple measurement tools can be used such as the MMSE, concentration, memory or orientation test[189]. If a patient in rehabilitation does not progress as expected, it is possible that an undetected cognitive impairment is responsible for this lack of progress, so the patient should perhaps be submitted to a more detailed evaluation of the cognitive functions[189].

It is difficult to choose a screening tool, as there is no gold standard either for vascular dementia diagnosis or for cognitive impairment diagnosis[292].

The MMSE[293] has been broadly used and it has been recommended as an initial test in the diagnosis of dementia in those individuals in whom cognitive impairment is suspected[294,295], although other tools are currently available such as the General Practitioner Assessment of Cognition (CPGOG), the clock drawing test (specific for praxis and executive functions), 7-minute screen or the 6 item Cognitive Impairment Test, among others[296].

Cognitive rehabilitation as treatment for cognitive impairment

Cognitive rehabilitation refers to "therapeutic processes used in order to increase or improve the individual capacity of the person to process and use incoming information, as well as to permit adequate functioning in their daily lives"[297]. Each specific intervention may include several approaches[298]:

- Reinforce, strengthen or re-establish behavioural patterns learned previously.
- Establish new patterns of cognitive activity through compensatory cognitive mechanisms for impaired neurological systems.
- Establish new activity patterns through external compensatory mechanisms such as external orthosis or environment support and structures.
- Empower people to adapt to their disability even in cases where it is not possible to compensate the cognitive impairment.

Cognitive rehabilitation can be geared towards the improvement of different cognition areas such as attention, memory, communication, understanding, reasoning, problem-solving, judgement and planning, among others,[298].

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According to the result of one SR, cognitive rehabilitation is beneficial in the case of patients who have suffered a stroke or a cranioencephalic traumatism, although on occasions the improvement observed is small and very specific for some concrete tasks. For patients who have suffered a stroke, the training strategies to compensate attention deficits during the post-acute phase of rehabilitation are effective. Training for problem-solving and training techniques for spatial neglect have also proven to be efficient. Although the benefits of some concrete interventions are specific for patients with cranioencephalic traumatism (use of notes and other external aids, compensatory training techniques for patients with memory deficits), the authors consider the results extendable to the stroke population[186,298].

CPG, SR (several types of studies) 1+/2+/3

A later update of this review found new evidence that supported the use of cognitive rehabilitation strategies in patients with spatial neglect after a stroke, with attention and/or memory deficits after cranioencephalic traumatism and strategies for problem-solving in both groups of patients. According to this SR, apraxia can be treated efficiently via cognitive rehabilitation and thus improve the independence of patients for ADL. The use of external devices (agendas, diaries, alarms) is beneficial for serious memory deficits. The authors conclude that in general cognitive rehabilitation produces a significant benefit when compared with other alternative treatments[299].

SR (several types of studies) 1+/2+/ 3

In another SR, the usefulness of rehabilitation and cognitive training was evaluated in patients with Alzheimer's disease and vascular dementia in its initial stages. The studies did not show any difference between cognitive training and the comparison measures used for any of the outcomes studied, although the authors recommend taking these results with care given the small number of studies and their methodological limitations. On the other hand, no RCT was identified in the SR about cognitive rehabilitation in patients with vascular type dementia[300].

SR 1+

Three Cochrane reviews have studied the usefulness of cognitive rehabilitation in patients who have suffered a stroke, for memory deficits[301], attention deficits[302], and spatial neglect[303].

With respect to memory deficits, the SR considered cognitive rehabilitation to include all those attempts to improve memory through education by repetition and practice, use of memory aids (internal, external or both) of by teaching strategies to manage memory problems. Neither of the two RCTs included in the SR found an immediate or long-term effect in the objective or subjective memory measurements, or in those qualified by the observer[301].

SR 1+

Regarding the effectiveness of cognitive rehabilitation in attention deficits, the SR concluded that despite the fact that the two studies included in the review showed an improvement in the alert status and in attention after training, this evidence is not sufficient to support or reject routine training as a measure to improve attention deficits[302].

SR 1+

After the rehabilitation aimed specifically a spatial neglect, the patients improved their ability to complete standardised tests to measure neglect. However, it is not clear if these interventions exercise any influence on the patients' independence or improvement of their daily activities[303].

SR 1+ +

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Summary of evidence

3	Up to two thirds of the patients who have suffered a stroke will present cognitive impairment, and approximately one third will develop dementia[292].
4	The assessment of the cognitive functions is considered an integral part of the general evaluation that must be carried out n those patients who have suffered a stroke[185,186,189,205].
1++ /1+/2+/ 3	Cognitive rehabilitation following a stroke improves some specific tasks, although there is not sufficient evidence to show that this translates into an functional improvement of the patients[298-303].

Recommendations

D	An assessment of cognitive functions is recommended in all patients who have suffered a stroke.
√	The evaluation by a specialist is recommended when cognitive impairment that interferes with the patient's rehabilitation or daily life is detected.

8.3.4. Social or family problems in the patient's environment

8.3.4.1. Activities of Daily Living (ADL)

The activities of daily living (ADL) can be divided into two categories:

- Personal ADL: these include tasks for basic self-care such as having a shower, going to the toilet, getting dressed or eating.
- Instrumental ADL: these refer to the necessary skills to be independent at home and in the community such as cooking, going shopping, driving.

The guidelines consulted[186,189] recommend making an evaluation of the ADL. The RCP[189] adds that this evaluation should be done by using validated tools and it especially recommends using the Barthel Index for ADL (Appendix 7).

CPG (experts' opinion) 4

The Barthel Index assesses the activities of daily living through 10 categories. The total score, which varies from 0 to 100, gives guidance about the degree of dependence. As it does not consider the instrumental ADL, the maximum score does not guarantee that the person can live alone[304,305].

Other scales, apart from the Barthel index, can be used. The functional independence measure scale (FIM) considers 18 items, of which 13 correspond to motor aspects and 5 to cognitive aspects. Each item is assessed with a 7-point scale, where the lowest corresponds to complete dependence and the highest to total independence[306]. The modified Rankin scale evaluates the disability globally at seven levels, from 0 (no symptoms) to 6 (death) 62,63 (appendix 7).

If difficulties are detected for ADL it is the occupational therapist who takes charge of helping maximise the patients' skills to obtain the maximum level of functionality and independence possible.

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In those patients, who following a stroke, present problems in ADL, occupational therapy reduces the risk of a worse evolution (when death or impairment of the patient is used as an outcome variable (OR=0.67; 95% CI: 0.51 to 0.87) and increases the scores for independence in ADL. It is necessary to treat approximately 11 patients by occupational therapy to avoid impairment in one of them (NNT=11)[307]. In another additional meta-analysis the benefits of community occupational therapy have been verified, above all when specifically geared interventions are used[205,308].

CPG (meta-analysis) 1++

Summary of evidence

4	An evaluation of independence for ADL is considered necessary in those patients who have suffered a stroke, if possible using validated tools (Barthel index)[186,189].
1++	Occupational therapy reduces the risk of impairment and mortality and increases independence in ADL in patients who, following a stroke, have difficulties in carrying out ADL[307,308].

Recommendations

D	An evaluation of the (personal and instrumental) ADL is recommended using validated tools such as the Barthel Index.
A	If difficulties for ADL are detected, it is advisable for the patient to be treated by an occupational therapist.

8.3.4.2. Return to work

Given the heterogeneity of the work definitions included in the studies, in literature, the percentage of patients who return to work following a stroke is very variable. But it has been possible to identify factors that are associated with this return to work. Individuals with jobs classified as "white collar" (office workers) are more likely to return to work than "blue collar" workers (manual workers). Younger patients, as well as married patients and with a higher education level, are also more likely to return to work. The degree of disability, above all a reduction of the ability to walk and residual cognitive deficits are negatively associated with a return to work. It has also been observed in some studies that in "white collar" workers, the return to work is associated with a more favourable subjective perception of the state of well-being and greater satisfaction[209].

SR (descriptive studies) 3

Summary of evidence

3	In "white collar" workers the return to work is associated with a more favourable subjective perception of the state of well-being and greater satisfaction[309].

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Recommendations

√	Evaluating the possibility of starting work or requesting permanent disability is recommended.
D	Encouraging patients who worked beforehand to return to work is recommended, if the conditions permit this.

8.3.4.3. Driving

Having suffered a stroke represents a road risk, not only due to the deficits that the stroke may have caused (hemiplegia, hemianopsia, spatial neglect, psychomotor slowness, attention deficits, hemianesthesia, vascular dementia), but due to the risk of suffering another stroke whilst driving and the side effects of the drugs that the patient is receiving. All these questions must be taken into account when evaluating the patient's driving capacity[310].

According to the *"general driving regulation"*, patients who have suffered a TIA may not obtain or prolong their driving licence until at least six months have elapsed without any neurological symptoms and they must provide a neurologist's report that verifies the absence of sequelae. If there were neurological sequelae and these did not prevent obtaining or extending the licence, a favourable report from the specialist will be required and the validity period will be limited to a maximum of one year. Recurrent ischaemic attacks, on their part, disqualify them from obtaining or extending their driving licence[311]. LG (legislation)

Summary of evidence

LG	Patients who have suffered a TIA may not obtain or prolong their driving licence until at least six months have elapsed without any neurological symptoms and they must provide a neurologist's report that verifies the absence of sequelae. If there were neurological sequelae and these did not prevent obtaining or extending the licence, a favourable report from the specialist will be required and the validity period will be limited to a maximum of one year. Recurrent ischaemic attacks, on their part, disqualify them from obtaining or extending their driving licence[311].

Recommendations

√	A recommendation will be made to those patients who, after a stroke, have sequelae that might interfere with driving, to avoid driving and to inform the Directorate General for Traffic of their status.
√	It is advisable for those patients who wish to drive again to be assessed at an accredited psychotechnical centre.
√	Patients wishing to obtain or extend their driving licence will be informed about the regulation that requires demonstrating at least six months free from neurological symptomatology and the need to present a favourable report from the specialist in the event of sequelae. They will also be informed that the validity period will be limited to one year at the most. Patients who have suffered recurrent TIAs will be informed that they cannot obtain or extend their driving licence according to the legislation in force.

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8.3.4.4. Sexuality

It is very common for patients who have suffered a stroke to have difficulties in their sex lives. The prevalence of sexual dissatisfaction is very high, both in the patients and in their partners[309].

Apart from physical factors, other factors that may affect sexuality after a stroke include social and psychological factors. A negative physical image of oneself, lack of communication with respect to sexual questions between the couple, language alterations, fear, anxiety or lack of excitation are some of these factors[309].

Some patients have also expressed fear that sex many trigger another stroke, although studies have demonstrated that this does not seem to be the case[185,312,313]. CPG (descriptive studies) 3

Patients can maintain sexual relations again as soon as they feel ready for it. It is advisable to ask patients and their partners, when this is deemed appropriate, about their concerns and problems related to their sex lives. If there is a limitation of the sexual activity it is necessary to verify if there are treatable causes, as well as provide information and advice[185,189.205]. CPG (experts' opinion (4)

Although in some cases, it is recommended to evaluate the treatment with sildenafil in those patients who have erectile dysfunction following a stroke[189], according to the technical data sheet of the drug, the efficiency and safety of sildenafil, tadafil and vardenafil has not been studied in patients who have suffered a recent ischaemic stroke, so their use in these patients is not indicated[314]. CPG (experts' opinion) 4

Summary of evidence

3	Some patients have expressed fear that sex many trigger another stroke, although studies have demonstrated that this does not seem to be the case[312,313].
4	It is advisable to ask patients and their partners, when this is deemed appropriate, about their concerns and problems related to their sex lives[185,189,205].
4	Sexual dysfunction can originate from certain treatable causes that must be evaluated[189].
4	The efficiency and safety of sildenafil, tadalafil and vardenafil in patients with erectile dysfunction following a recent ischaemic stroke has not been studied[314].

Recommendations

√	It is advisable to maintain an attitude of availability to be able to discuss with the patient and his or her partner the problems and concerns related to sexuality, when they consider this appropriate, providing the necessary information and support.
D	If sexual dysfunction exists, the existence of treatable causes must be evaluated.
D	The use of sildenafil or other phosphodiesterase inhibitors (vardenafil, tadalafil) is not recommended for patients with erectile dysfunction who have suffered a recent ischaemic stroke.

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8.4. Nursing role: Nursing diagnoses

The use of nursing diagnoses is essential in nursing activity, which is also essential for the correct global approach to stroke patients. The North American Nursing Diagnosis Association (NANDA) is a scientific nursing society whose objective is to standardise the nursing diagnosis, developing the nomenclature, criteria and taxonomy of these diagnoses. In 2002, NANDA became NANDA International, and there is an International Nursing Diagnosis Classification known as the "NANDA" Classification. This classification does not include the diagnosis of stroke as such, but there are other diagnoses mainly related with the sequelae and complications of this pathology[315]. The related diagnoses are presented below, which the group has considered must be evaluated in any stroke patient. Each associated diagnosis includes a section of *"expressed by"* (defining characteristics of the persons, families and communities that are observable and verifiable) and other of *"associated with"* (associated factors that provide the context for the defining features).

The nursing diagnoses enclosed are presented together with the Nursing Intervention Classification (NIC) and the Nursing Outcome Classification (NOC)[316,317].

The care plans included in the guideline represent an approximation to the possible standardised nursing diagnoses that a patient may present. It is not necessary to address all the NIC and NOC of each one of the nursing diagnoses included in the guideline, but just those that the professional evaluates as adequate according to his or her clinical judgement.

The nursing diagnoses (NANDA) selected and included in nursing care of patients following a stroke in PC are given below:

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PHYSICAL PROBLEMS

00085 IMPAIRMENT OF PHYSICAL MOBILITY	
Associated with: Perceptive sensory impairment. Neuromuscular or musculoskeletal impairment. Intolerance to activity or reduction of strength or resistance. Joint contractions Reduction of muscular control. Reduction of muscular mass. Reduction of muscular strength. Reduction of muscular mass. Cognitive impairment Rigidity or joint contractions. Lack of physical or social support.	**Expressed by:** Difficulty and/or inability to move. Changes in gait. Limitation of the ability, for gross and fine motor skills and amplitude of movements. Postural lack of stability during the execution of normal activities of daily life. Discoordinated movements.
RESULTS (NOC)	
0200 Gait 020002 Walks with efficient gait. 020006 Goes up stairs. 020007 Goes down stairs. 020010 Walks short distances. 020011 Walks moderate distances 020012 Walks long distances.	**Assessment scale:** 1. Seriously affected 2. Substantially affected 3. Moderately affected 4. Slightly affected 5. Not affected
0208 Mobility 020801 Maintenance of equilibrium 020809 Coordination. 020810 Gait. 020803 Muscular movement	**Assessment scale:** 1. Seriously affected 2. Substantially affected 3. Moderately affected 4. Slightly affected 5. Not affected
INTERVENTIONS (NIC)	
0840 Change in position Explain to the patient that you are going to change their position, if appropriate. Encourage the patient to take part in position changes, if appropriate. Place in specified therapeutic position. Foster the execution of active or passive exercises with a margin of movements. Develop a protocol for position changing, if appropriate.	

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0221 Exercise therapy: walking Advice the patient to use footwear that facilitates wandering around and prevents lesions. Consult with the physiotherapist about the walking plan, if necessary. Apply/provide an aid device (stick, crutches or wheelchair, etc.) for getting around if the patient does not walk well. Instruct the patient or carer about the safe walking and transfer techniques. Help the patient stand up and walk certain distances and with a specific number of personnel. Foster independent moving around within the safety limits.
0224 Exercise therapy: Joint mobility Determine the limitations of joint movement and act upon the function. Determine the patient's level of motivation. Explain to the patient and family the aim and the plan of exercises for the joints. Start up pain control measures before starting exercising with the joints. Foster the execution of movement arc exercises in agreement with a regular and planned programme. Teach the patient and family to systematically carry out the passive or active movement arc exercises.

00047 RISK OF IMPAIRMENT OF SKIN INTEGRITY	
Risk factor: Physical immobility. Alteration in sensitivity. Alteration of nutritional state. Mechanical factors. Pressure, fastenings. Faecal and/or urinary incontinence. Bone projections	
RESULTS (NOC)	
1902 Risk control 190201 Recognises risk factors. 1902094 Develops effective risk control strategies. 190205 Adapts the control strategies.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated

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INTERVENTIONS (NIC)
3500 Management of pressures Use an established risk evaluation tool to watch over the patient's risk factors. Use the right devices to keep heels and bone projections free from continuous pressure. Watch over the patient's nutritional state. Observe if there are shearing sources.
3590 Skin surveillance Observe colour, pulses, texture, if there is swelling, oedema, ulcers, reddening and loss of skin integrity, pressure and friction areas. Instruct the member of the family / carer about the signs of loss of skin integrity, if appropriate.

00123 ONE-SIDED DISATTENTION (NORMALLY IN PATIENTS WITH LESION IN RIGHT HEMISPHERE)	
Associated with: Brain lesion due to brain vascular problems. Left hemiplegia due to cerebral vascular accident of the right hemisphere. Brain lesion due to neurological disease.	**Expressed by:** Does not seem to be aware of the position of the affected limbs. Fails to eat the food on the portion of the plate corresponding to the affected side. Fails to dress the body side affected. Fails to wash the affected side. Fails to move the limbs, head, trunk in the hemispace of the affected side despite being aware of the stimuli that are produced. Marked deviation of the head, trunk, eyes towards the non-affected side faced with stimuli and activities on that side.
RESULTS (NOC)	
1308 Adaptation to the physical disability 130801 Verbally expresses the ability to adapt to the disability. 130802 Verbally expresses reconciliation with the disability. 130803 Adapts to functional imitations. 130804 Modifies the style of life to adapt to the disability. 130810 Identifies a plan to fulfil the instrumental activities of daily living.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated

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INTERVENTIONS (NIC)
2760 Management faced with the annulment of one side of the body /protection and safe recovery of the body part affected of a patient, as well as aid in adapting to disturbed perceptive capacities). Provide realistic statements about the patient's perceptive deficit. Carry out personal care consistently with a complete explanation. Ensure that the limbs affected are in the correct position. Supervise and/or help in transfer and walking around. Place the food and drink within the visual field and turn the plate, if necessary. Provide frequent reminders to reconduct the patient's attention, oriented towards the patient in the environment. Carry out amplitude movements and massage on the affected side.
5230 Increase coping Evaluate the patient's adjustment to the changes in body image, if indicated. Encourage the patient to find a realistic description of the change in role. Foster gradual domination of the situation. Foster social and community activities. Favour situations that foster the patient's autonomy. Encourage the expression of feelings, perceptions and fears. Help the patient identify adequate short and long term objectives. Help the patient identify available support systems. Encourage the family to express their feelings for the sick family member.

00051 IMPAIRMENT OF VERBAL COMMUNICATION (NORMALLY IN PATIENTS WITH LESIONS IN THE LEFT HEMISPHERE)	
Associated with: Alteration of perceptions. Alteration of self-esteem Anatomical defects. Reduction of brain circulation. Weakening of the musculoskeletal system.	**Expressed by:** Inability to speak the dominant language. Difficulty to understand the normal communication pattern. Difficulty to express thoughts verbally. Difficulty to form words or sentences. Difficulty and inability to express themselves and understand. Difficulty and inability to use body and facial expression. Verbalise with difficulty.

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RESULTS (NOC)	
0902 Communication 090201 Uses written language. 090202 Uses spoken language. 090203 Uses drawings and illustrations. 090204 Uses sign language. 090205 Uses non-verbal language. 090206 Recognises the messages received. 090210 Exact interpretation of messages received. 090207 Directs the message appropriately. 088888090208 Exchanges messages with others.	**Assessment scale:** 1. Seriously affected 2. Substantially affected 3. Moderately affected 4. Slightly affected 5. Not affected
INTERVENTIONS (NIC)	
4976 Improve communication. Speech deficit Listen with attention. Use simple words and short sentences, if appropriate. Perform language-speech therapies prescribed during the informal contacts with the patient. Use cards with drawings or gestures with hands, if appropriate. Instruct the patient and the family about the use of speech aid devices. Encourage the patient to repeat words. Provide positive reinforcement and evaluation, if appropriate. Reinforce the need for monitoring with a speech therapist after discharge.	

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00103 SWALLOW IMPAIRMENT	
Associated with: Neuromuscular impairment (e.g. reduction or absence of gag reflex, reduction of strength or distension of muscles involved in chewing, perceptual impairment, facial palsy).	**Expressed by:** Anomaly in oesophagic phase demonstrated by: study of swallow Cough on awakening or at night. Observation of evidence of difficulty in swallowing. Odinophagia. Vomits. Anomaly in the oral phase evidenced by a swallow study. Cough before swallowing. Nauseas. Inability to empty oral cavity. Lack of chewing. Lack of action of tongue to form bolus. Prolongation of meals with less consumption of food. Sialorrhea. Slowing down in formation of bolus. Choking, Multiple swallow. Recurrent lung infections. Anomaly in the pharyngeal phase evidenced by a swallow study.
RESULTS (NOC)	
1010 Swallow state 101001 Keeps the food in the mouth. 101004 Chewing ability. 101006 Ability to clean oral cavity. 101008 Number of swallow appropriate for size/texture of bolus. 101010 Moment of the swallow reflex. 101012 Choking, cough or nausea. 101013 Increased swallow effort. 101018 Study of swallow	**Assessment scale:** 1. Seriously affected 2. Substantially affected 3. Moderately affected 4. Slightly affected 5. Not affected

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1918 Prevention of aspiration 191804 Sits up to eat or drink. 191805 Selects meals according to swallow ability. 191808 Uses liquid thickeners, as required.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
3200 Care to avoid aspiration Watch over level of consciousness, cough reflex, gases reflex and swallow ability. Upright placement at 90º or as upright as possible. Food in small quantities. Avoid liquids and use thickening agents. Offer food and drink that can form a bolus before swallow. Cut up food into small portions. Break or chop up pills before administration. Keep the bed head raised for 30 to 45 minutes after eating.	
1860 Swallow therapy Determine the patient's ability to focus attention on learning/executing intake and swallow tasks. Explain the swallow regime basis to patient and family. Collaborate with the speech therapist to teach the patient's family the swallow exercise regime. Avoid the use of drinking straws. Help the patient sit up straight or place his or her head bending forwards, to eat. Help maintain a seated position for 30 minutes after finishing eating. Teach patient not to talk when eating, if appropriate. Give the patient a lollipop to suck on and thus foster the strength of the tongue, if there is no contra-indication. Observe if there are aspiration signs and/or symptoms. Watch over the movements of the patient's tongue when eating. Observe the sealing of the lips and control if there are fatigue signs when eating, drinking and swallowing. Provide a rest period before eating/doing exercise to avoid excessive fatigue. Teach the family/carer to change position, feed and watch over the patient, the nutritional needs, emergency measures for choking and if there are food remains after eating. Help maintain the appropriate calorific and liquid intake. Control the body weight. Watch over body hydration and provide mouth hygiene, if necessary.	

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00035 RISK OF LESION (NORMALLY IN PATIENTS WITH LESIONS IN THE RIGHT HEMISPHERE AND ONE-SIDED DISATTENTION)	
Risk factor: Alteration of mobility. Sensory deficiencies Perception deficit of affected limb. Lack of awareness about lesion risk.	
RESULTS (NOC)	
1909 Fall prevention behaviour 190903 Placement of barriers to prevent falls. 190915 Use of handrails to hold on to. 190914 Use of rubber mats in bath or shower. 190901 Correct use of aid devices. 190906 Elimination of objects, spillages and polish on floor. 190907 Fixation of mats. 190917 Take care when taking medicines that increase the risk of falls.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
6490 Fall Prevention Identify cognitive or physical deficits of the patient that may increase the possibility of falls in a certain environment. Identify behaviour and factors that affect the risk of falls. Identify the characteristics of the environment that might increase the possibilities of falls (slipper y floors and stairs without handrails). Help the patient adapt to the modifications suggested about the way of walking. Provide aid devices. Have adequate lighting to increase visibility. Make sure the patient wears shoes that fit correctly, firmly tied and with non-slip soles. Educate the members of the family about the risk factors that contribute to falls and how to reduce these risks. Suggest adaptations in the home to increase safety. Develop ways for the patient to safely participate in leisure activities.	

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00020 FUNCTIONAL URINARY INCONTINENCE	
Associated with: Cognition impairment. Sensory impairment. Neuromuscular limitations.	**Expressed by:** The time required to reach the toilet exceeds the time that passes between the feeling of urgency and non-controlled miction. Urine loss before reaching the toilet. Perception of the need to urinate.
RESULTS (NOC)	
0502 Urinary continence 050201 Recognises the urination urgency. 060203 Responds adequately to the emergency. 050205 Sufficient time to reach the toilet between the emergency and the urine evacuation. 050208 Able to stop and start the urine squirt. 050217 Able to use the toilet independently. 050209 Empties the bladder completely.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
0600 Training in urinary habit Establish an initial time and interval to go to the toilet, depending on the elimination outline and the normal routine. Help patient go to the toilet and provoke the elimination at the prescribed intervals. Maintain going to the toilet, as scheduled, to help establish and maintain the elimination habit.	

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PSYCHOLOGICAL PROBLEMS

00120 LOW SITUATIONAL SELF-ESTEEM	
Associated with: Functional impairment. Change in social role.	**Expressed by:** Expressions of despair and uselessness. Self-negative verbalisations.
RESULTS (NOC)	
1305 Psychosocial modification: Change of life 130502 Maintenance of self-esteem 130504 Expressions of usefulness. 130509 Use of effective surmounting strategies. 030511 Expression of satisfaction with the reorganisation of life.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
5230 Increase coping Evaluate the impact of the patient's life situation on the roles and relationships. Evaluate the patient's understanding of the disease process. Encourage a realistic attitude of hope as a way of managing feelings of impotence. Foster gradual domination of the situation. Introduce the patient to people or groups who have gone through the same experience with success. Encourage the expression of feelings, perceptions and fears.	
5400 Fostering of self-esteem Encourage the patient to identify his or her virtues. Show confidence in the patient's ability to control a situation. Help establish realistic objectives to achieve higher self-esteem. Help the patient re-examine the negative perceptions he or she has of themselves.	

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00146 ANXIETY	
Associated with: Change or threat in: – State of health. – Interaction patterns. – Role functions. Situational crises. Unconscious conflict about the goals and values of life.	**Expressed by:** Expression of concerns due to changes in life events. Increasing despair. Nervousness. Uncertainty. Concern. Increase of stress, of perspiration, Breathing. Irritability. Concern. Difficulty to concentrate.
RESULTS (NOC)	
1402 Self-control of anxiety 140202 Eliminate precursors of anxiety. 140205 Plan strategies to overcome stressful situations. 140207 Use relaxation techniques to reduce anxiety. 140215 Refers to absence of physical expressions of anxiety. 140216 Refers to absence of expression of anxiety behaviour.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
5820 Reduction of anxiety Use a calm approach that gives security. Clearly establish the expectations of the patient's behaviour. Try to understand the patient's perspective about a stressful situation. Provide objective information about the diagnosis treatment and prognosis. Create an environment that provides trust. Encourage the expression of feelings, perceptions and fears. Establish recreational activities aimed at reducing stress Instruct the patient on the use of relaxation techniques. Determine the patient's ability to take decisions.	

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SOCIAL OR FAMILY PROBLEMS

00102, 00108 and 00109 DEFICIT FOR SELF-CARE (FEEDING /BATHING / HYGIENE /DRESSING and GROOMING	
Associated with: Cognitive impairment Musculoskeletal impairment. Neuromuscular impairment. Perceptual impairment. Weakness.	**Expressed by:** Difficulty and/or inability to eat. Inability to swallow food. Inability to use aid devices. Inability to get dressed – undressed and impairment of skill to get dressed or remove the necessary garments of clothing. Inability to totally or partially wash their body. Inability to get in and out of the bath.
RESULTS (NOC)	
0300 Self-care. Activities of Daily Living (ADL) 030001 Eats. 030002 Gets dressed. 030004 Has a bath. 030006 Hygiene.	**Assessment scale:** 1. Seriously affected 2. Substantially affected 3. Moderately affected 4. Slightly affected 5. Not affected
1803 Help with self-care: feeding Lay the tray and table attractively. Create a pleasant atmosphere at meal time. Open packaged food. Avoid placing the food on the blind side of a person. Encourage the patient to eat in the dining room, if available. Provide adaptation devices to help the patient feed him or herself.	
1804 Help with self-care: cleanliness Help the patient in hygiene/cleanliness at specific intervals. Provide intimacy during elimination. Teach the patient or other significant people the cleanliness hygiene. Provide aid devices, if appropriate.	
1801 Help with self-care: Bathing/hygiene Provide the desired personal objects. Facilitate maintenance of the patient's routines in hygiene. Provide help until the patient is totally capable of assuming the self-care.	
1802 Help with self-care: Dressing/personal arrangement. Reaffirm the efforts to dress themselves.	

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00069 INEFFECTIVE COPING	
Associated with: Lack of confidence in the capacity to cope with the situation. Perception of an inadequate control level. Inadequacy of social support determined by the characteristics of the relations. Situational crises.	**Expressed by:** Changes in normal communication Patterns. Reduction in use of social support. Destructive behaviour towards others and towards themselves. Inability to satisfy basic needs and role expectations. Inadequate solution of problems. Lack of behaviour aimed at achieving objectives or solving problems, including inability to deal with the difficulty of organising information. Use of coping methods that prevent adaptative behaviour. Expressions of inability to ask for help or to cope with the situation.
RESULTS (NOC)	
1300 Acceptance: State of health 13008 Recognition of reality of the health situation. 130017 Adapts to the change in state of health. 130010 overcomes health situation. 130011 Takes decisions related to health.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
1308 Adaptation to the physical disability 130801 Verbally expresses the ability to adapt to the disability. 130803 Adapts to functional imitations. 130804 Modifies the style of life to adapt to the disability 130806 Uses strategies to reduce stress related to the disability. 130814 Looks for support groups in the community for the disability. 130815 Seeks professional help as appropriate. 130816 Uses available social support. 130817 Informs of the reduction of stress related to the disability.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated

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INTERVENTIONS (NIC)
5230 Increase coping
Evaluate the patient's understanding of the disease process.
Help the patient develop an objective evaluation of the event.
Assess the patient's ability to take decisions.
Try to understand the patient's perspective about a stressful situation.
Encourage the patient to develop relationships.
Foster social and community activities.
Facilitate constructive ways out of anger and hostility.
Favour situations that foster the patient's autonomy.
Encourage the expression of feelings, perceptions and fears.
Encourage the patient to identify strengths and abilities.
Reduce the stimuli from the environment that could be misinterpreted as threatening.
Help the patient identify positive strategies to take responsibility for his limitation and manage this style of life or role necessary in it.
Encourage the patient to assess his or her own behaviour.
5250 Help in decision-making
Facilitate decision-making in collaboration.
Determine if there are differences between the patient's viewpoint and the health carers' viewpoint about the patient's condition.
Inform the patient about the existence of alternative viewpoints and the solutions.
5820 Reduction of anxiety
Create an environment that provides trust.
Encourage the expression of feelings, perceptions and fears.
Identify changes in the level of anxiety.
Support the use of adequate defence mechanisms.

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0059 SEXUAL DYSFUNCTION	
Associated with: Alteration of the body function.	**Expressed by:** Real limitation imposed by the illness or therapy. Perceptions of limitations imposed by the illness. Verbalisation of the problem.
RESULTS (NOC)	
0119 Sexual functioning 011904 Carries out sexual activity with aid devices if necessary. 011905 Adapts the sexual technique when necessary. 011907 Expresses ability to carry out sexual activity despite physical imperfections. 011922 Communicates sexual needs.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
5248 Sexual advice Inform the patient at the beginning of the relationship that sexuality is an important part of life and that illnesses, medicines and stress often alter sexual functioning. Discuss the effect of the situation of illness/health on sexuality. Encourage the patient to verbally express fears about sexuality. Discuss the need to modify sexual activity, if appropriate. Discuss alternative ways of sexual expression that are acceptable for the patient, if appropriate. Help the patient develop an objective evaluation of the event.	

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00082 EFFECTIVE MANAGEMENT OF THE THERAPEUTIC REGIME	
	Expressed by: Choice of appropriate activities of daily living to reach the objectives of the treatment or of the prevention programme. Verbal expression of the desire to manage the treatment of the illness and the prevention of sequelae.
RESULTS (NOC)	
1609 Therapeutic behaviour: Illness or lesion 160902 Satisfies the recommended therapeutic regime. 160906 Avoid behaviours that foster the pathology. 160912 Uses devices correctly. 160915 Seeks advice from a health professional when necessary. **1601 Compliance behaviour** 160101 Confidence in health professional about the information obtained. 160102 Requests the prescribed guideline. 160103 Communicates following the prescribed guideline. 160106 Modifies the guideline counselled by the health professional.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
5520 Facilitate learning Provide information in agreement with the patient's control position. Associate information with the patient's personal desires / needs. Repeat the important information. Reinforce behaviour when appropriate. Give the patient time to ask question and discuss concerns.	
5510 Health education Teach strategies that can be used to resist unhealthy behaviours or that entail risks, instead of giving advice to avoid or change the behaviour. Focus on immediate or short term positive health benefits for positive life style behaviours, instead of long term benefits or negative effects derived from failures to comply. Plan a long-term follow-up to reinforce the adaptation of life styles and healthy behaviour.	

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00082 EFFECTIVE MANAGEMENT OF THE THERAPEUTIC REGIME	
Associated with: Complexity of the therapeutic regime. Lack of knowledge. Subjective perception of seriousness. Perception of barriers. Lack of confidence in the regime or in the health care personnel.	**Expressed by:** Inefficient choices of daily living to satisfy the objectives of a treatment or prevention programme. Verbalisation of the difficulty to carry out part of the treatment. Verbalisation of not having carried out the necessary actions to include the treatment in the daily habits.
RESULTS (NOC)	
1609 Therapeutic behaviour: Illness or lesion 160902 Satisfies the recommended therapeutic regime. 160903 Satisfies the prescribed treatments. 160906 Avoid behaviours that foster the pathology.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
1813 Knowledge: Therapeutic regime 181310 Description of the justification of the therapeutic regime 181304 Description of the expected effects of the treatment.	**Assessment scale:** 1. None 2. Scarce 3. Moderate 4. Substantial 5. Extensive
1608 Symptom control 160805 Recognises the variation of the symptom. 160811 Refers to control of symptoms.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
4360 Modification of behaviour Foster the replacement of undesirable habits with desirable habits. Discuss the behaviour modification process with the patient. Develop a behavioural change programme. Facility family involvement in the modification process, if appropriate. Administer positive reinforcement to behaviour that must be increased.	

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5616 Teaching: Prescribed medicines

Inform the patient about the purpose and action of each medication.

Instruct the patient about the dose, route and duration of the effects of each treatment. Inform the patient about what he or she has to do if they forget a dose.

Inform patients about consequences of not taking or of suddenly suspending the medication.

Instruct the patient about the possible adverse effects of each medication.

Instruct patients about possible interactions of drugs/ food, if appropriate.

Recommend the patient to carry documentation about the prescribed medication.

00075 WILLINGNESS TO IMPROVE FAMILY COPING	
Associated with: Sufficiently satisfied needs so as to permit self-realisation objectives to flourish.	**Expressed by:** The person expresses interest in entering into individual contact or through a mutual help group with another person who has experienced a similar situation. The member of the family tries to describe the increasing impact of the crisis on his own values. Objectives, priorities or relationships.
RESULTS (NOC)	
2600 Coping with family problems. 260002 The family permits the members to undertake the flexibility role. 260003 The family copes with the problems. 260006 Involves members of the family in decision-making. 260010 Seeks attention for the needs of all the family members. 260012 Establishes programmes for family activities and routine. 260017 Uses social support.	**Assessment scale:** 1. Never demonstrated 2. Rarely demonstrated 3. Sometimes demonstrated 4. Frequently demonstrated 5. Always demonstrated
INTERVENTIONS (NIC)	
7140 Support to the family Guarantee the family that the patient is being offered the best possible care. Evaluate the emotional reaction of the family to the patient's illness. Listen to the family's concerns, feeling and questions. Facilitate communication between the patient and the family or among members of the family. Favour a relationship of trust with the family. Provide help to cover the family's basic needs. Help the members of the family identify and solve conflicts of values. Support adaptation mechanisms used by the family.	

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Recommendations

√	The basic nursing diagnoses (NANDA) that must be evaluated in primary health care in all patients after a stroke are: – Impairment of physical mobility – Risk of impaired skin integrity – Unilateral neglect (normally in patients with lesions in right hemisphere) – Verbal communication impairment (normally in patients with lesions in left Hemisphere) – Swallow impairment – Risk of lesion (normally in patients with lesions in right hemisphere and unilateral neglect) – Functional urinary incontinence – Low situational self-esteem – Anxiety – Deficit for self-care: Food/Bathing/Hygiene/Dressing and Grooming – Ineffective coping – Sexual dysfunction – Effective/ineffective management of the therapeutic regime – Willingness to improve family coping

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9. Information and communication to the patient

Question to be answered

- What basic information must be given to stroke patients?
- How must the information be given to patients and carers?

Despite the fact that information should form part of the integral management of patients who have suffered a stroke, at all health care levels, often both patients and carers acknowledge that they do not receive sufficient information and they think that they are not prepared to cope with their new lives after discharge[318-320]. Several studies have shown that a considerable percentage of patients are not able to distinguish or identify the basic aspects of their illness[321,322].

In one Cochrane SR, both passive information interventions (leaflets, referral notes and personalised information for each patient, in writing or multimedia) and active information interventions (conference/course programmes, in some cases with additional nursing support and multifactor interventions combining training programmes for carers with other interventions such as telephone calls, monthly examinations by nurses, written information and others) were assessed[323]. SR 1++

These interventions globally (meta-analysis) have a significant effect on the knowledge that both patients and carers have of the illness (p=0.0009 and p=0.03 respectively). After one week, they had much greater knowledge than the patients in the control group about the etiology of the illness and treatment received, but not about the prognosis and available benefits or aid. Some aspects of the patient's satisfaction also increase.

With relation to the psychological aspects, in this review it was found that information interventions, above all active ones, reduced the depression scores of the patients (p=0.01), although the authors consider that this reduction was probably not clinically significant.

In one of the active information studies, greater quality of life associated with the intervention (training of carers) was observed, although no differences were found in the other studies on active information or the studies on passive information with respect to states of health and quality of life perceived.

On the other hand, there is no evidence about the effectiveness of providing information to improve other results of the patient and carer (ADL, participation, social activities, use and costs of services, mortality) for either of the two types of interventions.

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Another study assessed the effectiveness of a personalised diary for patients, where the patient's care and his or her own comments were regularly noted down. It also included contact telephones for the personnel. During the follow-up, 27% of the patients had lost the diary, 59% of the patients read it regularly and two thirds said they found it difficult to get the health personnel to write down the notes in the diary. Half the patients found the diary to be more problematic than beneficial 79,324

CPG (observational studies) 2+

One survey, about the evaluation of the content of the information, showed that 53% of the patients during hospitalisation appreciated more the information about how to prevent a new episode (77%), where to obtain more information (65%), the causes of the stroke (65%), risk factors (61%), recovery (60%) stroke definition (54%) and drugs (53%); on the other hand, family members and carers of the patients were more interested in receiving information about psychological and emotional aspects. After six months, both for patients and carers, the most appreciated information was related to the prevention of new episodes (67%), where to obtain more information (33%) and the cognitive effects of the stroke (33%). It was also observed that the material handed over may not be appropriate for all the patients, as the average educational level of the patients and carers was below the education level required to understand this material[79,325].

CPG (descriptive studies) 3

Patients from another study were given a guide when discharged from hospital that they could use as a tool of reference. Both patients and carers suggested topics for this guide. The topics identified as most important were: Medical information about the course of the disease, causes, consequences and treatment, experiences of other patients and carers, recovery at home, and advice for the couple and social circle. 59% wanted to received information once or twice and 22% more frequently[79,326].

CPG (descriptive studies) 3

The information for patients/family is included in appendix 8.

Summary of evidence

1++	Information interventions (active and passive) increase the knowledge of both patient and carer respect to the disease[323].
1++	Information interventions, above all the active ones, significantly decrease the depression scores of patients, although there is some doubt about its clinical relevance[323].
1++	There is no evidence about the information interventions improving the ADL, participation, social activities, mortality and use and cost of services[323].
2+	Personalised diaries for patients where the care for the patient were regularly written down as well as his or her own comments, have not proved to e useful as information tools[324].
3	The most highly appreciated long-term information, both for patients and carers was related to the prevention of new episodes (67%), where to obtain more information (33%) and the cognitive effects of the stroke (33%). At times, the average education level of patients and carers has proved to be below the education level required to understand the information material handed over[325].

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Recommendations

A	To provide patients/carers with information after a stroke, strategies are recommended where they can actively participate and which include planned monitoring for explanation and reinforcement.
D	The information must be adequate for the education level of the patients/carers and include aspects related to the prevention of new episodes, resources where more information can be obtained, and cognitive effects of the stroke.

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10. Diagnostic and therapeutic strategies

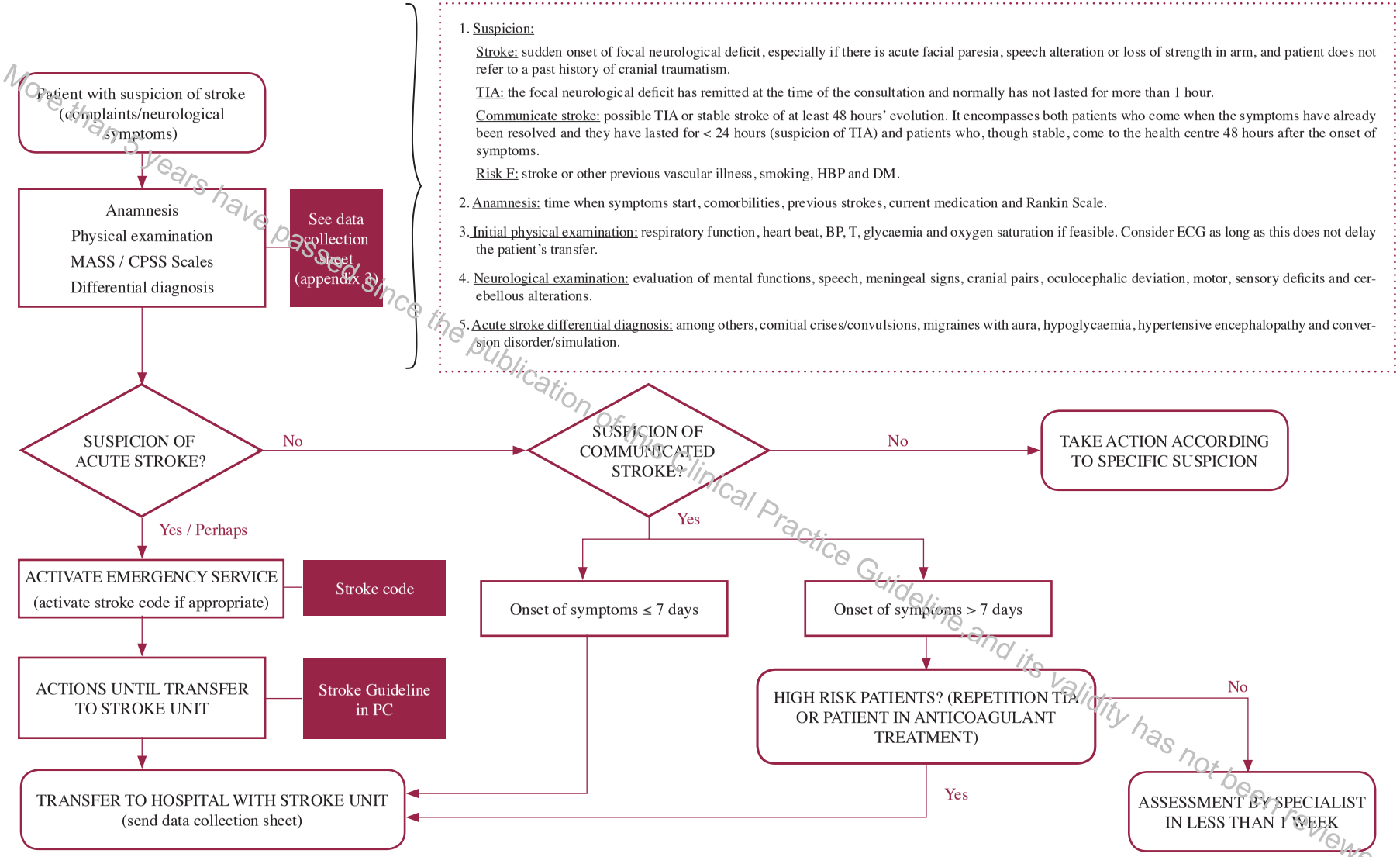
Question to be answered

- Which steps must be followed when stroke is suspected?
- What are the stroke referral criteria (acute/communicated stroke)?

To answer these questions, the *algorithm* prepared to manage patients with a suspicion of acute stroke and communicated stroke in PC is presented below, based on the recommendations presented previously in the Guideline.

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MANAGEMENT ALGORITHM FOR SUSPICION OF ACUTE/COMMUNICATED STROKE IN PC



1. Suspicion:

   Stroke: sudden onset of focal neurological deficit, especially if there is acute facial paresia, speech alteration or loss of strength in arm, and patient does not refer to a past history of cranial traumatism.

   TIA: the focal neurological deficit has remitted at the time of the consultation and normally has not lasted for more than 1 hour.

   Communicate stroke: possible TIA or stable stroke of at least 48 hours' evolution. It encompasses both patients who come when the symptoms have already been resolved and they have lasted for < 24 hours (suspicion of TIA) and patients who, though stable, come to the health centre 48 hours after the onset of symptoms.

   Risk F: stroke or other previous vascular illness, smoking, HBP and DM.

2. Anamnesis: time when symptoms start, comorbilities, previous strokes, current medication and Rankin Scale.

3. Initial physical examination: respiratory function, heart beat, BP, T, glycaemia and oxygen saturation if feasible. Consider ECG as long as this does not delay the patient's transfer.

4. Neurological examination: evaluation of mental functions, speech, meningeal signs, cranial pairs, oculocephalic deviation, motor, sensory deficits and cerebellous alterations.

5. Acute stroke differential diagnosis: among others, comitial crises/convulsions, migraines with aura, hypoglycaemia, hypertensive encephalopathy and conversion disorder/simulation.

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11. Dissemination and implementation

11.1. Dissemination and implementation strategy

Clinical practice guidelines are useful to improve the quality of care and the results in patients. The great challenge today is to achieve the adherence of professionals. An implementation strategy, aimed at overcoming the existing barriers in the setting where it is going to be applied is therefore essential.

The plan to implement the guideline for the management of stroke patients in Primary Care includes the following interventions:

- Presentation of the guideline to the media by the health authorities.
- Presentation of the guideline to the Directorates and Sub-directorates for Primary Care and Specialised Care of the different Regional Health Services.
- Institutional presentation of the guideline in collaboration with the Quality Agency of the Ministry of Heath and Social Policies to the different scientific societies, associations of patients and professionals involved.
- The information prepared for the patient in order to favour its distribution among all the health professionals and also among patients with this health problem will be highlighted at all the presentations.
- Effective distribution aimed at the professional groups involved (physicians, nurses and social workers from Primary Care, neurologists, rehabilitators, psychiatrists, geriatrists, occupational therapists) to facilitate dissemination.
- Interactive presentation of the guideline in the health centres by the local stakeholders.
- Dissemination of the guideline on electronic format on the web pages of the Ministry of Health and Social Policies, of GUIASALUD, of the UETS and of the scientific societies and associations of patients involved in the project.
- Publication of the guideline in scientific magazines.
- Establishment of best care criteria for stroke patients in programme contracts and clinical management contracts, as established in the guideline.
- Assessment of the effectiveness of the implementation, establishing support systems for the clinical decision, integrating the guideline and the indicators selected in the computer program used in primary care.

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11.2. Proposed Quality Indicators

The authors of the this CPG have designed a series of indicators that it must be possible to measure through the information system in Primary Care, in order to assess both the health care provided to the patient who has suffered a stroke and the possible impact of the implementation of the guideline. It was not the intention of the authors to design an exhaustive and detailed assessment that involves the use of all the indicators proposed. The aim is to provide interested agents and clinicians with a tool that may be useful to specifically design the assessment of care of stroke patients in Primary Care.

Two types of indicators are proposed:

- Activity indicators: With this list of indicators the aim is to carry out a follow-up of the distribution of the patients and the use of the treatments and assessment tools in PC.
- Compliance indicators: These are based on the recommendations proposed in this guideline and therefore on the available scientific evidence and on the consensus of professionals. Although the compliance standards proposed should be 100% (or 0% in any other case), the reality of the PC context has been taken into account when establishing these standards.

Assessment criterion	Activity indicators:
1. Suspicion of stroke	– Number of episodes of suspicion of acute/"communicated" stroke seen in PC
2. Use of scales	– Percentage of patients, with suspicion of stroke, who were assessed with prehospital scales (face-to-face and/or telephone).
3. Follow-up	– Percentage of stroke monitored in PC with rehabilitation completed after hospital discharge.
4. Referral to Specialised Care	– Percentage of stroke patients monitored in PC who are referred to Specialised care due to lesion/after-effect/complication.

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Good care criterion	Activity indicators:	Standard
1. Clinical diagnosis (suspicion)	– Percentage of patients with diagnostic suspicion of stroke who follow the clinical criteria of the guideline. – Percentage of patients, with stroke suspicion, who were assessed with prehospital scales (CPSS, MASS), in PC.	85% 90%
2. Pre-hospital management of acute stroke	– Percentage of patients, with suspicion of acute stroke, who were referred to hospitals with stroke units. – Percentage of patients, with suspicion of acute stroke and with "stroke code" criteria with respect to whom this "code" was activated. – Percentage of patients, with suspicion of acute stroke and PAS figures<220 or PAD<120 who with SBP of <220 or DBP <120 who received treatment from PC. – Percentage of patients, with suspicion of acute stroke and glycaemia figures>200mg/dl who received treatment for hyperglycaemia. – Percentage of patients, with suspicion of acute Stroke who, with no clinical signs of hypoxia or Saturation below 94-98%, received supplementary oxygen. – Percentage of patients, with suspicion of acute Stroke, who started antiaggregant treatment in outpatients in PC.	80% 100% 10% 90% 0% 0%
3. Pre-hospital management of "communicated" stroke	– Percentage of patients who, with suspicion of "communicated" stroke, with onset of symptoms 7 days or less earlier, were referred to the hospital.	100%

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4. Follow-up (patients with stroke monitored in PC)	– Percentage of stroke patients who receive a neurological assessment within three months after hospital discharge. – Percentage of patients with light spasticity, which does not interfere with their recovery, treated with oral drugs. – Percentage of patients, with persistent shoulder pain, referred to rehabilitation specialists. – Percentage of stroke patients and with dysphagia, who, requiring enteral nutrition for short periods (<1 months),wear a nasogastric probe. – Percentage of stroke patients on whom depression screening has been carried out. – Percentage of stroke patients on whom a the cognitive functions and/or the ADL have been assessed. – Percentage of stroke patients on whom it has been evaluated if the rehabilitation treatment has been fulfilled (or is being fulfilled) – Percentage of stroke patients on whom a the functional state achieved (after the hospital discharge and when rehabilitation ends) is evaluated. – Percentage of stroke patients monitored in PC on whom the nursing diagnoses according to the NANDA classification have been reviewed.	100% 0% 90% 90% 90% 90% 100% 90% 80%
5. Information to patient	– Percentage of stroke patients / family member monitored in PC who receive written information about the stroke. – Percentage of stroke patients / family member monitored in PC satisfied with the information received.	100% 80%

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12. Future research recommendations

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During the development of this guideline the need for information in some stroke management areas has been detected, either because the existing information is not upheld in well-designed studies or because they have not be studied.

Clinical diagnosis of stroke

- Studies to validate the prehospital scales in our country are necessary.

Pre-hospital management of acute stroke

- Prehospital services must be incorporated into studies about the appropriate management of acute stroke.
- Well-designed studies are necessary that permit specifying both the impact and the cost-effectiveness of the implementation of the stroke code.
- Studies are necessary that permit clarifying the most appropriate management of PC in patient who suffer an acute stroke: figures based on which treatment is necessary, as well as drugs that must be used.
- The execution of studies must be fostered to be able to determine the benefit of correcting glycaemia in patients with acute stroke and permit establishing the glycaemia figures from when it is advisable to treat, both in diabetic and non-diabetic patients.

Management of "communicated" stroke

- The ABCD2 scale, to determine the risk of recurrence of TIA, has been internationally validated, but studies would be necessary to able to validate it on a prehospital scale, in our country.

Management of stroke after hospital discharge

- At Primary Care level there is no evidence about the most appropriate tests and tools to evaluate the motor, sensory, language or sight deficits, so it would be appropriate to study which instruments are the most appropriate for this care level.
- Foster research in PC about the use and benefits of the available social resources.
- The treatment of spasticity via oral drugs has not been widely studied, and the few studies that do exist are usually small in size, so the execution of RCTs in this sense must be fostered, due to the repercussion that these drugs have in the treatment of spasticity, above all, generalised spasticity, which does not benefit from other local treatments.
- Well-designed studies are needed that assess the effectiveness of the different treatments (postures, supports, mobilisations), which have been proposed to prevent the appearance of hemiplegic shoulder pain.
- The execution of broad, well-designed RCTs is recommended, to establish the effect of the gabapentin, mexyletin and SSRI in the treatment of central post stroke pain.

– With respect to dysphagia, it is necessary to study the effect of the modifications in the diet on patients (reduction of aspiration risk) as well as possible adverse effects (undernourishment, dehydration).

– The execution of studies to verify the effectiveness and cost/effectiveness of the screening of mood alterations in all patients who have suffered a stroke is recommended, as well as to study the most appropriate moment to do the screening and appropriate screening test.

– Given the existing discrepancy between the evidence found, the execution of well-designed RCTs is also recommended to determine if antidepressants and/or psychotherapy should be administered to all patients who have suffered a stroke as prevention measure and which would be the appropriate dose and the duration of the treatment.

– With respect to cognitive rehabilitation, broad, well-designed and specific studies are required for stroke patients, that will help demonstrate the efficiency of these interventions in improving the quality of life and functional recovery of the patient.

– With respect to the legislation on driving, "transient ischaemic attacks" are mentioned, but not strokes, within the section on diseases and deficiencies that will be a cause of denial or adaptations, driving restrictions or other limitations in obtaining or extending the driving licence. Furthermore, according to this legislation, there must be no recurrent ischaemic attacks to be able to obtain or extend the driving licence. This fact seems to be frequent in clinical practice, remitting in many cases with adequate specific treatment, so we suggest that these aspects be reviewed and modified.

Information / communication to patient

– Studies are required in the Primary Care context about which are the best information strategies for patients who have suffered a stroke and their family members.

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13. Appendices

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Appendix 1: Evidence levels and recommendation degrees

Levels of evidence and degrees of recommendation SIGN[327].

	Level of scientific evidence
1++	High quality meta-analysis, systematic reviews of clinical trials or high-quality clinical trials with very little bias risk.
1+	Well-performed meta-analyses, systematic reviews of clinical trials or well-performed clinical trials with little bias risk.
1-	Meta-analyses, systematic reviews of clinical trials or clinical trials with high bias risk.
2++	High-quality systematic reviews of studies of cohorts or of cases and controls. Well-performed studies of cohorts or of cases and controls with low bias risk and with moderate probability of establishing a causal relationship.
2+	Well-performed studies of cohorts or of cases and controls with very low bias risk and with moderate probability of establishing a causal relationship.
2-	Studies of cohorts or of cases and controls with high bias risk and significant risk of the relationship not being causal.
3	Non-analytical studies, such as case reports and case series.
4	Experts' opinion.

	Degrees of recommendation
A	At least one meta-analysis, systematic review or clinical trial classified as 1++ and directly applicable to the target population of the guidelines; or a volume of scientific evidence comprised of studies classified as 1+ and with great consistency between them.
B	A volume of scientific evidence comprised of studies classified as 2++, directly applicable to the target population of the guideline and that show great consistency between them; or scientific evidence extrapolated from studies classified as 1.
C	A volume of scientific evidence comprised of studies classified as 2+, directly applicable to the target population of the guideline and that show great consistency between them; or scientific evidence extrapolated from studies classified as 2 ++
D	Scientific evidence of level 3 or 3; or scientific evidence extrapolated from studies classified as 2+.

The studies classified as 1 and 2 must not be used in the recommendations preparation process due to their high bias possibility.

√ [1]	Recommended practice based on clinical experience and the consensus of development team.

[1] Sometimes the development group realised that there were some important practical aspects which they wished to place emphasis on and for which there is probably no evidence that supports it. In general these cases have to do with some aspects of the treatment considered as good clinical practice and that nobody would normally question. These aspects are assessed as points of good clinical practice. These messages are not an alternative to the scientific evidence-based recommendations, but they must only be considered when there is no other way to highlight this aspect.

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Levels of evidence and formulation of recommendations for questions on diagnosis (The adaptation of the NICE of the Oxford Centre for Evidence-based Medicine and of the Centre for Reviews and Dissemination is used, as included in the methodological manual[1,328]).

Level of scientific evidence	Type of scientific evidence
Ia	Systematic review with homogeneity of level 1 studies.
Ib	Level 1 studies.
II	Level 2 studies. Systematic review of level 2 studies
III	Level 3 studies. Systematic review of level 3 studies.
IV	Consensus, expert's opinions without explicit critical evaluation.
Level 1 studies	They satisfy: – Masked comparison with a reference test "golden pattern" valid. – Adequate spectrum of patients.
Level 2 studies	They only have one of these biases: – Non representative population (the sample does not reflect the population where the test will be applied). – Comparison with the inappropriate reference pattern ("gold pattern") (the test that will be assessed forms part of the gold pattern or the result of the test influences the execution of the gold pattern. – Non-masked comparison. – Case studies-control.
Level 3 studies	They have two or more of the criteria described in level 2 studies.

Recommendation	Evidence
A	Ia or Ib
B	II
C	III
D	IV

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Appendix 2. Main guidelines consulted as a secondary source of evidence

Acute stroke management

1. "National clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)". National Collaborating Centre for Chronic Conditions. National Institute for Clinical Excellence (NICE) guidelines. 2008.
2. "Management of stroke patients or TIA: assessment, investigation, immediate management and secondary prevention". Scottish Intercollegiate Guidelines Network (SIGN). 2008.
3. "Guidelines for the early Management of Adults with Ischaemic Stroke" American Heart Association/ American Stroke Association (AHA/ASA). 2007
4. "Clinical Guidelines for Acute Stroke Management". National stroke Foundation (NSF). Australian government. 2007.

Stroke management after acute phase

1. "National clinical guideline for stroke". Intercollegiate Stroke Working Party. Royal College of Physicians (RCP) 2008.
2. "Management of stroke patients: Assessment, Rehabilitation, Prevention and Management of Complications, and Discharge Planning". Scottish Intercollegiate Guidelines Network (SIGN). 2002.
3. "C clinical practice guideline for the management of stroke rehabilitation in the primary care setting" Veterans Health Administration, Department of Defence. VA/DoD. 2003
4. "Clinical Guideline for Stroke Rehabilitation and Recovery". National stroke Foundation (NSF). Australian government. 2005.

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Appendix 3. Data collection sheet in acute stroke

SUSPICION OF STROKE: DATA COLLECTION SHEET

PATIENT'S IDENTIFICATION DATA

NAME: SURNAME:

NATIONAL IDENTITY CARD:

DATA OF CENTRE REFERRING THE PATIENT

NAME. ADDRESS:

ANAMNESIS:

- Date and time of onset of symptoms:
- Previous stroke/TIA ☐
- Recent episodes: AMI ☐ Traumatism ☐ Surgery ☐ Bleeding ☐
- Comorbility/risk factors: HBP ☐ DM ☐ Arrhythmias ☐ Nicotine addiction ☐ Alcoholism ☐ Dyslipidemia ☐ o Past history of dementia or cognitive impairment ☐
- Current medication: Insulin ☐ Antihypertensive ☐ Anti-aggregants ☐ Anticoagulants ☐
- Rankin Scale:
  - 0 - No symptoms. ☐
  - 1 - No important disability ☐
  - 2 - Light disability ☐
  - 3 - Moderate disability ☐
  - 4 - Moderately severe disability ☐
  - 5 - Severe disability ☐
  - 6 - Death ☐
- Other data of interest (in there is time):
  - Telephone numbers of witnesses or relations:
  - Duration of the symptoms:
  - Accompanying systems:
  - Triggering circumstances:
  - Risk factors for CV/arteriosclerosis:
  - Drug abuse:
  - Cardiac pathology:
  - Episodes of migraine, convulsions, infections:
  - Pregnancy ☐ - Puerperium ☐ - Consumption of anovlulatories ☐ - Hormone therapy ☐

INITIAL EXAMINATION

Respiratory function: Heart beat:

Blood pressure: Temperature:

If feasible: Glycaemia: Blood saturation:

NEUROLOGICAL EXAMINATION (evaluate mental functions, language, meningeal signs, cranial pairs, oculocephalic deviation, motor, sensory deficits and cerebellar alterations). (Describe the neurological examination if this does not delay the patient's transfer).

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Appendix 4. Cincinnati Prehospital Stroke Scale (CPSS)[82]

Facial droop (have patient show teeth or smile)

- Normal: Both sides of face move equally.
- Abnormal: One side of face does not move as well as the other side

Arm Drift (patient closes eyes and extends both arms straight out for 10 seconds)

- Normal: Both arms move the same or both arms do not move.
- Abnormal: One arm does not move or one arms drifts down compared with the other.

Speech (have the patient repeat a sentence)

- Normal: The patient uses correct words with no slurring
- Abnormal: The patient slurs words, uses the wrong words or is unable to speak

Criteria for identifying stroke
Presence of any of the abnormal elements in the physical examination.

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Appendix 5. Melbourne Ambulance Stroke Screen (MASS)[84]

Clinical history elements
Age > 45 years no past history of convulsions or epilepsy. Patient not in med or in wheelchair Glycaemia between 50 and 400 mg/dL
Physical examination elements
Facial droop Have patient show teeth or smile *Normal. Both sides of face move equally* *Abnormal: One side of face does not move*
Strength in arms Ask patient to close eyes and extend both arms straight out for 10 seconds *Normal: Both arms move/do not move the same .* *Abnormal: One arm does not move and drifts down compared with the other.*
Handshake Hold both patient's hands and ask him or her to press hard *Normal: Handshake same in both hands / no shake in either of the hands* *Abnormal: Weakness or no shake in one of the hands.*
Speech Have patient repeat a sentence *Normal:* *Abnormal: Slurs, unable to speak, wrong words*
Criteria for identifying stroke
Presence of any of the elements in the physical examination and Affirmative answer in all the elements of the clinical history

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Appendix 6. Stroke code (Madrid Community)[93]

Inclusion criteria for an outpatient's stroke code

– Onset of symptoms: Exact time when they began. Objective: Onset of symptoms to hospital door < 6 hours.

– Basal situation of patient: Rankin Index < 2.

– Current neurological focality present at time of diagnosis. Presence of any of the following symptoms of stroke suspicion:

1. Numbness, weakness or sudden paralysis of face, arm or leg of one half the body.
2. Sudden confusion.
3. Difficulty to speak or understand.
4. Sudden loss of sight in one or both eyes.
5. Intense, sudden cephalea without any apparent cause, associated with nauseas and vomits (not attributable to other causes).
6. Difficult to walk, loss of balance or concentration.

Exclusion criteria for an outpatients stroke code

– Does not satisfy stroke diagnosis criteria
– More than 6 hours' evolution no symptoms
– Patient with great dependence
– Terminal illnesses and/or dementia

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Appendix 7. Functional evaluation scales

Modified Rankin Scale[62,63]

0	**No symptoms at all**	
1	**No significant disability**	Able to carry out all usual duties and activities.
2	**Slight disability**	Unable to carry out all previous activities, but able to look after own affairs without assistance.
3	**Moderately disability**	Symptoms that significantly restrict style of life or prevent totally autonomous subsistence (e.g. requiring some help).
4	**Moderately severe disability**	Symptoms that clearly prevent independent subsistence although not requiring continuous care (e.g. unable to attend to own bodily needs without assistance).
5	**Severe disability**	Totally dependent, requiring nursing care and attention, day and night.
6	**Dead**	

Modified Rankin Scale[62,63]

Basic Activities of Daily Living		
Parameter	**Patient's situation**	**Score**
Total		
Feeding	- Totally independent - Needs help cutting meat, bread, etc. - Unable	10 5 0
Bathing	- Independent: Get in and out of the bath alone - Dependent	5 0
Dressing	- Independent: Able to get dressed and undressed, fasten buttons, tie shoes - Needs help - Dependent	10 5 0
Grooming	- Independent to wash face, hands, comb hair, shaving, make up, etc. - Dependent	5 0
Bowels (Evaluate previous week)	- Continent - Occasional accident, or requires help to administer suppositories or laxatives - Incontinent	10 5 0

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Basic Activities of Daily Living		
Parameter	**Patient's situation**	**Score**
Bladder control (Evaluate previous week)	- Continent, or is able to take care of probe if uses one - One daily episode at most of incontinence, or needs help to care for problem - Incontinent	10 5 0
Toilet use	- Independent to go to toilet, remove and put on clothes… - Needs help to go to toilet, but can clean themselves - Dependent	10 5 0
Transfers (bed to chair and back)	- Independent to go from armchair to bed and back - Minor physical help or supervision to do so - Needs major help but can sit alone - Dependent	15 10 5 0
Mobility	- Independent, walks 50 metres alone - Needs physical help or supervision to walk 50 metres - Wheelchair independent without help - Dependent	15 10 5 0
Stairs	- Independent to go up and down stairs - Needs physical help or supervision to do so - Dependent	10 5 0

Maximum score: 100 points (90 if in wheelchair)	
Result	**Degree of dependence**
<20	Total
20-35	Serious
40-55	Moderate
≥60	Slight
100	Independent

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Functional Independence Measurement Scale (FIM)[306]

CATEGORIES	DOMAIN	TOTAL FIM
Self-care 1. Eating 2. Grooming 3. Bathing/showering 4. Dressing upper hemibody 5. Dressing lower hemibody 6. Toileting	**Motor** 91 points	126 points
Control of sphincters 7. Bladder management 8. Bowel management		
Mobility 9. Transfers from bed to chair or wheel-chair 10. Transfers in toilet 11. Transfers in bathtub or shower		
Locomotion 12. Walk/move in wheelchair 13. Go up and down stairs		
Communication 14. Comprehension 15. Expression	**Cognitive** 35 points	
Social knowledge 16. Social interaction 17. Problem solving 18. Memory		

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Each item is scored from 1 to 7 as follows:

Degree of dependence	**Level of functionality**
Complete independence	7 fully independent 6 modified independence
Modified dependence	5 Supervision 4 Minimal assistance (more than 75% independence) 3 Moderate assistance (more than 50% independence)
Complete dependence	2 Maximal assistance (more than 25% independence) 1 Total assistance (less than 25% independence)

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Appendix 8. Information for.

Advice and care after a stroke: information for patients and family members.

Information for the patient

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This information for patients has been proved by the development group of the Clinical Practice Guideline for the Management of Stroke Patients in Primary Care. Quality Plan for the National Health System of the Ministry of Health and Social Policies. Health Technology Assessment Unit of the Lain Entralgo Agency of the Community of Madrid; 2009. Clinical Practice Guidelines in the Spanish NHS: UETS No. 2007/5-2

This information is also available in electronic format on the web pages of GuiaSalud and of the UETS. The full version and the abridged version of the CPG can be consulted on these pages.



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Who is this information directed at?

This information is intended for adult patients who have suffered a stroke or a Transient Ischaemic Attack and for their relations and carers.

The aim of the information given herein is to help understand the illness, as well as provide advice and information about the care and treatment options available in Primary Care.

What is a stroke? What is a Transient Ischaemic Attack?

A stroke is a neurological illness that occurs when the blood flow from the brain is interrupted. There are two types:

Ischaemic stroke: When the blood flow is interrupted due to an obstruction (for example a clot) in a blood vessel.

Haemorrhagic stroke: When a blood vessel breaks, causing bleeding in the brain.

A Transient ischaemic attack (TIA): This is an ischaemic stroke that also occurs due to the interruption of the blood flow, but temporarily. It is normal for the symptoms to last for a few minutes and for the patient to recover entirely in less than 24 hours. The TIA increases the risk of suffering a stroke and, the same as the latter, it is also a medical emergency.

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What are the symptoms of a strokeor TIA?

Some of the most common symptoms of a stroke are described below:

SYMPTOMS

- **Sudden loss of movement** or weakness of the arm, leg or face, especially when it occurs on one side of the body.
- **Sudden loss of sight** in one or both eyes.
- **Sudden headache**, with no known cause.
- **Speech difficulty**: mumbling, inability to find the right words or unable to understand what other people are saying.
- **Sudden problems for walking** or loss of equilibrium or coordination.
- **Sudden feeling of numbness** or pins and needles in the face, arm and/or leg on one side of the body.

What must I do if I have these symptoms?

If you believe that you or someone close to you is suffering a stroke you must immediately call the emergency services

Call 112

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The professionals will probably ask you questions to be able to assess if it is a stroke, like those described below:

— Have patient show teeth and smile, to see if both sides of the face move equally.
— Have patient close eyes and extend arms straight out for 10 seconds to see if one of the arms does not move or drifts down compared with the other.
— Ask patient to repeat a sentence to see if he or she can speak, if they use wrong words or slur their words.

If the professionals confirm the suspicion of stroke, the patient will be referred to a hospital.

What is the evolution of patients who suffer a stroke?

Recovering from a stroke will depend on several factors such as the extension and area of the lesion that has been damaged, speed with which the blood irrigation is re-established and the previous state of health.

Three things can happen after suffering a stroke:

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EVOLUTION

- **An almost immediate recovery** (minutes or hours). This is the case of Transient Ischaemic Attacks, which generally do not leave after effects.
- **A recovery to a greater or lesser extent.** In this case recovery normally takes weeks or months and requires rehabilitation, and may leave some type of after effect.
- **Worsening of the patient**. This can be due to neurological causes or other complications such as fever, infections or others.

If I have already had a stroke, can I prevent a new attack?

People who have suffered a stroke or a Transient Ischaemic Attack have a greater risk of suffering a stroke again.

PREVENTION

To reduce the risk of a relapse insofar as possible, it is important to follow the advice provided by the physician regarding diet, exercise, and consumption of alcohol and tobacco among others. If you have high blood pressure it is essential to control it correctly.

You must also follow the pharmacological treatment prescribed in each case.

To prevent another stroke, it is very important to continue with all these measures during the rest of your life.

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What sequelae and complications may I have after having suffered a stroke? What treatments are available in Primary Care?

PHYSICAL PROBLEMS

MOVEMENT	After having suffered a stroke a secondary disability may remain which will affect movement. This is expressed as a loss of strength (called plegia or paralysis if no movement can be made with the part of the body affected or paresia if it possible to make movements but with less strength than with the part not affected), lack of coordination or loss of control of movement. These alterations tend to improve, although it is possible that, despite the rehabilitation, recovery may not be complete.
FALLS	Patients who have suffered a stroke are more prone to having falls, so it is important to do the exercises recommended to strength the muscles and train equilibrium at home. It is also important, insofar as possible, to identify and modify those aspects in the home that may give rise to a greater risk of falls, such as remove carpets, place plastic chairs in the bathtub or shower, as well as handles, and use shoes with non-slip soles.

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SIGHT	**Sight impairments** are also frequent. Sometimes a loss of sight of half the field of vision occurs, which is called hemianopsia. Other times the patient may not be aware of this loss of sight of half the field of vision. In these cases, the family must remind the patient to look towards the affected side, as with a little training, the hemianopsia is compensated by turning the head to look towards the damaged side.
SPEECH	Speech impairment may also occur. This is called aphasia when the patient is unable to understand and/or emit any type of adequate speech. Dysarthria is a speech alteration, which is expressed by difficulties in articulating words. Some patients are unable to emit a single word, which is called mutism. The speech therapist is the professional who will be responsible for evaluating and rehabilitating in the cases where speech alterations occur after a stroke.
SENSITIVITY	In other cases, there may be a **sensitivity disorder**, which is expressed as pins and needles, unpleasant sensations or lack of sensitivity to touch. There alterations generally occur on one single side of the body and are usually accompanied by problems of movement on that same side. Special care must be taken when sensitivity of a side of the body has been lost as injuries or burns can happen without the person realising it.

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SPASTICITY		**Spasticity** is another problem that usually appears and consists of a permanent contraction of certain muscles. This may cause rigidity, pain, spasms and hinder some movements. Spasticity will be taken into account in rehabilitation. When it is slight no treatment is required and when it is serious it will have to be evaluated by a specialist. If the spasticity is moderate, your physician may prescribe some drugs to treat it.
SPASTICITY	**CENTRAL**	**Central pain** is a superficial type of pain such as a burning or pricking feeling which gets worse when touched, with water or with movements and which has been associated in a small percentage of patients who have suffered a stroke. Some antidepressants and anticonvulsants have proven to be efficient when controlling this type of pain.
	SHOULDER	Another type of pain that is associated with patients who have suffered a stroke is **shoulder pain** of the paralysed arm. Some type of simple analgesic can be used during the pain episodes, but if the pain persists, it is best to consult your physician.

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DYSPHAGIA	Another possible after-effect is the difficulty to swallow, which is called dysphagia. To help patients with dysphagia problems, measures can be taken such as changes in diet and safe eating techniques to prevent undernourishment and dehydration of the patient and avoid aspirations, that is, passage of food or liquid to the lung.	
	PROBES	Sometimes, in the more serious cases of dysphagia or at the start of the illness, a probe may have to be used to guarantee the correct nutrition of the patient. When the probe is used for a short period, the patient can be discharged with a nasal probe. However, if it is going to be required for a long period, the probe may have to be inserted directly into the stomach, which is called gastrostomy. The advice on what and how to eat and necessary care in patients with dysphagia are given below in another section of this guideline called *What advice on care in daily living must I follow?*
URINARY INCONTINENCE	At times the patient may suffer urinary incontinence, which is usually transient, although it may last in patients with important sequelae. If the problems still persist when discharged, the Primary Care physician or nurse must be consulted about the treatment and management of incontinence. If a catheter is worn, ask your physician about the possibility of removing it.	

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PSYCHOLOGICAL PROBLEMS

During convalescence, during the rehabilitation process and when this ends, mood alterations often take place.

MOOD ALTERATIONS

Depression is particularly common and may interfere or slow down the rehabilitation process. Anxiety is also frequent (with or without attacks of panic), emotionalism (going from crying to laughing without any reason, crying or laughing without any apparent cause), apathy, irritability and lack of awareness of the sequelae of the stroke.

Due to the high frequency, the physician will probably ask you questions or give you a test that will enable him or her to evaluate if there is depression or any of the other alterations mentioned. Patients who have suffered a stroke do not need to receive antidepressants in order to prevent a possible depressive episode, although they may perhaps need to receive pharmacological treatment if depression is finally diagnosed.

Emotionalism tends to disappear with time, but if it is serious and persistent, the patient may perhaps benefit from treatment with antidepressants.

In any case, if you believe you have mood alterations you must consult your physician or nurse.

COGNITIVE AFFECTATION

Sometimes, after a stroke, cognitive impairment occurs (reduction of memory, attention, orientation, difficulty in planning and organising tasks). Your physician will

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probably ask you questions or give you a test to evaluate if any type of cognitive affectation has occurred after the stroke. Although this deterioration may improve with time, in those cases where it may affect your recovery, you will probably have to consult a specialist.

DURATION OF THE REHABILITATION

In moderate or serious lesions, the recovery mainly takes place in the first three months after the stroke. Recovery continues, in a much slower manner up to at least six months and some patients continue recovering slightly up to one year. Not all patients recover entirely.

The rehabilitation time that a patient will require (physiotherapy, occupational therapy, speech therapy or others) is going to vary depending on the objectives of each case. So, in a older patient with serious affectation, the rehabilitation can focus on achieving a transfer from the bed to the wheelchair with ease and without harming the carer. This can occur in a few days or weeks; however, in a young and occupationally active patient, with a slight or moderate affectation of speech or mobility, the rehabilitation may last for up to 6 months, or until the greatest functional capacity and return to work is achieved.

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What advice about care in daily living must I follow?

Activities of Daily Living

Activities of daily living include both daily self-care activities (washing, dressing, eating) and the necessary skills to be independent at home and in the community (cooking, shopping, driving). If difficulties arise to carry out this type of activity, **occupational therapy** may be beneficial. This consists of capacitating people who suffer discapacitating states to carry out the daily tasks required and to achieve maximum independence and integration to improve their independence.

Personal cleanliness and hygiene

It is important to care for the patient's hygiene to avoid infections, with special attention if there is urinary or faecal incontinence, and for the patient to feel better. If possible the person must assume responsibility for his or her own hygiene.

To make personal hygiene easier, place a chair for the patient to wash his or her face, comb his or her hair or shave. The shower is better than the bathtub. You can place a chair or stool in the shower and it is advisable to fit a handle on the shower or bath wall for the patient to hold on to and avoid falls.

If the patient cannot get out of bed, wash with a sponge and neutral soap, paying special attention to drying folds in the skin, as moisture favours the growth of bacteria

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and fungi.

Dressing

One of the objectives to increase the patient's independence is for them to put on all possible garments alone, reserving the carer's help just for what they cannot do. It is advisable to facilitate the operation by replacing buttons with strips of Velcro. To begin with, it is best to use loose and practical clothing, like sports clothes.

To get dressed, always begin with the affected limb and when getting undressed, the other way round.

Long-handled shoehorns can be used to put on shoes, which must be comfortable and closed-toe for the foot to be secure.

If the patient is in bed and cannot put on trousers, put the legs in first with the trousers bunched up and then the patient or carer will complete the operation by pulling upwards whilst the patient (if they can) helps by lifting up their buttocks whilst resting on the bed with back and heels.

Food and hydration

A balanced diet, with sufficient protein and caloric intake and good hydration are essential for the patient's good general state. Bad nutrition is a frequent problem and can give rise to skin ulcers, oedemas, and reduction of defences, making it easier to contract infections.

If the patient can swallow properly, the diet must be similar to a normal diet. Food rich in fibre must be taken into account to avoid constipation.

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If the patient can be fed by oral route (mouth), but does not swallow properly, it is advisable to follow the advice given below:

FEDDING BY ORAL ROUTE

- Modify the consistency of the food, in other words, grind all the food and bit by bit change the texture as the patient gets better.
- If the dysphagia is to liquids, thicken the liquids with special thickening agents or with corn flour, purée, gelatine. The ability to swallow solid food is recovered first and then liquids.
- Maintain a correct posture. The person must be seated, the food must be offered to the unaffected part of the mouth and sometimes it is advisable to lower the chin to swallow.
- Give small servings slowly and frequently. This will prevent the person from getting tired.
- Stimulate the swallow reflex. This can be done by administered cold food, unless there is a possibility of cold food triggering muscular spasms in the person.
- If the person chokes, always consult, do not force him.

Example of advisable food:

Thick vegetable cream, fruit purée, yoghurt, custard, egg pudding, scrambled eggs, thick semolina soup, minced meat, mild fish.

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Examples of food that must be avoided:

Liquids (water, milk, juices), raw fruit, bread, non-minced meat, soups, cakes,…

If the patient cannot be fed orally (mouth), as they are not able to swallow or easily choke with liquids, an alternative route must be sought. In this case, the physician will indicate the alternative to be followed, which may include feeding through a probe (tube), which is called enteral feeding.

FEEDING BY PROBE

Feeding by probe

- Maintain a correct posture. The person must be seated or half-seated
- Mouth hygiene must not be forgotten as this is important in patients fed by probe.
- Pass a little water through the probe when feeding is interrupted to prevent obstructions.
- When food is administered, this must be ground and mixed with water.
- If the probe gets obstructed, try to remove the obstruction with oil or a coke drink. If this is not possible, go to the health centre.
- Keep the probe plugs closed when not in use.

In patients with gastrostomy, the skin around the probe, the probe and the connections must be cleaned each day with soap and water. It is advisable to place some dressings and cover with a soft sticking plaster, changing the plaster each day and the place where the probe is secured.

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In patients with nasogastric probe, the nostrils must be cleaned each day, supporting the probe in a different part of the nose each day to prevent sores.

Postural mobilisation of the patients

The best way to avoid bad postures of feet and ankles is to use cushions to keep them at the right angle. With the cushions we will also lighten the contact of the body on the bed and avoid the appearance of pressure ulcers.



We will make posture changes every three or four hours in a bed well prepared with cushions, preferably in a lateral position.



In general, whenever we have to make some type of movement, or we simply have to address a person who has suffered a stroke, it is advisable to do so on the plegic

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side, so as to stimulate the afferences as much as possible. If we have to help them get up, make a transfer, walk, etc. it is advisable to do so on the affected side, always avoiding holding them or pulling their arms as the possible flaccidity of the shoulder muscles could lead to a subluxation of the joint. This is the best way to lift the patient from the bed:

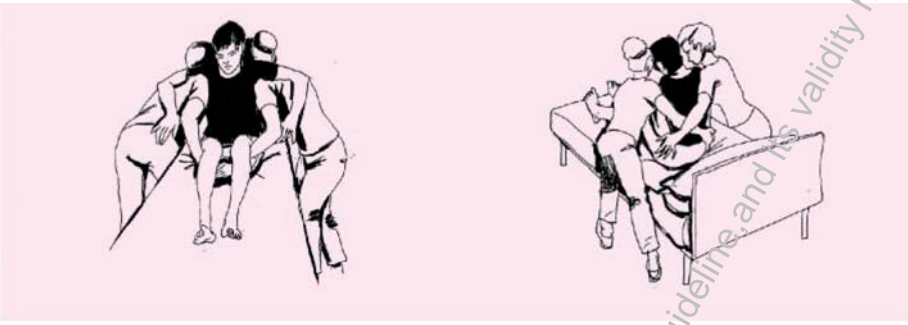


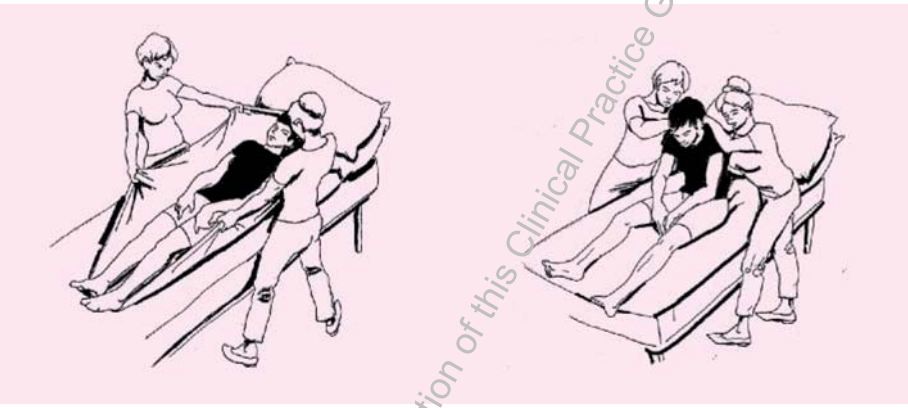
To pass the patient from the bed to the chair or vice-versa, keep the back straight and the legs bent.



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The coordination of two people is also a way of carrying out a mobilisation, above all if the person does not collaborate:





Prevention of immobility complications: Sores and ulcers

The skin of patients with sequelae after a stroke is very sensitive. The paralyses mean that certain areas are exposed to long supports and suffer alterations that lead to the formation of sores and ulcers. The most predisposed places for these to form are: Sacrum area and back, ankles, hips and knees.

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Frequent changes in posture, massage of these areas with moisturising cream, trying to correct vicious postures and good diet are the most efficient preventive measures.

If possible, place an anti-bed sore mattress (on sale in surgical aids shops) to avoid the appearance of ulcers. If ulcers do appear, dressings can be used to treat them correctly.

Postural changes must be carried out every 3 or 4 hours.

Communication with people who have speech difficulties: Advice for carers and relations

Our relation can communicate even though they have a lot of difficulties in the language and speech area:

- We will call their attention when we want to communicate something.
- We will use simple and short sentences, we will talk in a normal tone of voice, without shouting, making it easy for them to answer, giving them several options.
- Trying to get them to make decisions: "what do you like" or "what do you prefer" and always trying not to answer for them.
- We will ask questions that can be answered with a "yes" or "no".
- We will be direct, with specific messages.
- In the communication field, we may find technical aid and adaptations on computers for the telephone, writing and others.

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Leisure and free time.

Free time leisure activities can be adapted. For example:

- Large chess boards with adapted pieces
- Card shuffler
- Aid for threading needles
- Adaptations for oil painting
- Musical instruments.

Rest and sleep

Maintain the patient's stimulation during the day, as the inactivity that is typical of this illness leads to boredom and to the person sleeping for a large part of the time, thus making it difficult to sleep later at night.

Sexuality

During the first weeks after the stroke it is normal for there to be a lack of sexual appetite; after the first few months this will gradually be recovered. With some exceptions, sexual activity is recommendable once the patient has been stabilised and the recovery phases has started. The lack of libido is often due to psychological problems, to some drugs (tablets for sleeping or to lower blood pressure, antidepressants and others) and/or incorrect beliefs that they can interfere with the sexual function or cause impotence. In this case, do not hesitate to consult your physician or nurse.

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Return to work

The return to work will take place sooner or later depending on the sequelae and on the type of job carried out. In some companies, less heavy work can be done temporarily, which adapts to your situation better.

Role of the carer: Taking care of yourself to care for others

PHYSICAL PROBLEMS OF THE CARER

When the patient who has suffered a stroke preserves very little ability or no ability to move, it is recommendable to change posture frequently to avoid skin ulcers. **It is not advisable for one single person to carry out the movement without the help of another person or of a mechanism such as a crane**, as moving a person who does not collaborate is too much of a strain.

In those cases where the patient does collaborate to a certain extent, consult with the physiotherapist about the best way to mobilise the patient, to optimise their rehabilitation, and always taking care so as not to harm our backs. The bed must be high (about 70 cm) to make it easy for the patient to get in and out easily as well as to avoid unnecessary effort by the carers.

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STRESS OF THE CARER

The stress that families suffer and especially the main carer is due to several factors. On the one hand, it is due to the dependence of the patient and to the care that must be provided as a result of this dependence. On the other hand, factors related to changes in the patient's state of mind, behaviour or cognitive alterations and factors related to changes that take place on a social and family level (changes in family relationships, financial situation, leisure activities).

If the carer suffers stress or anxiety he must consult his physician or nurse when the first symptoms appear.

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DECALOGUE FOR THE CARER

1. Ask for help without waiting for people to offer it. The others may not know when you need it.
2. Get information and use the social-health and community resources.
3. Plan the activities and the future, and organise your time to find a moment in the day for yourself. A relaxing bath, reading a book or just resting is essential to be able to continue providing care.
4. Do not medicate yourself.
5. Do not abandon your relationship with friends.
6. Do not judge your own feelings; they are not good or bad.
7. Express your feelings and emotions.
8. Set limits.
9. Go to family associations and/or mutual help groups, as they play an essential role in providing support, information and advice to patients and their carers.
10. Intervene in family respite programmes (programmes to facilitate the rest of those families who have dependent people under their charge), fostered by the provincial councils and in multimodal workshops (nutrition, mobilisation of the patients, etc) that is done from Primary Care.

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What resources, and health and social aid can I request?

It is important to know what resources are available both from the health care and from the social point of view. You can find information about the available resources and on how to request them at your health centre.

Health Centres

The Primary Health teams are the link between the different care levels, exercising the function of welfare coordination. The Primary Care of the National Health System has also established home medical care systems and nursing systems to manage frequent problems in strokes, such as managing probes, enteral feeding, administration of injectables, dressings and others.

Remote care (Local/State Level)

Uninterrupted telephone service, with permanent control so that the user can stay at home. This must be requested at the social services.

Day Centres

Day centres are amenities whose objective is to provide social-health care that will prevent and compensate the loss of independence of the stroke patient,

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which will provide support for the family or carers to make it possible for the patient to remain in his or her normal environment.

Temporary Residences

These residences can be used in certain transient circumstances (hospital admission, maternity) when the family or carers cannot devote all the attention required to the patient.

Permanent Residences

The requirements to request admission into a residence may vary from one Autonomous Community to another, but they usually include: Being 65 years of age or older (sometimes people aged 60 to 65 are admitted), proving that they have lived in the Community for the two previous years and have no infectious diseases. The social services normally take charge of all the details.

Medium and long stay hospitals

These are centres that base their care activity on the treatment of patients who may need palliative care, functional rehabilitation in a hospital and care for convalescence or other disorders.

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EVALUATION OF THE DEPENDENCE

What is the Law of Dependence?

Law 39/2006, 14 December 2006, on promotion of personal autonomy and care for people in a situation of dependence, entered into force on 1 January 2007.

This law regulates the basic conditions to promote personal autonomy and care of people in situation of dependence via the creation of the System for Autonomy in which the General State Administration, the Autonomous Communities and the local administrations collaborate and take part.

The procedure to evaluate the situation of dependence will start, on the request of the citizen, through the municipal services of the town where the requesting party is registered.

Under the concept of care to dependence, both financial benefits and services are contemplated, although the latter will be priority and will be given through the public offer of the Social Services Network, by the respective Autonomous Communities, via centres and public or private, duly authorised, services.

Prosthesis

In those cases where the patient needs ortho-prosthesic devices (wheelchair, cushions, walker, splints on feet or hands or others), these are financed provided that this is justified by a specialist's report and presenting the purchase receipt. The references of the

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items that are financed by the Social Security can be consulted at the surgical aids shops.

Adaptations of the home and home aids

It may be advisable to carry out certain adaptations in the home, especially when a wheelchair is used.

When the home is evaluated, apart from the actual house, the entrance door, lift and accesses must be considered.

The occupational therapist is the best professional to help us evaluate which adaptations are appropriate in each particular case.

In some circumstances there may be aid to finance the necessary reforms. We advise you to consult the social services of your town council or the Social Services Management of the Regional Health Department of your Community.

You can also consult the social services of your town council about home aid programmes, which provide help for several hours a day, cleaning, hygiene, cooking or daily shopping and which can thus permit those patients who live alone maintain their independence thanks to minimal supervision, and in other cases, facilitate the work of the carer in those cases of more serious disabilities.

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Parking space for the disabled

Consult with your Town Council about the possibility of requesting a parking space for the disabled.

Incapacity for work

In the case of those people who were working when they had a stroke, the family physician will prepare the relevant reports that will permit the medical tribunal of the INSS to grant the degree of disability. Several reports may be requested or an update of the reports already issued by the hospital.

Incapacity for work has a series of degrees that are going to determine the amount of pension the person is entitled to.

- Temporary incapacity for work.
- Permanent incapacity for work.
- Permanent partial incapacity.
- Total permanent incapacity.
- Absolute partial incapacity
- Severe disablement

Certain requirements must be met in each one of them such as the time contributions have been made for, the normal profession, age or others. The requirements differ depending on the degree of disability and according to the cause of incapacity (illness).

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Where can I obtain more information?

ASSOCIATIONS OF PATIENTS AND RELATIONS

Spanish Stroke Federation (FEI)

C/ Riereta, 4
08830-Sant Boi de Llobregat (Barcelona)
Tel. 93 661 25 25
www.ictusfederacion.es
E-mail: fei.ictus.secretaria@hotmail.es

MEMBER ASSOCIATIONS OF THE SPANISH STROKE FEDERATION

Stroke Association of the Principality of Asturias (ADIPA)
C/ Calvo Sotelo, nº 15, 1º derecha
33007- Oviedo (Asturias)
Tel. 616012442
E-mail: katia@estors.es

Stroke Association of Aragon (AIDA)
C/ Ventura Rodríguez, nº 12-16 (local)
50007 Zaragoza
Tel. 976 282 242
E-mail: asociacion@aidaictus.com

Associació Catalana de persones amb Accident Vascular Cerebral (AVECE)
C/ Riereta, nº 4
08830-Sant Boi de Llobregat (Barcelona)
Tel. 936 402 482
E-mail: avecRCT@hotmail.com

- Association of Stroke Patients and Families (NEURO-AFEIC)

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Avda. de Cádiz, nº 46, Complejo Galicia, Edif. Orense B
18006- Granada
Tel. 958 089 449
E-Mail: neuroafeic@hotmail.es

Associació Balear de Familiars i Malalts d'Ictus (AIBAL)
C/ de Sor Clara Andreu, 15-Baixos
07010-Palma (Mallorca)
Tel. 971 498 777
E-mail: ictusbalears@gmail.com

Association of Families with stroke in Extremadura (AFIEX)
C/ Carreras, nº 8 Bajo
10002-Cáceres
Tel. 927 238 856
E-mail: afiex@hotmail.es

REGIONAL SOCIAL SERVICES DEPARTMENTS OF THE AUTONOMOUS COMMUNITIES.

PROVINCIAL SOCIAL SERVICES OFFICES.

ONLINE RESOURCES.

Institute of Older People and Social Services (IMSERSO)
Avda de la Ilustración, s/n. – 28029-Madrid
Tel. 913 638 935
Fax.: 913 638 880
www.seg-social.es/imserso/

Spanish Society of Neurology
www.sen.es/publico

Study Group of Cerebrovascular Diseases
of the Spanish Society of Neurology.

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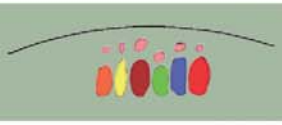
www.ictussen.org/pacientes

Spanish Foundation of Neurological Diseases
www.feeneurologia.com/pacientes.php

ONCE Foundation
www.fundacionONCE.es

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Appendix 9. Glossary and abbreviations

GLOSSARY

AGREE: (Appraisal of Guidelines, Research and Evaluation for Europe): International initiative to facilitate the design and assessment of clinical practice guidelines.

Aphasia: Alteration of speech/oral communication. The patient does not understand what he is told, he cannot express himself correctly or both things.

Agnosia: Inability to recognise the meaning of the different sensorial stimuli.

Allodynia: Secondary pain to a stimulation that normally does not trigger pain.

Sensitivity analysis: Analytical process that examines how the results of the study change when the values of certain relevant variables are modified.

Intention to treat analysis: In a controlled RCT, analysis of the data according to the treatment group initially assigned, instead of by the treatment really received.

Apraxia: Loss of ability to carry out learned and familiar movements on purpose, despite having physical capacity (muscular tone and coordination) and the desire to carry them out.

DALY (Disability adjusted life years) Measure of the overall burden of disease that reflects the number of years that a person would have been able to live, lost due to early death, and the productive life years lost due to disability.

Cochrane library: Database on effectiveness produced by the Cochrane Collaboration, comprised among others, of original systematic reviews of this organisation.

Interobserver concordance: This refers to the consistency between two different observers when they assess the same measurement in the same individual.

Direct health costs: These are the costs directly related to the health services consumed.

Indirect costs: These refer to the losses of productivity caused by the illness, early retirements, loss of productivity of the relations that must accompany these patients to the doctor's and travelling costs.

Helsingborg Declaration: Declaration of Consensus on Stroke Management and the plans of action suggested to implement this Declaration.

Deficiency: This represents the abnormality of the structure or function of an organ or system.

Disability: Restriction or loss of the ability to carry out an activity in a certain way or within an interval considered as normal.

Dysesthesia: Abnormal sensation not motivated by an outside stimulation or caused by a normal contact, but where the perception is deformed.

Effectiveness: Magnitude that measures the degree in which an intervention or procedure achieves the intended result in normal medical practice conditions.

Efficiency: Magnitude that measures the degree in which an intervention or procedure

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achieves the intended result in experimental conditions.

Embase: European (Dutch) database produced by Excerpta Medica with clinical medicine and pharmacology content.

Randomised Clinical Trial (RCT): This is a study design where the individuals are randomly assigned to two groups: One (experimental group) receives the treatment that is being tested and the other (comparison or control group) receives standard treatment (or sometimes a placebo). The two groups are monitored to observe any difference in the results. Thus the efficiency of the treatment is assessed.

Ashworth scale: Test that measures the resistance of the muscles whilst the examiner moves them. It goes from 0 (no increase in muscle tone) to 5 (the affected muscle is rigid in flexion or extension).

Spasticity: Alteration of the motor function where there is an increase in resistance to the passive stretching of the muscles, in proportion to the speed of the latter.

Specificity: This is the probability of correctly classifying a healthy individual, in other words, the probability of obtaining a negative result for a healthy individual. Cost effectiveness study: Social-economic form of analysis where the costs are measured in monetary terms and the results are expressed as effectiveness. Prospective study: This is a type of study that starts with the presentation of a supposed cause and then continues through time to a certain population until the appearance of the effect is determined or not.

Retrospective study: This is a longitudinal study in time that is analysed in the present, but with data from the past, in other words, both cause and effect have already been presented.

Transversal descriptive study: This is a study that describes the frequency of an event or of a presentation at a certain moment (single measurement). It permits examining the relationship between a risk factor (or exposure) and an effect (or result) of a defined population and at a certain moment (a cut). Also called prevalence studies.

Case studies-control: A study that identifies people with an illness (cases), for example lung cancer, and compares them with a group without the illness (control). The relationship between one or several factors (for example tobacco) related to the illness is examined, comparing the frequency of exposure to this or other factors among the cases and the controls.

Cohort Studies: This consists in monitoring one or more cohorts of individuals who present different degrees of exposure to a risk factor in whom the appearance of the illness or condition studied is measured.

Reliability: This indicates the extent to which the same values are obtained when the measurement is made on more than one occasion, under similar conditions.

Fibrinolysis: Treatment that consists in administering a fibrinolytic drug in order to dissolve the clot (thrombus or piston) which has produced a vascular episode.

Hemianopsia: Loss of half the field of vision.

Heterogeneity: See Homogeneity.

Homogeneity: This means 'similarity'. It is said that studies are homogeneous if their results do not vary from each other more than what can be expected by random. The opposite to homogeneity is heterogeneity.

Incidence: Number of new cases of an illness that are developed in a population during a certain period of time.

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Kappa Index: Measurement to evaluate the concordance: The values go from 0 (no agreement) to 1 (total concordance).

Confidence Interval: This is the interval in which the real magnitude of the effect is found (never known exactly) with a pre-established degree of safety or confidence. 95% confidence interval (or 95% confidence limits) are often spoken of. This means that within that interval the real value would be found in 95% of the cases.

Medline: Predominantly clinical database produced by the National Library of Medicine of the US available in CD-Rom and Internet (PubMed).

Meta-analysis: This is a statistical technique that permits integrating the results from different studies (diagnostic test studies, clinical trials, cohort studies, etc.) in one single estimator, giving greater weight to the results of the larger studies.

Activity limitation: A disadvantageous situation for a certain individual, resulting from a deficiency or a disability, which limits or prevents carrying out a role which is normal in their case (depending on age, sex, and social and cultural factors).

Morbility: Illness or frequency with which an illness occurs in a population.

Mortality: Rate of deaths or number of deaths for a certain illness in a group of people and a certain period.

Spatial neglect: This is a disorder that may reduce the ability of a person to look, listen or carry out movements in one half of his environment.

NICE: This forms part of the NHS (National Health Service in England). Its role is to provide physicians, patients and the public at large with the best available evidence, mainly in the form of clinical guidelines.

NNT/NNH: A measurement of the efficiency of a treatment that consists in the number of people need to be treated (NNT) with a specific treatment to produce or prevent an additional episode. Likewise, the number needed to harm (NNH) is defined to assess undesirable effects.

Odds Ratio (OR): This is a measurement of the efficiency of a treatment: If it is 1, the effect of the treatment is not different to the effect of the control. If the OR is greater or less than 1, the effect of the treatment is greater or less than the effect of the control. Take note that the effect that is being measured may be adverse (e.g. death, disability) or desirable (e.g. stop smoking).

Paramedic: Professionals trained at medical intermediate-technical level of the emergency.

Prevalence: The proportion of people with a finding or illness in a certain population, at a certain time.

QUALY: Life years corrected by a value that measures the relative quality of life experienced.

Incremental ratio: Cost of a unit of effect of one intervention compared with another.

Rate of verisimilitude: This measures the more probable a specific result (positive or negative) is according to the presence of absence of disease.

Systematic review (SR): This is a review where the evidence about a topic has been systematically identified, assessed and summed up in agreement with predetermined criteria. It may or may not include the meta-analysis.

Relative risk (RR): This is the quotient between the rate of events in the treatment and control groups. Its value follows the same interpretation as the OR.

rt-PA: Recombinant tissue plasminogen activator. Fibrinolytic drug.

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Sensitivity: This is the proportion (or percentage) of really ill patients who have a positive test result. Otherwise, it is the proportion of real positives.

Case series: Analysis of series of patients with the illness.

Bias: This is the systematic deviation between the result obtained and the real value, due to the way in which the study was done.

SIGN: Scottish multidisciplinary agency that prepares evidence-based clinical practice guidelines as well as methodological documents on their design.

Negative predictive value (NPV): This is the probability that the individual is really healthy when the result of the test is negative.

Positive predictive value (PPV): This is the probability that the individual is really ill when the result of the test is positive.

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ABBREVIATIONS

AHA	*American Heart Association*
NSAID	Non-Steroid Anti-inflammatory Drugs
TIA	Transient Ischaemic Attack
PC	Primary Care
ARA	Angiotensin Receptor Antagonists
ASA	*American Stroke Association*
DALY	Disability Adjusted Life Years
ADL	Activities of Daily Living
CAST	*Chinese Acute Stroke Trial*
ICPC	International Classification of Primary Care
ICD	International Classification of Diseases
CNE	National Centre of Epidemiology
CPSS	*Cincinnati Prehospital Stroke Scale*
DM	Diabetes Mellitus
DSM-IV	*Diagnostic And Statistical Manual of Mental Disorders IV*
DUE	University Diploma in Nursing
CT	Clinical Trial
RCT	Randomised clinical trial
ECG	Electrocardiogram
CVD	Cerebrovascular Diseases
FAST	*Face Arm Speech Test*
FEI	Spanish Stroke Federation
PEG	Percutaneous Endoscopic Gastrostomy
CPG	Clinical Practice Guidelines
CPGOG	*General Practitioner Assessment of Cognition*
ICH	Intracerebral haemorrhage
SAH	Subarachnoid haemorrhage
HBP	High Blood Pressure
AMI	Acute Myocardial Infarction
CI	Confidence Interval:
ACEI	Angiotensin Converting Enzyme Inhibitors
MAOI	Monoamino-oxidase inhibitors

IPSM	Insulin-Potassium-Saline-Magnesium
ISEDIC	Social Impact of Dependent Stroke Patients
SSRI	Selective Serotonin Reuptake Inhibitors
IST	*International Stroke Trial*
LAPSS	*Los Angeles Prehospital Stroke Scale*
LG	Legislation
MASS	*Melbourne Ambulance Stroke Screen*
MMSE	*Mini Mental State Examination*
NANDA	*North American Nursing Diagnosis Association*
NBO	Normobaric Oxygen
NIC	Nursing Intervention Classification
NICE	*National Institute for Clinical Excellence*
NIHSS	*National Institute of Health Stroke Scale*
NINDS	*National Institute of Neurological Disorders and Stroke*
NOC	Nursing Outcome Classification
NSF	*National Stroke Foundation*
WHO	World Health Organisation
OR	Odds ratio
BP	Blood pressure:
DBP	Diastolic Blood Pressure
SBP	Systolic Blood Pressure
RCP	*Royal College of Physicians*
MR	Magnetic Resonance
ROSIER	*Recognition of Stroke in the Emergency Room*
RR	Relative risk
SR	Systematic review
SEDENE	Spanish Society of Neurological Nursing
SEMAP	Madrid Primary Health Care Nursing Society
SEMERGEN	Spanish Society of Primary Health Care Physicians
SEMFYC	Spanish Society of Family and Community Medicine
SEMG	Spanish Society of General and Family Medicine
SEN	Spanish Neurology Society
SIGN	*Scottish intercollegiate guidelines network*
NGP	Nasogastric probe
NHS	National Health System
SoMaMFYC	Spanish Society of Family and Community Medicine
CT	Computerised Tomography
HTAU	Health Technology Assessment Unit
VA/DoD	*Veterans Affairs, Department of Defence*
NPV	Negative Predictive Value
PPV	Positive Predictive Value
WONCA	*World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians*

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Appendix 10. Conflict of interest declaration

All the members of the development group have declared no conflicts of interest.

The members of the group, Oscar Aguado Arroyo, Carmen Aleix Ferrer, José Álvarez Sabín, Ángel Cacho Calvo, Mª Isabel Egocheaga Cabello, Javier Gracia San Román, Juan Carlos Ballabona Rebollar, Beatriz Nieto Pereda, Raquel Ramírez Parrondo and Paloma Roset Monrós, have declared no conflicts of interests.

Jose Vivancos Mora has been an advisor for Pzifer for the last two years. He is also the national coordinator of the PERFORM study on secondary stroke prevention, as well as the principal investigator in several clinical trials on acute phase stroke prevention and management.

Jaime Masjuan Vallejo carried out a medical expert's report for MSD in 2007 and also received financing through the Ramon y Cajal Foundation for Research for the participation in clinical trials.

The form used to facilitate the collection of the declaration of interests is included in the methodological material, available both on the Guia Salud website and on the UETS website, where detailed information is presented with the methodological process of the CPG.

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