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## Original article

# Stroke care in 1960 and now—the case of René Maugras

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## ABSTRACT

**Background/Objective.** – Georges Simenon accurately describes, in a novel called *Les Anneaux de Bicêtre*, the clinical picture and course, and the hospital procedures and treatment of a patient with a large left hemispheric stroke, presumably ischemic.

**Methods.** – I here summarize these features and use them as a basis to discuss the marked changes in stroke evaluation and care in the last 60 years.

**Results/Case Report.** – A 54-year old Newspaper director was admitted shortly after an acute stroke leading to temporary loss of consciousness, to motor aphasia and right hemiplegia and hypoaesthesia. Risk factors included hypertension, a sedentary life, smoking, and a previous episode of cardiac arrhythmia possibly related to congenital heart disease. Evaluation included electroencephalography, cerebral arteriography and cerebrospinal fluid analysis. The acute treatment involved prolonged bed rest in a private room, prophylactic antibiotics, and oral anticoagulation. Smoking was allowed. Prolonged in-hospital rehabilitation followed initial passive physical therapy provided by nurses. After many months, the patient was released with persistent motor problems and a marked psychological change.

**Conclusion.** – The entire field of acute stroke care has been revolutionized in the last 60 years. Big data management, telemedicine, software, new brain and vascular imaging techniques, biomarkers, robotics etc., are currently in development and again should lead to new and surprising changes during the next decades.

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Nous guérissons bon nombre de nos patients mais, la plupart du temps, nous ignorons comment et pourquoi... Chaque fois que nous pensons faire une découverte, de nouvelles questions se posent, si bien que cela ressemble plutôt à un pas en arrière qu'à un pas en avant...

Dans cent ans ou dans cinq siècles, nos descendants parleront de nous comme nous parlons des sorciers africains...

Georges Simenon, *Les Anneaux de Bicêtre*

The brilliant Belgian writer Georges Simenon (1903–1989) [1] (Fig. 1) authored more than 500 romances, novels, short stories, autobiographical works, journalistic articles and reports. He is the most translated Belgian author, with more than 500 million copies of his works sold worldwide.

Although best known for his novels centered on the Parisian police inspector Jules Maigret, Simenon also wrote many texts involving other complex personages. A remarkable novel called *The Rings of Bicêtre* (*Les Anneaux de Bicêtre*) first

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**Fig. 1 – Georges Simenon (1903–1989) in front of the Maison d'Épalinges, house near Lausanne, Switzerland constructed under his guidance and to which he moved in 1963, the year of publication of *Les Anneaux de Bicêtre*. Retrieved in March 15, 2019, at: [https://lib.uliege.be/simenon/?attachment\\_id=90](https://lib.uliege.be/simenon/?attachment_id=90) [1].**

appeared in 1963 [2]. The main character is René Maugras, a powerful 54-year old newspaper director and magazine editor who suffers a major stroke (cardio-embolic infarct?) involving the middle cerebral artery territory and leading to a short period of decreased level of consciousness, to right hemiplegia and hypoesthesia, and motor aphasia. The drama is centered on his thoughts during the prolonged hospital stay at the Kremlin-Bicêtre, in Paris. Maugras' questioning and reasoning eventually leads him to new perceptions and attitudes concerning his marriage, profession, and his future.

His clinical course and treatment are very well described in the novel. I here present the main aspects of stroke evaluation and treatment in the early 1960s as depicted by Simenon in *Les Anneaux de Bicêtre*, highlighting the tremendous differences between these and the current approach.

## 1. Case Report [2]

In the winter season of 1960, at the age of 54, René Maugras, a sedentary newspaper director, collapsed during a monthly lunch party with other Parisian prominent men. He was first seen at the Auteuil clinic but was soon transferred by ambulance to the Bicêtre hospital, where the famous neurosurgeon, Professor Audoire - considered the most brilliant French specialist of that period and chief medical doctor of the institution - was responsible for his care. Initially unconscious, Maugras awakened after two days. He exhibited a dense right hemiplegia and hypoesthesia, and a severe motor aphasia. Despite being lucid, he exhibited for many days an emotional indifference and passivity that exasperated the health team. The admission heart frequency was 68 bpm (no mention of arrhythmias), the systolic blood pressure went up to 200 mm Hg, and laboratory results disclosed hyperglycemia and normal cholesterol levels.

His medical history included an operation for appendicitis, and a long-lasting and untreated systemic hypertension. After 30 years

of smoking (pipe and then cigarettes), he had quit three years earlier. Maugras led a stressful and sedentary life, and he had been admitted to Auteuil for the treatment of depression at the age of 50. At the age of 17, he suffered an episode of cardiac arrhythmia. Although considered minor by his treating physician, he failed a medical evaluation for the military service several months later. A congenital cardiac condition was suspected.

Following hospital admission, the patient was submitted to electroencephalographic studies, lumbar puncture and cerebrospinal fluid analysis to exclude cerebral hemorrhage, cerebral angiography (possibly by carotid puncture), and electrocardiographic and chest X-ray studies. He remained in bed for many days, and was treated with oral anticoagulants (acenocoumarol, a vitamin K antagonist) "to prevent the formation of new blood clots". He also received alcohol rubbing, parenteral sedatives and glucose solutions, and single prophylactic injections of penicillin (1 million units) and neuraphyline (7-[2,3-dioxipropil]-theophylline).

Two nurses on 12-hour shifts took care of him in a private room. They were responsible for feeding, psychological support, and the initial physical training and speech therapy. After 4 days, he received oral fluids-orange juice. Passive physical therapy was begun on the third day, and after six days, he was put in the upright position.

On the fifth day, Maugras developed fever and respiratory stress attributed to a tracheal infection. He received new doses of penicillin (although antibiotic resistance was suspected) and emergency oro-tracheal suctioning in a special room, followed by cigarettes (!) and an intravenous sedative. He was kept for one day in Trendelenburg position to ease the clearance of respiratory secretions.

Maugras gradually recovered from the aphasia, with paraphasias and slow speech being present on the second week of hospital stay. Glucose infusions were discontinued on the eighth day, as the patient, who had then lost much weight, was already able to eat. Parenteral sedatives were still being given. He now stayed in a wheelchair, but tended to deviate to the right side (Pusher syndrome?). He was allowed to smoke at will. After less than one month, he felt more motivated. He was now able to support his weight on his unaffected foot and to move his right hand fingers. He then started treatment in the rehabilitation gymnasium, progressing to awkward but independent walking during the next one or two months. Long visits from his wife led to increasing intimacy and eventually to a satisfactory sexual relation.

In the fourth month, Maugras was again interested in his job and former activities, even if he experienced a different and deeper understanding of his life. He enthusiastically adhered to the rehabilitative program, ate a number of exquisite delicacies, and substituted his favorite Bordeaux for the hospital wine. Ready to leave the hospital after five months, he did not find answers, but had questioned himself a lot, and was sure that this inner search would continue, not inhibiting however his strong and renewed desire to live intensely.

## 2. Discussion

A summary of the main aspects of stroke treatment in the early 1960s is presented in Table 1. Contrasts between that

**Table 1 – Main aspects of stroke treatment in the early 1960 decade, as depicted by Georges Simenon [2]. Significant differences between that approach and the current one are highlighted.**

Characteristics	1960	2020
<b>Hospital Structure</b>		
Dimensions and focus	Large institutions (e.g., Bicêtre: 2,500 inpatients, essentially devoted to neuropsychiatry)	General hospitals–internal medicine and surgery–with sophisticated resources <sup>a</sup>
Care setting	Large rooms for multiple diseases (e.g., up to 40 beds in Bicêtre) and a few private rooms	Stroke care units, intensive care units; multiple specialists (radiology, neurosurgery) available
Vital support resources (X-rays, oxygen, aspiration equipment)	Only delivered in special rooms in urgent cases	Bed-side availability
Advanced ventilator and hemodynamic support	Essentially unavailable (Bird Mark7 released in 1957; Swan-Ganz in 1970)	Widely available, multiple options; various adrenergic solutions and mechanical devices for cardiovascular support
<b>Health Team</b>		
Chief medical staff	Neurosurgeon	Stroke physician/neuro-intensive care specialist
Team work	Highly hierarchical structure <sup>b</sup>	Collaborative work, approved protocols consensually designed and periodically reviewed
Telemedicine	–	Increasing use–care delivery in rural settings, fast transfer decisions etc.
Rehabilitation team	Nurse-centered at onset; physical therapy delivered in special hospital facilities after the acute phase	Early involvement of multiple specialists.
Weekends and night-shifts	Much reduced personnel and resources	Still room for improvement [14]
<b>Diagnostic Methods</b>		
Blood tests	Some available, conservative use	Extensive, frequently repeated
Bedside monitoring (blood pressure and cardiac rhythm, respiratory etc.)	–	Routine in stroke units and intensive care units
Neuroimaging	Cerebral angiography (Moniz, 1927; Seldinger 1957), used to exclude tumors and cerebral hemorrhage	Advanced CT (Hounsfield 1971, 1973) and MR techniques, including CTA, MRA, perfusion techniques; bed-side CT increasingly available
Lumbar puncture and cerebrospinal fluid analysis	Routine use to “exclude” cerebral hemorrhage	Rarely used (e.g., meningo-vascular syphilis)
Electroencephalography	Routine use (short exams with few electrodes in special rooms)	Special cases (seizures, convulsive and non-convulsive status epilepticus, comatose patients); EEG monitoring and video-EEG (non-uniform availability)
<b>Acute Treatment Strategy</b>		
Ambulance	Transport only	Used for emergency evaluation and vital support; fast communication with receiving hospital; multiple trials of emerging diagnostic methods (e.g., CT) and therapies
Fluid replacement	Dextrose solution	Crystalloid solutions
Drugs used	Parenteral cardiac stimulants, preventive antibiotics (penicillin), sedatives	r-tPA, double antiplatelet therapy, anti-hypertensive drugs in continuous infusion etc.
Anticoagulation	Routine (thrombosis, embolism)	Rarely indicated at onset; late and individualized start in cardio-embolic strokes; increasing use of DOACs
Thrombectomy, angioplasty and stenting, carotid endarterectomy	–	Increasing use
Nutrition	Early dextrose infusions, gradual introduction of oral fluids and solids; significant weight loss common	Routine evaluation for risk of aspiration, early feeding strategy [15]
Surgical treatment	–	Decompressive hemi-craniectomy for massive hemispheric infarcts; posterior fossa decompression and ventricular drainage for large cerebellar strokes; carotid endarterectomy for minor strokes and transient ischemic attacks
Other	Essentially none; smoking allowed	Prevention of VTE (pneumatic compression, LMWH); routine pre-hospital introduction of drugs for secondary prevention; nicotine replacement therapy

## Rehabilitation Strategy

Initial	Nurse responsibilities: feeding and phono-therapy, physical therapy (passive exercises), psychological support	Early mobilization; early involvement of multiple specialized therapists; defined protocols adapted to specific needs
Continued care	Long hospital stay and treatment; essentially physical therapy	Early discharge to special facilities or own house; home or office-based multi-modality treatment afterwards

CT: computed tomography; MR: magnetic resonance; CTA: MR angiography; MRA: MR angiography; EEG: electroencephalography; r-tPA: recombinant tissue plasminogen activator; DOACs: direct oral anticoagulants; VTE: venous thromboembolism; LMWH-low molecular weight heparin.

<sup>a</sup> The Bicêtre hospital was created in 1657 and was the home for some of the most renowned neurologists and psychiatrists such as Pinel, Bourneville, Broca, Vulpian and Déjerine. It was thoroughly restructured since the 1960s and is currently a 891-bed hospital serving the Paris Sud University [16]. It has a specialized stroke unit and a busy emergency unit (around 100,000 visits/year).

<sup>b</sup> Although exerting a central therapeutic role, nurses are shown in the novel as hierarchically and socially inferior—health comments usually disregarded by attending doctors, visitors do not even present themselves.

approach and the current one are highlighted. They clearly demonstrate how we moved from an era of eminence-based medicine (with its known risks) to evidence-based medicine (not without its own pitfalls).

Stroke evaluation in the 1960s and 1970s relied heavily on the exclusion of alternative diagnoses such as brain tumors and cerebral hemorrhages using indirect evidence provided by cerebral arteriography and cerebrospinal fluid examination. These techniques were associated with significant risks and provided unreliable information. The appearance of computerized tomography in 1977 was a landmark in neuroimaging and led to an almost complete abandonment of these invasive techniques in the following decade [3]. Cerebral angiography, however, is nowadays increasingly used in the hyper-acute stroke setting, as mechanical thrombectomy has been shown to improve outcomes in patients with acute large artery infarcts [4]. Invasive radiology facilities are now deemed obligatory in any hospital aiming to treat large numbers of acute stroke patients.

As for treatment, the field has been revolutionized. Prolonged bed rest, passive physical therapy, and oral anti-coagulation constituted the main aspects of treatment in the 1960s. No formal evaluation of feeding capabilities, nutrition needs, risk of aspiration or other infections was routinely done, and long hospital stays for rehabilitation were the rule in individuals with significant impairments. The development of stroke units and the demonstration in the 1990s of the survival benefits associated with their implantation constituted a landmark in the field [5]. Although the specific components leading to reduced mortality may be discussed, rational protocols for prevention and treatment of infections and closer monitoring and treatment of cardio-pulmonary complications such as arrhythmias and pulmonary embolism are certainly involved. The specialization and early active involvement of a number of rehabilitation professionals also leads to a better recovery and lessening of disabilities.

The demonstration of improvement of functional outcomes with intravenous thrombolysis in 1995 [6] helped to promote the formation of large numbers of specialized physicians and the creation of stroke teams actively involved in the development of rational protocols. More recent advances include decompressive hemi-craniectomy for large hemispheric infarcts [7], the introduction of thrombectomy for acute infarcts associated with occlusion of the internal carotid

artery and large intracranial arteries [8], and the development and expansion of telemedicine as a means to improve stroke care in remote areas or less specialized institutions [4,9].

Patients admitted for acute strokes should be discharged only after addressing and optimizing secondary prevention strategies [4,10]. This includes the routine evaluation and treatment of cardiac arrhythmias, vascular risk factors and atherosclerotic conditions such as coronary heart disease, and the prescription of antiplatelet drugs and eventually anti-coagulants. Continued care after discharge should be planned, and this is an area where further improvement should be pursued [11].

A remarkable aspect of *Les Anneaux de Bicêtre* is the precise description of the psychological reactions of Maugras during his prolonged hospital stay. Apparent indifference to the information provided by his doctors initially led to a passive resistance to the health team efforts and recommendations. Rapid resolution of this neglecting attitude indicates a non-organic origin. Other psychological aspects described in detail include uncertainty about the physicians' and nurses' sincerity; anger because of their indirect or childish talk and of the need to passively submit to unexplained care; fear to return to daily life and about the future; and the perceived opportunity to reflect deeply about previous behaviours and priorities and to consider real long-term change. All these traits are certainly present nowadays in many stroke patients and improvement in communication skills of the health team when addressing patients and their families would be welcome.

We may look critically to the way stroke was managed 60 years ago, as the field has been revolutionized. We should however reflect about the potential impact of future technological breakthroughs. Extension of the time window for thrombolytic treatment and embolectomy has been proved feasible and useful. Automated software for the demonstration of viable ischemic tissue will continue to improve and become widely available. Telemedicine (rarely used in the 1960s) will become omnipresent, helping not only in initial decision-making but also in skills training, patient monitoring, invasive procedures and surgery. Big data, artificial and collective intelligence, new imaging and monitoring techniques, genetic data and biomarkers will lead to more precise prognosis and individualized therapies [12,13]. Brain chips, intelligent intravascular devices and nanoparticles should help monitoring health status during hospital stay or at home.

Robotics and implantable brain devices will completely transform neuro-rehabilitation.

In conclusion, stroke care has changed dramatically over the last decades. This indicates that in the future it may also be very different than what we imagine today. We should keep in mind the prophetic words of Simenon depicted in *Les Anneaux de Bicêtre*: “Every time we think we have made a discovery, new questions appear, and it may actually seem to constitute a step behind, not ahead. . . In one hundred years or in five centuries, our descendants will talk about us as we talk about African sorcerers. . .”

## Declarations of interest

The author declares that he has no competing interest.

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