Effectiveness of Citrate as an Alternative to Heparin for the Locking of Hemodialysis Catheters

Emmanuel CICOLARI - University of Lorraine, Faculty of Medicine, Nancy

Introduction

In France, nearly 19% of hemodialysis patients (REIN annual report 2017) use a central venous catheter as a vascular approach, compared to 77,5% for arteriovenous fistulas and 3,5% for prosthetic bypass.
Prolonged life expectancy and comorbidities lead to the treatment of increasingly aged patients with impaired venous capital.
However, the catheter contributes to increasing the morbidity and the mortality of the patients because of the risks of infection and thrombosis which can affect the quality of the dialysis. The need for an effective lock solution to be delivered into the catheter lumen between dialysis sessions is therefore essential to avoid thrombus formation and colonization by pathogenic organisms.
Heparin remains the most used lock. But in the event of a leak in the bloodstream, its systemic anticoagulant action presents significant risks of bleeding.
Used in the anticoagulation of blood lines in continuous hemodialysis, the 4% citrate has the advantage of acting locally by chelation of ionized calcium. But there are few studies that compare heparin to citrate.
Can 4% citrate be a good alternative to heparin 5000UI / ml as a lock solution for hemodialysis catheters?

Method

A search was conducted in Pubmed for resources published between 1998 and 2019 in english and in french. The keywords « Hemodialysis, Catheters, Heparin, Citrate and Catheters Lock Solution" were used in all relevant combinations. Inclusion criteria were the use of hemodialysis catheters and comparison between 4% citrate lock and 5000 IU / ml heparin. This resulted in a total of 84 records, 78 of which were excluded after evaluation because the access to the full article was limited, or because of the use of other locks, concentrations or catheters.

Results

6 Studies selected
- ✓ Hemodialysis patients
- ✓ Patients with different hemodialysis catheters

Patients divided into 2 groups
- ✓ Group with catheter lock 4% Citrate
- ✓ Group with catheter lock 5000UI / ml Heparin

Comparison of the lock effectiveness according to 3 common qualitative items :
- ✓ Dysfunction
- ✓ Infection
- ✓ Haemorrhage

	Number of patients	Dysfunction	Infection	Haemorrhage
Quenot *et al. (2019)*	396	C = H	C = H	C = H
Lok *et al. (2006)*	250	C > H	-	-
Huang *et al. (2019)*	120	C > H	C > H	C > H
MacRae *et al.(2008)*	61	C = H	C = H	C > H
Chazot *et al. (2017)*	48	C = H	C = H	-
Buturovic *et al. (1998)*	30	C = H	C = H	-

Difference in efficacy between Heparin (H) and Citrate (C) locks on the reduction of complications associated with hemodialysis catheters

Conclusion

These results show that a 4% citrate lock solution is no less effective than a 5000UI / ml heparin lock solution on dysfunctions and infections of hemodialysis catheters.
The 4% citrate has the advantage of avoiding hemorrhagic complications related to systemic anticoagulation in case of leakage of the heparin lock.
Citrate 4% is therefore an interesting alternative to heparin as a lock solution for hemodialysis catheters.
However, controlled and randomized studies remain to be done. A larger sample and the use of the same type of hemodialysis catheter are essential. These tests are necessary to determine the optimal concentration of citrate to use. Nevertheless, at concentrations of 30 to 46% (US FDA et al. 2000), citrate is likely to increase significantly risks of hypocalcemia and myocardial toxicity in the event of a leak in the bloodstream.

References

The Role of Advanced Practice Nurse in Therapeutic Education for Oncology Patients

Nadin Caroline, Student nurse in advanced practice in University of Lorraine (2019)

BACKGROUND

Faced with the increase and chronicisation of cancer in France, Patient Therapeutic Education (PTE) is a real added value in patient care during cancer therapy. It is especially true in a healthcare context where there are many requests in education in a limited time.

Important elements include the impact of side effects on the quality of life and guide research focus on the utility of APN in the field of PTE in oncology.

This aims at establishing APN in France.

How can APN be a real need in PTE in oncology in France compared to nurses already established ?

METHODS

The research is based on the role of undergraduate nurses and the role of APN in oncology PTE. Inclusion of first cycle nurses in France, APN working with patients under cancer therapy, with some experience in PTE :

Switzerland : Qualitative study on the perception of the APN' role from professionnals and patients,

USA : Study protocol examining APN's intervention in the development of observance of treatments,

Canada : Descriptive study based on the patients/caregivers's empowerment,

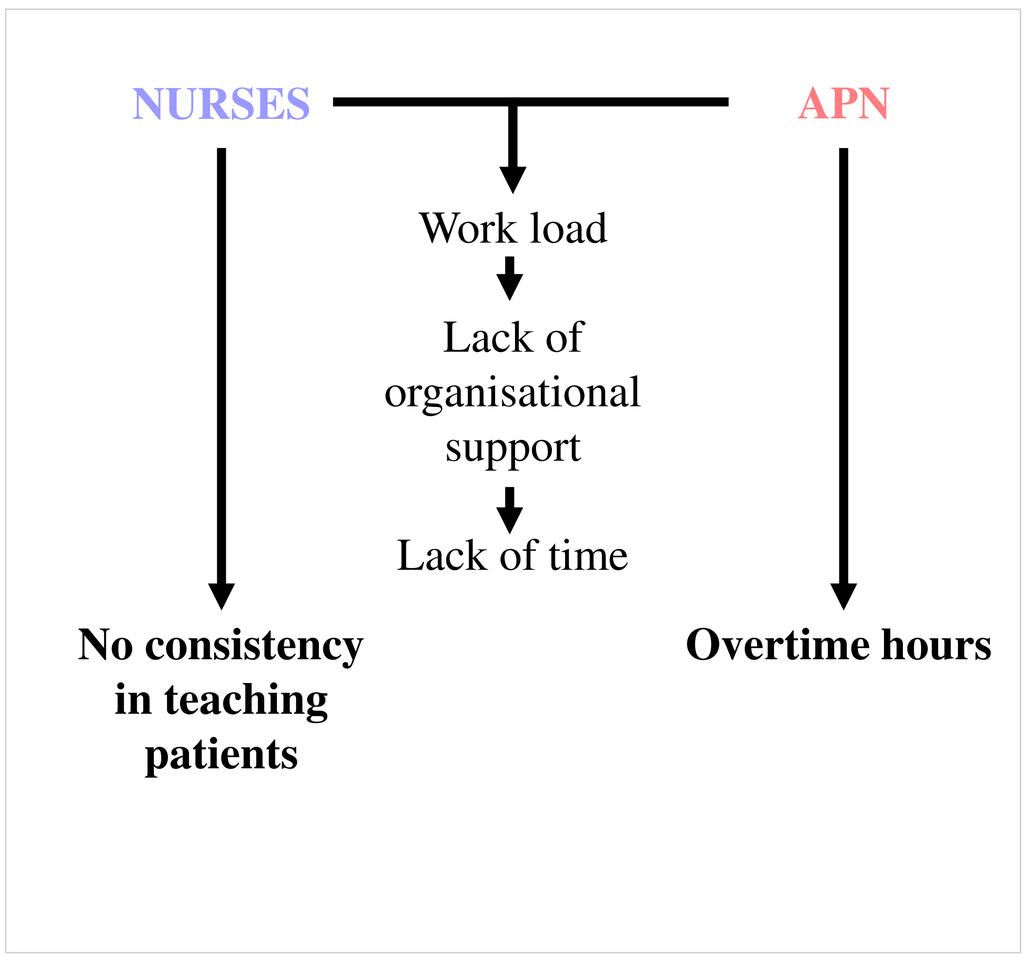
France : Study developed on oncology's PTE and focusing on patient's skills.

RESULTS

Tab. 1 : Comparison between the role of nurses in France and the role of APN (Nurses / APN)

Quality of specific knowledge				
Improving therapeutic response				
Guiding patients in treatment				
Improving continuity of care				
Time for the patient				
Using Cognitivo-Behavioural Therapy				
Conducting motivationnal discussions				
Promoting the self-management of side effects				
Promoting the self-management of treatments				

Fig. 1 : Limits for nurses and for APN



CONCLUSION

Nurses are already well established but their job is limited in terms of coordination and continuity of care, availability and performance due to their specific knowledge. Improved therapeutic response shows the real role of APN in PTE. The nurses' lack of time may therefore be overcome by the work of APN. The optimal therapeutic response of treatments will mark the completion of the implementation of oncology APN in France. We will question the APN's role in the quality of life of patients undergoing cancer treatment. in France.

REFERENCES

Influences on a nurse's clinical judgment in advanced practice

Sophie GUIOT APN, M2, University of Lorraine

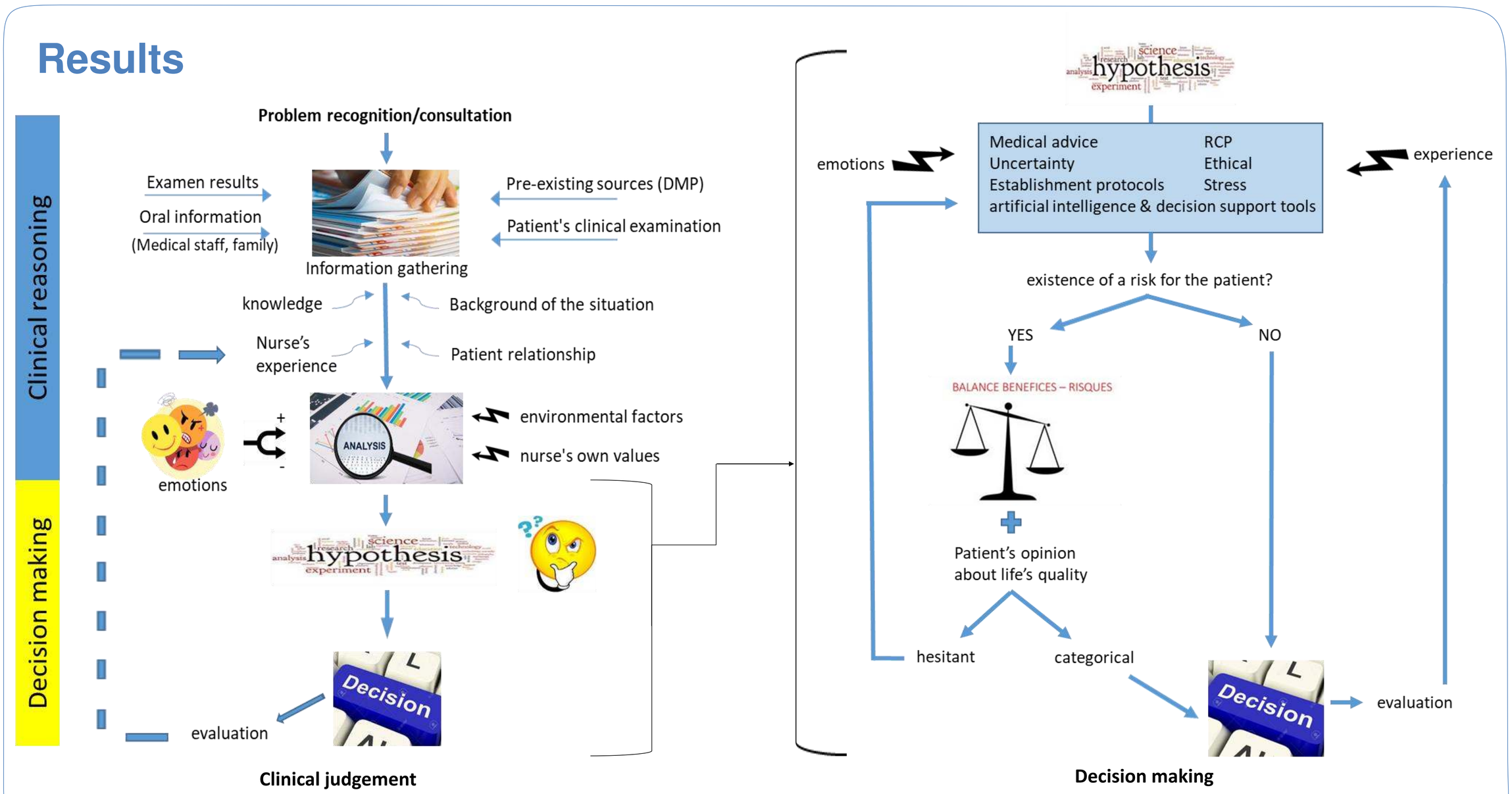
Introduction

In medicine, 70% of consultations are situations that are not characteristic of a disease, resulting in diagnostic **uncertainty**. In the absence of pathognomonic signs, clinical reasoning leading to **decision-making**, more commonly known as clinical judgment, is a process that helps to better understand the patient's situation as a whole, in order to propose the most relevant and acceptable action**. Clinical judgment is an ambiguous term synonymous with clinical decision-making. It results from critical thinking and reasoning, which is a process of solving clinical problems**.
In recent years, a paradigm shift in decision-making theories has been created, showing the various components of a complex process involving many extrinsic factors. With the emergence of advanced practice nurses (APN), it is questionable if their decision-making will be the same as that of a doctor and if being a nurse will influence their clinical judgment. We will attempt to answer those questions by explaining the **clinical reasoning process** and the resulting decision-making in order to try to identify everything that can influence the nurse's clinical judgment in advanced practice.

Methods

A search was conducted in Pubmed and Ulysse for resources published between 2008 and 2019 in English and in French. The keywords: **decision making, clinical judgement, nurse, nursing, incertitude** were used in all relevant combinations, and inclusion criteria were to find at least two of the terms in the title. This resulted in a total of several thousand records, from which we excluded more than half which were not a method but the analysis of a specific clinical case or a specific population of children. "**Emotions**" an additional frequently occurring keyword was added and this brought the total of articles for evaluations to five.

Results



Conclusion

Clinical judgment is therefore a complex process based on information processing. It's found that the nurse's **emotions**, **knowledge** and **experience** have a significant influence on her decisions. One study showed that experienced nurses tend to make intuitive decisions, while less experienced nurses tend to make analytical decisions. An APN is by definition an experienced nurse, it can be assumed that she will rely more on her previous experiences, which will be enriched as she practices. However, since the APN function is a new activity in France, we do not have sufficient data to analyze its clinical judgment. It would be interesting in a few years to conduct a study comparing the decisions made by an APN and those made by a doctor. Similarly, it will be necessary to study the consequences of the use of the new decision support tools for artificial intelligence that are beginning to appear.

References

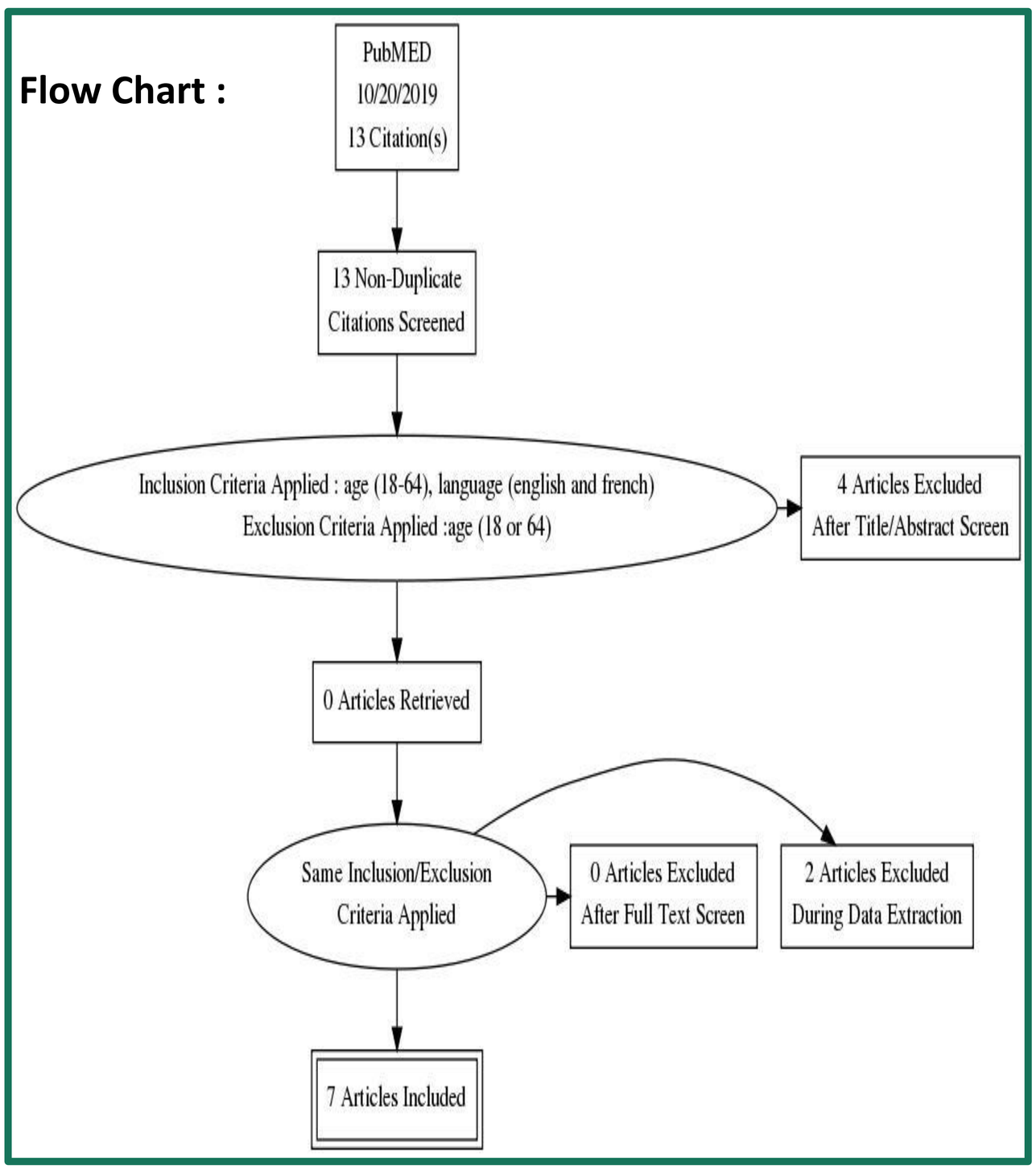
Evaluation of the quality of life of brain tumor patients: the tools used. A literature review

Aurélie BROUSSOIS ARENDARCZYK, Université de Lorraine, Faculté de Médecine, DE IPA 2ème année, CHRU de NANCY a.broussois@chru-nancy.fr

INTRODUCTION: Patients with brain tumors often experience a decrease in their **quality of life** (QoL). The various health plans agree to evaluate QoL and make it a **quality indicator of the care** offered.
The purpose of this literature review is to identify the **tools** used to assess the quality of life of adult patients with brain tumors.

METHODS: A search was conducted in **PubMed** for resources published from January 1 to October 20, **2019** in French and in English. The research equation was: ("Brain Neoplasms"[Mesh]) AND "Quality of Life"[Mesh]. I excluded 4 records because they concerned children, adolescents or their parents. I excluded 2 other records because the concept of QoL was not found in the study. This yielded a total of 7 records. (cf QR code)

Flow Chart :



RESULTS: The majority of studies used a questionnaire specific to QoL assessment (fig 1). 28% combined it with other tools to refine their results (fig 2). 28% assessed quality of life without using validated tools.
No study justifies its choice of tool for assessing QoL.

Fig 1: Tools used in assessing the QoL of patients with brain tumours

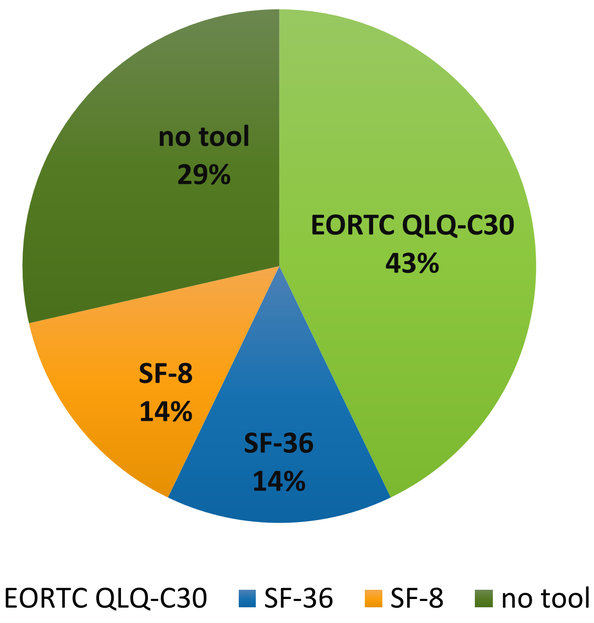
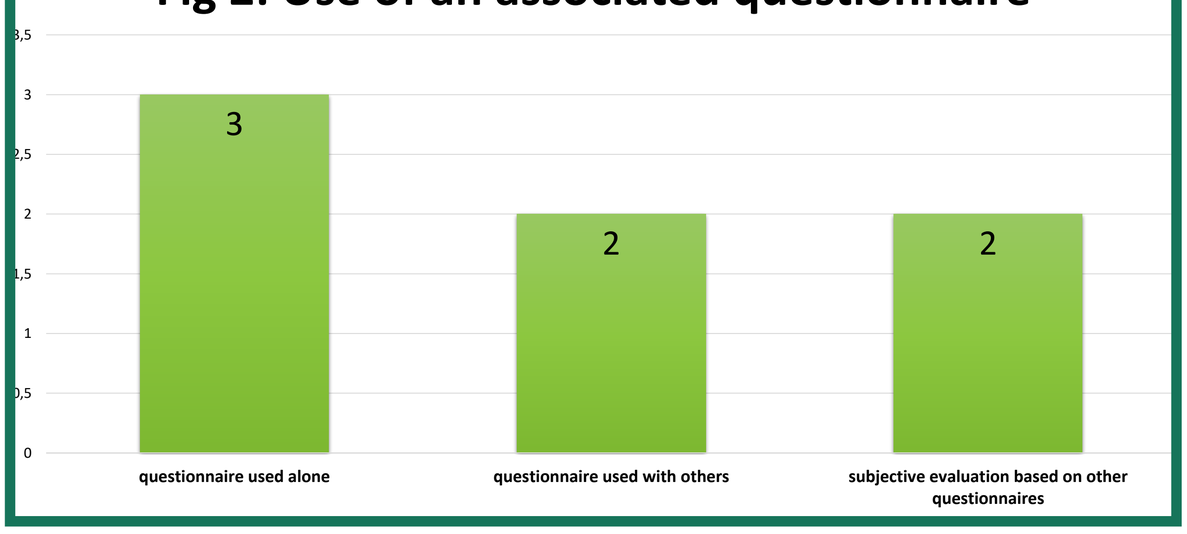


Fig 2: Use of an associated questionnaire



CONCLUSION: Although the majority of researchers used a **validated tool** to assess quality of life, their choice was never justified.
There are other assessment tools available, specific to patients with brain tumors.
We can therefore ask ourselves how the choice of evaluation tools was made, what influences this choice and what it implies for the research results.

Which vascular access must have the prior for the dialysis in the elderly person?

LECOMTE Christophe, Msc, RN, University of Lorraine

INTRODUCTION :

Worldwide more than two million patients with end-stage renal disease (ESRD) have renal replacement therapy (RRT). The number of elderly (>65 years of age) patients on HD is growing more rapidly than younger age groups.

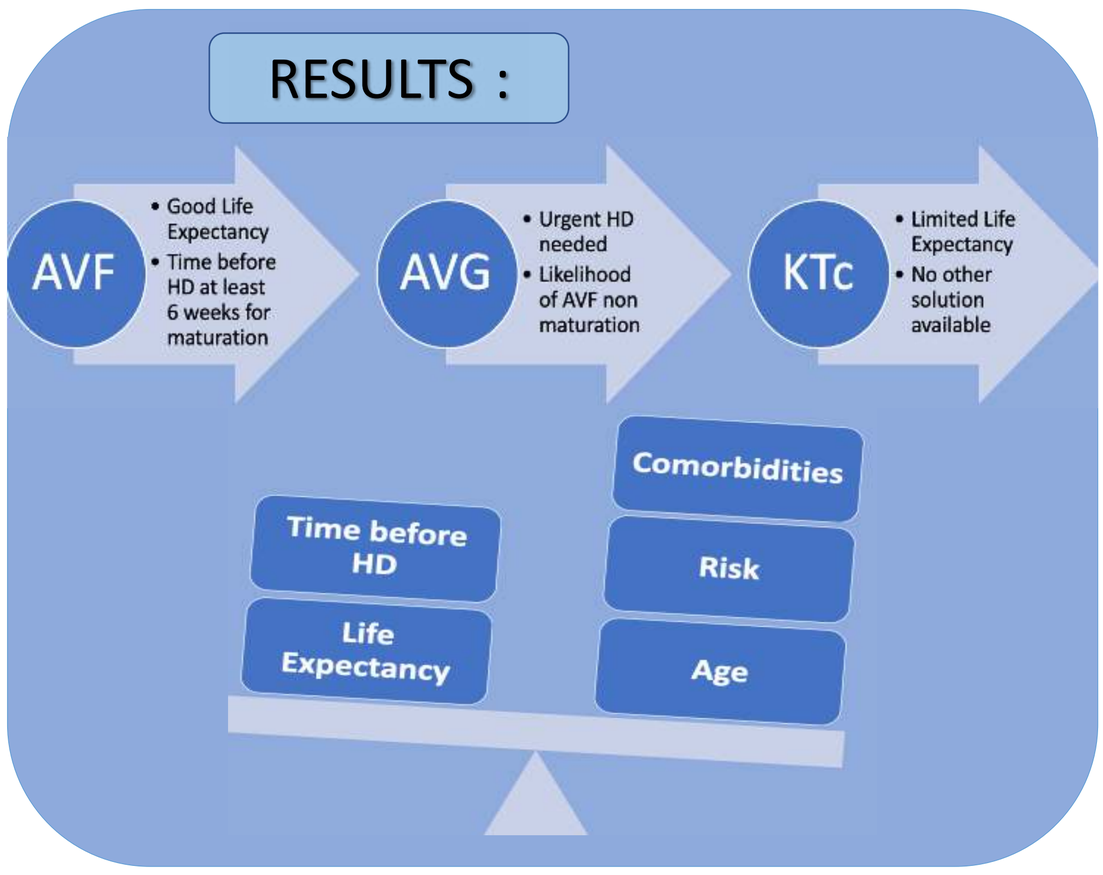
The co-morbidities associated with IRCt in the elderly (diabetes, atherosclerosis) make the creation of vascular approaches more difficult and the number of AVFs is decreasing. Malfunctions in vascular access to dialysis remain a major source of morbidity and are the second leading cause of cardiovascular disease for patients with CKD. (Cui et al., 2016)

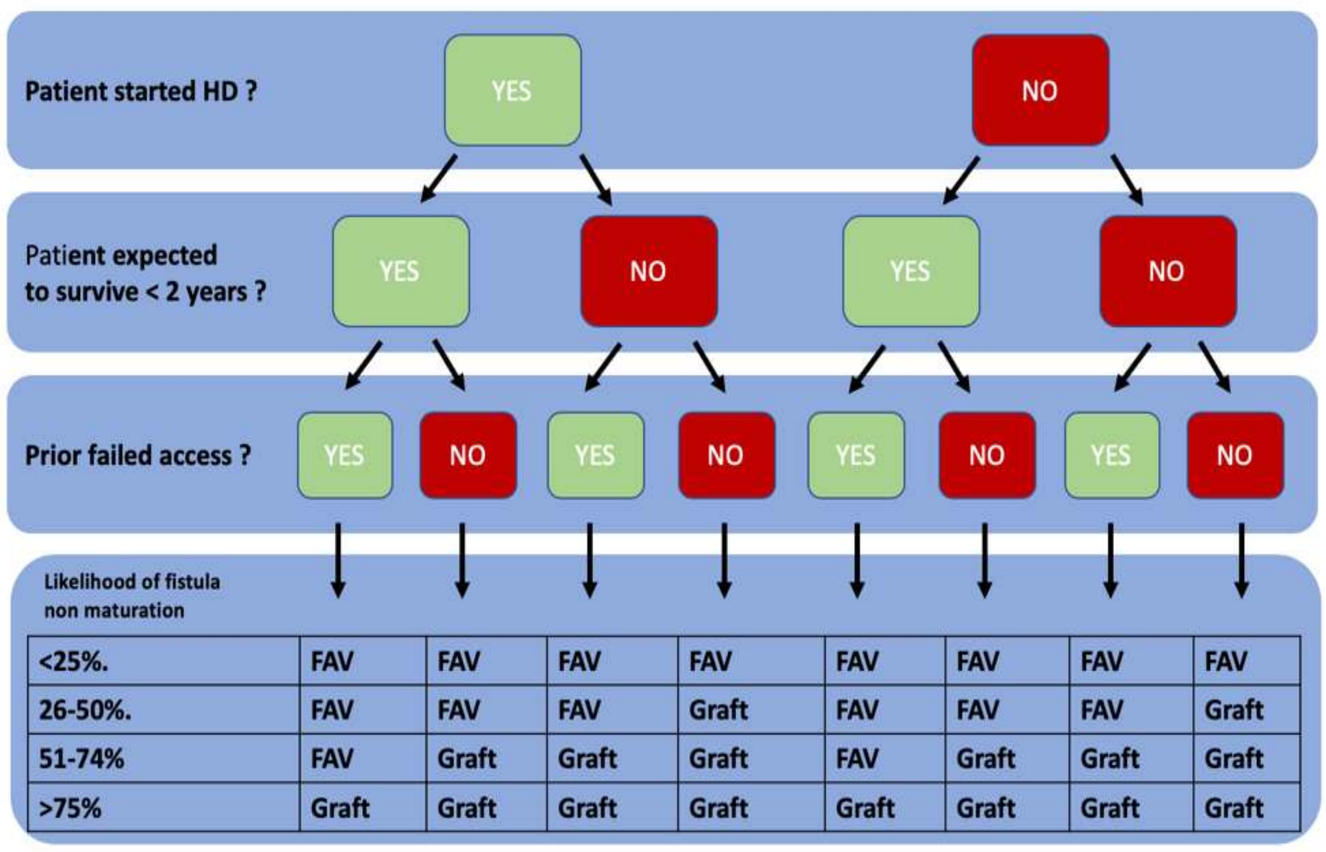
The purpose of the study is to review the literature and find a way to easily decide **which approach is preferred in the elderly,** with end-stage renal failure (IRCt). Several vascular approaches exist, the central catheter (KTc), arteriovenous fistula (AVF) and arteriovenous prosthetic vascular graft (AVG) and they all guarantee efficient hemodialysis but with different risk.

METHOD :

A literature search was conducted in the **Google scholar database** in English, retaining only **post-2015 publications**. The key words **"vascular access" AND "hemodialysis" AND "elderly"** were used in all relevant combinations. Publication that did not speak about the elderly, or vascular access for hemodialysis were excluded after evaluation. Moreover, "Non-European publications" were excluded too. A critical reading was done using Critical Appraisal Skills Program (CASP) tool available online. **Four publications have been selected,** appropriately framing my research question. We would focus the work on the European Good Practice Guide for vascular hemodialysis which is the gold standard.

RESULTS :





<25%.	FAV	FAV	FAV	FAV	FAV	FAV	FAV	FAV
26-50%.	FAV	FAV	FAV	Graft	FAV	FAV	FAV	Graft
51-74%	FAV	Graft	Graft	Graft	FAV	Graft	Graft	Graft
>75%	Graft	Graft	Graft	Graft	Graft	Graft	Graft	Graft

CONCLUSION :

For very elderly patients with limited life expectancy, KTc dialysis may be an acceptable option, but such a strategy is not suitable for a patient whose age may give him hope for many more years to live. (Tordoir et al., 2015)

Younger patients with acceptable risk factors should preferably receive, if necessary, an AVF or AVG according to the "Tordoir et al." algorithm coupled with a temporary KTc.

Further studies must be conducted to define the « standard of care » for elderly in the rest of the world and not only in Europe.

REFERENCE :