

# Validation of the Clinical Frailty Score (CFS) in French language

**PAUL ABRAHAM** (✉ [paul.abraham@unige.ch](mailto:paul.abraham@unige.ch))

Universite de Geneve <https://orcid.org/0000-0002-3914-4242>

**Delphine S. COURVOISIER**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Cedric ANNWEILER**

Centre Hospitalier Universitaire d'Angers

**Cliff LENOIR**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Thomas MILLIEN**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Francoise DALMAZ**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Hans FLATTEN**

Haukeland Universitetssjukehus

**Rui MORENO**

Hospital San Jose

**Steffen CHRISTENSEN**

Aarhus Universitetshospital

**Dylan De Lange**

University Medical Center, University Utrecht

**Bertrand GUIDET**

Assistance Publique - Hopitaux de Paris

**Karim Bendjelid**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Bernhard WALDER**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

**Bernardo BOLLEN PINTO**

Hopitaux Universitaires de Geneve Site Cluse-Roseiraie

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# Abstract

**Background** Very old critical ill patients are a rapid expanding group. To better understand the magnitude of the challenges involved in intensive care practice for an ageing population and discuss a rational allocation of resources, healthcare practitioners need a reliable evaluation of frailty. In order to promote the adequate use of the Clinical Frailty Scale (CFS) in a wider panel of countries, we aimed to develop, validate and characterise a French (FR) version from the originale English (EN) CFS. **Methods** We included participants recruited prospectively for the observational “The very old intensive care patient: A multinational prospective observation study” (VIP Study) at Geneva University Hospitals (FR speaking hospital). A FR version of the CFS was obtained by translation (EN->FR) and back translation (FR->EN). The final CFS-FR was then evaluated twice on the same participants with at least a 2-week interval by FR-speaking doctors and nurses. **Results** Inter-rater reliability was 0.87 (95%CI: 0.76-0.93) between doctors for the original CFS version and 0.76 (95%CI: 0.57-0.87) between nurses for the FR version. Inter-rater variability between doctor and nurse was 0.75 (95%CI: 0.56-0.87) for the original version, and 0.73 (95%CI: 0.52-0.85) for the FR version. Test-retest (stability) with the original vs the FR version was 0.86 (95%CI: 0.72-0.93) for doctors and 0.87 (95%CI: 0.76-0.93) for nurses. Differences between the evaluations of the CFS-EN and CSF-FR were not different from 0, with a mean difference of 0.06 (95%CI -0.24, 0.36) for the EN version and -0.03 (95%CI -0.47, 0.41) for the FR version. Average original version ratings were slightly lower than FR version ratings, though this difference did not reach significance: -0.29 (95%CI -0.54, 0.04). **Conclusion** In this prospective cohort of very old intensive care participants we developed and tested the basic psychometric properties (internal consistency, reproducibility) of a French version of the CFS. This manuscript provides clinically meaningful psychometric properties that have not been previously reported in any other language, including in the original EN version. The French cultural adaptation of this CFS has adequate psychometric properties for doctors or nurses to evaluate frailty in very old intensive care patients.

## Introduction

As Europeans continue to experience increasing lifespans, surgical and perioperative care for the old (> 65) and very old (> 80 years) patients has become commonplace, and is expected to continue to increase in volume and complexity in future decades. Advanced age, as a risk factor in surgery, is the complex combination of an increased probability of comorbidities and “frailty”. Frailty is an insufficiently understood decline in physiological reserve and resilience that may be related to energy production, energy utilization and defective repair mechanisms (1). Frailty is strongly associated with increased mortality after intensive care (ICU) admission, even when controlling for chronological age and other risk factors (2).

To better understand the magnitude of the challenges involved in intensive care practice for an ageing population and discuss a rational allocation of resources, healthcare practitioners need a reliable evaluation of frailty (3). There are multiple instruments to evaluate frailty with a diverse range of complexity, from the 70 items Frailty Index (FI) (4) to the more feasible clinical frailty scale (CFS)(5). The

latter, an ordinal 9-point visual scale in which the assessor makes decisions about the degree of frailty from clinical data, is well correlated with the FI ( $r = 0.80$ ), but much easier to conduct (5). The score ranges from very fit (CFS = 1) to very severely frail (CFS = 8) and terminally ill (CFS = 9) (Figure 1). Frailty is usually defined as CFS > 4 (6).

Frailty assessment using tools such as the CFS should be part of the standard multimodal evaluation routinely performed in older adults (5). However, after a literature search we were only able to identify the original English (EN) version of the CFS validation, thereby limiting its use by clinicians from other native languages. The use of the EN version or a non-validated translation of the CFS by healthcare personnel can result in different assessments and contribute to biases. Items could be answered differently because of differences in translation or culture instead of differences in actual patients' status, which can lead to inadequate scoring of frailty. Therefore, in order to promote the adequate use of this scale in a wider panel of countries, we aimed to develop, validate and characterise a French (FR) version of the CFS.

## Methods

We included participants recruited prospectively for the observational "The very old intensive care patient: A multinational prospective observation study" (VIP Study) (3) in the Intensive Care and Peri-Interventional Intermediate Care Units at Geneva University Hospitals (FR speaking hospital), between January and July 2017. The study was approved by the Geneva Regional Ethics Committee (Commission cantonale d'éthique de la recherche de Genève, CCER: 2016-01773, President: Professor Bernard Hirschel) that waived the need for informed consent. Observational data were collected according to international ethics standards conforming to the Declaration of Helsinki (7).

### Obtaining a French version for testing

The translation from EN to FR was made in 4 steps by 4 clinicians (2 doctors and 2 nurses) with C2 (Europass) level of both languages, whose native language is FR. The text was then back-translated into EN by 2 independent clinicians (doctor and nurse) with the same language skills whose native language was EN. They were blinded to the original EN version. All translators were aware of the study design.

The original EN (CFS-EN) and EN back-translated versions were then compared qualitatively. Differences or incoherence between the two versions (CFS EN-original and EN-back-translated) were resolved by agreement in order to improve the French translated version.

The FR version was then further assessed by 5 Healthcare workers whose native language is French (nurses and doctors) working in the Geneva intensive or intermediate care units. Their feedback was used to further modify the scale and obtain the definite FR translated version (CFS-FR).

### Characterizing and validating the FR-final version

The CFS was evaluated twice on the same participants with at least a 2-week interval. Evaluators were either of the same profession (nurse or physician) or of differing profession, to assess interjudge

agreement within and between professions. The CSF was also assessed twice by the same evaluators, to evaluate test-retest reliability. Furthermore, the scale used was either in the same language or of differing language, to assess whether the ratings were similar with the French, compared to the English version of the scale. Doctors evaluated the English version twice and nurses evaluated the French version twice. Evaluators were blinded to each other's evaluation.

Criterion validity was assessed by examining the relation of CFS EN and CFS-FR with mortality at 30-days after ICU admission, using Wilcoxon rank sum test.

Interjudge reliability and test-retest reliability were assessed using intraclass correlation (ICC) (1,1) and Bland and Altman plot. ICC inter-rater agreement measures were considered poor - Less than 0.40, fair - Between 0.40 and 0.59, good - Between 0.60 and 0.74, excellent - Between 0.75 and 1.00 (8).

## Results

Of the 40 participants recruited to the VIP1 study, the CFS evaluation was performed in 34 participants. In 6 (15%) participants, one or more operators were not able to provide a score due to insufficient data on participant health status prior to ICU admission. These 6 participants were excluded from further analysis. Mortality follow up was completed for all participants. Participants were mostly female (57%) and were on average 84.1 years old.

Inter-rater reliability was 0.87 (95%CI: 0.76-0.93) between doctors for the EN version (Figure 1), and 0.76 (95%CI: 0.57-0.87) between nurses for the FR version (Figure 2). Inter-rater variability between doctor and nurse was 0.75 (95%CI: 0.56-0.87) for the EN version, and 0.73 (95%CI: 0.52-0.85) for the FR version.

Test-retest (stability) with the EN vs the FR version was 0.86 (95%CI: 0.72-0.93) for doctors and 0.87 (95%CI: 0.76-0.93) for nurses.

Differences between the evaluations of the CFS-EN and CSF-FR were not different from 0, with a mean difference of 0.06 (95%CI -0.24, 0.36) for the EN version and -0.03 (95%CI -0.47, 0.41) for the FR version (Figure 3A, 3B). Agreement between the FR and the EN version for doctors was similar (Figure 3C). Average English version ratings were slightly lower than French version ratings, though this difference did not reach significance: -0.29 (95%CI -0.54, 0.04).

There were 15 deaths within 30-days of ICU admission. There were no significant differences in the CFS scores between participants who died within 30 days and participants who survived for either the EN (median survived: 4.7, median died: 4.0,  $p=0.52$ ) or FR (median survived: 4.7, median died: 4.5,  $p=0.56$ ) versions.

## Discussion

Overall, the EN and FR versions of the CFS exhibited good to excellent interjudge reliability, between doctors, between nurses, and to a lesser extent between nurses and doctors (8). The test retest of either the FR or the EN versions showed a good stability. Bland and Altman representation showed a good agreement between doctors (see Figure 3A).

Only 2 measures differed by more than 2 points with the CFS-EN scale performed by 2 independent doctors. Agreement between nurses with the FR version was fair (see figure 3B). Moreover, agreement between the FR and the EN versions for Doctors seemed strong enough to validate this EN-to-FR translation in clinical practice (see figure 3C).

As expected, the CFS scores were slightly higher in participants who died than in those who survived, though significance could not be achieved in this small cohort.

This study has some limitations. This is a report of a simple study using a standard forward-back translation method to develop and test a French version of an English questionnaire. The characterization and validation the FR-final version was performed in a relatively small number of participants, as this was a convenience sample using patients enrolled in the larger VIP1 study in Geneva University Hospitals. However, our sample size of 40 patients would allow us to detect an ICC of 0.75 with a half-confidence interval width of 0.25. In 6 patients one or more operators were not able to provide a score due to insufficient data, thus raising the possibility of selection bias. Importantly, all values from the CFS except 9 are represented in the sample; hence in our opinion it is unlikely that the missing patients have an important influence in the validation study considering the range of analyses performed.

## **Conclusion**

In this prospective cohort of very old intensive care participants we developed and tested the basic psychometric properties (internal consistency, reproducibility) of a French version of the CFS. This manuscript provides clinically meaningful psychometric properties that have not been previously reported in any other language, including in the original EN version (5). The French cultural adaptation of this CFS has adequate psychometric properties for doctors or nurses to evaluate frailty in very old intensive care patients.

## **List Of Abbreviations**

|            |                               |
|------------|-------------------------------|
| <i>CI</i>  | <i>Confidence Interval</i>    |
| <i>CFS</i> | <i>Clinical frailty Scale</i> |
| <i>EN</i>  | <i>English</i>                |
| <i>FI</i>  | <i>Frailty Index</i>          |
| <i>FR</i>  | <i>French</i>                 |
| <i>ICC</i> | <i>Intraclass correlation</i> |
| <i>ICU</i> | <i>Intensive care unit</i>    |

## Declarations

### Ethics approval and consent to participate

The study was approved by the Geneva Regional Ethics Committee (Commission cantonale d'éthique de la recherche de Genève, CCER: 2016-01773, President: Professor Bernard Hirschel) that waived the need for informed consent. Observational data were collected according to international ethics standards conforming to the Declaration of Helsinki

### Consent for publication

"Not applicable"

### Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request

### Competing interests

"The authors declare that they have no competing interests"

### Funding

"Not applicable"

### Authors' contributions

PA DC and BP recorded analyzed and interpreted the participant data. DC gave methodology, statistical support and analysis, PA, BP, CL, TM, FD performed the forward and back-translation methodology. CA, KB, BW were major contributors in writing the manuscript. HF RM SC DDL BG gave insightfull comments and critical review of the manuscript. All authors read and approved the final manuscript."

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“Not applicable”

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## Figures



Figure 1

Clinical Frailty Scale, Original EN Version (CFS-EN-original). Permission to use the CSF was granted from Dalhousie University, Ca. May 15, 2017.

## Score de Fragilité Clinique



**1 Très en forme** - Personnes qui sont robustes, actives, énergiques et motivées. Ces personnes font de l'exercice régulièrement. Ils sont parmi les plus en forme de leur âge.



**2 Bien** - Personnes qui ne présentent **aucun symptôme de maladie active** mais sont moins en forme que la catégorie 1. Font souvent, des exercices ou sont très **actives par période**. (par exemple des variations saisonnières).



**3 Assez bien** - Personnes dont les **problèmes médicaux sont bien contrôlés**, mais ne sont **pas régulièrement actives** au-delà de la marche quotidienne.



**4 Vulnérable** - **Sans être dépendantes** des autres pour l'aide quotidienne, souvent leurs **symptômes limitent leurs activités**. Une plainte fréquente est d'être ralentie et/ou d'être fatiguée pendant la journée.



**5 Légèrement fragile** - Personnes qui ont souvent un **ralentissement plus évident**, et ont besoin d'aide dans les **activités d'ordre élevé de la vie quotidienne** (finances, transport, grosses tâches ménagères, médicaments). Généralement, la fragilité légère empêche progressivement de faire les courses, de marcher seul dehors, de préparer les repas et de faire le ménage.



**6 Modérément fragile** - Personnes qui ont besoin d'aide pour **toutes les activités à l'extérieur** et pour l'**entretien de la maison**. A l'intérieur, elles ont souvent des problèmes pour monter/descendre les escaliers, ont besoin d'aide **pour prendre un bain** et pourraient avoir besoin d'une aide minimale (être à côté) pour s'habiller.



**7 Sévèrement fragile** - **Totalement dépendantes pour les soins personnels**, quelle que soit la cause (physique ou cognitive). Malgré tout, elles semblent stables et n'ont pas un risque élevé de décéder (dans les prochains 6 mois).



**8 Très sévèrement fragile** - Totalement dépendantes, la fin de vie approche. Typiquement, elles ne pourraient pas récupérer même d'une maladie mineure/ maladie légère.



**9 En phase terminale** - Approchant la fin de vie. Cette catégorie concerne les personnes ayant une **espérance de vie < 6 mois**, qui **sinon ne sont pas fragiles de façon évidente**.

### Classification de la fragilité des personnes atteintes de démence.

Le degré de fragilité correspond au degré de démence.

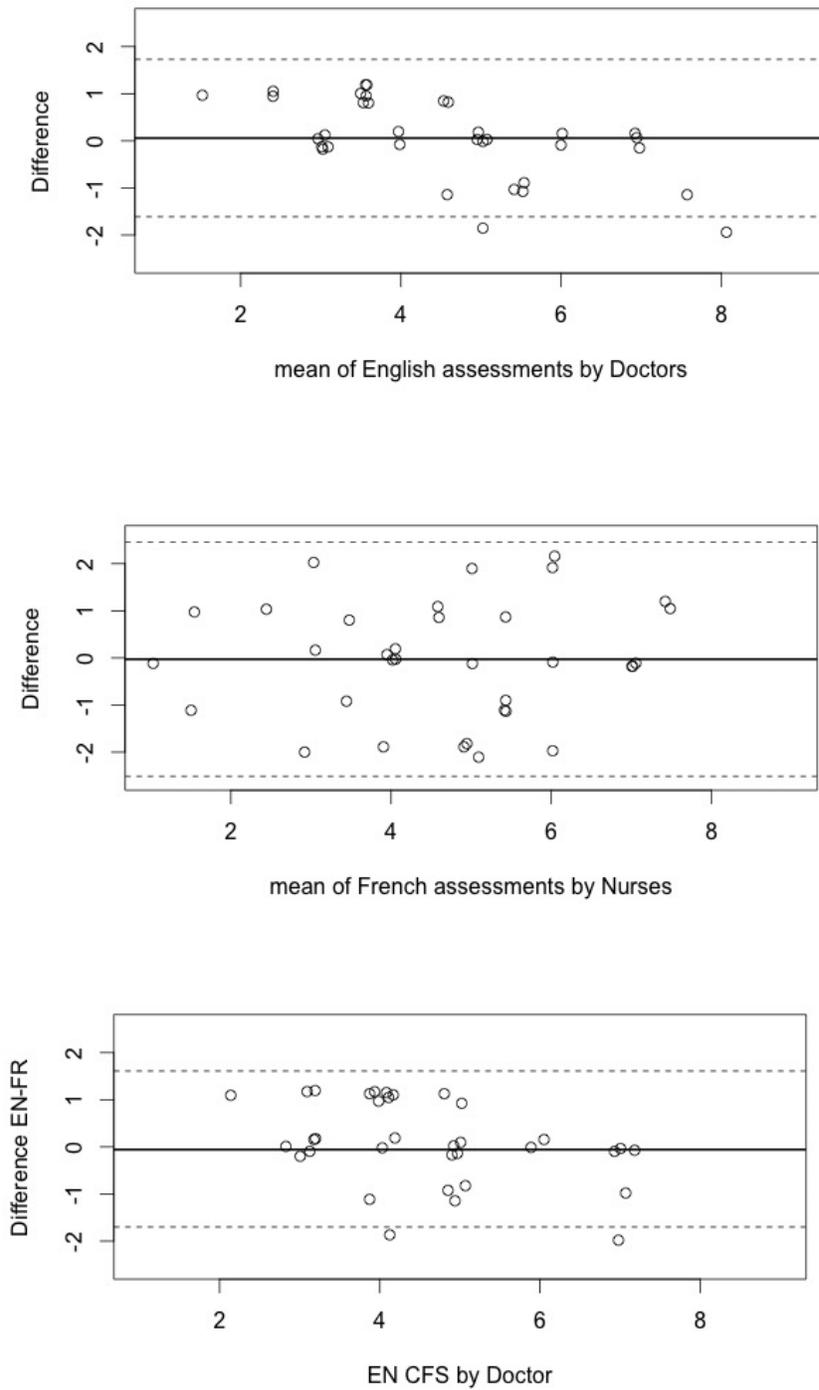
Les **symptômes courants de démence légère** inclus : l'oubli des détails d'un événement récent mais le souvenir que l'événement a eu lieu, la répétition de la même question / histoire et le retrait social.

Dans la **démence modérée**, la mémoire récente est très altérée, même si les personnes peuvent bien se rappeler des événements de leur vie passée. Ils peuvent faire des soins personnels avec incitation.

Dans la **démence grave**, elles ne peuvent pas faire les soins personnels sans aide.

Figure 2

Clinical Frailty Scale, French translated final version (CFS-FR). Permission to use the CSF was granted from Dalhousie University, Ca. May 15, 2017.



**Figure 3**

Bland et Altman plot for CFS scoring between 2 independent Doctors with CFS-EN (3A), between 2 independent Nurses with CFS-FR (3B), with the EN then FR version by Doctor (3C).