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To cite this version:

Clement Baumgarten. Personal and psychosocial factors of burnout: a survey within the French neurosurgical community. Human health and pathology. 2020. dumas-02987106

HAL Id: dumas-02987106

https://dumas.ccsd.cnrs.fr/dumas-02987106v1

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Année 2020

Facteurs Personnels et Psychosociaux du Burnout : Questionnaire au sein de la Communauté Neurochirurgicale Française

THÈSE
PRÉSENTÉE POUR L'OBTENTION DU TITRE DE DOCTEUR EN MÉDECINE

DIPLÔME D'ÉTAT

Clément Baumgarten

[Données à caractère personnel]

THÈSE SOUTENUE PUBLIQUEMENT AU CONGRES DE LA SOCIETE FRANCAISE DE NEUROCHIRURGIE DE SAINT MALO

Le : 14/10/2020

DEVANT LE JURY COMPOSÉ DE

Président du jury :

M. le Pr Emmanuel Gay

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Clément Baumgarten

Facteurs Personnels et Psychosociaux du Burnout: Questionnaire au sein de la Communauté Neurochirurgicale Française

RÉSUMÉ :

Objectif : La communauté neurochirurgicale est particulièrement exposée au burnout. Nous avons décrit la prévalence et les facteurs associés au burnout des internes et des neurochirurgiens à l'aide d'échelles psychologiques académiquement validées.

Méthodes : Un questionnaire national a été envoyé à 141 internes et 432 neurochirurgiens entre avril et juillet 2019. Le burnout a été diagnostiqué en utilisant le questionnaire de burnout de Maslach. Le questionnaire comprenait des données démographiques et plusieurs échelles psychologiques validées. Une analyse de régression pas-à-pas a été utilisée pour déterminer les facteurs associés au burnout.

Résultats : Le taux de réponse était respectivement de 100% et 23,6% pour les internes et neurochirurgiens. La prévalence du burnout au sein de la communauté neurochirurgicale française était de 49%. Il n'y avait pas de différence significative entre internes et neurochirurgiens. Deux catégories de facteurs étaient associées aux dimensions principales du burnout lors de l'analyse de régression : la personnalité et des facteurs associés à l'exercice neurochirurgical. Les personnalités névrotiques étaient négativement associées au burnout alors que l'agréabilité était protectrice. Les profils addicts au travail avec un travail excessif et absorbés étaient négativement associés. Les facteurs liés à l'exercice neurochirurgical comme le conflit entre le travail et la famille, un déséquilibre du ratio entre les efforts et la récompense, le temps de travail étaient négativement associés. Le plaisir au travail était protecteur.

Conclusion : la prévalence du burnout est haute parmi la communauté neurochirurgicale française. Des modèles prédictifs peuvent être utilisés pour identifier et prévenir le burnout parmi les profils à risques.

MOTS CLÉS : Burnout, Santé au travail, Modélisation, Prévention, Neurochirurgie

FILIÈRE: NEUROCHIRURGIE

PLOS ONE

RESEARCH ARTICLE

Personal and psychosocial factors of burnout: A survey within the French neurosurgical community

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Citation: Baumgarten C, Michinov E, Rouxel G, Bonneterre V, Gay E, Roche P-H (2020) Personal and psychosocial factors of burnout: A survey within the French neurosurgical community. PLoS ONE 15(5): e0233137. https://doi.org/10.1371/journal.pone.0233137

Editor: Sergio A. Useche, Universitat de Valencia, SPAIN

Received: January 9, 2020

Accepted: April 28, 2020

Published: May 29, 2020

Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: https://doi.org/10.1371/journal.pone.0233137

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Data Availability Statement: All files are available from OSF: https://osf.io/3h5a7.

Funding: The authors received no specific funding for this work.

Abstract

Object

The neurosurgical community is particularly exposed to burnout. The objectives of this study were to report the prevalence and associated factors of burnout within the French neurosurgical community using validated academic and psychologic scales.

Methods

A national survey was sent to 141 French residents and 432 neurosurgeons between April and July 2019. Burnout was surveyed using the Maslach burnout inventory. The survey included demographic data and several academic psychologic scales. A stepwise multiple regression was used to determine factors that are associated with burnout scores.

Results

The response rate was 100% and 23.6% for residents and neurosurgeons, respectively. Prevalence of burnout within the French neurosurgical community was 49%. There were no significant differences between residents and neurosurgeons. Two categories of factors were associated with the main dimensions of burnout during the stepwise multiple regression: personality and factors related with neurosurgical practice. Personality types such as neuroticism were negatively associated with burnout while agreeableness was protective. Work addictive profile with excessive work and absorption at work were negatively associated. Factors associated with neurosurgical practice such as conflict of work into family life, unbalanced effort to reward ratio, work duration were negatively associated. Pleasure at work was protective.

Conclusion

Prevalence of burnout is high among French neurosurgeons. Predictive models can be used to identify and prevent burnout among profiles at risk.

Competing interests: The authors have declared that no competing interests exist.

Introduction

Workers in many occupational sectors are susceptible to creating a situational context that leads to burnout symptoms [1]. Burnout is a syndrome defined by emotional exhaustion (EE), feelings of depersonalization (DP) and a lack of personal accomplishment (PA) in relation to professional activity [2]. Studies have demonstrated that chronic stressors could increase burnout arise from an imbalance between job demands and job resources [3]. Burnout is associated with several comorbid factors such as chronic fatigue, addictive behaviors, substance use and suicidal ideation, and different health complains [4]. Studies suggest that burnout has a negative impact on psychological and physical health of workers, but also on their interpersonal relationships and job environment. For healthcare professionals and physicians, burnout affects the quality of patients' care through increased medical errors, decreased empathy and decreased productivity at work [5]. Thus, efforts to identify and prevent burnout should lead to better health at work and better quality of care. The prevalence of burnout within different surgical specialties is about 40% [6], and for certain subspecialties such as neurosurgery, the prevalence of burnout is estimated to be 27% to 56.7% [7–9]. Neurosurgery is a demanding specialty in medicine. Work hours are among the longest [10] as the number of night shifts, and has a heavy medicolegal burden due to high malpractice risk [11].

In different American studies [7,8], prevalence and associated factors of burnout in residents and neurosurgeons have been reported. Surprisingly, Shakir et al. [7] reported a burnout rate of 36.5%, Attenello et al. [8] a 67% rate for residents, with an association with inadequate operative exposure, and social stressors while mentorship was a protective factor. McAbee et al. [9] reported for board certified neurosurgeons a 56.7% rate with an association with an unbalanced work and family life and anxiety over future earnings and health care reform. Still, burnout prevalence may differ depending on the health care system and further studies are needed to understand such a complex phenomenon. Moreover, psychological profiles and validated work-related academic scales have never been used when studying burnout in neurosurgery.

In this paper, we present the results of a nationwide survey targeting the entire neurosurgical community in France: residents and neurosurgeons, including those in private practice. The objectives of this work were to report the prevalence and associated factors of burnout within the French neurosurgical community using validated academic and psychologic scales.

Material and methods

Participants

At the time of the survey there were 587 board certified neurosurgeons. 354 worked in a public hospital, 139 were exclusively in private practice and 94 worked in both. There were 141 residents in the accredited French residency program. Contact information was obtained from the French Society of Neurosurgery. 141 and 432 email addresses were available for residents and neurosurgeons, respectively. An email with an anonymized link to the study survey was sent to the population mentioned above. For residents, the survey was part of the national days of neurosurgery teaching. The content of the mail is provided in the supplementary material (S1 Appendix). The mail was sent in April 2019 and two follow up requests were sent in May and June 2019. Responses were collected in July 2019. Survey responses were anonymous. Completing all of the questions was mandatory, so there was no missing data. Written consent was not required due to the non-mandatory nature of this questionnaire. The questionnaire was declared to the CNIL, the French Commission of Informatics and Liberty, (n° 2211947 v 0). The questionnaire was approved by the ethics committee (ref. IRB00011687).

Questionnaire

The questionnaire included several work scales and psychologic tests: the Siegrist effort-reward scale [12]; the French DUWAS scale [13] to explore addiction at work; a two sided work-family conflict scale [14]; the work-related flow inventory [15]; the big five inventory for personality traits [16]; the Maslach Burnout Inventory scale [2] and several demographic data sets.

All definitions were based on the MBI scale [2]. Burnout was defined as having high score for emotional exhaustion and/or depersonalization in the MBI. High EE was defined by an EE score $\geq$30. High DP was defined by a score higher than 12. Low PA was defined by a score lower than 33.

Statistical analysis

Demographic information was compiled from a series of descriptive statistics. Overall burnout rate and differences in MBI scores, depending on gender and hierarchical status, were reported. Prior to any analysis, we conducted a Cronbach's alpha analysis to explore the reliability of each questionnaire's items. Item 20 of the overinvestment scale as well as item 35 et 41 of the BFI test were excluded. Cronbach's alphas are reported in S2 Table. Gender and hierarchical status comparison of severe burnout was done using a chi-square test for association. All expected cell frequencies were greater than five. An independent-sample t-test was run to determine if there were differences in MBI scores between genders. An independent-samples test was also run for worked hours and number of night shifts comparison depending on resident and neurosurgeons. A one-way ANOVA was run to determine if there were differences in MBI score between professional status (i.e. fellows, professor. . .). Prior assumptions were checked when one-way ANOVA was used for mean comparisons between multiples groups. There were no outliers, as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$); and there was homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p = >0.05$). A Tukey post hoc test was used when the result of the one-way ANOVA showed significance.

We conducted a stepwise multiple regression to determine factors that are associated with burnout scores. The list of entered factors is available in S2 Table. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of respectively 2.02, 1.97, 2.045 for EE, DP and PA scores. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and values for Cook's distance above 1. There assumption of normality was met, as assessed by Q-Q Plot. All data were analyzed using the SPSS 24.0 statistical software (IBM, Armonk, New York).

Results

141 residents (100%) completed the survey as it was part of national days of teaching of neurosurgery in France. Of the 432 contacted neurosurgeons, 102 (23.6%) completed the survey. The demographic characteristics of the respondents are shown in Table 1. Thus, more than half of the population were residents (57.3%). In the overall population: 26.6% were women; 28% of the residents and 22% of the neurosurgeons.

Fig 1 represents the mean declared working time per week and number of night shifts of residents and neurosurgeons. There was a significant difference depending on hierarchical status in working time: mean working time n = 69.65h and n = 57.08h for residents and

Table 1. Demographic data.

Sex	n	%
Men	179	73.4
Women	64	26.6
Professional status		
Resident	141	58
1st year	26	10.6
2nd year	24	9.8
3rd year	23	9.3
4th year	31	12.6
5th year	37	15.04
Fellow	22	9.1
Attending neurosurgeon	31	12.8
Professor	21	8.6
Private practice	28	11.5
Children		
Yes	92	37.9
No	151	62.1
Marital status		
Single	79	32.5
Common law	72	29.6
Married	84	34.6
Divorced	8	3.3
Security rest		
Yes	77	30.9
No	90	36.6
It depends	79	32.5

https://doi.org/10.1371/journal.pone.0233137.t001

neurosurgeons, respectively ($p<0.001$). There was also a significant difference for the number of shifts with residents declaring the most shifts: n = 5.91 and n = 3.76 for residents and neurosurgeons, respectively ($p<0.001$).

Table 2 reports an overall burnout rate of 49% within the French neurosurgical community. This is a prevalence and reflects the burnout rate at the time of the study i.e. July 2019. A comparison of MBI scores is reported depending on gender and hierarchical status. There was no significant difference between gender and hierarchical status for severe burnout. There was only a significant difference between residents and neurosurgeons for DP ($p = 0.002$). There was a significant difference depending on hierarchical status for depersonalization according to the one-way ANOVA test. However, there were conflicting results with a Tukey post hoc test that did not show significant differences between groups.

Table 3 reports the stepwise multiple regression analysis demonstrating the associations between burnout categories and several factors. Two types of variables are associated with burnout categories. Personality dimensions appear to be an independent variable with neurosurgical practice. Neuroticism was associated with EE. Agreeableness was a protective factor against depersonalization and has a positive impact on personal accomplishment. Openness to experience, extraversion and consciousness was associated with personal accomplishment. Fig 2 represents the mean BFI scores for each dimension within the French neurosurgical community. Neurosurgeons appear as introverted, conscientious, compassionate, inventive, and rather secure regarding the neuroticism dimension. There were variables related to neurosurgical practice: the conflict of work on family life has a negative impact on emotional exhaustion

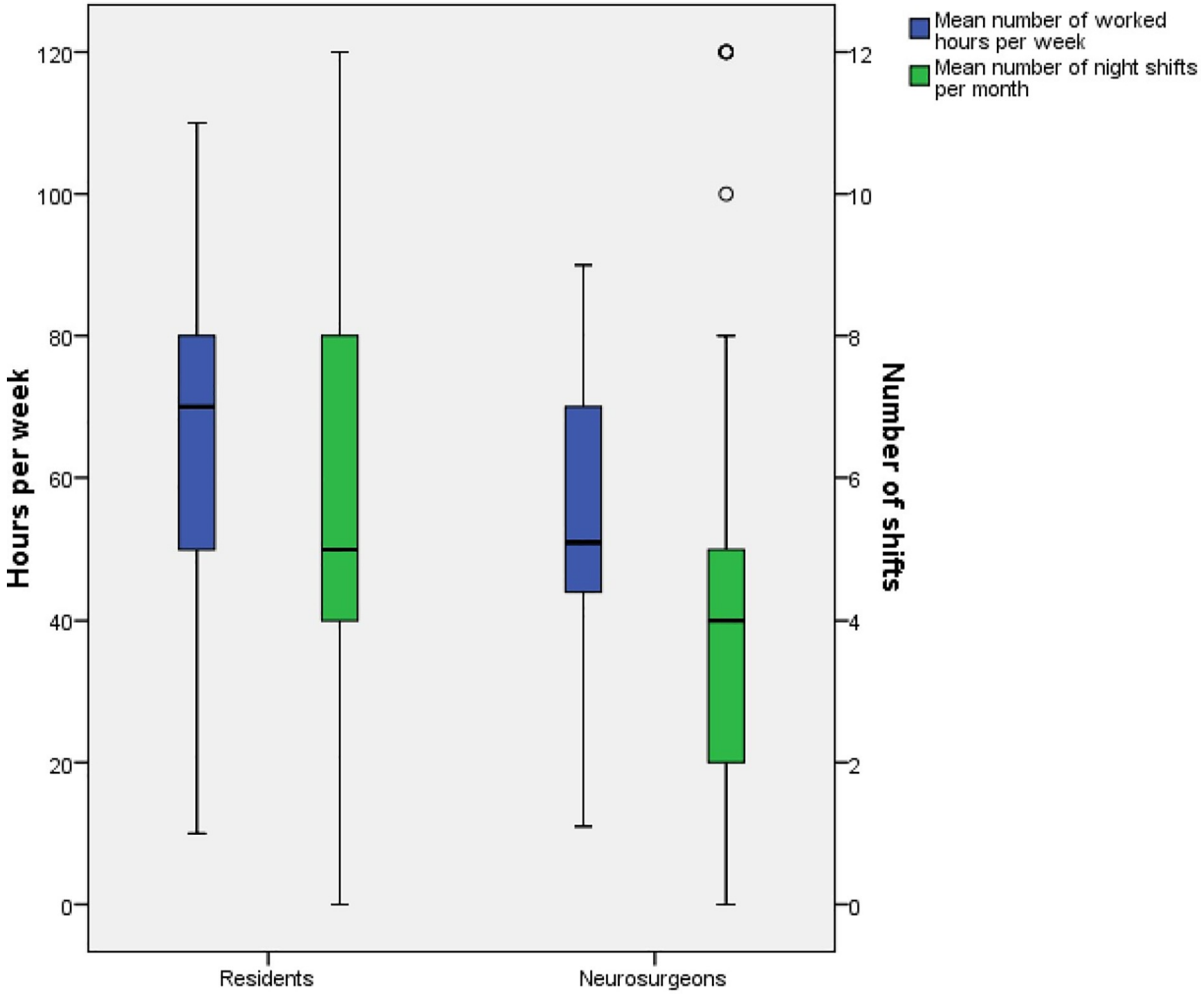

Fig 1. Worked hours per week and number of night shifts per month depending on hierarchical status.

https://doi.org/10.1371/journal.pone.0233137.g001

and depersonalization. Pleasure at work was negatively associated with EE and DP while it was positively associated with PA. Absorption at work has a negative association with EE. An unbalance effort/reward ratio has a negative association with EE but positive association with PA. Excessive work according to Duwas scale was associated with EE. Rise on hierarchical status has a positive association with DP. Finally, working hours have a negative association with EE. The univariates analysis and direction of each associated factors obtained during the stepwise multiple regression are represented in the S1 Fig.

Table 4 reports the suicidal thoughts and drug uses within the French neurosurgical community. Use of drugs and consultation of a psychiatrist were significantly associated with burnout. There was only a non-significant trend with suicidal thoughts.

Discussion

This study assessed burnout within the French neurosurgical community and explored associated factors. To our knowledge, this is the first study that assessed burnout rate of neurosurgeons and residents in neurosurgery at the same time and with the same variables, giving a full picture of a community. Overall burnout rate was 49% and no significant differences between

Table 2. Overall burnout rate and differences in MBI scores depending on gender and hierarchical status.

			Emotional exhaustion		Personal accomplishment		Depersonalization		Burnout Proportion
		N	Mean	(SD)	Mean	(SD)	Mean	(SD)	
Overall		243	23.84	11.01	33.04	8.2	10.41	6.21	49%
Gender									
Women		64	23.79	10.94	33.5	8.34	9.3	5.95	48.4%
Men		179	23.84	10.07	32.88	8.16	10.79	6.28	49.2%
p-value			0.97		0.61		0.12		0.92
Professional status									
Residents		141	23.22	11.14	32.43	9.03	11.45	6.45	52.5%
Neurosurgeons		102	24.68	10.82	33.90	6.82	8.99	5.56	47.5%
p-value			0.31		0.32		**0.002**		0.24
	Fellows	22	25.78	10.47	33.27	4.89	10.04	6.34	54.5%
	Senior	31	26.81	11.57	32.48	7.53	8.09	5.56	48.4%
	Professor	21	24.14	10.24	36.24	5.81	7.81	4.64	38.1%
	Private practice	28	21.89	10.59	34.21	7.78	9.14	5.75	35.7%
	p-value		0.37		0.32		**0.03**		0.51

https://doi.org/10.1371/journal.pone.0233137.t002

hierarchical status were found. Two types of variables were found: 1) the impact of personality as an independent factor with neurosurgical practice and 2) factors associated with neurosurgical practice measured with validated academic scales. In the following sections, we discuss

Table 3. Stepwise multiple regression analyses to test the relative contributions of different predictors on burnout dimensions.

	β	t	p	R^2	F	p
Emotional exhaustion				.524	36.47	< **.001**
Big Five Neuroticism dimension	.22	4.46	< .001			
Work to family conflict	.31	6.02	< .001			
Effort/Reward Ratio	.18	3.72	< .001			
Pleasure at Work—Flow	-.30	-5.14	< .001			
Absorption at Work–Flow	.13	2.18	.03			
Excessive Work–Workaholism	.11	1.94	.054			
Work duration	.10	2.01	.046			
Depersonalization				.323	22.29	< **.001**
Big Five Agreeableness dimension	-.18	-3.17	.002			
Work to family conflict	.25	4.13	< .001			
Overinvestissment	.16	2.69	.008			
Pleasure at Work—Flow	-.25	-4.36	< .001			
Hierarchical Status	.26	4.68	< .001			
Personal accomplishment				.339	19.89	< **.001**
Big Five Agreeableness dimension	.26	4.44	< .001			
Big Five Openness dimension	.19	3.19	.002			
Big Five Extraversion dimension	.17	2.94	.004			
Big Five Consciousness dimension	.16	2.75	.006			
Pleasure at Work—Flow	.19	3.31	.001			
Effort/Reward Ratio	.15	2.64	.009			

Professional Status (coded 1 = Residents; 0 = Clinical practitioners in private and public sectors). Work duration = continuous variable.

https://doi.org/10.1371/journal.pone.0233137.t003

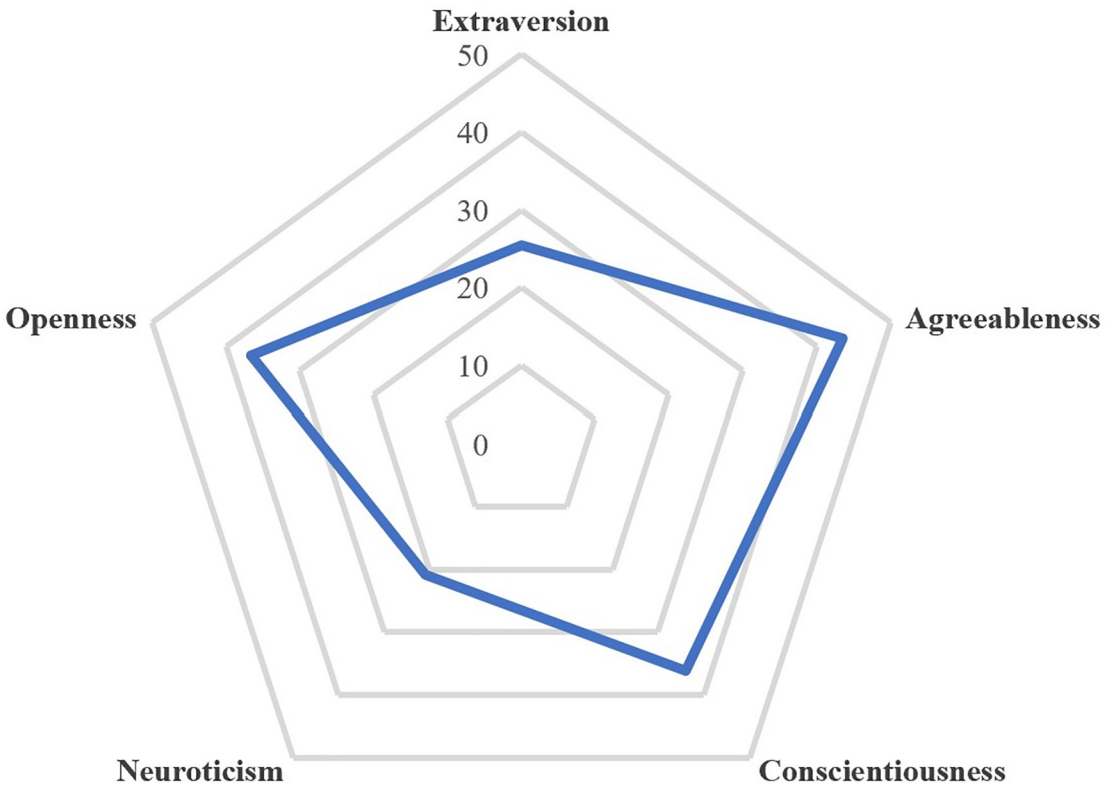

Fig 2. Big five personality traits mean scores within the French neurosurgical community.

https://doi.org/10.1371/journal.pone.0233137.g002

the results and the proposed multivariate model to predict and prevent burnout in neurosurgery.

Burnout rate and comparisons

Burnout has been largely described in the medical field [17] and even among surgical communities [18]. Little data exists in neurosurgery event though this is an extreme specialty in terms of working hours [10] and medicolegal burden [11]. American studies showed an overall burnout rate of 56.7% for neurosurgeons [9] and two studies reported either a 36.5% [7] and 67% [8] rate for residents. Keeping the same burnout definition, burnout among Lithuanian neurosurgeons [19] vary between 25.8–41.9%. In this study we reported an overall burnout rate of

Table 4. Association between suicidal thoughts, drug uses, psychological needs and burnout.

Suicidal thoughts	n	%	p-value
Never	173	70.3	
Rarely	61	24.8	
Often	5	12.3	
Yes, with intention to act	7	2.85	0.062
Psychiatry, psychology	22	8.9	**0.019**
Antidepressant	11	4.47	0.32
Sleeping pill	21	8.5	0.42
Drugs	15	6.1	**0.013**
Performance enhancer	8	3.3	0.52

https://doi.org/10.1371/journal.pone.0233137.t004

49% which is higher than the 29% rate in comparison with the most comprehensive and complete meta-analysis of French physicians [17] following the same burnout definition. As for surgeons, Campbell et al. [18] reported a 32% rate in a population of American surgeons.

As the female proportion is growing in neurosurgery [20] and some studies tend to demonstrate that females were more susceptible to burnout [21], we investigated if burnout rate differs between genders. In this study there was no significant difference between genders. There are 28% of women among residents and 22% among neurosurgeons. A growing percentage of women among neurosurgeons should not affect burnout rate in the years to come.

Although there was a trend of decreased burnout rate when one advanced in hierarchical status, no significant difference was shown in the analysis. Lack of power due to lower response rate among neurosurgeons can explain this tendency. There was no difference in the effort/reward ratio of residents and neurosurgeons (0.7). Hierarchical status was only associated with depersonalization in the stepwise multiple regression. The only variables that appear to be statistically different are shifts per month (5.91 vs 3.76: $p<0.001$) and working hours (69.65 vs 57.08 $p<0.001$) for residents and neurosurgeons, respectively. Data in the literature finds inadequate operative exposure, lack of opportunities for professional development, and dissatisfaction with colleagues are all common factors between residents and neurosurgeons [8,9]. Residents face problems like working hours, night shifts, social stressors and lack of mentorship [8]. As their careers advance, neurosurgeons face unbalance between work and life outside of the hospital and anxiety over future earnings and/or health care reform [9]. Our data suggests that burnout rate does not seem to vary during the career. From residency to retirement, physicians face different problems with potential negative impacts during the advancement of their career. Zoer et al. [22] drew similar conclusions when they studied associations between psychosocial workload and mental health complaints in different age groups in a railway company. Understanding those subtle differences is crucial to provide accurate interventions.

Impact of personality

Personality appears as an independent variable within neurosurgical practice. The stepwise multiple regression analysis showed a negative impact of the neuroticism factor for emotional exhaustion. Openness to experience, conscientiousness, extraversion and agreeableness was associated with personal accomplishment. Agreeableness was a protective factor against depersonalization. To our knowledge, this is the first study to explore personality in neurosurgery. Association between personality and burnout has been reported in several work domains [23,24] and also among physicians [25,26]. There are suggestions that surgeons are more likely to be associated with extraversion and openness to experience while pediatricians and family practitioners are more likely to correspond to higher neuroticism [27]. Though neurosurgery is more likely to be exposed to stress and medicolegal burden [11,28], personality traits seems to be protective against burnout in this specialty. In our sample, personality traits tend to show higher levels on agreeableness, openness to experience and conscientiousness and low levels on extraversion and neuroticism. Personality modification does not seem either ethical or desirable. Still, cognitive and psychosocial interventions [29,30] that reduce stress, and anxiety while increasing social support and self-esteem might reduce the complex impact of personality factors on burnout. Also, personality screening at the beginning of residency can be measured to follow personality traits that are more likely to develop burnout. This strategy has been adopted in other fields with high responsibilities and high levels of competence such as special forces in the army [31,32] or airline pilots [33].

Factors associated with neurosurgical practice

Work to family conflict is a well-documented association with burnout. Jensen et al. [34,35] rigorously demonstrated in a longitudinal study the reciprocal relationships between work to family conflict, emotional exhaustion and psychological health complaints in a population with a lot of business travels. In our study, work to family conflict was the first associated variable in both emotional exhaustion and depersonalization regression models. The results are in line with numerous other studies [36–38]. This is not surprising; neurosurgery is a specialty with night shifts, work hours are among the longest [10], there is some work schedule inflexibility and shiftwork is irregular. All of those factors are associated with work to family conflict [39]. According to the conclusion of Jensen et al, it is likely that today's organization in neurosurgery produces a vicious circle leading to burnout and its consequences. Better organization of continuity of care to clear regular family time may improve this factor.

While high score of absorption according to the WOLF of Bakker et al. [15] has a negative impact, work enjoyment is a protective factor against emotional exhaustion and depersonalization. Neurosurgeons seems to particularly enjoy operative exposure [9] or more broadly clinical work [19] while administrative tasks, which seem to take one-sixth of a physician's time [40], lower career satisfaction. Recruiting administrative assistants whose training time is not as long as that of a neurosurgeon could be a strategy to improve neurosurgeons' clinical productivity as well as improving health at work. Finally, according to Siegrist et al. [12], improvement in rebalancing the effort /reward ratio, which appeared as an independent factor of emotional exhaustion, may reduce burnout.

More modestly, working hours have a negative association. This seems especially true for residents (mean declared working time 69.65h per week) who work at least 20h more than the EU working time directive (48h per week). According to previous discussion, we did not explore the concept of quantity of work weighted by quality. There might be a shift of administrative burden from neurosurgeons to residents that needs to be explored to explain these results. The status of residents seems to expose to depersonalization while advancing during the career seems to protect from depersonalization.

Associations between burnout, suicidal thoughts and drug uses

Burnout as a syndrome does not have a particular impact but has been described in literature as associated with a negative impact for patient's care and the own physician's health [5,41]. Though it was not the main primary objective of the study we assessed the associations between burnout and health consequences in our studied population. Suicidal thoughts showed a trend that was not statistically significant. Psychiatry or psychologic consultation was associated as well as drug usage. Those results confirm previous findings, [42–45] and actions to prevent burnout may improve physicians' health in neurosurgery.

Limitations

There are some usual limitations regarding survey studies. There was a 100% answer rate for the residents because it was part of national teaching days. It was a common decision by the French national society of neurosurgery and the college of neurosurgery teachers to make it part of this pedagogic events. There were no significant outliers in the residents' responses after visual inspection of the boxplots. The neurosurgeons were harder to reach with a 23.6% response rate which is rather low in such studies but comparable to the answer rate of other neurosurgical surveys [8,9,46]. This rate was exposed to a selection bias, attending physicians are usually less involved in academic work and are under-represented in this study.

This was not the first study about burnout in neurosurgery. We chose to explore different variables associated with burnout to further understand the phenomenon. Previous studies identified mainly dichotomous variables such as operative exposure and binary feeling of unbalance work and family life [7–9,19]. In this study we used quantified validated scales that help to understand and explain previous results.

Survey studies cannot be exhaustive, and a longer questionnaire would have lowered the response rate. Neurosurgeons shares many well documented associated factors of burnout with other occupational groups. While we did not measure occupational stress in this study it is certainly a shared features, notably with lawyers [47] and non-medical occupational health staff [48]. Further studies are required for further comprehension of this complex phenomenon. Moreover, as it is a transversal study, we can only identify associations related to burnout. Further studies will address the causality between those variables and burnout.

Conclusion

We have reported the prevalence and factors associated with burnout within the French neurosurgical community from the residents to the professors. Burnout prevalence is high in comparison with physicians and even among surgeons. Two categories of factors were identified. Personality types have an independent association regarding neurosurgical practice. Still, inherent factors associated with neurosurgical practice such as conflict of work into family life, unbalanced effort/reward ratio and work duration exist. Thus, this study may identify two levers of action to prevent and reduce burnout. A preliminary screening of personality may be proposed for a closer follow-up during residency. Improvement of working conditions, division of tasks of continuity of care and a readjustment of the effort / reward ratio may lower burnout in neurosurgery.

A prospective follow-up of the French neurosurgical cohort may answer if those levers of action can be effective to improve health at work in neurosurgery.

Supporting information

S1 Appendix. Questionnaire.
(PDF)

S1 Table. Cronbach alphas. Alphas on the diagonal: [a] after elimination of item 20; [b]: after elimination of items 35 and 41.
(DOCX)

S2 Table. Variables entered during the stepwise multiple regression.
(DOCX)

S1 Fig. Univariate analysis of each associated factors with the main dimensions of burnout. Factors associated with emotional exhaustion: a, b, c, d, e, f, g. a: linear regression between emotional exhaustion and pleasure at work; b: linear regression between emotional exhaustion and neuroticism; b: linear regression between emotional exhaustion and work to family conflict; c: linear regression between emotional exhaustion and effort/reward ratio; d: linear regression between emotional exhaustion and pleasure at work; e: linear regression between emotional exhaustion and absorption at work; f: linear regression between emotional exhaustion and excessive work; g: linear regression between emotional exhaustion and work duration. Factors associated with depersonalization: h, i, j, k, l. h: linear regression between depersonalization and agreeableness; i: linear regression between depersonalization and work to family conflict; j: linear regression between depersonalization and overinvestment; k: linear regression between depersonalization and pleasure at work; l: linear regression between

depersonalization and hierarchical status. Factors associated with personal accomplishment: m, n, o, p, q, r. m: linear regression between personal accomplishment and agreeableness; n: linear regression between personal accomplishment and openness; o: linear regression between personal accomplishment and extraversion; p: linear regression between personal accomplishment and consciousness; q: linear regression between personal accomplishment and pleasure at work; r: linear regression between personal accomplishment and effort/reward ratio.
(TIFF)

Acknowledgments

We would like to thank Blake Fleck for revising the English style.

Portions of this work has been presented (oral communication, plenary) during the annual research meeting of the French National Academy, Paris, France, and has been awarded the "Risk Prevention Prize", the 22nd of November 2019.

Author Contributions

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THÈSE SOUTENUE PAR : Clément Baumgarten

TITRE :

FACTEURS PERSONNELS ET PSYCHOSOCIAUX DU BURNOUT : QUESTIONNAIRE AU SEIN DE LA COMMUNAUTE NEUROCHIRURGICALE FRANÇAISE

CONCLUSION :

La communauté neurochirurgicale est particulièrement à risque de burnout. Nous avons décrit la prévalence et les facteurs associés au burnout des internes et des neurochirurgiens à l'aide d'échelles psychologiques académiquement validées.
Un questionnaire national a été envoyé à 141 internes et 432 neurochirurgiens entre avril et juillet 2019. Le burnout a été diagnostiqué en utilisant le questionnaire de burnout de Maslach. Le questionnaire comprenait des données démographiques et plusieurs échelles psychologiques validées. Une analyse de régression pas-à-pas a été utilisée pour déterminer les facteurs associés au burnout.
Le taux de réponse était respectivement de 100% et 23,6% pour les internes et neurochirurgiens. La prévalence du burnout au sein de la communauté neurochirurgicale française était de 49%. Il n'y avait pas de différence significative entre internes et neurochirurgiens. Deux catégories de facteurs étaient associées aux dimensions principales du burnout lors de l'analyse de régression : la personnalité et des facteurs associés à l'exercice neurochirurgical. Les personnalités névrotiques étaient négativement associées au burnout alors que l'agréabilité était protectrice. Les profils addicts au travail avec un travail excessif et absorbés étaient négativement associés. Les facteurs liés à l'exercice neurochirurgical comme le conflit entre le travail et la famille, un déséquilibre du ratio entre les efforts et la récompense, le temps de travail étaient négativement associés. Le plaisir au travail était protecteur.
La prévalence du burnout est haute parmi la communauté neurochirurgicale française. Des modèles prédictifs peuvent être utilisés pour identifier et prévenir le burnout parmi les profils à risques à l'aide d'un suivi personnalisé.

VU ET PERMIS D'IMPRIMER
Grenoble, le : 21/01/2020

LE DOYEN

Pr. Patrice MORAND

Pour le Président
et par délégation

Le Doyen de Médecine
Pr. Patrice MORAND

LE PRÉSIDENT DE LA THÈSE

Pr. Emmanuel Gay

Remerciements

Je remercie l'ensemble de ma famille pour leur soutien durant toutes ces années. Merci à mes parents Isabelle et Jean-Louis de m'avoir donné la chance d'apprendre. L'éducation de leurs enfants est une priorité et je leur en suis reconnaissant. Ils m'ont donné toutes les valeurs, la sagesse et l'attention pour m'amener à ce jour. Merci à mon bro' pour toutes ses sorties d'hiver et d'été à cheval entre les révisions, à son engagement et sa persévérance inspirante dans le soin. Courage à ma sœur qui s'apprête à suivre la même voie.

Merci à Claire, mon amour et ma future femme, avec qui j'apprends à aimer tous les jours. Elle est l'équilibre qui permet à un soignant de continuer à soigner. Elle m'a appris que pour soigner les autres il fallait aussi prendre soin de soi. Elle fête les moments d'ivresse et console les déceptions. Sa bienveillance quotidienne m'a permis d'en arriver là aujourd'hui.

Merci à mes enseignantes de l'école, Mme Mandon et Mme Lamy, qui m'ont donné le goût d'apprendre.

Merci aux professeurs inspirants de mes début rennais, la Pr Haegelen, Pr Morandi, Pr Jannin, pour avoir inspiré et tirer vers le haut un jeune étudiant en médecine.

Merci à mes mentors, Mr Chabardès, pour son écoute scientifique et sa bonne humeur, Mr Palombi, pour sa méthode et son intelligence, Mr Ashraf, pour sa gentillesse et ses astuces pour éviter les pièges, la porte à laquelle on peut toujours frapper, Mr Seigneuret pour son calme et sa sagesse, Mr Hoffman, pour ses discussions et ses attentions, Stéphanie, pour son énergie et tout ce qu'elle a à m'apprendre.

Merci à mes collègues et amis, qui m'apprenne tous les jours le travail d'équipe. Un maillon individuel dans une chaîne de soin est bien démuni s'il est isolé. Je leur suis reconnaissant et je tiens à leur témoigner mon amitié. A Emmanuel pour son attention bienveillante depuis le début, à Francois voisin de chambrée à l'internat, toujours perspicace et de bon conseil, à Florian, vieil interne bienveillant et partenaire de chambrée lors des déplacements, à Julien, pour sa bonne humeur et son écoute, à Arnaud, camarade et complice, à Mazen, (enfin un nouveau après moi !) acolyte et interne prometteur et à tous ceux qui sont passés : Emiliano, Rivus, Katia, Amaury, Louis…

Merci à toute l'équipe du service de neurochirurgie, aux filles d'en bas et d'en haut, pour tous leurs conseils et leur expérience. J'ai appris et j'apprends encore beaucoup. Merci de m'avoir fait entrer « dans la famille ».

Merci à mes collèges anesthésistes pour m'avoir accueilli et enseigné pendant 6 mois.

Merci à tous ceux que je n'ai pu nommer.

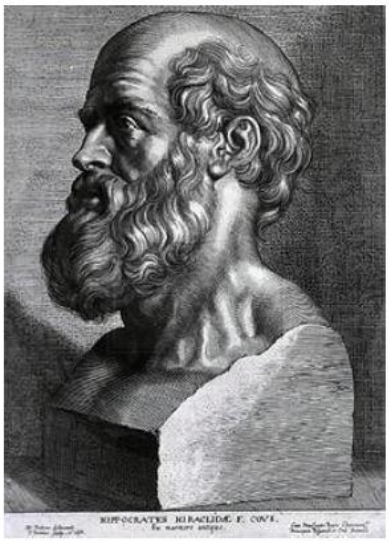
Merci au Pr Michinov et au Dr Rouxel pour avoir accepté d'encadrer à distance un inconnu… Merci pour votre confiance et vos conseils éclairés. J'espère que nous pourrons continuer cette démarche interdisciplinaire.

Merci à Charlotte Laclau pour sa contribution informatique et statistique.

Merci à l'académie de chirurgie pour avoir distingué ces travaux amplifiant ainsi la portée du message à l'ensemble de la communauté neurochirurgicale.

Merci à Mr Gay, médecin et homme inspirant. C'est une fierté de sortir de l'école grenobloise que vous dirigez. C'est un plaisir de pouvoir s'inspirer de vos astuces et votre patte chirurgicale. Merci pour votre attention bienveillante et votre humanisme.

Enfin, merci à Mr Roche, personnage fédérateur et énergique, directeur de cette thèse pour m'avoir lancé sur ce travail et de m'avoir accordé sa confiance avec le collège de neurochirurgie. Merci de nous avoir donné la parole. J'espère que cette thèse est une modeste contribution pour que la génération de neurochirurgiens à venir fasse fructifier la bienveillance de nos aînés. Je suis fier d'entrer dans cette communauté. Une communauté d'individus hors du commun et dévoués à leur art.



SERMENT D'HIPPOCRATE

En présence des Maîtres de cette Faculté, de mes chers condisciples et devant l'effigie d'HIPPOCRATE,

Je promets et je jure d'être fidèle aux lois de l'honneur et de la probité dans l'exercice de la Médecine.

Je donnerai mes soins gratuitement à l'indigent et n'exigerai jamais un salaire au dessus de mon travail. Je ne participerai à aucun partage clandestin d'honoraires.

Admis dans l'intimité des maisons, mes yeux n'y verront pas ce qui s'y passe ; ma langue taira les secrets qui me seront confiés et mon état ne servira pas à corrompre les mœurs, ni à favoriser le crime.

Je ne permettrai pas que des considérations de religion, de nation, de race, de parti ou de classe sociale viennent s'interposer entre mon devoir et mon patient.

Je garderai le respect absolu de la vie humaine.

Même sous la menace, je n'admettrai pas de faire usage de mes connaissances médicales contre les lois de l'humanité.

Respectueux et reconnaissant envers mes Maîtres, je rendrai à leurs enfants l'instruction que j'ai reçue de leurs pères.

Que les hommes m'accordent leur estime si je suis fidèle à mes promesses.

Que je sois couvert d'opprobre et méprisé de mes confrères si j'y manque.

Doyen de la Faculté : **Pr. Patrice MORAND**

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PU-PH	CHAVANON Olivier	Chirurgie thoracique et cardiovasculaire

CORPS	NOM-PRENOM	Discipline universitaire
PU-PH	CHIQUET Christophe	Ophtalmologie
PU-PH	CHIRICA Mircea	Chirurgie viscérale et digestive
PU-PH	CINQUIN Philippe	Biostatistiques, informatique médicale et technologies de communication
MCU-PH	CLAVARINO Giovanna	Immunologie
PU-PH	COHEN Olivier	Histologie, embryologie et cytogénétique
PU-PH	COURVOISIER Aurélien	Chirurgie infantile
PU-PH	COUTTON Charles	Génétique
PU-PH	COUTURIER Pascal	Médecine interne ; gériatrie et biologie du vieillissement ; addictologie
PU-PH	CRACOWSKI Jean-Luc	Pharmacologie fondamentale ; pharmacologie clinique ; addictologie
PU-PH	DEBATY Guillaume	Médecine d'Urgence
PU-PH	DEBILLON Thierry	Pédiatrie
PU-PH	DECAENS Thomas	Gastroentérologie ; hépatologie ; addictologie
PR Ass. Méd.	DEFAYE Pascal	Cardiologie
PU-PH	DEGANO Bruno	Pneumologie ; addictologie
PU-PH	DEMATTEIS Maurice	Pharmacologie fondamentale ; pharmacologie clinique ; addictologie
PU-PH émérite	DEMONGEOT Jacques	Biostatistiques, informatique médicale et technologies de communication
MCU-PH	DERANSART Colin	Physiologie
PU-PH	DESCOTES Jean-Luc	Urologie
PU-PH	DETANTE Olivier	Neurologie
MCU-PH	DIETERICH Klaus	Génétique
MCU-PH	DOUTRELEAU Stéphane	Physiologie
MCU-PH	DUMESTRE-PERARD Chantal	Immunologie
PU-PH	EPAULARD Olivier	Maladies infectieuses ; Maladies tropicales
PU-PH	ESTEVE François	Biophysique et médecine nucléaire
MCU-PH	EYSSERIC Hélène	Médecine légale et droit de la santé
PU-PH	FAUCHERON Jean-Luc	Chirurgie viscérale et digestive
MCU-PH	FAURE Julien	Biochimie et biologie moléculaire
PU-PH	FERRETTI Gilbert	Radiologie et imagerie médicale
PU-PH	FEUERSTEIN Claude	Physiologie
PU-PH	FONTAINE Éric	Nutrition
PU-PH	FRANCOIS Patrice	Epidémiologie, économie de la santé et prévention
MCU-MG	GABOREAU Yoann	Médecine Générale
PU-PH	GARBAN Frédéric	Hématologie ; Transfusion
PU-PH	GAUDIN Philippe	Rhumatologie
PU-PH	GAVAZZI Gaétan	Médecine interne ; gériatrie et biologie du vieillissement ; addictologie
PU-PH	GAY Emmanuel	Neurochirurgie
MCU-PH	GILLOIS Pierre	Biostatistiques, informatique médicale et technologies de communication
PU-PH	GIOT Jean-Philippe	Chirurgie plastique, reconstructrice et esthétique ; Brûlologie
MCU-PH	GRAND Sylvie	Radiologie et imagerie médicale
PU-PH émérite	GRIFFET Jacques	Chirurgie infantile
MCU-PH	GUZUN Rita	Nutrition
PU-PH	HAINAUT Pierre	Biochimie et biologie moléculaire
PU-PH émérite	HALIMI Serge	Nutrition
PU-PH	HENNEBICQ Sylviane	Biologie et médecine du développement et de la reproduction ; gynécologie médicale
PU-PH	HOFFMANN Pascale	Gynécologie-obstétrique ; gynécologie médicale
PU-PH émérite	HOMMEL Marc	Neurologie
PU-MG	IMBERT Patrick	Médecine Générale

CORPS	NOM-PRENOM	Discipline universitaire
PU-PH émérite	JOUK Pierre-Simon	Génétique
PU-PH	KAHANE Philippe	Physiologie
MCU-PH	KASTLER Adrian	Radiologie et imagerie médicale
PU-PH	KRAINIK Alexandre	Radiologie et imagerie médicale
PU-PH	LABARERE José	Epidémiologie, économie de la santé et prévention
MCU-PH	LABLANCHE Sandrine	Endocrinologie, diabète et maladies métaboliques
MCU-PH	LANDELLE Caroline	Bactériologie – virologie ; Hygiène hospitalière
PU-PH	LANTUEJOUL Sylvie	Anatomie et cytologie pathologiques
PR Ass. Méd.	LARAMAS Mathieu	Cancérologie ; radiothérapie
MCU-PH	LARDY Bernard	Biochimie et biologie moléculaire
MCU - PH	LE GOUELLEC LE PISSART Audrey	Biochimie et biologie moléculaire
PU-PH	LECCIA Marie-Thérèse	Dermato-vénéréologie
MCF Ass.MG	LEDOUX Jean-Nicolas	Médecine Générale
PU-PH émérite	LETOUBLON Christian	Chirurgie viscérale et digestive
PU-PH	LEVY Patrick	Physiologie
PU-PH	LONG Jean-Alexandre	Urologie
MCU-PH	LUPO Julien	Bactériologie-virologie ; Hygiène hospitalière
PU-PH	MAIGNAN Maxime	Médecine d'urgence
PU-PH	MAITRE Anne	Médecine et santé au travail
MCU-PH	MALLARET Marie-Reine	Bactériologie – virologie ; Hygiène hospitalière
MCU-PH	MARLU Raphaël	Hématologie ; Transfusion
PR Ass. Méd.	MATHIEU Nicolas	Gastroentérologie ; hépatologie ; addictologie
MCU-PH	MAUBON Danièle	Parasitologie et mycologie
PU-PH	MAURIN Max	Bactériologie-virologie ; Hygiène hospitalière
MCU-PH	MC LEER Anne	Histologie, embryologie et cytogénétique
MCU-PH	MONDET Julie	Histologie, embryologie et cytogénétique
PU-PH	MORAND Patrice	Bactériologie-virologie ; Hygiène hospitalière
PU-PH	MOREAU-GAUDRY Alexandre	Biostatistiques, informatique médicale et technologies de communication
PU-PH	MORO Elena	Neurologie
PU-PH	MORO-SIBILOT Denis	Pneumologie ; addictologie
MCU-PH	MORTAMET Guillaume	Pédiatrie
PU-PH	MOUSSEAU Mireille	Cancérologie ; radiothérapie
PU-PH émérite	MOUTET François	Chirurgie plastique, reconstructrice et esthétique ; brûlologie
MCF Ass.MG	ODDOU Christel	Médecine Générale
PR Ass. Méd.	ORMEZZANO Olivier	Cardiologie
MCU-PH	PACLET Marie-Hélène	Biochimie et biologie moléculaire
PU-PH	PAILHE Régis	Chirurgie orthopédique et traumatologie
PU-PH	PALOMBI Olivier	Anatomie
PU-PH	PARK Sophie	Hématologie ; Transfusion
PU-PH	PASSAGGIA Jean-Guy	Anatomie
PR Ass.MG	PAUMIER-DESBRIERES Françoise	Médecine Générale
PU-PH	PAYEN DE LA GARANDERIE Jean-François	Anesthésiologie-réanimation et médecine péri-opératoire
MCU-PH	PAYSANT François	Médecine légale et droit de la santé
MCU-PH	PELLETIER Laurent	Biologie cellulaire
PU-PH	PELLOUX Hervé	Parasitologie et mycologie
PU-PH	PEPIN Jean-Louis	Physiologie
PU-PH	PERENNOU Dominique	Médecine physique et de réadaptation

CORPS	NOM-PRENOM	Discipline universitaire
PU-PH	PERNOD Gilles	Chirurgie vasculaire ; Médecine vasculaire
PU-PH	PIOLAT Christian	Chirurgie infantile
PU-PH	PISON Christophe	Pneumologie ; Addictologie
PU-PH	PLANTAZ Dominique	Pédiatrie
PU-PH	POIGNARD Pascal	Bactériologie-virologie ; Hygiène hospitalière
PU-PH	POLACK Benoît	Hématologie ; Transfusion
PU-PH	POLOSAN Mircea	Psychiatrie d'adultes ; Addictologie
PU-PH	RAMBEAUD Jean-Jacques	Urologie
PU-PH	RAY Pierre	Biologie et médecine du développement et de la reproduction ; gynécologie médicale
PR Ass. Méd.	RECHE Fabian	Chirurgie viscérale et digestive
MCU-PH	RENDU John	Biochimie et biologie moléculaire
MCU-PH émérite	RIALLE Vincent	Biostatistiques, informatique médicale et technologies de communication
PU-PH	RIETHMULLER Didier	Gynécologie-obstétrique ; gynécologie médicale
PU-PH	RIGHINI Christian	Oto-rhino-laryngologie
PU-PH émérite	ROMANET Jean Paul	Ophtalmologie
PU-PH	ROSTAING Lionel	Néphrologie
PU-PH	ROUSTIT Matthieu	Pharmacologie fondamentale ; pharmacologie clinique ; addictologie
MCU-PH	ROUX-BUISSON Nathalie	Biochimie et biologie moléculaire
PR Ass.MG	ROYER DE VERICOURT Guillaume	Médecine Générale
PU-PH émérite	SARAGAGLIA Dominique	Chirurgie orthopédique et traumatologie
MCU-PH	SATRE Véronique	Génétique
PU-PH	SAUDOU Frédéric	Biologie cellulaire
PU-PH	SCHMERBER Sébastien	Oto-rhino-laryngologie
PU-PH	SCHWEBEL Carole	Médecine intensive-réanimation
PU-PH	SCOLAN Virginie	Médecine légale et droit de la santé
MCU-PH	SEIGNEURIN Arnaud	Epidémiologie, économie de la santé et prévention
PU-PH émérite	STAHL Jean-Paul	Maladies infectieuses ; Maladies tropicales
PU-PH	STANKE Françoise	Pharmacologie fondamentale ; pharmacologie clinique ; addictologie
MCU-PH	STASIA Marie-José	Biochimie et biologie moléculaire
PU-PH	STURM Nathalie	Anatomie et cytologie pathologiques
PU-PH	TAMISIER Renaud	Physiologie
PU-PH	TERZI Nicolas	Médecine intensive-réanimation
PU-PH	THEVENON Julien	Génétique
MCU-PH	TOFFART Anne-Claire	Pneumologie ; Addictologie
PU-PH	TONETTI Jérôme	Chirurgie orthopédique et traumatologie
PU-PH	TOUSSAINT Bertrand	Biochimie et biologie moléculaire
PU-PH	VALMARY-DEGANO Séverine	Anatomie et cytologie pathologiques
PU-PH	VANZETTO Gérald	Cardiologie
PU-PH	VUILLEZ Jean-Philippe	Biophysique et médecine nucléaire
PU-PH	WEIL Georges	Epidémiologie, économie de la santé et prévention
PU-PH	ZAOUI Philippe	Néphrologie
PU-PH émérite	ZARSKI Jean-Pierre	Gastroentérologie ; hépatologie ; addictologie

PU-PH : Professeur des Universités - Praticiens Hospitaliers
MCU-PH : Maître de Conférences des Universités - Praticiens Hospitaliers
PU-MG : Professeur des Universités de Médecine Générale
MCU-MG : Maître de Conférences des Universités de Médecine Générale
PR Ass. Méd. : Professeur des Universités Associé de Médecine
PR Ass.MG : Professeur des Universités Associé de Médecine Générale
MCF Ass.MG : Maître de Conférences Associé de Médecine Générale