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CLINICAL STUDY

COVID-19 Cancer Recommendation Consequences on One Radiation Therapy Department Economics and Employee Working Conditions' Satisfaction in France

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ABSTRACT

National and international authorities and scientific societies have recently published important cancer treatment recommendations in order to propose extra measures that should be taken during the COVID-19 epidemic. These measures in Radiation Therapy (RT) include, among others, the reduction of the number of cancer patients treated, their respective sessions and the personnel present. For a small private RT department in France and for the period between mid-March and mid-May 2020 these measures resulted in one third less treated patients per week, no new prostate cases and fewer breast and palliative ones, less medical consultations, almost half patient sessions and a quarter less new patients in total. This translates in an income reduction of more than 50%, if compared with the same period one year ago. However, the personnel, although more tired mentally, is happier working less hours and days, with 62.5% of them working less than 40% than predicted in their contracts and without any impact on their salary. The pandemic continuing and the Management reducing the salary respectively was not part of most of the employees' thoughts before filling in a questionnaire for this article, but even after only two of them had some relevant concerns.

Keywords : Cancer, COVID-19, radiation therapy.**Correspondence:** Christos Melidis. Radiation Therapy Department, CAP Santé, 13 Rue Marcel Paul, 20200 Bastia, France. E-mail: melichristos@hotmail.com**Copyright** © 2020 Melidis C et al. This is an open access article distributed under the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium provided the original work is properly cited.**INTRUDUCTION**

In March 2020, when COVID-19 became a pandemic (1) and most European countries took measures of lockdown, scientific societies and health organisations proposed measures to protect the Health System and its workers from mass utilisation of its resources and getting infected by the virus respectively. Concerning cancer, the recommendations (2–7) proposed, among others:

- i) Treatment omission for certain non-urgent cases and all COVID-19 positive patients,
- ii) Prioritisation for intent-to-cure treatments versus palliative ones,
- iii) Prioritisation of younger versus older patients (with 65 years old usually set as the cutoff age),
- iv) Hypofractionation and Simultaneously Integrated Boost, where possible,
- v) Reduction of the number of personnel present to As Low As Reasonably Achievable (ALARA) and

- vi) Reduction of the number of “live” medical consultations to a strict minimum, while patients, for either consultation or irradiation, should be unescorted.

If these recommendations are followed, cancer treatment services will experience a strong reduction in the number of patients treated among others (8), resulting in lower income. Additionally, cancer care employees may feel that their working conditions have become insecure, at least concerning professional stability, since less people are expected to carry out the same amount of tasks.

It is not the authors' intention to question the necessity of the before mentioned cancer recommendations, but rather to highlight some of their consequences on income of a small private Radiation Therapy (RT) department in France and its employees' working conditions' satisfaction. Of note that the department's only income comes from Social Security (there are no private

payments) and no raises or cut-downs have taken place in France concerning the reimbursement of RT medical acts since 2010 (9). Additionally, the company management decided to keep all employees' statuses as were before the pandemic, without putting them on "technical unemployment" status (part of the salary being paid by the state), although it had the right.

METHODS

The department's own accountancy will be used in order to compare the income of the COVID-19 period of lockdown in France (mid-March to mid-May 2020) with the average income of the past 2 years during the same period.

Additionally, for the periods starting on Monday, 9th March 2020 (second full week of March) and ending on Friday, 15th May (second full week of May) a comparison between year 2020 and the last 5 years will take place concerning:

- i) the number of medical consultations of new and already treated (old) patients,
- ii) the total number of patient sessions,
- iii) the number of new patients starting their treatment and
- iv) the number of non-urgent cases (prostate and breast under point (i) of the introduction), palliative (point (ii) of the introduction) and "other" cases starting their treatment.

The same comparison will also be conducted for the lockdown period versus the first two months of the year.

The exact numbers of patients, patient sessions, income, etc., will be omitted in the Results section and only the percentage of difference will be presented for (business) confidentiality reasons. However, these numbers are available if asked for.

Lastly, an anonymous questionnaire will be distributed to all personnel in order to investigate their concerns about their satisfaction with the new (ALARA) working

conditions during COVID-19 and professional stability after COVID-19.

RESULTS

Based on the recommendations, the department adapted accordingly, meaning that:

- A. prostate and breast cases, where appropriate, were postponed (point (i) of the recommendations),
- B. the number of palliative cases was reduced (point (ii) of the recommendations),
- C. hypofractionation and Simultaneously Integrated Boost were used as much as possible (as an example, a breast case that would normally receive 33 sessions of RT before the recommendations, would now receive 21, but offering, at least in theory, the same radiobiological result (3)) [point (iv) of the recommendations],
- D. our opening was reduced to 4 instead of 5 days per week (most, if not all, cancer treatment services work on a 5-days a week schedule, meaning that there are no treatments during weekends or bank holidays) and the personnel present was ALARA [point (v) of the recommendations], resulting in:
 - 1 FTE secretary present out of 2
 - 2 FTE Radiation Technologists out of 3

Points (A) to (C) reduced the daily program by almost 30% (the department was open for 5 hours per day instead of 7), and, in combination with point (D), secretaries were present only 28.5% of their contract predicted time, while Radiation Technologists only 38.1%.

The difference in the number of patients treated per day during the second full week of March 2020, just before the French lockdown, in comparison with the second full week of May 2020, is -17.2%, but given the fact that the department was open 4 days per week instead of 5, the total number was reduced by -33.8%.

Table 1: Difference of cases per treatment site

	Cases per treatment site			
	Prostate	Breast	Palliative	Other
Difference of 2015-2019 average versus 2020 mid-March to mid-May:	-100.0%	-20.0%	-11.1%	1.1%
Difference of January-February versus mid-March to mid-May 2020	-100.0%	-20.0%	-23.8%	-2.0%

Table 2: Difference of medical consultations, patient sessions and new patients.

	Medical Consultations		Patient Sessions	New patients
	New patients	Old patients		
Difference of 2015-2019 average versus 2020 mid-March to mid-May:	-24.9%	-100.0%	-47.6%	-25.4%
Difference of January-February versus mid-March to mid-May 2020	-21.9%	-100.0%	-47.8%	-24.3%

No new prostate cases were treated (prostate is among the most income generative techniques of RT) and breast and palliative cases were reduced, while the number of "all other cases" remained unchanged (Table 2). This resulted in a strong reduction in the number of patient sessions and new patients, while medical consultations of already

treated patients did not occur (Table 2). Of course, the difference in the number of medical consultations of future patients followed the reduction of the number of new patients. Of note that both in Table 1 and Table 2 the differences of 5-years' average with the COVID-19 period and the first two months of the year with the same period

are very well balanced, showing a rather constant flow of patients per month (besides the COVID-19 period).

Table 3: Difference in income during the COVID-19 period in comparison with the same period during the last 2 years.

	Income
Difference of 2018-2019 average versus 2020 mid-March to mid-May:	-44.0%
Difference of 2019 average versus 2020 mid-March to mid-May:	-53.6%

In Table 3 the income difference between 2018 and 2019 can be explained by the fact that Intensity Modulated RT (IMRT), a sophisticated RT technique that is less toxic for healthy tissues surrounding the tumor and, economically

speaking, more profitable, was still under development at site.

The reduced number of new patients alone cannot explain the difference in income. As already mentioned, omitted prostate cases represent a substantial part of the income, while this is also the case for medical consultations. Another reason is that the number of Portable Imaging, a technique accompanying each patient session in order to perfectly position the patients and paying a bit more than 25 euros per use, was almost cut in half (number of patient sessions in Table 2).

A small questionnaire, presented at the Appendix, has been created and all employees have given their answers during the third full week of May 2020. Questions and answers are shown in Table 4, where 1 stands for “completely disagree” and 5 stands for “completely agree”:

Table 4: COVID-19 working conditions questionnaire answered by all employees.

QUESTION	ANSWER BY: ^a							
	S1	S2	MPE	RadOnc ^b	RTT1	RTT2	RTT3	QM
Physical fatigue	2	2	4	4	3	4	4	1
Mental fatigue	4	5	5	5	3	5	4	1
Work less days/week	5	3	5	2	5	5	4	4
Work less hours/day	4	3	4	2	5	5	4	4
Contract becoming half-time?	2	1	5	5	1	1	2	4
Afraid of half-time?	2	1	1	5	3	1	5	1

^a S = secretary, MPE = Medical Physics Expert, RadOnc = Radiation Oncologist, RTT = Radiation Therapy Technologist, QM = Quality Manager.

^b The Radiation Oncologist is, a mentioned in the “Conflict of Interest” section, stakeholder of the Department.

As can be seen in Table 4, answers are quite diverse and, given the small number of employees, statistically non-significant. However, if some conclusions could be drawn, then they would be summarised as follows:

- i) Three quarters of the employees declared experiencing bigger mental fatigue,
- ii) all employees but the RadOnc declared being happy by working ALARA,
- iii) Some of the employees had thought of the possibility that ALARA conditions, this time accompanied by official salary reductions, could be imposed even after the pandemic, but only two of them (plus the RadOnc) declared being afraid that this could indeed become true, both only after having read the question and, thus, thought of it as a possibility.

DISCUSSION

It is logical to assume that private RT departments in France have adjusted their activities to the corresponding law describing their reimbursements (9). Cancer recommendations during the COVID-19 pandemic proposed measures that strongly reduced the income of at least one such department, as proven here.

However, given the strategic decision of the Management to keep employees' contracts untouched and allow them ALARA, they were all happy to work less hours per day and less days per week, even if their physical and, mainly, mental fatigue is presented augmented. Actually, ALARA allowed to five (secretaries and RT technologists) out of eight of them to experience a reduction of working hours of more than 60% and to a quarter of them (secretaries)

even 70%, but this positive reaction was also observed to the other two employees (Medical Physics Expert and Quality Manager) who worked at about 80% of their contract predicted duration.

Typically enough (10), although a few employees had thought beforehand that ALARA could be officialised and have an impact on their wages should the pandemic continue, they rather thought of it as an exception period. However, it is also true that the Management thoughts were similar.

There are limitations in this study, such as the non-proven repeatability and reliability of the questionnaire and its very small number of answers, but also the limited period checked concerning the department's economics.

However, we consider that the questionnaire could be trusted at least concerning the satisfaction of ALARA and the unconcern of both personnel and Management about possible employee salary reductions. Additionally, the existing balance of numbers presented between the differences of 5-years' average with the COVID-19 period and the first two months of the year with the same period is reassuring.

Should the COVID-19 pandemic come to past, the recommendations should also be levied and prostate and breast cases that were omitted (point (i) of the recommendations) would, eventually, be irradiated at the same RT department as initially predicted, thus restoring the budget balance. However, this could create problems of patient “overflow” during the first weeks or months after the deconfinement, especially when employees tend to get easier accustomed to working less than more (11).

In addition to that, it is interesting to note that some of these measures, such as points (iv) and (v), could, at least in theory, remain in place after the pandemic as well. Would less treatment sessions, thus less income, in combination with ALARA concerning personnel, thus less salary costs, be more cost effective than before?

APPENDIX:

Questionnaire

FATIGUE:

- A) Your physical fatigue is higher than usual
- B) Your mental fatigue is higher than usual

NEW WORKING CONDITIONS:

- C) Working fewer days per week is positive
- D) Working fewer hours per day is positive

PROFESSIONAL STABILITY:

- E) You have already thought about the possibility that your limited working time will be officialised after the COVID-19 period and impacting also your salary, since working in this way seems to be enough for the company
- F) Are you afraid that point [E] will become a reality? (possible answers ranging from 1, meaning “completely disagree”, to 5, meaning “completely agree”)

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AUTHORS’ CONTRIBUTIONS

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CONFLICT OF INTEREST

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