



HAL
open science

Impact of systematic advanced care planning in lung cancer patients: A prospective study

N. Denis, J.-F. Timsit, M. Giaj Levra, L. Sakhri, M. Duruisseaux, C. Schwebel, P. Merle, J. Pinsolle, L. Ferrer, D. Moro-Sibilot, et al.

► To cite this version:

N. Denis, J.-F. Timsit, M. Giaj Levra, L. Sakhri, M. Duruisseaux, et al.. Impact of systematic advanced care planning in lung cancer patients: A prospective study. *Respiratory Medicine and Research*, 2020, 77, pp.11 - 17. 10.1016/j.resmer.2019.09.003 . hal-03490126

HAL Id: hal-03490126

<https://hal.science/hal-03490126>

Submitted on 21 Jul 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

Impact of systematic advanced care planning in lung cancer patients: a prospective study

Natacha Denis¹, Jean-François Timsit², Matteo Giaj Levra¹, Linda Sakhri³, Michaël Duruisseaux⁴, Carole Schwebel^{5,6}, Patrick Merle⁷, Julian Pinsolle¹, Léonie Ferrer¹, Denis Moro-Sibilot^{1,8} and Anne-Claire Toffart^{1,8}

Affiliations: ¹Department of pneumology, CHU Grenoble Alpes, Grenoble, France. ²Department of medical and infectious resuscitation, Hôpital Bichat Claude Bernard, Paris, France. ³Department of oncology, Institut Daniel Hollard, Groupe Hospitalier Mutualiste, Grenoble, France. ⁴Department of pneumology, Hôpital Louis Pradel, Institut de Cancérologie des Hospices Civils de Lyon, Bron, France. ⁵Department of intensive care and resuscitation, Pôle Urgences Médecine Aiguë, Centre Hospitalier Universitaire Grenoble Alpes, Grenoble, France. ⁶Laboratoires des pharmaceutiques biocliniques U 1039, Université Grenoble Alpes, Grenoble, France. ⁷Department of pneumology, CHU G Montpied / UMR INSERM 1240, Clermont-Ferrand, France. ⁸Institut pour l'Avancée des Biosciences, Centre de Recherche UGA / Inserm U 1209 / CNRS UMR 5309, La Tronche, France.

Correspondence: Anne-Claire Toffart, Service de pneumologie, CHU Grenoble Alpes, boulevard de la Chantourne, CS10217, 38043 Grenoble Cedex 9, France. Phone: +33 (0)4 76 76 55 89 E-mail: AToffart@chu-grenoble.fr

ABSTRACT

Background: End-of-life (EOL) communication is crucial, particularly for cancer patients. While advanced care planning is still uncommon, we sought to investigate its impact on care intensity in case of organ failure in lung cancer patients.

Methods: We prospectively included consecutive lung cancer patients hospitalised at the Grenoble University Hospital, France, between January 1, 2014 and March 31, 2016. Patients could be admitted several times and benefited from advanced care planning based on three care intensities: intensive care, maximal medical care, and exclusive palliative care. Patients' wishes were addressed.

Results: Data of 739 hospitalisations concerning 482 patients were studied. During the three first admissions, 173 (25%) patients developed organ failure, with intensive care proposed to 56 (32%), maximal medical care to 104 (60%), and exclusive palliative care to 13 (8%). Median time to organ failure was 9 days [IQR 25%-75%: 3-13]. All patients benefited from care intensity that was either equal to or lower than the care proposed. Specific wishes were recorded for 158 (91%) patients, with a discussion about EOL conditions held in 116 (73%).

Conclusions: In case of organ failure, advanced care planning helps provide reasonable care intensity. The role of the patient's wishes as to the proposed care must be further investigated.

Clinical Trial Registration: The study was registered at www.ClinicalTrials.gov with the identifier NCT02852629.

Keywords: advanced care planning, lung cancer, end-of-life conditions, intensity of care, palliative care.

1. Introduction

Lung cancer patients have the highest rates of intensive care unit (ICU) admission among tumour patients, straight after lower intestinal and genito-urinary cancers [1,2]. In recent decades, there has been a decrease in mortality for these ICU-admitted patients [1]. Despite the improvements in cancer treatments and resuscitation techniques, the mortality rate is still high in the event of organ failure in lung cancer patients. Recently, there has been increasing awareness of the inadequacy of end-of-life (EOL) care, partially because the patients' wishes were not known by their physicians, and due to a lack of communication [3–5], particularly before the patients lose their decision-making capacity. This may result in inappropriate care that the patients would not have chosen if they had been informed properly and involved in the decision-making [6]. Even if cancer patients likely think more about EOL care and advance directives [7,8], this decision-making process proves difficult. Previous studies have reported that patients think they do not have enough medical information about the disease and its treatments, but they likewise experience inner conflicts about quality/quantity of life [9]. Patients and physicians should be better prepared for these decisions, with tools available to assist in the process [10]. The quality of medical care delivered to cancer patients nearing the EOL is of significant concern. The issues that physicians face are how to evaluate the quality of care that patients should receive, as well as its adequacy with the patients' wishes [11]. Advance care planning is a distinct part of EOL care, representing a means to know patients' preferences, but it provides also an opportunity for a multidisciplinary discussion about care limitations in the event of acute disease, in both oncology and emergency units.

We sought to investigate the impact of systematic advance planning of EOL care in lung cancer patients admitted to a thoracic oncology unit.

2. Methods

2.1 Study design

We included all consecutive patients admitted to the thoracic oncology unit (conventional hospital stay) of the Grenoble University Hospital, France, between 28th January 2014 and 31st March 2016, and followed them up until 31st December 2016. Data were collected prospectively. Only patients with thoracic tumours like lung cancer and mesothelioma were studied, **regardless of their ECOG-performance status (PS)**. Exclusion criteria were absence of cytological or histological cancer diagnosis, as well as remission for more than 5 years. At hospital admission, each patient benefited from a standardized advance care planning developed at the Grenoble University Hospital (annex 1). The programme was established based on the legal framework of the Kouchner Act of 4th March 2002, Leonetti Act of 22nd April 2005, and Leonetti-Claeys Act of 2nd February 2016 [12–14]. Depending on the patient's wishes and referent medical team's experience, an appropriate care intensity level was proposed. This was always carried out straight upon the patient's admission to the hospitalisation unit, designed to be just a proposition of care intensity, whereas the physician in charge of the patient at the time of organ failure remained master of the decision-making process. The propositions of care intensity recorded in this tool could be modified any time during the hospitalisation according to the patient's clinical progression and own wishes. Patients were evaluated at each admission, with their wishes as well as discussions with relatives recorded in the **electronic** medical chart. These discussions could be held before or after the advance care planning, which could be modified accordingly. **The discussion was held with at least one physician, one resident and one nurse. The referent oncologist was contacted as soon as possible.** The study protocol was published in 2015 [15].

The study primarily sought to evaluate whether the proposed care intensity level in the event of acute organ failure was in accordance with the standardized advance care planning. The secondary objectives were to better determine the conditions surrounding the discussions with patients and relatives, reasons of non-ICU admission in the case of proposed intensive care, as well as variations in the propositions during the first and subsequent hospitalisations. The association between patients' characteristics and care intensity propositions were likewise studied.

2.2 Ethics

Ethical Committee approval was obtained on 5th November 2013 (CECIC Rhône-Alpes-Auvergne, Clermont-Ferrand, IRB 5891). An information letter was handed to the patients, enabling them to refuse study participation. The study was registered at www.ClinicalTrials.gov with the identifier NCT02852629.

2.3 Data collection

The following patients' data were recorded: ECOG-PS, weight loss, Charlson Comorbidity Index (CCI) [16], and cancer history (status, histological type, and previous and current anticancer treatments). Reasons of admission were likewise collected, as were causes of organ failure. The advance care planning performed at admission and upon subsequent hospitalisations was recorded, as was the manner how planning evolved (more or less intensive), along with the respective reasons (annex 1). Care intensity propositions were divided into three categories; 1) intensive care (cardio-pulmonary resuscitation, transfer to the ICU, oro-tracheal intubation or tracheotomy, dialysis, and inotrope administration); 2)

maximal medical care (non-invasive ventilation, artificial nutrition, antibiotic treatment, and blood transfusion); 3) exclusive palliative care (peripheral venous catheter, complementary examinations, vital signs, anticoagulation, fibro-aspiration). Reasons for discordance between care intensity proposition and care actually performed in the event of organ failure were likewise recorded, as were discussions with the patients or relatives.

2.4 Statistical analyses

Continuous variables have been expressed as median and interquartile range [IQR 25%-75%] and categorical variables as numbers and percentages (%). Associations between categorical variables were compared using the Chi-squared or Fisher's exact tests, and those between continuous variables using the Wilcoxon test. Patients were followed up until the 31st December 2016, with patients lost to follow-up censored.

Organ failure occurring during the three first hospitalisations was studied. If patients developed more than one organ failure, only the first one was considered. Kaplan-Meier plots of survival curves from organ failure onset were compared between groups using the log-rank test.

All tests were two-sided, with *P* values <0.05 considered statistically significant. All statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, NC, USA).

3. Results

3.1 Patient characteristics

In total, 739 hospitalisations involving 482 patients were studied (figure 1). Nine patients were excluded and 473 analysed. Overall, 314 patients were not admitted for a second hospitalisation, 93 of whom died during their 1st hospitalisation and 164 thereafter, with 57 still alive. Thus, 159 patients were hospitalised a second time, and 69 a third time.

Patient characteristics at 1st hospitalisation and according to the first planned care intensity level have been provided in table 1. A large majority of patients were metastatic (393, 85% at 1st admission. At 1st admission, 182 (38%) patients were not yet treated and 165 (35%) in cancer progression, whereas at 3rd admission, 52 (75%) were in progressive disease. Reasons of admission at 1st hospitalisation were recorded as acute disease (n=208, 48%), improvement in supportive care (n=167, 35%), scheduled hospitalisation (n=50, 11%), and toxicity of anticancer treatment (n=48, 10%). Among acute diseases, the main cause concerned respiratory disorders (n=119, 57%), followed by neurological disorders (n=41, 20%).

3.2 Planned care intensity

Concerning planned care intensity, at 1st admission, intensive care was proposed for the majority of the patients in the event of acute organ failure (n=331, 70%), whereas it concerned only 77 (48%) at 2nd hospitalisation, and 37 (54%) at 3rd one (table 2). At 1st admission, 62 (13%) patients benefited from a second care proposition. In most cases, the trend was towards more palliative care. Among the 39 patients with at least two propositions at 1st admission and initial intensive care proposition, the 2nd proposition was maximal medical care in 17 (44%) and exclusive palliative care in 2 (5%). Among the 23 patients with initial maximal medical care proposition, the 2nd proposition was exclusive palliative care in 8 (35%) and intensive care in 2 (9%).

Patient characteristics varied according to the planned care intensity (table 1). The ECOG-PS was significantly poorer in the medical or palliative care groups (109, 76% patients with an ECOG-PS of 3 to 4) versus the intensive care group (117, 35% patients with an ECOG-PS of 3 to 4) ($P < 10^{-4}$). In univariate analysis, patient characteristics (age, modified CCI, and weight loss), cancer characteristics (time since cancer diagnosis, metastatic disease, cancer status, and current anticancer treatment) and reason of admission were likewise associated with the planned care intensity.

Median survival from the first hospitalization was 3.5 months [IQR 25%-75%, 1.0-9.7]. Among the 173 patients with organ failure, the in-hospital mortality was 41% (n=7) for patients who benefited from intensive care, 55% (n=27) for those with maximal medical care, and 92% (n=98) for those with exclusive palliative care. From the organ failure, median OS was 2 days [IQR 25%-75%, 0-13].

3.3 Patients with organ failures

At 1st hospitalisation, 127/473 (27%) patients developed organ failure, 34/159 (21%) at 2nd (3 not studied because 2nd organ failure), and 15/69 (22%) at 3rd hospitalisation. These 173 patients have been further described in table 3.

Main causes of organ failure were as follows: respiratory failure (n=68, 39%), coma (n=52, 30%), shock except for septic one (n=19, 11%), and sepsis (n=18, 10%). Median time from admission to organ failure was 9 days [IQR 25%-75%, 3-13].

The characteristics of patients who developed organ failure and care intensity administered are summarised in table 3. The main reason of admission was the improvement in supportive care (n=53, 50%). All patients who received exclusive palliative care suffered from metastatic

disease, their ECOG-PS proved to be worse, and they lost more weight. Most were in disease progression, without any further perspective of anticancer treatment.

3.4 Adequacy between planned and actual care intensity in the event of organ failure

Among the 173 patients who developed organ failure, care intensity was always equal or inferior to the care proposition just before organ failure (table 3). Among patients planned for intensive care (n=56, 32%), 39 (70%) did not benefit from it. In most cases (35/39), the oncologist did not solicit the opinion of the intensivist, reasons for this being a lack of updated care proposition in 18 patients, yet for 12 of them it was clearly stated in the medical records, ability to treat the organ failure in the medical unit in 13 patients, patients considered too frail to benefit from ICU admission in two, unreasonable intensive care proposition regarding patient's general conditions in one patient, with one patient found dead. In 4/39 cases, the intensivist's opinion was sought and the patient was thus not admitted to ICU because he was considered too frail to benefit from ICU admission in three cases, and because no ICU bed was available in the last case. Among patients without initial intensive care proposition, seven cases were discussed with the intensivist, with none admitted to ICU.

3.5 Condition surrounding the discussion with patients and relatives

For each hospitalisation, discussions with patients and relatives for those patients who developed organ failure were held for with most patients or relatives (n= 158, 91%), as summarized in table 4. In some cases (n=17/158, 11%), the discussion took place after organ failure, and the topics discussed were disease, disease severity, and EOL condition. Concerning the latter, discussions were held with patients and relatives for 116/173 (67%) during the hospitalisation, with the care proposition agreed upon in all cases. There **was no**

divergence between the medical team and patients or relatives point of view regarding the proposition of care at the time of organ failure.

4. Discussion

We have reported herein the data of a 2-year, prospective, hospital-wide study, designed to evaluate advance care planning developed at the Grenoble University Hospital. By means of this tool, no patient underwent more aggressive care than initially planned.

The study's strengths were its prospective design, along with the recording of both the physicians' and patients/relatives' point of view. Most studies published to date concerned only advance care planning according to the physician's decision [17,18], or depending on what the patients chose for their EOL conditions [3,19–21]. This is the first study reporting the use of a formal tool for advance care planning. A large number of patients were included, with an important rate of organ failures (36%). Patient characteristics were in line with real-life setting of hospitalised patients, and similar to those reported by other studies [22,23]. The single-centre patient recruitment, however, does not imply the applicability of our results to other centres. Of particular note is that this study was performed based on the thoracic oncologist's point of view, without systematically calling for the intensivist in the event of an intensive care proposition. Besides, the influence of patients' and relatives' wishes concerning the care intensity proposition was not collected either. These wishes were actually recorded in real-life conditions, but not following a thorough discussion.

In no case was the care intensity administered more aggressive than the one initially proposed. Previous studies [24–26] had already confirmed the crucial place of advance care planning and directives as regards EOL care, which resulted in less patients undergoing

intensive care. Concerning the people participating in the decision-making process, a lack of discussions with intensivists, owing due to an auto-censorship of the thoracic oncologist or physician in charge of the patient upon organ failure, has previously been highlighted [23]. This could be a particularity of our institution where thoracic oncologists are very committed to this topic. Recently, differences in view points between oncologists and intensivists regarding life support measures in critically-ill cancer patients have been reported in two different settings, namely metastatic breast cancer and metastatic pancreatic cancer [27]. It was reported that oncologists tend to focus on the cancer characteristics, but intensivists focus rather on multiple organ failure when confronted with the same decisions. Regular meetings between oncologists and intensivists during the disease course and prior to acute disease onset may reduce possible conflicts in the critical care of cancer patients. Physicians must keep in mind the objective of ICU admission: the patient should leave the ICU alive and still benefit from anticancer treatment, with sufficient quality of life, especially in metastatic cancer.

Regarding discussion with patients and relatives concerning EOL conditions, in 65% of cases, they were held during first hospitalisation. This number reached 87% for the third hospitalisation. Several studies have previously reported how these discussions likely influence the medical decision [4,8,21]. The earlier this discussion takes place, the more the patient's choices are respected. In the Mack et al. report [8], patients who had had EOL discussions with their physicians within the last 30 days of life were less likely to receive aggressive measures at EOL, including chemotherapy. In another study, 120 patients with metastatic cancer were randomized to receive either intervention on end-of-life decision making or treatment as usual [28]. The intervention made up of an informational pamphlet and discussions was associated with earlier exclusive palliative care implementation, along with less likelihood of in-hospital death. In our study, most of the discussions between thoracic oncologist and patients or relatives concerned the cancer and its prognosis,

particularly at EOL. They did, however, not imply a formal discussion to collect EOL wishes and were not meant to write advance directives, as framed by French laws on EOL care [12–14]. Hospitalisation may occur too late in the patient’s history to this end. Given this context, it appears warranted to increase the rate of patients who put down their advance directives at an earlier time in their cancer history. These patients’ preferences should be accurately recorded in medical charts, thereby facilitating the decision around care intensity. This is an essential aspect of quality of care for patients with aggressive disease [11].

This advance care planning cannot be self-sufficient. A discussion between the physician in charge of the patient at the time of organ failure (or the intensivist) and the patient (and/or relatives) remains central to the decision-making about care intensity. In cancer cases, conditions of patients may change during the same hospitalisation and differ from others due to efficacy or inefficacy of anti-cancer treatment. In our study, we have noted several times that the deterioration of the patient condition was not properly acknowledged in the medical record. In case of re-hospitalisation, particularly at the emergency unit, we generally prefer the reflection to take into account each prognostic factor rather than a previous advance care planning that may even not be update. For optimal decision-making, emergency physicians, intensivists, oncologists, and the patient and his relatives must communicate in the best possible manner [29].

5. Conclusions

The care intensity propositions recorded in this tool for decision making in advance care planning were followed in terms of maximal care intensity. Such an aid in the decision-making appears to be useful for the physicians in charge of the patient, in the event of organ

failure, likewise respecting the patients' wishes. It should, however, never replace a thorough discussion with the patient and his relatives, and we should better investigate the precise role of the patients' wishes in terms of the care intensity proposed. This tool must now be validated in a multicentre study involving patients with cancer or other chronic diseases.

Author contributions: A.-C. Toffart and J. -F. Timsit conceived the study. A.-C. Toffart, M. Duruisseaux and L. Sakhri included patients. A.-C. Toffart, N. Denis and J. -F. Timsit were involved in the analysis strategy and drafted the manuscript. All authors participated in the interpretation of the findings, reviewed the manuscript and revised it critically before submission. All authors have seen and approved the final version of the manuscript.

Declarations of interest: none.

Acknowledgment: The authors thank Gabrielle Cremer for providing language help and writing assistance.

Support statement: This study was financially supported by the publicly funded non-profit organisation Cancéropole Lyon Auvergne Rhône-Alpes (CLARA).

References

- [1] Ostermann M, Ferrando-Vivas P, Gore C, Power S, Harrison D. Characteristics and Outcome of Cancer Patients Admitted to the ICU in England, Wales, and Northern Ireland and National Trends Between 1997 and 2013. *Crit Care Med* 2017;45:1668–76. doi:10.1097/CCM.0000000000002589.
- [2] Soares M, Caruso P, Silva E, Teles JMM, Lobo SMA, Friedman G, et al. Characteristics and outcomes of patients with cancer requiring admission to intensive care units: a prospective multicenter study. *Crit Care Med* 2010;38:9–15. doi:10.1097/CCM.0b013e3181c0349e.
- [3] Almack K, Cox K, Moghaddam N, Pollock K, Seymour J. After you: conversations between patients and healthcare professionals in planning for end of life care. *BMC Palliative Care* 2012;11:15. doi:10.1186/1472-684X-11-15.
- [4] Covinsky KE, Fuller JD, Yaffe K, Johnston CB, Hamel MB, Lynn J, et al. Communication and decision-making in seriously ill patients: findings of the SUPPORT project. The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *J Am Geriatr Soc* 2000;48:S187-193.
- [5] Golin CE, Wenger NS, Liu H, Dawson NV, Teno JM, Desbiens NA, et al. A prospective study of patient-physician communication about resuscitation. *J Am Geriatr Soc* 2000;48:S52-60.
- [6] Detering KM, Hancock AD, Reade MC, Silvester W. The impact of advance care planning on end of life care in elderly patients: randomised controlled trial. *BMJ* 2010;340:c1345. doi:10.1136/bmj.c1345.
- [7] Park IK, Jun HJ, Park SJ, Lim GJ, Cho S-J, Song A, et al. Differences in end-of-life care decision making between patients with and without cancer. *Am J Hosp Palliat Care* 2015;32:797–801. doi:10.1177/1049909114542646.
- [8] Mack JW, Weeks JC, Wright AA, Block SD, Prigerson HG. End-of-life discussions, goal attainment, and distress at the end of life: predictors and outcomes of receipt of care consistent with preferences. *J Clin Oncol* 2010;28:1203–8. doi:10.1200/JCO.2009.25.4672.
- [9] Heyland DK, Heyland R, Dodek P, You JJ, Sinuff T, Hiebert T, et al. Discordance between patients' stated values and treatment preferences for end-of-life care: results of a multicentre survey. *BMJ Support Palliat Care* 2017;7:292–9. doi:10.1136/bmjspcare-2015-001056.
- [10] Sudore RL, Fried TR. Redefining the “Planning” in Advance Care Planning: Preparing for End-of-Life Decision Making. *Ann Intern Med* 2010;153:256–61. doi:10.1059/0003-4819-153-4-201008170-00008.
- [11] Earle CC, Landrum MB, Souza JM, Neville BA, Weeks JC, Ayanian JZ. Aggressiveness of Cancer Care Near the End of Life: Is It a Quality-of-Care Issue? *Journal of Clinical Oncology* 2008;26:3860. doi:10.1200/JCO.2007.15.8253.
- [12] LOI n° 2002-303 du 4 mars 2002 relative aux droits des malades et à la qualité du système de santé. 2002.
- [13] LOI n° 2005-370 du 22 avril 2005 relative aux droits des malades et à la fin de vie. 2005.
- [14] LOI n° 2016-87 du 2 février 2016 créant de nouveaux droits en faveur des malades et des personnes en fin de vie. 2016.
- [15] Toffart A-C, Sakhri L, Girard N, Couraud S, Merle P, Fournel P, et al. [Assessment of a tool for decision making in case of worsening condition of cancer patients]. *Rev Mal Respir* 2015;32:66–72. doi:10.1016/j.rmr.2014.02.006.

- [16] Quan H, Li B, Couris CM, Fushimi K, Graham P, Hider P, et al. Updating and validating the Charlson comorbidity index and score for risk adjustment in hospital discharge abstracts using data from 6 countries. *Am J Epidemiol* 2011;173:676–82. doi:10.1093/aje/kwq433.
- [17] Cortegiani A, Russotto V, Raineri SM, Gregoret C, Giarratano A, Mercadante S. Attitudes towards end-of-life issues in intensive care unit among Italian anesthesiologists: a nation-wide survey. *Support Care Cancer* 2018;26:1773–80. doi:10.1007/s00520-017-4014-z.
- [18] Garrouste-Orgeas M, Tabah A, Vesin A, Philippart F, Kpodji A, Bruel C, et al. The ETHICA study (part II): simulation study of determinants and variability of ICU physician decisions in patients aged 80 or over. *Intensive Care Med* 2013;39:1574–83. doi:10.1007/s00134-013-2977-x.
- [19] Pardon K, Deschepper R, Vander Stichele R, Bernheim JL, Mortier F, Schallier D, et al. Preferred and actual involvement of advanced lung cancer patients and their families in end-of-life decision making: a multicenter study in 13 hospitals in Flanders, Belgium. *J Pain Symptom Manage* 2012;43:515–26. doi:10.1016/j.jpainsymman.2011.04.008.
- [20] Elliott J, Olver I. Choosing between life and death: patient and family perceptions of the decision not to resuscitate the terminally ill cancer patient. *Bioethics* 2008;22:179–89. doi:10.1111/j.1467-8519.2007.00620.x.
- [21] Mack JW, Cronin A, Keating NL, Taback N, Huskamp HA, Malin JL, et al. Associations between end-of-life discussion characteristics and care received near death: a prospective cohort study. *J Clin Oncol* 2012;30:4387–95. doi:10.1200/JCO.2012.43.6055.
- [22] Saltbaek L, Michelsen HM, Nelausen KM, Gut R, Nielsen DL. Old age and poor prognosis increase the likelihood of disagreement between cancer patients and their oncologists on the indication for resuscitation attempt. *Support Care Cancer* 2013;21:3363–70. doi:10.1007/s00520-013-1916-2.
- [23] Toffart A-C, Pizarro CA, Schwebel C, Sakhri L, Minet C, Duruisseaux M, et al. Selection criteria for intensive care unit referral of lung cancer patients: a pilot study. *Eur Respir J* 2015;45:491–500. doi:10.1183/09031936.00118114.
- [24] Mehlis K, Becker C, Christ C, Laryionava K, Hiddemann W, Heußner P, et al. [Frequency and Timing of Decisions to Limit Intensive Medical Care and Tumor-Specific Therapy in University Hematology and Oncology]. *Dtsch Med Wochenschr* 2017;142:e116–23. doi:10.1055/s-0043-103340.
- [25] Levin TT, Li Y, Weiner JS, Lewis F, Bartell A, Piercy J, et al. How do-not-resuscitate orders are utilized in cancer patients: timing relative to death and communication-training implications. *Palliat Support Care* 2008;6:341–8. doi:10.1017/S1478951508000540.
- [26] Ahluwalia SC, Tisnado DM, Walling AM, Dy SM, Asch SM, Ettner SL, et al. Association of Early Patient-Physician Care Planning Discussions and End-of-Life Care Intensity in Advanced Cancer. *J Palliat Med* 2015;18:834–41. doi:10.1089/jpm.2014.0431.
- [27] Nassar AP, Dettino ALA, Amendola CP, Dos Santos RA, Forte DN, Caruso P. Oncologists' and Intensivists' Attitudes Toward the Care of Critically Ill Patients with Cancer. *J Intensive Care Med* 2017;885066617716105. doi:10.1177/0885066617716105.
- [28] Stein RA, Sharpe L, Bell ML, Boyle FM, Dunn SM, Clarke SJ. Randomized controlled trial of a structured intervention to facilitate end-of-life decision making in patients with advanced cancer. *J Clin Oncol* 2013;31:3403–10. doi:10.1200/JCO.2011.40.8872.
- [29] Le Conte P, Riochet D, Batard E, Volteau C, Giraudeau B, Arnaudet I, et al. Death in emergency departments: a multicenter cross-sectional survey with analysis of

withholding and withdrawing life support. *Intensive Care Med* 2010;36:765–72.
doi:10.1007/s00134-010-1800-1.

Figure caption

FIGURE 1 Flow chart of the study patients. Quantitative data were reported as median [interquartile range 25%-75%].

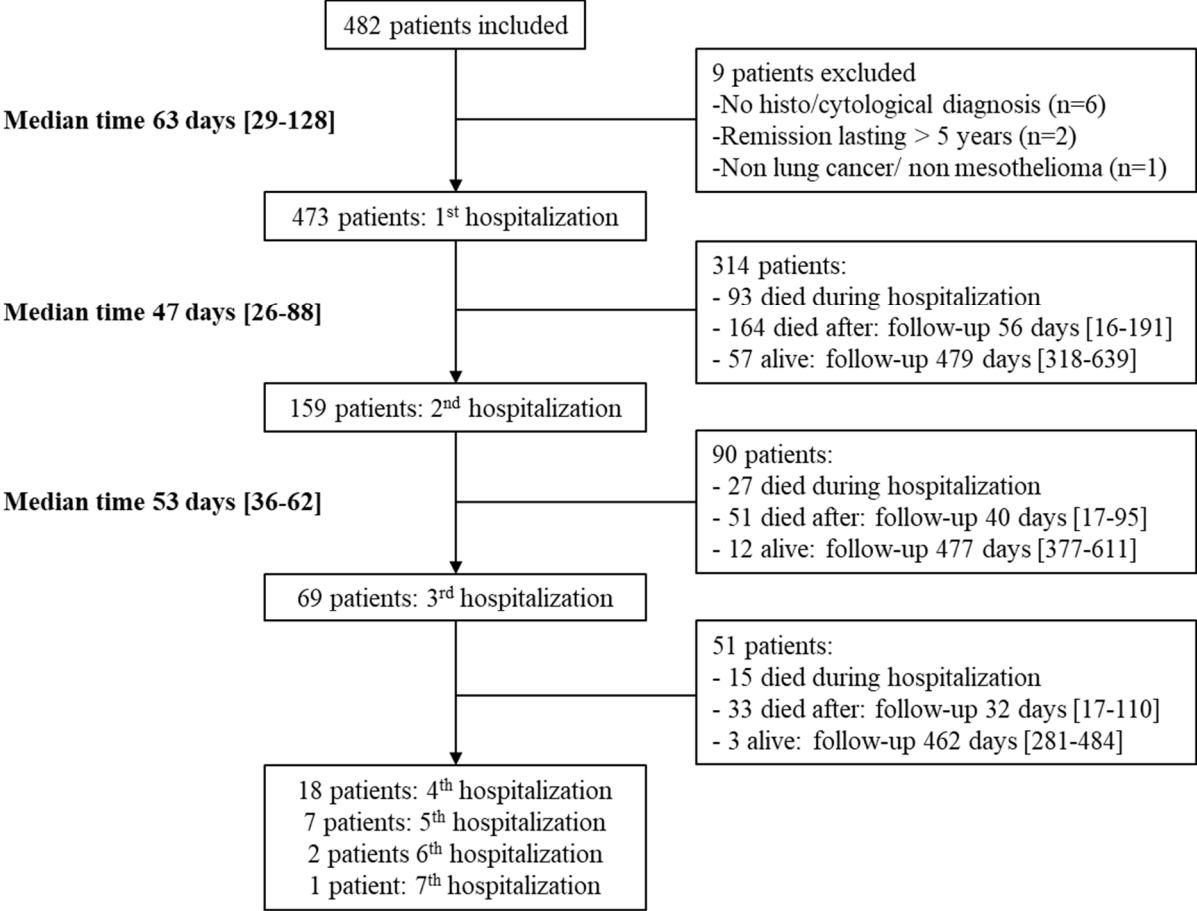


TABLE 1 Patient characteristics at first admission according to first planned care intensity

Variables	1 st admission n=473	Intensive care proposition n=330 (70)	Maximal medical or palliative care proposition n=143 (30)	P-value
Demographics				
Male gender	335 (71)	227 (69)	108 (76)	0.14
Age (years)	67 [60-75]	66 [59-73]	70 [61-77]	8.10 ⁻³
Modified CCI (points)	1 [0-3]	1 [0-2]	1 [0-3]	3.10 ⁻³
ECOG-PS at admission				<10 ⁻⁴
- 0-1	124 (26)	116 (35)	8 (6)	
- 2	123 (26)	97 (29)	23 (18)	
- 3-4	226 (48)	117 (35)	109 (76)	
Weight loss (%)	8 [1-15] (MD=18)	8 [0-13] (MD=11)	11 [3-19] (MD=7)	2.10 ⁻³
Cancer history				
Cancer diagnosis before hospitalization	400 (85)	270 (82)	130 (91)	0.01
Time since cancer diagnosis				
- If diagnosis before hospitalization (days)	189 [30-505], n=400	146 [24-471], n=270	274 [85-584], n=130	8. 10 ⁻⁴
- If diagnosis during hospitalization (days)	4 [1-8], n=73	4 [1-8], n=60	4 [2-6], n=13	0.91
Cancer type				
- Adenocarcinoma	264 (56)	195 (59)	69 (48)	0.30
- Squamous cell carcinoma	72 (15)	46 (14)	26 (18)	
- Small cell carcinoma	76 (16)	50 (15)	26 (18)	
- Other NSCLC	49 (10)	31 (9)	18 (13)	
- Mesothelioma	12 (3)	8 (2)	4 (3)	
Metastasis (except mesothelioma)	393 / 461 (85)	261 / 322 (81)	132 / 139 (95)	10 ⁻⁴
Cancer status				
- Not yet treated	182 (38)	148 (45)	34 (24)	<10 ⁻⁴
- Progression	165 (35)	78 (24)	87 (61)	
- Controlled disease	75 (16)	53 (19)	12 (8)	
- Unknown	51 (11)	41 (12)	10 (7)	
Current anticancer treatment				
- Awaiting new treatment	187 (40)	156 (47)	31 (22)	<10 ⁻⁴
- Treatment ongoing	148 (31)	98 (30)	50 (35)	
- Included in clinical trial	30 (6)	24 (7)	6 (4)	
- Therapeutic window	53 (11)	40 (12)	13 (9)	
- Palliative care	55 (12)	12 (4)	43 (30)	
Reason of admission				
Acute disease	208 (44)	143 (43)	65 (45)	6. 10 ⁻⁴
Respiratory disorder				
- Pleural effusion	119/208 (57)	89/143 (62)	30/65 (46)	
- Pneumonia	33/119 (28)	25/89 (28)	8/30 (27)	
- Tumour compression	27/119 (23)	19/89 (21)	8/30 (27)	
- Tumour compression	25/119 (21)	19/89 (21)	6/30 (20)	
Neurological disorder				
- Coma	41/119 (20)	22/89 (15)	19/30 (29)	
- Coma	7/41 (17)	3/22 (14)	4/19 (21)	
Improvement in supportive care	167 (35)	104 (32)	43 (44)	
Scheduled hospitalisation	50 (11)	46 (14)	4 (3)	
Toxicity of anticancer treatment	48 (10)	37 (11)	11 (8)	

Data are expressed as median [interquartile range] for quantitative variables and numbers (%) for qualitative variables. CCI: Charlson Comorbidity Index [16]]; MD: missing data; NSCLC: non-small cell lung cancer, PS: performance status.

TABLE 2 Planned care intensity in the event of organ failure

Variables	1st admission n=473 patients	2nd admission n=159 patients	3rd admission n=69 patients
1st proposition	473 (100)	159 (100)	69 (100)
- Intensive care	330 (70)	77 (48)	37 (54)
- Maximal medical care	141 (30)	81 (51)	31 (45)
- Exclusive palliative care	2 (0)	1 (1)	1 (1)
First discussion at the day of admission	310 (65)	130 (82)	47 (68)
First discussion within the next days of admission	163 (35)	29 (18)	22 (32)
With a median time from admission (days)	2 [1-4]	1 [1-3]	2 [1-3]
2nd proposition	62 (13)	16 (10)	7 (10)
Time between 2 nd and 1 st proposition (days)	9 [4-14]	7 [5-12]	8 [6-9]
- Intensive care	22 (35)	2 (13)	3 (43)
- Maximal medical care	30 (48)	11 (69)	2 (29)
- Exclusive palliative care	10 (16)	3 (19)	2 (29)
Sense of the 2 nd proposition compared to the first one			
- More palliative	52 (84)	13 (81)	6 (86)
- Equal	3 (5)	1 (6)	1 (14)
- More intensive	7 (11)	2 (13)	...
3rd proposition	16 (3)	2 (1)	...
Time between 3 rd and 2 nd proposition (days)	6 [4-10]	6-17	
- Intensive care	2 (13)	1 (50)	...
- Maximal medical care	8 (50)	1 (50)	...
- Exclusive palliative care	6 (38)	...	...

Data are expressed as numbers (%).

TABLE 3 Patients' characteristics according to intensity of care at organ failure

Variables	Organ failure n=173	Intensive care n=17 (10)	Maximal medical care n=49 (28)	Exclusive palliative care n=107 (62)	p-value
Demographics					
Male sex	128 (74)	13 (76)	36 (73)	79 (74)	0.97
Age (years)	67 [59-76]	62 [54-69]	64 [55-74]	69 [61-77]	0.02
Modified CCI (points)	0 [0-2]	1 [0-2]	1 [0-3]	0 [0-2]	0.21
ECOG-PS: 3-4 vs 0-2	134 (77)	11 (65)	35 (71)	88 (82)	0.13*
Weight loss (%)	11 [4-18] (MD=15)	8 [4-12] (MD=1)	9 [2-16] (MD=5)	13 [6-20] (MD=9)	0.02
Cancer history					
Time since cancer diagnosis (months) if diagnosis before admission	8.9 [2.6-18.5] n=153	6.4 [1.5-16.4] n=14	12.2 [3.3-25.2] n=42	8.6 [2.7-15.6] n=97	0.32
Type of cancer					0.60*
- Adenocarcinoma	96 (55)	10 (58)	27 (55)	59 (55)	
- Small cell carcinoma	27 (16)	2 (12)	6 (12)	19 (18)	
- Squamous cell carcinoma	24 (14)	4 (24)	5 (10)	15 (14)	
Metastasis (except mesothelioma)	160 / 168 (95)	13 / 17 (76)	44 / 48 (92)	103/103 (100)	<10 ⁻⁴ *
Cancer status					0.02*
- Not yet treated	49 (28)	7 (41)	13 (27)	29 (27)	
- Progression	103 (60)	5 (29)	27 (55)	71 (66)	
- Controlled disease	16 (9)	4 (24)	7 (14)	5 (5)	
- Unknown	5 (3)	1 (6)	2 (4)	2 (2)	
Current anticancer treatment					<10 ⁻⁴ *
- Awaiting new treatment	47 (27)	8 (47)	17 (35)	22 (21)	
- Treatment ongoing	49 (28)	6 (35)	15 (31)	28 (26)	
- Included in clinical trial	12 (7)	1 (6)	7 (14)	4 (4)	
- Therapeutic window	16 (9)	2 (12)	7 (14)	7 (7)	
- Palliative care	49 (28)	...	3 (6)	46 (43)	
Reason of admission					
Acute disease	94 (54)	13 (76)	32 (65)	49 (46)	0.02*
- Respiratory disorder	51 (54)	10 (77)	20 (63)	21 (43)	
- Neurological disorder	18 (19)	...	3 (9)	15 (31)	
Improvement of supportive care	69 (40)	3 (18)	13 (27)	53 (50)	
Scheduled hospitalisation	2 (1)	...	1 (2)	1 (1)	
Toxicity of anticancer treatment	8 (5)	1 (6)	3 (6)	4 (4)	
Planned intensity of care before OF					
- Intensive care	56 (32)	17 (100)	22 (45)	17 (16)	<10 ⁻⁴ *
- Maximal medical care	104 (60)	...	27 (55)	77 (72)	
- Exclusive palliative care	13 (8)	...	...	13 (12)	
Organ failures					
Time between admission and OF (days)	8 [3-13]	8 [1-10]	4 [1-10]	10 [6-15]	2. 10 ⁻⁴
Respiratory disorder	68 (39)	10 (59)	26 (53)	32 (30)	5.10 ⁻³
Coma*	52 (30)	...	4 (8)	48 (45)	<10 ⁻⁴
Shock (except septic)	19 (11)	2 (12)	6 (12)	11 (10)	0.93*
Sepsis	18 (10)	2 (12)	10 (20)	6 (6)	0.01*
Death	7 (4)	...	...	7 (7)	

Data are expressed as median (interquartile range) for quantitative variables and numbers (%)

for qualitative variables. *Use of Fisher exact. CCI: Charlson Comorbidity Index; MD: missing data; NSCLC: non-small cell lung cancer; OF: organ failure.

*Reason of coma were: complication of central nervous system metastasis (n=22), drug-related (n= 13) or as a consequence of another organ failure (n=13). No explanation was identified for 4 patients.

TABLE 4 Patient and relative information for patients with organ failure (n=173)

Variables	Total of the 3 admissions n=173	1 st admission n=127	2 nd admission n=31* Excluding 3 patients	3 rd admission n=15
Reason of no discussion in the medical chart	n=15 (9)	n=13 (10)	n=1 (3)	n=1 (7)
- Patient/ relative unable for discussion	3 (20)	3 (23)	...	...
- Sudden death	2 (13)	2 (15)	...	...
- Rapidly reversible	2 (13)	1 (1)	...	1 (100)
- No explanation / missing data	8 (53)	7 (54)	1 (100)	
1 st discussion	158 (91)	n=114 (90)	n=30 (97)	n=14 (93)
- Time from admission (day)	5 [2-9]	5 [2-9]	6 [2-10]	5 [1-10]
- Before organ failure	141 (89)	103 (90)	25 (81)	13 (93)
- End of life condition	73 (46)	49 (43)	14 (47)	10 (71)
- Cancer	61 (39)	47 (41)	11 (37)	3 (21)
- Severity of disease	24 (15)	18 (16)	5 (17)	1 (7)
2 nd discussion	n=86 (50)	n=62 (49)	n=16 (53)	n=8 (53)
- End of life condition	68 (79)	50 (81)	12 (75)	6 (75)
- Cancer	8 (9)	6 (10)	2 (13)	...
- Severity of disease	10 (6)	6 (10)	2 (13)	2 (25)
End of life discussion during hospitalisation	116 (67)	82 (65)	21 (68)	13 (87)

Data are expressed as median [interquartile range] for quantitative variables and numbers (%)

for qualitative variables.

*3 patients excluded because of organ failure at 1st hospitalisation.

APPENDIX:

Annex 1. Form for advanced care planning in the thoracic oncology unit

Grenoble University Hospital
December 2012 - version 6

Patient's name tag :

« Advanced care planning form for patients with advanced disease »

1st part : Legal procedure

Referring doctor to the patient :.....

First meeting date: / /

Regular reassessment is necessary

- This document refers to the care planning for M./ Ms
- The goal of this form is to help decision making in case of acute event, for nurses and on-call physicians.
- Patient's wishes should be followed. Relative's opinion is recorded.
- This form is filled under the responsibility of a medicine doctor, **MD**
- It follows a meeting with caregivers where they expressed their opinion and comments to enlighten the physician's decision.
- If the patient cannot express his wishes, a collegiate procedure should be made*.
- Propositions of care are regularly reassessed.
- **The physician in responsibility of the patient at the time of organ failure remains judge of his decision.**

DIAGNOSIS

- Main disease :
- Stage of the disease :
- Main comorbidities:.....

WISHES

Patient able to express his will	Patient unable to express his will <small>Collegiate procedure for decision making, written in the medical chart</small>
<p>Patient's wishes : Is he informed about the diagnosis : yes <input type="checkbox"/> no <input type="checkbox"/> Is he informed about the prognosis? yes <input type="checkbox"/> no <input type="checkbox"/> What are his wishes about the therapeutic project? :</p> <p><i>As long as the patient is able to understand and express himself, his will is priority over advanced directives and relatives' wishes :</i></p> <p>Are-they advanced directives? yes <input type="checkbox"/> no <input type="checkbox"/> Is there a designated proxy? yes <input type="checkbox"/> no <input type="checkbox"/> Name</p> <p>Relatives' opinion</p>	<p>Patient's wishes before inability : Was he informed about the diagnosis : yes <input type="checkbox"/> no <input type="checkbox"/> Was he informed about the prognosis? yes <input type="checkbox"/> no <input type="checkbox"/> What were his wishes about the therapeutic project? :</p> <p>Are-they advanced directives? yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>Is there a designated proxy? yes <input type="checkbox"/> no <input type="checkbox"/> Name</p> <p>Relatives' opinion.....</p> <p>Referring doctor's opinion</p> <p>.....</p> <p>Complementary opinion</p> <p>.....</p>

Task force : Palliative and Supportive care activities federation/ Ethical unit in Grenoble University Hospital
A.C. Toffart, N. Carlin, S. Courby, C. Crotti, M. Dufour, C. Finet, D. Grunwald, M. Hinaux, G. Laval, V. Mercier-Cubizolles, M. Mousseau, E. Rivaux, L. Sakhr, C. Schwebel, O. Shestaeva
* 04/03/2002 law -22/04/2005 law + implementation decrees.

2nd part : Datas of advanced care planning to help decision making in case of organ failure in a patient with a severe or terminal illness, the physician on duty stays in responsibility of the decision.

	1 st evaluation	2 nd evaluation	3 rd evaluation	4 th evaluation
DATE	.../.../...	.../.../...	.../.../...	.../.../...
In case of collegiate procedure :				
Name of referring doctor:.....
Paramedical team yes <input type="checkbox"/> no <input type="checkbox"/>

	1 st evaluation	2 nd evaluation	3 rd evaluation	4 th evaluation
MEDICAL PROPOSITIONS	YES / NO	YES / NO	YES / NO	YES / NO
Blue Code Procedure				
Cardio-pulmonar resuscitation				
Patient's transfer to intensive care unit (if no, patients stays in medical unit with maximal medical care)				
Oro-tracheal intubation or tracheotomy				
Dialyssis				
Amines				
Non invasive ventilation				
Artificial nutrition				
Start antibiotics				
Transfusion				
Peripheral venous catheter				
Further examination (biology, radiology,...)				
Vital signs monitoring				
Anticoagulant				
Fibro-aspiration				
Other : IV fluids, insulin,... (precise)				

In every proposition, assessment of patient's confort and treatments: pain killers, anxiolytics,...

The medical team will judge the most appropriated way to inform the patient from the decision taken:

	1 st evaluation	2 nd evaluation	3 rd evaluation	4 th evaluation
DATE	.../.../...	.../.../...	.../.../...	.../.../...
DOCTOR IN RESPONSIBILITY & Signature				

CHU de Grenoble
 Décembre 2012 - version 6

Etiquette patient :

**« Fiche d'aide à la décision
 en cas d'aggravation d'un patient atteint d'une pathologie avancée »**

1^{ère} partie : procédure légale

Médecin référent du patient :

Date de la 1^{ère} réunion: / /

Réévaluation régulière indispensable

- Ce document synthétise la réflexion de projet de soins de Mr / Mme
- Il se veut une aide pour les soignants et médecins de garde, quant à la conduite à tenir en cas d'événement aigu.
- La volonté du patient doit être respectée au mieux. L'avis des proches est recueilli.
- Ce document est élaboré sous la responsabilité d'un médecin thésé, le Dr.
- Il fait suite à une réunion au cours de laquelle les soignants ont exprimé leurs avis et commentaires permettant d'éclairer au mieux la décision du praticien.
- Si le patient n'est pas apte à exprimer sa volonté, une procédure collégiale s'impose*.
- Ces propositions sont à réévaluer régulièrement.
- Le médecin de garde reste juge de ses décisions face à la situation qui se présente.

DIAGNOSTIC

- Pathologie principale :
- Stade de la maladie :
- Comorbidité(s) principale(s) :

AVIS

Patient apte à exprimer sa volonté	Patient non apte à exprimer sa volonté Procédure collégiale avec décision motivée inscrite dans le dossier médical
<p>Avis du patient :</p> <p>Est-il informé du diagnostic : oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Est-il informé du pronostic ? oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Quelles sont ses volontés concernant le projet thérapeutique:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p><i>Tant que le patient est apte à comprendre et à s'exprimer, son avis est prioritaire sur les directives anticipées et sur l'avis des proches :</i></p> <p>Y a-t-il des directives anticipées oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Y a-t-il une personne de confiance oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Nom</p> <p>Avis des proches</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>Avis du patient avant l'incapacité :</p> <p>Etait-il informé du diagnostic ? oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Etait-il informé du pronostic ? oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Quel était son avis :</p> <p>.....</p> <p>Y a-t-il des directives anticipées oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>.....</p> <p>.....</p> <p>Y a-t-il une personne de confiance oui <input type="checkbox"/> non <input type="checkbox"/></p> <p>Nom</p> <p>Avis des proches</p> <p>.....</p> <p>.....</p> <p>Avis du médecin consultant</p> <p>.....</p> <p>Avis complémentaire éventuel</p> <p>.....</p> <p>.....</p>

Groupe de travail mixte : Fédération des activités de soins palliatifs et soins de support / Espace éthique du CHU de Grenoble.
 A.C. Toffart, N. Carlin, S. Courby, C. Crotti, M. Dufour, C. Finet, D. Grunwald, M. Hinaux, G. Laval, V. Mercier-Cubizolles, M. Mousseau, E. Rivaux, L. Sakhr, C. Schwebel, O. Shestaeva.
 * loi du 04/03/2002 – loi du 22/04/2005 + décrets d'application.

2^{ème} partie : Données pour aide à la décision du médecin de garde qui reste juge de ses décisions en cas d'aggravation d'un patient atteint d'une maladie grave ou en fin de vie

	1 ^{ère} évaluation	2 ^{ème} évaluation	3 ^{ème} évaluation	4 ^{ème} évaluation
DATE	... / ... / / ... / / ... / / ... / ...
En cas de décision collégiale :				
Médecin consulté, nom :
Equipe paramédicale oui <input type="checkbox"/> non <input type="checkbox"/>

	1 ^{ère} évaluation	2 ^{ème} évaluation	3 ^{ème} évaluation	4 ^{ème} évaluation
PROPOSITIONS MEDICALES	Oui / Non	Oui / Non	Oui / Non	Oui / Non
Procédure SIERRA				
Réanimation cardio-pulmonaire				
Transfert du patient en réanimation (Si non, maintien du patient dans le service, avec traitement médical renforcé)				
Intubation ou trachéotomie				
Dialyse				
Amines				
Ventilation non invasive				
Nutrition artificielle				
Débuter ATB				
Transfusion				
Reposer une voie d'abord veineuse				
Examen complémentaire (biologique ou radiologique)				
Prises de constantes				
Anticoagulant				
Fibro-aspiration				
Autre : hydratation, insuline... (préciser)				

Dans tous les cas, maintien de l'évaluation rapprochée du confort et de ses traitements : antalgie, anxiolyse...

L'équipe médicale jugera de la façon la plus appropriée pour informer le patient des décisions concertées :

	1 ^{ère} évaluation	2 ^{ème} évaluation	3 ^{ème} évaluation	4 ^{ème} évaluation
DATE	... / ... / / ... / / ... / / ... / ...
MEDECIN RESPONSABLE & Signature				