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Management of cancer patients in COVID-19 era in hematologic malignancies

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Protecting measures and screening in cancer patients

General consensus measures taken by ‘Cancer Core Europe’ (CCE) centers during the COVID-19 pandemic

Category	Measure
Hospital wide	► Hospital wide Construct a hospital-wide crisis team responsible for coordinating measures between departments.
	► Encourage patients not to arrive early. Offer to text patients when you are ready to see them, so they can wait outside or in the car.
	► Instruct patients not to visit the hospital if they have symptoms indicative of possible COVID-19 (unless urgent attention is required).
	► Call patients the day before planned hospital admissions, to discuss the presence of any COVID-19-related symptoms.
	► Screen patients at the entrance for symptoms of COVID-19 and fever.
	► Quickly isolate patients with COVID-19 in specialized departments, with the intent of relocation to regional collaborating hospitals (if possible).
	► Reduce preclinical research activities to a bare minimum.
	► Stop patient inclusion for clinical studies or trials requiring additional actions and/or visits.
	► Consider a tumor type–specific ‘exception list’ of particularly successful studies for which inclusion continues.
	► Discuss each patient with a multidisciplinary team to consider alternative treatment modalities with the fewest visits or lowest capacity problems or that are the shortest in duration.
	► Therapeutic adjustments (versus regular guidelines) should be discussed in a multidisciplinary team meeting.
	► Conduct multidisciplinary team consultations remotely if possible or include only one representative of each discipline to limit the number of people participating in the meetings. Inform patients about a possibly increased risk associated with anticancer therapy during the COVID-19 pandemic.
	► Enable telephone or video consultations for healthcare professionals who need to self-isolate. When postponing procedures or contact moments, anticipate future capacity problems.
	► Do not prescribe corticosteroids as anti-emetics (if avoidable), and limit their use in patients treated with immune-checkpoint blockade, to reduce vulnerability to COVID-19.
	► With each patient, discuss resuscitation status to anticipate future decisions about intensive care.

How manage patients flow in hospital: ESMO's guidelines: who's at risk?

In cancer patients, categories at risk include:

- Patients receiving chemotherapy, or who have received chemotherapy in the last 3 months
- Patients receiving extensive radiotherapy
- People who have had bone marrow or stem cell transplants in the last 6 months, or who are still taking immunosuppressive drugs
- People with some types of blood or lymphatic system cancer which damage the immune system, even if they have not needed treatment (for example, chronic leukaemia, lymphoma or myeloma)

Specific high risk for leucopenia, low Ig's, chronic immunosuppression (steroids, MoAb's)

General consensus measures taken by ‘Cancer Core Europe’ (CCE) centers during the COVID-19 pandemic

Category	Measure
Outpatient clinic	► Do all follow up appointments by phone (except when physical examination is necessary). ► When possible, reduce or delay the number of radiological-response evaluations. ► Prioritize oral or subcutaneous treatments above infusion-based treatments to reduce time spent in the hospital. ► Perform blood tests outside the hospital (e.g., at a general practice or at home), when possible. ► Have oral medications delivered to the patient’s home, rather than being picked up at the pharmacy ► Consider omitting supportive treatments (e.g., no bisphosphonate infusion, except in the case of hypercalcemia) ► When possible, organize the administration of intravenous maintenance treatments at home ► When administration at home is impossible, consider temporary breaks or reductions in the frequency of intravenous maintenance treatments for less-aggressive metastatic cancers on a per-patient basis

How manage patients flow in hospital: ESMO's guidelines. (2) patients undergoing active treatment

- Hospitals should identify **specific pathways** in order to guarantee timing of treatment with curative intent and, when possible, also for patients with metastatic disease.
- **Outpatient visit**s for cancer patients should be **reduced to the safest and most feasible level** without jeopardising patient care.
- For patients **receiving oral treatment** for which monitoring can be done remotely**, drug supply should be provided for at least 3 courses** to **reduce access to the hospital.**
- **Blood monitoring** for those patients can be done **in local labs close to home.**
- We suggest implementation of **telemedicine** services.
- We advise to **delay all follow-up visits**.
- **More intensive surveillance** should be used during treatment **for patients with lung cancer** or who **received previous lung surgery**, and for **older patient**s or those patients with **other comorbidities**.
- Intensive measures should be undertaken to avoid nosocomial spread.
- There should be **strict and safe triaging procedures** to **assess any COVID-19 symptoms and the urgency and necessity of ho**spitalisation.
- In order to regulate access to the "Cancer Hubs", establish **"checkpoint areas" screening for early detection** of potentially infectious persons.
- Clinical staff responsible for the checkpoint area should be trained and wear PPE.
- Individuals who meet criteria for highly communicable diseases requiring isolation, such as novel COVID-19 or other emerging infections, must be placed in a private exam room as soon as possible, as per the infectious control guidance found on the WHO and CDC websites. They should be tested and transferred to COVID-19 dedicated areas.

Slide Sets based on the ESMO recommendations for cancer patient management during the COVID-19 pandemic. Downloaded from ESMO website: https://www.esmo.org/guidelines/covid-19-adapted-recommendations-slide-sets. Last Access December 4th

Protecting measures and screening in cancer patients

Hematology departments

Compliance to rules

Testing of HCP’s and patients even with mild symptoms

Van Doesum, J., et al. Leukemia 34, 2536–2538 (2020).

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Are cancer patients at higher risk to be infected with SARS-CoV-2?

Are cancer patients at higher risk to be infected with SARS-CoV-2?

- HEMATOLOGIC
- Insufficient data published
- Screening largely suboptimal
- Higher risk of false negative testing in hematological patients with PCR (> 20%)
- Hematological cancer patients usually adhere better to hygienic measures

- But: patients with hematological malignancies
  - frequently have **decreased immune function** (due to their disease and their treatments) → increased risk of community- and hospital-acquired infections
  - usually need **frequent visits** to the hospital for evaluation and/or treatment

He W, et al. Leukemia. 2020 Jun;34(6):1637-1645.

Are cancer patients at higher risk to be infected with SARS-CoV-2?

- HEMATOLOGIC

Table 1
Patient characteristics. Number of cases and percentage (%) are shown. Only major categories of races are shown.

Patient	Study population	Hematologic malignancies (all-time)	Hematologic malignancies (recent)	COVID-19	COVID-19 + hematologic malignancies (all-time)	COVID-19 + hematologic malignancies (recent)
Total	73,668,830	517,580	56,680	17,130	420	270
Gender						
Female	39,532,900 (54%)	272,010 (53%)	29,860 (53%)	10,050 (59%)	260 (62%)	160 (59%)
Male	33,642,290 (46%)	244,270 (47%)	26,190 (46%)	7060 (41%)	160 (38%)	110 (41%)
Unknown	507,990 (<1%)	1440 (<1%)	780 (1%)	40 (<1%)	0 (0%)	0 (0%)
Age						
Junior (< 18)	10,569,970 (14%)	10,800 (2%)	2180 (4%)	1110 (6%)	30 (7%)	20 (7%)
Adult (18 to 65)	44,101,640 (60%)	200,640 (39%)	23,580 (42%)	11,980 (70%)	210 (50%)	130 (48%)
Senior (> 65)	18,025,500 (24%)	302,110 (58%)	31,160 (55%)	4070 (24%)	180 (43%)	120 (44%)
Race						
Caucasian	40,253,700 (55%)	397,650 (77%)	42,290 (75%)	8460 (49%)	230 (55%)	150 (56%)
African American	7,599,730 (10%)	53,470 (10%)	7210 (13%)	6680 (39%)	160 (38%)	100 (37%)
Asian	1,190,850 (2%)	7480 (1%)	660 (1%)	160 (1%)	0 (0%)	0 (0%)
Hispanic/ Latino	1,054,410 (1%)	4320 (<1%)	310 (<1%)	20 (<1%)	0 (0%)	0 (0%)
Unknown	9,030,700 (12%)	63,640 (12%)	4770 (8%)	930 (5%)	30 (7%)	20 (7%)

Wang Q, et al. Blood Rev. 2020 Nov 9:100775.

Are cancer patients at higher risk to be infected with SARS-CoV-2?

- HEMATOLOGIC

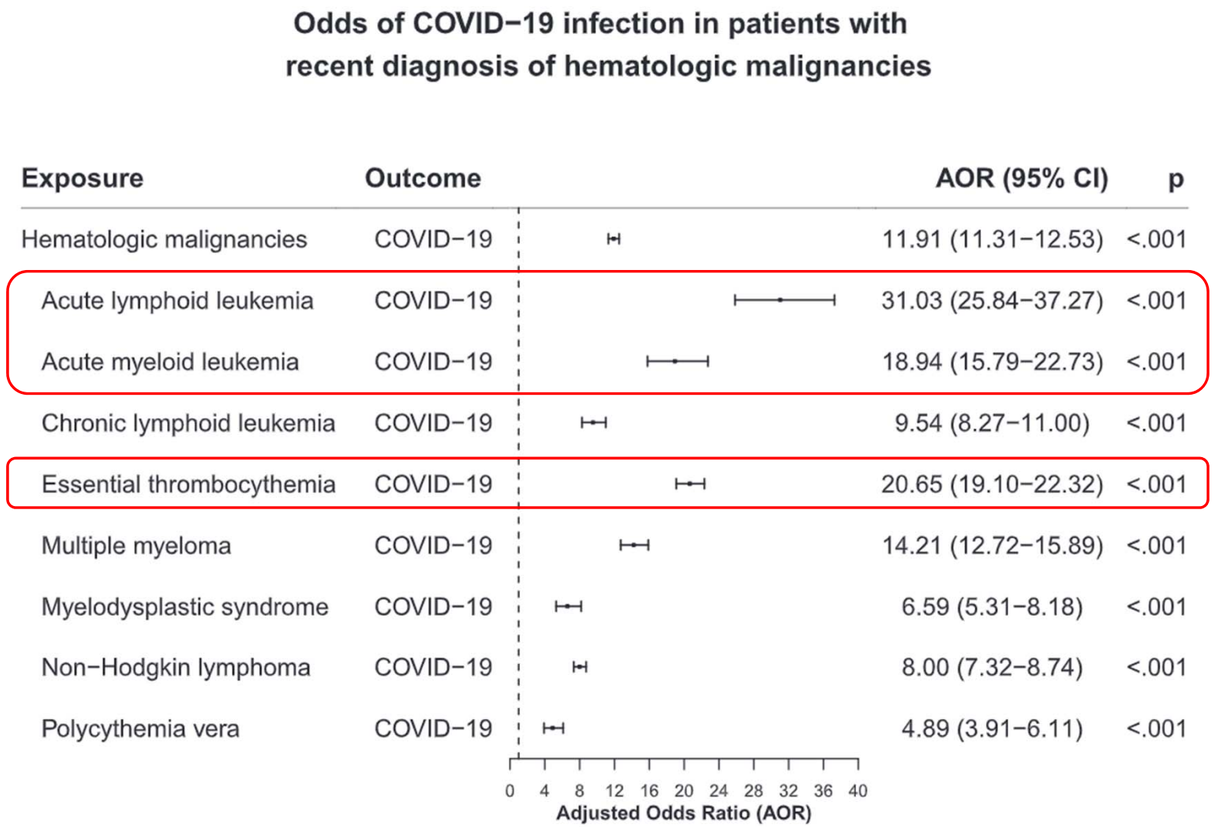


Fig. 1. Odds of COVID-19 infection in patients with recent versus all-time diagnosis of hematologic malignancies, adjusted for age, gender, race and potential COVID-19 risk factors (cardiovascular diseases, type 2 diabetes, obesity, chronic kidney diseases, chronic obstructive pulmonary disease (COPD), asthma, substance use disorders, cancer therapy (chemotherapy, radiotherapy, immunotherapy), transplant procedure (bone marrow transplant, solid organ transplant) and nursing home stay status.

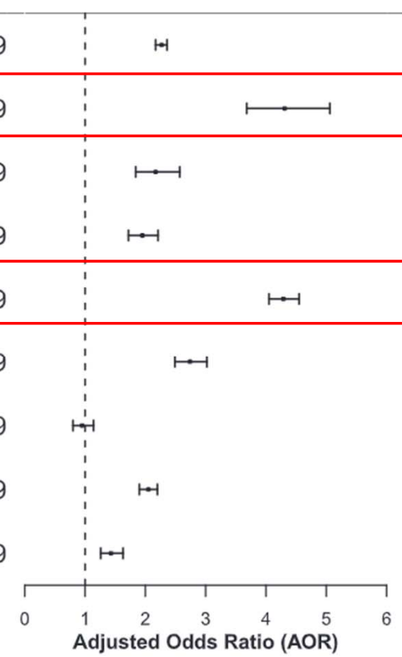
Wang Q, et al. Blood Rev. 2020 Nov 9:100775.

Are cancer patients at higher risk to be infected with SARS-CoV-2?

- HEMATOLOGIC

Odds of COVID−19 infection in patients with all−time diagnosis of hematologic malignancies

Exposure	Outcome	AOR (95% CI)	p
Hematologic malignancies	COVID−19	2.27 (2.17−2.36)	<.001
Acute lymphoid leukemia	COVID−19	4.31 (3.68−5.06)	<.001
Acute myeloid leukemia	COVID−19	2.17 (1.84−2.57)	<.001
Chronic lymphoid leukemia	COVID−19	1.95 (1.72−2.21)	<.001
Essential thrombocythemia	COVID−19	4.29 (4.05−4.55)	<.001
Multiple myeloma	COVID−19	2.74 (2.49−3.02)	<.001
Myelodysplastic syndrome	COVID−19	0.95 (0.80−1.14)	0.660
Non−Hodgkin lymphoma	COVID−19	2.05 (1.90−2.20)	<.001
Polycythemia vera	COVID−19	1.43 (1.26−1.63)	<.001



Wang Q, et al. Blood Rev. 2020 Nov 9:100775

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Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

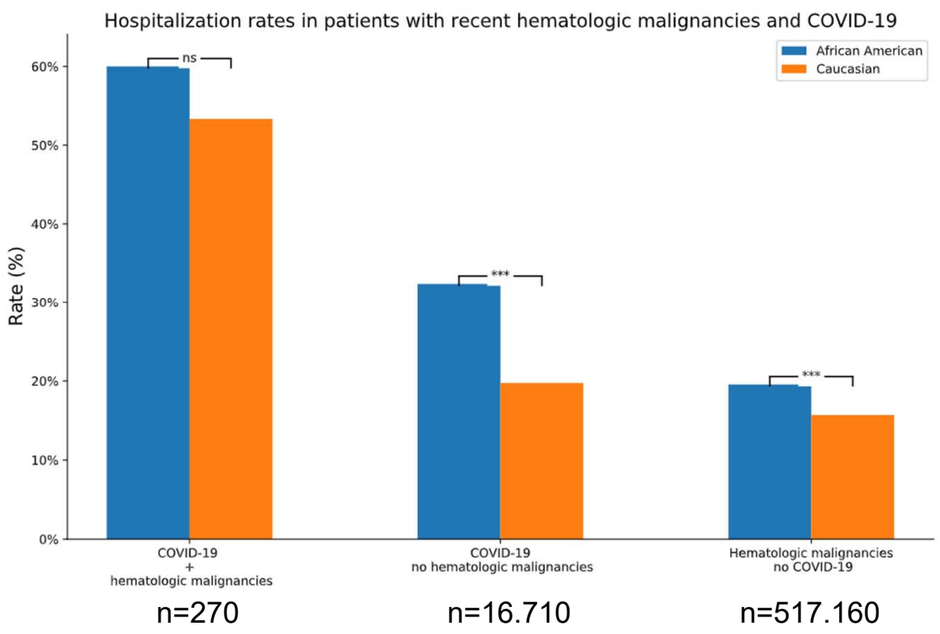
Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

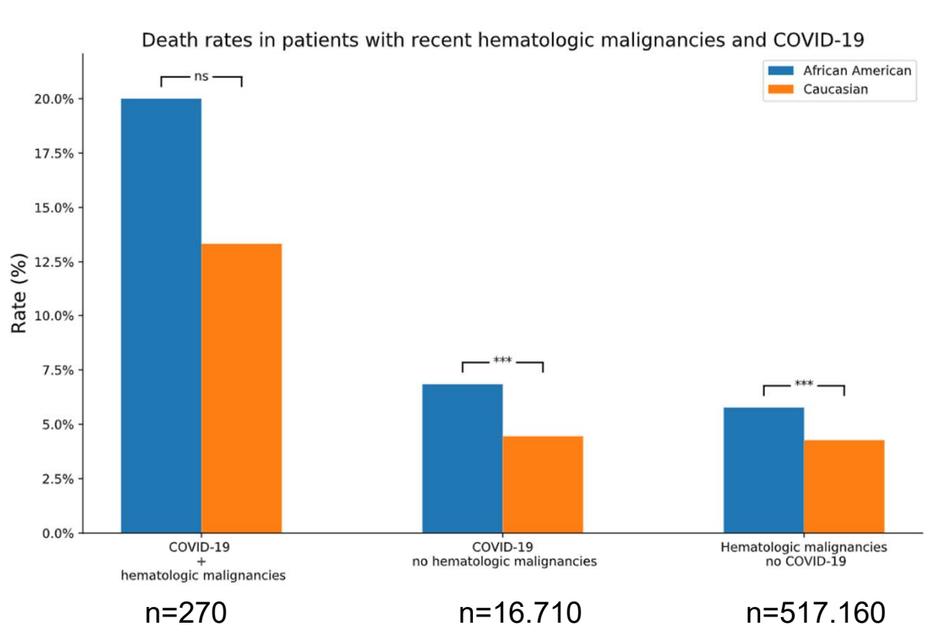
- HEMATOLOGIC
- Are patients with a hematological malignancy **more vulnerable to a more severe course** of COVID-19 compared to patients without a malignancy?
- Are patients with a haematological malignancy **more likely to die** from COVID-19?

Van Doesum, J., et al. Leukemia 34, 2536–2538 (2020). Wang Q, et al. Blood Rev. 2020 Nov 9:100775.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Patients with a hematological malignancy have a **higher hospitalization rate** and have a **higher death rate (compared to patients without hematologic malignancies)**





Wang Q, et al. Blood Rev. 2020 Nov 9:100775.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Patients with a haematological malignancy have a **higher mortality rate** of COVID (n=39 vs n=53 age-matched controls, COVID+, no hem-cancer)

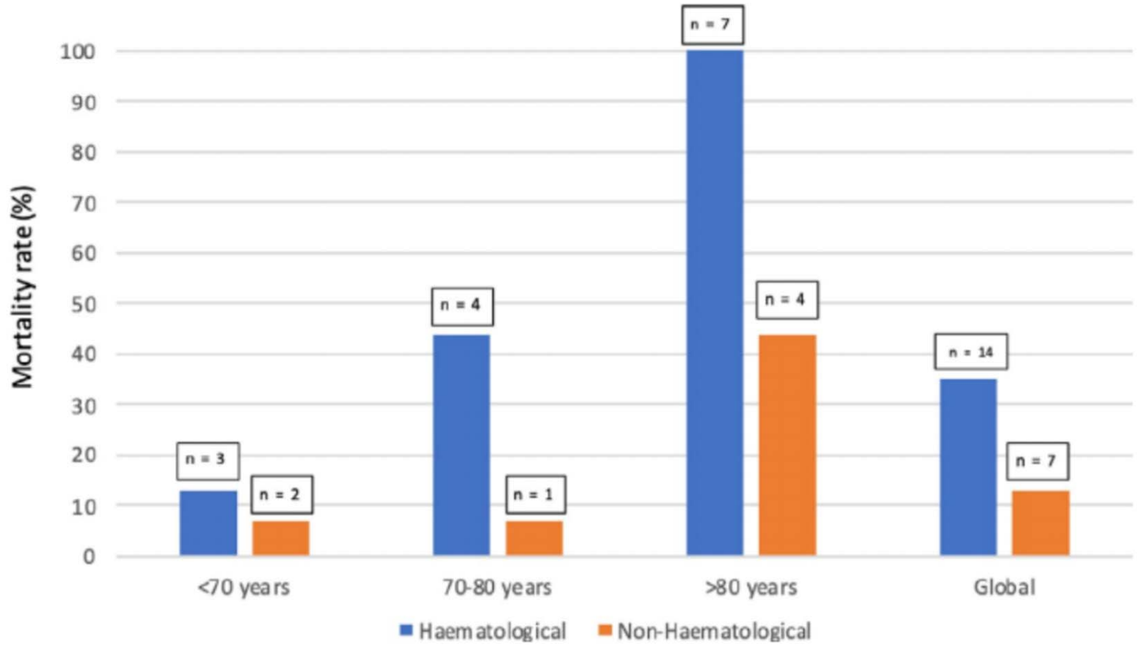


FIGURE 3 Mortality rate by age group among haematological and non-haematological patients. Beyond 70 years mortality rate is significantly higher in patients with haematological malignancies compared to patients without haematological malignancies. Global column shows overall mortality rate in both populations [Colour figure can be viewed at wileyonlinelibrary.com]

Sanchez-Pina JM, Eur J Haematol. 2020;105:597–607.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- **Risk factors for COVID death** (n=92 hem-cancer and no hem-cancer)

	Univariate			Multivariate		
Variable	OR	95% CI	*P* value	OR	95% CI	*P* value
Age >70	4.896	1.685-14.228	.004	7.471	2.109-26.472	.002
ACEi/ARBs	3.4	1.242-9.308	.017			
Need of oxygen therapy	4.894	1.497-16.004	.009	8.482	2.112-34.058	.003
Severity > moderate	4.373	1.443-13.258	.009			
Haematological disease	3.680	1.314-10.305	.013	6.652	1.868-23.688	.003

TABLE 4 Univariate and multivariate logistic regression analysis determining risk factors of death in non-survivor haematologic and non-haematologic patients

Sanchez-Pina JM, Eur J Haematol. 2020;105:597–607.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- **Risk factors for COVID death** in patients with a hematological malignancy (n=39 vs n=53 controls, COVID+, no hem-cancer)

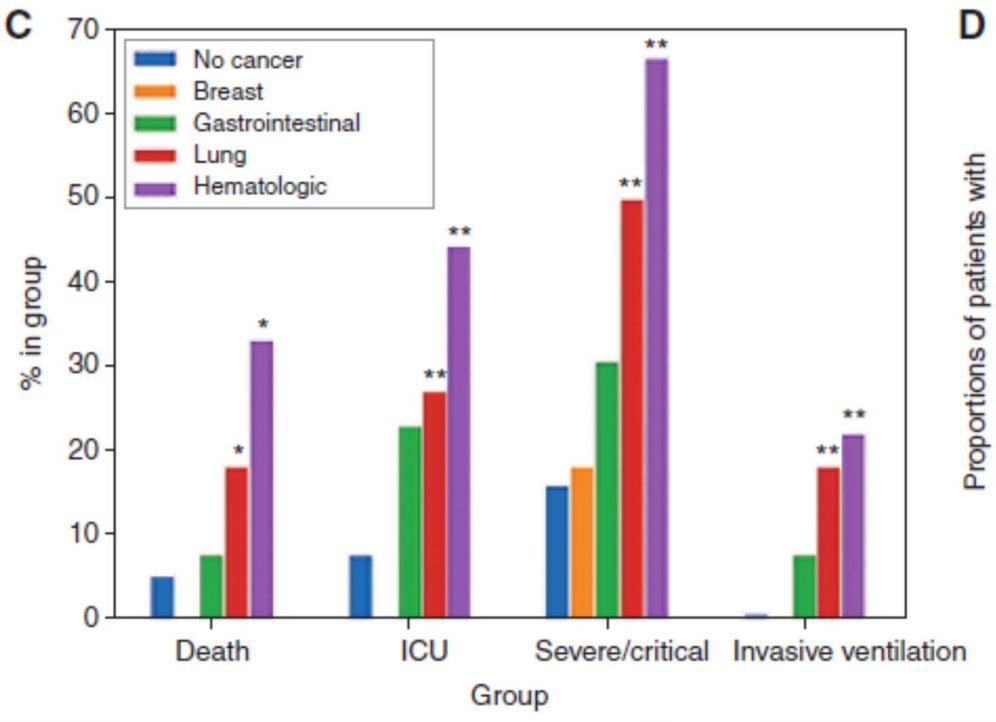
	Univariate			Multivariate		
Variable	OR	95% CI	*P* value	OR	95% CI	*P* value
Age >70	19.25	3.641-101.773	.000	34.86	3.407-356.8	.003
Hypertension	4.444	1.076-18.355	.039			
ACEi/ARBs	9.778	1.965-48.665	.005			
Need of Oxygen therapy	7.792	1.690-35924	.008			
Severity > moderate	9.429	2.008-44.271	.004			
CRP > 10	7.6	1.609-35.906	.010	13.56	1.28-143.45	.03

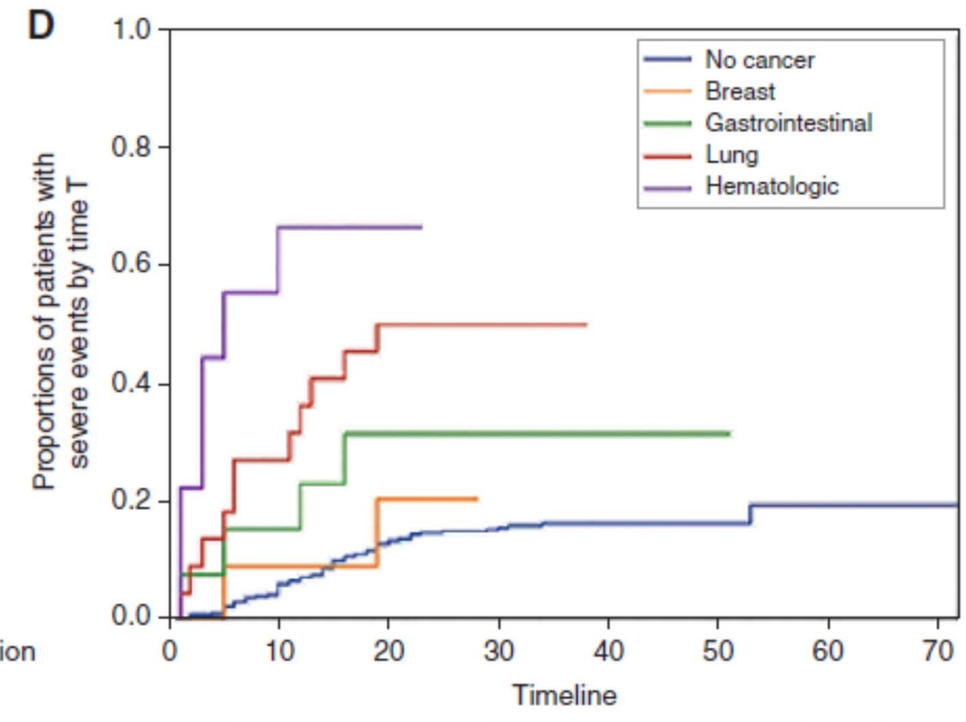
TABLE 3 Univariate and multivariate logistic regression analysis determining risk factors of death in haematological malignancies patients with COVID-19

Sanchez-Pina JM, Eur J Haematol. 2020;105:597–607.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Patients with a hematological malignancy have a **more severe course** of COVID and a **higher death rate** (n=9), compared to other cancer patients





Dai M, et al. Cancer Discov 2020;10:783–91.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Within patients with a hematological malignancy and COVID (n=39), **significant differences between disease types** are observed.

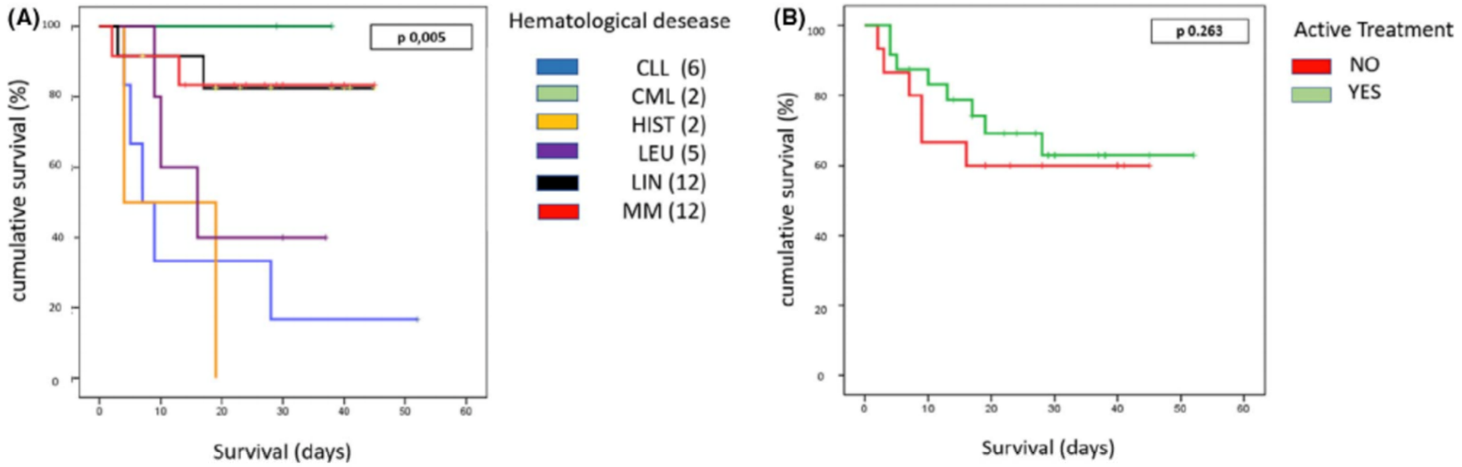
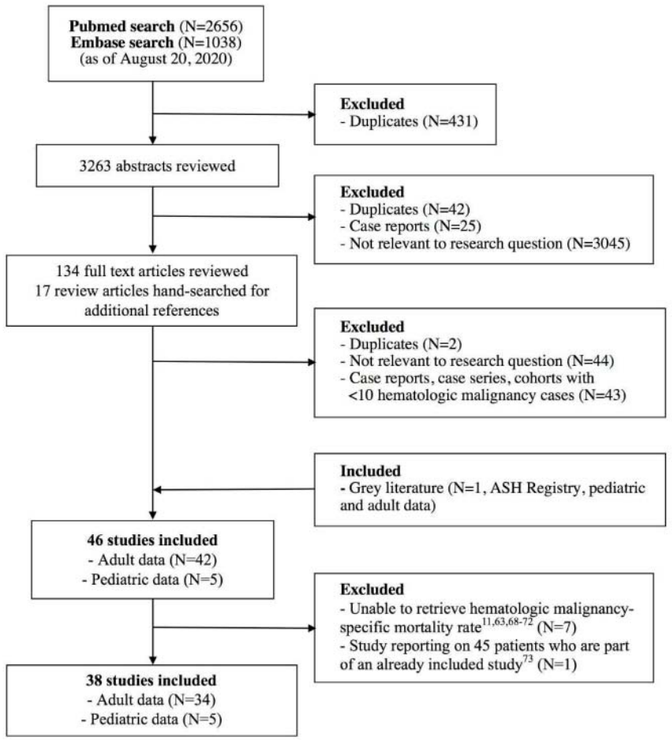


FIGURE 1 A. Kaplan-Meier survival plot comparing survival among the different haematological patients according to the underlying disease. Chronic lymphocytic leukaemia, acute leukaemia, and histiocytosis had shorter survival. B. Kaplan-Meier survival plot comparing survival among haematological patients with active treatment vs. non-active treatment from hospital admission until last follow-up. CLL, Chronic Lymphocytic Leukaemia; CML, Chronic Myeloid Leukaemia; HIST, Histiocytosis; LEU, Acute Leukaemia; LIN, Lymphoma; MM, Multiple Myeloma [Colour figure can be viewed at wileyonlinelibrary.com]

Sanchez-Pina JM, Eur J Haematol. 2020;105:597–607.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Systematic review and meta-analysis (n=3377)

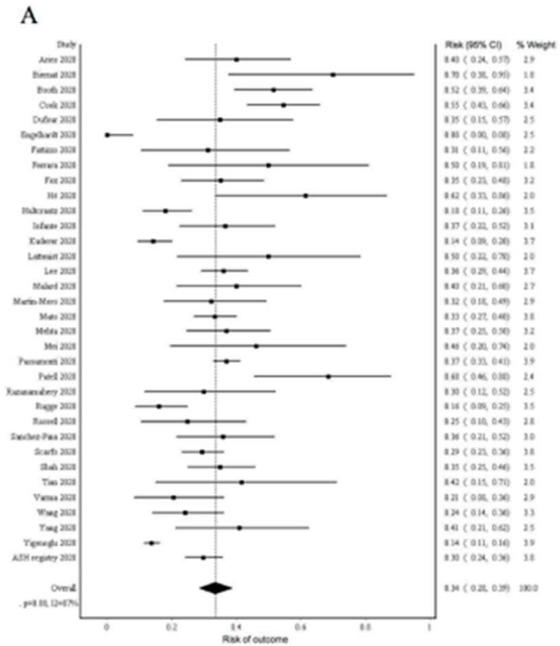


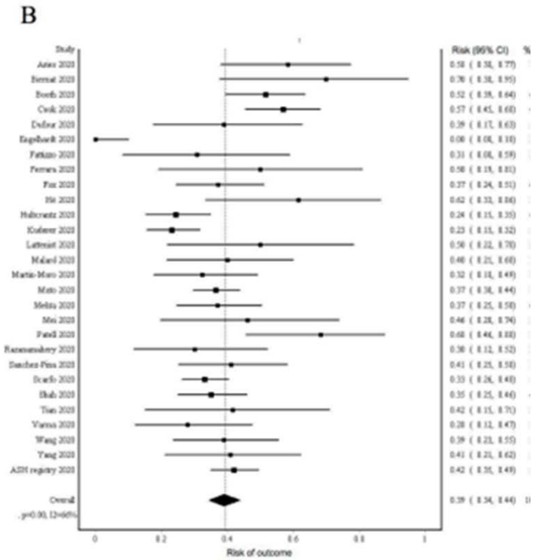
Underlying disease	n	% died
Bone marrow failure (AA-MDS)	231	53
Acute leukemias	289	41
Myeloproliferative disorders	293	34
Plasma cell disorders	412	33
NHL (including CLL)	1324	32
NHL (without CLL)	485	32
CLL	517	31

Vijenthira A, et al. Blood. 2020 Oct 28:blood.2020008824.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Systematic review and meta-analysis (n=3377)
- Pooled mortality risk (a: all patients, b: hospitalized patients)

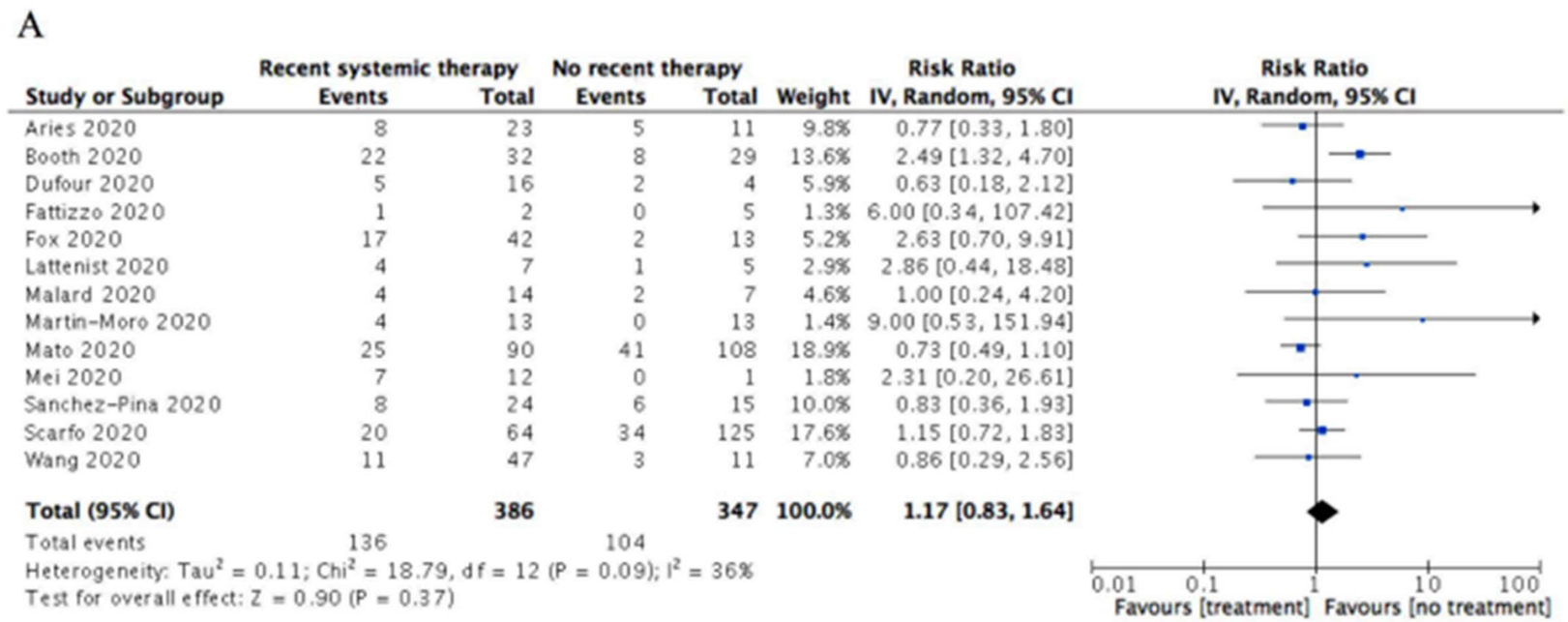




Vijenthira A, et al. Blood. 2020 Oct 28:blood.2020008824.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Systematic review and meta-analysis (n=3377)
- Risk ratio of **death** (**systemic anti-cancer therapy** vs **no therapy**)



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Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

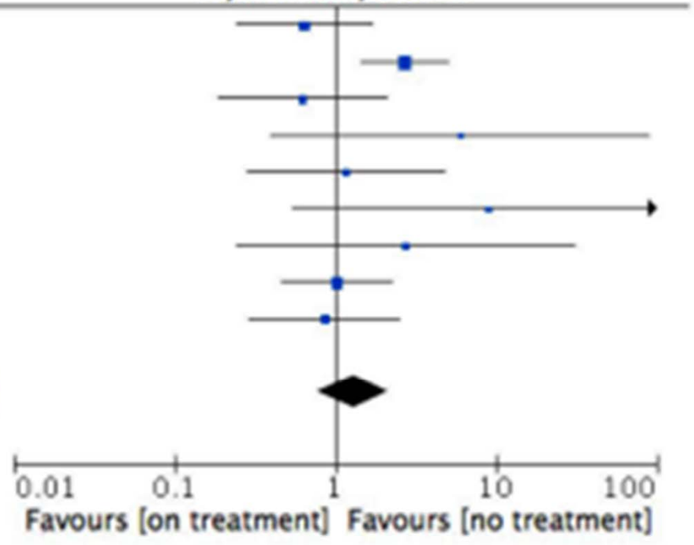
- HEMATOLOGIC
- Systematic review and meta-analysis (n=3377)
- Risk ratio of **death** (**cytotoxic systemic anti-cancer therapy** vs **no therapy**)

B

Study or Subgroup	Recent cytotoxic therapy Events	Total	No recent therapy Events	Total	Weight	Risk Ratio IV, Random, 95% CI
Aries 2020	5	17	5	11	15.1%	0.65 [0.24, 1.72]
Booth 2020	17	23	8	29	22.3%	2.68 [1.42, 5.07]
Dufour 2020	5	16	2	4	11.5%	0.63 [0.18, 2.12]
Ferrara 2020	5	10	0	5	3.2%	6.00 [0.40, 90.97]
Malard 2020	4	12	2	7	9.3%	1.17 [0.28, 4.82]
Martin-Moro 2020	4	13	0	13	2.9%	9.00 [0.53, 151.94]
Mei 2020	7	10	0	1	3.9%	2.73 [0.24, 31.11]
Scarfo 2020	5	18	34	125	18.6%	1.02 [0.46, 2.27]
Wang 2020	11	47	3	11	13.2%	0.86 [0.29, 2.56]
Total (95% CI)		**166**		**206**	**100.0%**	**1.29 [0.78, 2.15]**
Total events	63		54			

Heterogeneity: $Tau^2 = 0.19$; $Chi^2 = 12.50$, $df = 8$ ($P = 0.13$); $I^2 = 36\%$

Test for overall effect: $Z = 1.00$ ($P = 0.32$)



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Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Systematic review and meta-analysis (n=3377)

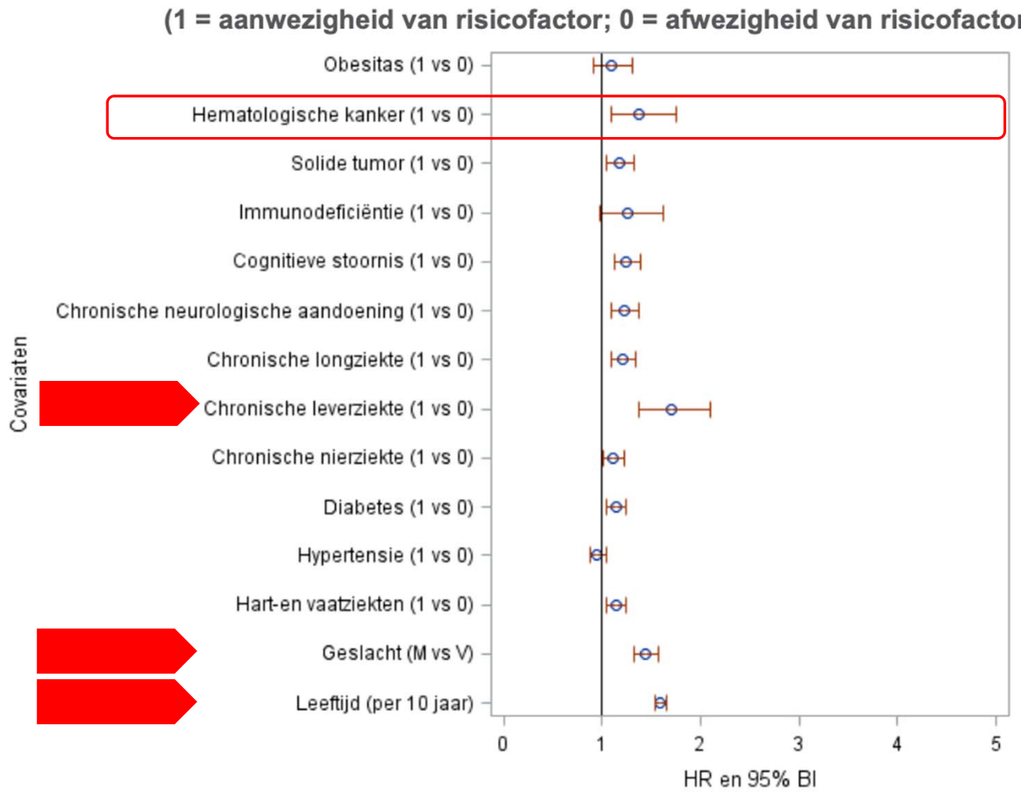
Take-home Points for Clinical Practice - Regarding Patients with Hematologic Malignancy & COVID

- Mortality appears to be high, estimated at 34%, however, estimate may be biased by a high number of hospitalized patients in published studies
- Age is strongly associated with mortality: among those ≥60 years mortality is estimated at 47% (95% CI 41 – 54%), among those <18 years mortality is estimated at 4% (95% CI 1 – 9%)
- Non-white patients appear to experience higher mortality than white patients
- Recent systemic anti-cancer therapy may not impact mortality
- Most patients with hematologic malignancy and COVID survive

Vijenthira A, et al. Blood. 2020 Oct 28:blood.2020008824.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- Sciensano report Belgium June 2020 (n= 60.029, n=9.655 died)



risk to die in the hospital

Sciensano data 2020, thematisch rapport 2020 (15/3 until 14/6/2020).

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC
- BHS registry 2020 of all patients with a hematological disease hospitalized for a PCR+ COVID during the first wave (n=226: 211 hem-cancer, 15 non-malignant-hem)

BHS COVID registry
Belgian Hematology Society

Our Belgian results for the first wave in line with the international literature:

Patients with a hematological disease
were often hospitalized for COVID (especially MM and AML, less so for HL)

with acceptable survival and a subset requiring intensive care

BHS registry data, courtesy of Hélène Schoemans and Toine Mercier.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC: what about SCT recipients?
- EBMT registry report
- 500 patients registered (> 22 countries)
- 6-week mortality:
  - autologous SCT recipients: 19%
  - allogeneic SCT recipients: 24%

EBMT COVID-19 recommendations, DEC 2020.

Are cancer patients at higher risk for a more severe course and poor outcome after COVID-19?

- HEMATOLOGIC: identified **predictive factors** for poor outcome / death
- At **diagnosis**
  - Same as **general** population:
    - High age, comorbidities, high ECOG PS
    - High CRP, leucocytosis, neutrophilia, lymphopenia
  - Specific for **hematological** patients
    - Active malignancy, progression
    - Intensity of therapy
    - Underlying disease: acute leukemia, MM, CLL, ET?, HL less
- At **admission**:
  - Age >70, ECOG ≥ 2
  - CRP >11, platelet count < 40.000, LDH > UNL, ALC < 600/µL

Malard F et al. Bone Marrow Transplant. 2020;6:1-5. He W et al. Leukemia. 2020;34(6):1637-1645. Martín-Moro F et al. Br J Haematol. 2020;190(1):e16-e20. Aries JA et al. Br J Haematol. 2020;190(2):e64-e67. Infante MS et al. Int J Lab Hematol. 2020;4:e13301. Piñana JL et al. Exp Hematol Oncol. 2020;9:21. Shah V et al Br J Haematol. 2020;190(5):e279-e282. Garcia-Suárez J et al. J Hematol Oncol. 2020;13(1):133.

De Ramon C, et al, Presented at ASH Annual Meeting, December 5-9, 2020. Abstract 312 . Niu A, et al, Presented at ASH Annual Meeting, December 5-9, 2020. Abstract 313.

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Should we adapt treatment of cancer patients during the COVID pandemic?

Should we adapt treatment of cancer during the COVID pandemic?

- GENERAL/SOLID
- Because of the expected long duration before normalisation of hospital care, treatment of the underlying disease should be continued when possible

Van Doesum, J., et al. Leukemia 34, 2536–2538 (2020).

Should we adapt treatment of cancer during the COVID pandemic?

- GENERAL/SOLID
- Do not prescribe corticosteroids as anti-emetics (if avoidable), and limit their use in patients treated with immune-checkpoint blockade, to reduce vulnerability to COVID-19.
- Prioritize oral or subcutaneous treatments above infusion-based treatments to reduce time spent in the hospital. Eg SCIG instead of IVIG
- Consider omitting supportive treatments (e.g., no bisphosphonate infusion, except in the case of hypercalcemia)
- When possible, organize the administration of intravenous maintenance treatments at home
- When administration at home is impossible, consider temporary breaks or reductions in the frequency of intravenous maintenance treatments for less-aggressive metastatic cancers on a per-patient basis

Van Doesum, J., et al. Leukemia 34, 2536–2538 (2020).

Should we adapt treatment of cancer during the COVID pandemic?

- HEMATOLOGIC
- No clear data – *will there ever be?*
- No general rules, but for every patient/case: carefully weigh benefit and risks, taking into account:
  - Risk of the disease
  - Risk of the treatment and its effect on the immune system
- Treatment of high-risk diseases (eg. acute leukemias): start asap
- Treatment of lower-risk diseases (eg. CLL, low grade lymphomas): consider delay
- Maintenance treatment?

Van de Haar J, et al NATURE MEDICINE, Vol 26 ; May 2020 pp 665–671.

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Are there specific points of attention in treating COVID for cancer patients?

Are there specific points of attention in treating COVID in cancer patients?

- HEMATOLOGIC – SCT or CAR-T recipients
- Patients positive for SARS-CoV-2, should **not** be treated in rooms with **laminar air flow** or other rooms **(HEPA) with positive pressure**

  - unless the ventilation can be turned off.
- **No clear recommendations** can be made on specific therapies in **SCT** recipients, due to **limited data** and **unknown risk vs benefit**.
- Even less data available for **pediatric patients**.
- Therapy should be given in close **collaboration with ID specialists.**

EBMT COVID-19 recommendations, NOV 2020.

Are there specific points of attention in treating COVID in cancer patients?

- HEMATOLOGIC – SCT or CAR-T recipients
- **Antiviral drugs: no significant impact on death rate**
  - **Five days of remdesivir** might provide benefit, especially in SCT patients with moderate to severe COVID-19: recommendation weakened in 12th version vs 11th version of the EBMT recommendations
- **Anti inflammatory therapy**:
  - with corticosteroids:
    - of value in non-transplant patients with hematological malignancy
    - Short-term (7-10 d) therapy in immunocompromised patients with severe/critical COVID-19: lower mortality
  - other anti-inflammatory therapies (including tocilizumab): conflicting data
- **Supportive care** is **crucial** including:
  - non-invasive ventilation
  - anti-coagulants: to prevent thromboembolic complications

EBMT COVID-19 recommendations, NOV 2020.

Are there specific points of attention in treating COVID in cancer patients?

- HEMATOLOGIC – SCT or CAR-T recipients
- **Convalescent plasma**:
  - **Randomized** trials: no effect on mortality in randomized trials
  - **Observational** trials: reduced mortality in subgroups of patients
    - Convalescent plasma with **higher antibody levels**
    - Plasma received **within 3 days** of COVID-19 diagnosis
- Treatment of viral, bacterial, and fungal co-pathogens should be optimized
- It is currently recommended that **immunosuppressive prophylaxis/treatment** is **continued:**
  - no data supporting reducing immunosuppression
  - it might even cause harm

EBMT COVID-19 recommendations, NOV 2020.

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Risks of delaying consultation, diagnosis and treatment…

COVID treatment of cancer patients : a simple answer (NIH/NCCN)

- “The recommendations for treating COVID-19 in patients with cancer are the same as those for the general population **(AIII)”**

COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. National Institutes of Health. Available at https://www.covid19treatmentguidelines.nih.gov/. Accessed Dec 12th 2020

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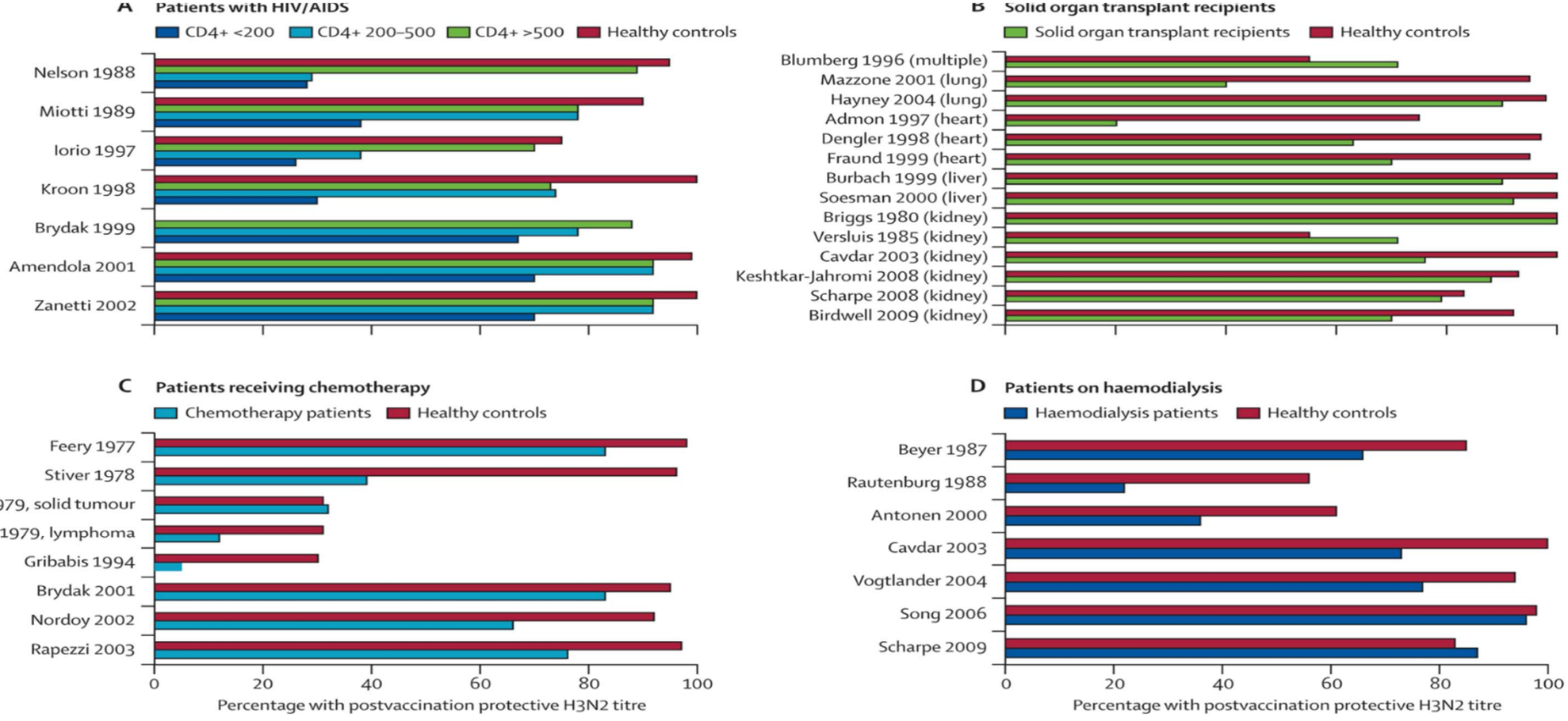
What about vaccination of cancer patients?

Will a COVID vaccine be effective in cancer patients? : a study on Influenza in immunocompromised patients



Post vacc H3N2 protective serum titers

Kunisak KM, et al., Lancet Infect Dis. 2009 Aug;9(8):493-504.

What about vaccination of cancer patients?

- HEMATOLOGIC
- Several vaccines are in development: mRNA (dead) vaccine
- No specific information on efficacy of COVID vaccine in hematologic patients: based on knowledge of other vaccines
  - Not sooner than 3 months after SCT? 6m after SCT? (depending on surrounding risk)
  - B-cell aplasia?: shown decrease of anti-spike mAbs after anti-CD20 (Rituximab)
  - Effect on T-cells (CD4-help? CD4/CD8-cytotoxic?): expected higher after mRNA vaccines
- Influenza and pneumococcal vaccination is strongly recommended in patients treated for hematologic cancers, esp SCT and CAR T cell treated patients
- Vaccination of close contacts with normal immune system is recommended

EBMT COVID-19 recommendations, NOV 2020.

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Hematologic changes in patients with COVID-19?

Hematologic changes in patients with COVID-19?

Stem Cell Reviews and Reports
https://doi.org/10.1007/s12015-020-09987-4

Is COVID-19 a New Hematologic Disease?

Benjamin Debuc[1] · David M. Smadja[2,3]

Abstract
SARS-CoV-2 viruses are positive single-stranded RNA viruses, whose infection can be asymptomatic or lead to the coronavirus disease 2019 (Covid-19). Covid-19 is a respiratory infection with a significant impact on the hematopoietic system and hemostasis leading to several cardiovascular complications. Hematologic consequences of this new infection allowed medical community to start new treatment approaches concerning infection going from targeted anti-inflammatory drugs to anticoagulation or stem cell therapies. A better understanding of Covid-19 pathophysiology, in particular hematological disorders, will help to choose appropriate treatment strategies.

Keywords SARS-CoV-2 · Covid-19 · Coagulopathy · D-dimers · Lymphopenia · Mesenchymal stem cells · Cytokine · Inflammation · Thrombosis · Stem cells

Hematological findings and complications of COVID-19

- COVID-19 is a systemic infection with a significant impact on the hematopoietic system and hemostasis

- At **diagnosis**:
  - PBO:
    - **Lymphopenia**: cardinal laboratory finding, with prognostic potential
    - Neutrophil/lymphocyte ratio and peak platelet/lymphocyte ratio: may have prognostic value
  - Biomarkers: poor prognostic markers
    - high **serum procalcitonin**
    - High **ferritin**

- During the **disease course**: longitudinal evaluation of
  - **lymphocyte count** dynamics
  - **inflammatory indices**, including **LDH**, **CRP** and **IL-6**

  → identify cases with dismal prognosis and start prompt intervention in order to improve outcomes

Terpos E, et al. Am J Hematol. 2020 Jul;95(7):834-847.

Hematological findings and complications of COVID-19

- **Blood hypercoagulability** (high risk for VTE): common among hospitalized COVID-19 patients
  - Elevated D-Dimer levels
    - gradual increase during disease course is associated with disease worsening
  - PT and aPTT prolongation
  - DIC (disseminated intravascular coagulation)

    → high risk for thrombosis and death
- Need for early and prolonged pharmacological thromboprophylaxis with low molecular weight heparin
  - Exact dosing not known yet

Terpos E, et al. Am J Hematol. 2020 Jul;95(7):834-847.