COVID-19 Outcomes in Children, Adolescents and Young Adults with Cancer

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Table S1. WHO COVID-19 severity classification based severity categorization used in the study.

Severity	Definition
Mild Disease	No evidence of pneumonia
Moderate Disease	Non severe pneumonia: pneumonia (difficulty breathing, tachypnea, hypoxia[a], or radiological evidence of pneumonia) without signs of severe pneumonia.
Severe Disease	Severe pneumonia: clinically evident pneumonia with at least one of the following: 1) oxygen saturation <90% on room air 2) severe respiratory distress (severe retractions or grunting) 3) Respiratory rate >30/min for adolescents and adults 4) Lethargy, unconsciousness or inability to drink in case of children
Critical Disease	Cases requiring life-sustaining treatment (non-invasive ventilation[b], invasive ventilation, or vasopressors[c]) for acute respiratory distress syndrome (ARDS), septic shock, or multi-system Inflammatory syndrome of children[d].

[a]Hypoxia: oxygen saturation <93% on room air

[b]Non-invasive ventilation: continuous positive airway pressure (CPAP) or bilevel positive airway pressure (BIPAP)

[c]Invasive ventilation: Intubation and mechanical ventilation

[d]Multisystem Inflammatory Syndrome of Childhood defined as age <20 years with fever for more than 3 days and two or more of the following (a-e):
a) rash or bilateral non-purulent conjunctivitis or inflammation of mouth, hands or feet
b) hypotension
c) cardiac dysfunction, pericarditis, valvulitis, or coronary vascular abnormalities;
d) evidence of coagulopathy excluding coagulopathy due to asparaginase
e) diarrhoea, vomiting, or abdominal pain
and laboratory evidence of hyperinflammation (high ESR or C-reactive protein)
and no non-COVID etiology for inflammation

Table S3. Details about patients who underwent multiple COVID-19 related hospitalizations

Subject ID	Age	Diagnosis	Anti-Cancer Therapy	Hospitalizations	Hospitalization Indication	COVID Disease Severity	COVID treatment
3	21	ALL	CAR-T	6	1.Fever, hypoxemia 2.Fever, respiratory distress 3. Hypotension 4.Fever, pneumonia 5. Fever, pneumonia 6. Fever, respiratory distress	Critical	Remdesivir, convalescent plasma, azithromycin
20	3	ALL	Chemotherapy-Delayed Intensification	3	1. Fever, dehydration 2. Fever, hypoxemia 3. Fever, tachycardia	Mild for first admission, severe for second admission	Remdesivir
32	16	Medulloblastoma	Chemotherapy discontinued two months prior due to disease progression	2	1. Dehydration 2. Dehydration	Mild	IV fluids, No specific anti-COVID treatment
59	12	ALL	Chemotherapy-Maintenance	2	1. Tachycardia 2. Chest pain, tachycardia	Mild	IV fluids, No specific anti-COVID treatment

*ID 32: No disease progression between two hospitalizations

Table S4. Details about patients with COVID-19 infection at the time of cancer diagnosis.

Subject ID	Age	Diagnosis	Chemo Modification/Delay	Hospitalization	COVID Severity	COVID treatment	Comment
23	12	Osteosarcoma	No	No	mild		
37	8	AML	No-- tolerated FLAG-IDA	Yes, COVID related	moderate	Remdesivir steroids	EOI MRD negative
53	13	AML	Yes, low dose cytarabine x13 days; delayed 15 days	Yes, COVID related	critical	Remdesivir steroids convalescent plasma	Acute respiratory failure, intubation. EOI MRD negative
54	13	Osteosarcoma	No	Yes, unrelated to COVID	mild		
58	3	ALL	No	Yes, COVID related	mild		EOI MRD negative
60	10	Burkitt Lymphoma	No, tolerated COP prephase	Yes, unrelated to COVID	mild		
66	5	ALL	Yes, 5 days	Yes, unrelated to COVID	mild		EOI MRD negative
77	1	Retinoblastoma	No	No	mild		

EOI MRD: end of induction minimal residual diseas

Table S5. Associations between baseline characteristics and cohort (cancer or normal).

Variables		Cancer N=87	Normal N=87	p value
Age (years)[a]				
	≥15 years	29	19	0.13
	<15 years	58	68	
Sex				
	Male	48	40	0·29
	Female	39	47	
Ethnicity				
	Hispanic	64	62	
	Non-Hispanic	23	25	
Time period				
	Before 12/1/2020	38	39	
	After 11/30/2020	49	48	

Time period refers to when COVID-19 infection was diagnosed.

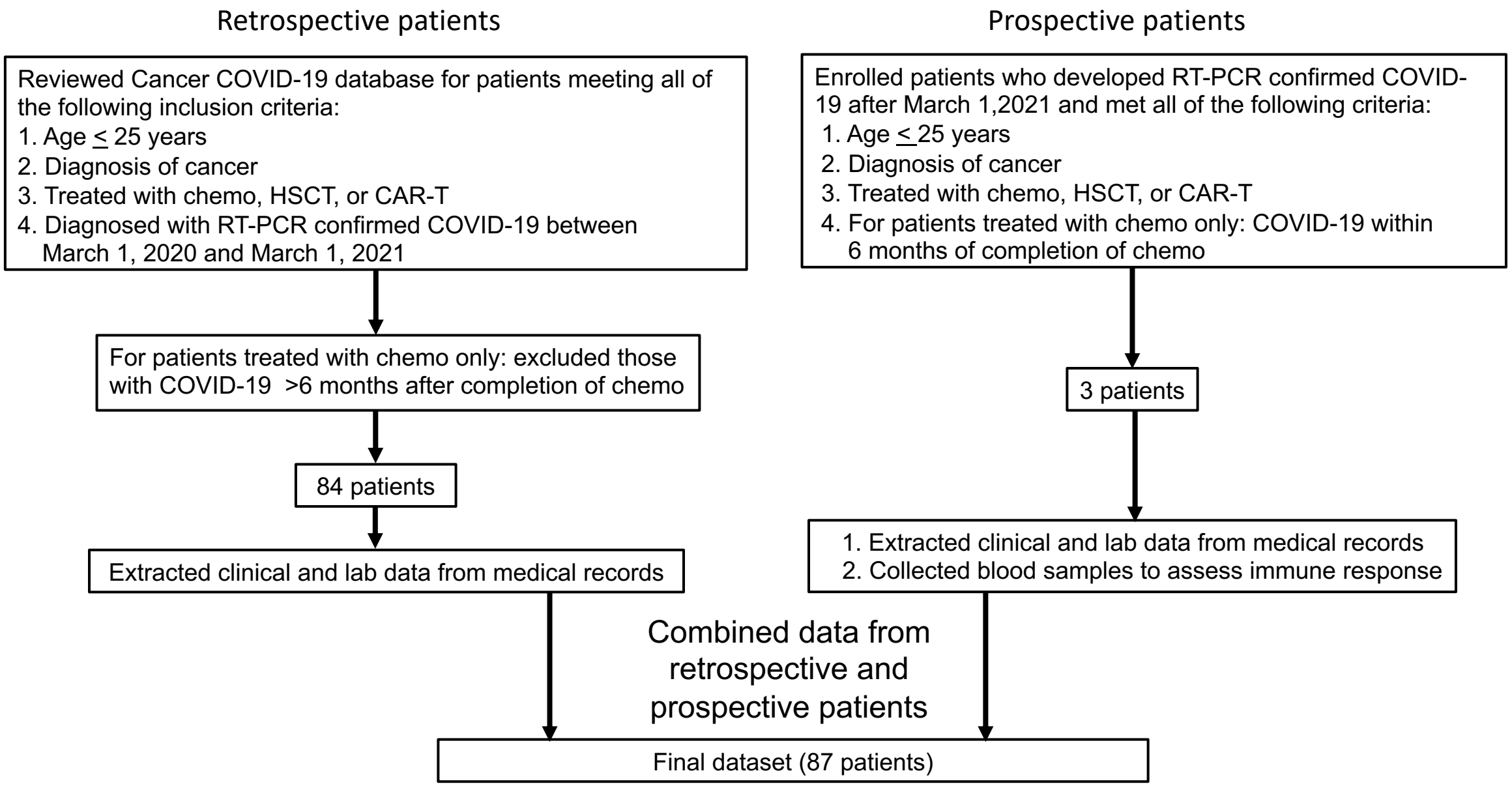

Figure S1. Study design for cancer cohort. Chemo: chemotherapy; HSCT: hematopoietic stem cell transplantation; CAR-T: chimeric antigen receptor T-cell therapy.

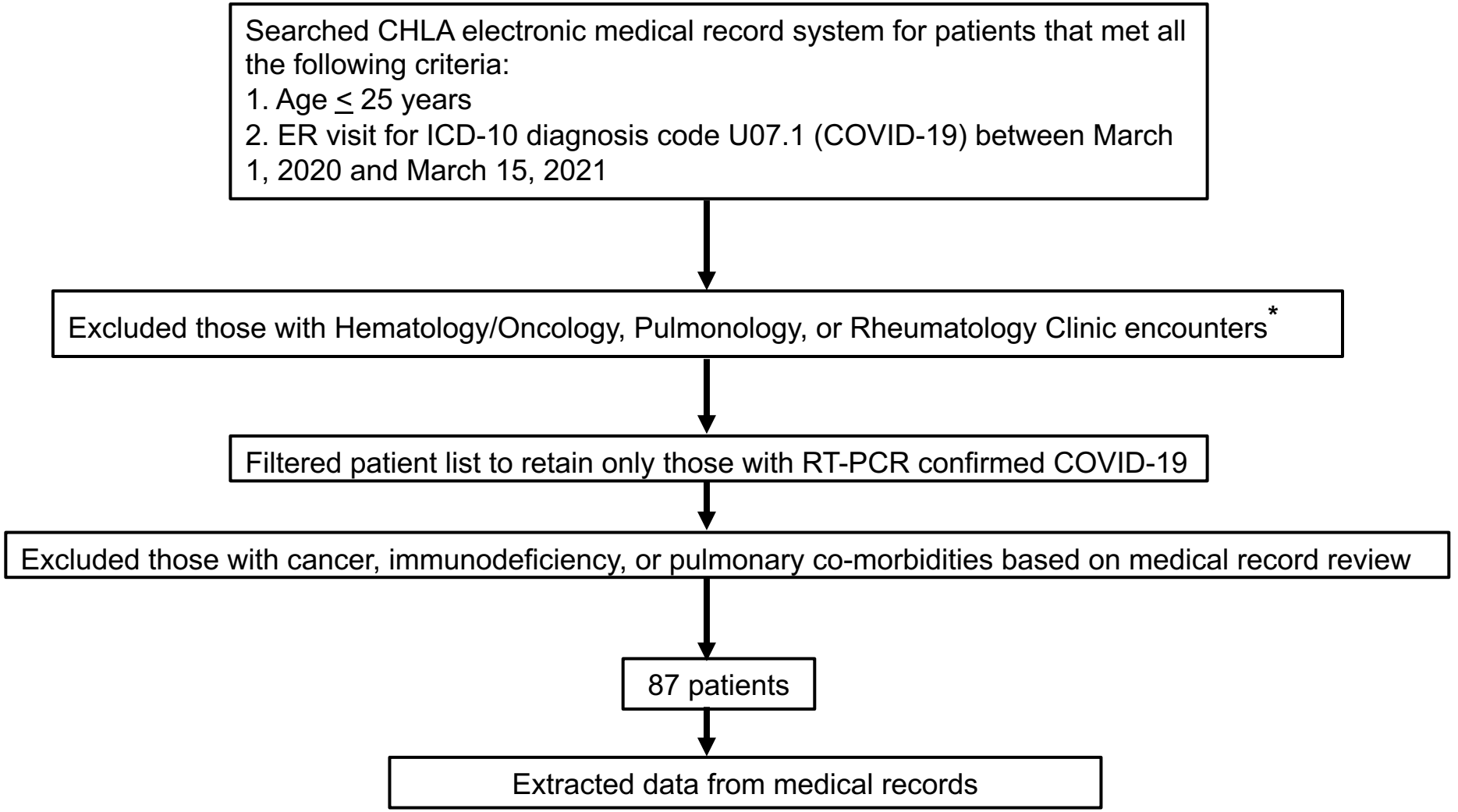

Figure S2. Study design for control cohort. * This step represents a preliminary filter to exclude those with cancer, those on immunosuppressive medications, or those with pulmonary co-morbidities.