1593P - Real World Data on Anemia Management in Patients with Solid Tumors and Malignant Lymphoma in Germany

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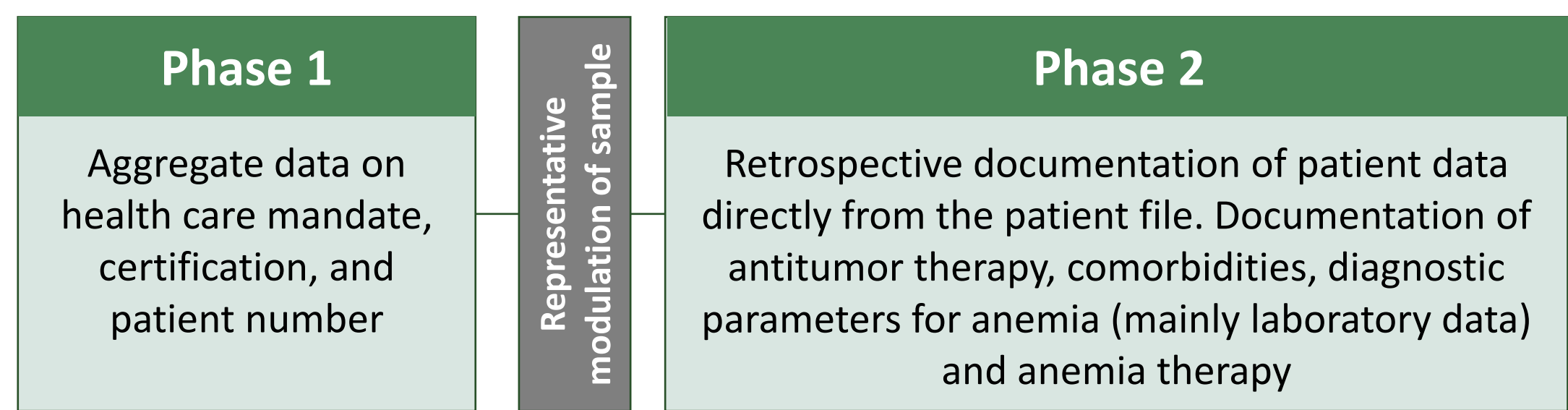
Background

- **Anemia** and **iron deficiency** (ID) are frequent complications in patients with breast cancer (BC), gastrointestinal tumors (GC), lung cancer (LC) and malignant lymphomas (ML)
- **Consequences** of anemia are
  - **Reduced Quality of Life (QoL)**
  - **Lower overall response rate to therapy (ORR)**
  - **Reduced Overall Survival (OS)**
- Different **Guidelines** (ESMO Guideline (1), DGHO Onkopedia Germany (2), German guideline on supportive care (3), German Federal Medical Association (4)) provide dedicated decision support algorithms (depending on diagnostic parameters) to treat anemia and reduce anemia-related complications: red blood cell transfusion (RBC), erythropoiesis stimulating agents (ESA), iron substitution.
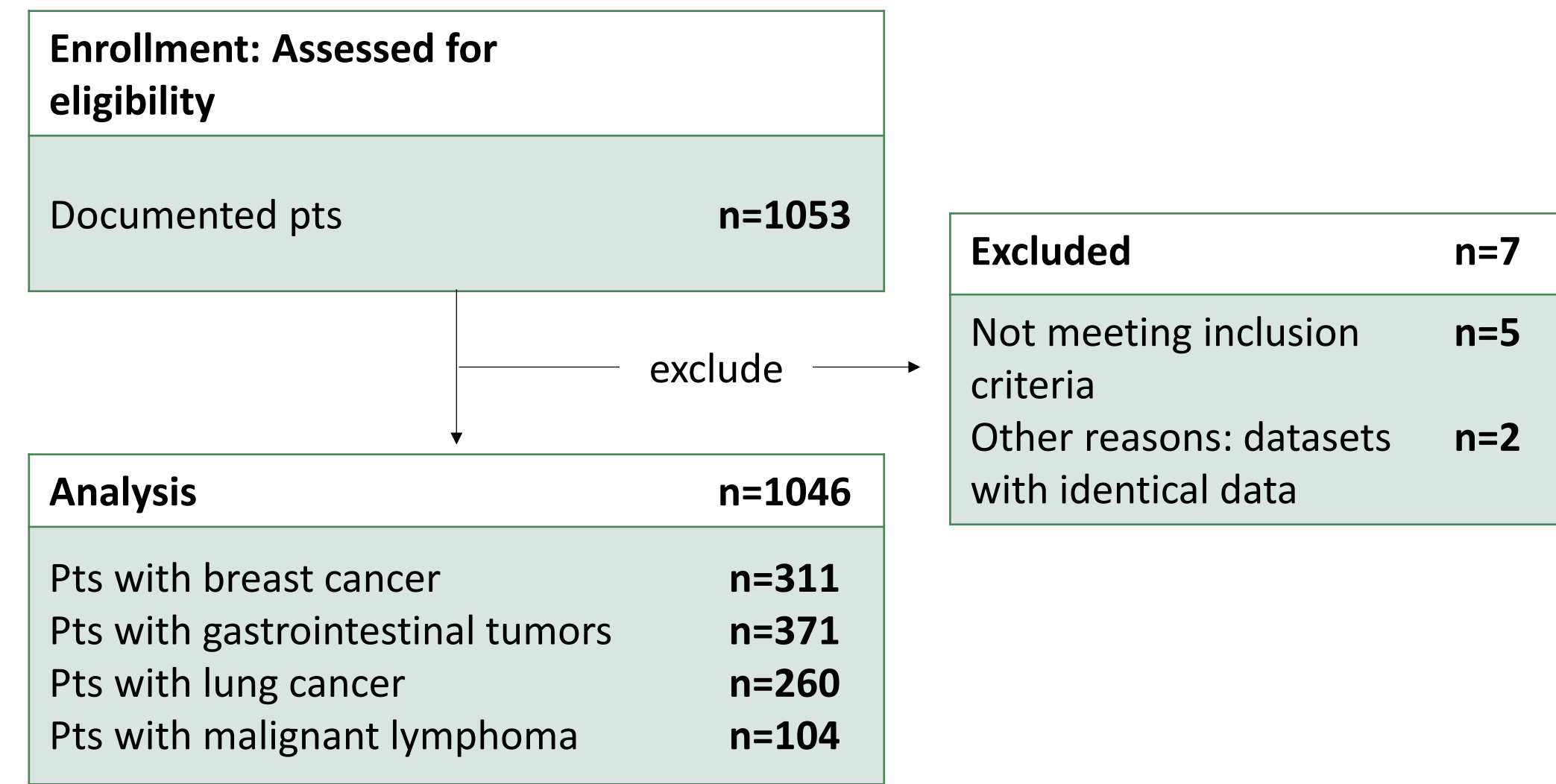
Aim of the Study

Aim of the study was to analyze the implementation of guideline recommendations on anemia management in clinical routine in patients with solid tumors and malignant lymphomas with a high risk of anemia-related complications (Hb below 10g/dl).
To this end a nationwide, representative, retrospective patient documentation was conducted to observe the current practice of anemia management in hospitals and among office-based physicians.

Methods

Phase 1		Phase 2
Aggregate data on health care mandate, certification, and patient number	Representative modulation of sample	Retrospective documentation of patient data directly from the patient file. Documentation of antitumor therapy, comorbidities, diagnostic parameters for anemia (mainly laboratory data) and anemia therapy

To ensure the representativeness of the sample, the number of patients to be documented was adjusted according to the real distribution based on the results of the health care structure analysis (Phase 1). For this purpose, the facility types were assigned to clusters based on the type of care and patient (pts) number (in each case based on the quartiles of the patient number)

Enrollment: Assessed for eligibility	
Documented pts	n=1053

Excluded	n=7
Not meeting inclusion criteria	n=5
Other reasons: datasets with identical data	n=2

exclude

Analysis	n=1046
Pts with breast cancer	n=311
Pts with gastrointestinal tumors	n=371
Pts with lung cancer	n=260
Pts with malignant lymphoma	n=104

Two **"Guideline Adherence Scores (GLAD scores)"** have been developed for guideline adherence. One score for the guideline-compliant differential diagnosis of anemia (GLAD score D). Another score was defined for the classification of anemia therapy according to the guideline recommendations of ESMO, the DGHO Onkopedia, German Guideline on Supportive Care, and the German Federal Medical Association (GLAD score T).

An Analysis of Variance for Repeated Measures (rmANOVA) was performed to analyze the increase in Hb after the diagnosis of anemia or the start of anemia therapy. Since the sphericity is not given in the sample examined here, the p-values for the rmANOVA are calculated and presented with the Greenhouse-Geisser correction.
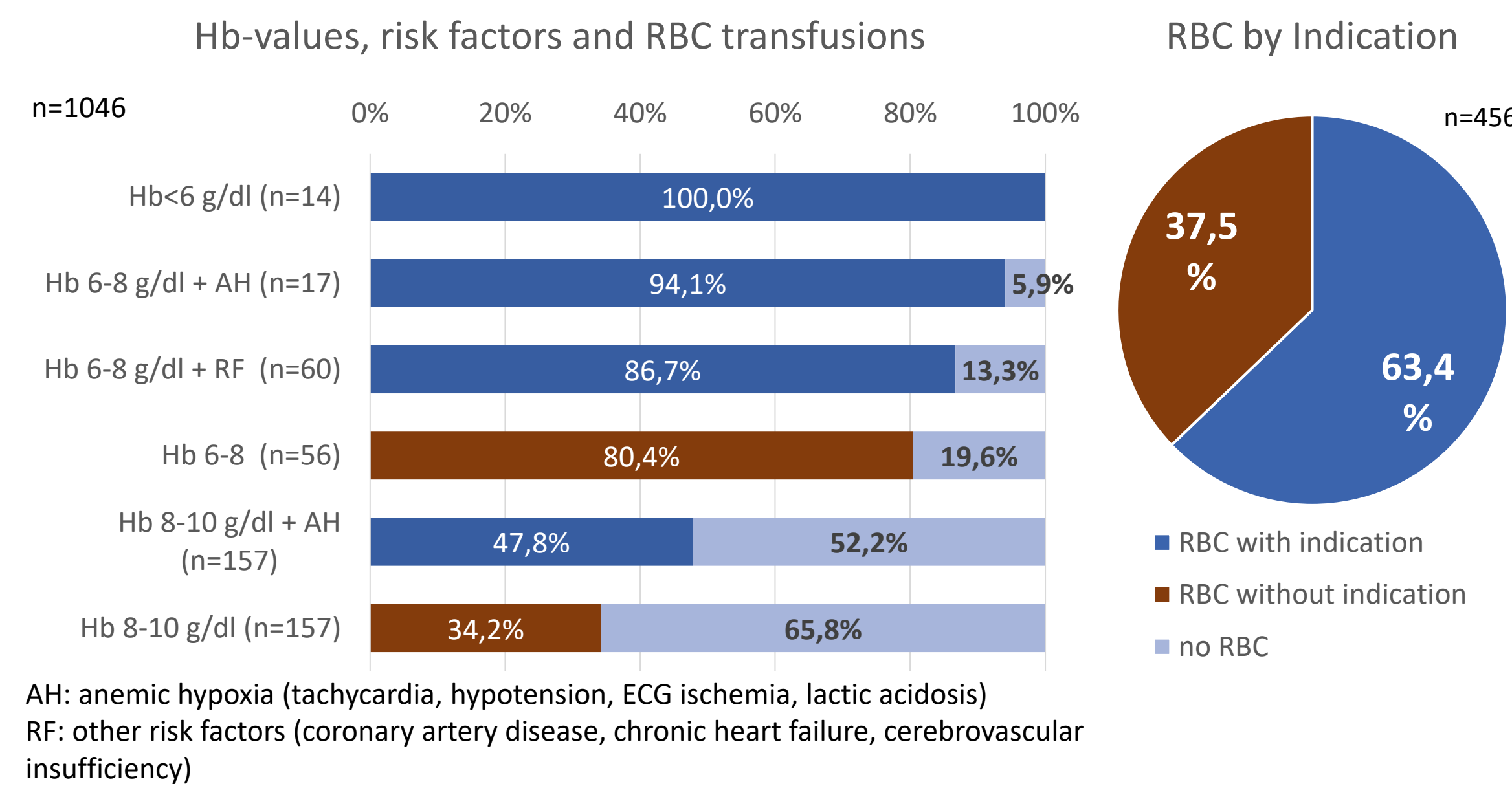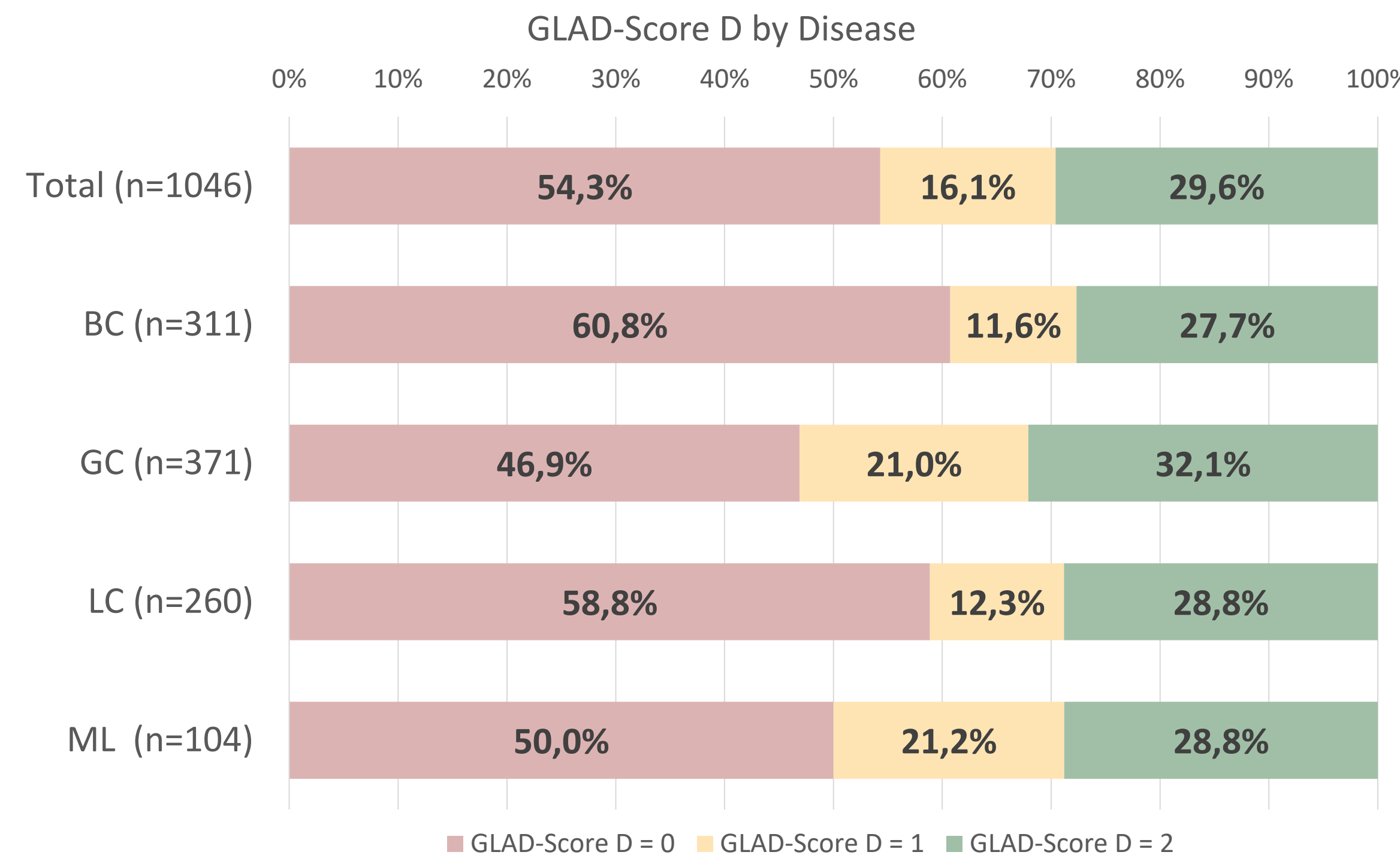
Definitions

Guideline Adherence Scores Diagnosis (GLAD-Score D)

GLAD-Score D	Criteria
2	diagnosis according to guidelines: diagnosis of vitamin B12 or folate deficiency if no diagnosed vitamin B12 or folate deficiency: differential diagnosis of iron metabolism (SF + TF or TSAT or %HYPO or CHr).
1	lack of differential diagnosis: low MCV without further differential diagnosis normal MCV + normal SF without further differential diagnosis normal vitamin B12 and folate level, no further differential diagnosis
0	lack of diagnosis: normal or elevated MCV and no vitamin B12 diagnostics and/or no differential diagnosis of iron metabolism.

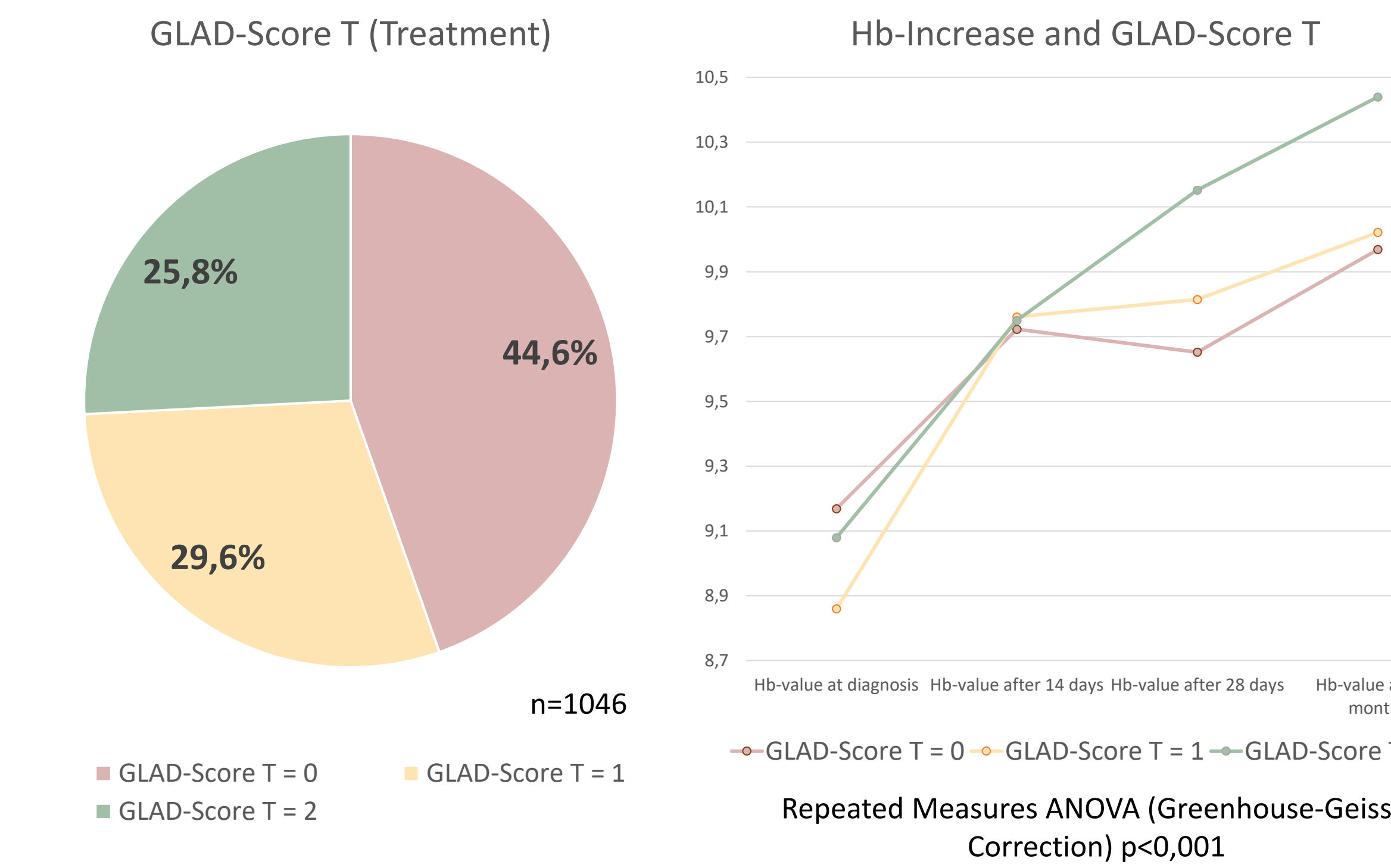| Hb	Red Blood Cell (RBC) Transfusion Indicated (4)
Hb < 6 g/dl	yes
Hb 6-8 g/dl	yes: in case of case of evidence of anemic hypoxia
	yes: in case of other risk factors/inadequate compensation
	no: without risk factors and adequate compensation
Hb 8-10 g/dl	yes: only in case of evidence of anemic hypoxia
	no: without evidence of anemic hypoxia
Hb > 10g/dl	no

Guideline Adherence Scores Therapy (GLAD-Score T)

GLAD-Score T	Criteria
2	AID/ID: i.v. iron or oral iron, if CRP < 5mg/l, (+/- ESA) FID: ESA* + i.v. iron or oral iron, if CRP < 5mg/l, no ID: ESA* (if no vitamin B12 or folate deficiency) vitamin B12 or folate deficiency: vitamin B12 or folate-substitution
1	RBC with indication as primary and only anemia therapy FID: only ESA* or only iron substitution Hb≥8g/dl: no RBC, no other anemia therapy
0	RBC without indication as primary and only anemia therapy** Hb≤8g/dl: no anemia therapy ID: oral iron substitution and CRP > 5mg/l vitamin B12 or folate deficiency without substitution

* Only required for chemotherapy; ** Excludes RBC directly related to major surgery

Results

GLAD-Score D by Disease

Total (n=1046): GLAD-Score D = 0: 54,3%, GLAD-Score D = 1: 16,1%, GLAD-Score D = 2: 29,6%
BC (n=311): 60,8%, 11,6%, 27,7%
GC (n=371): 46,9%, 21,0%, 32,1%
LC (n=260): 58,8%, 12,3%, 28,8%
ML (n=104): 50,0%, 21,2%, 28,8%

Hb-values, risk factors and RBC transfusions

n=1046

Hb<6g/dl (n=14): 100,0%
Hb 6-8 g/dl + AH (n=17): 94,1%, 5,9%
Hb 6-8 g/dl + RF (n=60): 86,7%, 13,3%
Hb 6-8 (n=56): 80,4%, 19,6%
Hb 8-10 g/dl + AH (n=157): 47,8%, 52,2%
Hb 8-10 g/dl (n=157): 34,2%, 65,8%

RBC by Indication

n=456

RBC with indication: 63,4%
RBC without indication: 37,5%
no RBC

AH: anemic hypoxia (tachycardia, hypotension, ECG ischemia, lactic acidosis)
RF: other risk factors (coronary artery disease, chronic heart failure, cerebrovascular insufficiency)

GLAD-Score T (Treatment)

n=1046

GLAD-Score T = 0: 44,6%
GLAD-Score T = 1: 29,6%
GLAD-Score T = 2: 25,8%

Hb-Increase and GLAD-Score T

Hb-value at diagnosis, Hb-value after 14 days, Hb-value after 28 days, Hb-value after 2 months

GLAD-Score T = 0, GLAD-Score T = 1, GLAD-Score T = 2

Repeated Measures ANOVA (Greenhouse-Geisser Correction) p<0,001

Multivariable Model of Patient Characteristics and GLAD-Score T

Variable	N	Odds ratio	p
Age			
<65	461	Reference	
65-74	325	0.85 (0.59, 1.23)	0.391
75+	260	1.19 (0.80, 1.79)	0.389
Sex			
male	430	Reference	
female	616	0.75 (0.50, 1.10)	0.140
ECOG			
0/1	724	Reference	
2+/u.	322	0.70 (0.49, 0.99)	0.048
CCI			
2	628	Reference	
3	248	1.08 (0.74, 1.57)	0.700
4+	170	0.80 (0.50, 1.26)	0.350
Disease			
gastrointestinal cancer	371	Reference	
breast cancer	311	2.40 (1.50, 3.86)	<0.001
lung cancer	260	1.50 (0.99, 2.28)	0.055
malignant lymphoma	104	0.29 (0.12, 0.62)	0.003
Surgery			
yes	322	Reference	
no	724	0.83 (0.59, 1.17)	0.275
Chemotherapy			
yes, adjuvant/neoadjuvant	440	Reference	
yes, advanced/metastatic	526	0.67 (0.47, 0.97)	0.032
no	80	1.76 (0.98, 3.15)	0.056
Radiotherapy			
yes	317	Reference	
no	729	1.03 (0.73, 1.45)	0.866
GLAD_D			
0	568	Reference	
1	168	1.22 (0.75, 1.93)	0.410
2	310	4.41 (3.17, 6.17)	<0.001

favors GLAD T 0/1 — favors GLAD T 2

Multivariable Model of Center Characteristics and GLAD-Score T

Variable	N	Odds ratio	p
Certification			
certified	811	Reference	
not certidfied	235	0.96 (0.65, 1.42)	0.854
Facility			
Hospital	740	Reference	
Office-based physician	306	2.42 (1.70, 3.48)	<0.001
Specialization			
Hematology/Oncology	674	Reference	
Gastroenterology	146	1.84 (1.16, 2.88)	0.009
Gynecology	212	3.81 (2.68, 5.45)	<0.001
Pulmonology	14	1.91 (0.42, 6.39)	0.333
PatientBloodManagement			
yes	451	Reference	
no/n.a.	595	1.39 (1.03, 1.89)	0.034

favors GLAD T 0/1 — favors GLAD T 2

Conclusion

37.5% of RBC transfusions were not indicated according to guidelines. Anemia diagnosis was guideline compliant in only 25.85%. With a GLAD-T score of 2, Hb increases significantly higher than with insufficient or no guideline adherence. Significant positive factors for a high GLAD-T score were breast cancer, a GLAD-D score 2, therapy in practices, gastroenterology, or gynecology. Significant negative factors were malignant lymphoma and advanced/metastatic disease. GLAD is insufficient in Germany, especially concerning liberal transfusion policy and the lack of differential diagnostics of iron metabolism.

Funding

References

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