Supplemental Figure 1: Algorithm for the management of preoperative anemia

Patient: 1-28 days prior to elective surgery with risk of transfusion >10%

Anemia
- Male Hgb <13g/dl
- Female Hgb <12g/dl

No Anemia
- Male Hgb ≥13g/dl
- Female Hgb ≥12g/dl

Hgb >9g/dl, Iron deficiency anemia

- All criteria have to be fulfilled:
  - Ferritin ≤200ng/mL
  - Transferrin saturation ≤20%
  - No infection
  - No other contraindication

- IV iron infusion on the same day

Hgb >9g/dl, Iron deficiency anemia

- Any of the following criteria was a contraindication:
  - Ferritin >200ng/mL
  - Transferrin saturation >20%
  - Sign of infection
  - Other contraindication

- No IV iron substitution

Hgb ≤9g/dl + pathological value of other cell line (leucocytes, thrombocytes)

Differential diagnosis
(Department of Medicine A: Hematology, Hemostaseology, Oncology and Pneumology)

Algorithm for the management of preoperative Anemia

All patients in the anesthesia/PBM were screened for iron deficiency anemia. The anemic patients with iron deficiency anemia (Hgb >9g/dl, ferritin ≤200ng/mL, transferrin saturation ≤20%) and no sign of infection or other contraindication were treated with IV iron in the anesthesia/PBM clinic.
Patient's flow diagram

1,144 patients were seen in the anesthesia/PBM clinic until July 4th, 2016. N=43 patients were excluded, so 1,101 patients were included into the analysis. Of the anemic patients, 46.7% were treated with IVI. The remaining anemic patients (53.3%) could not be treated with IVI due to contraindications.
Supplemental Figure 3: Patients per surgical department

Patients per surgical department
The patients included in the analysis were sent from different surgical departments. The majority of patients (n=656) were sent by the department of cardiac and thoracic surgery. Second sender was the department of orthopedics (n=122) and third the department of gynecology and obstetrics (n=116).
Description of patients visiting the anesthesia/PBM clinic

A.) Anemia prevalence in all patients. 319 of the 1,101 patients were anemic (29.0%) and 782 patients were non-anemic (71.0%). B) Prevalence of IDA, ACD and IDA/ACD in all anemic patients. Patient’s laboratory values were categorized to IDA, if MCV<83fL and MCH<27pg. ACD was defined in case of 83fL≤MCV<98fL and 27pg≤MCH<32.3pg.
Supplemental Figure 5: Hgb non-invasive (g/dl) compared to Hgb invasive (g/dl)

Hgb non-invasive (g/dl) compared to Hgb invasive (g/dl)
The Hgb levels of the patients were measured in the Center for Laboratory Medicine and additionally noninvasive with Massimo Pronto-7® between January 2015 and April 2016. In order to evaluate, if non-invasive Hgb measurement was a useful tool for screening of anemic patients the mean difference between invasive and non-invasive Hgb measurement, the bias and the 95% limits of agreement were visualized using Bland-Altman-Plots. The analysis revealed that the non-invasive measurement with Massimo Pronto-7® can underestimate the Hgb level by up to 2.8g/dl and overestimate it by up to 1.8g/dl. (Bias 0.504, SD of bias: 1.184, 95% limits of agreement (1.96 S.D. of the difference): -1.817 to 2.825 g/dl).
Supplemental Figure 6 Increase of Hgb levels in anemic patients with and without IVI

The multivariable linear regression analysis presented in Supplemental table 6 was repeated omitting the explanatory variables age and gender (n = 287). The result is represented graphically in this Supplemental Figure 6. The linear regression shows a difference in the average delta Hb between anemic patients with and without IVI while adjusting for the influence of time. Patients treated with IVI presented with higher delta Hb levels compared to untreated anemic patients.
**Supplemental Figure 7: RBC transfusion**

A) RBC transfusion in the department of Urology. There was a lower need for RBC transfusions in non-anemic patients from the department of Urology (\(^*P=0.0004\)): non anemic vs anemia, no FCM, \(^{**}P=0.0009\): non anemic vs anemia + FCM.  

**B) RBC transfusion rate in the department of General/Visceral surgery.**
Supplemental Figure 8: Health-related events

Health-related events
Since October 2015, patients were interviewed via standardized telephone interviews. The results of the telephone interview were compared using Fisher tests. A) After 30 days the patients were asked about health-related events. There was no difference within the three groups. B) A second phone interview was performed after 90 days. N=801 patients were interviewed. There was no difference between the health-related events within the three groups.