**Supplemental Table 1. Blood utilization by year for Hospital #1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year(No. of inpatients) | 2014\*(n=49,967) | 2015†(n=50,296) | 2016†(n=48,970) | 2017†(n=23,983) | *P* Value |
| RBCs |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 728 | 733 | 699 | 612 | 0.0007 |
| No. (%) of patients transfused | 7,650 (15.3%) | 7,666 (15.2%) | 7,074 (14.5%) | 3,590 (14.9%) | 0.0004 |
| No. (%) orders ≥ 2 units | 7,238 (38.4%) | 4,952 (25.3%) | 3,022 (14.3%) | 2,329 (19.5%) | < 0.0001 |
| No. (%) orders for Hb ≥ 8 g/dL‡ | 6,643 (35.8%) | 6,680 (34.7%) | 5,943 (28.5%) | 2,861 (25.2%) | < 0.0001 |
| Plasma |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 343 | 316 | 329 | 207 | 0.0021 |
| No. (%) of patients transfused | 2,406 (4.8%) | 2,190 (4.4%) | 1,895 (3.9%) | 894 (3.7%) | < 0.0001 |
| No. (%) orders for INR < 1.5§ | 1,460 (40.4%) | 1,275 (40.2%) | 1,179 (38.2%) | 934 (51.5%) | < 0.0001 |
| Platelets |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 329 | 315 | 312 | 311 | 0.19 |
| No. (%) of patients transfused | 2,772 (5.6%) | 2,592 (5.2%) | 2,512 (5.1%) | 1,218 (5.1%) | 0.0057 |
| No. (%) orders for PLTS ≥ 50K\*\* | 1,911 (19.7%) | 1,839 (19.3%) | 2,464 (22.0%) | 1,461 (20.6%) | < 0.0001 |

\* - Year 2014: baseline period, pre-patient blood management.

† - Years 2015, 2016, 2017: post-patient blood management time period. 2017 includes 6 months (July, 2016 to December, 2016).

†† - All units divided by all patients, including those who received no transfusions.

‡ - Orders with preceding Hb ≥ 8 g/dL within 24 h before order, or Hb missing (no Hb measured within 24 h).
§ - Orders with preceding INR < 1.5 within 24 h before order, or INR missing (no INR measured within 24 h).
\*\* - Orders with preceding PLTS ≥ 50K within 24 h before order, or PLTS missing (no PLTS measured within 24 h).
RBC – erythrocyte, Hb - hemoglobin; INR - international ratio; PLTS - platelet count.

**Supplemental Table 2. Blood utilization by year for Hospital #2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year(No. of inpatients) | 2014\*(n=20,658) | 2015†(n=19,659) | 2016†(n=19,829) | 2017†(n=10,255) | *P* Value |
| RBCs |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 252 | 225 | 218 | 239 | 0.12 |
| No. (%) of patients transfused | 1,589 (7.7%) | 1,410 (7.2%) | 1,496 (7.5%) | 786 (7.7%) | 0.20 |
| No. (%) orders ≥ 2 units††† | -- | -- | 565 (15.7%) | 404 (20.3%) | -- |
| No. (%) orders for Hb ≥ 8 g/dL‡ | 1,127 (24.2%) | 656 (16.8%) | 634 (18.0%) | 320 (16.8%) | < 0.0001 |
| Plasma |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 75 | 60 | 58 | 58 | 0.15 |
| No. (%) of patients transfused | 438 (2.1%) | 325 (1.7%) | 341 (1.7%) | 167 (1.6%) | 0.001 |
| No. (%) orders for INR < 1.5§ | 445 (41.6%) | 370 (44.4%) | 233 (39.0%) | 121 (39.0%) | 0.23 |
| Platelets |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 30 | 29 | 33 | 30 | 0.75 |
| No. (%) of patients transfused | 313 (1.5%) | 280 (1.4%) | 311 (1.6%) | 145 (1.4%) | 0.59 |
| No. (%) orders for PLTS ≥ 50K\*\* | 307 (51.3%) | 305 (55.2%) | 293 (47.7%) | 144 (50.2%) | 0.088 |

\* - Year 2014: baseline period, pre-patient blood management.

† - Years 2015, 2016, 2017: post-patient blood management time period. 2017 includes 6 months (July, 2016 to December, 2016).

†† - All units divided by all patients, including those who received no transfusions.

††† - Missing data in years 2014 and 2015 due to electronic medical record data limitations.

‡ - Orders with preceding Hb ≥ 8 g/dL within 24 h before order, or Hb missing (no Hb measured within 24 h).

§ - Orders with preceding INR < 1.5 within 24 h before order, or INR missing (no INR measured within 24 h).

\*\* - Orders with preceding PLTS ≥ 50K within 24 h before order, or PLTS missing (no PLTS measured within 24 h).
RBC – erythrocyte, Hb - hemoglobin; INR - international ratio; PLTS - platelet count. **Supplemental Table 3. Blood utilization by year for Hospital #3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year(No. of inpatients) | 2014\*(n=19,627) | 2015†(n=20,056) | 2016†(n=20,914) | 2017†(n=10,491) | *P* Value |
| RBCs |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 230 | 211 | 171 | 164 | < 0.0001 |
| No. (%) of patients transfused | 1,551 (7.9%) | 1,530 (7.6%)  | 1,457 (7.0%)  | 680 (6.5%) | < 0.0001 |
| No. (%) orders ≥ 2 units | 1,737 (68.1%) | 1,465 (56.3%) | 805 (30.1%) | 302 (21.7%) | < 0.0001 |
| No. (%) orders for Hb ≥ 8 g/dL‡ | 875 (36.0%) | 735 (29.6%) | 546 (21.1%) | 214 (15.8%) | < 0.0001 |
| Plasma |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 32 | 33 | 31 | 28 | 0.89 |
| No. (%) of patients transfused | 170 (0.9%) | 199 (1.0%) | 160 (0.8%) | 79 (0.8%) | 0.05 |
| No. (%) orders for INR < 1.5§ | 43 (17.2%) | 68 (24.1%) | 91 (36.8%) | 43 (28.3%) | < 0.0001 |
| Platelets |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 11 | 13 | 11 | 9 | 0.51 |
| No. (%) of patients transfused | 105 (0.5%) | 126 (0.6%) | 110 (0.5%) | 60 (0.6%) | 0.52 |
| No. (%) orders for PLTS ≥ 50K\*\* | 62 (31.6%) | 71 (30.2%) | 81 (35.7%) | 36 (38.3%) | 0.41 |

\* - Year 2014: baseline period, pre-patient blood management.

† - Years 2015, 2016, 2017: post-patient blood management time period. 2017 includes 6 months (July, 2016 to December, 2016).

†† - All units divided by all patients, including those who received no transfusions.

‡ - Orders with preceding Hb ≥ 8 g/dL within 24 h before order, or Hb missing (no Hb measured within 24 h).
§ - Orders with preceding INR < 1.5 within 24 h before order, or INR missing (no INR measured within 24 h).
\*\* - Orders with preceding PLTS ≥ 50K within 24 h before order, or PLTS missing (no PLTS measured within 24 h).
RBC – erythrocyte, Hb - hemoglobin; INR - international ratio; PLTS - platelet count.

**Supplemental Table 4. Blood utilization by year for Hospital #4**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year(No. of inpatients) | 2014\*(n=13,524) | 2015†(n=14,089) | 2016†(n=13,777) | 2017†(n=7,205) | *P* Value |
| RBCs |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 194 | 188 | 154 | 143 | < 0.0001 |
| No. (%) of patients transfused | 932 (6.9%) | 960 (6.8%) | 817 (5.9%) | 396 (5.5%) | < 0.0001 |
| No. (%) orders ≥ 2 units | 942 (58.5%) | 918 (55.3%) | 473 (29.3%) | 196 (24.3%) | < 0.0001 |
| No. (%) orders for Hb ≥ 8 g/dL‡ | 535 (37.9%) | 371 (25.2%) | 283 (18.8%) | 108 (14.2%) | < 0.0001 |
| Plasma |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 13 | 13 | 13 | 16 | 0.90 |
| No. (%) of patients transfused | 69 (0.5%) | 61 (0.4%) | 58 (0.4%) | 27 (0.4%) | 0.51 |
| No. (%) orders for INR < 1.5§ | 23 (27.1%) | 18 (23.1%) | 24 (28.6%) | 12 (23.5%) | 0.84 |
| Platelets |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 12 | 10 | 13 | 11 | 0.84 |
| No. (%) of patients transfused | 78 (0.6%) | 73 (0.5%) | 73 (0.5%) | 37 (0.5%) | 0.65 |
| No. (%) orders for PLTS ≥ 50K\*\* | 39 (28.5%) | 28 (23.3%) | 43 (29.3%) | 25 (36.8%) | 0.28 |

\* - Year 2014: baseline period, pre-patient blood management.

† - Years 2015, 2016, 2017: post-patient blood management time period. 2017 includes 6 months (July, 2016 to December, 2016).

†† - All units divided by all patients, including those who received no transfusions.

‡ - Orders with preceding Hb ≥ 8 g/dL within 24 h before order, or Hb missing (no Hb measured within 24 h).
§ - Orders with preceding INR < 1.5 within 24 h before order, or INR missing (no INR measured within 24 h).
\*\* - Orders with preceding PLTS ≥ 50K within 24 h before order, or PLTS missing (no PLTS measured within 24 h).
RBC – erythrocyte, Hb - hemoglobin; INR - international ratio; PLTS - platelet count.

**Supplemental Table 5. Blood utilization by year for Hospital #5**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year(No. of inpatients) | 2014\*(n=13,668) | 2015†(n=13,590) | 2016†(n=13,251) | 2017†(n=6,798) | *P* Value |
| RBCs |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 348 | 302 | 240 | 230 | < 0.0001 |
| No. (%) of patients transfused | 1,488 (10.9%) | 1,384 (10.2%) | 1,249 (9.4%) | 636 (9.4%) | 0.0002 |
| No. (%) orders ≥ 2 units | 1,734 (65.0%) | 1,424 (57.8%) | 695 (29.0%) | 282 (22.4%) | < 0.0001 |
| No. (%) orders for Hb ≥ 8 g/dL‡ | 843 (33.6%) | 678 (29.0%) | 417 (18.3%) | 172 (14.2%) | < 0.0001 |
| Plasma |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 77 | 78 | 66 | 42 | 0.0017 |
| No. (%) of patients transfused | 288 (2.1%) | 262 (1.9%) | 251 (1.9%) | 95 (1.4%) | 0.0042 |
| No. (%) orders for INR < 1.5§ | 219 (58.4%) | 157 (39.5%) | 127 (34.1%) |  35 (27.8%) | < 0.0001 |
| Platelets |  |  |  |  |  |
| Utilization (units/1,000 patients)†† | 63 | 55 | 42 | 38 | 0.0019 |
| No. (%) of patients transfused | 342 (2.5%) | 284 (2.1%) | 231 (1.7%) | 112 (1.7%) | < 0.0001 |
| No. (%) orders for PLTS ≥ 50K\*\* | 327 (52.4%) | 271 (45.3%) | 181 (42.1%) | 93 (40.1%) | 0.001 |

\* - Year 2014: baseline period, pre-patient blood management.

† - Years 2015, 2016, 2017: post-patient blood management time period. 2017 includes 6 months (July, 2016 to December, 2016).

†† - All units divided by all patients, including those who received no transfusions.

‡ - Orders with preceding Hb ≥ 8 g/dL within 24 h before order, or Hb missing (no Hb measured within 24 h).
§ - Orders with preceding INR < 1.5 within 24 h before order, or INR missing (no INR measured within 24 h).
\*\* - Orders with preceding PLTS ≥ 50K within 24 h before order, or PLTS missing (no PLTS measured within 24 h).
RBC – erythrocyte, Hb - hemoglobin; INR - international ratio; PLTS - platelet count.