

Literaturhinweise

Transfusion von Erythrozytenkonzentraten: Welche Evidenz gibt es für den richtigen Transfusionstrigger?

- 1) Whitaker B, Schlumpf J, Green J.
The 2009 national blood collection and utilization survey report.
Washington, D.C.: US Department of Health and Human Services, Office of the Assistant Secretary for Health; 2011.
- 2) Takei T, Amin NA, Schmid G, et al.
Progress in global blood safety for HIV.
J Acquir Immune Defic Syndr 2009; **52** (Suppl 2): S127–131.
- 3) Carson JL, Carless PA, Hebert PC.
Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion.
Cochrane Database Syst Rev 2012; **4**:CD002042.
Most recent systematic review of the clinical trials evaluating transfusion thresholds.
- 4) Adams RC, Lundy JS.
Anesthesia in cases of poor surgical risk: some suggestions for decreasing the risk.
Surg Gynecol Obstet 1941; **71**:1011–1014.
- 5) Madjdpour C, Spahn DR, Weiskopf RB.
Anemia and perioperative red blood cell transfusion: a matter of tolerance.
Crit Care Med 2006; **34**:S102–S108.
- 6) Napolitano LM, Kurek S, Luchette FA, et al.
Clinical practice guideline: red blood cell transfusion in adult trauma and critical care.
Crit Care Med 2009; **37**:3124–3157.
- 7) Ferraris VA, Ferraris SP, Saha SP, et al.
Perioperative blood transfusion and blood conservation in cardiac surgery:
the Society of Thoracic Surgeons and The Society of Cardiovascular Anesthesiologists clinical practice guideline.
Ann Thorac Surg 2007; **83**:S27–S86.
- 8) Liubruno GM, Bennardello F, Lattanzio A, et al.
Recommendations for the transfusion management of patients in the peri-operative period. III. The postoperative period.
Blood Transfus 2011; **9**:320–335.
- 9) Carson JL, Grossman BJ, Kleinman S, et al.
Red blood cell transfusion: a clinical practice guideline from the AABB.
Ann Intern Med 2012; **157**:49–58.
This is an authoritative guideline on RBC transfusion based on a systematic review of the literature.
- 10) Leal-Noval SR, Munoz-Gomez M, Jimenez-Sanchez M, et al.
Red blood cell transfusion in nonbleeding critically ill patients with moderate anemia: is there a benefit?
Intensive Care Med 2013; **39**:445–453.
- 11) Hebert PC, Wells G, Blajchman MA, et al.
A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care. Transfusion Requirements in Critical Care Investigators, Canadian Critical Care Trials Group [see comments].
N Engl J Med 1999; **340**:409–417.
- 12) Lacroix J, Hebert PC, Hutchison JS, et al.
Transfusion strategies for patients in pediatric intensive care units.
N Engl J Med 2007; **356**:1609–1619.
- 13) Zilberberg MD, Stern LS, Wiederkehr DP, et al.
Anemia, transfusions and hospital outcomes among critically ill patients on prolonged acute mechanical ventilation: a retrospective cohort study.
Crit Care 2008; **12**:R60.

- 14)** Marik PE, Corwin HL.
Efficacy of red blood cell transfusion in the critically ill: a systematic review of the literature.
Crit Care Med 2008; 36:2667–2674.
- 15)** Engoren M, Arslanian-Engoren C.
Long-term survival in the intensive care unit after erythrocyte blood transfusion.
Am J Crit Care 2009; 18:124–131; quiz 132.
- 16)** Park DW, Chun BC, Kwon SS, et al.
Red blood cell transfusions are associated with lower mortality in patients with severe sepsis and septic shock: a propensity-matched analysis.
Crit Care Med 2012; 40:3140–3145.
- 17)** Engoren M.
The effect of red blood cell transfusion on 90-day mortality in patients with acute lung injury.
J Intensive Care Med 2012; 27:112–118.
- 18)** Vincent JL, Baron JF, Reinhart K, et al.
Anemia and blood transfusion in critically ill patients.
J Am Med Assoc 2002; 288:1499–1507.
- 19)** Corwin HL, Gettinger A, Pearl RG, et al.
The CRIT Study: anemia and blood transfusion in the critically ill—current clinical practice in the United States.
Crit Care Med 2004; 32:39–52.
- 20)** Friedman EA, Burns TL, Shork MA.
A study of national trends in transfusion practice.
Springfield, VA: National Technical Information Service; 1980.
- 21)** Eisenstaedt RS.
Modifying physicians' transfusion practice.
Transfus Med Rev 1997; 11:27–37.
- 22)** Carson JL, Noveck H, Berlin JA, Gould SA.
Mortality and morbidity in patients with very low postoperative Hb levels who decline blood transfusion.
Transfusion 2002; 42:812–818.
- 23)** Carson JL, Terrin ML, Noveck H, et al.
Liberal or restrictive transfusion in highrisk patients after hip surgery.
N Engl J Med 2011; 365:2453–2462.
This is a large clinical trial that demonstrated the safety of restrictive transfusion in elderly surgical patients with underlying cardiovascular disease or risk factors.
- 24)** So-Osman C, Nelissen R, Brand R, et al.
The impact of a restrictive transfusion trigger on postoperative complication rate and well being following elective orthopaedic surgery: a posthoc analysis of a randomised study.
Blood Transfus 2013; 11:289–295.
- 25)** Hajjar LA, Vincent JL, Galas FR, et al.
Transfusion requirements after cardiac surgery: the TRACS randomized controlled trial.
JAMA 2010; 304:1559–1567.
- 26)** Galas FR, Almeida JP, Fukushima JT, et al.
Blood transfusion in cardiac surgery is a risk factor for increased hospital length of stay in adult patients.
J Cardiothorac Surg 2013; 8:54.
- 27)** Biancari F, Kinnunen EM.
Red blood cell transfusion is associated with troponin release after elective off-pump coronary artery bypass surgery.
Ann Thorac Surg 2012; 94:1901–1907.

Literaturhinweise

- 28)** Bhaskar B, Dulhunty J, Mullany DV, Fraser JF.
Impact of blood product transfusion on short and long-term survival after cardiac surgery: more evidence.
Ann Thorac Surg 2012; **94**:460–467.
- 29)** Carson JL, Carless PA, Hebert PC.
Outcomes using lower vs higher hemoglobin thresholds for red blood cell transfusion.
JAMA 2013; **309**:83–84.
- 30)** Howard J, Malfroy M, Llewelyn C, et al.
The Transfusion Alternatives Preoperatively in Sickle Cell Disease (TAPS) study: a randomised, controlled, multicentre clinical trial.
Lancet 2013; **381**:930–938.
This is the first clinical trial to establish the need for liberal transfusion in patients with sickle cell disease.
- 31)** Vichinsky EP, Haberkern CM, Neumayr L, et al.
A comparison of conservative and aggressive transfusion regimens in the perioperative management of sickle cell disease.
The Preoperative Transfusion in Sickle Cell Disease Study Group [see comments].
N Engl J Med 1995; **333**:206–213.
- 32)** Laine L, Yang H, Chang SC, Datto C.
Trends for incidence of hospitalization and death due to GI complications in the United States from 2001 to 2009.
Am J Gastroenterol 2012; **107**:1190–1195; quiz 1196.
- 33)** Schiff L.
The treatment of bleeding peptic ulcer: with a report of 160 cases treated by a prompt feeding program.
Southern Med J 1944; **37**:335–342.
- 34)** Barkun AN, Bardou M, Kuipers EJ, et al.
International consensus recommendations on the management of patients with nonvariceal upper gastrointestinal bleeding.
Ann Intern Med 2010; **152**:101–113.
- 35)** Hearnshaw S, Logan RF, Palmer KR, et al.
Outcomes following early red blood cell transfusion in acute upper gastrointestinal bleeding.
Aliment Pharmacol Ther 2010; **32**:215–224.
- 36)** Colomo A, Hernandez-Gea V, Madoz P, et al.
Hemodynamic changes and transfusion strategies in cirrhotic patients with acute variceal bleeding.
Hepatology 2009; **50**:403A.
- 37)** Villanueva C, Colomo A, Bosch A, et al.
Transfusion strategies for acute upper gastrointestinal bleeding.
N Engl J Med 2013; **368**:11–21.
This is the first trial to show a lower mortality in patients receiving restrictive transfusion compared to liberal transfusion in patients with gastrointestinal bleeding.
- 38)** Salisbury AC, Amin AP, Reid KJ, et al.
Hospital-acquired anemia and in-hospital mortality in patients with acute myocardial infarction.
Am Heart J 2011; **162**:300–309; e303.
- 39)** Arant CB, Wessel TR, Olson MB, et al.
Hemoglobin level is an independent predictor for adverse cardiovascular outcomes in women undergoing evaluation for chest pain: results from the National Heart, Lung, and Blood Institute Women's Ischemia Syndrome Evaluation Study.
J Am Coll Cardiol 2004; **43**:2009–2014.
- 40)** Sabatine MS, Morrow DA, Giugliano RP, et al.
Association of hemoglobin levels with clinical outcomes in acute coronary syndromes.
Circulation 2005; **111**:2042–2049.

- 41) Vis MM, Sjauw KD, van der Schaaf RJ, et al.
Prognostic value of admission hemoglobin levels in ST-segment elevation myocardial infarction patients presenting with cardiogenic shock.
Am J Cardiol 2007; 99:1201–1202.
- 42) Cooper HA, Rao SV, Greenberg MD, et al.
Conservative versus liberal red cell transfusion in acute myocardial infarction (the CRIT Randomized Pilot Study).
Am J Cardiol 2011; 108:1108–1111.
- 43) Carson JL, Brooks MM, Abbott JD, et al.
Liberal versus restrictive transfusion thresholds for patients with symptomatic coronary artery disease.
Am Heart J 2013; 165:964–971; e961.
- 44) Chatterjee S, Wetterslev J, Sharma A, et al.
Association of blood transfusion with increased mortality in myocardial infarction: a meta-analysis and diversity-adjusted study sequential analysis.
JAMA Intern Med 2013; 173:132–139.
- 45) Garfinkle M, Lawler PR, Filion KB, Eisenberg MJ.
Red blood cell transfusion and mortality among patients hospitalized for acute coronary syndromes: a systematic review.
Int J Cardiol 2013; 164:151–157.
- 46) Carson JL, Hebert PC.
Here we go again—blood transfusion kills patients?: comment on 'Association of Blood Transfusion With Increased Mortality in Myocardial Infarction: A Meta-analysis and Diversity-Adjusted Study Sequential Analysis'.
JAMA Intern Med 2013; 173:139–141.
This article summarizes the limitations of observational studies evaluating transfusion thresholds.
- 47) Hanna EB, Alexander KP, Chen AY, et al.
Characteristics and in-hospital outcomes of patients with non-ST-segment elevation myocardial infarction undergoing an invasive strategy according to hemoglobin levels.
Am J Cardiol 2013; 111:1099–1103.
- 48) LeRoux P.
Haemoglobin management in acute brain injury.
Curr Opin Crit Care 2013; 19:83–91.
- 49) Dhar R, Scalfani MT, Zazulia AR, et al.
Comparison of induced hypertension, fluid bolus, and blood transfusion to augment cerebral oxygen delivery after subarachnoid hemorrhage.
J Neurosurg 2012; 116:648–656.
- 50) McIntyre LA, Fergusson DA, Hutchison JS, et al.
Effect of a liberal versus restrictive transfusion strategy on mortality in patients with moderate to severe head injury.
Neurocrit Care 2006; 5:4–9.
- 51) Oddo M, Levine JM, Kumar M, et al.
Anemia and brain oxygen after severe traumatic brain injury.
Intensive Care Med 2012; 38:1497–1504.
- 52) Kramer AH, Le Roux P.
Red blood cell transfusion and transfusion alternatives in traumatic brain injury.
Curr Treat Options Neurol 2012; 14:150–163.
- 53) Shander A, Gross I, Hill S, et al.
A new perspective on best transfusion practices.
Blood Transfus 2013; 11:193–202.