Angeborenen Herzkrankheiten, a book and systematic review of embryology that included congenital cardiac anomalies. One of the sections was entitled, "Incomplete Division and Unilateral Transformation of a Primary Truncus. Persistence of the Truncus Arteriosus—Presence of Only One Single Major Arterial Vessel."³ In this section, he used descriptors for the common arterial trunk similar to those presented in the article by Russell and colleagues.¹ This simplified approach was discussed by Calder and associates⁴ and emphasized by Jacobs,⁵ as indicated in Russell and colleagues' article,¹ but had initially been presented almost a century before. Vierordt's original classification was also discussed on page 1250 of the seminal work by Collette and Edwards.⁶ Vierordt³ reviewed 40 cases (including some of Rokitansky's original preparations) and proposed 3 categories: (1) "partial persistence of an embryonic truncus arteriosus: one major vessel from which arises an aorta and pulmonary artery"; (2) "a single major vessel arising from the heart of the character of an aorta with more or less typical branching of the same, lacking a pulmonary artery as such, and the pulmonary vessels arise from the main arterial vessel"; and (3) "a single vessel of the character of a pulmonary artery." It is also ironic that Vierordt³ states before presenting his 3 categories, "It would be highly desirable that there would be agreement in the nomenclature." He pointed out how useful this would be for better definition of these types of lesions. It seems that we have come full circle in the description and categorization of the common arterial trunk and have rediscovered the original classification of these lesions and a plea for common nomenclature. We would like to recognize the initial classification and echo the plea of Vierordt³ by encouraging the adoption of this simple categorization presented recently by Russell and colleagues¹ and realized by others before them.³⁻⁶

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References

1. Russell HM, Jacobs ML, Anderson RH, Mavroudis C, Spicer D, Corcrain E, et al. A simplified categorization for common arterial trunk. *J Thorac Cardiovasc Surg.* 2011;141:645-53.
2. Evans WN, Acherman RJ, Anderson RH. One hundred years of texts describing congenitally malformed hearts from 1814 to 1914. *Cardiol Young.* 2009;19:12-29.
3. Vierordt H. Die angeborenen Herzkrankheiten; Unvollständige Theilung und einseitige Umbildung des primären Truncus arteriosus. *Specielle Pathologie und Therapie.* 1898;15:132-8. German.
4. Calder L, Van Praagh R, Van Praagh S, Sears WP, Corwin R, Levy A, et al. Truncus arteriosus communis. Clinical, angiographic, and pathologic findings in 100 patients. *Am Heart J.* 1976;92:23-38.
5. Jacobs ML. Congenital Heart Surgery Nomenclature and Database Project: truncus arteriosus. *Ann Thorac Surg.* 2000;69(4 Suppl):S50-5.
6. Collette RW, Edwards JE. Persistent truncus arteriosus: a classification according to anatomic types. *Surg Clin North Am.* 1949;29:1245-70.

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Reply to the Editor:

We appreciate the letter from Erickson and Opitz in support of our categorization of common arterial trunk as either aortic or pulmonary dominant.¹ We are intrigued that they have brought to our attention the work of Vierordt² published more than 100 years ago. Although his theme was similar, there are important differences that we believe deserve emphasis.

As we understood Vierordt's categorization,² he distinguished between a common arterial trunk, a solitary aorta, and a solitary pulmonary trunk. Although this is similar to our concept, our suggestion is that common arterial trunk itself, according to its pattern of branching, is best

subdivided on the basis of aortic or pulmonary dominance. The semantics are important. Our emphasis on this particular categorization is related to the accepted definition of common arterial trunk: a solitary trunk that exits the heart through a common ventriculoarterial junction and supplies directly the systemic, pulmonary, and coronary arterial pathways. A solitary aorta, such as exists in tetralogy with pulmonary atresia and major aortopulmonary collateral arteries (historically and erroneously labeled "pseudotruncus"), does not fit this definition. A solitary pulmonary artery, such as seen in hypoplastic left heart syndrome with aortic atresia, also does not fit this definition. Thus our interpretation of Vierordt's analysis² is somewhat different than that of Erickson and Opitz.

We support Erickson and Opitz in their acknowledgement of the works of Vierordt,² Calder and associates,³ Van Praagh and Van Praagh,⁴ Jacobs,⁵ and Collette and Edwards⁶ in arriving at what we consider to be the optimal approach to categorization of common arterial trunk.

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References

1. Russell HM, Jacobs ML, Anderson RH, Mavroudis C, Spicer D, Corcrain E, et al. A simplified categorization for common arterial trunk. *J Thorac Cardiovasc Surg.* 2011;141:645-53.
2. Vierordt H. Die angeborenen Herzkrankheiten; Unvollständige Theilung und einseitige Umbildung des primären Truncus arteriosus. *Specielle Pathologie und Therapie.* 1898;15:132-8. German.
3. Calder L, Van Praagh R, Van Praagh S, Sears WP, Corwin R, Levy A, et al. Truncus arteriosus communis. Clinical, angiographic, and pathologic findings in 100 patients. *Am Heart J.* 1976;92:23-38.
4. Van Praagh R, Van Praagh S. The anatomy of common aorticopulmonary trunk (truncus arteriosus communis) and its embryologic implications. A study of 57 necropsy cases. *Am J Cardiol.* 1965;16:406-25.

5. Jacobs ML. Congenital Heart Surgery Nomenclature and Database Project: truncus arteriosus. *Ann Thorac Surg.* 2000;69(4 Suppl):S50-5.
6. Collette RW, Edwards JE. Persistent truncus arteriosus: a classification according to anatomic types. *Surg Clin North Am.* 1949;29:1245-70.

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DABIGATRAN AFTER CARDIAC SURGERY: CAUTION ADVISED To the Editor:

We recently read the interesting study by McKellar and associates¹ evaluating the effectiveness of dabigatran for thromboprophylaxis after implantation of mechanical heart valves. Using a heterotopic aortic valve model, the authors randomized 30 swine to receive dabigatran, enoxaparin, or no anticoagulation after implantation of a mechanical valve conduit. At 30 days, McKellar and associates¹ reported that dabigatran reduced thrombus and platelet deposition on the mechanical valve leaflets without an increase in adverse events.

Several new oral direct thrombin inhibitors are being evaluated as alternatives for long-term anticoagulation because of the widely known difficulties associated with warfarin, including its long half-life and unpredictable dose response. Compared with warfarin, dabigatran has no food or drug interactions, has a rapid onset of action, and does not require blood monitoring.^{2,3} Paradoxically, while lauded for its ease of use, the management of patients receiving dabigatran may be extremely challenging in the setting of active bleeding and coagulopathy. McKellar and colleagues¹ claim that, in contrast to warfarin, dabigatran “could prove safer should emergency surgery be needed.” We respectfully disagree with this statement. There is no known antidote available for dabigatran. Vitamin K and fresh frozen plasma are ineffective, and dialysis may be the only means available to rapidly reverse the anticoagulant effects of dabigatran.^{4,5}

We recently prescribed dabigatran to a 74-year-old woman after coronary

artery bypass graft surgery. The patient had a history of atrial fibrillation and had previously refused warfarin therapy. After surgery, she continued to refuse warfarin, but she agreed to take dabigatran to reduce the risk of stroke and systemic embolism.⁶ Dabigatran was initiated on postoperative day 3 using the lowest possible dose (75 mg twice daily), given the patient’s frailty and mild renal insufficiency. She was monitored in the hospital for 6 additional days before transfer to a rehabilitation facility. A chest x-ray film before discharge noted a very small left pleural effusion. Two days after transfer, the patient returned to hospital with a massive left hemothorax and gastrointestinal bleeding. She was treated with intubation for respiratory distress and placement of a left thoracostomy tube, draining more than 2 L of blood. The patient had evidence of a severe coagulopathy, with an international normalized ratio of 21.5 and a partial thromboplastin time of 161.2. To manage the bleeding, we instituted emergency dialysis, successfully correcting the coagulopathy. After 2 dialysis treatments, the international normalized ratio and partial thromboplastin time were reduced to 1.9 and 47.4, respectively, and the chest and gastrointestinal bleeding had subsided. The patient made a miraculous recovery and was discharged back to rehabilitation 2 weeks later without anticoagulation therapy.

McKellar and associates¹ are to be congratulated for their novel study. Their animal model data suggest that dabigatran may have a role in the thromboprophylaxis of mechanical valves. We would be intrigued to learn whether they have had any clinical experience using dabigatran in patients undergoing cardiac surgery, either for the thromboprophylaxis of mechanical valves or for the anticoagulation of atrial fibrillation. Although our experience is limited to a single case, the outcome was nearly fatal. We would therefore strongly advise caution when prescribing dabigatran

early after cardiac surgery, at least until additional clinical experience accrues.

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References

1. McKellar SH, Abel S, Camp CL, Suri RM, Ereth MH, Schaff HV. Effectiveness of dabigatran etexilate for thromboprophylaxis of mechanical heart valves. *J Thorac Cardiovasc Surg.* 2011; 141:1410-6.
2. Stangier J. Clinical pharmacokinetics and pharmacodynamics of the oral direct thrombin inhibitor dabigatran etexilate. *Clin Pharmacokinet.* 2008;47: 285-95.
3. Francis CW. New issues in oral anticoagulants. *Hematology Am Soc Hematol Educ Program.* 2008;259-65.
4. van Ryn J, Stangier J, Haertter S, Liesenfeld KH, Wienen W, Feuring M, et al. Dabigatran etexilate—a novel, reversible, oral direct thrombin inhibitor: interpretation of coagulation assays and reversal of anticoagulant activity. *Thromb Haemost.* 2010;103:1116-27.
5. Lee CJ, Ansell JE. Direct Thrombin Inhibitors. *Br J Clin Pharmacol.* 2011 Jan 17 [Epub ahead of print].
6. Connolly SJ, Ezekowitz MD, Yusuf S, Eikelboom J, Oldgren J, Parekh A, et al. Dabigatran versus warfarin in patients with atrial fibrillation. *N Engl J Med.* 2009;361:1139-51.

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DOUBLE RIGHT CORONARY ARTERY OR CONUS ARTERY WITH SEPARATE ORIFICE?

To the Editor:

In their recent Cardiothoracic Imaging article, Chen, Chien, and Lee¹ have applied the term “double right coronary artery”¹ (RCA) in a debatable way.

The anatomic nomenclature for the situation they have described has been better termed “the conus artery: a third coronary artery”²; “conus coronary artery with aortic origin”³; or, more appropriately, “conus artery with separate orifice,” coded as