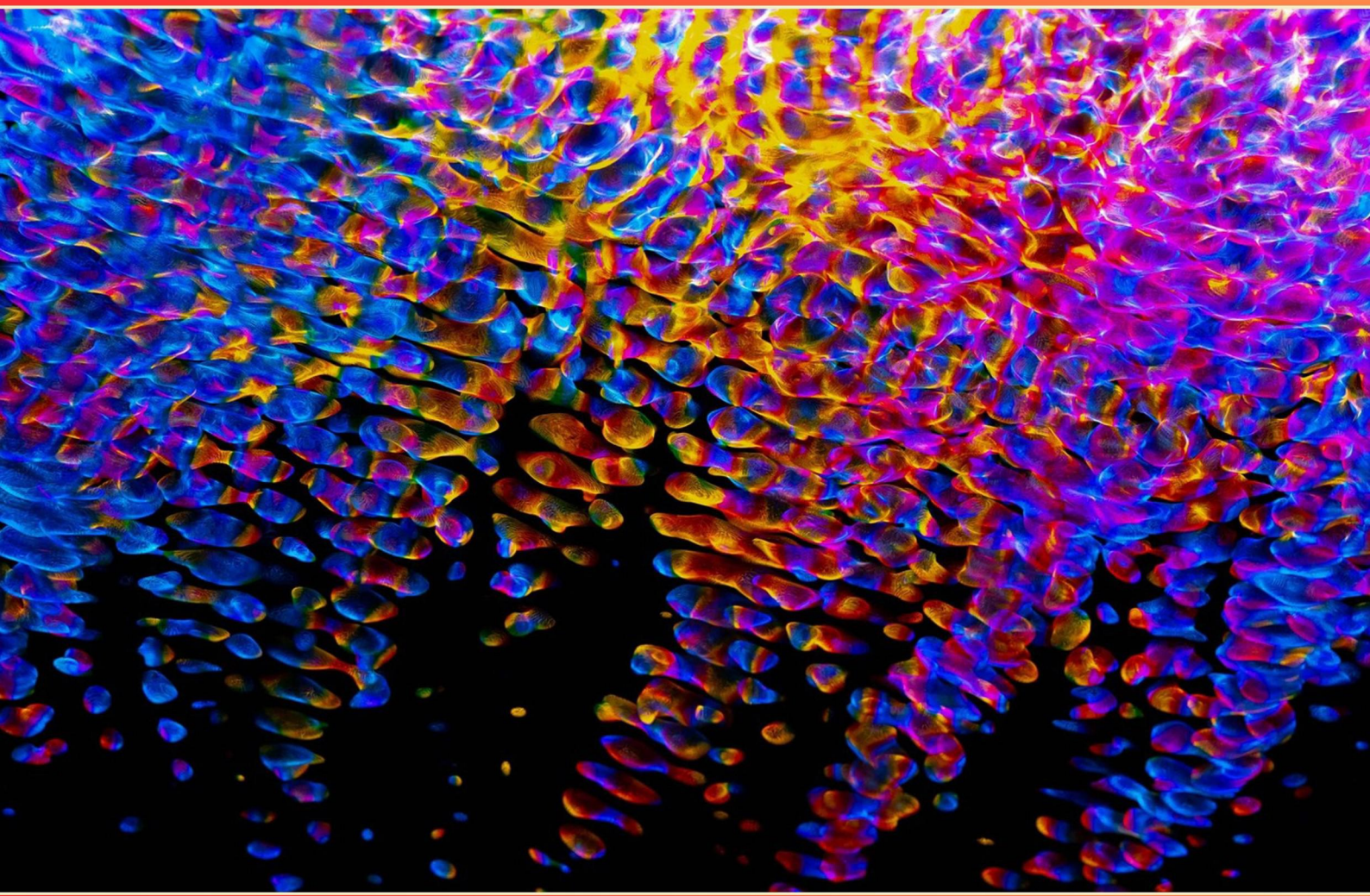
# TCD AND CEREBRAL CIRCULATION PRACTICE TEST (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

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# How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

### 1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

### 2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

### 3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

### 4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

### 5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

### 6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

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# Questions

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**1. Which of the two terminal branches of the internal carotid artery is a rare site for stenosis or occlusion?**

A. Middle cerebral artery (MCA)

B. Posterior cerebral artery (PCA)

C. Anterior cerebral artery (ACA)

D. Internal carotid artery (ICA)

**2. The posterior communicating artery connects the internal carotid artery to which artery in the posterior circulation?**

A. Anterior cerebral artery (ACA)

B. Posterior cerebral artery (PCA)

C. Middle cerebral artery (MCA)

D. Basilar artery

**3. Which pattern on transcranial Doppler would most strongly suggest microvascular or distal resistance rather than proximal stenosis?**

A. Diffuse, multiterritorial velocity elevation across multiple vascular territories

B. Isolated high velocity in MCA only

C. No velocity change

D. Decreased velocities in all arteries

**4. The anterior communicating artery connects which arteries?**

A. The left and right anterior cerebral arteries across the interhemispheric fissure

B. The left and right posterior cerebral arteries

C. The internal carotid arteries

D. The vertebral arteries

**5. How many segments does PCA have, and which is evaluated during TCD?**

A. 3 segments; P2

B. 4 segments; P1

C. 5 segments; P3

D. 2 segments; A1

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**6. What is post-stenotic turbulence on transcranial Doppler?**

A. Global hyperemia across all vessels.

B. Uniform spectral broadening across all vessels.

C. Increased velocity in collateral pathways.

D. Post-stenotic turbulence distal to a stenosis.

**7. In sickle cell disease, cerebral infarction is most strongly associated with occlusive vasculopathy affecting which arteries?**

A. Proximal ICA and proximal MCA

B. Distal ICA and PCA

C. Terminal ICA, MCA, ACA

D. Basilar artery

**8. What is the typical normal range for MCA MFV in adults, and how do PCA and ACA velocities compare?**

A. MCA MFV approximately 50–60 cm/s on average; PCA and ACA velocities are generally lower (roughly 40–50 cm/s), with individual variation.

B. MCA MFV about 40–50 cm/s; PCA/ACA about 60–70 cm/s.

C. MCA MFV about 70–90 cm/s; PCA/ACA about 60–70 cm/s.

D. MCA MFV about 20–30 cm/s; PCA/ACA about 30–40 cm/s.

**9. What does ACoA stand for?**

A. Anterior Cerebral Artery

B. Posterior Communicating Artery

C. Anterior Communicating Artery

D. Basilar Artery

**10. What is the role of serial transcranial Doppler monitoring after subarachnoid hemorrhage (SAH) in guiding therapy?**

A. Serial measurements track the evolution of vasospasm, help risk-stratify delayed cerebral ischemia, and guide therapeutic decisions (e.g., to escalate therapy or intervene).

B. Serial measurements are only used to monitor heart rate.

C. They replace CT angiography for all imaging.

D. They have no impact on treatment decisions.

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# Answers

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1. C
2. B
3. A
4. A
5. B
6. D
7. C
8. A
9. C
10. D

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# Explanations

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## 1. Which of the two terminal branches of the internal carotid artery is a rare site for stenosis or occlusion?

A. Middle cerebral artery (MCA)

B. Posterior cerebral artery (PCA)

C. Anterior cerebral artery (ACA)

D. Internal carotid artery (ICA)

*Two terminal branches of the internal carotid artery form the anterior circulation: the middle cerebral artery and the anterior cerebral artery. The middle cerebral artery is the more common site for stenosis or occlusion because it handles a large, high-flow territory and has many branching points where atherosclerotic plaque or emboli can lodge. The anterior cerebral artery, in contrast, is a rarer site for such blockage. Its smaller caliber and the robust collateral supply via the anterior communicating artery and the contralateral ACA help preserve perfusion when one side narrows, making true occlusion less frequent. Clinically, ACA occlusion tends to produce leg-dominant weakness and medial frontal–lobe effects, whereas MCA strokes are more common and typically produce aphasia or lateralized cortical deficits depending on the hemisphere.*

## 2. The posterior communicating artery connects the internal carotid artery to which artery in the posterior circulation?

A. Anterior cerebral artery (ACA)

B. Posterior cerebral artery (PCA)

C. Middle cerebral artery (MCA)

D. Basilar artery

*In the Circle of Willis, the posterior communicating artery serves as a bridge between the internal carotid system and the posterior circulation. It directly connects the internal carotid artery to the posterior cerebral artery, near where the PCA originates from the basilar artery. This link enables communication and collateral flow between anterior and posterior territories. The other vessels aren't connected by this artery in the same way: the anterior communicating artery links the two anterior cerebral arteries, the middle cerebral artery branches from the internal carotid, and the basilar artery sits in the posterior circulation but is connected to the PCA rather than directly to the internal carotid by the posterior communicating artery.*

## 3. Which pattern on transcranial Doppler would most strongly suggest microvascular or distal resistance rather than proximal stenosis?

A. Diffuse, multiterritorial velocity elevation across multiple vascular territories

B. Isolated high velocity in MCA only

C. No velocity change

D. Decreased velocities in all arteries

*The pattern being evaluated is how flow velocity on transcranial Doppler distributes across the intracranial circulation. Proximal stenosis tends to produce a focal velocity spike at the narrowed segment, with other vessels often normal. In contrast, microvascular or distal resistance issues affect the downstream bed broadly, so the upstream arteries show elevated velocities in multiple territories rather than in just one spot. Seeing diffuse, multiterritorial velocity elevation across several arteries points to a distal resistance or microvascular process rather than a single proximal stenosis. This pattern is different from no velocity change, which would argue against a hemodynamically significant lesion, or from decreased velocities, which would suggest reduced overall flow.*

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## 4. The anterior communicating artery connects which arteries?

A. The left and right anterior cerebral arteries across the interhemispheric fissure

B. The left and right posterior cerebral arteries

C. The internal carotid arteries

D. The vertebral arteries

*The anterior communicating artery is the bridge between the two anterior cerebral arteries. It runs across the midline in the interhemispheric fissure, connecting the left and right ACA as they originate from the internal carotid system. This direct link allows cross-hemisphere blood flow and provides a collateral route if one side is narrowed or blocked. It does not connect the posterior cerebral arteries, the internal carotid arteries directly, or the vertebral arteries.*

## 5. How many segments does PCA have, and which is evaluated during TCD?

A. 3 segments; P2

B. 4 segments; P1

C. 5 segments; P3

D. 2 segments; A1

*The PCA is described as having four segments, labeled P1 through P4. The P1 segment runs from the basilar tip to the posterior communicating artery, and it is the proximal portion of the PCA that is most reliably assessed with transcranial Doppler using standard acoustic windows. Because it lies closer to the trunk of the posterior circulation and remains within the typical insonation window, the P1 segment is the one most commonly evaluated during TCD. The more distal segments (P2 to P4) exist, but they are harder to visualize with standard TCD and are less consistently assessed. Hence, there are four segments, and the P1 segment is the one evaluated during TCD.*

## 6. What is post-stenotic turbulence on transcranial Doppler?

A. Global hyperemia across all vessels.

B. Uniform spectral broadening across all vessels.

C. Increased velocity in collateral pathways.

D. Post-stenotic turbulence distal to a stenosis.

*Post-stenotic turbulence is the disturbed, non-laminar flow that happens downstream of a narrowed artery. When the vessel narrows, blood accelerates to a high-velocity jet at the stenosis. After the stenosis, the flow can separate from the wall and form eddies and chaotic motion as energy is lost and the jet decelerates. This turbulence shows up on transcranial Doppler as spectral broadening: a wider range of Doppler frequencies and erratic velocity signals distal to the lesion, rather than a simple, single, high-velocity peak. It's a localized phenomenon tied to the narrowed segment, not a global change across all vessels. Collateral pathways may carry more flow to compensate, but that increased flow in collaterals isn't the same as turbulence downstream of the stenosis.*

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**7. In sickle cell disease, cerebral infarction is most strongly associated with occlusive vasculopathy affecting which arteries?**

A. Proximal ICA and proximal MCA

B. Distal ICA and PCA

C. Terminal ICA, MCA, ACA

D. Basilar artery

*In sickle cell disease, the dangerous vasculopathy tends to be moyamoya–like, targeting the end portion of the internal carotid artery and the proximal segments where it gives rise to the middle and anterior cerebral arteries. stenosis here cuts off the major anterior circulation supply, so infarcts usually involve the MCA territory and related areas. The basilar artery and more distal or posterior vessels are not the primary sites early in this disease, and involvement of the PCA specifically is less characteristic. So, occlusion at the terminal internal carotid and the origins of the MCA and ACA best explains the pattern of cerebral infarction seen in SCD.*

**8. What is the typical normal range for MCA MFV in adults, and how do PCA and ACA velocities compare?**

A. MCA MFV approximately 50–60 cm/s on average; PCA and ACA velocities are generally lower (roughly 40–50 cm/s), with individual variation.

B. MCA MFV about 40–50 cm/s; PCA/ACA about 60–70 cm/s.

C. MCA MFV about 70–90 cm/s; PCA/ACA about 60–70 cm/s.

D. MCA MFV about 20–30 cm/s; PCA/ACA about 30–40 cm/s.

*In resting adults, the velocity values reflect how much blood is flowing through each artery and the size of the vessel. The middle cerebral artery carries a large portion of cerebral blood flow, so its mean flow velocity is typically around the mid-50s cm/s, about 50–60 cm/s on average. The anterior cerebral artery and posterior cerebral artery supply smaller territories and/or have smaller calibers, so their velocities are generally lower, commonly in the 40–50 cm/s range, with some individual variation. These patterns stay consistent across people, though factors like CO2 levels, blood pressure, and hematocrit can shift the absolute numbers.*

**9. What does ACoA stand for?**

A. Anterior Cerebral Artery

B. Posterior Communicating Artery

C. Anterior Communicating Artery

D. Basilar Artery

*ACoA stands for Anterior Communicating Artery. This small vessel sits in the Circle of Willis and links the left and right anterior cerebral arteries, allowing cross-flow between the hemispheres. It's a communication between the two ACAs, not one of the arteries themselves. It's distinct from the artery called the Anterior Cerebral Artery, the Posterior Communicating Artery, or the Basilar Artery.*

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**10. What is the role of serial transcranial Doppler monitoring after subarachnoid hemorrhage (SAH) in guiding therapy?**

A. Serial measurements track the evolution of vasospasm, help risk-stratify delayed cerebral ischemia, and guide therapeutic decisions (e.g., to escalate therapy or intervene).

B. Serial measurements are only used to monitor heart rate.

C. They replace CT angiography for all imaging.

D. They have no impact on treatment decisions.

*Serial transcranial Doppler monitoring after subarachnoid hemorrhage is a dynamic way to watch for cerebral vasospasm and the risk of delayed cerebral ischemia. By repeatedly measuring blood flow velocity in key intracranial arteries, clinicians can see how vasospasm is evolving over days. Rising velocities signal increasing vessel narrowing, which can reduce cerebral perfusion and raise the chance of delayed ischemia. Because this process unfolds over time, serial measurements help risk-stratify patients and guide decisions about therapy—such as tightening hemodynamic targets, ensuring adequate volume status, or stepping up treatment. In cases of severe or refractory vasospasm, these trends can prompt consideration of more aggressive interventions, including endovascular vasodilation or angioplasty. It's important to view TCD as a piece of the puzzle, not a stand-alone diagnostic tool. Imaging with CT angiography or catheter angiography, along with the clinical exam and other perfusion studies, is still used to confirm the presence and severity of vasospasm and to plan definitive treatments. TCD has limitations: it's operator-dependent, can be limited by patient anatomy or poor acoustic windows, and single values can be misleading, so tracking trends over time is the real value.*

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# Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://tcdcerebralcirculation.examzify.com

We wish you the very best on your exam journey. You've got this!

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