

PULSE EXPERIENTIAL TEAM ASSIGNMENT

1. Title of your PULSE experiential assignment. <i>Provide a creative and informative title.</i>
The Role of Antiphospholipid Syndrome in Thromboembolism.
2. Please summarize your PULSE experiential assignment (max 300 words). <i>Provide a non-technical (lay) summary of your PULSE assignment. Prompts to think about: What is the topic? What is the format? Why did you choose this topic and format? The summary for lay audience is a brief and accessible summary of the assignment that is used to explain complex ideas, technical writing and scientific terms to people who do not have prior knowledge of the subject (e.g., high school science level). This summary should include the importance, impact, and content of your assignment to a broader audience.</i> <i>[Team 23 is an example of an informative lay summary.]</i>
Our project focused on using an autoimmune disease, antiphospholipid syndrome (APS), as an example to explain the concepts of blood clotting. We started off with a case to explain that APS is a condition where the body's immune system mistakenly attacks healthy cells, which in this case, causes blood clot. We then moved on to talk about blood clotting in general, not just caused by APS. We brought up the Virchow's Triad, which describes the three factors that the blood clot can arise from. Blood clot is more likely to form when there is damage to the blood vessel, when the blood itself becomes more "sticky", and when the blood flow becomes slow. We also mentioned what else could go wrong if there's a blood clot. The blood clot can travel through the blood vessel to different parts of the body, causing problems at that area. Some common areas include the brain, heart, lungs, liver, intestines, and dermal tissues. We chose to use a magazine to present our content because it allows us to use diagrams to explain ideas, effectively combine text and visuals, and engage the audience better than plain texts. Our topic is important and meaningful because blood clotting disorders usually develop with few symptoms but occur suddenly. As a result, most people may be unaware of an underlying problem until a serious condition occurs. This makes it important to raise awareness of the general public about how this disorder develops and why early attention to risk factors is important.
3. Provide up to 6 keywords relevant to your PULSE experiential assignment. <i>3-6 keywords are ideal.</i>
Hemodynamic Disorders, Thromboembolism, Antiphospholipid syndrome, Virchow's triad
4. Identify the course topic with which your PULSE assignment most aligns. <i>Refer to the various topics outlined under 'Course content and Schedule' in the syllabus (e.g. Inflammation).</i>
Hemodynamic Disorders, Thromboembolism & Shock
5. What are the learning outcomes?

There should be a minimum of 2 learning outcomes for your assignments. For further information on learning outcomes, the Centre for Teaching and Learning offers information:

<https://teaching.uwo.ca/curriculum/coursedesign/learning-outcomes.html>

- Define the Antiphospholipid syndrome (APS) and its mechanisms, symptoms and complications.
- Describe how Virchow's triad contributes to thrombi formation
- Describe the major players in APS-induced thrombosis and relate them to Virchow's triad
- Understand how APS can lead to fetal loss and how the surgery increases the risk of thrombosis in patients with APS using Virchow's triad
- Describe the major sites of thrombosis in the body and relevant complications
- Explain the diagnosis, treatment, prognosis and prevention of APS

6. Why did the team select the chosen topic and the medium? How will the topic and medium of choice help learners?

Why did the team select the chosen topic and the medium?

The team chose to examine the topic of Antiphospholipid Syndrome (APS) because it provides a good example of hypercoagulability, one of the three components of Virchow's Triad (endothelial injury, abnormal blood flow, and hypercoagulability). In our coursework, the slides have emphasized the importance of Virchow's Triad in thrombosis formation. However, there was limited exploration of specific conditions that directly contribute to a hypercoagulable state. As a result, we think some students may understand the theory of Hypercoagulability, but lack the ability to connect it to real-world scenarios.

APS addresses this problem by showcasing as a clear example of secondary (acquired) hypercoagulability, where autoimmune antibodies significantly increase the risk of thrombosis. By focusing on APS, we hoped to provide a real-world case that illustrates how disruptions in coagulation can lead to severe, life-threatening outcomes such as stroke, pulmonary embolism, or myocardial infarction (or just thrombosis in general). This makes the learning experience more tangible, clinically meaningful, and easier to retain.

Our team chose a magazine format as the medium because it effectively balances the proportion of pure, text-based information with appealing, visual-based information. We have always wanted an eye-catching "case report" at the beginning to effectively hook the readers. Originally, we wanted to make a newspaper, because it naturally goes well with a case report, but that plan was discarded because we agreed a newspaper is a little plain and text-heavy for our taste. A magazine allows for the integration of images, diagrams, and structured sections that guide the reader through complex information in a more accessible way, and so it was chosen instead.

How will the topic and medium of choice help learners?

The topic and medium help learners understand the concept by engaging the learner while educating them on the potentially deadly effects of hypercoagulability.

Focusing on APS helps learners fill in the gap between theory and real-life scenarios. Instead of memorizing Virchow's Triad as a concept in theory, learners can see how hypercoagulability presents itself in a real condition, thereby reinforcing their learning through means of application. Making this connection makes it easier for learners to recall and apply knowledge of hemodynamics in future academic or clinical settings. Additionally, examining APS displays the severity and real-world consequences of thrombosis, which can help to increase a learner's interest in the topic.

The magazine format, on the other hand, enhances learning by balancing visuals and text-based information. Visual elements such as diagrams, infographics, and highlighted key points can simplify complex mechanisms like pathophysiology. Meanwhile, the inclusion of a case report introduces storytelling, and can help improve retention of information by placing it within a meaningful context. This structure allows learners to first engage emotionally and cognitively with a real-life scenario, and then build their understanding through supporting explanations.

Overall, the topic and medium work together to create a learning experience that is interactive, memorable, and clinically relevant, helping learners not only understand APS but also appreciate its importance within the broader framework of thrombosis and patient care.

7. Did the team use an artificial intelligence (AI) technology tool? If so, which AI technology tool(s) did the team use? What other technology tools did the team use? Is the technology tool novel? Is the team using this technology tool in a novel fashion? If the team did not use technology tool, why did the team decide against using the technology tool(s)?

Please include details (e.g., for what purpose was the tool used for? Why was the tool the best tool to use for your assignment? Are there alternative tools that were considered?)

The team utilized AI tools, specifically ChatGPT Plus and Gemini3.1, to support the creation of our magazine. ChatGPT was used to generate and refine prompts, which were then input into Gemini to produce images that aligned closely with the magazine's content. By combining these two tools, we were able to leverage their complementary strengths, ChatGPT for prompt optimization and Gemini for visual generation, resulting in more accurate and relevant illustrations.

Importantly, we chose not to use AI tools for sourcing academic information. This decision was made to ensure the reliability and accuracy of our content, as AI-generated information may sometimes be based on unverified or non-credible sources. Instead, we relied on trusted academic and clinical resources for all factual information.

In addition to AI tools, we used several collaborative and design technologies. Google Docs was used for brainstorming and drafting content. Features such as tab organization allowed us to divide the magazine into sections, enabling each team member to work independently while maintaining overall cohesion. For the final layout and presentation, we used Canva, which allowed us to organize the content into a visually appealing, magazine-style format.

While these tools are not novel, our approach of combining multiple AI tools for different purposes represents an effective use of available technology

8. How is your PULSE experiential assignment innovative and/or novel?

Describe what about the PULSE assignment is innovative/novel. Is there a particular component or content that is innovative/novel? How is it different from other content that already exists?

I believe the case report section of the PULSE experiential assignment can be considered to be “novel”. We formulated the storyline of the scenario completely on our own from scratch. This content is different from other content because it combines information and story in a rather creative way that we’ve not seen in most of the examples given to us. It’s exaggerated, and it’s a bit morbid, but we think it captures learners’ attention well.

We also created a word puzzle using an online word puzzle generator, which we think will help with learner retention, particularly of the important terms. This is a form of media that allows the learners to interact with the magazine in a directly engaging way. We believe this is a novel form of content rarely used in other forms of media because “games” are often not the first thing that comes to mind when people think about “educational magazines”, but we believe direct engagement with content is a great way to enhance learner enthusiasm and promote actual retention of the material.

9. If you used an AI tool, please copy and paste the prompt(s)/question(s) used along with the output(s)/answer(s) from the AI tool.

The response here is to allow others to replicate the team’s work. If the prompts/outputs are lengthy (over 1 page), please attach it as a separate document and note below [Please see attached document].

Please see the attached document.

<https://docs.google.com/document/d/1Of03ct98U3oJfB-wnoMfklusMNpAsSSBdVHsfElfhNA/edit?tab=t.0>

10. If you did not use an AI tool, please attach a copy of the team’s notes to the assignment.

The response here is to allow others to observe the ‘behind the scenes’ team’s work.

N/A

11. How did the team ensure the veracity of the information presented in the PULSE assignment?

The response should highlight how the team has ensured that the information presented in the assignment is evidence-based and not spreading misinformation. You should specifically mention which databases (if any) or textbook materials you used, and how you kept track of the sources/references for each claim. If AI provided you with false information, please describe how the team has fact-checked the AI response and the legitimate (scientific) sources you used. A reference document should be provided in the reference section (15. References) below. Please ensure to include in-text citations in your assignment where applicable.

The team ensured the veracity of the information presented in the PULSE assignment by relying primarily on peer-reviewed scientific journal articles and credible academic sources. All claims were supported by evidence obtained from established databases such as PubMed and Google Scholar, as well as relevant course textbooks. Each team member carefully read and interpreted original research articles rather than relying on secondary summaries, ensuring an accurate understanding of the findings. References for every claim were systematically recorded and incorporated into the assignment using appropriate in-text citations and a comprehensive reference list. The team did not use AI tools to generate or collect information, minimizing the risk of misinformation. However, if AI-generated content were to be considered, the team would verify its accuracy by consulting the original published studies and cross-checking against primary sources. This approach ensured that all information included in the assignment was evidence-based, accurate, and free from misinterpretation or unsupported claims.

12. Write a meaningful team reflection about the PULSE session (max 250 words).

Prompts to help your team write the reflection: Were there any team/individual biases that surfaced when creating content for the assignment? Did the team implement any practices to ensure the content was equitable, diverse, and/or inclusive? How has the PULSE assignment helped with the team's learning? If the team had to estimate, how long did the assignment take? What worked well for your team? What would the team do differently next time? What were the opportunities and challenges with creating the PULSE assignment to help others' learning? Were there any barriers or limitations?

Reflection: The team's experience completing the PULSE assignment was highly collaborative and constructive. Throughout the process, no significant individual or group biases emerged during content development. This was largely due to the team's intentional approach to dividing responsibilities equally and ensuring that each member contributed to both the design and conceptual aspects of the assignment. By maintaining open communication and regularly reviewing each other's work, the team ensured that the final product was balanced, inclusive, and representative of diverse perspectives. The assignment contributed positively to the team's learning by reinforcing key concepts and requiring members to explain material in a way that would be accessible to others. This process deepened understanding and improved the ability to communicate complex

ideas effectively. The team estimates that the assignment took approximately four weeks to complete, including planning, development, revisions, and finalization. A major strength of the team was its ability to collaborate efficiently, with members supporting one another and integrating feedback constructively. This resulted in a cohesive and well-structured final product. If the team were to approach a similar assignment in the future, they would consider allocating more time for early-stage brainstorming and iterative feedback. While the process was generally smooth, minor challenges included coordinating schedules and ensuring consistency across sections. Overall, the experience provided valuable insight into collaborative learning and content creation.

13. Write the contributions of individual team members using unique initials.

Example: All team members contributed to the design of the prompts used in the technology tool, ChatGPT (GPT-3.5). T.K and T.K2 fact checked the information presented by ChatGPT using published literature on PubMed (PMID 29211319, 32477271). Y.Z finalized and formatted the final infographic and compiled the prompts and outputs. P.E was involved in...

A.Y did the research on the APS complication and formatted the content into the magazine. Used ChatGPT and Gemini to generate images corresponding to each complication.

J.N. worked on the pathogenesis section of the magazine, including on researching and writing the pathogenesis of APS-induced thrombosis and Virchow's Triad: The 3 Forces Behind Thrombosis. Used ChatGPT and Gemini to generate images complementary to the text.

V.Z. worked on the case report, Diagnosis/Prognosis/Treatment section, and the general formatting of the magazine. I used ChatGPT and Gemini to generate images relevant to the content.

X.Z. worked on symptoms of APS-related thrombosis. I used Gemini to generate images of the human body to indicate different parts of symptoms.

14. Other comments (Optional)

Any comments the team would like to let the coordinator and/or TAs know.

N/A

15. References

Please provide a numbered reference list with Nature citation style. [Please feel free to use citation management software (i.e., free citation manager, e.g., Zotero and Mendeley)]

1. Mayo Clinic Staff. Antiphospholipid syndrome [Internet]. Mayo Foundation for Medical Education and Research; 2025 [cited 2026 Apr 7]. Available from: <https://www.mayoclinic.org/diseases-conditions/antiphospholipid-syndrome/symptoms-causes/syc-20355831>
2. Espinosa G, Cervera R. Antiphospholipid syndrome: Frequency, main causes and risk factors of mortality [Internet]. Nature Publishing Group; 2010 [cited 2026 Apr 7]. Available from: <https://www.nature.com/articles/nrrheum.2010.47>
3. DE GROOT PG, DERKSEN RHW. Pathophysiology of the antiphospholipid syndrome. *Journal of Thrombosis and Haemostasis*. 2005 Aug;3(8):1854–60. doi:10.1111/j.1538-7836.2005.01359.x
4. Kumar DR, Hanlin E, Glurich I, Mazza JJ, Yale SH. Virchow's contribution to the understanding of thrombosis and cellular biology. *Clinical Medicine & Research*. 2010 Aug 25;8(3–4):168–72. doi:10.3121/cmr.2009.866
5. Lowe GDO. Virchow's Triad revisited: Abnormal flow. *Pathophysiology of Haemostasis and Thrombosis*. 2003;33(5–6):455–7. doi:10.1159/000083845
6. Zhou C, Zhou Y, Ma W, Liu L, Zhang W, Li H, et al. Revisiting virchow's triad: Exploring the cellular and molecular alterations in cerebral venous congestion. *Cell & Bioscience*. 2024 Oct 23;14(1). doi:10.1186/s13578-024-01314-5
7. Chung I, Lip GYH. Virchow's Triad revisited: Blood constituents. *Pathophysiology of Haemostasis and Thrombosis*. 2003;33(5–6):449–54. doi:10.1159/000083844
8. Patriarcheas V, Tsamos G, Vasdeki D, Kotteas E, Kollias A, Nikas D, et al. Antiphospholipid Syndrome: A comprehensive clinical review. *Journal of Clinical Medicine*. 2025 Jan 23;14(3):733. doi:10.3390/jcm14030733
9. Lóczi L, Kappelmayer J, Tarr T, Bagoly Z. Antiphospholipid syndrome and the risk of myocardial infarction: Current evidence and uncertainties. *Kardiologia Polska*. 2020 Jan 24;78(1):6–14. doi:10.33963/kp.15090
10. Ghani Dehkordi A, Koh R, Devaiah P, Alexander AA, Rajamanoharan D, Mohan M, et al. Acute myocardial infarction and Antiphospholipid Syndrome: An updated systematic review and meta-analysis. *Annals of Medicine & Surgery*. 2025 Oct 9;87(12):8678–98. doi:10.1097/ms9.0000000000004003
11. Ahn Y, Hawkins C, Pearson E, Kubler P. Diagnosis and management of antiphospholipid syndrome. *Australian Prescriber*. 2024 Dec 17;47(6):179–85. doi:10.18773/austprescr.2024.055
12. Rout P. Antiphospholipid syndrome [Internet]. U.S. National Library of Medicine; 2024 [cited 2026 Apr 7]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430980/>
13. Arreola-Diaz R, Majluf-Cruz A, Sanchez-Torres L, Hernandez-Juarez J. The pathophysiology of the antiphospholipid syndrome: A perspective from the blood

coagulation system. *Clinical and Applied Thrombosis/Hemostasis*. 2022 Jan;28.
doi:10.1177/10760296221088576

14. Prevention of perioperative deep vein thrombosis (DVT) [Internet]. 2025 [cited 2026 Apr 7]. Available from:
<https://www.anesthesiaservicesla.com/prevention-of-deep-vein-thrombosis/>
15. Obeagu EI. Stress-induced hemostasis: Mechanisms and implications for health. *Annals of Medicine & Surgery*. 2025 May 21;87(6):3300–9.
doi:10.1097/ms9.0000000000003012
16. Thrombosis Canada. Antiphospholipid antibody syndrome objective [Internet]. 2013 [cited 2026 Apr 7]. Available from: <https://thrombosiscanada.ca/guides/pdfs/APS.pdf>

16. Annotated Bibliography

An annotated bibliography is a list of sources (books, articles, websites, etc.) that you used for your project. Each entry has two parts:

- 1. Citation – written in the required citation style (same formatting and order as the Nature citation style in your list of references).*
- 2. Annotation – a short paragraph that summarizes, evaluates, and explains how the source is useful for your assignment.*

Why do this?

- Helps you keep track of your research.*
- Shows your instructor you read and understood your sources.*
- Develops critical thinking by requiring you to evaluate the quality and relevance of each source.*

Write the annotation (about 150–200 words each)

- Summary: Briefly describe the main argument or purpose of the source.*
- Evaluation: Comment on the credibility, strengths, or weaknesses of the source.*
- Relevance: Explain how you will use this source in your assignment.*

1. Mayo Clinic Staff. Antiphospholipid syndrome [Internet]. Mayo Foundation for Medical Education and Research; 2025 [cited 2026 Apr 7]. Available from:

<https://www.mayoclinic.org/diseases-conditions/antiphospholipid-syndrome/symptoms-causes/syc-20355831>

Overall, this article explains the pathophysiology of obstetric Antiphospholipid Syndrome, emphasizing that pregnancy complications are driven by both immune-mediated and thrombotic mechanisms.

The main usage of the source is to provide a general overview of symptoms, causes, and diagnosis of APS. The information is used to formulate the creative “case report” at the beginning of the magazine.

As well, the information is used later in “complications” to show that antiphospholipid antibodies (aPL) disrupt normal placental development by targeting trophoblast cells, activating endothelial and immune pathways, and triggering complement-mediated inflammation. These processes impair trophoblast invasion and spiral artery remodeling, resulting in placental dysfunction and reduced blood flow, which ultimately leads to pregnancy loss and complications.

In terms of evaluating the credibility, this source is highly credible because it is a peer-reviewed article indexed in PubMed Central and synthesizes current research on APS mechanisms. A major strength is its detailed explanation of cellular-level processes, including trophoblast damage, complement activation, and inflammatory pathways, which provides deeper insight beyond general clinical descriptions. However, its complexity may make it less accessible for general audiences.

2. Espinosa G, Cervera R. Antiphospholipid syndrome: Frequency, main causes and risk factors of mortality [Internet]. Nature Publishing Group; 2010 [cited 2026 Apr 7]. Available from: <https://www.nature.com/articles/nrrheum.2010.47>

This review article examines mortality in antiphospholipid syndrome (APS), focusing on its frequency, causes, and risk factors. The authors argue that thrombotic events are the leading cause of death in APS, with arterial complications such as stroke and myocardial infarction being particularly significant. The paper highlights that, although overall mortality is relatively low (about 5.3% over five years), catastrophic APS—a rare but severe form—has a much higher mortality rate. It also emphasizes that recurrent thrombosis remains a major clinical challenge despite anticoagulation therapy, and that combination treatments (e.g., anticoagulants, corticosteroids, plasma exchange, etc.) can significantly reduce mortality in severe cases.

The source is highly credible, as it is published in *Nature Reviews Rheumatology* and draws upon multiple large cohort studies and systematic reviews. However, it is an observational study and its generalizability to other populations, and the ability to make definitive conclusions may be limited.

The information in this paper is primarily used to generate informative quotes for the “case report”, as well as help to formulate the general storyline of the case report, and determine what phenomenon doctors are likely to find during autopsy.

3. DE GROOT PG, DERKSEN RHW. Pathophysiology of the antiphospholipid syndrome. *Journal of Thrombosis and Haemostasis*. 2005 Aug;3(8):1854–60. doi:10.1111/j.1538-7836.2005.01359.x

This paper summarized the underlying mechanisms of Antiphospholipid Syndrome (APS), highlighting the contributions of the antiphospholipid antibodies targeting B2-glycoprotein I (B2GPI) to thrombosis and other clinical symptoms. The authors argue that APS is misnamed since the major antibodies are directed against plasma proteins rather than phospholipids themselves. The paper also mentioned how antibody and B2GPI complexes interact with endothelial cells, platelets, and monocytes, leading to cell activation, increased tissue factor expression, and a prothrombotic state. It also introduces the “two-hit” hypothesis, suggesting that antibodies alone are insufficient to cause thrombosis without an additional trigger. This source is highly credible as it is published in a peer-reviewed hematology journal and written by experts in the field. It explained both serological testing and cellular mechanisms in detail, although some aspects remain theoretical due to incomplete understanding of APS pathophysiology. This article is useful for explaining how APS leads to clot formation at the cellular and molecular levels, supporting my discussion of endothelial activation, platelet involvement, and the coagulation cascade.

4. Kumar DR, Hanlin E, Glurich I, Mazza JJ, Yale SH. Virchow’s contribution to the understanding of thrombosis and cellular biology. *Clinical Medicine & Research*. 2010 Aug 25;8(3–4):168–72. doi:10.3121/cmr.2009.866

This article is an overview of Rudolf Virchow’s contributions to both cellular biology and the understanding of thrombosis. It described how Virchow helped establish the concept of cellular pathology, proposing that disease originates at the level of individual cells. The paper also discussed his work on thrombosis and the historical development of what is now called Virchow’s Triad, which is an outline of the three major factors, endothelial injury, abnormal blood flow (stasis), and hypercoagulability, that contribute to clot formation. In addition, the article placed his work in historical context, highlighting earlier contributors and clarifying that the triad was formalized after Virchow’s time. This source is credible because it is a peer-reviewed journal article indexed in PubMed Central. Its strengths include detailed historical context and clear explanations of physiological mechanisms. However, it is somewhat dense and may require careful reading to extract key points. This article supports my explanation of

Virchow's triad and provides authoritative background on the mechanisms of thrombosis. I used it to justify the three-factor model of clot formation and to explain its continued importance in modern medicine.

5. Lowe GDO. Virchow's Triad revisited: Abnormal flow. *Pathophysiology of Haemostasis and Thrombosis*. 2003;33(5–6):455–7. doi:10.1159/000083845

This article reviewed the role of abnormal blood flow in thrombosis. It explained how normal laminar flow helps maintain vascular health by regulating endothelial function and keeping platelets separated from the vessel wall. Under these conditions, red blood cells remain centrally located, while platelets are less likely to interact with the endothelium, reducing clot formation. The article also described how disturbed flow, such as turbulence or stasis, alters shear stress, promotes platelet adhesion, and allows clotting factors to accumulate. The author also highlighted how low-flow or recirculating regions, like in veins or around vessel bifurcations, increase the risk of thrombosis by impairing the removal of thrombin and fibrin. This source is credible as it is published in a peer-reviewed journal. It clearly linked hemodynamics to thrombosis, although it is more of a review than primary research. This article supports my explanation of how abnormal blood flow contributes to clot formation. I used it to explain the differences between laminar and turbulent flow, and how stasis promotes accumulation of clotting factors and increases thrombosis risk.

6. Zhou C, Zhou Y, Ma W, Liu L, Zhang W, Li H, et al. Revisiting virchow's triad: Exploring the cellular and molecular alterations in cerebral venous congestion. *Cell & Bioscience*. 2024 Oct 23;14(1). doi:10.1186/s13578-024-01314-5

This article described the cellular and molecular mechanisms underlying thrombosis in the context of cerebral venous congestion (CVC). The study demonstrated that impaired blood flow (stasis) leads to endothelial cell damage and a shift from an anticoagulant to a procoagulant state. The authors showed that endothelial injury increases the expression of key coagulation factors such as von Willebrand factor (vWF) and factor VIII, while also enhancing platelet activation and coagulation pathways. The findings highlighted how disruption of normal endothelial function, such as reduced nitric oxide and anticoagulant signaling, promotes thrombosis at a molecular level. This source is credible as it is a 2024 peer-reviewed journal article presenting original experimental data, including transcriptomic analysis and laboratory assays. Its strengths include up-to-date molecular insights and strong experimental design, though its technical detail may be complex for general readers. This article supports my explanation of how endothelial damage contributes to thrombosis. I used it to explain how normal anticoagulant functions of the endothelium are lost during injury, leading to platelet activation and coagulation cascade progression.

7. Chung I, Lip GYH. Virchow's Triad revisited: Blood constituents. *Pathophysiology of Haemostasis and Thrombosis*. 2003;33(5–6):449–54. doi:10.1159/000083844

This article focused on the “blood constituents” component of Virchow's Triad, explaining how abnormalities in the composition of blood contribute to thrombosis. It highlighted the roles of platelets, coagulation factors (such as fibrinogen and tissue factor), and the balance between coagulation and fibrinolysis in maintaining normal hemostasis. The authors described how elevated levels of procoagulant factors, increased platelet activation, and impaired fibrinolysis can shift the body toward a hypercoagulable state. The article also emphasized that increasing abnormalities in blood constituents correlate with a higher risk of clot formation and disease progression. This source is credible as it is a peer-reviewed review article. It's a detailed explanation of molecular and cellular contributors to hypercoagulability. This article supports my explanation of hypercoagulability as a key factor in thrombosis. I used it to explain how intrinsic changes in blood, whether genetic or acquired, lower the threshold for clot formation and increase thrombotic risk.

8. Ahn, Y., Hawkins, C., Pearson, E. & Kubler, P. Diagnosis and management of antiphospholipid syndrome. *Australian Prescriber* **47**, 179–185 (2024).
<https://doi.org/10.18773/austprescr.2024.055>

This article provides a comprehensive overview of the diagnosis and management of antiphospholipid syndrome (APS), with particular attention to its clinical manifestations, including those related to pregnancy. The authors explain that APS is an autoimmune disorder characterized by abnormal blood clotting and pregnancy complications. In pregnancy, common symptoms and outcomes include recurrent miscarriages, especially in the first trimester, as well as later complications such as preeclampsia, fetal growth restriction, and stillbirth. The paper highlights that these symptoms are often linked to placental thrombosis, which disrupts normal blood flow to the fetus. The source is highly credible, as it is published in *Australian Prescriber*, a peer-reviewed medical journal, and written by healthcare professionals with expertise in the field. One strength is its clear explanation of both clinical symptoms and underlying mechanisms, making it accessible yet informative. However, it is more focused on clinical guidance than detailed case studies. This source is relevant to my assignment because it provides reliable information on the symptoms of thrombosis caused by APS during pregnancy. I will use it to explain how APS affects maternal and pre-eclampsia and to support discussion of pregnancy-related complications and listed out some symptoms.

9. Lóczi L, Kappelmayer J, Tarr T, Bagoly Z. Antiphospholipid syndrome and the risk of myocardial infarction: Current evidence and uncertainties. *Kardiologia Polska*. 2020 Jan 24;78(1):6–14. doi:10.33963/kp.15090

This article examines the relationship between antiphospholipid syndrome (APS) and the increased risk of arterial and venous thrombotic events, particularly myocardial infarction (heart attack) and pulmonary embolism. The authors explain that APS promotes a hypercoagulable state, which can lead to clot formation in coronary arteries, resulting in myocardial infarction, even in younger patients without typical cardiovascular risk factors. Symptoms of heart attack in APS patients may include chest pain, shortness of breath, and discomfort in the upper body. The article also discusses pulmonary embolism as a serious complication caused by clots traveling to the lungs, leading to symptoms such as sudden shortness of breath, chest pain when breathing, and rapid heart rate. The source is credible because it is published in a peer-reviewed cardiology journal and written by experts in hematology and cardiovascular research. A key strength is its focus on both established evidence and remaining uncertainties, providing a balanced perspective. However, some sections are technical and may require background knowledge to fully understand. This source is relevant to my assignment as it provides detailed information on the symptoms and risks of heart attack and pulmonary embolism caused by APS. I will use it to support my discussion of serious thrombotic complications associated with the condition.

10. Ghani Dehkordi A, Koh R, Devaiah P, Alexander AA, Rajamanoharan D, Mohan M, et al. Acute myocardial infarction and Antiphospholipid Syndrome: An updated systematic review and meta-analysis. *Annals of Medicine & Surgery*. 2025 Oct 9;87(12):8678–98. doi:10.1097/ms9.0000000000004003

This systematic review and meta-analysis primarily investigates the association between antiphospholipid syndrome (APS) and acute myocardial infarction, but it also discusses the broader thrombotic risks linked to APS, including deep vein thrombosis (DVT). The authors explain that APS creates a hypercoagulable state, increasing the likelihood of clot formation in both arteries and veins. In the context of DVT, the article highlights common symptoms such as unilateral leg swelling, pain, warmth, and redness, which result from clot formation in deep veins, typically in the lower limbs. It also emphasizes that untreated DVT can lead to serious complications like pulmonary embolism. The source is highly credible as it is a recent systematic review and meta-analysis, meaning it synthesizes data from multiple studies to provide strong evidence. Its strength lies in its comprehensive and up-to-date analysis of APS-related thrombotic events. However, its primary focus on myocardial infarction means that discussion of DVT is less detailed. This source is relevant to my assignment because it supports the connection between APS and venous thrombosis, particularly DVT. I will use it to explain the symptoms and risks of DVT as part of the broader complications caused by APS.

11. Patriarcheas V, Tsamos G, Vasdeki D, Kotteas E, Kollias A, Nikas D, et al. Antiphospholipid Syndrome: A comprehensive clinical review. *Journal of Clinical Medicine*. 2025 Jan 23;14(3):733. doi:10.3390/jcm14030733

This comprehensive clinical review provides an in-depth overview of antiphospholipid syndrome (APS), including its pathophysiology, diagnosis, and wide range of clinical manifestations. The article highlights stroke as one of the most serious arterial complications associated with APS. It explains that APS increases the risk of blood clots forming in cerebral arteries, which can lead to ischemic stroke, particularly in younger individuals without traditional risk factors. Common symptoms of stroke discussed in the review include sudden weakness or numbness on one side of the body, difficulty speaking, vision problems, dizziness, and loss of coordination. The paper also emphasizes the recurrent nature of thrombotic events in APS patients if not properly managed. The source is highly credible, as it is published in a peer-reviewed medical journal and written by multiple experts in the field. A major strength is its broad and detailed coverage of APS, making it useful for understanding both mechanisms and clinical outcomes. However, because it covers many aspects of the condition, the discussion of stroke is not as deeply focused as in specialized studies. This source is relevant to my assignment because it provides clear and reliable information on stroke symptoms caused by APS. I will use it to explain how APS can lead to neurological complications and to support my discussion of arterial thrombosis.

12. Rout P. Antiphospholipid syndrome [Internet]. U.S. National Library of Medicine; 2024 [cited 2026 Apr 7]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430980/>

This source from the NCBI Bookshelf provides a comprehensive clinical overview of antiphospholipid syndrome (APS), focusing on its diagnosis, manifestations, and management. It explains that APS is defined by the presence of antiphospholipid antibodies in combination with clinical features such as vascular thrombosis or pregnancy morbidity. The source clearly outlines diagnostic criteria, including the requirement for persistent antibody positivity on two occasions at least 12 weeks apart. It also highlights major complications, including recurrent fetal loss, stroke, pulmonary embolism, and catastrophic antiphospholipid syndrome (CAPS), emphasizing the systemic nature of the disease.

This source is highly credible as it is a peer-reviewed medical reference written by healthcare professionals and designed for clinical education. Its strengths include clear organization and strong alignment with established clinical guidelines, making complex information accessible. However, it mainly provides a broad overview and lacks detailed mechanistic explanations.

This source is highly relevant to my magazine, as it directly supports key sections such as diagnosis criteria, pregnancy morbidity, and thrombotic complications. It was particularly useful

in explaining recurrent fetal loss, multiorgan thrombosis, and the requirement for persistent antibody testing, which are central concepts presented in my work.

13. Arreola-Diaz R, Majluf-Cruz A, Sanchez-Torres L, Hernandez-Juarez J. The pathophysiology of the antiphospholipid syndrome: A perspective from the blood coagulation system. *Clinical and Applied Thrombosis/Hemostasis*. 2022 Jan;28. doi:10.1177/10760296221088576

This article explains the pathophysiology of obstetric Antiphospholipid Syndrome, emphasizing that pregnancy complications are driven by both immune-mediated and thrombotic mechanisms. The main purpose of the source is to show that antiphospholipid antibodies (aPL) disrupt normal placental development by targeting trophoblast cells, activating endothelial and immune pathways, and triggering complement-mediated inflammation. These processes impair trophoblast invasion and spiral artery remodeling, resulting in placental dysfunction and reduced blood flow, which ultimately leads to pregnancy loss and complications.

This source is highly credible because it is a peer-reviewed article indexed in PubMed Central and synthesizes current research on APS mechanisms. A major strength is its detailed explanation of cellular-level processes, including trophoblast damage, complement activation, and inflammatory pathways, which provides deeper insight beyond general clinical descriptions. However, its complexity may make it less accessible for general audiences.

14. Prevention of perioperative deep vein thrombosis (DVT) [Internet]. 2025 [cited 2026 Apr 7]. Available from: <https://www.anesthesiaservicesla.com/prevention-of-deep-vein-thrombosis/>

This source explains the prevention of deep vein thrombosis (DVT) in the perioperative setting, emphasizing that surgery significantly increases thrombotic risk through mechanisms described by Virchow's triad: venous stasis, endothelial injury, and hypercoagulability. It highlights that anesthesia and postoperative immobility reduce blood flow, while surgical tissue damage and physiological stress promote clot formation. The purpose of the article is to outline both the mechanisms and prevention strategies of perioperative thrombosis, including anticoagulation, mechanical prophylaxis, and early mobilization.

This source is credible as it is written for clinical and educational purposes within an anesthesia-focused practice. Its main strength is its clear explanation of perioperative thrombosis mechanisms in a practical context, making it highly applicable to surgical settings. However, it is not a peer-reviewed academic article and lacks detailed citations or primary research evidence.

15. Obeagu EI. Stress-induced hemostasis: Mechanisms and implications for health. *Annals of Medicine & Surgery*. 2025 May 21;87(6):3300–9. doi:10.1097/ms9.0000000000003012

This article explores how physiological stress affects the hemostatic system, emphasizing that both psychological and physical stress promote a hypercoagulable state through activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis. The main purpose is to explain how stress hormones such as cortisol, adrenaline, and noradrenaline increase coagulation factor levels, enhance platelet activation, and reduce fibrinolysis, ultimately increasing the risk of thrombosis. It also highlights that physical stressors, including surgery and trauma, trigger coagulation pathways and inflammatory responses, further contributing to clot formation.

This source is highly credible as it is a peer-reviewed review article published in a scientific journal and indexed in PubMed Central. A key strength is its detailed mechanistic explanation of how stress influences coagulation at hormonal, cellular, and systemic levels. However, its complexity may make it less accessible for general audiences.

16. Thrombosis Canada. Antiphospholipid antibody syndrome objective [Internet]. 2013 [cited 2026 Apr 7]. Available from: <https://thrombosiscanada.ca/guides/pdfs/APS.pdf>

This paper is a guideline that provides a general overview of the diagnosis and management of Antiphospholipid Syndrome (APS) for Canadian healthcare givers. The guide outlines the criteria for a definitive diagnosis of the condition: clinical events (venous/arterial thrombosis or pregnancy complications) and persistent laboratory findings (Lupus Anticoagulant, anticardiolipin, or anti-b2 glycoprotein I antibodies). It emphasizes the distinction between primary APS and secondary APS—the latter occurring alongside conditions like systemic lupus erythematosus. Furthermore, the document offers clear protocols for anticoagulant therapy, specifically recommending a combination of Low-Molecular-Weight Heparin (LMWH) and Aspirin to pregnant women instead of Warfarin.

The source is very credible, as it is published by Thrombosis Canada, a very credible and nationally recognized organization/authority on thrombosis. The strength of this paper is that it is applicable to practical, clinical settings. It summarizes all of the current diagnosis and treatment methods for practitioners. However, its weakness is that it is a guideline made back in 2013, and more than a decade has passed since it was made. It may be outdated.

This paper is mainly used in the “diagnosis, prognosis, treatment, prevention” section. It is used to outline the diagnosis criteria and potential method of treatment for different groups of patients. Specifically, for pregnant individuals, Warfarin shouldn’t be used and an alternative protocol should be administered