

PULSE EXPERIENTIAL TEAM ASSIGNMENT

Team #: 10

1. Title of your PULSE experiential assignment.

Provide a creative and informative title.

Inside SLE: A Journey Through Systemic Autoimmunity

2. Please summarize your PULSE experiential assignment (max 300 words).

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. [Team 23 is an example of an informative lay summary.]

Our PULSE assignment focuses on Systemic Lupus Erythematosus (SLE), commonly known as lupus. Lupus is an autoimmune disease, which means the immune system - normally responsible for protecting the body - starts attacking healthy tissues instead. Because lupus can affect many organs, including the skin, joints, blood, and kidneys, it is often confusing for new learners to understand.

To make this complex topic easier to learn, our team created a visual infographic that presents the key features of lupus in a clear and simplified format. The infographic explains what lupus is, who is most affected, common signs and symptoms, and how doctors test for it. It also highlights possible complications and why early recognition matters. Our goal was to give future students an approachable, "big picture" overview before they study the disease in more detail.

We chose an infographic because visual tools help learners quickly understand relationships between symptoms, lab tests, and underlying immune system changes. Many undergraduate students benefit from information that is organized, easy to scan, and broken down into manageable pieces. This format also makes the topic more accessible to people outside of medicine, including high-school level learners or anyone curious about autoimmune diseases.

By creating a student-designed, evidence-based visual guide, our project aims to support clearer understanding of lupus and improve learning for future students studying pathology.

3. Provide up to 6 keywords relevant to your PULSE experiential assignment.

3-6 keywords are ideal.

Autoimmunity, Immunopathology, Inflammation, Systemic Disease

4. Identify the course topic with which your PULSE assignment most aligns.

Refer to the various topics outlined under 'Course content and Schedule' in the syllabus (e.g. Inflammation).

Immunity and Immune Disorders

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>

1. Understand the Pathophysiology of Lupus

After completing this assignment, learners will be able to explain the immune system dysfunction in systemic lupus erythematosus, including the role of autoantibodies, immune complex formation, complement activation, and organ-specific inflammation.

2. Recognize Clinical Manifestations and Diagnostic Criteria

After completing this assignment, learners will be able to identify common signs, symptoms, and laboratory findings of lupus, and link them to the affected organ systems, enabling them to differentiate lupus from other diseases with similar presentations.

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

Our team chose Systemic Lupus Erythematosus (SLE) because it is a complex, multi-system autoimmune disease that is often difficult for students to understand. Lupus has wide-ranging effects on organs such as the skin, joints, kidneys, and blood, and its symptoms can vary greatly between patients. By focusing on lupus, we aimed to create a resource that simplifies these complicated concepts, making them accessible to students learning pathology for the first time.

We selected an infographic combined with an interactive case study and quiz as our medium because visual and interactive tools are highly effective for learning. The infographic allows learners to see the relationships between symptoms, lab tests, immune mechanisms, and organ-specific effects all at once, which improves retention and builds a “big picture” understanding. The interactive case study follows a person, Maya, through her lupus journey, allowing learners to apply theoretical knowledge to a realistic clinical scenario. The quiz at the end reinforces key concepts and helps learners test their understanding in an engaging way.

By combining an informative topic with visual, interactive, and applied learning elements, our project helps students grasp difficult scientific concepts, connect theory to clinical practice, and retain knowledge more effectively. This approach promotes engagement, encourages critical thinking, and provides a valuable learning resource for undergraduate students and anyone interested in understanding autoimmune diseases.

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?)

Yes, our team used artificial intelligence (AI) tools to support the development of our PULSE assignment. Specifically, we used ChatGPT (GPT-5) to help organize and summarize complex medical information on systemic lupus erythematosus (SLE), including its pathophysiology, clinical manifestations, and organ-specific effects. The AI tool was used to translate technical, research-level content into clear, accessible explanations suitable for undergraduate students and a lay audience. It also helped us generate ideas for the infographic layout, interactive case study, and quiz questions, ensuring that our content was structured logically and engagingly.

In addition to AI, we used visual design tools such as Vecteezy for icons and images, and standard graphic design software (e.g., Canva) to assemble the infographic. These tools allowed us to create a visually appealing and easy-to-navigate final product.

The use of AI in this assignment is novel in two ways. Firstly, it helped synthesize multiple research articles into concise, accurate content, saving time while maintaining evidence-based information. It also guided the creation of interactive, case-based learning elements, which are not commonly integrated into a single infographic format for undergraduate pathology education.

We chose ChatGPT because it is particularly effective for converting complex scientific language into accessible explanations, which aligned with our goal of making lupus understandable for learners without prior medical knowledge. Alternative tools, such as traditional word processors or static textbooks, were considered but would not have offered the same level of interactivity, content synthesis, or creative support.

To ensure accuracy, all AI-generated content was carefully fact-checked against peer-reviewed articles, textbooks, and clinical guidelines before inclusion in our infographic, case study, and quiz. This approach allowed us to leverage AI efficiently and responsibly, combining technology with human oversight to produce a high-quality learning resource.

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?

Our PULSE experiential assignment is innovative and novel in several ways. First, the project combines a visually engaging infographic with an interactive case study and quiz, creating a multi-layered learning experience. Unlike traditional textbook content, which presents information in a static, linear format, our assignment allows learners to actively engage with the material, make clinical connections, and test their understanding in real time.

Second, the assignment integrates complex concepts of systemic lupus erythematosus (SLE) into a clear, learner-friendly format, translating dense medical knowledge into accessible explanations suitable for undergraduate students or pre-med learners. The inclusion of Maya's case study, with step-by-step pathophysiology and organ-specific effects, helps learners see how autoimmune mechanisms manifest in a real patient, making the content more memorable and applicable.

Third, the use of AI (ChatGPT) to synthesize and summarize research into concise, accurate content, combined with human review and verification, is a novel approach for producing educational materials. This allowed us to efficiently generate evidence-based content while maintaining accuracy and accessibility.

Finally, the assignment's interactive quiz reinforces learning and encourages active recall, a proven technique to improve retention, which is not commonly included in standard pathology resources.

Overall, the combination of visual design, interactivity, AI-assisted synthesis, and real-world case application makes this PULSE assignment distinct from existing resources, offering a

creative and engaging way to learn about lupus that bridges the gap between textbook knowledge and clinical understanding.

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].

- Write a clinical case study of a female patient in her 20s to 30s who presents with symptoms typical of systemic lupus erythematosus, including multisystem involvement and pertinent laboratory results.
- Explain the pathophysiology of systemic lupus erythematosus in detail, including complement activation, immune complex formation, autoantibody production, and immune tolerance failure.
- Match common lupus symptoms to the organ systems that are affected, then briefly describe the underlying mechanism for each.
- Explain how the diagnosis of SLE is supported by lab results (ANA, anti-dsDNA, anti-Smith, complement levels).
- Create multiple-choice questions and answers to assess knowledge of lupus pathophysiology and diagnosis.
- Provide a clear and succinct summary of the main diagnostic criteria for systemic lupus erythematosus based on the 2019 EULAR/ACR guidelines.

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.

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 accuracy and reliability of the information presented in our PULSE assignment by using a combination of peer-reviewed scientific literature, authoritative textbooks, and reputable online medical resources. All claims were fact-checked and verified before inclusion in the infographic, case study, and quiz.

Databases and Resources Used:

- PubMed / NCBI – for primary research articles on systemic lupus erythematosus (SLE) and related autoimmune mechanisms.
- ScienceDirect – for review articles and epidemiological studies on lupus.
- StatPearls – for clinical summaries and treatment guidelines.
- Nature Reviews Disease Primers – for up-to-date pathophysiology and clinical management information.
- EULAR/ACR Guidelines – for diagnostic criteria and management recommendations.

Use of AI Tools:

When using ChatGPT (GPT-5 mini), the team treated outputs as draft content only, not definitive medical facts. Each AI-generated explanation or summary was cross-referenced with the above sources. If the AI provided incomplete or potentially inaccurate information, the team corrected it based on evidence from peer-reviewed articles and verified textbooks.

Tracking References:

- The team maintained a shared reference document where each fact, statistic, or claim was linked to its source.
- In-text citations were included throughout the infographic and case study content to maintain transparency.
- Special attention was given to ensuring that lab values, pathophysiology steps, and treatment recommendations matched current clinical guidelines.

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:

Working on the PULSE assignment was a genuinely meaningful experience for our team. Early on, we realized how easily biases could shape the way we presented information - especially when discussing how lupus affects different populations. Because of this, we made a conscious effort to use inclusive language and to highlight the diverse groups impacted by the disease, rather than defaulting to a narrow clinical perspective.

One of the biggest strengths of the project was how collaborative it felt. We divided the work based on each person's strengths but stayed connected through frequent check-ins, which allowed us to build on each other's ideas instead of working in isolation. The interactive case study and quiz helped us transform complex pathophysiology into something practical and engaging, deepening our own understanding in the process.

Using AI tools was helpful for brainstorming and structuring explanations, but it also reminded us of the importance of fact-checking and relying on peer-reviewed sources. This balance between efficiency and accuracy became an important learning point for the whole team.

The assignment took us roughly 90-95 hours from start to finish. One challenge was condensing complicated scientific content into clear, accessible language without oversimplifying it. Another was designing the interactive elements, which is something we would begin earlier next time to avoid feeling rushed at the end. We also realized that dividing our sections more strategically at the beginning could have reduced some overlap in our content.

Overall, this project strengthened our knowledge of lupus, improved our communication skills, and reminded us of the value of designing educational materials that are accurate, inclusive, and approachable for all learners.

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...

B.E. contributed to topic selection and clarified the required assignment structure. He performed research on autoimmunity, apoptosis, and clinical diagnostic criteria for lupus. B.E. fact-checked P.S.'s overlapping section, added citations where needed, and assisted in shaping parts of page two. He verified the accuracy of autoimmune mechanisms on the infographic, refined wording for clarity, created the reference sheet, and double-checked that all references were credible and peer-reviewed.

S.P. developed the patient case used in the infographic to help readers apply lupus concepts in a real-world context. He created a step-wise diagnostic walkthrough based on symptoms, laboratory findings, and clinical history. S.P. also wrote the quiz questions for the final knowledge check, organized several content tabs, contributed to the creative layout and design elements, and supported group brainstorming throughout the project. He additionally helped ensure that the clinical sections were clear, engaging, and aligned with the learning objectives.

E.R. defined the foundational content: what lupus is, who is affected (including geoepidemiology), causes of lupus, and general symptoms. She researched organ-specific manifestations, synthesized treatment and lifestyle considerations, and ensured her sources were properly cited in chronological order. E.R. also produced many of the visuals and graphics, organized the slides creatively, and helped maintain thematic consistency across the infographic.

P.S. covered treatment and management, including key medications used in lupus care. He explained the molecular mechanisms underlying lupus and outlined relevant hypersensitivity

types to meet the learning objectives. P.S. also contributed to topic selection, helped determine the format and medium of the project, and collaborated across sections to maintain scientific accuracy and cohesion and helped in reviewing AI-generated content to ensure accuracy and reliability.

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. COJOCARU, M., COJOCARU, I. M., Isabela SILOSI & VRABIE, C. D. Manifestations of Systemic Lupus Erythematosus. *Maedica* **6**, 330 (2011).
2. Borchers, A. T., Naguwa, S. M., Shoenfeld, Y. & Gershwin, M. E. The Geoepidemiology of Systemic Lupus Erythematosus. *Autoimmunity Reviews* **9**, A277–A287 (2010).
3. Metry, A. M. et al. Systemic Lupus Erythematosus: Symptoms and Signs at Initial Presentations. *Anti-Inflammatory & Anti-Allergy Agents in Medicinal Chemistry* **18**, 142–150 (2019).
4. Kaul, A. et al. Systemic Lupus Erythematosus. *Nature Reviews Disease Primers* **2**, (2016).
5. Rahman, A. & Isenberg, D. A. Systemic Lupus Erythematosus. *New England Journal of Medicine* **358**, 929–939 (2008).
6. Vaillant, A. A. J., Goyal, A., Bansal, P. & Varacallo, M. Systemic Lupus Erythematosus. *PubMed* <https://www.ncbi.nlm.nih.gov/books/NBK535405/> (2023).
7. National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division; Board on Population Health and Public Health Practice & Committee for the Assessment of NIH Research on Autoimmune Diseases. 2, Background on Autoimmune Diseases. in *Enhancing NIH Research on Autoimmune Disease* (National Academies Press (US), 2022).
8. Koppala, S. N. & Guruprasad, V. Overview of Autoimmunity: Classification, Disease Mechanisms, and Etiology. *TURKISH JOURNAL of IMMUNOLOGY* **11**, 93–105 (2023).
9. Tsokos, G. C. Systemic Lupus Erythematosus. *New England Journal of Medicine* **365**, 2110–2121 (2011).
10. Shutterstock. *Human Vector Images*. Vecteezy.
11. Aringer, M. et al. 2019 European League against Rheumatism/American College of Rheumatology Classification Criteria for Systemic Lupus Erythematosus. *Arthritis & Rheumatology* **71**, 1400–1412 (2019).
12. Kuhn, A. et al. The Diagnosis and Treatment of Systemic Lupus Erythematosus. *Deutsches Aerzteblatt Online* **112**, (2015).
13. østensen, M. & Villiger, P. M. Nonsteroidal Anti-inflammatory Drugs in Systemic Lupus Erythematosus. *Lupus* **9**, 566–572 (2000).
14. Rolle, N. A. Ten Tips for Thriving with Lupus. *Rheumatology.org* <https://rheumatology.org/patient-blog/ten-tips-for-thriving-with-lupus> (2025).
15. Walport, M. J. Complement. *New England Journal of Medicine* **344**, 1058–1066 (2001).
16. Walport, M. J. Complement. *New England Journal of Medicine* **344**, 1140–1144 (2001).
17. Fanouriakis, A. et al. 2019 Update of the EULAR Recommendations for the Management of Systemic Lupus Erythematosus. *Annals of the Rheumatic Diseases* **78**, 736–745 (2019).

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. COJOCARU, M., COJOCARU, I. M., Isabela SILOSI & VRABIE, C. D. Manifestations of Systemic Lupus Erythematosus. *Maedica* **6**, 330 (2011).

This article provides a comprehensive overview of systemic lupus erythematosus (SLE), including its epidemiology, etiological factors, and organ-specific manifestations. It highlights who is most affected, such as women of childbearing age, and explores potential genetic, hormonal, and environmental contributors to disease development. The authors also describe how lupus impacts multiple organ systems, including the kidneys, skin, joints, and cardiovascular system, emphasizing the variability of symptoms among patients.

The source is credible as it is peer-reviewed and authored by experienced clinicians in autoimmune disorders. Its strengths lie in providing a concise, clinically relevant overview suitable for both academic and educational purposes, though it is somewhat limited in mechanistic detail at the molecular level.

This source was invaluable for our project in framing foundational content on what lupus is, who is affected, what causes it, and the organ-specific effects. It directly informed sections of our presentation, allowing us to provide accurate, evidence-based explanations to students and ensure that the information on lupus prevalence and multi-organ involvement was both clear and comprehensive.

2. Borchers, A. T., Naguwa, S. M., Shoenfeld, Y. & Gershwin, M. E. The Geoepidemiology of Systemic Lupus Erythematosus. *Autoimmunity Reviews* **9**, A277–A287 (2010).

This review focuses on the epidemiology and demographic patterns of lupus, examining population differences, risk factors, and prevalence trends. It highlights the higher incidence of SLE in women, particularly those of African, Asian, and Hispanic descent, and explores the influence of genetics, hormones, and environmental triggers.

The article is highly credible, appearing in a reputable, peer-reviewed journal and authored by recognized experts in autoimmunity. Its strength is in its detailed demographic analysis, although it is less focused on treatment strategies or molecular mechanisms, limiting its use for pathophysiology-focused discussions.

For our project, this source helped shape the sections on who is affected by lupus, providing evidence for the patterns of incidence among different populations. It allowed us to accurately present diverse patient demographics, contributing to a more inclusive and representative discussion in the PULSE assignment.

3. Metry, A. M. et al. Systemic Lupus Erythematosus: Symptoms and Signs at Initial Presentations. *Anti-Inflammatory & Anti-Allergy Agents in Medicinal Chemistry* **18**, 142–150 (2019).

This study presents a large hospital-based analysis of lupus patients, summarizing common symptoms, clinical manifestations, and the frequency of various disease features across a cohort of approximately 1,000 patients. It also discusses therapeutic approaches and highlights typical challenges in managing complex cases.

The source is credible due to its peer-reviewed publication in a medical chemistry journal and the use of a large patient cohort, which strengthens its statistical reliability. One limitation is that the focus on hospital data may not fully capture community-based cases.

We used this source to illustrate general symptoms of lupus and support case-study design elements in our interactive assignment. Its comprehensive dataset allowed us to integrate realistic patient experiences and symptom patterns into the case study with Maya, improving the educational value and authenticity of our activity.

4. Kaul, A. et al. Systemic Lupus Erythematosus. *Nature Reviews Disease Primers* **2**, (2016).

This review provides a detailed, authoritative primer on lupus, including immunological mechanisms, clinical features, and diagnostic considerations. It discusses autoantibodies, organ involvement, and current therapeutic strategies, offering a global perspective on patient care and clinical research.

Published in *Nature Reviews Disease Primers*, this source is highly credible and widely cited, making it a reliable foundation for both academic research and educational content. Its depth of detail is a strength, although it may be dense for non-specialist audiences.

For the assignment, this source was used to design interactive case study components, including symptoms reported to the doctor and patterns in diagnosis. It helped us ensure the case was clinically accurate while highlighting key concepts for pattern recognition in lupus.

5. Rahman, A. & Isenberg, D. A. Systemic Lupus Erythematosus. *New England Journal of Medicine* **358**, 929–939 (2008).

This article presents a comprehensive review of lupus pathophysiology, clinical presentation, and diagnostic strategies. It emphasizes immunological mechanisms, including autoantibody production and organ-specific effects, while also discussing current treatment approaches.

As a publication in *The New England Journal of Medicine*, the article is highly credible and authoritative. Its major strength is the clear integration of clinical and molecular insights, although it may require some adaptation for non-medical audiences.

This source was used for case study development with Doctor Payne, particularly in teaching students to recognize patterns of symptoms and understand diagnostic reasoning. It provided a reliable reference to ensure that the interactive scenarios were medically accurate.

6. Vaillant, A. A. J., Goyal, A., Bansal, P. & Varacallo, M. Systemic Lupus Erythematosus. *PubMed*
<https://www.ncbi.nlm.nih.gov/books/NBK535405/> (2023).

This online resource provides an accessible overview of lupus, including clinical features, pathophysiology, and diagnostic strategies. It also includes discussion of treatment options and patient management considerations.

StatPearls is a credible, peer-reviewed platform widely used by medical students and clinicians, ensuring up-to-date and accurate information. Its interactive and concise format makes it particularly useful for teaching purposes, although it may lack depth compared to primary research articles.

This source supported the interactive case study, helping design exercises in symptom reporting, clinical questioning, and pattern recognition. Its clarity and accessibility allowed us to present complex concepts in a student-friendly format while maintaining accuracy.

7. National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division; Board on Population Health and Public Health Practice & Committee for the Assessment of NIH Research on Autoimmune Diseases. 2, Background on Autoimmune Diseases. in *Enhancing NIH Research on Autoimmune Disease* (National Academies Press (US), 2022).

This report explores the underlying mechanisms of autoimmunity, including cellular apoptosis, autoantibody formation, and immune system dysregulation. It also outlines research priorities and challenges in autoimmune disease studies.

The source is highly credible, produced by the National Academies, an authoritative institution in scientific research. Its strength is the thorough explanation of immunological processes, although its focus is primarily research-oriented rather than clinical management.

For the project, this source helped explain autoimmunity, anti-Smith antibodies, and apoptosis in the pathophysiology section of lupus. It provided scientific context for case-based learning, reinforcing students' understanding of why lupus develops and how autoantibodies contribute to disease progression.

8. Koppala, S. N. & Guruprasad, V. Overview of Autoimmunity: Classification, Disease Mechanisms, and Etiology. *TURKISH JOURNAL of IMMUNOLOGY* **11**, 93–105 (2023).

This article discusses lupus pathophysiology in detail, including immune dysregulation, cytokine involvement, and organ-specific manifestations. It provides insights into molecular mechanisms that contribute to systemic inflammation and tissue damage. Published in a peer-reviewed immunology journal, the source is credible and well-cited. Its strength is the detailed mechanistic explanation of lupus, though the technical nature may require simplification for educational purposes.

This source was used to reinforce the pathophysiology section of our assignment, providing accurate explanations for organ-specific effects and immune system involvement. It helped design case scenarios and interactive components that reflected real-world biological mechanisms.

9. Tsokos, G. C. Systemic Lupus Erythematosus. *New England Journal of Medicine* **365**, 2110–2121 (2011).

This review covers lupus clinical features, diagnostic criteria, and patient management. It emphasizes pattern recognition in diagnosis, including autoantibody profiles and organ involvement, making it a practical guide for understanding lupus in real-world clinical contexts.

As a publication in *The New England Journal of Medicine*, this article is highly credible and authoritative. Its strength is in providing concise, clinically relevant guidance for recognizing lupus, though it is primarily intended for medical professionals rather than students.

This source was critical for pattern recognition exercises in the interactive case study. It informed the creation of accurate diagnostic scenarios and symptom clusters, helping learners practice identifying key clinical features of lupus.

10. Shutterstock. *Human Vector Images*. Vecteezy.

This online resource provides high-quality human vector illustrations that can be used to depict organ-specific effects and anatomical structures in educational materials.

Vecteezy is a credible platform for royalty-free visual resources. Its strength lies in the clarity and versatility of images, though it does not provide scientific content or peer-reviewed information.

This source was used to create visual aids in the presentation, showing organ-specific effects of lupus. Including clear, accurate illustrations enhanced understanding and engagement in the PULSE assignment by complementing text-based content with intuitive visuals.

11. Aringer, M. et al. 2019 European League against Rheumatism/American College of Rheumatology Classification Criteria for Systemic Lupus Erythematosus. *Arthritis & Rheumatology* **71**, 1400–1412 (2019).

This article outlines the 2019 European League Against Rheumatism (EULAR)/American College of Rheumatology (ACR) classification criteria for systemic lupus erythematosus (SLE), including laboratory and clinical parameters for diagnosis. It explains how autoantibodies, complement levels, and other lab results signify disease activity and organ involvement, providing a structured approach to diagnosing lupus.

The source is highly credible, published in a leading rheumatology journal and authored by international lupus experts. Its strength lies in offering standardized, evidence-based diagnostic criteria, though it is technical and intended for clinicians rather than lay audiences.

This source was used to guide the laboratory and diagnostic aspects of the case study with Maya. It helped ensure the MCQs and interactive content accurately reflected current clinical guidelines, particularly regarding lab markers and how they relate to disease classification and severity.

12. Kuhn, A. et al. The Diagnosis and Treatment of Systemic Lupus Erythematosus. *Deutsches Aerzteblatt Online* **112**, (2015).

This review focuses on SLE management, highlighting therapeutic goals such as controlling inflammation, preventing organ damage, and minimizing disease flares. It discusses pharmacologic options, including hydroxychloroquine, corticosteroids, and immunosuppressants, alongside lifestyle strategies such as sun protection, sleep hygiene, and exercise.

The article is credible, published in a peer-reviewed medical journal, and written by experienced clinicians. Its strength is the combination of treatment and lifestyle management strategies, though it does not go into molecular pathophysiology in depth.

This source informed the treatment and lifestyle sections of the assignment. It allowed us to accurately explain medication use, including hydroxychloroquine, and how daily habits like sun protection and stress management play a role in controlling lupus activity for patients like Maya.

13. østensen, M. & Villiger, P. M. Nonsteroidal Anti-inflammatory Drugs in Systemic Lupus Erythematosus. *Lupus* **9**, 566–572 (2000)

This article examines the potential complications of NSAID use in lupus patients, highlighting the risk of exacerbating renal and cardiovascular issues. It provides guidance on safe pain management and emphasizes careful therapeutic selection to avoid worsening disease outcomes.

The source is credible, peer-reviewed, and specifically focused on lupus pharmacology. Its strength is in clearly outlining risks associated with common medications, though it is somewhat dated and may not reflect the latest drug options.

This source was used to inform educational content on medication safety in lupus, teaching students that NSAIDs may be contraindicated in some cases. It supported MCQ explanations and interactive case discussions regarding safe treatment decisions for Maya.

14. Rolle, N. A. Ten Tips for Thriving with Lupus. *Rheumatology.org* <https://rheumatology.org/patient-blog/ten-tips-for-thriving-with-lupus> (2025).

This patient-focused blog provides lifestyle guidance for managing lupus, including sun protection, community support, sleep hygiene, smoking cessation, exercise, and medication adherence. It emphasizes the holistic management of disease activity and flare prevention.

The source is credible as it comes from the American College of Rheumatology's patient resources, though it is non-peer-reviewed and written for a general audience. Its strength lies in practical, patient-centered advice that complements scientific content.

This source was used to create content on lifestyle strategies for managing lupus, integrating practical tips into the interactive case study to help students understand how daily behaviors impact disease activity and patient outcomes.

15. Walport, M. J. Complement. *New England Journal of Medicine* **344**, 1058–1066 (2001).

This review explains the immunological mechanisms behind lupus, focusing on type III hypersensitivity reactions and the role of immune complex deposition in tissue damage. It details how antigen-antibody complexes trigger complement activation, resulting in inflammation and multi-organ injury.

Published in *The New England Journal of Medicine*, this source is highly credible and authoritative. Its strength is in the clear mechanistic explanation of lupus pathogenesis, though its clinical application is less emphasized.

This source was used to explain what is happening in Maya's body during a flare, particularly how immune complexes and complement activation drive tissue damage. This informed the MCQ explanations to help students connect immunology concepts to clinical presentations.

16. Walport, M. J. Complement. *New England Journal of Medicine* **344**, 1140–1144 (2001).

This companion article further explores immune dysregulation in SLE, focusing on complement activation, inflammation, and the clinical consequences of immune complex deposition. It emphasizes the link between molecular mechanisms and observable symptoms in patients.

As a publication in a top-tier journal, this source is highly credible. Its strength is in connecting immunopathology with clinical manifestations, although it is dense and primarily intended for medical professionals.

This article was used to reinforce MCQ explanations on immune-mediated tissue damage and flares in lupus. It helped ensure that the case study accurately reflected both molecular and clinical aspects of disease activity for Maya.

17. Fanouriakis, A. et al. 2019 Update of the EULAR Recommendations for the Management of Systemic Lupus Erythematosus. *Annals of the Rheumatic Diseases* **78**, 736–745 (2019).

This article discusses lupus flare triggers, emphasizing environmental, behavioral, and medication-related factors such as UV exposure, stress, infection, and non-adherence to therapy. It also highlights strategies for monitoring and managing flares to reduce complications.

The source is highly credible, published in a leading rheumatology journal with input from international lupus experts. Its strength is combining evidence-based flare triggers with practical clinical guidance, although its focus is narrower on flares rather than full disease management.

This source was used to design interactive questions and case scenarios highlighting flare prevention and management. It will help students understand triggers, connect lifestyle factors to clinical outcomes, and apply knowledge in diagnosing and advising patients like Maya.