PULSE EXPERIENTIAL TEAM ASSIGNMENT

Team #: 34

1. Title of your PULSE experiential assignment.
Provide a creative and informative title.

Systemic Lupus Erythematosus

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.]

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease. The immune system mistakenly attacks the body's own tissues. This leads to ongoing inflammation. It can also cause damage in multiple organs. These include the skin, joints, kidneys, and blood vessels. Because SLE can affect many parts of the body, symptoms vary widely. This makes the disease difficult to diagnose. It is also challenging to manage. This is an unpredictable and complex condition.But from the studying of SLE, we may obtain important insight on its impact on overall health.

This infographic was designed to provide a clear and visual overview of SLE. It includes causes, disease mechanisms, symptoms, diagnosis, and treatment options. The goal was to simplify complex medical concepts. The content is organized into clear sections. This makes it easier to understand for people without a strong science background. Visual presentation helps readers quickly identify key ideas. It also shows how different parts of the disease are connected.

We chose this topic because, as medical students, we are interested in complex disorders. SLE involves both immune system dysfunction and multi-organ effects. Small changes in the immune system can lead to widespread damage. This makes the disease important to study. The infographic format was selected to improve both engagement and understanding. It is especially helpful for learners who find text-heavy materials difficult.

Overall, this project aims to increase awareness of SLE. It helps learners understand its complexity. It also shows its clinical impact. This is important for both patient care and medical education.

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

lupus, autoimmunity, systemic disease, inflammation

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*
Learning outcomes: 1. Identify the causes, risk factors and underlying mechanisms of Systemic Lupus Erythemotosus (SLE), including genetic, environmental, and hormonal influences 2. Describe the pathogenesis of SLE, including immune system dysfunction, autoantibody production and inflammation 3. Recognize the signs, symptoms, and clinical findings of SLE 4. Explain the diagnostic methods used to identify and monitor SLE 5. Understand the epidemiology of SLE, including population groups most affected and patterns of disease 6. Identify different treatment approaches for SLE
6. Why did the team select the chosen topic and the medium? How will the topic and medium of choice help learners?
Topic Choice: Our team selected Systemic Lupus Erythemotosus because it is a complex autoimmune disorder. In order to further research it, it requires strong understanding of both pathology and clinical manifestation understanding. As four medical students, we are interested in exploring diseases that may demonstrate the interaction between the immune system and overall health. This topic allowed us to express our passion for studying disorders that impact different organs, and strengthened our individual awareness of how such conditions could affect our quality of life. Medium: We chose an infographic to be our medium because we believe an infographic is a very audience-friendly way to present complex medical information. We are able to divide multiple information flows into separate key concepts. This function also matches our formula of building logic flow of reading. We may lead the audience to travel from each section in order to introduce this type of disorder in and out. From what it is to its etiology; from the possible signs to the approaches of diagnosis, and what are the existing treatments.
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?)*
We decided against the utilization of AI technology tools for our assignment. Although AI tools, such as ChatGPT, can help to quickly answer questions, gather information, and generate ideas, we felt that using it would undermine the extensive time and work we put into this project. We brainstormed together to create a framework, did our own independent research, and sifted through several reports to find articles that informed us on the relevant material we needed to complete our sections. AI will often not provide the sources it used to create a response, which could lead to it outputting unsubstantiated or incorrect

claims. Additionally, we wanted to ensure that our writing reflected our own thinking, represented our perspectives, and depicted our interpretations of the content. We considered using citation software such as Zotero or MyBib however, we decided to manually type out our references to ensure that our formatting was correct and that no small details were missed.

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?

For the pathogenesis section, it was difficult to find icons that could illustrate the particular mechanisms that are characteristic to SLE. Using the BioRender website (https://app.biorender.com/), we were able to create custom graphics by removing and adding elements to clipart templates. This allowed us to specifically tailor diagrams to match the information we were trying to convey.

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].

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.

https://drive.google.com/file/d/12AphdMRxNOi1FTKq3PtsE6TP-PMyzMEI/view?usp=sharing

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.

When we were finding our preliminary research, we prioritized choosing research reports and published journal articles over less formal non-scientific based news articles. The information we gathered came from well-established databases such as Springer Nature and PubMed, the latter of which is a website run by the NIH, a division of the federal government of the USA. To further solidify the credibility of the content we gleaned, we each used multiple sources to cross-check our references, ultimately allowing us to consolidate our material and further develop our ideas. We made notes in a separate Google Docs file [the link to the document is provided in Q.10] for our project and under each paragraph, we included a link to the paper we used to determine our findings.

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?

The group was very well organised, with delegation of sections determined early, as well as the opportunity to change if needed. Everyone was given a fair share of the work, and each member went outside of their tasks to help others finish as well. The assignment itself has helped our team not only learn more about SLE, but how to carefully review research and pick good sources, emphasizing quality over quantity. Around 2 days, or about 12 hours total could be estimated to research, produce, and proofread the product. Having regular meetings to coordinate efforts helped our team, and for next time, our group would like to set deadlines to ensure everything is completed ahead of time. The PULSE assignment presented the opportunity to teach others about the complex topics of pathology, but at the same time, it was challenging to present such information so that it can be read and understood by non-experts. A communication barrier was present at first, but we quickly were able to move from emailing to a group chat, where talking about what to do next was much easier. Overall, this session was informative of SLE and group work, as well as getting to meet new people within the class.

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…

- What is Systemic Lupus Erythematosus? - General explanation about the disease - Z.Y
- Causes and Risk factors (Etiology)– what causes it to occur, what increases the chances of it occurring (i.e. age, genetics, smoking, etc.) - Z.Y
- Mechanisms of action and pathogenesis - How normal bodily functions are altered and affected by this condition, process of how it develops, associated complications - A.P
- Signs and symptoms – hallmark indicators of disease, effects that can be noticed/observed by others, feelings that the affected individual can detect – A.W
- Epidemiology – global prevalence (number of existing cases), incidence (number of new cases), geographical distribution – A.W
- Management and treatment – how to minimize the symptoms or control the effects of the disease when it is present - A.P and B.W
- Diagnosis and prognosis – Processes of identification, Methods of evaluation, tests to be run, clinical findings, predicted disease progression/course of action – B.W
- Creation and design of the infographic - Z.Y, A.P, A.W, B.W
- Completion of this PULSE assignment template - Z.Y, A.P, A.W, B.W

15. References

Please provide a numbered reference list with Nature citation style.
https://docs.google.com/document/d/1VcBfqbcsaWfXvpHK-NeF4iJGoZfKqj3d/edit?usp=sharing&ouid=113446156647258033901&rtpof=true&sd=true

16. Annotated Bibliography

1. Kiriakidou M, Ching CL. Systemic lupus erythematosus. *Ann Intern Med.* 2020;172(11):ITC81–ITC96. doi:10.7326/AITC202006020.

This article provides an overview and definition of systemic lupus erythematosus (SLE), describing it as a chronic autoimmune disease characterized by abnormal immune system activity that can affect multiple organs in the body. The purpose of the article is to summarize key aspects of SLE, including its causes, symptoms, diagnosis, and treatment approaches. The authors explain that SLE occurs when the immune system mistakenly attacks the body's own tissues, leading to inflammation and a wide range of clinical manifestations. The disease can affect the skin, joints, kidneys, and other organs, with lupus nephritis being one of the most common and serious complications. The article also highlights that SLE is more common in women, particularly those from certain ethnic groups, and that managing the disease often requires individualized treatment and a multidisciplinary medical approach. This source is credible because it is published in a reputable peer-reviewed medical journal and written by experts in the field of autoimmune diseases. A strength of the article is that it provides a clear and concise overview of SLE, making it useful for understanding the basic definition and clinical features of the disease. However, since it is a review article, it summarizes existing research rather than presenting new experimental findings. Overall, the article is a reliable source for defining and explaining systemic lupus erythematosus.

2. Yen CY, Wang PY, Chen KY, Tseng CC, Wu CC, Ou TT, Yen JH. HLA-DR genotypes in patients with systemic lupus erythematosus in Taiwan. *J Chin Med Assoc.* 2024;87(2):173-179. doi:10.1097/JCMA.0000000000001009. PMID: 37801591. PMCID: PMC12718894.

This article investigates the relationship between HLA-DR genotypes and the risk of developing systemic lupus erythematosus (SLE) in a Taiwanese population. The purpose of the study is to determine whether certain genetic variations in the human leukocyte antigen (HLA) system are associated with susceptibility to SLE and with differences in disease characteristics. The researchers compared 234 patients diagnosed with SLE with 346 healthy individuals and analyzed their HLA-DR genotypes using genetic testing methods. The results showed that the HLA-DR2 genotype appeared significantly more often in SLE patients than in healthy controls, suggesting that this genetic variation increases the risk of developing lupus. The study also found that patients with this genotype tended to develop the disease at an earlier age and were more likely to experience certain complications, including oral ulcers, bone damage, and kidney involvement such as lupus nephritis. This source is credible because it is a peer-reviewed scientific study that uses genetic analysis and statistical testing to investigate disease risk. A strength of the study is that it provides direct experimental evidence linking genetic factors to SLE. However, one limitation is that the study focuses on a specific population, so the findings may not fully apply to other ethnic groups. Overall, the article supports the idea that genetic factors, particularly HLA-DR genotypes, play an important role in the etiology of SLE.

3. Truedsson L, Bengtsson AA, Sturfelt G. Complement deficiencies and systemic lupus erythematosus. *Autoimmunity.* 2007 Dec;40(8):560-6. doi:10.1080/08916930701510673. PMID: 18075790.

This article examines the relationship between complement deficiencies and systemic lupus erythematosus (SLE). The purpose of the study is to explain how abnormalities in the complement system contribute to the development and progression of lupus. The complement system is an important part of both the innate and adaptive immune systems and plays a key role in clearing immune complexes and damaged cells from the body. The article explains that deficiencies in complement proteins, particularly those in the classical pathway such as C1q, C2, and C4, increase the risk of developing SLE. When these components are deficient, the body cannot properly remove immune complexes or apoptotic cells, which can lead to abnormal immune activation and the production of autoantibodies. This process contributes to inflammation and tissue damage in lupus patients. This source is credible because it is a peer-reviewed scientific review published in a medical journal and supported by immunological research. A major strength of the article is that it clearly explains the biological mechanisms linking complement deficiencies to lupus development. However, as a review article, it summarizes existing research rather than presenting new experimental findings. Overall, the article supports the understanding that defects in immune system regulation, particularly complement deficiencies, play an important role in the etiology of SLE.

4. Quaglia M, Merlotti G, De Andrea M, Borgogna C, Cantaluppi V. Viral infections and systemic lupus erythematosus: new players in an old story. *Viruses.* 2021;13(2):277. doi:10.3390/v13020277. PMID: 33670195. PMCID: PMC7916951.

This article reviews the relationship between viral infections and the development of systemic lupus erythematosus (SLE). The purpose of the study is to explain how certain viruses may trigger or worsen autoimmune responses in individuals who are genetically predisposed to lupus. The authors discuss several viruses that have been associated with SLE, including Epstein–Barr virus (EBV), parvovirus B19, cytomegalovirus (CMV), and human endogenous retroviruses. These viruses may contribute to the disease by activating the immune system and promoting abnormal immune responses. The article also explains mechanisms such

as molecular mimicry, where viral proteins resemble human proteins, causing the immune system to mistakenly attack the body's own tissues. Viral infections can also stimulate inflammatory pathways and influence gene expression related to immune responses. This source is credible because it is a peer-reviewed scientific review published in a medical journal and supported by multiple studies on viral infections and autoimmune diseases. A strength of the article is that it explains the biological mechanisms linking viral infections and SLE. However, as a review article, it mainly summarizes existing research rather than presenting new experimental data. Overall, the article supports the idea that viral infections can act as environmental triggers contributing to the etiology of SLE.

5. Speyer CB, Costenbader KH. Cigarette smoking and the pathogenesis of systemic lupus erythematosus. *Expert Rev Clin Immunol.* 2018 Jun;14(6):481-487. doi:10.1080/1744666X.2018.1473035. Epub 2018 May 11. PMID: 29724134.

This article explores the relationship between cigarette smoking and the development of systemic lupus erythematosus (SLE). The purpose of the study is to review scientific evidence linking environmental exposures, particularly smoking, to the risk of developing lupus. The authors explain that SLE is a complex autoimmune disease whose exact cause is not fully understood, but environmental factors can trigger the disease in genetically susceptible individuals. The article highlights epidemiological evidence showing that current smokers have a higher risk of developing SLE, especially forms of the disease associated with specific autoantibodies. It also describes biological mechanisms through which smoking may contribute to lupus, including oxidative stress, inflammation, immune system activation, and effects on T cells and B cells. Smoking can also lead to the formation of DNA damage products that may trigger autoimmune responses. This source is credible because it is a peer-reviewed scientific review published in a medical journal and supported by epidemiological and biological research. Its strength is that it explains both the statistical association and the biological mechanisms linking smoking to SLE. However, as a review article, it summarizes existing research rather than presenting new experimental data. Overall, the article supports the idea that environmental factors such as smoking can contribute to the etiology and progression of SLE.

6. Gompel A. Systemic lupus erythematosus and menopause. *Climacteric.* 2020 Apr;23(2):109-115. doi:10.1080/13697137.2019.1679113. Epub 2019 Oct 28. PMID: 31657240.

This article examines the relationship between systemic lupus erythematosus (SLE) and menopause, with a focus on the role of estrogen and hormonal changes in autoimmune activity. The purpose of the study is to review existing research on how estrogen influences the development and progression of lupus and how menopause and hormone therapy affect patients with SLE. The article explains that estrogen can trigger or worsen autoimmune responses by influencing immune system activity. Because SLE occurs much more frequently in women, especially during reproductive years, hormonal factors such as estrogen are considered important contributors to disease development. The study also discusses health risks faced by women with lupus, including premature ovarian insufficiency, osteoporosis, and increased risk of thrombosis. In addition, it evaluates the benefits and risks of menopausal hormone therapy in women with lupus. This source is credible because it is a peer-reviewed scientific article that reviews clinical evidence and previously published research. Its strength lies in clearly explaining the connection between hormones and autoimmune disease. However, as a review article, it mainly summarizes existing studies rather than presenting new experimental data. Nevertheless, it provides strong support that estrogen is an important factor influencing the development and progression of SLE.

7. Wang W, He S, Zhang W, Zhang H, DeStefano VM, Wada M, et al. BCMA-CD19 compound CAR T cells for systemic lupus erythematosus: a phase 1 open-label clinical trial. *Ann Rheum Dis.* 2024 Sep 30;83(10):1304-1314. doi:10.1136/ard-2024-225785. PMID: 38777376.

This article examines the safety and effectiveness of BCMA-CD19 compound chimeric antigen receptor T-cell (cCAR-T) therapy in patients with systemic lupus erythematosus (SLE), particularly those with lupus nephritis. The purpose of the study is to determine whether targeting B cells and plasma cells can reset the immune system and reduce disease activity. In this multicenter phase 1 clinical trial, patients received cCAR-T therapy designed to eliminate autoreactive immune cells that produce harmful autoantibodies. The results showed that many patients achieved symptom improvement and medication-free remission after treatment. Within three months, autoantibodies became undetectable and complement levels returned to normal, and the SLE Disease Activity Index significantly decreased, indicating reduced disease severity. Renal function also improved in several patients. This source is credible because it reports findings from a clinical trial conducted across multiple research centers and uses established immunological techniques such as B-cell receptor sequencing and flow cytometry. A major strength is that it directly links immune cell dysfunction to disease activity and demonstrates that targeting these cells can improve symptoms. However, the study has limitations, including a relatively small sample size and a single-arm design without a control group. Despite this, it provides strong evidence that dysregulated B cells and immune responses contribute to SLE.

8. Vaillant AA, Goyal A, Bansal P, Varacallo M. Systemic Lupus Erythematosus [Internet]. Treasure Island (FL): StatPearls Publishing; c 2026. [updated 2023 Aug 4; cited 2026 Apr 8]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535405/

This article in the StatPearls review book provides an analysis on Systemic Lupus Erythematosus (SLE), with a general overview of the clinical manifestations, progression, and processes behind this disease. This source is credible, as it was published in the Bookshelf database on the National Center for Biotechnology Information (NCBI) website. NCBI is a division of the National Library of Medicine, which is affiliated with the government of the United States of America. As a whole, the article was very informative on other topics that are needed to get a fuller comprehension of the hallmarks that characterize SLE. For the infographic, I primarily gathered my information from the pathophysiology and histopathology sections of the article. It touched upon the cascade of events that precede the activation of the immune system, the altered production of cytokines by T cells, and the immunologic role that B cells have in this condition. While it did provide lots of detail on the signalling mechanisms that result in interferon production and the expulsion of nuclear material from cells, it did not fully illustrate the interconnected nature and contributions of the adaptive and innate immune systems.

8. Vaillant AA, Goyal A, Bansal P, Varacallo M. Systemic Lupus Erythematosus [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2023. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535405/

This article provides a clinical overview of SLE, covering its etiology, pathophysiology, and most extensively its signs and symptoms across every major organ system, including mucocutaneous, musculoskeletal, neuropsychiatric, renal, cardiovascular, and pulmonary manifestations. It also addresses diagnosis, treatment, and prognosis. The article will be used for the signs & symptoms section, as well as some parts for the epidemiology section in the infographic. The source is credible, published on the National Centre for Biotechnology Information (NCBI), a government website, and is authored by multiple medical professionals. The article highlights an important case, constitutional symptoms, which are important for initial clinical manifestations and diagnosis. The organ-by-organ breakdown allows for a discussion of observable signs, including the hallmark sign, the malar, or butterfly rash. In addition, the subjective symptoms are also covered, such as fatigue, joint pain, and headaches. This source provides a well-rounded and clinically relevant foundation for the basis of the infographic.

9. Su X, Yu H, Lei Q, Chen X, Tong Y, Zhang Z, et al. Systemic lupus erythematosus: pathogenesis and targeted therapy. Molecular Biomedicine. 2024 Oct 30;5(54): [about 30p.]. doi: 10.1186/s43556-024-00217-8

This article in the Molecular Biomedicine journal examines the pathologic mechanisms that underlie SLE and therapeutic techniques that target the immune dysregulation and inflammation associated with this condition. This article is peer-reviewed and is published by Springer Nature, which is a well-established company. A strength of this review is that it is contained within a scientific journal that is open access, and is therefore fully accessible to the public. I used this article to understand how patients can manage their exposure to triggers, and to learn more about the formation of immune complexes, loss of tolerance, and altered cell activation of this multifaceted autoimmune disease. Additionally, there were sections that were specifically dedicated to the key immune cells that are involved in the pathogenesis of SLE, including B cells, T cells, neutrophils, and dendritic cells. This allowed me to go into further detail about the specificities and processes involved in the pathogenesis and physiology of SLE.

10. COJOCARU M, COJOCARU IM, Isabela SILOSI, VRABIE CD. Manifestations of Systemic Lupus Erythematosus. Mædica [Internet]. 2011 Oct;6(4):330. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC3391953/

This article reviews the broad spectrum of clinical manifestations in SLE, systematically covering constitutional, musculoskeletal, dermatological, renal, neuropsychiatric, pulmonary, gastrointestinal, cardiac, vascular, ocular, obstetric, endocrine, and hematologic symptoms. Its central argument is that SLE is a highly heterogeneous disease whose diverse manifestations make diagnosis inherently challenging. The article was published in a medical journal, and through PubMed Central and the National Library of Medicine. Authored by multiple MD and PhD holders, information is credible. A limitation of the source is its age, meaning some clinical details may not reflect the most current diagnostic criteria or findings. The article was published in 2011, however, many of the symptoms can be cross-referenced with other papers, ensuring their validity. The source will further support the signs and symptoms section, especially with the system-by-system breakdown, and is useful for distinguishing symptoms, such as the alopecia and malar rash.

11. Tian J, Zhang D, Yao X, Huang Y, Lu Q. Global epidemiology of systemic lupus erythematosus: a comprehensive systematic analysis and modelling study. Annals of the Rheumatic Diseases. 2022 Oct 14;82(3).

This article goes into the global epidemiology of systemic lupus erythematosus (SLE) using large-scale modelling to estimate disease burden across populations. According to the available abstract and supporting summaries, SLE affects approximately 3.4 million people worldwide, highlighting its significance as a global health concern. The disease disproportionately affects women, particularly those of reproductive age, with a female-to-male ratio of roughly 9:1. Additionally, the study emphasizes important health disparities, noting that Asian, Black, Hispanic, and Indigenous populations experience higher prevalence and often more severe disease outcomes. A strength of this source is its comprehensive, global perspective, which allows for meaningful comparisons across regions and populations. However, a major limitation is that I was unable to access the full article, restricting my ability to evaluate the methods, statistical modelling, and detailed regional data. Despite this limitation, the article remains a credible and valuable source for understanding the epidemiological patterns and inequities associated with SLE.

12. Hoi A, Igel T, Mok CC, Arnaud L. Systemic lupus erythematosus. Lancet. 2024;403(10441):2326-38.

This article gives a clear overview of Systemic Lupus Erythematosus (SLE). It explains that SLE is a chronic autoimmune disease. The immune system attacks healthy tissues. This causes inflammation in organs like the skin, joints, and kidneys. The article focuses on how SLE is diagnosed and how the disease progresses over time. It explains that diagnosis can be difficult. Early symptoms are often general and unclear. A structured approach is needed. This includes checking symptoms, medical history, and autoantibody tests. The article also explains that SLE does not follow a fixed pattern. Patients may have periods of flare and remission. Long-term outcomes depend on disease activity, treatment, and complications. This source is very reliable. It is published in The Lancet, which is a well-known medical journal. The authors are experts in this field. The article is also recent, so the information is up to date. One limitation is that it is very broad. Some details about specific tests are not explained deeply. This source will be useful for our diagnosis and prognosis section. It helps explain how SLE is identified. It also shows how the disease changes over time. This supports our infographic by giving clear and accurate clinical information.

13. Pagkopoulou E, Loutradis C, Papaioannou M, Daoudaki M, Stangou M, Dimitroulas T. Autoantibodies in systemic lupus erythematosus: diagnostic and pathogenic insights. J Clin Med. 2025;14(16):5714.

This article explains the role of autoantibodies in Systemic Lupus Erythematosus (SLE). It shows that autoantibodies are a key feature of the disease. They target different parts of the cell. This leads to immune complex formation and organ damage. The article also explains that autoantibodies are important for diagnosis. Tests like ANA and anti-dsDNA are commonly used. These markers help doctors confirm SLE and monitor disease activity. Some autoantibodies are linked to specific organ problems, such as kidney involvement or skin symptoms. The article also discusses how these antibodies can help predict disease flares and outcomes. This source is reliable. It is published in a peer-reviewed journal. The article is recent and provides updated information. It is also a review article, which means it summarizes many studies. This is a strength because it gives a broad understanding. However, it may not go into deep detail for every test or mechanism. This source will support our diagnosis and prognosis section. It helps explain how autoantibody tests are used in diagnosis. It also shows how these markers relate to disease progression and organ involvement.

14. Bai Y, Tong Y, Liu Y, Hu H. Self-dsDNA in the pathogenesis of systemic lupus erythematosus. Clin Exp Immunol. 2018;191(1):1-10. doi:10.1111/cei.13041.

This article explains how self-dsDNA contributes to the development of SLE. It shows that self-dsDNA comes from cell death, such as apoptosis, necrosis, and NETosis. When this DNA is not cleared properly, it accumulates in the body. This triggers the immune system to produce anti-dsDNA antibodies. These antibodies form immune complexes that cause inflammation and tissue damage. The article also explains that self-dsDNA activates immune pathways, especially type I interferon (IFN-I), which drives disease progression. This source is reliable. It is published in a peer-reviewed immunology journal. It provides detailed mechanisms of how SLE develops. This is a strength because it explains the disease at a molecular level. However, it focuses more on mechanisms than clinical use. This source will support our pathophysiology section. It helps explain how SLE starts and progresses. It also shows why anti-dsDNA is important in causing tissue damage.

15. Contin-Bordes C, Lazaro E, Pellegrin JL, Viallard JF, Moreau JF, Blanco P. Systemic lupus erythematosus: from pathophysiology to treatment. Rev Med Interne. 2009;30(12 Suppl):H9-H16. doi:10.1016/S0248-8663(09)73167-4.

This article gives an overview of SLE from its pathophysiology to treatment. It explains that SLE is a systemic autoimmune disease that can affect many organs. The disease is caused by an abnormal immune response against nuclear material. The article shows that immune complexes and autoantibodies play a key role in causing inflammation and tissue damage. It also explains that dendritic cells and interferon-alpha are important in driving the disease process. In addition, the article discusses how the disease can vary between patients and often occurs in flares. It also introduces treatment options. These include drugs that reduce immune activity and target specific immune pathways .This source is reliable. It is published in a medical journal and written by experts. It gives a clear overview of both disease mechanisms and treatment. This is a strength because it connects theory with clinical use. However, the article is older, so some treatments may not be the most current. This source will support both our diagnosis and treatment sections. It helps explain disease mechanisms and how they relate to clinical management.