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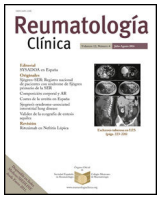

Consensus statement

Clinical Practice Mexican Guidelines for the Treatment of Systemic Lupus Erythematosus: 2024 Update

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ABSTRACT

Herein we present the update for the Mexican Guidelines for the Treatment of Systemic Lupus Erythematosus.

It involves the participation of several experts along the country, following the GRADE system.

We included aspects regarding vaccines, pregnancy and cardiovascular risk which were not presented in the previous guidelines in 2017.

Guías de Práctica Clínica para el tratamiento del lupus eritematoso sistémico del Colegio Mexicano de Reumatología. Actualización 2024

Palabras clave:
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RESUMEN

Presentamos la actualización de las Guías de Práctica Clínica para el tratamiento del lupus eritematoso sistémico del Colegio Mexicano de Reumatología elaboradas por un grupo de expertos en la enfermedad tanto a nivel privado como gubernamental, de acuerdo con la metodología GRADE.

Se incluyen por primera vez aspectos sobre vacunación, embarazo y riesgo cardiovascular.

Introduction

In 2017, the Mexican College of Rheumatology published the first Clinical Practice Guidelines (CPG) for the treatment of Mexican patients with systemic lupus erythematosus (SLE) and committed to update them periodically.[1]

CPGs are an extremely useful tool to guide physicians on the treatment of a specific disease and require a strict methodology in their development and implementation. Therapeutic guidelines need to be updated when new drugs emerge with sufficient evidence to support their use, or when the indications change for drugs that are already in use.

SLE is a prototypical autoimmune disease, in terms of both its complexity and heterogeneity. Currently, the therapeutic strategy aims to achieve specific targets and, as much as is possible, limit accumulated damage, especially when secondary to drugs used in the treatment of the disease. Given the characteristics of SLE patients, recommendations should include general patient management, specific treatment of target organ manifestations, and monitoring of comorbidities arising from both treatment and disease. It is also important to consider genetic and ethnic factors (such as the higher severity observed in Mestizos), as well as access to health systems and appropriate therapies.

This paper includes topics that were not covered in previous guidelines, such as treat-to-target, cardiovascular risk, and treatment during pregnancy and lactation. In addition, all recommendations for drug groups and organ- and system-specific manifestations are updated.

Methodology

A working group of 40 rheumatologists, all certified and active members of the Mexican College of Rheumatology, with experience in the treatment of patients with SLE and professionally active in different institutions and regions of the country, in both private and governmental practice, was formed to undertake this update. Two medical experts in CPG methodology were also involved.

The expert panel met for the first time remotely in September 2023. At this meeting, the methodology was defined, and the content of the guidelines was divided into four sections: 1. General considerations, 2. Drugs, 3. Treatment by organ and system, and 4. Special situations. Specific working teams were formed for each of the subtopics and together they reviewed and updated the research questions using the PICO format (patient, intervention, comparison, outcomes), developing those that corresponded to topics not included in the previous recommendations.[2]

A systematic review of the literature was conducted covering information published since 2017. All articles from PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Google Scholar, and SCIELO published between January 2017 and December 2023 were taken into account for this update (considering that previous guidelines had included publications up to December 2016). Articles published from January 2010 onwards were considered for de novo questions.

All study designs were included, with priority given to meta-analyses, clinical trials, cohort, case-control, and cross-sectional studies. However, case reports, narrative reviews, or consensus studies were considered in the case of research questions with very limited information or where there were no papers of sufficient quality.

Each team received the PICO search mechanisms from the methodologists, which were adapted to the topic allocated. The articles were then reviewed, and the search was completed based on those that were related and the references consulted. The articles selected were those that provided clear answers to the research questions posed. The findings from the eligible studies were synthesised in evidence tables, using the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) approach.[2] From the evidence tables, adjustments were made to previous recommendations or new recommendations were

Table 1
General principles.

A	Optimal treatment of patients with SLE requires pharmacological and non-pharmacological interventions by a multidisciplinary team coordinated by the rheumatology specialist.[3]
B	Treatment should be based on shared decision-making between patient and physician. This facilitates adherence, which in turn will improve disease control.[3,4,7,8]
C	Early diagnosis and timely treatment improve the patient's prognosis. Disease activity should be determined at each clinical evaluation and the damage associated with the disease should be determined at least once a year, using validated instruments.[9–11]
D	The goal of treatment is to control disease activity, limit damage, and improve patients' quality of life.[10,12] The ideal therapeutic goal is to put the disease into remission and if this is not possible, at least reach a state of low disease activity (Table 2).[13,14]
E	The treatment of SLE should be personalised and consider the specific organ involvement and its severity. It is also necessary to consider the efficacy, safety, and availability of treatment, the patient's comorbidities, as well as the societal, economic, and family impact of the disease.[3,7,8]
F	Non-pharmacological treatment should include photoprotection, balanced diet, smoking cessation, regular exercise, psychological support, cardiovascular risk assessment, family planning counselling, and prenatal care.[15–18]

SLE: systemic lupus erythematosus.

developed, grading the level of evidence and strength of each recommendation as per the GRADE system.

All initial recommendations were sent for review and suggestions to the team, who provided feedback. Disagreements were resolved by discussion among team members.

In January 2024, a hybrid meeting was held with the entire research team to review each of the recommendations issued, deliberate, and establish the degree of consensus, resulting in the final version. Recommendations were accepted with more than 80% agreement; in cases where this figure was not achieved, they were analysed and amended as necessary, repeating the vote to achieve consensus or to establish that consensus had not been reached.

Recommendations

This update of recommendations for the management of SLE is structured as follows:

1 General principles for management of the disease.

Recommendations:

2 On the indications for and monitoring of the main groups of drugs used in SLE.
3 For the specific treatment of the disease in the different organs and systems.
4 For special situations that are important because of their impact on SLE, such as the perioperative period, vaccination, pregnancy, and cardiovascular risk.

General principles

The general principles of treatment in SLE encompass the concept of comprehensive management of a very complex disease. They highlight the role of the rheumatologist as the leader of the multidisciplinary care team and the importance of regular patient assessment. They emphasise the need for an end goal of treatment (remission or low disease activity) and relapse prevention as the primary means to reduce progression and long-term damage. They consider the importance of non-pharmacological measures, as well as the selection of drugs based on their increased efficacy, safety, and availability. They also stress that the patient should always be involved in therapeutic decisions.[3–6] (Tables 1 and 2)

Drugs

Treatment of SLE includes a combination, often sequential, of antimalarials, glucocorticoids (GCs), non-steroidal anti-inflammatory drugs (NSAIDs), disease-modifying drugs, immunosuppressants, and biological therapy. The choice of drugs, as well as the dose and duration of administration, should be individualised according to the type and severity of clinical manifestations, disease activity, organs and systems involved, as well as associated comorbidities.

Table 2
Definitions of remission and low activity.

Domain	Remission DORIS	LLDAS
SLEDAI-2K	SLEDAI clinical=0 (allows for serological activity)	SLEDAI ≤4* - no major organ activity - no haemolytic anaemia or gastrointestinal activity - no new features of activity compared with the previous assessment
PGA (0–3)	<.,5	≤1
PDN dose (or equivalent)	≤5 mg/day	≤7.5 mg/day
Other therapies	Stable doses of antimalarials, immunosuppressants, or biologicals	

DORIS 2021: Definition of Remission In SLE; LLDAS: Lupus Low Disease Activity State; PDN: prednisone; PGA: Physician Global Assessment; SLEDAI-2K: Systemic Lupus Erythematosus Disease Activity Index 2000.
* Includes serological activity.[6,19]

Antimalarials are considered mainstays in the treatment of SLE; they have photoprotective, lipid-lowering, anti-angiogenic, antithrombotic, and hypoglycaemic effects and, through their interaction with Toll-like receptors (TLRs), they also inhibit the function of B-cell activating factor (BAFF) and phospholipase A2 (PLA2). This pleiotropic effect makes them drugs of choice to treat cutaneous manifestations, mild to moderately active SLE, to concomitantly treat major organ involvement, and to prevent long-term relapse.[20–22]

GCs are the cornerstone of the immediate treatment of the disease. Their anti-inflammatory and immunomodulatory effect allows rapid control of many manifestations of lupus. The dose and time of administration of this group of drugs is determined by the severity of the condition and, by international consensus, the doses of prednisone (or its equivalent) have been defined as low dose (<7.5 mg), moderate dose (>7.5 mg and <30 mg), high dose (>30 mg and <100 mg), and very high dose (>100 mg).[23] Despite their undoubted efficacy, because of their short- and long-term adverse effects, GCs should always be administered concomitantly with other disease-modifying or immunosuppressive drugs so as to reduce the dose and even discontinue them as quickly as possible.[24]

NSAIDs are often used for symptomatic treatment of pain and inflammation in SLE patients. Generally, NSAIDs are used at the full recommended dose for as short a time as possible in acute conditions, and at the minimum dose necessary to maintain clinical response in chronic conditions. The choice of individual NSAID will depend on the variability of response and the patient's risk factors for gastrointestinal, cardiovascular, renal, and hepatic toxicity,

Table 3
Recommendations for using glucocorticoids, antimalarials, and NSAIDs.

Recommendation	Quality of evidence	Strength of recommendation
It is recommended to use GCs with doses and route of administration according to the disease activity, type of manifestation, and severity. In mild forms doses ≤10 mg/day of prednisone or equivalent are recommended, in moderate forms .5–1 mg/kg/day, and in severe forms doses ≥1 mg/kg/day. Intravenous methylprednisolone pulses 250–1,000 mg/day, for 1–3 days should be indicated in patients with moderate and/or severe forms.[23,24]	High	Strong
Gradual tapering of GCs is recommended in patients with stable disease, with close monitoring for early detection of relapse after discontinuation[24,45].	High	Strong
Hydroxychloroquine (HCQ) or chloroquine (CLQ) is recommended for all patients with SLE unless contraindicated.[20–22]	High	Strong
It is recommended that the daily dose of HCQ not exceed 5 mg/kg day per actual body weight for all patients and CLQ 2.3 mg/kg.[46]	Low	Strong
A baseline and then annual ophthalmological assessment are recommended for adverse effect monitoring.[47] In patients with prolonged exposure (>5 years), OCT (optical coherence tomography) is recommended.[47,48]	Low	Strong
The use of NSAIDs is recommended in mild SLE activity for short periods for the control of joint pain, arthritis, myalgias, chest pain, and/or fever, when the potential benefit outweighs the known risks of NSAIDs, and paracetamol has been insufficient or has not been tolerated.[26]	Low	Strong
It is recommended that patients taking NSAIDs chronically should undergo cardiovascular and renal risk assessment, and monitoring of allergic reactions, skin reactions, and aseptic meningitis, due to the high risk in patients with SLE.[25]	Low	Strong

GC: glucocorticoids; NSAIDs: nonsteroidal anti-inflammatory drugs; SLE: systemic lupus erythematosus.

Table 4
Recommendations for using DMARDs and immunosuppressants.

Recommendation	Quality of evidence	Strength of recommendation
It is recommended that methotrexate be used especially for musculoskeletal manifestations at doses of 7.5–25 mg orally or parenterally; adverse events to watch for are myelosuppression, hepatotoxicity, pneumonitis, alopecia, stomatitis, and teratogenicity.[27]	Moderate	Strong
Using leflunomide is suggested in similar circumstances.[49]	Low	Weak
It is recommended that the dose of azathioprine range from 1 to 3 mg/kg/day and closely monitor for adverse events (myelosuppression, hepatotoxicity, lymphoproliferative disorders, and teratogenicity).[28]	Moderate	Strong
Mycophenolic acid/MMF is recommended at doses of 1–3 g/day according to the organ involved and the severity of the manifestation. Adverse events to be monitored are cytopenias, impaired liver function, diarrhoea, and teratogenicity.[50]	High	Strong
It is recommended that calcineurin inhibitors (cyclosporine, tacrolimus, voclosporin) be used mainly in refractory nephropathy or as part of multiple therapy; their main adverse events are gingival hyperplasia, arterial hypertension, hirsutism, renal failure, and anaemia.[31,32]	High	Strong
IV CPM at a dose of 500 to 1,000 mg/m^2 based on body surface area is recommended. Adverse events to watch for are cytopenias, infertility, teratogenicity, myeloproliferative disorders, haemorrhagic cystitis, and bladder cancer. It is recommended to use the lowest dose of CPM possible on a case-by-case basis.[29,30]	Moderate	Strong
The use of gonadotrophin-releasing hormone (GnRH) is recommended as ovarian protection in the case of women treated with CPM and who wish to have (more) children.[51]	High	Strong
Combination therapy with immunosuppressants (multiple therapy) is recommended, and is considered a first treatment option in moderate to severe lupus after each patient has been appropriately assessed.[31–35,41]	High	Strong
It is recommended that the prevention, follow-up, and treatment of infections be a priority in patients using immunosuppressants, particularly CPM.[30,52,53]	High	Strong

CPM: cyclophosphamide.

among others. It is necessary to periodically evaluate the indication for continued use and always assess the risk of interactions and adverse events when using other commonly used drugs in SLE patients (GCs, antihypertensives, hypoglycaemics, anticoagulants, etc.).[25,26]

Disease-modifying drugs such as methotrexate and leflunomide are useful when there are musculoskeletal manifestations.[27] Immunosuppressants are used in various moderate and severe manifestations of the disease, but also in mild forms due to their GC-sparing effect. The most commonly used are azathioprine (AZA), mycophenolate mofetil (MMF), cyclophosphamide (CPM), and calcineurin inhibitors (cyclosporine, tacrolimus, and voclosporin). In some circumstances, a remission induction schedule followed by a lower dose as maintenance therapy is used to consolidate remission and prevent relapse. The choice of immunosuppressant will depend on the type of manifestation, its severity, and the individual toxicity profile. Multiple therapy is increasingly indicated as a way to achieve better short- and long-term outcomes with less toxicity.[28–35]

Biological therapy has been used for a decade in SLE, specifically monoclonal antibodies directed against B cells, T cells and, more recently, type I interferon. These mechanisms of action have been shown to be effective, and they work in conjunction with standard therapy to control various manifestations of the disease and to reduce the frequency and severity of relapses, as well as delay cumulative damage. Although results appear better in antinuclear antibody-positive patients, their use should not be limited to this subset of patients. Belimumab has recently been licensed for use as concomitant therapy in patients with lupus nephritis.[36–41]

Clinical trials of Janus tyrosine kinase inhibitors in SLE patients are currently underway with promising results for manifestations in various organs, including the kidney. CAR-T cells (chimeric molecules capable of redirecting T-cell specificity against target antigens) are a novel area of research in patients with severe and refractory SLE, with encouraging results.[42–44]

Tables 3–5 describe the treatment recommendations for SLE with the different drug groups.

Constitutional manifestations

The constitutional manifestations of lupus, as is common in many chronic systemic conditions, are a multifactorial phenomenon that significantly impacts patients' quality of life. In the event of fever, infectious processes must be ruled out before attributing fever to disease activity alone.

Table 5
Recommendations for using biological therapy.

Recommendation	Quality of evidence	Strength of recommendation
Biological therapy (belimumab, anifrolumab) is recommended as adjuvant treatment to standard management in patients with active, antibody-positive SLE and failure of previous therapy.[36,37]	High	Strong
Belimumab in combination with standard immunosuppressive therapies is recommended for the treatment of patients with active lupus nephritis.[38]	High	Strong
Rituximab is suggested for moderate to severe manifestations of lupus with failure of previous treatments.[39,40,43,54,55]	Moderate	Weak

SLE: systemic lupus erythematosus.

Table 6
Recommendations for the management of constitutional manifestations.

Recommendation	Quality of evidence	Strength of recommendation
It is recommended that assessment of the presence and intensity of fatigue and its impact on quality of life be included as part of the routine clinical care of the patient with SLE.[56–58]	Low	Strong
It is recommended that a physical exercise programme, preferably aerobic, be included as an adjunct to treatment in SLE patients without clinical disease activity.[59–63]	Moderate	Strong
It is recommended that an education and support programme related to the disease be provided and implemented.[64,65]	Moderate	Strong
The addition of belimumab is suggested for the treatment of fatigue that is disabling or severely interferes with quality of life in SLE patients who have not responded to other treatment regimens.[66,67]	High	Weak
Optimising vitamin D levels is suggested as adjuvant treatment.[68–70]	Low	Weak
Using medium-dose GCs is recommended in the presence of fever attributed to SLE activity, expecting fever remission in 1–5 days.[23,71,72]	Very low	Strong
Good clinical practice point. Infection or toxic effect of drugs must be ruled out before attributing fever to lupus activity.		

GC: glucocorticoids; SLE: systemic lupus erythematosus.

Table 7
Recommendations for the management of mucocutaneous manifestations.

Recommendation	Quality of evidence	Strength of recommendation
Localised cutaneous manifestations		
Short-term medium potency topical GC preparations (e.g. fluocinolone acetonide, betamethasone valerate) as first line of treatment are recommended.[73,74]	Moderate	Strong
Topical calcineurin inhibitor preparations are recommended as second-line therapy, or as a first choice for the treatment of localised lesions in skin areas at high risk of sequelae due to adverse effects of topical corticosteroid therapy (e.g. facial lesions).[73,74]	Moderate	Strong
Good clinical practice point. Consider dermatology referral for patients with localised cutaneous lupus erythematosus (CLE) lesions that do not respond to the interventions outlined above. In this case using dermatological therapeutic interventions may be effective.		
Disseminated or severe cutaneous manifestations		
Medium- or high-dose systemic GCs in combination with antimalarials are recommended as first-line treatment for acute, subacute, or chronic CLE lesions that are disseminated or significantly interfere with quality of life or are life-threatening.[73,75,76]	Moderate	Strong
Additional use of methotrexate, mycophenolic acid (or MMF) is recommended in patients with SLE whose cutaneous manifestations have been refractory or who experience relapse despite GC and antimalarial therapy.[73,77]	Moderate	Strong
The addition of belimumab or anifrolumab to treatment is suggested in SLE patients with severe skin manifestations refractory to GCs, antimalarials, and immunosuppressants.[37,77–80]	High	Weak
Treatment with systemic retinoids, or alternatively dapsone, thalidomide, or lenalidomide, is suggested in patients with subacute or chronic CLE lesions who are refractory to or relapsing despite GC, antimalarial, and immunosuppressive therapy.[73,75]	Low	Weak
Mucosal ulcers and alopecia		
It is suggested that for the specific management of oral ulcers or ulcers in other mucosal sites, or transient diffuse alopecia due to lupus activity, the same treatment guidelines should be followed as those issued for the other cutaneous manifestations.[73,75–77]	Very low	Weak
Good clinical practice point. For all manifestations, the importance of avoiding exposure to ultraviolet radiation, optimising vitamin D levels, and avoiding smoking should be emphasised.		

GC: glucocorticoids; SLE: systemic lupus erythematosus.

Treatment of fatigue should be symptomatic and holistic, including regular assessments, exercise programmes, and psychoeducational interventions, always considering other related causes such as injury or comorbidities and taking the influence of psychological, societal, and lifestyle factors into account. The evidence found in the literature allows the following recommendations to be made for this group of manifestations of the disease.[56,57] (Table 6)

Mucocutaneous manifestations

Mucocutaneous involvement in SLE is very common and can occur in the context of patients with or without systemic involvement; it is usually classified into specific and non-specific manifestations.[73] The choice of optimal treatment is difficult because most efficacy evaluations group the outcome as 'cutaneous manifestations' without any further distinction as to the type of manifestation.

Nevertheless, current information on this particular topic is useful for issuing a number of recommendations including management using increasingly fewer GCs, the addition of topical therapy, the use of antimalarials as a cornerstone and, if necessary, immunosuppressants and biological therapy.[73–78] (Table 7)

Musculoskeletal manifestations

Joint manifestations are common in SLE patients, occurring in up to 85% of cases in the course of the disease. Most patients present with arthralgias with inflammatory features, but a low percentage

Table 8
Recommendations for the management of musculoskeletal manifestations.

Recommendation	Quality of evidence	Strength of recommendation
The use of NSAIDs for short periods is recommended for the control of joint manifestations, assessing the risk/benefit in each patient according to comorbidities. The choice between traditional NSAID vs. selective COX-2 inhibitor will depend on each case and should be individualized.[26]	Moderate	Strong
GCs are recommended for inflammatory joint manifestations refractory to NSAIDs or antimalarials. They can be used at the onset of the disease or in periods of relapse, in low doses and monitoring for dose response, and discontinued once control of inflammation and pain has been achieved. In cases of refractory monoarticular inflammation, we recommend intra-articular injection of GCs (ruling out an infectious process beforehand).[81]	Low	Strong
HCQ or CLQ is recommended for the control of joint pain and inflammation.[8,82]	Moderate	Strong
Methotrexate is recommended in patients with persistent joint inflammation despite NSAIDs, low-dose GCs, and antimalarials.[8]	Low	Strong
Leflunomide is suggested in patients with persistent joint inflammation despite NSAIDs, low-dose GCs, and antimalarials.[8,49]	Low	Weak
Belimumab is recommended in patients refractory to standard treatment, as an adjuvant treatment to achieve control of joint manifestations.[84]	Moderate	Strong
Rituximab is recommended in cases refractory to previous treatment.[8,26,85]	Low	Strong
Anifrolumab is suggested in cases refractory to previous treatment[86–88].	Moderate	Weak

CLQ: chloroquine; GCs: glucocorticoids; HCQ: hydroxychloroquine; NSAIDs: non-steroidal anti-inflammatory drugs.

develop persistent and/or erosive arthritis. Myalgias and, in rare cases, myositis with weakness and elevated muscle enzymes may also occur, almost always with a self-limiting course. Treatment of this group of manifestations depends on their severity and includes the use of NSAIDs, GCs, disease-modifying drugs and, in some cases, biological therapy.[26,81–84] (Table 8)

Haematological manifestations

Haematological involvement in SLE is very common and occurs in more than 90% of patients.[89] It affects all cell lines and is characterised by mild manifestations such as chronic leukolymphopenia, and severe and acute life-threatening conditions requiring prompt specific treatment, such as haemolytic anaemia, autoimmune thrombocytopenia, thrombotic thrombocytopenic purpura, and haemophagocytic syndrome. In addition, multifactorial disorders occur such as anaemia of chronic disease and cytopenias associated with chronic organ damage (liver or kidney), infectious events, and/or drugs.[90]

Under the heading of recommendations for the treatment of haematological manifestations, guidelines on the evaluation and treatment of antiphospholipid syndrome (APS) have been included in this update. Up to 30% of patients with SLE have APS or positive antibodies, and the impact of this association on patient morbidity and prognosis is well known.[91–93] (Table 9)

Renal manifestations

Renal involvement in lupus is one of the most frequent manifestations and has the greatest impact on patient prognosis.

Table 9
Recommendations for the management of haematological manifestations.

Recommendation	Quality of evidence	Strength of recommendation
Thrombocytopenia		
In cases of moderate thrombocytopenia without signs of bleeding, high-dose prednisone is recommended until platelet counts reach above 100,000 cells/μL and gradually tapering the GC dose until discontinuation, adding another immunosuppressant to reduce the risk of relapse.[94,95]	Moderate	Strong
In cases of severe thrombocytopenia (<15,000 cells/μL) or with life-threatening signs of bleeding, the use of methylprednisolone pulses (1 g/day for 3–5 days, depending on the severity of the condition) is recommended for faster responses, making sure to continue high doses of prednisone or equivalent to avoid the risk of relapse. It is recommended that these doses be continued until the count is higher than 50,000 cells/μL and that some other immunosuppressant be added.[94,96,97]	Moderate	Strong
Danazol (200–800 mg/day) and/or antimalarials are recommended as adjunct therapy to oral GC treatment.[94,98,99]	Moderate	Strong
Rituximab is recommended in refractory cases.[100,101]	Moderate	Strong
IV immunoglobulin is recommended only in patients with poor response to GCs.[94,102–104]	Moderate	Strong
CPM is recommended for 3–6 months, depending on the severity of thrombocytopenia and clinical response, in patients who have not responded to previous therapy.[105–107]	Low	Strong
MMF is suggested in patients who are refractory to previous treatment.[108,109]	Low	Weak
AZA is suggested in patients who are refractory to other lines of treatment.[95,110,111]	Low	Weak
Alternatively, human recombinant thrombopoietin plus dexamethasone or other GCs are recommended.[94,112,113]	High	Strong
In patients with platelet counts below 10,000 cells/μL, regardless of whether or not there are signs of bleeding or a count below 50,000 cells/μL with active bleeding, the use of platelet concentrates is recommended.[114]	Moderate	Strong
Splenectomy is suggested in cases refractory to the four previous lines of treatment.[115,116]	Low	Weak
Autoimmune haemolytic anaemia		
GCs are recommended in situations where anaemia is life-threatening; use methylprednisolone pulses, followed by high-dose oral GCs.[117,118]	High	Strong
Concomitant use of AZA or danazol is recommended.[119–121]	Moderate	Strong
MMF, CPM, or biological therapy (rituximab, belimumab, anifrolumab) is suggested in refractory cases.[87,88,117,122–130]	Low	Weak
Packed red cell transfusion is not recommended, except in life-threatening cases, where washed red blood cells should be used.[131]	Moderate	Strong
Neutropenia, leukolymphopenia		
In neutropenia <1,000 cells/μL, associated with fever or infection, it is recommended to initiate granulocyte-colony-stimulating factor (300 μg/day) and continue with the minimum effective dose to achieve neutrophil counts greater than 1,000 cells /μL.[89,132–136]	Low	Strong
High doses of prednisone or its equivalent are suggested.[89,132]	Low	Weak
Concomitant use of AZA or MMF is suggested.[132,137]	Low	Weak

Table 9
(*Continued*)

Recommendation	Quality of evidence	Strength of recommendation
Rituximab is suggested in refractory disease (375 mg/m^2 body surface area for four weeks or 1 g on day zero and day 14).[132,137]	Very low	Weak
Good clinical practice point. Rule out infection or drug toxicity.		
Thrombotic thrombocytopenic purpura		
It is recommended to initiate plasma exchange as soon as the diagnosis is suspected (within 4–8 h) and administer until response is achieved, in combination with GCs. Exchange should be with fresh frozen plasma.[138]	Low	Strong
Methylprednisolone pulses as first-line therapy (1 g/day for 5 days) are recommended, followed by oral GCs with progressive dose reduction.[138,139]	Low	Strong
Second-line use of CPM, MMF, or biologicals such as rituximab, belimumab, or eculizumab is suggested in resistant cases.[138,140,141]	Low	Weak
Haemophagocytic syndrome		
Pulse methylprednisolone or prednisone is recommended.[142,143]	Low	Strong
Concomitant addition of cyclosporine, MMF, CPM, or rituximab is suggested.[144,145]	Low	Weak
Good clinical practice point. Supportive treatment (fluid resuscitation, antibiotics, covering transfusion requirements) should be provided, and search for and treat infectious foci.[142]		
Antiphospholipid antibody syndrome		
Primary thromboprophylaxis		
In any patient with antiphospholipid antibodies, treatment or correction of cardiovascular risk factors is highly recommended.[146,147]	Moderate	Strong
In patients with a medium/high risk profile (presence of lupus anticoagulant, high titres of antiphospholipid antibodies, or double or triple positivity), treatment with antiplatelet doses of acetylsalicylic acid (ASA 75–100 mg/day) is recommended indefinitely, as long as not contraindicated.[148]	Low	Strong
Good clinical practice point. In patients with antiphospholipid antibodies, in situations of high thrombotic risk (surgery, prolonged immobilisation, puerperium, among others), treatment with low-molecular-weight heparin at prophylactic doses should be used.		
Secondary thromboprophylaxis		
For secondary prevention of venous thrombosis, indefinite anticoagulation therapy with vitamin K antagonists (VKA) to achieve an INR 2.0–3.0, is recommended.[149]	Moderate	Strong
For the prevention of recurrence of arterial thrombosis, anticoagulation with VKA (INR 2.0–3.0 or 3.0–4.0 depending on individual thrombotic/haemorrhagic risk) or a combination of VKA (INR 2.0–3.0) plus ASA is recommended.[150–153]	Low	Strong
In case of thrombotic recurrence (venous or arterial) despite the treatment established, it is recommended to increase the VKA dose to INR 3.0–4.0 or to add ASA if not already on this treatment. HCQ or statins may be useful.[154,155]	Low	Strong
Direct oral anticoagulants (DOACs) are not recommended in patients with APS.[91,149,156–163]	Low	Strong
Prudent use of DOACs is suggested only in situations of intolerance to or ineffectiveness of VKAs, and only in patients with venous thrombosis. DOACs should not be used in triple positive or arterial thrombosis.[160,161,164,165]	Low	Weak

APS: antiphospholipid syndrome; AZA: azathioprine; CPM: cyclophosphamide; GCs: glucocorticoids; MMF: mycophenolate mofetil.

There are populations, such as the Mexican population, in which lupus nephritis presents at a younger age and is usually more severe.[166,167]

The optimal treatment of lupus nephritis is defined by both histological findings and clinical behaviour. In proliferative nephritis, a period of remission induction followed by prolonged maintenance therapy is still recommended, although multiple therapy may be initiated early on (e.g., MMF or CPM plus a calcineurin inhibitor), especially in patients with poor prognostic data. Recent evidence shows that this regimen may be superior to monotherapy in terms of long-term outcomes.[168–170] The use of anti-Blys/BAFF biological therapy (specifically belimumab) is also suggested as an adjuvant to standard management, as this has been shown to result in longer renal survival and fewer relapses.[50,171,172]

Current recommendations emphasise the detection of associated poor prognostic data (e.g., antiphospholipid antibodies) and concomitant management of risk factors for progression of renal damage as an indispensable measure to improve long-term prognosis.[173,174] (Table 10)

Neuropsychiatric manifestations

Neuropsychiatric involvement in SLE is highly variable, with frequencies reported to range from 14% to 75%.[188] This wide variation in frequency is due to the difficulty in attributing neuropsychiatric manifestations with certainty to the disease, after secondary causes such as metabolic and infectious, have been ruled out.[189] The American College of Rheumatology published the nomenclature for neuropsychiatric lupus syndromes,[190] which includes 18 manifestations; however, virtually any manifestation can occur in SLE, whether or not accompanied by activity in another organ or system. Neuropsychiatric involvement is a major cause of mortality and cumulative damage. (Table 11)

Cardiopulmonary manifestations

The spectrum of cardiopulmonary manifestations in SLE patients is very diverse, ranging from mild, often subclinical conditions such as pleuritis or pericarditis, chronic manifestations with significant impact on quality of life such as interstitial pneumonitis or pulmonary arterial hypertension (PAH), to acute and life-threatening events such as diffuse alveolar haemorrhage.[207,208] Timely detection of these manifestations requires a high degree of clinical suspicion and, of course, treatment will depend on the type and severity of each manifestation, ranging from symptomatic management to the use of high doses of GCs, immunosuppressants, or even biological therapies. Specific treatment recommendations are also included, for example for PAH, and the need for joint management with cardiology and pulmonology is highlighted.[209] (Table 12)

Gastrointestinal manifestations, hepatitis, and pancreatitis

Gastrointestinal and hepatic manifestations are common in SLE patients. They are complex to assess and treat because they are often multifactorial. Gastrointestinal involvement varies from drug-associated dyspepsia to episodes of intestinal pseudo-obstruction and severe vasculitis.[239] Hepatitis and pancreatitis especially, can be explained by disease activity, but may also be due

Table 10
Recommendations for the management of renal manifestations.

Recommendation	Quality of evidence	Strength of recommendation
Nephritis in Mexican patients (Latino, Mesoamerican)		
Remission induction therapy with MMF (2–3 g/day) or CPM (1 g/m^2 body surface area) monthly is recommended in this population.[166,175]	Moderate	Strong
Class I and II nephritis		
Immunosuppressive therapy is suggested for class I and II nephritis with impaired renal function, active sediment, or proteinuria ≥1 g/day.[167,176]	Low	Weak
Treatment with AZA, MMF (1–2 g/day), or CPM is suggested for a minimum period of six months, together with medium-dose GCs and gradual tapering.[177,178]	Low	Weak
Remission induction therapy for class III/IV nephritis with proliferative component		
Remission induction therapy with MMF (2–3 g/day) or CPM (monthly pulses of 1 g/m^2 body surface area), combined with gradually tapered GCs, is recommended for a period of six months.[168,177,178]	High	Strong
In the event of no response, multiple therapy is recommended: MMF plus tacrolimus (3–4 mg/day) and) and GCs.[168.]	High	Strong
As an alternative, it is recommended to combine MMF plus voclosporin (23.7 mg/12 h).[169,170]	Moderate	Strong
Adding belimumab to standard management is recommended in patients with poor prognostic factors or refractory cases.[172,179]	Moderate	Strong
Adding rituximab or anifrolumab to standard management is suggested in patients with poor prognostic factors or refractory cases.[50,80,171]	Low	Weak
Pulsed or high-dose oral GCs are recommended as initial treatment in addition to the immunosuppressive regimen, with gradual tapering.[177,178]	Moderate	Strong
Class V nephritis without proliferative component		
MMF (2–3 g/day) or AZA (1–3 mg/kg) is recommended.[177,178]	High	Strong
Tacrolimus, voclosporin, cyclosporin A, CPM, or rituximab are suggested for patients who are refractory to treatment.[169,180]	Moderate	Weak
Maintenance therapy for class III/IV and V nephritis with proliferative component		
MMF (1–2 g/day), AZA (1–3 mg/kg), or continuation of multiple therapy: MMF plus tacrolimus is recommended. Treatment should be long-term: at least 2–5 years.[177,178,181]	High	Strong
Quarterly CPM, tacrolimus, cyclosporin A, or rituximab are suggested in patients with intolerance to MMF or AZA.[177,178,182]	Moderate	Weak
Rapidly progressive nephritis/with cellular crescents		
Induction therapy with monthly CPM (.750–1 g/m^2 body surface area) or MMF (2–3 g/day) for six months is recommended. Both options combined with high-dose pulse methylprednisolone or prednisone, with gradual tapering depending on progression.[177,178,183,184]	High	Strong
If there is no response, multiple therapy is suggested: MMF plus tacrolimus and GCs.[184]	Moderate	Weak
The use of rituximab or belimumab is suggested in the treatment of refractory cases.[172,185]	Low	Weak
Adjuvant management		
Management to reduce renal risk factors is recommended in all patients: ACE inhibitors, ARA II, or SGLT2i, adequate control of hypertension, dyslipidaemia, hyperuricaemia, avoidance of smoking, and control of body weight.[173]	High	Strong
HCQ is recommended on an ongoing basis to reduce the likelihood of renal relapse and for its benefits on dyslipidaemia.[20–22]	High	Strong
It is recommended to assess for the presence of antibodies or APS and the use of antiplatelet agents or anticoagulants in patients at risk.[174]	High	Strong
Treatment of relapse		
Repeat previously effective remission induction therapy is recommended.[177,178]	Moderate	Strong
Management with renal replacement therapy and transplantation		
In patients with end-stage chronic kidney disease due to lupus nephritis, renal transplantation is recommended as the best long-term treatment option.[177,178,186]	High	Strong
Haemodialysis is recommended over peritoneal dialysis as replacement therapy in patients with end-stage chronic kidney disease due to lupus nephritis, because peritoneal dialysis has been associated with increased complications and mortality.[177,178,187]	Moderate	Strong

ARA II: angiotensin II receptor antagonists; AZA: azathioprine; CPM: cyclophosphamide; GCs: glucocorticoids; ACEI: angiotensin-converting enzyme inhibitor; MMF: mycophenolate mofetil; SGLT2i: sodium-glucose cotransporter 2 inhibitors.

to primary autoimmune conditions, metabolic events, infectious conditions, or drug toxicity.[239–241] (Table 13)

Vaccination

Current evidence is clear that most vaccines are safe and effective in lupus patients. Despite initial controversies regarding the possibility of polyclonal activation in patients upon vaccination, or doubts regarding the level of seroprotection and seroconversion, the benefit of vaccination has been shown to outweigh the risk and it is now recommended that all lupus patients have a full vaccination schedule. Ideally, vaccinations should be given before the start of immunosuppressive treatment, but when not possible they should be scheduled for the most appropriate time. A special situation is the live attenuated virus vaccines, which can be administered in patients with inactive SLE who are not receiving immunosuppressive drugs.[258–261] (Table 14)

Perioperative period

Undertaking surgical procedures in patients with lupus requires special attention because these patients are often medically complex due to disease activity, potential organ damage, comorbidities, and immunosuppressive therapy. It has been shown that patients with lupus suffer more perioperative complications than the general population and therefore, whenever possible, surgery in these patients requires adequate planning, adjustment of treatment, and careful monitoring during and after the procedure, with a multidisciplinary approach. The following recommendations highlight the most important aspects regarding the adjustment of treatment with GCs, immunosuppressants, and biological therapies during the perioperative period.[274,275] (Table 15)

Pregnancy

The period of pregnancy and lactation requires special attention in patients with SLE associated or not with antiphospholipid anti-

Table 11
Recommendations for the management of neuropsychiatric manifestations.

Recommendation	Quality of evidence	Strength of recommendation
General recommendations		
Good clinical practice point. Other neuropsychiatric causes should be excluded before attributing manifestations to disease activity. Management of these manifestations should be assessed in conjunction with a neurologist or psychiatrist, as appropriate.		
GCs and immunosuppressive therapy are recommended for neuropsychiatric manifestations that are considered secondary to inflammatory process or activity (e.g., aseptic meningitis, myelitis, cranial and peripheral neuropathies, and psychosis).[188]	Moderate	Strong
Anticoagulant therapy is recommended when manifestations are related to APS, especially in cerebral vascular events of thrombotic origin.[188]	Moderate	Strong
Antiplatelet therapy is recommended when manifestations are related to APS.[188]	Moderate	Strong
Cognitive dysfunction		
Management of associated factors such as anxiety, depression, control of cardiovascular risk factors, as well as psychological support are suggested, as they may prevent further cognitive decline.[191]	Low	Weak
Epileptic seizures		
Antiepileptic drugs are recommended when there are recurrent seizures or when there are at least two episodes within the first 24 h or there is epileptogenic activity on EEG.[188]	Moderate	Strong
IV methylprednisolone, followed by prednisone (1 mg/kg/day for no more than three months), tapered according to disease activity, is recommended for refractory seizures associated with SLE activity.[192]	Moderate	Strong
Concomitant IV CPM (.75 g/m^2 body surface area) monthly for 12 months is recommended.[192]	Moderate	Strong
Peripheral neuropathy, myelopathy, and optic neuritis		
IV methylprednisolone is recommended, followed by prednisone (1 mg/kg/day), and tapering according to disease activity.[192–195]	Moderate	Strong
Concomitant monthly IV CPM for 12 months is recommended.[192–194]	Moderate	Strong
IV immunoglobulin (2 g/kg divided over five days) is suggested in refractory cases.[193,194,196–198]	Moderate	Weak
Methylprednisolone, CPM, AZA, or rituximab is recommended in cases of extensive transverse myelitis.[199,200]	Moderate	Strong
Chorea and other abnormal involuntary movements		
ASA is suggested for use in antiphospholipid antibody-associated chorea and anticoagulation if there is coexisting APS.[201–203]	Low	Weak
Symptomatic therapy with dopamine antagonists is recommended in case of abnormal involuntary movement.[201]	Moderate	Strong
Psychosis		
Prednisone 1 mg/kg/day for eight weeks with gradual tapering to 5 mg/day is recommended.[204]	Moderate	Strong
Symptomatic therapy with dopamine antagonists is recommended.[205]	Moderate	Strong
Concomitant monthly IV CPM for six months is recommended.[204,206]	Moderate	Strong
Rituximab or plasmapheresis is suggested in refractory cases.[188]	Low	Weak
Intravenous immunoglobulin is suggested if all of the above fails.[188]	Low	Weak

ASA: acetylsalicylic acid; APS: antiphospholipid syndrome; AZA: azathioprine; CPM: cyclophosphamide; GCs: glucocorticoids.

body syndrome. Because disease relapses are more frequent during pregnancy and there is a higher risk of complications for both mother and infant, basic recommendations for pregnancy planning, appropriate contraception, surveillance, and treatment of women during this period are included in this document.[285,286] (Table 16)

Table 17 summarises the current evidence on the safety of the main drugs used in this disease during pregnancy and lactation. For a more extensive description of the topic refer to the CPG on the management of pregnancy in women with rheumatological autoimmune diseases.[287]

Cardiovascular risk

Patients with SLE are known to have an increased cardiovascular and cerebrovascular risk, which may be more than double that of the general population and is one of the main determinants of long-term morbidity and mortality. This increased risk is explained by a multifactorial process of accelerated atherosclerosis involving endothelial dysfunction, autoantibody-induced damage, chronic inflammation, changes in lipid and lipoprotein profile, increases in traditional risk factors and even adverse effects of GC and NSAID therapy.[325–327] Therefore, in this update of lupus treatment recommendations, it was considered essential to include guidelines on the best methods of assessment, prevention, and treatment of cerebrovascular and cardiovascular events. (Table 18)

Discussion

The treatment of a disease as complex as SLE undoubtedly benefits from treatment guidelines that guide rheumatologists and other treating physicians on the best management options for patients with a personalised approach.

Given the advance of knowledge and the emergence of new therapeutic options for the treatment of SLE, this new version of the Mexican College of Rheumatology guidelines is the result of the collaborative work of a large group of rheumatologists with expertise in the field who, after systematically reviewing the most recent evidence in the literature, issue recommendations that update the therapeutic guidelines for the manifestations in the different organs and systems affected by the disease based on the most recent knowledge.

By including in these recommendations general principles on the management of the disease, the role of the rheumatologist as a leader in the treatment of these patients is highlighted, the general concepts that should govern treatment, always having a treat-to-target (T2T) strategy, and the importance of the treatment being chosen in agreement with the patient considering the individual benefit/risk profile.

The importance of the use of antimalarials is highlighted as long as there is no contraindication as a strategy to control the disease, avoid relapses, spare GCs, and reduce cardiovascular risk. There is a clear need to use GCs more rationally, with appropriate doses at baseline according to the manifestation, and tapering as quickly as possible, due to evidence of an association between steroid use and long-term damage.

The timely use of disease course modifiers or immunosuppressants indicated according to the different manifestations of the condition, or even multiple therapy in the case of lupus nephritis, is increasingly evident in the literature. This strategy allows for better and faster control of disease activity, and spares GCs. Recommendations on the use of new drugs such as voclosporin and others, which have been shown to be effective in the treatment of lupus, have been included.

Table 12
Recommendations for the management of cardiopulmonary manifestations.

Recommendation	Quality of evidence	Strength of recommendation
Pericarditis		
NSAIDs are suggested in cases of mild, acute, or chronic pericarditis, with or without effusion, until clinical symptoms improve.[210,211]	Low	Weak
For acute or chronic pericarditis with pericardial effusion, prednisone at a dose of 1 mg/kg/day is recommended in patients with mild to moderate pericarditis as the initial manifestation. For severe or constrictive pericarditis, pulse methylprednisolone is recommended.[211–215]	Moderate	Strong
In patients with new-onset or recurrent pericarditis, colchicine 1 mg in combination with GCs and immunosuppressants is suggested until remission is achieved. To avoid relapse, the addition of colchicine for at least one month is recommended.[213,215,216]	Moderate	Weak
Good practice point. Surgery is indicated for treatment-resistant pericarditis or tamponade unresponsive to pharmacological treatment.		
Myocarditis		
Pulse methylprednisolone is recommended for severe myocarditis with arrhythmias and/or ventricular ejection fraction of <55%, then treatment with moderate- to high-dose prednisone with progressive tapering.[217]	Low	Strong
HCQ or CLQ is suggested for the maintenance stage (except in cases of prolonged QT interval).[217]	Low	Weak
For severe manifestation with arrhythmias or ventricular ejection fraction <40%, CPM is suggested for 3–10 months as first-line therapy in conjunction with GCs. It is suggested response be evaluated at three months; if no improvement, discontinue to avoid risk of toxicity; if there is improvement, a minimum of six months of treatment is recommended.[218]	Moderate	Weak
MMF is suggested as maintenance therapy after CPM, to reduce relapse.[217]	Moderate	Weak
AZA is suggested as maintenance therapy after CPM in patients with intolerance to MMF.[217]	Low	Weak
Immunoglobulin is suggested for patients with complicated myocarditis who have failed standard induction therapy with GCs and CPM.[217]	Low	Weak[217]
Pulmonary Arterial Hypertension		
High-dose GCs are recommended for four weeks with gradual tapering.[219,220]	Moderate	Strong
Pulse methylprednisolone is recommended in severe cases when concurrent with other organ involvement and in relapse.[221,222]	Low	Strong
CPM is recommended for 3–6 months as immunosuppressive therapy combined with GCs, vasodilators, diuretics, and other supportive measures.[220,221,223]	Moderate	Strong
It is suggested to use MMF as maintenance after CPM or in case of intolerance or contraindication to CPM.[222]	Low	Weak
Bosentan 62.5 mg twice daily for four weeks and follow up with 125 mg twice daily for 3–12 months in conjunction with GCs and immunosuppressants as first-line therapy in patients with NYHA functional classes II and III is recommended.[224–226]	High	Strong
Additional use of sildenafil, at an initial dose of 20 mg three times daily, which can be gradually increased to 80 mg three times daily according to patient tolerability, is recommended as first-line therapy in patients with PAH and NYHA functional classes II and III.[224,226]	High	Strong
It is suggested to consider its use in patients with functional class IV.[224,226–228]	Low	Weak
Selexipag is suggested at doses of 200–600 mcg twice daily in patients with NYHA functional class I-II.[209]	High	Weak
Good practice point. In patients with NYHA functional class III and IV, use of epoprostenol and teprostinil should be assessed individually in conjunction with the heart and lung services, as well as the use of combination therapy with vasodilators, phosphodiesterase inhibitors, and endothelin-1 antagonists.		
Pleuritis with or without pleural effusion		
NSAIDs are recommended.[229,230]	Moderate	Strong
GCs are recommended when there is no therapeutic response with NSAIDs for 1–2 weeks, prednisone in medium doses and tapering within 2–3 weeks.[229,230]	Moderate	Strong
Good practice point. There is insufficient evidence on the use of immunosuppressants in this context.		
Acute lupus pneumonitis		
Prednisone (1 mg/kg/day) for three days and assessing clinical response is recommended; if no response, consider IV methylprednisolone for three days.[231]	Moderate	Strong
It is suggested that CPM (.5–1 g/m^2 body surface area) monthly for 3–6 months be considered in cases refractory to GCs.[231]	Low	Weak
It is suggested that immunoglobulin be considered for cases refractory to or contraindicated for immunosuppressive therapy.[230–232]	Low	Weak
Interstitial lung disease		
Prednisone (.5–1 mg/kg/day) is recommended for 2–4 weeks with gradual tapering.[233]	Moderate	Strong
Monthly CPM is recommended for 6–12 months in severe cases.[232,233]	Moderate	Strong
Rituximab is suggested in refractory cases.[232,233]	Low	Weak
Good practice point. Smoking cessation, consideration of supplemental oxygen and vaccination schedule for influenza, pneumococcal, respiratory syncytial virus, and SARS-CoV-2232 are indicated.[232]		
Diffuse alveolar haemorrhage		
Methylprednisolone pulses are recommended.[234,235]	Moderate	Strong
Monthly CPM is recommended for 6–12 months.[235,236]	Low	Strong
MMF or AZA is recommended as maintenance therapy.[234,236]	Low	Strong
Rituximab with CPM is recommended for refractory cases.[237]	Low	Strong
Immunoglobulin is recommended for cases resistant to previous treatment.[236]	Low	Strong
Plasma exchange (5–7 sessions) is suggested in patients resistant to previous treatment.[235,238]	Low	Weak
It is suggested to consider recombinant factor VIIa in refractory cases.[237]	Low	Weak
Good practice point. Take bronchial secretion cultures if there is suspected association with pulmonary infectious processes.[236]		

AZA: azathioprine; CLQ: chloroquine; CPM: cyclophosphamide; GCs: glucocorticoids; HCQ: hydroxychloroquine; MMF: mycophenolate mofetil; NSAIDs: nonsteroidal anti-inflammatory drugs; NYHA: New York Heart Association; PAH: pulmonary arterial hypertension.

The role of biological therapy, in addition to standard treatment and even in the future as a first line of treatment, for various manifestations of lupus is now clearer, and recommendations for belimumab, anifrolumab, and rituximab have been updated.

The update addresses special aspects of lupus treatment such as comprehensive treatment during pregnancy and lactation, as well as safe medications during this period, therapeutic adjustment during the perioperative period and current indications for vaccination.

Finally, the increased cardiovascular risk of lupus patients is well known, explained by an accelerated atherosclerosis process caused by the inflammatory phenomenon of the disease itself, traditional

Table 13
Recommendations for the management of gastrointestinal manifestations.

Recommendation	Quality of evidence	Strength of recommendation
Intestinal vasculitis		
Administration of pulse methylprednisolone followed by high-dose prednisone is recommended.[239,242–244]	Low	Strong
Concomitant use of GCs and CPM is recommended.[239,242–244]	Low	Strong
MMF and AZA are suggested as maintenance therapy.[239]	Low	Weak
Immunoglobulin IV is suggested in patients who are refractory to previous treatment (lack of response in 24–48 h) or if an associated infectious process is suspected.[239]	Low	Weak
Good clinical practice point. Exploratory laparotomy is indicated in refractory cases or if there are complications.		
Intestinal pseudo-obstruction		
Methylprednisolone pulses are recommended, followed by high-dose prednisone or equivalent.[245–248]	Low	Strong
Addition of CPM is recommended.[240,245,247]	Low	Strong
MMF or AZA is suggested as maintenance treatment.[240,245]	Low	Weak
Immunoglobulin is recommended in refractory cases (lack of response within 24–48 h after GC administration).[240,247]	Low	Strong
Good practice point. General measures such as prokinetics, decompression catheters, hydration, and electrolyte control should be administered in all cases, and exploratory laparotomy should be considered in refractory cases or in the event of complications.[240]		
Protein-losing enteropathy		
High-dose GCs are recommended. Pulse methylprednisolone should be considered if the patient has severe disease complications (severe hypoalbuminemia with capillary leak and pleural or pericardial effusion, or severe hepatic involvement).[1,239,242,244,249]	Moderate	Strong
Concomitant GCs and immunosuppressants are suggested.[1,239,242,244,249]	Low	Weak
Rituximab is suggested in patients resistant to previous treatment.[239]	Low	Weak
Good practice point. Diets high in protein and medium-chain triglycerides are useful, as well as treatment with octreotide.		
Lupus hepatitis		
GCs at medium and high doses are recommended until normalization or reduction of liver enzymes <2 times their normal values.[240,241,250–252]	Low	Strong
Immunosuppressants (AZA or MMF) are recommended in combination with GCs.[173,240,250–252]	Low	Strong
Belimumab is suggested in patients who have failed previous treatment.[253,254]	Low	Weak
Good practice point. Causes of secondary hepatitis associated with hepatic autoimmune diseases (autoimmune hepatitis, primary biliary cholangitis, primary sclerosing cholangitis, overlap syndromes); alternative liver diseases, such as liver damage from drugs, alcohol, fatty liver, vascular causes, hypercoagulable states, and viral infectious hepatitis should always be considered.[244,255,256]		
Lupus pancreatitis		
High-dose GCs are recommended in patients with acute pancreatitis. Pulse methylprednisolone for three doses can be used in patients who do not respond to the initial dose.[1,239,257]	Low	Strong
Plasma exchange is recommended for patients who are refractory to GC therapy.[1,239]	Moderate	Strong
IV immunoglobulin is suggested in patients who are refractory to GCs or when an associated infectious process is suspected.[239]	Low	Weak
Concomitant use of GCs and immunosuppressants is suggested.[1,239]	Low	Weak
Rituximab is suggested in patients who are refractory to previous treatment.[239]	Low	Weak
Good practice point. The diagnosis of lupus pancreatitis is made after excluding other causes, such as obstructive, toxic-metabolic, drug-induced, or viral. Treatment should be escalated if there is no response to GCs in 24–48 h and should include the usual supportive management of pancreatitis.		

AZA: azathioprine; CFM: cyclophosphamide; GCs: glucocorticoids; MMF: mycophenolate mofetil.

Table 14
Recommendations on vaccination.

Recommendation	Quality of evidence	Strength of recommendation
The following vaccines are recommended in patients with SLE: influenza (H1N1, H3N2, influenza type B),[259,261–264] pneumococcal (heptavalent pneumococcal conjugate vaccine, pneumococcal conjugate vaccine PCV13 or pneumococcal polysaccharide vaccine PPSV23),[258,261,265,266] SARS-CoV-2 (mRNA),[267,268] herpes zoster,[269–271] human papillomavirus (in people under 45 years of age).[272,273]	Moderate	Strong
Vaccination against hepatitis B is suggested in patients with inactive SLE.[260]	Moderate	Weak

SLE: systemic lupus erythematosus.

Table 15
Recommendations on perioperative management.

Recommendation	Quality of evidence	Strength of recommendation
It is suggested to continue the same dose of methotrexate, antimalarials, and sulfasalazine during the perioperative period.[274,276–278]	Low	Weak
In patients with moderate lupus undergoing elective surgery, it is recommended that MMF, AZA and/or tacrolimus be discontinued one week before surgery and restarted in the absence of infection or healing complications.[274,278–280]	Low	Strong
In patients with severe lupus undergoing elective surgery, it is recommended not to discontinue MMF, AZA, and/or tacrolimus.[274,278–280]	Low	Strong
In patients on biological therapy with rituximab or belimumab, it is recommended to withhold the next dose before surgery and to restart in the absence of infection or healing complications.[281–284]	Low	Strong
In SLE patients receiving moderate or high doses of GCs, perioperative stress doses (50 mg hydrocortisone every 8 h) are recommended.[280]	Low	Strong
In SLE patients receiving low doses of GCs, the use of stress doses is not suggested, as long as they continue their usual dose.[280]	Low	Weak

AZA: azathioprine; GCs: glucocorticoids; MMF: mycophenolate mofetil; SLE: systemic lupus erythematosus.

Table 16
Recommendations in pregnancy and lactation.

Recommendation	Quality of evidence	Strength of recommendation
It is recommended that women with SLE in remission or with low disease activity, without antiphospholipid antibodies, use a highly effective contraceptive method (hormonal contraceptives or IUD) instead of less effective methods or no contraception.[288–290]	High	Strong
It is recommended that women with SLE with moderate or severe disease activity or with positive antiphospholipid antibodies use progestins or IUDs as a contraceptive method.[291,292]	Moderate	Strong
Preconception counselling is recommended for all women with SLE of childbearing age, especially if they are receiving potentially teratogenic drugs.[285,286,293,294]	Low	Strong
It is recommended that pregnancy in a woman with SLE be planned to decrease the risk of obstetric complications.[295–299]	Low	Strong
It is recommended that pregnancy be contraindicated in SLE patients with severe organ damage, such as class III-IV heart failure, moderate to severe renal disease, severe PAH, cerebrovascular event, or recent thrombosis, due to the high risk of complications for the mother and foetus.[300]	High	Strong
It is recommended that a woman with SLE planning pregnancy be in remission or at least low disease activity for at least six months.[301–304]	Low	Strong
It is recommended that anti-Ro and anti-La antibodies be determined before or immediately after conception to better stratify the patient's obstetric risk.[305]	Moderate	Strong
Determination of antiphospholipid antibodies (lupus anticoagulant, anticardiolipin, anti-Beta-2 glycoprotein) is recommended before or immediately after conception to better stratify the patient's obstetric risk.[306–311]	High	Strong
In women with pregnancy plans, switching to non-contraindicated drugs is recommended rather than discontinuing treatment.[312–314]	High	Strong
Good practice point. The pregnant patient with SLE should be followed up at least once in each trimester of gestation and postpartum, including clinical and analytical data to assess disease activity.[287,315–319]		
Good practice point. The pregnant patient should be followed up and assessed in conjunction with specialists in maternal-foetal medicine and any others necessary for the monitoring and timely detection of pregnancy-related complications.[287,317–319]		

GCs: glucocorticoids.

Table 17
Use of drugs during pregnancy and lactation in SLE patients.

Drugs	Use during pregnancy	Use during lactation	Comments
Non-selective non-steroidal anti-inflammatory drugs	YES	YES	Discontinue if the patient cannot conceive. Discontinue by gestational week 30 due to the risk of premature closure of the ductus arteriosus. Preferably use those with a short half-life.[320]
COX-2 inhibitors[320]	NO	NO	
Glucocorticoids	YES	YES	Prednisone equivalent <20 mg/day is relatively safe, but lower doses and a GC-sparing drug should be used whenever possible. If the dose is >20 mg/day, lactation should be delayed four hours.[321]
Chloroquine/hydroxychloroquine[314]	YES	YES	
Azathioprine/6-mercaptopurine[287,319,322]	YES	YES	
Methotrexate	NO	NO	Discontinue three months before attempting pregnancy.[287,319,321]
Leflunomide	NO	NO	Discontinue 24 months before attempting conception or attempt cholestyramine washout and determine serum levels.[287,319,321]
Danazol	NO	NO	Discontinue 1–3 months before attempting pregnancy.[319]
Thalidomide	NO	NO	Discontinue 1–3 months before attempting pregnancy.[319]
Mycophenolate mofetil	NO	NO	Discontinue three months before attempting pregnancy.[287,319,323]
Cyclophosphamide	NO	NO	Discontinue three months before attempting pregnancy. Consider use in the second and third trimester of pregnancy if the patient has a life-threatening condition.[287,319,321]
Cyclosporine A[287,319]	YES	YES	
Tacrolimus[319,321]	YES	YES	
Vitamin K antagonists	NO	YES	Substitute for heparin during pregnancy.[287,319]
Unfractionated heparin/low molecular weight heparin[319,323]	YES	YES	
Rituximab	NO	NO	Consider if patient has no other treatment option. Drug levels in breast milk are low, and therefore exposure in the infant is similarly low. [319]
Belimumab	NO	NO	Consider if the patient has no other treatment option. Drug levels in breast milk are low, and therefore exposure in the infant is similarly low.[324]
Anifrolumab	NO	NO	No information available.

IUD: intrauterine device; PAH: pulmonary arterial hypertension; SLE: systemic lupus erythematosus.

Table 18
Recommendations to reduce cardiovascular risk.

Recommendation	Quality of evidence	Strength of recommendation
It is recommended that cardiovascular risk be assessed based on the risk calculators used for the general population in all patients with SLE.[325–330]	Moderate	Strong
In patients with SLE and moderate cardiovascular risk according to the risk calculators, it is recommended that the approach to identifying subclinical atherosclerosis be complemented by coronary artery calcium scoring (CAC) or carotid US.[331,332]	Weak	Strong
Acetylsalicylic acid is recommended for primary prevention in patients with SLE and positive for antiphospholipid antibodies.[333–337]	Low	Strong
Statins are suggested to reduce progression in patients with SLE and evidence of subclinical atherosclerosis (identified by CAC or carotid US).[331,332,338–340]	High	Weak

SLE: systemic lupus erythematosus; US: ultrasound.

risk factors, and as a side effect of GC use. Therefore, general recommendations to address cardiovascular risk have been included.

These updated SLE treatment guidelines are intended to be a valuable and useful tool not only for specialist physicians in making treatment decisions for individual patients, but also as guidance for first-contact physicians or physicians in other specialties who sometimes have to initiate or modify treatments, as well as refer patients to rheumatology specialists. It is certainly desirable that they also form the basis for implementing healthcare policies for SLE patients at institutional and governmental level.

Of course, there are still areas of opportunity and rheumatologists must be prepared to address them. New evidence regarding disease diagnosis, markers of therapeutic response, and the design of pharmacological strategies to achieve remission, the latter a dynamic and rapidly changing definition, combined with the growing role of artificial intelligence in data analysis and drug design, portend an interesting and complex future for patients and specialists, a challenge that we must take up together.

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Declaration of competing interest

Deshire Alpizar-Rodriguez has undertaken previous work with GSK Mexico.

Lilia Andrade-Ortega has been a speaker, or advisor, for Astra Zeneca and GSK.

Sandra M. Carrillo-Vázquez has served as a lecturer for Abbvie, Asofarma, AstraZeneca, GSK, Novartis, and UCB.

Sergio Durán-Barragán has been a speaker for Amgen, Janssen, Novartis, and Abbvie, as well as principal investigator in clinical trials with Lilly, Janssen, Novartis, Pfizer, Glaxo, Abbvie, Biogen, BMS, Astra Zeneca, Merck Serono, and UCB.

Fedra Irazoque-Palazuelos has been a consultant and speaker for Abbvie, Lilly, and Janssen.

Javier Merayo-Chalico has served as a speaker for Abbvie, Astra Zeneca, and Janssen.

Sandra Sicsik-Ayala has been a speaker for Abbvie, Lilly, UCB, Janssen, and Roche.

Luis H. Silveira has served as speaker for Johnson & Johnson, Teva, and Novartis.

Daniel Xibillé-Friedmann has been a speaker and consultant for Astra Zeneca and Lilly, and conducted clinical trials with BMS and IDORSIA.

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References

1. Xibillé-Friedmann D, Pérez-Rodríguez M, Carrillo-Vázquez S, et al. Guía de práctica clínica para el manejo del lupus eritematoso sistémico propuesta por el Colegio Mexicano de Reumatología. Reumatol Clin. 2019;15(1):3–20, http://dx.doi.org/10.1016/j.reuma.2018.03.011.
2. Guyatt G, Oxman AD, Akl EA, et al. GRADE guidelines: 1. Introduction—GRADE evidence profiles and summary of findings tables. J Clin Epidemiol. 2011;64(4):383–94, http://dx.doi.org/10.1016/j.jclinepi.2010.04.026.
3. Fanouriakis A, Kostopoulou M, Andersen J, et al. EULAR recommendations for the management of systemic lupus erythematosus: 2023 update. Ann Rheum Dis. 2024;83(1):15–29, http://dx.doi.org/10.1136/ard-2023-224762.
4. Morrison T, Foster E, Dougherty J, Barton J. Shared decision making in rheumatology: a scoping review. Semin Arthritis Rheum. 2022;56:152041, http://dx.doi.org/10.1016/j.semarthrit.2022.152041.
5. Ugarte-Gil MF, Mendoza-Pinto C, Reátegui-Sokolova C, et al. Achieving remission or low disease activity is associated with better outcomes in patients with systemic lupus erythematosus: a systematic literature review. Lupus Sci Med. 2021;8(1):e000542, http://dx.doi.org/10.1136/lupus-2021-000542.
6. van Vollenhoven RF, Bertsias G, Doria A, et al. 2021 DORIS definition of remission in SLE: final recommendations from an international task force. Lupus Sci Med. 2021;8(1):e000538, http://dx.doi.org/10.1136/lupus-2021-000538.
7. Durcan L, O'Dwyer T, Petri M. Management strategies and future directions for systemic lupus erythematosus in adults. Lancet. 2019;393(10188):2332–43, http://dx.doi.org/10.1016/S0140-6736(19)30237-5.
8. Pons-Estel BA, Bonfa E, Soriano ER, et al. First Latin American clinical practice guidelines for the treatment of systemic lupus erythematosus: Latin American Group for the Study of Lupus (GLADEL, Grupo Latino Americano de Estudio del Lupus)-Pan-American League of Associations of Rheumatology (PANLAR). Ann Rheum Dis. 2018;77(11):1549–57, http://dx.doi.org/10.1136/annrheumdis-2018-213512.
9. Chen YM, Hung WT, Liao YW, et al. Combination immunosuppressant therapy and lupus nephritis outcome: a hospital-based study. Lupus. 2019;28(5):658–66, http://dx.doi.org/10.1177/0961203319842663.
10. Gatto M, Zen M, Iaccarino L, Doria A. New therapeutic strategies in systemic lupus erythematosus management. Nat Rev Rheumatol. 2019;15(1):30–48, http://dx.doi.org/10.1038/s41584-018-0133-2.
11. Kugasia A, Sehgal N, Dollear M, Sequeira W, Block JA, Jolly M. Practice patterns in longitudinal lupus care provision: patient and physician perspectives. Lupus. 2017;26(14):1556–61, http://dx.doi.org/10.1177/0961203317716788.
12. Ríos-Garcés R, Espinosa G, van Vollenhoven R, Cervera R. Treat to target in systemic lupus erythematosus. Rev Colomb Reumatol. 2021;28:101–6, http://dx.doi.org/10.1016/j.rcreu.2021.05.002.
13. Morand EF, Trasieva T, Berglind A, Illei GG, Tummala R. Lupus Low Disease Activity State (LLDAS) attainment discriminates responders in a systemic lupus erythematosus trial: post-hoc analysis of the Phase IIb MUSE trial of anifrolumab. Ann Rheum Dis. 2018;77(5):706–13, http://dx.doi.org/10.1136/annrheumdis-2017-212504.
14. Tselios K, Gladman DD, Touma Z, Su J, Anderson N, Urowitz MB. Clinical remission and low disease activity outcomes over 10 years in systemic lupus erythematosus. Arthritis Care Res (Hoboken). 2019;71(6):822–8, http://dx.doi.org/10.1002/acr.23720.
15. Abdul Kadir WD, Jamil A, Shaharir SS, Md Nor N, Abdul Gafor AH. Photoprotection awareness and practices among patients with systemic lupus erythematosus and its association with disease activity and severity. Lupus. 2018;27(8):1287–95, http://dx.doi.org/10.1177/0961203318770016.
16. Chanprapaph K, Ploydaeng M, Pakornphadungsit K, Mekwilaiphan T, Vachiramon V, Kanokrungsee S. The behavior, attitude, and knowledge towards photoprotection in patients with cutaneous/systemic lupus erythematosus:

a comparative study with 526 patients and healthy controls. Photochem Photobiol Sci. 2020;19(9):1201–10, http://dx.doi.org/10.1039/d0pp00073f.
17. Drosos GC, Vedder D, Houben E, et al. EULAR recommendations for cardiovascular risk management in rheumatic and musculoskeletal diseases, including systemic lupus erythematosus and antiphospholipid syndrome. Ann Rheum Dis. 2022;81(6):768–79, http://dx.doi.org/10.1136/annrheumdis-2021-221733.
18. Kuhn A, Gensch K, Haust M, et al. Photoprotective effects of a broad-spectrum sunscreen in ultraviolet-induced cutaneous lupus erythematosus: A randomized, vehicle-controlled, double-blind study. J Am Acad Dermatol. 2011;64(1):37–48, http://dx.doi.org/10.1016/j.jaad.2009.12.053.
19. Franklyn K, Lau CS, Navarra SV, et al. Definition and initial validation of a Lupus Low Disease Activity State (LLDAS). Ann Rheum Dis. 2016;75(9):1615–21, http://dx.doi.org/10.1136/annrheumdis-2015-207726.
20. Molad Y, Gorshtein A, Wysenbeek AJ, et al. Protective effect of hydroxychloroquine in systemic lupus erythematosus. Lupus. 2002;11(6):356–61, http://dx.doi.org/10.1191/0961203302lu203ra.
21. Fessler BJ, Alarcón GS, McGwin G, et al. Systemic lupus erythematosus in three ethnic groups: XVI. Association of hydroxychloroquine use with reduced risk of damage accrual. Arthritis Rheum. 2005;52(5):1473–80, http://dx.doi.org/10.1002/art.21039.
22. Pons-Estel GJ, Alarcón GS, Hachuel L, et al. Anti-malarials exert a protective effect while Mestizo patients are at increased risk of developing SLE renal disease: data from a Latin-American cohort. Rheumatology. 2012;51(7):1293–8, http://dx.doi.org/10.1093/rheumatology/ker514.
23. Buttgereit F. Standardised nomenclature for glucocorticoid dosages and glucocorticoid treatment regimens: current questions and tentative answers in rheumatology. Ann Rheum Dis. 2002;61(8):718–22, http://dx.doi.org/10.1136/ard.61.8.718.
24. Mosca M, Tani C, Carli L, Bombardieri S. Glucocorticoids in systemic lupus erythematosus. Clin Exp Rheumatol. 2011;29 5 Suppl 68: S126–9.
25. Bello N, Birt JA, Workman J, Zhou X, Ross-Terres JA, Petri M. Treatment patterns and clinical characteristics of patients with systemic lupus erythematosus and musculoskeletal symptoms: a retrospective, observational study. Adv Ther. 2022;39(7):3131–45, http://dx.doi.org/10.1007/s12325-022-02148-8.
26. Hill DD, Eudy AM, Egger PJ, Fu Q, Petri MA. Impact of systemic lupus erythematosus disease activity, hydroxychloroquine and NSAID on the risk of subsequent organ system damage and death: analysis in a single US medical centre. Lupus Sci Med. 2021;8(1), http://dx.doi.org/10.1136/lupus-2020-000446.
27. Yang BB, Xiao H, Li XJ, Zheng M. Safety and efficacy of etanercept-methotrexate combination therapy in patients with rhupus: an observational study of non-glucocorticoid treatment for rheumatic diseases. Discov Med. 2018;25(135):14–20.
28. Palmer SC, Tunnicliffe DJ, Singh-Grewal D, et al. Induction and maintenance immunosuppression treatment of proliferative lupus nephritis: a network meta-analysis of randomized trials. Am J Kidney Dis. 2017;70(3):324–36, http://dx.doi.org/10.1053/j.ajkd.2016.12.008.
29. Tian M, Song X, Dong L, Xin X, Dong J. Systematic evaluation of different doses of cyclophosphamide induction therapy for lupus nephritis. Medicine. 2017;96(51):e9408, http://dx.doi.org/10.1097/MD.0000000000009408.
30. Yuan Q, Xing X, Lu Z, Li X. Clinical characteristics and risk factors of infection in patients with systemic lupus erythematosus: a systematic review and meta-analysis of observational studies. Semin Arthritis Rheum. 2020;50(5):1022–39, http://dx.doi.org/10.1016/j.semarthrit.2020.06.004.
31. Lee YH, Song GG. A network meta-analysis of randomized controlled trials comparing the effectiveness and safety of voclosporin or tacrolimus plus mycophenolate mofetil as induction treatment for lupus nephritis. Z Rheumatol. 2023;82(7):580–6, http://dx.doi.org/10.1007/s00393-021-01087-z.
32. Rovin BH, Solomons N, Pendergraft WF, et al. A randomized, controlled double-blind study comparing the efficacy and safety of dose-ranging voclosporin with placebo in achieving remission in patients with active lupus nephritis. Kidney Int. 2019;95(1):219–31, http://dx.doi.org/10.1016/j.kint.2018.08.025.
33. Song GG, Lee YH. Comparison of treatment response and serious infection using tacrolimus, tacrolimus with mycophenolate mofetil, in comparison to cyclophosphamide as induction treatment for lupus nephritis. Int J Clin Pharmacol Ther. 2020;58(10):550–6, http://dx.doi.org/10.5414/CP203736.
34. Deng J, Luo L, Zhu L, Xie H. Multitarget therapy versus intravenous cyclophosphamide in the induction treatment of lupus nephritis: a meta-analysis of randomized controlled trials. Turk J Med Sci. 2018;48(5):901–10, http://dx.doi.org/10.3906/sag-1804-57.
35. Jorge A, Fu X, Cook C, et al. Kidney transplantation and cardiovascular events among patients with end-stage renal disease due to lupus nephritis: a nationwide cohort study. Arthritis Care Res (Hoboken). 2022;74(11):1829–34, http://dx.doi.org/10.1002/acr.24725.
36. Maslen T, Bruce IN, D'Cruz D, et al. Efficacy of belimumab in two serologically distinct high disease activity subgroups of patients with systemic lupus erythematosus: post-hoc analysis of data from the phase III programme. Lupus Sci Med. 2021;8(1):e000459, http://dx.doi.org/10.1136/lupus-2020-000459.
37. Morand EF, Abreu G, Furie RA, Golder V, Tummala R. Lupus low disease activity state attainment in the phase 3 TULIP trials of anifrolumab in active systemic lupus erythematosus. Ann Rheum Dis. 2023;82(5):639–45, http://dx.doi.org/10.1136/ard-2022-222748.
38. Zhang H, Chen J, Zhang Y, Zhao N, Xu D. Efficacy and safety of belimumab therapy in lupus nephritis: a systematic review and meta-analysis. Ren Fail. 2023;45(1):2207671, http://dx.doi.org/10.1080/0886022X.2023.2207671.
39. Tanaka Y, Nakayamada S, Yamaoka K, Ohmura K, Yasuda S. Rituximab in the real-world treatment of lupus nephritis: a retrospective cohort study in Japan. Mod Rheumatol. 2023;33(1):145–53, http://dx.doi.org/10.1093/mr/roac007.
40. Krustev E, Clarke AE, Barber MRW. B cell depletion and inhibition in systemic lupus erythematosus. Expert Rev Clin Immunol. 2023;19(1):55–70, http://dx.doi.org/10.1080/1744666X.2023.2145281.
41. Atisha-Fregoso Y, Malkiel S, Harris KM, et al. Phase II randomized trial of rituximab plus cyclophosphamide followed by belimumab for the treatment of lupus nephritis. Arthritis Rheumatol. 2021;73(1):121–31, http://dx.doi.org/10.1002/art.41466.
42. Richter P, Cardoneanu A, Burlui AM, et al. Why do we need JAK inhibitors in systemic lupus erythematosus? Int J Mol Sci. 2022;23(19), http://dx.doi.org/10.3390/ijms231911788.
43. González-García A, Cusácovich I, Ruiz-Irastorza G. Treatment of systemic lupus erythematosus: new therapeutic options. Rev Clin Esp. 2023;223(10):629–39, http://dx.doi.org/10.1016/j.rceng.2023.11.001.
44. Lin C, Lee Y, Shih P, Wei JC. From concept to reality: CAR-T therapy as a glimmer of hope for systemic lupus erythematosus patients. Int J Rheum Dis. 2023;26(11):2137–40, http://dx.doi.org/10.1111/1756-185X.14871.
45. Hoes JN, Jacobs JWG, Boers M, et al. EULAR evidence-based recommendations on the management of systemic glucocorticoid therapy in rheumatic diseases. Ann Rheum Dis. 2007;66(12):1560–7, http://dx.doi.org/10.1136/ard.2007.072157.
46. Marmor MF, Kellner U, Lai TYY, Melles RB, Mieler WF, American Academy of Ophthalmology. Recommendations on screening for chloroquine and hydroxychloroquine retinopathy (2016 Revision). Ophthalmology. 2016;123(6):1386–94, http://dx.doi.org/10.1016/j.ophtha.2016.01.058.
47. Canadian Hydroxychloroquine Study Group. A randomized study of the effect of withdrawing hydroxychloroquine sulfate in systemic lupus erythematosus. New England Journal of Medicine. 1991;324(3):150–4, http://dx.doi.org/10.1056/NEJM199101173240303.
48. Goker YS, Ucgul Atılgan C, Tekin K, et al. The validity of optical coherence tomography angiography as a screening test for the early detection of retinal changes in patients with hydroxychloroquine therapy. Curr Eye Res. 2019;44(3):311–5, http://dx.doi.org/10.1080/02713683.2018.1545912.
49. Pego-Reigosa JM, Cobo-Ibáñez T, Calvo-Alén J, et al. Efficacy and safety of nonbiologic immunosuppressants in the treatment of nonrenal systemic lupus erythematosus: a systematic review. Arthritis Care Res (Hoboken). 2013;65(11):1775–85, http://dx.doi.org/10.1002/acr.22035.
50. Li K, Yu Y, Gao Y, Zhao F, Liang Z, Gao J. Comparative effectiveness of rituximab and common induction therapies for lupus nephritis: a systematic review and network meta-analysis. Front Immunol. 2022;13:859380, http://dx.doi.org/10.3389/fimmu.2022.859380.
51. Ejaz K, Abid D, Juneau P, Chu J, Hasni S. Use of gonadotropin-releasing hormone agonists for ovarian preservation in patients receiving cyclophosphamide for systemic lupus erythematosus: a meta-analysis. Lupus. 2022;31(14):1706–13, http://dx.doi.org/10.1177/09612033221128740.
52. Pimentel-Quiroz VR, Ugarte-Gil MF, Harvey G, et al. Factors predictive of serious infections over time in systemic lupus erythematosus patients: data from a multi-ethnic, multi-national, Latin American lupus cohort. Lupus. 2019;28(9):1101–10, http://dx.doi.org/10.1177/0961203319860579.
53. García-Carrasco M, Mendoza-Pinto C, Rojas-Villarraga A, et al. Prevalence of cervical HPV infection in women with systemic lupus erythematosus: A systematic review and meta-analysis. Autoimmun Rev. 2019;18(2):184–91, http://dx.doi.org/10.1016/j.autrev.2018.09.001.
54. Jiang Y, Cheng Y, Ma S, et al. Systemic lupus erythematosus-complicating immune thrombocytopenia: from pathogenesis to treatment. J Autoimmun. 2022;132:102887, http://dx.doi.org/10.1016/j.jaut.2022.102887.
55. Il Shin J, Lee KH, Park S, et al. Systemic lupus erythematosus and lung involvement: a comprehensive review. J Clin Med. 2022;11(22):6714, http://dx.doi.org/10.3390/jcm11226714.
56. Kawka L, Schlencker A, Mertz P, Martin T, Arnaud L. Fatigue in systemic lupus erythematosus: an update on its impact, determinants and therapeutic management. J Clin Med. 2021;10(17), http://dx.doi.org/10.3390/jcm10173996.
57. Santos EJF, Farisogullari B, Dures E, Geenen R, Machado PM. EULAR taskforce on recommendations for the management of fatigue in people with inflammatory rheumatic diseases. Efficacy of non-pharmacological interventions: a systematic review informing the 2023 EULAR recommendations for the management of fatigue in people with inflammatory rheumatic and musculoskeletal diseases. RMD Open. 2023;9(3), http://dx.doi.org/10.1136/rmdopen-2023-003350.
58. Dures E, Farisoğulları B, Santos EJF, et al. 2023 EULAR recommendations for the management of fatigue in people with inflammatory rheumatic and musculoskeletal diseases. Ann Rheum Dis. 2023, http://dx.doi.org/10.1136/ard-2023-224514.
59. Youssef MK. Effect of training on health outcome including fatigue, depression and quality of life in patients with systemic lupus erythromatosus. Beni Suef Univ J Basic Appl Sci. 2021;10(1):90, http://dx.doi.org/10.1186/s43088-021-00185-w.
60. Youseff M. Efffect of excercises training on fatige, depression and physical activity in patients with systemic lupus erythematosus. J Health Medical Res. 2019;1(1):4–11.
61. Gavilán-Carrera B, Vargas-Hitos JA, Morillas-de-Laguno P, et al. Effects of 12-week aerobic exercise on patient-reported outcomes in women with systemic lupus erythematosus. Disabil Rehabil. 2022;44(10):1863–71, http://dx.doi.org/10.1080/09638288.2020.1808904.

62. Frade S, O'Neill S, Greene D, Nutter E, Cameron M. Exercise as adjunctive therapy for systemic lupus erythematosus. Cochrane Database Syst Rev. 2023;4(4):CD014816, http://dx.doi.org/10.1002/14651858.CD014816.pub2.
63. Vandenbulcke L, Erard M, Van Assche D, De Langhe E. The effect of physical exercise on fatigue in systemic lupus erythematosus: a systematic review. Acta Clin Belg. 2023;78(4):342–57, http://dx.doi.org/10.1080/17843286.2022.2163751.
64. Kankaya H, Karadakovan A. Effects of web-based education and counselling for patients with systemic lupus erythematosus: self-efficacy, fatigue and assessment of care. Lupus. 2020;29(8):884–91, http://dx.doi.org/10.1177/0961203320928423.
65. Khan F, Granville N, Malkani R, Chathampally Y. Health-related quality of life improvements in systemic lupus erythematosus derived from a digital therapeutic plus tele-health coaching intervention: randomized controlled pilot trial. J Med Internet Res. 2020;22(10):e23868, http://dx.doi.org/10.2196/23868.
66. Doria A, Stohl W, Schwarting A, et al. Efficacy and safety of subcutaneous belimumab in anti-double-stranded DNA-positive, hypocomplementemic patients with systemic lupus erythematosus. Arthritis Rheumatol. 2018;70(8):1256–64, http://dx.doi.org/10.1002/art.40511.
67. Strand V, Berry P, Lin X, Asukai Y, Punwaney R, Ramachandran S. Long-term impact of belimumab on health-related quality of life and fatigue in patients with systemic lupus erythematosus: six years of treatment. Arthritis Care Res (Hoboken). 2019;71(6):829–38, http://dx.doi.org/10.1002/acr.23788.
68. Lima GL, Paupitz J, Aikawa NE, Takayama L, Bonfa E, Pereira RMR. Vitamin D supplementation in adolescents and young adults with juvenile systemic lupus erythematosus for improvement in disease activity and fatigue scores: a randomized, double-blind, placebo-controlled trial. Arthritis Care Res (Hoboken). 2016;68(1):91–8, http://dx.doi.org/10.1002/acr.22621.
69. Ruiz-Irastorza G, Gordo S, Olivares N, Egurbide MV, Aguirre C. Changes in vitamin D levels in patients with systemic lupus erythematosus: Effects on fatigue, disease activity, and damage. Arthritis Care Res (Hoboken). 2010;62(8):1160–5, http://dx.doi.org/10.1002/acr.20186.
70. Magro R, Saliba C, Camilleri L, Scerri C, Borg AA. Vitamin D supplementation in systemic lupus erythematosus: relationship to disease activity, fatigue and the interferon signature gene expression. BMC Rheumatol. 2021;5(1):53, http://dx.doi.org/10.1186/s41927-021-00223-1.
71. Zhou W, Yang C. The causes and clinical significance of fever in systemic lupus erythematosus: a retrospective study of 487 hospitalised patients. Lupus. 2009;18(9):807–12, http://dx.doi.org/10.1177/0961203309103870.
72. Rovin BH, Tang Y, Sun J, et al. Clinical significance of fever in the systemic lupus erythematosus patient receiving steroid therapy. Kidney Int. 2005;68(2):747–59, http://dx.doi.org/10.1111/j.1523-1755.2005.00453.x.
73. Lu Q, Long H, Chow S, et al. Guideline for the diagnosis, treatment and long-term management of cutaneous lupus erythematosus. J Autoimmun. 2021;123:102707, http://dx.doi.org/10.1016/j.jaut.2021.102707.
74. Jessop S, Whitelaw DA, Grainge MJ, Jayasekera P. Drugs for discoid lupus erythematosus. Cochrane Database Syst Rev. 2017;2017(5), http://dx.doi.org/10.1002/14651858.CD002954.pub3.
75. Chasset F, Bouaziz JD, Costedoat-Chalumeau N, Francès C, Arnaud L. Efficacy and comparison of antimalarials in cutaneous lupus erythematosus subtypes: a systematic review and meta-analysis. Br J Dermatol. 2017;177(1):188–96, http://dx.doi.org/10.1111/bjd.15312.
76. Yokogawa N, Eto H, Tanikawa A, et al. Effects of hydroxychloroquine in patients with cutaneous lupus erythematosus: a multicenter, double-blind, randomized, parallel-group trial. Arthritis Rheumatol. 2017;69(4):791–9, http://dx.doi.org/10.1002/art.40018.
77. Fairley JL, Oon S, Saracino AM, Nikpour M. Management of cutaneous manifestations of lupus erythematosus: a systematic review. Semin Arthritis Rheum. 2020;50(1):95–127, http://dx.doi.org/10.1016/j.semarthrit.2019.07.010.
78. Iaccarino L, Bettio S, Reggia R, et al. Effects of belimumab on flare rate and expected damage progression in patients with active systemic lupus erythematosus. Arthritis Care Res (Hoboken). 2017;69(1):115–23, http://dx.doi.org/10.1002/acr.22971.
79. Kneeland R, Montes D, Endo J, Shields B, Bartels CM, Garg S. Improvement in cutaneous lupus erythematosus after twenty weeks of belimumab use: a systematic review and meta-analysis. Arthritis Care Res (Hoboken). 2023;75(8):1838–48, http://dx.doi.org/10.1002/acr.25058.
80. Morand EF, Furie RA, Bruce IN, et al. Efficacy of anifrolumab across organ domains in patients with moderate-to-severe systemic lupus erythematosus: a post-hoc analysis of pooled data from the TULIP-1 and TULIP-2 trials. Lancet Rheumatol. 2022;4(4):e282–92, http://dx.doi.org/10.1016/S2665-9913(21)00317-9.
81. Yates M. Commonly used medication for Lupus. Lupus. 2018;27 1_suppl:8–10, http://dx.doi.org/10.1177/0961203318801670.
82. Rosenbaum JT, Costenbader KH, Desmarais J, et al. American College of Rheumatology, American Academy of Dermatology, Rheumatologic Dermatology Society, and American Academy of Ophthalmology 2020 Joint Statement on Hydroxychloroquine Use With Respect to Retinal Toxicity. Arthritis Rheumatol. 2021;73(6):908–11, http://dx.doi.org/10.1002/art.41683.
83. Pons-Estel BA, Bonfa E, Soriano ER, et al. First Latin American clinical practice guidelines for the treatment of systemic lupus erythematosus: Latin American Group for the Study of Lupus (GLADEL, Grupo Latino Americano de Estudio del Lupus)–Pan-American League of Associations of Rheumatology (PANLAR). Ann Rheum Dis. 2018;77(11):1549–57, http://dx.doi.org/10.1136/annrheumdis-2018-213512.
84. Ceccarelli F, Cipriano E, Natalucci F, et al. Belimumab is able to induce a significant improvement of joint activity status in patients diagnosed with systemic lupus erythematosus: results from a 12-month longitudinal study. Isr Med Assoc J. 2020;22(7):415–9.
85. Fanouriakis A, Tziolos N, Bertsias G, Boumpas DT. Update on the diagnosis and management of systemic lupus erythematosus. Ann Rheum Dis. 2021;80(1):14–25, http://dx.doi.org/10.1136/annrheumdis-2020-218272.
86. Merrill JT, Furie R, Werth VP, et al. Anifrolumab effects on rash and arthritis: impact of the type I interferon gene signature in the phase IIb MUSE study in patients with systemic lupus erythematosus. Lupus Sci Med. 2018;5(1):e000284, http://dx.doi.org/10.1136/lupus-2018-000284.
87. Furie RA, Morand EF, Bruce IN, et al. Type I interferon inhibitor anifrolumab in active systemic lupus erythematosus (TULIP-1): a randomised, controlled, phase 3 trial. Lancet Rheumatol. 2019;1(4):e208–19, http://dx.doi.org/10.1016/S2665-9913(19)30076-1.
88. Morand EF, Furie R, Tanaka Y, et al. Trial of anifrolumab in active systemic lupus erythematosus. N Engl Jf Med. 2020;382(3):211–21, http://dx.doi.org/10.1056/NEJMoa1912196.
89. Newman K, Owlia MB, El-Hemaidi I, Akhtari M. Management of immune cytopenias in patients with systemic lupus erythematosus — Old and new. Autoimmun Rev. 2013;12(7):784–91, http://dx.doi.org/10.1016/j.autrev.2013.02.001.
90. Fayyaz A, Igoe A, Kurien BT, et al. Haematological manifestations of lupus. Lupus Sci Med. 2015;2(1):e000078, http://dx.doi.org/10.1136/lupus-2014-000078.
91. Porta SV, de Andrade DCO, Erkan D, et al. Controversies in the management of antiphospholipid syndrome. J Clin Rheumatol. 2023;29(5):e107–12, http://dx.doi.org/10.1097/RHU.0000000000001961.
92. Unlu O, Zuily S, Erkan D. The clinical significance of antiphospholipid antibodies in systemic lupus erythematosus. Eur J Rheumatol. 2016;3(2):75–84, http://dx.doi.org/10.5152/eurjrheum.2015.0085.
93. Riancho-Zarrabeitia L, Martínez-Taboada V, Rúa-Figueroa I, et al. Antiphospholipid syndrome (APS) in patients with systemic lupus erythematosus (SLE) implies a more severe disease with more damage accrual and higher mortality. Lupus. 2020;29(12):1556–65, http://dx.doi.org/10.1177/0961203320950477.
94. Lambert MP, Gernsheimer TB. Clinical updates in adult immune thrombocytopenia. Blood. 2017;129(21):2829–35, http://dx.doi.org/10.1182/blood-2017-03-754119.
95. Arnal C, Piette JC, Léone J, et al. Treatment of severe immune thrombocytopenia associated with systemic lupus erythematosus: 59 cases. J Rheumatol. 2002;29(1):75–83.
96. Eyanson S, Passo MH, Aldo-Benson MA, Benson MD. Methylprednisolone pulse therapy for nonrenal lupus erythematosus. Ann Rheum Dis. 1980;39(4):377–80, http://dx.doi.org/10.1136/ard.39.4.377.
97. Lurie DP, Kahaleh MB. Pulse corticosteroid therapy for refractory thrombocytopenia in systemic lupus erythematosus. J Rheumatol. 1982;9(2):311–4.
98. Letchumanan P, Thumboo J. Danazol in the treatment of systemic lupus erythematosus: a qualitative systematic review. Semin Arthritis Rheum. 2011;40(4):298–306, http://dx.doi.org/10.1016/j.semarthrit.2010.03.005.
99. West SG. Danazol for the treatment of refractory autoimmune thrombocytopenia in systemic lupus erythematosus. Ann Intern Med. 1988;108(5):703, http://dx.doi.org/10.7326/0003-4819-108-5-703.
100. Lindholm C, Börjesson-Asp K, Zendjanchi K, Sundqvist AC, Tarkowski A, Bokarewa M. Longterm clinical and immunological effects of anti-CD20 treatment in patients with refractory systemic lupus erythematosus. J Rheumatol. 2008;35(5):826–33.
101. Chen H, Zheng W, Su J, et al. Low-dose rituximab therapy for refractory thrombocytopenia in patients with systemic lupus erythematosus–a prospective pilot study. Rheumatology. 2011;50(9):1640–4, http://dx.doi.org/10.1093/rheumatology/ker176.
102. ter Borg EJ, Kallenberg CG. Treatment of severe thrombocytopenia in systemic lupus erythematosus with intravenous gammaglobulin. Ann Rheum Dis. 1992;51(10):1149–51, http://dx.doi.org/10.1136/ard.51.10.1149.
103. Maier WP, Gordon DS, Howard RF, et al. Intravenous immunoglobulin therapy in systemic lupus erythematosus-associated thrombocytopenia. Arthritis Rheum. 1990;33(8):1233–9, http://dx.doi.org/10.1002/art.1780330825.
104. Zandman-Goddard G, Levy Y, Shoenfeld Y. Intravenous immunoglobulin therapy and systemic lupus erythematosus. Clin Rev Allergy Immunol. 2005;29(3):219–28, http://dx.doi.org/10.1385/CRIAI:29:3:219.
105. Roach BA, Hutchinson GJ. Treatment of refractory, systemic lupus erythematosus-associated thrombocytopenia with intermittent low-dose intravenous cyclophosphamide. Arthritis Rheum. 1993;36(5):682–4, http://dx.doi.org/10.1002/art.1780360516.
106. Boumpas DT, Barez S, Klippel JH, Balow JE. Intermittent cyclophosphamide for the treatment of autoimmune thrombocytopenia in systemic lupus erythematosus. Ann Intern Med. 1990;112(9):674–7, http://dx.doi.org/10.7326/0003-4819-112-9-674.
107. Takada K, Illei GG, Boumpas DT. Cyclophosphamide for the treatment of systemic lupus erythematosus. Lupus. 2001;10(3):154–61, http://dx.doi.org/10.1191/096120301671376017.
108. Dall'Era M. Mycophenolate mofetil in the treatment of systemic lupus erythematosus. Curr Opin Rheumatol. 2011;23(5):454–8, http://dx.doi.org/10.1097/BOR.0b013e328349a1e5.
109. Vasoo S, Thumboo J, Fong KY. Refractory immune thrombocytopenia in systemic lupus erythematosus: response to mycophenolate mofetil. Lupus. 2003;12(8):630–2, http://dx.doi.org/10.1191/0961203303lu417cr.

110. Goebel KM, Gassel WD, Goebel FD. Evaluation of azathioprine in autoimmune thrombocytopenia and lupus erythematosus. Scand J Haematol. 1973;10(1):28–34, http://dx.doi.org/10.1111/j.1600-0609.1973.tb00035.x.
111. Abu-Shakra M, Shoenfeld Y. Azathioprine therapy for patients with systemic lupus erythematosus. Lupus. 2001;10(3):152–3, http://dx.doi.org/10.1191/096120301676669495.
112. Maroun MC, Ososki R, Andersen JC, Dhar JP. Eltrombopag as steroid sparing therapy for immune thrombocytopenic purpura in systemic lupus erythematosus. Lupus. 2015;24(7):746–50, http://dx.doi.org/10.1177/0961203314559632.
113. Scheinberg P, Singulane CC, Barbosa LSG, Scheinberg M. Successful platelet count recovery in lupus-associated thrombocytopenia with the thrombopoietin agonist eltrombopag. Clin Rheumatol. 2014;33(9):1347–9, http://dx.doi.org/10.1007/s10067-014-2600-8.
114. Estcourt LJ, Birchall J, Allard S, et al. Guidelines for the use of platelet transfusions. Br J Haematol. 2017;176(3):365–94, http://dx.doi.org/10.1111/bjh.14423.
115. Coon WW. Splenectomy for cytopenias associated with systemic lupus erythematosus. Am J Surg. 1988;155(3):391–4, http://dx.doi.org/10.1016/S0002-9610(88)80097-7.
116. Rivero SJ, Alger M, Alarcón-Segovia D. Splenectomy for hemocytopenia in systemic lupus erythematosus. A controlled appraisal. Arch Intern Med. 1979;139(7):773–6.
117. Gomard-Mennesson E, Ruivard M, Koenig M, et al. Treatment of isolated severe immune hemolytic anaemia associated with systemic lupus erythematosus: 26 cases. Lupus. 2006;15(4):223–31, http://dx.doi.org/10.1191/0961203306lu2292oa.
118. Kokori SIG, Ioannidis JPA, Voulgarelis M, Tzioufas AG, Moutsopoulos HM. Autoimmune hemolytic anemia in patients with systemic lupus erythematosus. Am J Med. 2000;108(3):198–204, http://dx.doi.org/10.1016/S0002-9343(99)00413-1.
119. Corley CC, Lessner HE, Larsen WE. Azathioprine therapy of? autoimmune? diseases. Am J Med. 1966;41(3):404–12, http://dx.doi.org/10.1016/0002-9343(66)90086-6.
120. AHN YS. Danazol therapy for autoimmune hemolytic anemia. Ann Intern Med. 1985;102(3):298, http://dx.doi.org/10.7326/0003-4819-102-3-298.
121. Blanco R, Martinez-Taboada VM, Rodriguez-Valverde V, Sanchez-Andrade A, Gonzalez-Gay MA. Successful therapy with danazol in refractory autoimmune thrombocytopenia associated with rheumatic diseases. Rheumatology. 1997;36(10):1095–9, http://dx.doi.org/10.1093/rheumatology/36.10.1095.
122. Mak A, Mok CC. Mycophenolate mofetil for refractory haemolytic anemia in systemic lupus erythematosus. Lupus. 2005;14(10):856–8, http://dx.doi.org/10.1191/0961203305lu2163cr.
123. Tselios K, Gladman DD, Su J, Urowitz MB. Mycophenolate mofetil in nonrenal manifestations of systemic lupus erythematosus: an observational cohort study. J Rheumatol. 2016;43(3):552–8, http://dx.doi.org/10.3899/jrheum.150779.
124. Howard J, Hoffbrand AV, Prentice HG, Mehta A. Mycophenolate mofetil for the treatment of refractory auto-immune haemolytic anaemia and autoimmune thrombocytopenia purpura. Br J Haematol. 2002;117(3):712–5, http://dx.doi.org/10.1046/j.1365-2141.2002.03430.x.
125. Moyo VM, Smith D, Brodsky I, Crilley P, Jones RJ, Brodsky RA. High-dose cyclophosphamide for refractory autoimmune hemolytic anemia. Blood. 2002;100(2):704–6, http://dx.doi.org/10.1182/blood-2002-01-0087.
126. Tokunaga M, Fujii K, Saito K, et al. Down-regulation of CD40 and CD80 on B cells in patients with life-threatening systemic lupus erythematosus after successful treatment with rituximab. Rheumatology. 2005;44(2):176–82, http://dx.doi.org/10.1093/rheumatology/keh443.
127. Barcellini W, Zaja F, Zaninoni A, et al. Low-dose rituximab in adult patients with idiopathic autoimmune hemolytic anemia: clinical efficacy and biologic studies. Blood. 2012;119(16):3691–7, http://dx.doi.org/10.1182/blood-2011-06-363556.
128. Perrotta S, Locatelli F, La Manna A, Cennamo L, De Stefano P, Nobili B. Anti-CD20 monoclonal antibody (Rituximab) for life-threatening autoimmune haemolytic anaemia in a patient with systemic lupus erythematosus. Br J Haematol. 2002;116(2):465–7.
129. Dierickx D, Kentos A, Delannoy A. The role of rituximab in adults with warm antibody autoimmune hemolytic anemia. Blood. 2015;125(21):3223–9, http://dx.doi.org/10.1182/blood-2015-01-588392.
130. Abdwani R, Mani R. Anti-CD20 monoclonal antibody in acute life threatening haemolytic anaemia complicating childhood onset SLE. Lupus. 2009;18(5):460–4, http://dx.doi.org/10.1177/0961203308098360.
131. Buetens OW, Ness PM. Red blood cell transfusion in autoimmune hemolytic anemia. Curr Opin Hematol. 2003;10(6):429–33, http://dx.doi.org/10.1097/00062752-200311000-00006.
132. Levine AB, Erkan D. Clinical assessment and management of cytopenias in lupus patients. Curr Rheumatol Rep. 2011;13(4):291–9, http://dx.doi.org/10.1007/s11926-011-0179-5.
133. Euler HH, Harten P, Zeuner RA, Schwab UM. Recombinant human granulocyte colony stimulating factor in patients with systemic lupus erythematosus associated neutropenia and refractory infections. J Rheumatol. 1997;24(11):2153–7.
134. Vasiliu IM, Petri MA, Baer AN. Therapy with granulocyte colony-stimulating factor in systemic lupus erythematosus may be associated with severe flares. J Rheumatol. 2006;33(9):1878–80.
135. Euler HH, Schwab UM, Schroeder JO. Filgrastim for lupus neutropenia. Lancet. 1994;344(8935):1513–4.
136. Newman KA, Akhtari M. Management of autoimmune neutropenia in Felty's syndrome and systemic lupus erythematosus. Autoimmun Rev. 2011;10(7):432–7, http://dx.doi.org/10.1016/j.autrev.2011.01.006.
137. Abu-Hishmeh M, Sattar A, Zarlasht F, et al. Systemic lupus erythematosus presenting as refractory thrombotic thrombocytopenic purpura: a diagnostic and management challenge. A case report and concise review of the literature. Am J Case Rep. 2016;17:782–7, http://dx.doi.org/10.12659/AJCR.898955.
138. Ma W, Bai W, Wu X, Zhao J, Li M, Zeng X. Successful treatment of refractory thrombotic thrombocytopenic purpura associated with systemic lupus erythematosus with combination of plasma exchange and low-dose rituximab. Lupus. 2020;29(14):1961–7, http://dx.doi.org/10.1177/0961203320953473.
139. Kotzen ES, Roy S, Jain K. Antiphospholipid syndrome nephropathy and other thrombotic microangiopathies among patients with systemic lupus erythematosus. Adv Chronic Kidney Dis. 2019;26(5):376–86, http://dx.doi.org/10.1053/j.ackd.2019.08.012.
140. Liang SJ, Zheng QY, Li MS, Lv MY, Chen WT, Yang Y. Response to belimumab in thrombotic thrombocytopenic purpura associated with systemic lupus erythematosus: a case-based review. Clin Rheumatol. 2022;41(8):2561–9, http://dx.doi.org/10.1007/s10067-022-06155-6.
141. Kello N, Khoury LE, Marder G, Furie R, Zapantis E, Horowitz DL. Secondary thrombotic microangiopathy in systemic lupus erythematosus and antiphospholipid syndrome, the role of complement and use of eculizumab: case series and review of literature. Semin Arthritis Rheum. 2019;49(1):74–83, http://dx.doi.org/10.1016/j.semarthrit.2018.11.005.
142. Gavand PE, Serio I, Arnaud L, et al. Clinical spectrum and therapeutic management of systemic lupus erythematosus-associated macrophage activation syndrome: a study of 103 episodes in 89 adult patients. Autoimmun Rev. 2017;16(7):743–9, http://dx.doi.org/10.1016/j.autrev.2017.05.010.
143. Wafa A, Hicham H, Naoufal R, et al. Clinical spectrum and therapeutic management of systemic lupus erythematosus-associated macrophage activation syndrome: a study of 20 Moroccan adult patients. Clin Rheumatol. 2022;41(7):2021–33, http://dx.doi.org/10.1007/s10067-022-06055-9.
144. Shah K, Porter A, Takhar G, Reddy V. Case of using mycophenolate in combination with steroids for concurrent macrophage activation syndrome and lupus flare. BMJ Case Rep. 2020;13(4), http://dx.doi.org/10.1136/bcr-2019-231554.
145. Tomofuji Y, Ishikawa Y, Hattori K, Fujiwara M, Kita Y. Successful treatment of refractory acute lupus haemophagocytic syndrome using rituximab: a case report. Mod Rheumatol Case Rep. 2020;4(2):222–8, http://dx.doi.org/10.1080/24725625.2019.1705529.
146. Posch F, Gebhart J, Rand JH, et al. Cardiovascular risk factors are major determinants of thrombotic risk in patients with the lupus anticoagulant. BMC Med. 2017;15(1):54, http://dx.doi.org/10.1186/s12916-017-0807-7.
147. Cuadrado MJ, Bertolaccini ML, Seed PT, et al. Low-dose aspirin vs low-dose aspirin plus low-intensity warfarin in thromboprophylaxis: a prospective, multicentre, randomized, open, controlled trial in patients positive for antiphospholipid antibodies (ALIWAPAS). Rheumatology (Oxford). 2014;53(2):275–84, http://dx.doi.org/10.1093/rheumatology/ket313.
148. Anderson M, Belmont HM. Severe thrombotic events associated with preprocedural interruption of anticoagulation in systemic lupus erythematosus with secondary antiphospholipid syndrome: cases and literature review. Lupus. 2022;31(2):261–7, http://dx.doi.org/10.1177/09612033221074920.
149. Cáliz Cáliz R, Díaz Del Campo Fontecha P, Galindo Izquierdo M, et al. Recommendations of the Spanish rheumatology society for primary antiphospholipid syndrome. Part I: diagnosis, evaluation and treatment. Reumatol Clin. 2020;16 2 Pt 1:71–86, http://dx.doi.org/10.1016/j.reuma.2018.11.003.
150. Okuma H, Kitagawa Y, Yasuda T, Tokuoka K, Takagi S. Comparison between single antiplatelet therapy and combination of antiplatelet and anticoagulation therapy for secondary prevention in ischemic stroke patients with antiphospholipid syndrome. Int J Med Sci. 2009;7(1):15–8, http://dx.doi.org/10.7150/ijms.7.15.
151. Aibar J, Schulman S. Arterial thrombosis in patients with antiphospholipid syndrome: a review and meta-analysis. Semin Thromb Hemost. 2021;47(6):709–23, http://dx.doi.org/10.1055/s-0041-1725057.
152. Attachaipanich T, Aungsusiripong A, Piriyakhuntorn P, et al. Antithrombotic therapy in antiphospholipid syndrome with arterial thrombosis: a systematic review and network meta-analysis. Front Med (Lausanne). 2023;10:1196800, http://dx.doi.org/10.3389/fmed.2023.1196800.
153. Bala MM, Celinska-Lowenhoff M, Szot W, et al. Antiplatelet and anticoagulant agents for secondary prevention of stroke and other thromboembolic events in people with antiphospholipid syndrome. Cochrane Database Syst Rev. 2017;10(10):CD012169, http://dx.doi.org/10.1002/14651858.CD012169.pub2.
154. Kwon OC, Park YB, Park MC. Effect of statins on the prevention of recurrent thrombosis in thrombotic antiphospholipid syndrome. Rheumatology (Oxford). 2022;61(4):1548–55, http://dx.doi.org/10.1093/rheumatology/keab410.
155. Broder A, Putterman C. Hydroxychloroquine use is associated with lower odds of persistently positive antiphospholipid antibodies and/or lupus anticoagulant in systemic lupus erythematosus. J Rheumatol. 2013;40(1):30–3, http://dx.doi.org/10.3899/jrheum.120157.
156. Woller SC, Stevens SM, Kaplan D, et al. Apixaban compared with warfarin to prevent thrombosis in thrombotic antiphospholipid syndrome: a randomized trial. Blood Adv. 2022;6(6):1661–70, http://dx.doi.org/10.1182/bloodadvances.2021005808.

157. Malec K, Góralczyk T, Undas A. The use of direct oral anticoagulants in 56 patients with antiphospholipid syndrome. Thromb Res. 2017;152:93–7, http://dx.doi.org/10.1016/j.thromres.2016.12.009.
158. Ordi-Ros J, Sáez-Comet L, Pérez-Conesa M, et al. Rivaroxaban versus vitamin K antagonist in antiphospholipid syndrome: a randomized noninferiority trial. Ann Intern Med. 2019;171(10):685–94, http://dx.doi.org/10.7326/M19-0291.
159. Pengo V, Banzato A, Bison E, Zoppellaro G, Padayattil Jose S, Denas G. Efficacy and safety of rivaroxaban vs warfarin in high-risk patients with antiphospholipid syndrome: Rationale and design of the Trial on Rivaroxaban in AntiPhospholipid Syndrome (TRAPS) trial. Lupus. 2016;25(3):301–6, http://dx.doi.org/10.1177/0961203315611495.
160. Lee YH, Song GG. Direct oral anticoagulants versus warfarin in patients with antiphospholipid syndrome: a meta-analysis of randomized controlled trials. Lupus. 2022;31(11):1335–43, http://dx.doi.org/10.1177/09612033221118463.
161. Cerdà P, Becattini C, Iriarte A, Hernández JC, Corbella X, Riera-Mestre A. Direct oral anticoagulants versus vitamin K antagonists in antiphospholipid syndrome: a meta-analysis. Eur J Intern Med. 2020;79:43–50, http://dx.doi.org/10.1016/j.ejim.2020.05.012.
162. Wu X, Cao S, Yu B, He T. Comparing the efficacy and safety of direct oral anticoagulants versus Vitamin K antagonists in patients with antiphospholipid syndrome: a systematic review and meta-analysis. Blood Coagul Fibrinolysis. 2022;33(7):389–401, http://dx.doi.org/10.1097/MBC.0000000000001153.
163. Dufrost V, Risse J, Reshetnyak T, et al. Increased risk of thrombosis in antiphospholipid syndrome patients treated with direct oral anticoagulants. Results from an international patient-level data meta-analysis. Autoimmun Rev. 2018;17(10):1011–21, http://dx.doi.org/10.1016/j.autrev.2018.04.009.
164. Balbi GGM, Pacheco M de S, Monticielo OA, et al. Antiphospholipid Syndrome Committee of the Brazilian Society of Rheumatology position statement on the use of direct oral anticoagulants (DOACs) in antiphospholipid syndrome (APS). Adv Rheumatol. 2020;60(1):29, http://dx.doi.org/10.1186/s42358-020-00125-9.
165. Al Sulaiman K, Hafiz A, Badreldin HA, et al. Evaluation of apixaban in patients with antiphospholipid syndrome: a case series and review of literature. J Investig Med High Impact Case Rep. 2022;10:23247096221099892, http://dx.doi.org/10.1177/23247096221099893.
166. Isenberg D, Appel GB, Contreras G, et al. Influence of race/ethnicity on response to lupus nephritis treatment: the ALMS study. Rheumatology. 2010;49(1):128–40, http://dx.doi.org/10.1093/rheumatology/kep346.
167. Arévalo-Martínez FG, Andrade-Ortega L, Irazoque-Palazuelos F, Badía-Flores JJ. Presentación atípica y evolución clínina de la nefropatía lúpica mesangial. Estudio de 20 pacientes. Reumatol Clin. 2006;2(1):4–9, http://dx.doi.org/10.1016/S1699-258X(06)73013-3.
168. Tunnicliffe DJ, Palmer SC, Henderson L, et al. Immunosuppressive treatment for proliferative lupus nephritis. Cochrane Database Syst Rev. 2018;2018(6), http://dx.doi.org/10.1002/14651858.CD002922.pub4.
169. Rovin BH, Teng YKO, Ginzler EM, et al. Efficacy and safety of voclosporin versus placebo for lupus nephritis (AURORA 1): a double-blind, randomised, multicentre, placebo-controlled, phase 3 trial. Lancet. 2021;397(10289):2070–80, http://dx.doi.org/10.1016/S0140-6736(21)00578-X.
170. Saxena A, Ginzler EM, Gibson K, et al. Safety and efficacy of long-term voclosporin treatment for lupus nephritis in the phase 3 AURORA 2 clinical trial. Arthritis Rheumatol. 2024;76(1):59–67, http://dx.doi.org/10.1002/art.42657.
171. Parra Sánchez AR, Voskuyl AE, van Vollenhoven RF. Treat-to-target in systemic lupus erythematosus: advancing towards its implementation. Nat Rev Rheumatol. 2022;18(3):146–57, http://dx.doi.org/10.1038/s41584-021-00739-3.
172. Levy RA, Gonzalez-Rivera T, Khamashta M, et al. 10 years of belimumab experience: what have we learnt? Lupus. 2021;30(11):1705–21, http://dx.doi.org/10.1177/09612033211028653.
173. Wang H, Li T, Sun F, et al. Safety and efficacy of the SGLT2 inhibitor dapagliflozin in patients with systemic lupus erythematosus: a phase I/II trial. RMD Open. 2022;8(2), http://dx.doi.org/10.1136/rmdopen-2022-002686.
174. Sciascia S, Yazdany J, Dall'Era M, et al. Anticoagulation in patients with concomitant lupus nephritis and thrombotic microangiopathy: a multicentre cohort study. Ann Rheum Dis. 2019;78(7):1004–6, http://dx.doi.org/10.1136/annrheumdis-2018-214559.
175. Appel GB, Contreras G, Dooley MA, et al. Mycophenolate mofetil versus cyclophosphamide for induction treatment of lupus nephritis. J Am Soc Nephrol. 2009;20(5):1103–12, http://dx.doi.org/10.1681/ASN.2008101028.
176. Collado MV, Dorado E, Rausch S, et al. Long-term outcome of lupus nephritis class II in Argentine patients. J Clin Rheumatol. 2016;22(6):299–306, http://dx.doi.org/10.1097/RHU.0000000000000395.
177. Fanouriakis A, Kostopoulou M, Cheema K, et al. 2019 Update of the Joint European League Against Rheumatism and European Renal Association–European Dialysis and Transplant Association (EULAR/ERA–EDTA) recommendations for the management of lupus nephritis. Ann Rheum Dis. 2020;79(6):713–23, http://dx.doi.org/10.1136/annrheumdis-2020-216924.
178. Rovin BH, Ayoub IM, Chan TM, Liu ZH, Mejía-Vilet JM, Floege J. KDIGO 2024 Clinical Practice Guideline for the management of LUPUS NEPHRITIS. Kidney Int. 2024;105(1):S1–69, http://dx.doi.org/10.1016/j.kint.2023.09.002.
179. Kidney Disease: Improving Global Outcomes (KDIGO) Lupus Nephritis Work Group. KDIGO 2024 Clinical Practice Guideline for the management of LUPUS NEPHRITIS. Kidney Int. 2024;105(1S):S1–69, http://dx.doi.org/10.1016/j.kint.2023.09.002.
180. Zheng Z, Zhang H, Peng X, et al. Effect of tacrolimus vs intravenous cyclophosphamide on complete or partial response in patients with lupus nephritis: a randomized clinical trial. JAMA Netw Open. 2022;5(3):e224492, http://dx.doi.org/10.1001/jamanetworkopen.2022.4492.
181. Sahin GM, Sahin S, Kiziltas S, Masatlioglu S, Oguz F, Ergin H. Mycophenolate mofetil versus azathioprine in the maintenance therapy of lupus nephritis. Ren Fail. 2008;30(9):865–9, http://dx.doi.org/10.1080/08860220802353843.
182. Ikeuchi H, Hiromura K, Takahashi S, et al. Efficacy and safety of multitarget therapy using a combination of tacrolimus, mycophenolate mofetil and a steroid in patients with active lupus nephritis. Mod Rheumatol. 2014;24(4):618–25, http://dx.doi.org/10.3109/14397595.2013.844397.
183. Tang Z, Wang Z, Zhang HT, et al. Clinical features and renal outcome in lupus patients with diffuse crescentic glomerulonephritis. Rheumatol Int. 2009;30(1):45–9, http://dx.doi.org/10.1007/s00296-009-0908-5.
184. Chen S, Chen H, Liu Z, et al. Pathological spectrums and renal prognosis of severe lupus patients with rapidly progressive glomerulonephritis. Rheumatol Int. 2015;35(4):709–17, http://dx.doi.org/10.1007/s00296-014-3140-x.
185. Cancarevic I, Malik BH. Use of rituximab in management of rapidly progressive glomerulonephritis. Cureus. 2020, http://dx.doi.org/10.7759/cureus.6820.
186. Kang SH, Chung BH, Choi SR, et al. Comparison of clinical outcomes by different renal replacement therapy in patients with end-stage renal disease secondary to lupus nephritis. Korean J Intern Med. 2011;26(1):60, http://dx.doi.org/10.3904/kjim.2011.26.1.60.
187. Weng CH, Hsu CW, Yu CC, Yen TH, Yang CW, Hung CC. Peritoneal dialysis and hemodialysis in systemic lupus erythematosus patients: comparison of clinical outcomes. Kidney Blood Press Res. 2009;32(6):451–6, http://dx.doi.org/10.1159/000266480.
188. Bertsias GK, Ioannidis JPA, Aringer M, et al. EULAR recommendations for the management of systemic lupus erythematosus with neuropsychiatric manifestations: report of a task force of the EULAR standing committee for clinical affairs. Ann Rheum Dis. 2010;69(12):2074–82, http://dx.doi.org/10.1136/ard.2010.130476.
189. Barile-Fabris LA, Fragoso-Loyo H, Wojdyla D, et al. Factors associated with neuropsychiatric involvement in Latin American patients with systemic lupus erythematosus. Lupus. 2021;30(9):1481–91, http://dx.doi.org/10.1177/09612033211020364.
190. The American College of Rheumatology nomenclature and case definitions for neuropsychiatric lupus syndromes. Arthritis Rheum. 1999;42(4):599–608, doi:10.1002/1529-0131(199904)42:4<599::AID-ANR2>3.0.CO;2-F.
191. McLaurin EY, Holliday SL, Williams P, Brey RL. Predictors of cognitive dysfunction in patients with systemic lupus erythematosus. Neurology. 2005;64(2):297–303, http://dx.doi.org/10.1212/01.WNL.0000149640.78684.EA.
192. Barile-Fabris L. Controlled clinical trial of IV cyclophosphamide versus IV methylprednisolone in severe neurological manifestations in systemic lupus erythematosus. Ann Rheum Dis. 2005;64(4):620–5, http://dx.doi.org/10.1136/ard.2004.025528.
193. Saison J, Costedoat-Chalumeau N, Maucort-Boulch D, et al. Systemic lupus erythematosus-associated acute transverse myelitis: manifestations, treatments, outcomes, and prognostic factors in 20 patients. Lupus. 2015;24(1):74–81, http://dx.doi.org/10.1177/0961203314547795.
194. Espinosa G, Mendizábal A, Mínguez S, et al. Transverse myelitis affecting more than 4 spinal segments associated with systemic lupus erythematosus: clinical, immunological, and radiological characteristics of 22 patients. Semin Arthritis Rheum. 2010;39(4):246–56, http://dx.doi.org/10.1016/j.semarthrit.2008.09.002.
195. Lin Y, Wang A, Yen M. Systemic lupus erythematosus-associated optic neuritis: clinical experience and literature review. Acta Ophthalmol. 2009;87(2):204–10, http://dx.doi.org/10.1111/j.1755-3768.2008.01193.x.
196. Levy Y. Intravenous immunoglobulins in peripheral neuropathy associated with vasculitis. Ann Rheum Dis. 2003;62(12):1221–3, http://dx.doi.org/10.1136/ard.2002.003996.
197. Vina ER, Fang AJ, Wallace DJ, Weisman MH. Chronic inflammatory demyelinating polyneuropathy in patients with systemic lupus erythematosus: prognosis and outcome. Semin Arthritis Rheum. 2005;35(3):175–84, http://dx.doi.org/10.1016/j.semarthrit.2005.08.008.
198. Man BL, Mok CC, Fu YP. Neuro-ophthalmologic manifestations of systemic lupus erythematosus: a systematic review. Int J Rheum Dis. 2014;17(5):494–501, http://dx.doi.org/10.1111/1756-185X.12337.
199. Dale RC, Yin K, Ding A, et al. Antibody binding to neuronal surface in movement disorders associated with lupus and antiphospholipid antibodies. Dev Med Child Neurol. 2011;53(6):522–8, http://dx.doi.org/10.1111/j.1469-8749.2011.03922.x.
200. Binstadt BA, Caldas AMC, Turvey SE, et al. Rituximab therapy for multisystem autoimmune diseases in pediatric patients. J Pediatr. 2003;143(5):598–604, http://dx.doi.org/10.1067/S0022-3476(03)00382-2.
201. Menozzi E, Mulroy E, Akbarian-Tefaghi L, Bhatia KP, Balint B. Movement disorders in systemic autoimmune diseases: clinical spectrum, ancillary investigations, pathophysiological considerations. Parkinsonism Relat Disord. 2021;88:116–28, http://dx.doi.org/10.1016/j.parkreldis.2021.05.026.
202. Magro-Checa C, Zirkzee EJ, Huizinga TW, Steup-Beekman GM. Management of neuropsychiatric systemic lupus erythematosus: current approaches and future perspectives. Drugs. 2016;76(4):459–83, http://dx.doi.org/10.1007/s40265-015-0534-3.
203. Peluso S, Antenora A, De Rosa A, et al. Antiphospholipid-related chorea. Front Neurol. 2012:3, http://dx.doi.org/10.3389/fneur.2012.00150.

204. Mok CC, Lau CS, Wong RWS. Treatment of lupus psychosis with oral cyclophosphamide followed by azathioprine maintenance: an open-label study. Am J Med. 2003;115(1):59–62, http://dx.doi.org/10.1016/S0002-9343(03)00135-9.
205. Abrol E, Coutinho E, Chou M, et al. Psychosis in systemic lupus erythematosus (SLE): 40-year experience of a specialist centre. Rheumatology. 2021;60(12):5620–9, http://dx.doi.org/10.1093/rheumatology/keab160.
206. Lim LSH, Lefebvre A, Benseler S, Silverman ED. Longterm outcomes and damage accrual in patients with childhood systemic lupus erythematosus with psychosis and severe cognitive dysfunction. J Rheumatol. 2013;40(4):513–9, http://dx.doi.org/10.3899/jrheum.121096.
207. Miner JJ, Kim AHJ. Cardiac manifestations of systemic lupus erythematosus. Rheum Dis Clin North Am. 2014;40(1):51–60, http://dx.doi.org/10.1016/j.rdc.2013.10.003.
208. Tselios K, Urowitz MB. Cardiovascular and pulmonary manifestations of systemic lupus erythematosus. Curr Rheumatol Rev. 2017;13(3), http://dx.doi.org/10.2174/1573397113666170704102444.
209. Gaine S, Chin K, Coghlan G, et al. Selexipag for the treatment of connective tissue disease-associated pulmonary arterial hypertension. Eur Respir J. 2017;50(2):1602493, http://dx.doi.org/10.1183/13993003.02493-2016.
210. Bertsias G, Ioannidis JPA, Boletis J, et al. EULAR recommendations for the management of systemic lupus erythematosus. Report of a Task Force of the EULAR Standing Committee for International Clinical Studies Including Therapeutics. Ann Rheum Dis. 2008;67(2):195–205, http://dx.doi.org/10.1136/ard.2007.070367.
211. Imazio M. Pericardial involvement in systemic inflammatory diseases. Heart. 2011;97(22):1882–92, http://dx.doi.org/10.1136/heartjnl-2011-300054.
212. Man BL, Mok CC. Serositis related to systemic lupus erythematosus: prevalence and outcome. Lupus. 2005;14(10):822–6, http://dx.doi.org/10.1191/0961203305lu2187oa.
213. Artom G, Koren-Morag N, Spodick DH, et al. Pretreatment with corticosteroids attenuates the efficacy of colchicine in preventing recurrent pericarditis: a multi-centre all-case analysis. Eur Heart J. 2005;26(7):723–7, http://dx.doi.org/10.1093/eurheartj/ehi197.
214. Kruzliak P, Novak M, Piler P, Kovacova G. Pericardial involvement in systemic lupus erythematosus: current diagnosis and therapy. Acta Cardiol. 2013;68(6):629–33, http://dx.doi.org/10.1080/AC.68.6.8000011.
215. Morel N, Bonjour M, Le Guern V, et al. Colchicine: a simple and effective treatment for pericarditis in systemic lupus erythematosus? A report of 10 cases. Lupus. 2015;24(14):1479–85, http://dx.doi.org/10.1177/0961203315593169.
216. Imazio M, Belli R, Brucato A, et al. Efficacy and safety of colchicine for treatment of multiple recurrences of pericarditis (CORP-2): a multicentre, double-blind, placebo-controlled, randomised trial. Lancet. 2014;383(9936):2232–7, http://dx.doi.org/10.1016/S0140-6736(13)62709-9.
217. Thomas G, Cohen Aubart F, Chiche L, et al. Lupus myocarditis: initial presentation and longterm outcomes in a multicentric series of 29 patients. J Rheumatol. 2017;44(1):24–32, http://dx.doi.org/10.3899/jrheum.160493.
218. Garcia MA, Alarcon GS, Boggio G, et al. Primary cardiac disease in systemic lupus erythematosus patients: protective and risk factors–data from a multi-ethnic Latin American cohort. Rheumatology. 2014;53(8):1431–8, http://dx.doi.org/10.1093/rheumatology/keu011.
219. Gonzalez-Lopez L, Cardona-Muñoz EG, Celis A, et al. Therapy with intermittent pulse cyclophosphamide for pulmonary hypertension associated with systemic lupus erythematosus. Lupus. 2004;13(2):105–12, http://dx.doi.org/10.1191/0961203304lu509oa.
220. Kommireddy S, Bhyravavajhala S, Kurimeti K, et al. Pulmonary arterial hypertension in systemic lupus erythematosus may benefit by addition of immunosuppression to vasodilator therapy: an observational study. Rheumatology. 2015;54(9):1673–9, http://dx.doi.org/10.1093/rheumatology/kev097.
221. Tanaka E, Harigai M, Tanaka M, Kawaguchi Y, Hara M, Kamatani N. Pulmonary hypertension in systemic lupus erythematosus: evaluation of clinical characteristics and response to immunosuppressive treatment. J Rheumatol. 2002;29(2):282–7.
222. Muangchan C, van Vollenhoven RF, Bernatsky SR, et al. Treatment algorithms in systemic lupus erythematosus. Arthritis Care Res (Hoboken). 2015;67(9):1237–45, http://dx.doi.org/10.1002/acr.22589.
223. Miyamichi-Yamamoto S, Fukumoto Y, Sugimura K, et al. Intensive immunosuppressive therapy improves pulmonary hemodynamics and long-term prognosis in patients with pulmonary arterial hypertension associated with connective tissue disease. Circulation J. 2011;75(11):2668–74, http://dx.doi.org/10.1253/circj.CJ-11-0473.
224. GalieN, Brundage BH, Ghofrani HA, et al. Tadalafil therapy for pulmonary arterial hypertension. Circulation. 2009;119(22):2894–903, http://dx.doi.org/10.1161/CIRCULATIONAHA.108.839274.
225. Galiè N, Humbert M, Vachiery JL, et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. Eur Heart J. 2016;37(1):67–119, http://dx.doi.org/10.1093/eurheartj/ehv317.
226. Beltrán-Gámez ME, Sandoval-Zárate J, Pulido T. Inhibidores de fosfodiesterasa-5 para el tratamiento de la hipertensión arterial pulmonar. Arch Cardiol Mex. 2015;85(3):215–24, http://dx.doi.org/10.1016/j.acmx.2015.03.001.
227. Badesch DB, Hill NS, Burgess G, et al. Sildenafil for pulmonary arterial hypertension associated with connective tissue disease. J Rheumatol. 2007;34(12):2417–22.
228. Rubin LJ, Badesch DB, Barst RJ, et al. Bosentan therapy for pulmonary arterial hypertension. N Engl J Med. 2002;346(12):896–903, http://dx.doi.org/10.1056/NEJMoa012212.
229. Keane MP. Rare diseases bullet 7: pleuropulmonary manifestations of systemic lupus erythematosus. Thorax. 2000;55(2):159–66, http://dx.doi.org/10.1136/thorax.55.2.159.
230. Pego-Reigosa JM, Medeiros DA, Isenberg DA. Respiratory manifestations of systemic lupus erythematosus: old and new concepts. Best Pract Res Clin Rheumatol. 2009;23(4):469–80, http://dx.doi.org/10.1016/j.berh.2009.01.002.
231. Matthay RA, Schwarz MI, Petty TL, et al. Pulmonary manifestations of systemic lupus erythematosus: review of twelve cases of acute lupus pneumonitis. Medicine. 1975;54(5):397–410, http://dx.doi.org/10.1097/00005792-197509000-00003.
232. Allen D, Fischer A, Bshouty Z, et al. Evaluating systemic lupus erythematosus patients for lung involvement. Lupus. 2012;21(12):1316–25, http://dx.doi.org/10.1177/0961203312454343.
233. Weinrib L, Sharma OP, Quismorio FP. A long-term study of interstitial lung disease in systemic lupus erythematosus. Semin Arthritis Rheum. 1990;20(1):48–56, http://dx.doi.org/10.1016/0049-0172(90)90094-V.
234. Badsha H, Teh CL, Kong KO, Lian TY, Chng HH. Pulmonary hemorrhage in systemic lupus erythematosus. Semin Arthritis Rheum. 2004;33(6):414–21, http://dx.doi.org/10.1016/j.semarthrit.2003.09.006.
235. Andrade C, Mendonça T, Farinha F, et al. Alveolar hemorrhage in systemic lupus erythematosus: a cohort review. Lupus. 2016;25(1):75–80, http://dx.doi.org/10.1177/0961203315605365.
236. Schwab EP, Schumacher HR, Freundlich B, Callegari PE. Pulmonary alveolar hemorrhage in systemic lupus erythematosus. Semin Arthritis Rheum. 1993;23(1):8–15, http://dx.doi.org/10.1016/S0049-0172(05)80022-8.
237. Tse JR, Schwab KE, McMahon M, Simon W. Rituximab: an emerging treatment for recurrent diffuse alveolar hemorrhage in systemic lupus erythematosus. Lupus. 2015;24(7):756–9, http://dx.doi.org/10.1177/0961203314564235.
238. Law AH, Chuah TY, Lee W, et al. Diffuse alveolar haemorrhage in systemic lupus erythematosus: a multicentre retrospective study in Singapore. Lupus. 2023;32(8):952–63, http://dx.doi.org/10.1177/09612033231180704.
239. Frittoli RB, Vivaldo JF, Costallat LTL, Appenzeller S. Gastrointestinal involvement in systemic lupus erythematosus: a systematic review. J Transl Autoimmun. 2021;4:100106, http://dx.doi.org/10.1016/j.jtauto.2021.100106.
240. Li Z, Xu D, Wang Z, et al. Gastrointestinal system involvement in systemic lupus erythematosus. Lupus. 2017;26(11):1127–38, http://dx.doi.org/10.1177/0961203317707825.
241. Wang CR, Tsai HW. Autoimmune liver diseases in systemic rheumatic diseases. World J Gastroenterol. 2022;28(23):2527–45, http://dx.doi.org/10.3748/wjg.v28.i23.2527.
242. Ronen JA, Mekala A, Wiechmann C, Mungara S. A flare-up of systemic lupus erythematosus with unusual enteric predominance. Cureus. 2020, http://dx.doi.org/10.7759/cureus.7068.
243. Quintana Lazopulos C, Orozco M, Balderramo D. Small-vessel intestinal vasculitis as an initial manifestation of systemic lupus erythematosus. Dig Liver Dis. 2018;50(10):1096, http://dx.doi.org/10.1016/j.dld.2018.04.026.
244. Brewer BN, Kamen DL. Gastrointestinal and hepatic disease in systemic lupus erythematosus. Rheum Dis Clin North Am. 2018;44(1):165–75, http://dx.doi.org/10.1016/j.rdc.2017.09.011.
245. Adler BL, Timlin H, Birnbaum J. Lupus intestinal pseudo-obstruction and hydronephrosis. Medicine. 2019;98(28):e16178, http://dx.doi.org/10.1097/MD.0000000000016178.
246. Ayari M, Nakhli A, Teyeb Z, Abdelaali I, Bellakhal S, Jomni T. Intestinal pseudo-obstruction: unusual presentation of systemic lupus erythematous. Clin Case Rep. 2021;9(3):1759–62, http://dx.doi.org/10.1002/ccr3.3907.
247. Zhang FJ, Zhang J, Zhou LP, Wang AM, Li XM. Intestinal pseudo-obstruction as the initial manifestation of systemic lupus erythematosus. Am J Emerg Med. 2019;37(1):176.e1–2, http://dx.doi.org/10.1016/j.ajem.2018.09.048.
248. Wang R, Zheng B, Wang B, Ma P, Chen F, Tang L. A report of chronic intestinal pseudo-obstruction related to systemic lupus erythematosus. Open Med. 2018;13(1):562–4, http://dx.doi.org/10.1515/med-2018-0083.
249. Alharbi S. Gastrointestinal manifestations in patients with systemic lupus erythematosus. Open Access Rheumatol. 2022;14:243–53, http://dx.doi.org/10.2147/OARRR.S384256.
250. Mustafa M, Bawazir YM. Acute liver failure as the first feature of systemic lupus erythematosus. Rheumatol Int. 2021;41(2):469–74, http://dx.doi.org/10.1007/s00296-020-04717-y.
251. Zhang L, Yin L, Lv W, et al. Clinical analysis of patients with systemic lupus erythematosus complicated with liver failure. Clin Rheumatol. 2023;42(6):1545–53, http://dx.doi.org/10.1007/s10067-023-06524-9.
252. Chaudhary FS, Sureen A, Yousaf MN, Rao DS, Siva C. Co-presentation of lupus nephritis with autoimmune hepatitis. Am J Case Reports. 2023:24, http://dx.doi.org/10.12659/AJCR.940478.
253. Arvaniti P, Giannoulis G, Gabeta S, Zachou K, Koukoulis GK, Dalekos GN. Belimumab is a promising third-line treatment option for refractory autoimmune hepatitis. JHEP Rep. 2020;2(4):100123, http://dx.doi.org/10.1016/j.jhepr.2020.100123.
254. Kolev M, Sarbu AC, Möller B, Maurer B, Kollert F, Semmo N. Belimumab treatment in autoimmune hepatitis and primary biliary cholangitis – a case series. J Transl Autoimmun. 2023;6:100189, http://dx.doi.org/10.1016/j.jtauto.2023.100189.
255. Gebreselassie A, Aduli F, Howell CD. Rheumatologic diseases and the liver. Clin Liver Dis. 2019;23(2):247–61, http://dx.doi.org/10.1016/j.cld.2018.12.007.

256. González-Regueiro JA, Cruz-Contreras M, Merayo-Chalico J, et al. Hepatic manifestations in systemic lupus erythematosus. Lupus. 2020;29(8):813–24, http://dx.doi.org/10.1177/0961203320923398.
257. Dima A, Balaban DV, Jurcut C, Jinga M. Systemic lupus erythematosus-related acute pancreatitis. Lupus. 2021;30(1):5–14, http://dx.doi.org/10.1177/0961203320978515.
258. Grabar S, Groh M, Bahuaud M, et al. Pneumococcal vaccination in patients with systemic lupus erythematosus: a multicenter placebo-controlled randomized double-blind study. Vaccine. 2017;35(37):4877–85, http://dx.doi.org/10.1016/j.vaccine.2017.07.094.
259. Huang Y, Wang H, Wan L, Lu X, Tam WWS. Is systemic lupus erythematosus associated with a declined immunogenicity and poor safety of influenza vaccination? Medicine. 2016;95(19):e3637, http://dx.doi.org/10.1097/MD.0000000000003637.
260. Kuruma KAM, Borba EF, Lopes MH, de Carvalho JF, Bonfá E. Safety and efficacy of hepatitis B vaccine in systemic lupus erythematosus. Lupus. 2007;16(5):350–4, http://dx.doi.org/10.1177/0961203307078225.
261. Pugès M, Biscay P, Barnetche T, et al. Immunogenicity and impact on disease activity of influenza and pneumococcal vaccines in systemic lupus erythematosus: a systematic literature review and meta-analysis. Rheumatology. 2016;55(9):1664–72, http://dx.doi.org/10.1093/rheumatology/kew211.
262. Milanovic M, Stojanovich L, Djokovic A, Kontic M, Gvozdenovic E. Influenza vaccination in autoimmune rheumatic disease patients. Tohoku J Exp Med. 2013;229(1):29–34, http://dx.doi.org/10.1620/tjem.229.29.
263. Elkayam O, Amir S, Mendelson E, et al. Efficacy and safety of vaccination against pandemic 2009 influenza A (H1N1) virus among patients with rheumatic diseases. Arthritis Care Res (Hoboken). 2011;63(7):1062–7, http://dx.doi.org/10.1002/acr.20465.
264. Liao Z, Tang H, Xu X, Liang Y, Xiong Y, Ni J. Immunogenicity and safety of influenza vaccination in systemic lupus erythematosus patients compared with healthy controls: a meta-analysis. PLoS One. 2016;11(2):e0147856, http://dx.doi.org/10.1371/journal.pone.0147856.
265. Adawi M, Bragazzi NL, McGonagle D, et al. Immunogenicity, safety and tolerability of anti-pneumococcal vaccination in systemic lupus erythematosus patients: An evidence-informed and PRISMA compliant systematic review and meta-analysis. Autoimmun Rev. 2019;18(1):73–92, http://dx.doi.org/10.1016/j.autrev.2018.08.002.
266. Rezende RPV, Oliveira-Santos M, Andrade LEC, Klumb EM. Combined 13-valent pneumococcal conjugate and 23-valent pneumococcal polysaccharide vaccine regimens for adults with systemic lupus erythematosus: does the sequence of pneumococcal vaccination affect immunogenicity responses? A single-center cohort study in Brazil. Lupus. 2023;32(5):694–703, http://dx.doi.org/10.1177/09612033231153535.
267. Jena A, Mishra S, Deepak P, et al. Response to SARS-CoV-2 vaccination in immune mediated inflammatory diseases: Systematic review and meta-analysis. Autoimmun Rev. 2022;21(1):102927, http://dx.doi.org/10.1016/j.autrev.2021.102927.
268. Ferri C, Gragnani L, Raimondo V, et al. Absent or suboptimal response to booster dose of COVID-19 vaccine in patients with autoimmune systemic diseases. J Autoimmun. 2022;131:102866, http://dx.doi.org/10.1016/j.jaut.2022.102866.
269. Law J, Sorrento C, Saxena A. Vaccination updates and special considerations for systemic lupus erythematosus patients. Curr Opin Rheumatol. 2024;36(2):148–53, http://dx.doi.org/10.1097/BOR.0000000000000992.
270. Krasselt M, Baerwald C, Liebert UG, Seifert O. Humoral immunity to varicella zoster virus in patients with systemic lupus erythematosus and rheumatoid arthritis compared to healthy controls. Vaccines (Basel). 2021;9(4):325, http://dx.doi.org/10.3390/vaccines9040325.
271. Mok CC, Chan KH, Ho LY, Fung YF, Fung WF, Woo PCY. Safety and immune response of a live-attenuated herpes zoster vaccine in patients with systemic lupus erythematosus: a randomised placebo-controlled trial. Ann Rheum Dis. 2019;78(12):1663–8, http://dx.doi.org/10.1136/annrheumdis-2019-215925.
272. Infante V, Miyaji KT, Soarez PC, Sartori AMC. Systematic review and meta-analysis of HPV vaccination in women with systemic lupus erythematosus (SLE). Expert Rev Vaccines. 2021;20(3):309–18, http://dx.doi.org/10.1080/14760584.2021.1889375.
273. Mok CC, Ho LY, Fong LS, To CH. Immunogenicity and safety of a quadrivalent human papillomavirus vaccine in patients with systemic lupus erythematosus: a case–control study. Ann Rheum Dis. 2013;72(5):659–64, http://dx.doi.org/10.1136/annrheumdis-2012-201393.
274. Albrecht K, Poddubnyy D, Leipe J, et al. Perioperative management of patients with inflammatory rheumatic diseases. Z Rheumatol. 2023;82(S1):1–11, http://dx.doi.org/10.1007/s00393-021-01150-9.
275. Zisa D, Goodman SM. Perioperative management of rheumatic disease and therapies. Med Clin North Am. 2021;105(2):273–84, http://dx.doi.org/10.1016/j.mcna.2020.09.011.
276. Grennan DM. Methotrexate and early postoperative complications in patients with rheumatoid arthritis undergoing elective orthopaedic surgery. Ann Rheum Dis. 2001;60(3):214–7, http://dx.doi.org/10.1136/ard.60.3.214.
277. Goodman S, Friedlander R, Figgie C, et al. Flares occur frequently in RA patients undergoing arthroplasty [abstract]. Arthritis Rheumatol. 2015;67(10).
278. Goodman SM, Springer BD, Chen AF, et al. 2022 American College of Rheumatology/American Association of Hip and Knee Surgeons Guideline for the Perioperative Management of Antirheumatic Medication in Patients With Rheumatic Diseases Undergoing Elective Total Hip or Total Knee Arthroplasty. Arthritis Care Res (Hoboken). 2022;74(9):1399–408, http://dx.doi.org/10.1002/acr.24893.
279. Klement MR, Penrose CT, Bala A, Wellman SS, Bolognesi MP, Seyler TM. How do previous solid organ transplant recipients fare after primary total knee arthroplasty? J Arthroplasty. 2016;31(3):609–15.e1, http://dx.doi.org/10.1016/j.arth.2015.10.007.
280. Marik PE. Requirement of perioperative stress doses of corticosteroids. Arch Surg. 2008;143(12):1222, http://dx.doi.org/10.1001/archsurg.143.12.1222.
281. Tarp S, Eric Furst D, Boers M, et al. Risk of serious adverse effects of biological and targeted drugs in patients with rheumatoid arthritis: a systematic review meta-analysis. Rheumatology. 2016, http://dx.doi.org/10.1093/rheumatology/kew442, kew442.
282. Ramos-Casals M, Soto M, Cuadrado M, Khamashta M. Rituximab in systemic lupus erythematosus: a systematic review of off-label use in 188 cases. Lupus. 2009;18(9):767–76, http://dx.doi.org/10.1177/0961203309106174.
283. Murray E, Perry M. Off-label use of rituximab in systemic lupus erythematosus: a systematic review. Clin Rheumatol. 2010;29(7):707–16, http://dx.doi.org/10.1007/s10067-010-1387-5.
284. Furie R, Petri M, Zamani O, et al. A phase III, randomized, placebo-controlled study of belimumab, a monoclonal antibody that inhibits B lymphocyte stimulator, in patients with systemic lupus erythematosus. Arthritis Rheum. 2011;63(12):3918–30, http://dx.doi.org/10.1002/art.30613.
285. Bundhun PK, Soogund MZS, Huang F. Impact of systemic lupus erythematosus on maternal and fetal outcomes following pregnancy: a meta-analysis of studies published between years 2001–2016. J Autoimmun. 2017;79:17–27, http://dx.doi.org/10.1016/j.jaut.2017.02.009.
286. Zhang S, Han X, Liu W, Wen Q, Wang J. Pregnancy in patients with systemic lupus erythematosus: a systematic review. Arch Gynecol Obstet. 2023;308(1):63–71, http://dx.doi.org/10.1007/s00404-022-06718-7.
287. Saavedra Salinas MÁ, Barrera Cruz A, Cabral Castañeda AR, et al. Guías de práctica clínica para la atención del embarazo en mujeres con enfermedades reumáticas autoinmunes del Colegio Mexicano de Reumatología. Parte II. Reumatol Clin. 2015;11(5):305–15, http://dx.doi.org/10.1016/j.reuma.2014.12.004.
288. Petri M, Kim MY, Kalunian KC, et al. Combined oral contraceptives in women with systemic lupus erythematosus. N Engl J Med. 2005;353(24):2550–8, http://dx.doi.org/10.1056/NEJMoa051135.
289. Sánchez-Guerrero J, Uribe AG, Jiménez-Santana L, et al. A trial of contraceptive methods in women with systemic lupus erythematosus. N Engl J Med. 2005;353(24):2539–49, http://dx.doi.org/10.1056/NEJMoa050817.
290. Rojas-Villarraga A, Torres-Gonzalez JV, Ruiz-Sternberg ÁM. Safety of hormonal replacement therapy and oral contraceptives in systemic lupus erythematosus: a systematic review and meta-analysis. PLoS One. 2014;9(8):e104303, http://dx.doi.org/10.1371/journal.pone.0104303.
291. Chabbert-Buffet N, Amoura Z, Scarabin PY, et al. Pregnane progestin contraception in systemic lupus erythematosus: a longitudinal study of 187 patients. Contraception. 2011;83(3):229–37, http://dx.doi.org/10.1016/j.contraception.2010.08.012.
292. Rebelo RC, Pignaton E, Valeria Bahamondes M, et al. Disease activity and thromboembolic events in women with systemic lupus erythematosus with and without anti-phospholipid syndrome: users of the 52-mg levonorgestrel-releasing intrauterine system. Arch Gynecol Obstet. 2019;299(6):1597–605, http://dx.doi.org/10.1007/s00404-019-05131-x.
293. Silverstein RG, Fitz V, Thornton M, Carter A, Morse JE. Contraceptive use and counseling in patients with systemic lupus erythematosus. Contraception. 2022;105:46–50, http://dx.doi.org/10.1016/j.contraception.2021.08.017.
294. Chandramouli S, Alvarez C, Englund TR, Silverstein RG, Sheikh SZ. Teratogenic medication use associated with favourable odds of contraception counselling in a cohort of women with systemic lupus erythematosus at a large tertiary academic medical centre. Lupus Sci Med. 2022;9(1):e000823, http://dx.doi.org/10.1136/lupus-2022-000823.
295. Wei Q, Ouyang Y, Zeng W, Duan L, Ge J, Liao H. Pregnancy complicating systemic lupus erythematosus: a series of 86 cases. Arch Gynecol Obstet. 2011;284(5):1067–71, http://dx.doi.org/10.1007/s00404-010-1786-5.
296. Rajendran A, Eudy AM, Balevic SJ, Clowse MEB. The importance of pregnancy planning in lupus pregnancies. Lupus. 2021;30(5):741–51, http://dx.doi.org/10.1177/0961203321989803.
297. Hamijoyo L, Martha JW, Hidayat S, et al. Risk factors for poor pregnancy outcome in systemic lupus erythematosus patients. Acta Med Indones. 2019;51(2):102–9.
298. Wu J, Zhang WH, Ma J, Bao C, Liu J, Di W. Prediction of fetal loss in Chinese pregnant patients with systemic lupus erythematosus: a retrospective cohort study. BMJ Open. 2019;9(2):e023849, http://dx.doi.org/10.1136/bmjopen-2018-023849.
299. Mokbel A, Attia DH, Zayed HS, et al. Pregnancy outcomes among Egyptian women with systemic lupus erythematosus: a prospective cohort study. Lupus. 2023;32(4):521–30, http://dx.doi.org/10.1177/09612033231159468.

300. Ma R, Gao H, Cui J, et al. Pregnancy feasibility in women with mild pulmonary arterial hypertension: a systematic review and meta-analysis. BMC Pregnancy Childbirth. 2023;23(1):427, http://dx.doi.org/10.1186/s12884-023-05752-w.
301. Skorpen CG, Lydersen S, Gilboe IM, et al. Influence of disease activity and medications on offspring birth weight, pre-eclampsia and preterm birth in systemic lupus erythematosus: a population-based study. Ann Rheum Dis. 2018;77(2):264–9, http://dx.doi.org/10.1136/annrheumdis-2017-211641.
302. Tani C, Zucchi D, Haase I, et al. Are remission and low disease activity state ideal targets for pregnancy planning in systemic lupus erythematosus? A multicentre study. Rheumatology. 2021;60(12):5610–9, http://dx.doi.org/10.1093/rheumatology/keab155.
303. Kim JW, Jung JY, Kim HA, Yang JI, Kwak DW, Suh CH. Lupus low disease activity state achievement is important for reducing adverse outcomes in pregnant patients with systemic lupus erythematosus. J Rheumatol. 2021;48(5):707–16, http://dx.doi.org/10.3899/jrheum.200802.
304. Ntali S, Nikolopoulos D, Pantazi L, et al. Remission or low disease activity at pregnancy onset are linked to improved foetal outcomes in women with systemic lupus erythematosus: results from a prospective observational study. Clin Exp Rheumatol. 2022;40(9):1769–78, http://dx.doi.org/10.55563/clinexprheumatol/g4rby6.
305. Sheng X, Song X, Xiong Y, et al. Maternal and infant outcomes of pregnancy associated with anti-SSA/RO antibodies: a systematic review and meta-analysis. Pediatr Rheumatol. 2023;21(1):22, http://dx.doi.org/10.1186/s12969-023-00803-0.
306. Borella E, Lojacono A, Gatto M, et al. Predictors of maternal and fetal complications in SLE patients: a prospective study. Immunol Res. 2014;60(2-3):170–6, http://dx.doi.org/10.1007/s12026-014-8572-6.
307. Jakobsen I, Helmig R, Stengaard-Pedersen K. Maternal and foetal outcomes in pregnant systemic lupus erythematosus patients: an incident cohort from a stable referral population followed during 1990–2010. Scand J Rheumatol. 2015;44(5):377–84, http://dx.doi.org/10.3109/03009742.2015.1013982.
308. Buyon JP, Kim MY, Guerra MM, et al. Predictors of pregnancy outcomes in patients with lupus. Ann Intern Med. 2015;163(3):153–63, http://dx.doi.org/10.7326/M14-2235.
309. Yelnik CM, Porter TF, Branch DW, et al. Brief report: changes in antiphospholipid antibody titers during pregnancy: effects on pregnancy outcomes. Arthritis Rheumatol. 2016;68(8):1964–9, http://dx.doi.org/10.1002/art.39668.
310. Deguchi M, Maesawa Y, Kubota S, et al. Factors associated with adverse pregnancy outcomes in women with systematic lupus erythematosus. J Reprod Immunol. 2018;125:39–44, http://dx.doi.org/10.1016/j.jri.2017.11.005.
311. Palma dos Reis CR, Cardoso G, Carvalho C, Nogueira I, Borges A, Serrano F. Prediction of adverse pregnancy outcomes in women with systemic lupus erythematosus. Clin Rev Allergy Immunol. 2020;59(3):287–94, http://dx.doi.org/10.1007/s12016-019-08762-9.
312. Fischer-Betz R, Specker C, Brinks R, Aringer M, Schneider M. Low risk of renal flares and negative outcomes in women with lupus nephritis conceiving after switching from mycophenolate mofetil to azathioprine. Rheumatology. 2013;52(6):1070–6, http://dx.doi.org/10.1093/rheumatology/kes425.
313. Clowse MEB, Saag KG. Unintended consequences of SCOTUS abortion decision for patients with rheumatic diseases. Ann Intern Med. 2022;175(9):1328–9, http://dx.doi.org/10.7326/M22-2246.
314. Hu Z, Gao R, Huang W, Wang H, Qin L. Effect of hydroxychloroquine on lupus activity, preeclampsia and intrauterine growth restriction in pregnant women with systemic lupus erythematosus and/or antiphospholipid syndrome: a systematic review and meta-analysis. J Clin Med. 2023;12(2):485, http://dx.doi.org/10.3390/jcm12020485.
315. McDonald EG, Bissonette L, Ensworth S, et al. Monitoring of systemic lupus erythematosus pregnancies: a systematic literature review. J Rheumatol. 2018;45(10):1477–90, http://dx.doi.org/10.3899/jrheum.171023.
316. Martínez López JA, García Vivar ML, Cáliz R, et al. Recomendaciones sobre actuaciones a seguir durante la edad fértil, el embarazo, posparto y lactancia en pacientes con enfermedades reumáticas inflamatorias y autoinmunes. Reumatol Clin. 2017;13(5):264–81, http://dx.doi.org/10.1016/j.reuma.2016.05.003.
317. Andreoli L, Bertsias GK, Agmon-Levin N, et al. EULAR recommendations for women's health and the management of family planning, assisted reproduction, pregnancy and menopause in patients with systemic lupus erythematosus and/or antiphospholipid syndrome. Ann Rheum Dis. 2017;76(3):476–85, http://dx.doi.org/10.1136/annrheumdis-2016-209770.
318. Keeling SO, Alabdurubalnabi Z, Avina-Zubieta A, et al. Canadian rheumatology association recommendations for the assessment and monitoring of systemic lupus erythematosus. J Rheumatol. 2018;45(10):1426–39, http://dx.doi.org/10.3899/jrheum.171459.
319. Sammaritano LR, Bermas BL, Chakravarty EE, et al. 2020 American College of Rheumatology Guideline for the Management of Reproductive Health in Rheumatic and Musculoskeletal Diseases. Arthritis Rheumatol. 2020;72(4):529–56, http://dx.doi.org/10.1002/art.41191.
320. Schreiber K, Frishman M, Russell MD, et al. British Society for Rheumatology guideline on prescribing drugs in pregnancy and breastfeeding: comorbidity medications used in rheumatology practice. Rheumatology. 2023;62(4):e89–104, http://dx.doi.org/10.1093/rheumatology/keac552.
321. Russell MD, Dey M, Flint J, et al. British Society for Rheumatology guideline on prescribing drugs in pregnancy and breastfeeding: immunomodulatory anti-rheumatic drugs and corticosteroids. Rheumatology. 2023;62(4):e48–88, http://dx.doi.org/10.1093/rheumatology/keac551.
322. Zhang Y, Li D, Guo H, Wang W, Li X, Shen S. Association between thiopurines use and pregnancy outcomes in female patients with inflammatory bowel disease: a meta-analysis. Curr Pharm Des. 2021;27(19):2317–24, http://dx.doi.org/10.2174/1381612826666200916144249.
323. Le HL, Francke MI, Andrews LM, de Winter BCM, van Gelder T, Hesselink DA. Usage of tacrolimus and mycophenolic acid during conception, pregnancy, and lactation, and its implications for therapeutic drug monitoring: a systematic critical review. Ther Drug Monit. 2020;42(4):518–31, http://dx.doi.org/10.1097/FTD.0000000000000769.
324. Petri M, Landy H, Clowse MEB, et al. Belimumab use during pregnancy: a summary of birth defects and pregnancy loss from belimumab clinical trials, a pregnancy registry and postmarketing reports. Ann Rheum Dis. 2023;82(2):217–25, http://dx.doi.org/10.1136/ard-2022-222505.
325. Magder LS, Petri M. Incidence of and risk factors for adverse cardiovascular events among patients with systemic lupus erythematosus. Am J Epidemiol. 2012;176(8):708–19, http://dx.doi.org/10.1093/aje/kws130.
326. Chuang MH, Chuang TL, Huang KY, Wang YF. Age-adjusted Charlson Comorbidity Index scores predict major adverse cardiovascular events and all-cause mortality among systemic lupus erythematosus patients. Tzu Chi Med J. 2017;29(3):154, http://dx.doi.org/10.4103/tcmj.tcmj_57_17.
327. Fernández-Garcés M, Haro G, Micó ML. Predisposing factors to nonfatal cardiovascular events in women with systemic lupus erythematosus. An observational, cross-sectional, multicenter study in Spain from the risk/systemic lupus erythematosus thematic network. Medicine. 2019;98(43):e17489, http://dx.doi.org/10.1097/MD.0000000000017489.
328. Haugaard JH, Dreyer L, Ottosen MB, Gislason G, Kofoed K, Egeberg A. Use of hydroxychloroquine and risk of major adverse cardiovascular events in patients with lupus erythematosus: a Danish nationwide cohort study. J Am Acad Dermatol. 2021;84(4):930–7, http://dx.doi.org/10.1016/j.jaad.2020.12.013.
329. Yang DH, Leong PY, Sia SK, Wang YH, Wei JCC. Long-term hydroxychloroquine therapy and risk of coronary artery disease in patients with systemic lupus erythematosus. J Clin Med. 2019;8(6):796, http://dx.doi.org/10.3390/jcm8060796.
330. Demir S, Artim-Esen B, Şahinkaya Y, et al. Metabolic syndrome is not only a risk factor for cardiovascular diseases in systemic lupus erythematosus but is also associated with cumulative organ damage: a cross-sectional analysis of 311 patients. Lupus. 2016;25(2):177–84, http://dx.doi.org/10.1177/0961203315603140.
331. Petri MA, Kiani AN, Post W, Christopher-Stine L, Magder LS. Lupus Atherosclerosis Prevention Study (LAPS). Ann Rheum Dis. 2011;70(5):760–5, http://dx.doi.org/10.1136/ard.2010.136762.
332. Plazak W, Gryga K, Dziedzic H, et al. Influence of atorvastatin on coronary calcifications and myocardial perfusion defects in systemic lupus erythematosus patients: a prospective, randomized, double-masked, placebo-controlled study. Arthritis Res Ther. 2011;13(4):R117, http://dx.doi.org/10.1186/ar3402.
333. Arnaud L, Mathian A, Devilliers H, et al. Patient-level analysis of five international cohorts further confirms the efficacy of aspirin for the primary prevention of thrombosis in patients with antiphospholipid antibodies. Autoimmun Rev. 2015;14(3):192–200, http://dx.doi.org/10.1016/j.autrev.2014.10.019.
334. Arnaud L, Mathian A, Ruffatti A, et al. Efficacy of aspirin for the primary prevention of thrombosis in patients with antiphospholipid antibodies: An international and collaborative meta-analysis. Autoimmun Rev. 2014;13(3):281–91, http://dx.doi.org/10.1016/j.autrev.2013.10.014.
335. Fasano S, Pierro L, Pantano I, Iudici M, Valentini G. Longterm hydroxychloroquine therapy and low-dose aspirin may have an additive effectiveness in the primary prevention of cardiovascular events in patients with systemic lupus erythematosus. J Rheumatol. 2017;44(7):1032–8, http://dx.doi.org/10.3899/jrheum.161351.
336. Iudici M, Fasano S, Gabriele Falcone L, et al. Low-dose aspirin as primary prophylaxis for cardiovascular events in systemic lupus erythematosus: a long-term retrospective cohort study. Rheumatology. 2016;55(9):1623–30, http://dx.doi.org/10.1093/rheumatology/kew231.
337. Fasano S, Margiotta DP, Navarini L, et al. Primary prevention of cardiovascular disease in patients with systemic lupus erythematosus: case series and literature review. Lupus. 2017;26(14):1463–72, http://dx.doi.org/10.1177/0961203317722847.
338. Ferreira GA, Navarro TP, Telles RW, Andrade LEC, Sato EI. Atorvastatin therapy improves endothelial-dependent vasodilation in patients with systemic lupus erythematosus: an 8 weeks controlled trial. Rheumatology. 2007;46(10):1560–5, http://dx.doi.org/10.1093/rheumatology/kem186.

339. Norby GE, Holme I, Fellström B, et al. Effect of fluvastatin on cardiac outcomes in kidney transplant patients with systemic lupus erythematosus: a randomized placebo-controlled study. Arthritis Rheum. 2009;60(4):1060–4, http://dx.doi.org/10.1002/art.24379.

340. Sahebkar A, Rathouska J, Derosa G, Maffioli P, Nachtigal P. Statin impact on disease activity and C-reactive protein concentrations in systemic lupus erythematosus patients: a systematic review and meta-analysis of controlled trials. Autoimmun Rev. 2016;15(4):344–53, http://dx.doi.org/10.1016/j.autrev.2015.12.007.