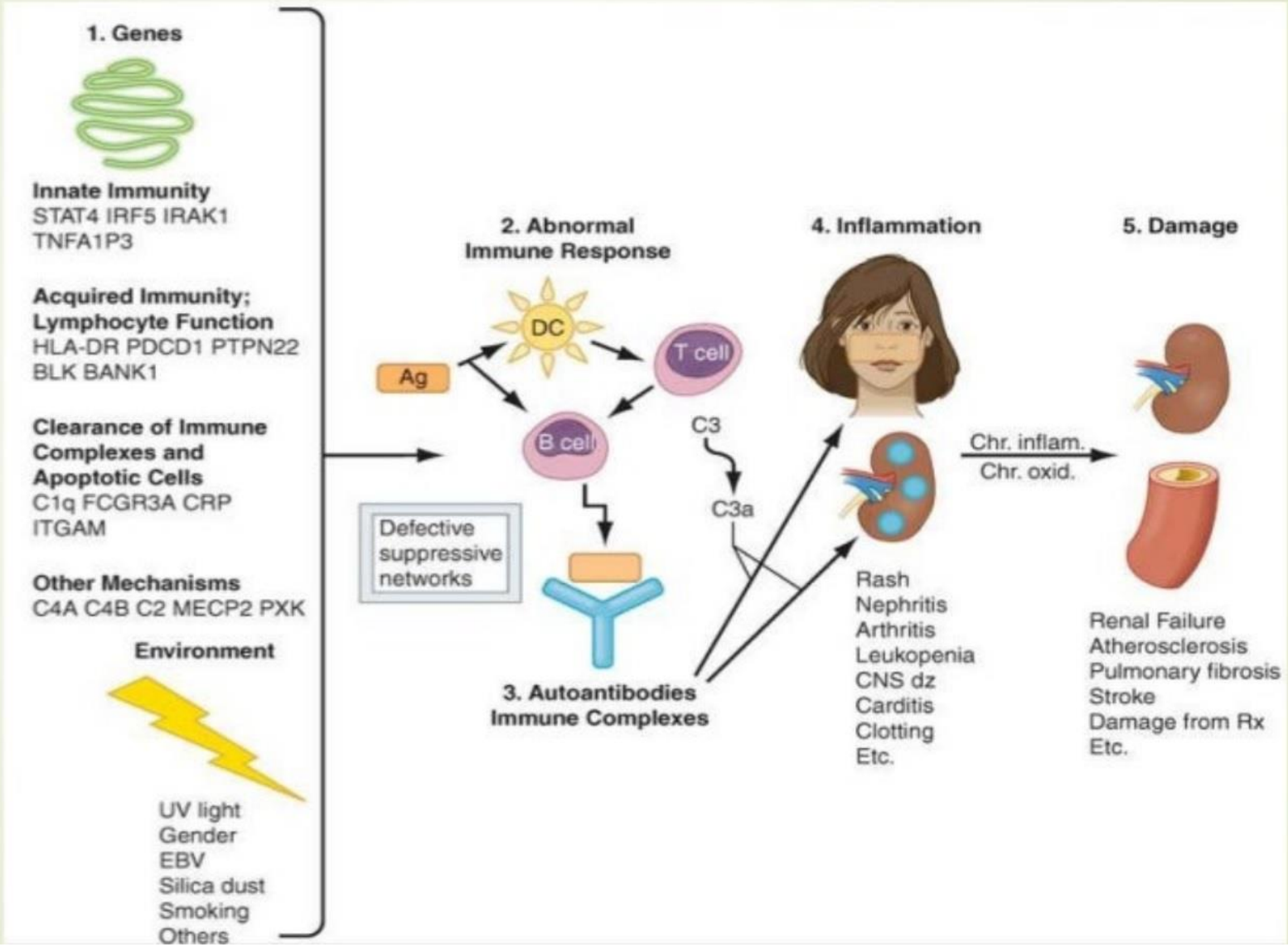
INTRODUCTION

- Systemic lupus erythematosus (SLE) is an autoimmune disease
- Ninety percent of patients are women of child-bearing years
- people of all genders, ages, and ethnic groups are susceptible
- highest prevalence is in African-American and Afro-Caribbean women, and lowest prevalence is in white men.

History of Lupus

- Lupus means "wolf" in Latin
- 10th century- case reports appeared in writings
- Late 1800s- Sir William Osler initially described the systemic nature and linked rashes to organ involvement
- 1949- LE cell described by Malcolm Hargraves at Mayo Clinic
- 1954- ANA described
- 1971- First set of classification criteria proposed for Lupus
- 1983- Antiphospholipid antibody syndrome described

PATHOGENESIS



ABNORMAL IMMUNE RESPONSES:

- **(1) activation of innate immunity** (dendritic cells, monocyte/ macrophages) by immune complexes or viral DNA / RNA
- **(2) lowered activation thresholds and abnormal activation** pathways in adaptive immunity cells (mature T and B lymphocytes)
- **(3) ineffective regulatory** CD4+ and CD8+ T cells, B cells, and myeloid-derived **suppressor cells**
- **(4) reduced clearance** of immune complexes and apoptotic cells

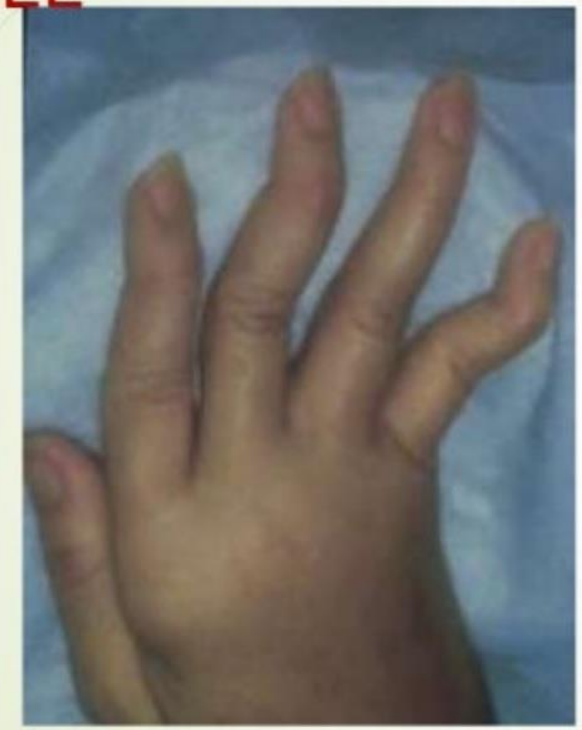
RISK FACTORS FOR SLE

- Female sex
- Oestrogen containing OCP or HRT (1.2- to 2-fold)
- XXY karyotype (Klinefelter's syndrome)
- Exposure to UV light causes SLE flares in approx. 70% patients.
- Epstein-Barr virus (EBV) can trigger SLE in susceptible individuals
- Current tobacco smoking (odds ratio [OR] 1.5)
- Prolonged occupational exposure to silica (OR 4.3)

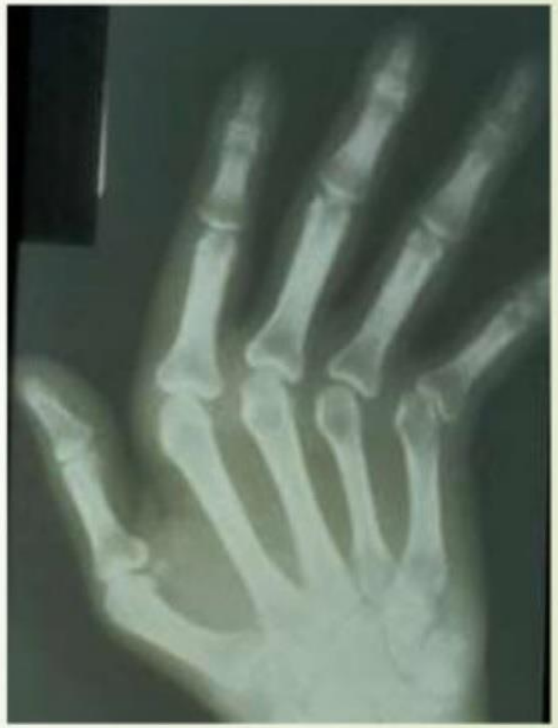
CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

Manifestation	Prevalence(%)
Systemic: Fatigue, malaise, fever, anorexia, weight loss	95
Musculoskeletal	95
Arthralgias/myalgias	95
Nonerosive polyarthritis	60
Hand deformities	10
Myopathy/myositis	25/5
Ischemic necrosis of bone	15

ARTHROPATHY & HAND DEFORMITY IN SLE



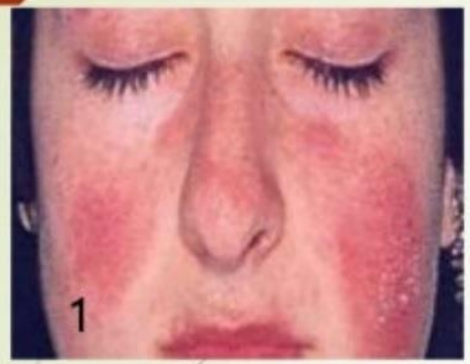
Jaccoud's arthopathy

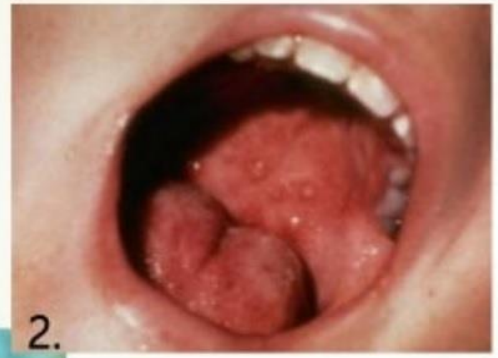


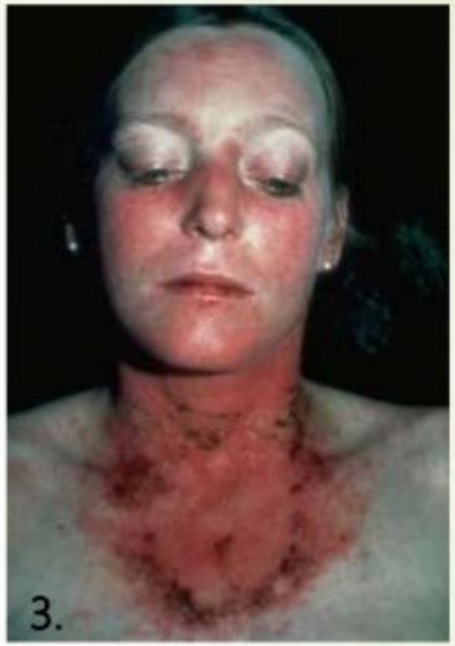
CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

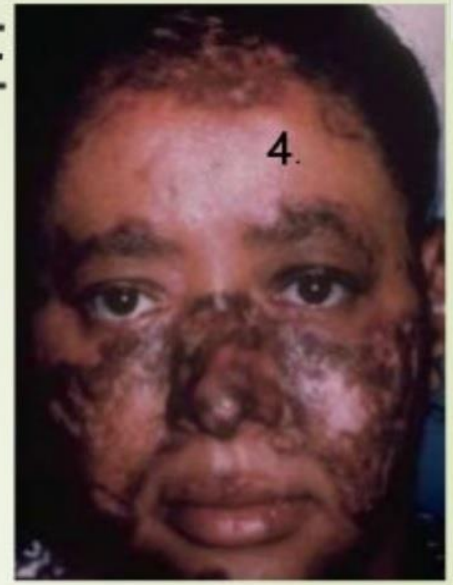
Manifestation	Prevalence(%)
Cutaneous	80
Photosensitivity	70
Malar rash	50
Oral ulcers	40
Alopecia	40
Discoid rash	20
Vasculitis rash	20
Other(e.g.,urticaria, subacute cutaneous lupus)	15

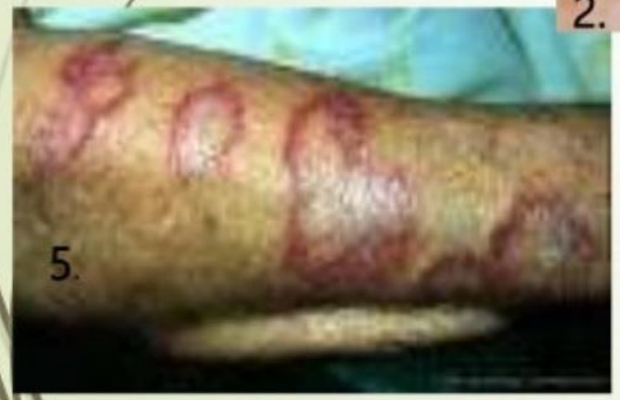
CUTANEOUS MANIFESTATIONS OF SLE

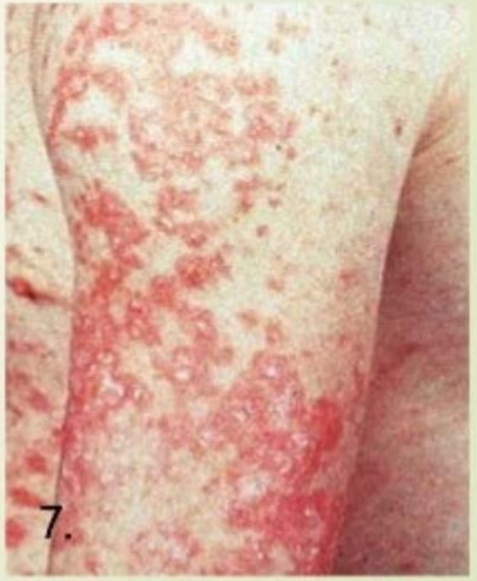












CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

Manifestation	Prevalence(%)
Hematologic	85
Anemia (chronic disease)	70
Hemolytic anemia	10
Leukopenia (<4000/µL)	65
Lymphopenia (<1500/µL)	50
Thrombocytopenia (<100,000/µL)	15
Lymphadenopathy	15
Splenomegaly	15

CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

Manifestation	Prevalence(%)
Neurologic	60
Cognitive disorder	50
Mood disorder	40
Headache	25
Seizures	20
Mono/ polyneuropathy	15
Stroke, TIA	10
Acute confusion /movement disorder	2–5
Aseptic meningitis, myelopathy	<1

CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

Manifestation	Prevalence(%)
<u>Cardiopulmonary</u>	60
Pleurisy, pericarditis, effusions	30–50
Myocarditis, endocarditis	10
Lupus pneumonitis	10
Coronary artery disease	10
Interstitial fibrosis	5
Pulmonary hypertension,ARDS,hemorrhage	<5
Shrinking lung syndrome	<5

LIBMAN-SACKS ENDOCARDITIS

Noninfective thrombotic endocarditis involving mitral valve in SLE.

Note nodular vegetations along line of closure and extending onto chordae tendineae

CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

Manifestation	Prevalence(%)
Renal	30–50
Proteinuria ≥500 mg/24 h, cellular casts	30–50
Nephrotic syndrome	25
End-stage renal disease	5–10

Nephritis is usually the most serious manifestation of SLE

CLASSIFICATION OF LUPUS NEPHRITIS

TABLE 378-2 CLASSIFICATION OF LUPUS NEPHRITIS (INTERNATIONAL SOCIETY OF NEPHROLOGY AND RENAL PATHOLOGY SOCIETY)

Class I: Minimal Mesangial Lupus Nephritis
Normal glomeruli by light microscopy, but mesangial immune deposits by immunofluorescence.
Class II: Mesangial Proliferative Lupus Nephritis
Purely mesangial hypercellularity of any degree or mesangial matrix expansion by light microscopy, with mesangial immune deposits. A few isolated subepithelial or subendothelial deposits may be visible by immunofluorescence or electron microscopy, but not by light microscopy.
Class III: Focal Lupus Nephritis
Active or inactive focal, segmental or global endo- or extracapillary glomerulonephritis involving ≤50% of all glomeruli typically with focal subendothelial immune deposits, with or without mesangial alterations.
Class III (A): Active lesions—focal proliferative lupus nephritis
Class III (A/C): Active and chronic lesions—focal proliferative and sclerosing lupus nephritis
Class III (C): Chronic inactive lesions with glomerular scars—focal sclerosing lupus nephritis

CLASSIFICATION OF LUPUS NEPHRITIS CONTD...

Class IV: Diffuse Lupus Nephritis

Active or inactive diffuse, segmental or global endo- or extracapillary glomerulonephritis involving >50% of all glomeruli, typically with diffuse subendothelial immune deposits with or without mesangial alterations. This class is divided into diffuse segmental (IV-S) lupus nephritis when ≥50% of the involved glomeruli have segmental lesions, and diffuse global (IV-G) lupus nephritis when ≥50% of the involved glomeruli have global lesions. Segmental is defined as a glomerular lesion that involves less than one-half of the glomerular tuft. This class includes cases with diffuse wire loop deposits but with little or no glomerular proliferation.

- Class IV-S (A): Active lesions—diffuse segmental proliferative lupus nephritis
- Class IV-G (A): Active lesions—diffuse global proliferative lupus nephritis
- Class IV-S (A/C): Active and chronic lesions—diffuse segmental proliferative and sclerosing lupus nephritis
- Class IV-G (A/C): Active and chronic lesions—diffuse global proliferative and sclerosing lupus nephritis
- Class IV-S (C): Chronic inactive lesions with scars—diffuse segmental sclerosing lupus nephritis
- Class IV-G (C): Chronic inactive lesions with scars—diffuse global sclerosing lupus nephritis

Class V: Membranous Lupus Nephritis

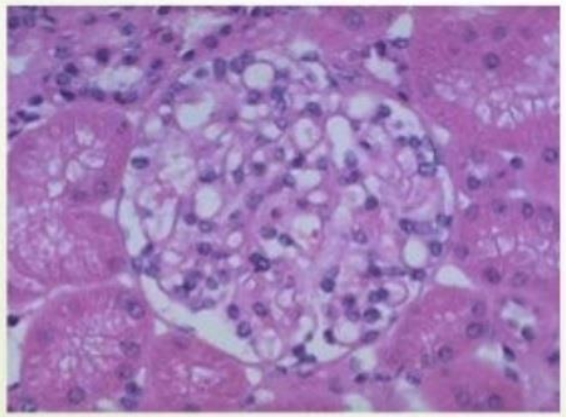
Global or segmental subepithelial immune deposits or their morphologic sequelae by light microscopy and by immunofluorescence or electron microscopy, with or without mesangial alterations. Class V lupus nephritis may occur in combination with class III or IV, in which case both will be diagnosed. Class V lupus nephritis may show advanced sclerosis.

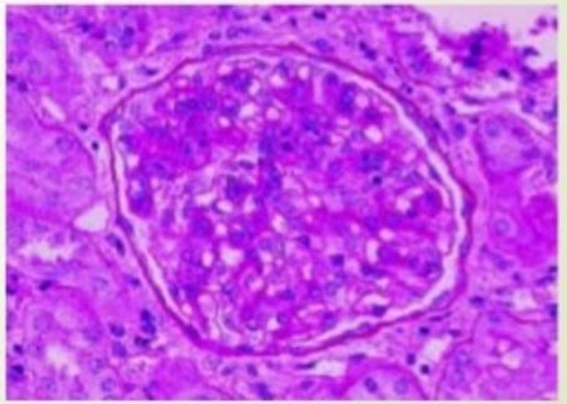
Class VI: Advanced Sclerotic Lupus Nephritis

≥90% of glomeruli globally sclerosed without residual activity.

ON RENAL BIOPSY

Inflammation can be:
Focal
Diffuse





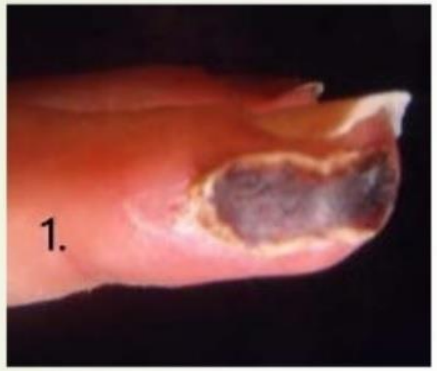
CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

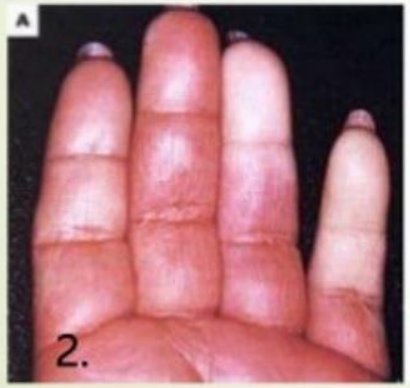
Manifestation	Prevalence(%)
Gastrointestinal	40
Nonspecific(nausea, mild pain, diarrhea)	30
Abnormal liver enzymes	40
Vasculitis	5

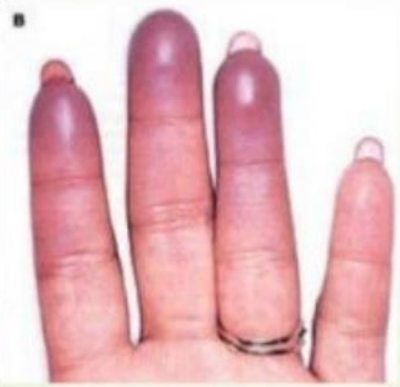
CLINICAL MANIFESTATIONS OF SLE & PREVALENCE OVER THE ENTIRE DISEASE COURSE

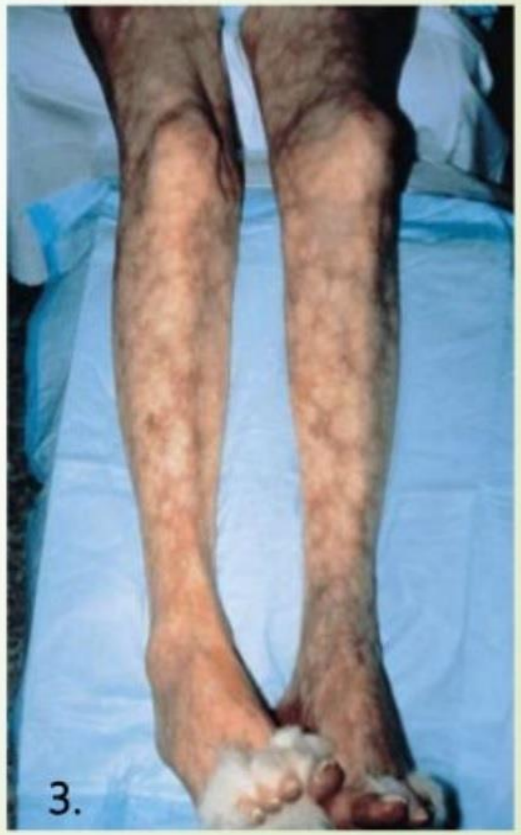
Manifestation	Prevalence(%)
Thrombosis	15
Venous	10
Arterial	5
Ocular	15
Sicca syndrome	15
Conjunctivitis, episcleritis	10
Vasculitis	5

COMPLICATIONS OF VASCULITIS







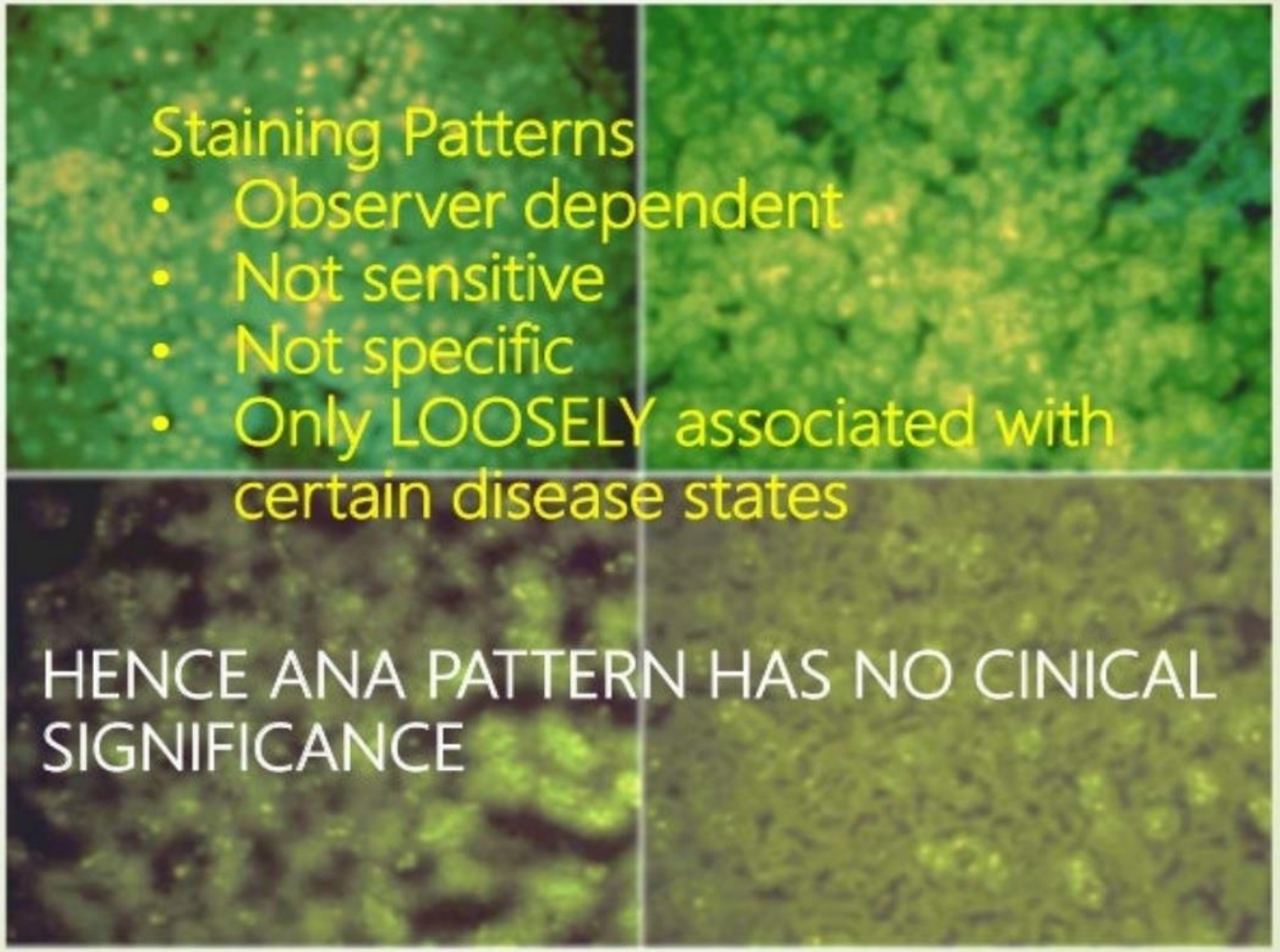


AUTOANTIBODIES IN SLE

TABLE 378-1 AUTOANTIBODIES IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)

Antibody	Prevalence, %	Antigen Recognized	Clinical Utility
Antinuclear antibodies	98	Multiple nuclear	Best screening test; repeated negative tests make SLE unlikely
Anti-dsDNA	70	DNA (double-stranded)	High titers are SLE-specific and in some patients correlate with disease activity, nephritis, vasculitis
Anti-Sm	25	Protein complexed to 6 species of nuclear U1 RNA	Specific for SLE; no definite clinical correlations; most patients also have anti-RNP; more common in blacks and Asians than whites
Anti-RNP	40	Protein complexed to U1 RNA	Not specific for SLE; high titers associated with syndromes that have overlap features of several rheumatic syndromes including SLE; more common in blacks than whites
Anti-Ro (SS-A)	30	Protein complexed to hY RNA, primarily 60 kDa and 52 kDa	Not specific for SLE; associated with Sjögren syndrome, predisposes to subacute cutaneous lupus, and to neonatal lupus with congenital heart block; associated with decreased risk for nephritis
Anti-La (SS-B)	10	47-kDa protein complexed to hY RNA	Usually associated with anti-Ro; associated with decreased risk for nephritis
Antihistone	70	Histones associated with DNA (in nucleosome, chromatin)	More frequent in drug-induced lupus than in SLE
Antiphospholipid	50	Phospholipids, β_2 glycoprotein 1 (β_2G1) cofactor, prothrombin	Three tests available—ELISAs for cardiolipin and β_2G1, sensitive prothrombin time (DRVVT); predisposes to clotting, fetal loss, thrombocytopenia
Antierythrocyte	60	Erythrocyte membrane	Measured as direct Coombs test; a small proportion develops overt hemolysis
Antiplatelet	30	Surface and altered cytoplasmic antigens on platelets	Associated with thrombocytopenia, but sensitivity and specificity are not good; this is not a useful clinical test
Antineuronal (includes antiglutamate receptor)	60	Neuronal and lymphocyte surface antigens	In some series, a positive test in CSF correlates with active CNS lupus
Antiribosomal P	20	Protein in ribosomes	In some series, a positive test in serum correlates with depression or psychosis due to CNS lupus

ANA patterns

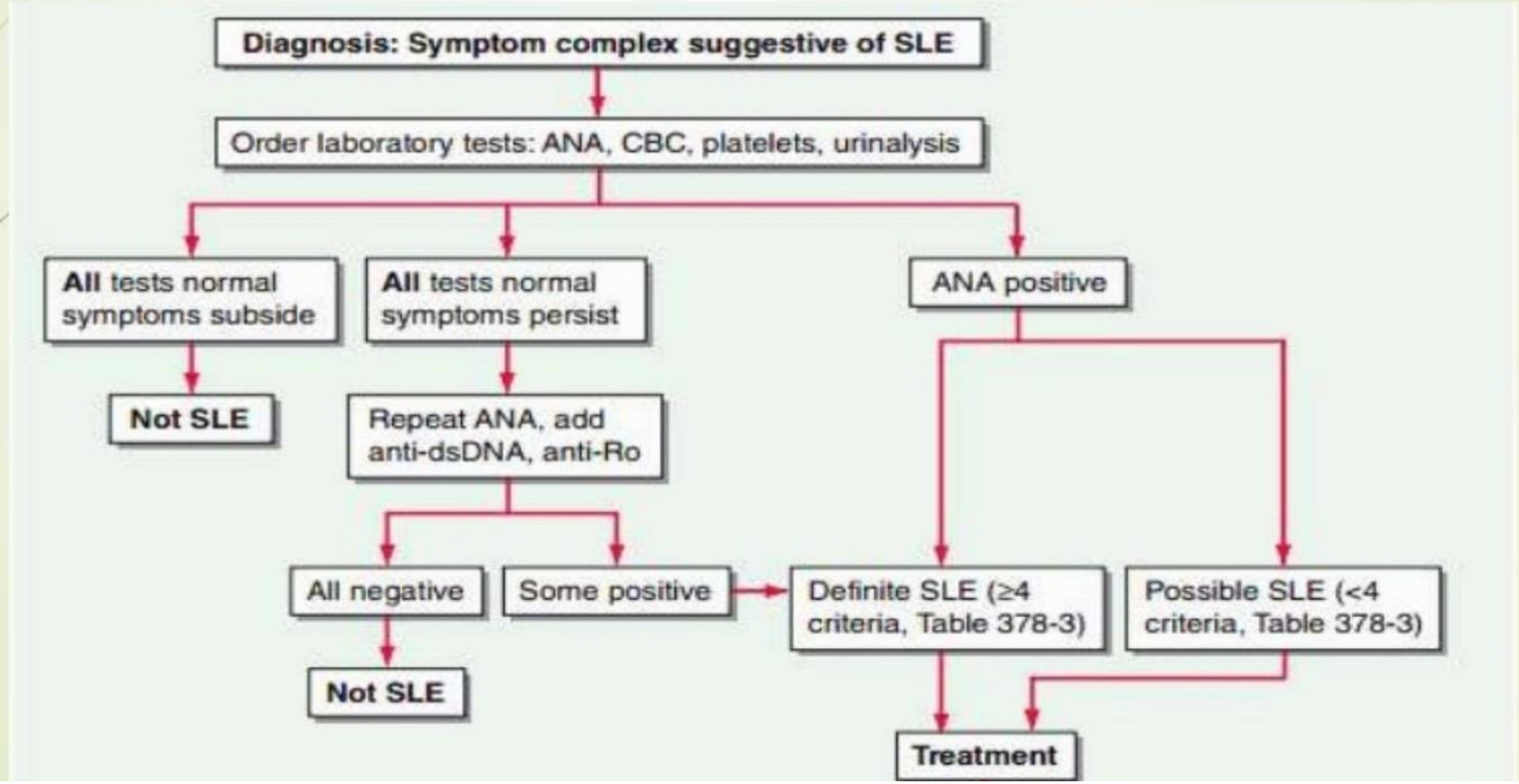


What other diagnoses should clinicians consider in patients with possible lupus?

- Chronic fatigue syndrome
- Fibromyalgia
- Rheumatoid arthritis
- Small or medium vessel vasculitides
- Thrombotic thrombocytopenic purpura
- Viral arthritis
- Hematopoietic cancer
- Malignant lymphoproliferative syndromes

DIAGNOSIS

- The diagnosis of SLE is based on characteristic clinical features and autoantibodies.



2012 SLICC Classification Criteria

Clinical Manifestations	Immunologic Manifestations
Skin	ANA > reference negative value
Acute, subacute cutaneous LE	Anti-dsDNA
Chronic cutaneous LE	Anti-Sm
Oral ulcers	Antiphospholipid
Alopecia	Low serum complement
Synovitis	Positive direct Coombs test
Renal	
Prot/Cr ≥0.5	
RBC casts	
Biopsy[a]	
Neurologic	
Seizures, psychosis, mononeuritis, myelitis, peripheral or cranial neuropathies, acute confusional state	
Hemolytic anemia	
Leukopenia (<4000) or	
Lymphopenia (<1000)	
Thrombocytopenia (<100,000)	

NO SEROSITIS in criteria

[a]Renal biopsy read as systemic lupus qualifies for classification as SLE even if none of the other above features are present.

Interpretation: Presence of any 4 criteria (must have at least 1 in each category) qualifies patient to be classified as having SLE with 93% specificity and 92% sensitivity.

Should clinicians screen patients for asymptomatic lupus if they are at increased risk?

- *Not* recommended
  - Including those with a family history
- Test for ANA produces too many false-positives
  - Detected in 3-5% of healthy individuals or patients with other autoimmune or infectious diseases
- Serologic evidence may precede clinical manifestations
  - By 3 to 9 years
  - Treating during this clinically 'silent' period doesn't halt or delay development

Drug- Induced Lupus

- syndrome appears during therapy with certain medications and biologic agents
- predominant in whites
- Production of autoantibodies more common than clinical symptoms commonly associated with antibodies to histones
- Rarely associated with anti-dsDNA
- 99% disappear within 3 months of stopping the medicine.
- Has less female predilection than SLE
- Rarely involves kidneys or brain

DIL COMMON ASSOCIATIONS

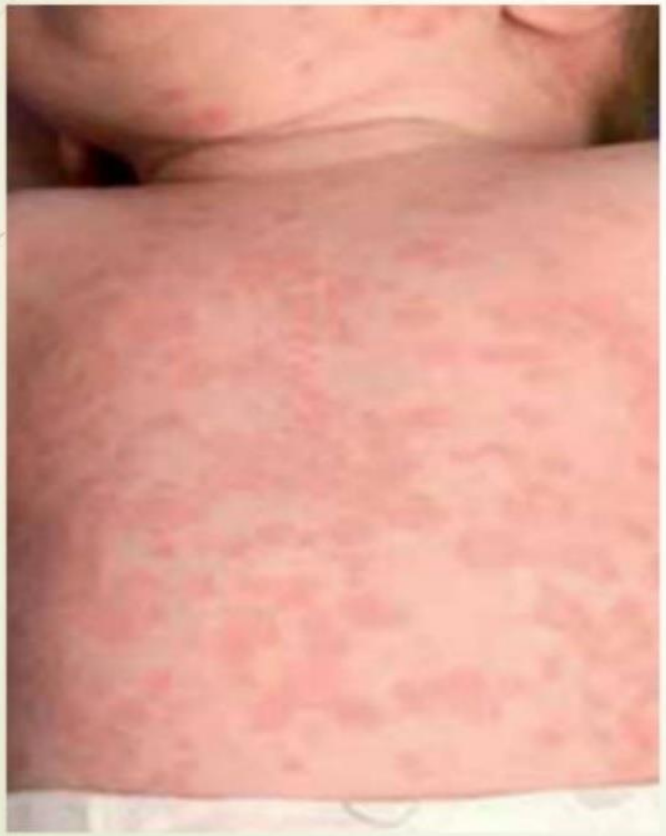
- Antiarrhythmics: procainamide, disopyramide, and propafenone
- Anti hypertensives: hydralazine; several ACE inhibitors and beta blockers
- Antithyroid: propylthiouracil
- Antipsychotics: chlorpromazine and lithium
- Anticonvulsants: carbamazepine and phenytoin
- Antibiotics: isoniazid, minocycline, and nitrofurantoin
- Antirheumatic: sulfasalazine
- Diuretic: hydrochlorothiazide
- Antihyperlipidemics: lovastatin and simvastatin
- IFNs and TNF inhibitors

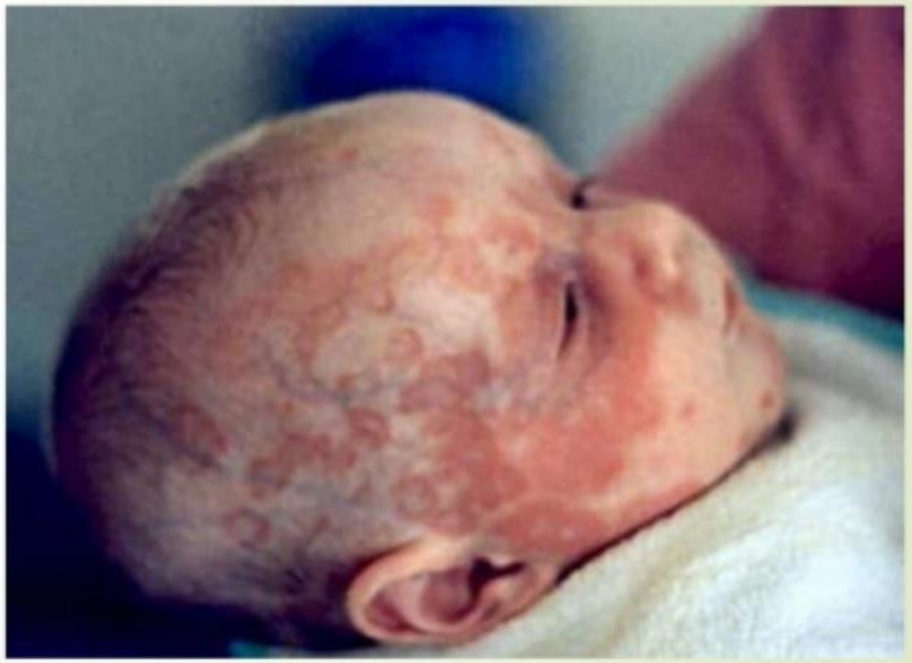
ANA usually appears before symptoms

Neonatal Lupus

- Rare condition
- not true lupus, passively transferred autoimmune disease
- Occurs when mother is SSA/SSB positive
- Transplacental transfer of IgG anti SSA or SSB antibodies
- 5-7% babies will have a transient rash, resolves by 6-8 months
- 2% of babies will have cardiac complications with congenital heart block

Neonatal Lupus





Treatment

- There is no cure for SLE, and complete sustained remissions are rare.

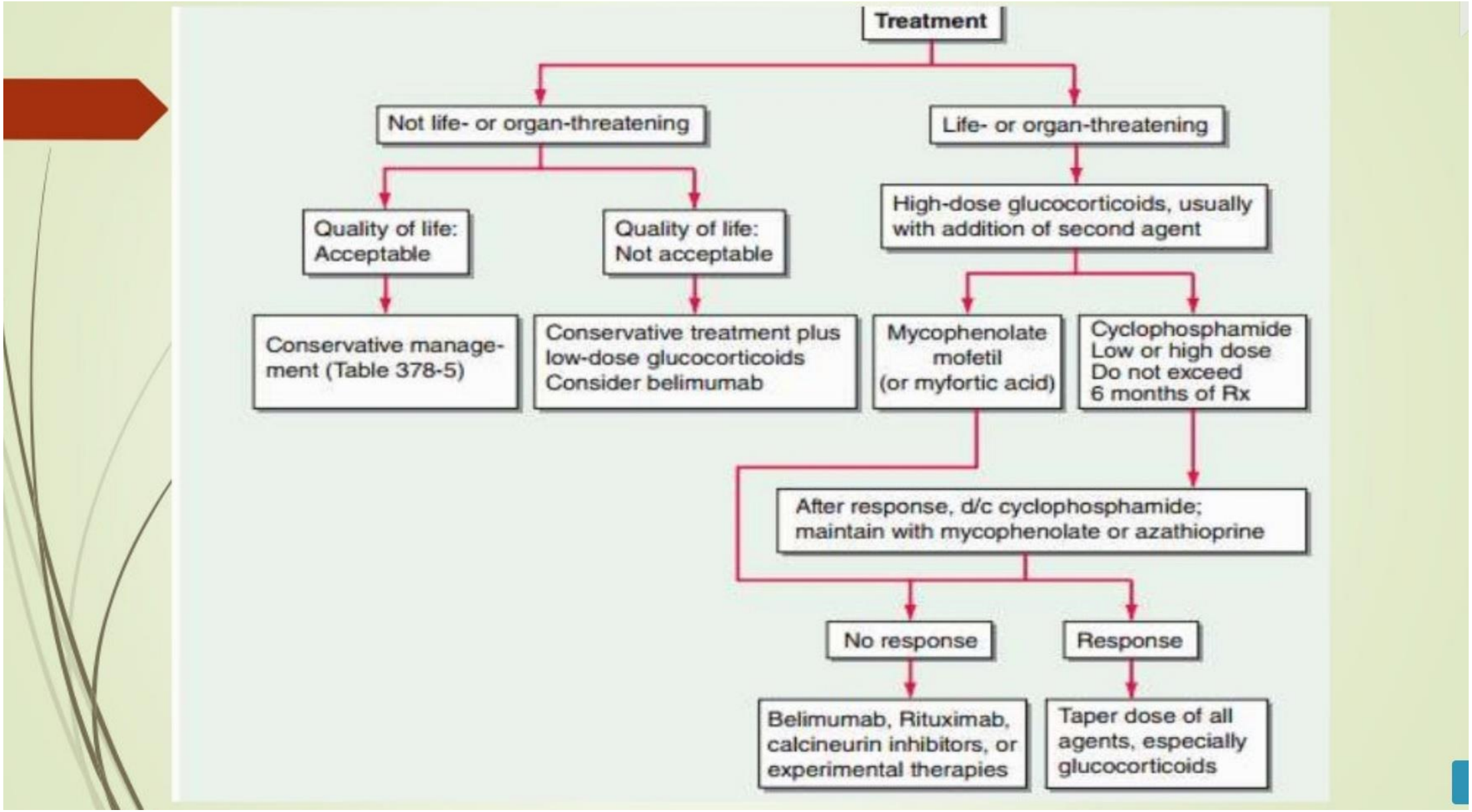
Treatment Plan: to **induce remissions of acute flares** and then **suppress symptoms to an acceptable level and prevent organ damage.**

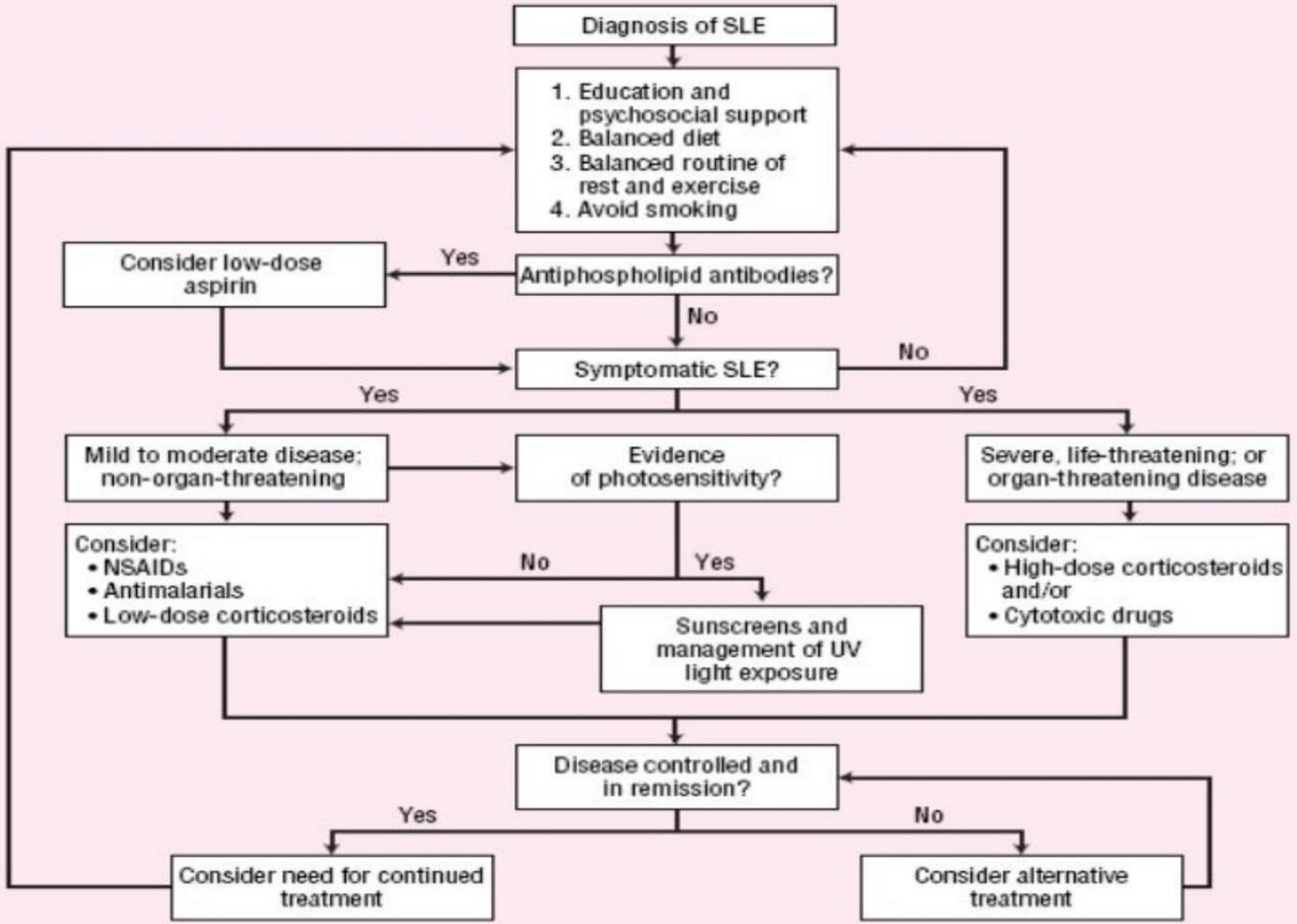
- Therapeutic choices depend on:
- (1) whether disease manifestations are **life-threatening** or likely to cause organ damage, justifying aggressive therapies
- (2) manifestations are **potentially reversible**
- (3) the best approaches to **preventing complications** of disease and its treatments.

- Evaluate for organ involvement

  SSA/SSB ab: **pregnancy risks**

  APL ab: **clotting, pregnancy risks**


Treatment
Not life- or organ-threatening
Life- or organ-threatening
Quality of life: Acceptable
Quality of life: Not acceptable
High-dose glucocorticoids, usually with addition of second agent
Conservative management (Table 378-5)
Conservative treatment plus low-dose glucocorticoids Consider belimumab
Mycophenolate mofetil (or myfortic acid)
Cyclophosphamide Low or high dose Do not exceed 6 months of Rx
After response, d/c cyclophosphamide; maintain with mycophenolate or azathioprine
No response
Response
Belimumab, Rituximab, calcineurin inhibitors, or experimental therapies
Taper dose of all agents, especially glucocorticoids


Diagnosis of SLE
1. Education and psychosocial support
2. Balanced diet
3. Balanced routine of rest and exercise
4. Avoid smoking
Antiphospholipid antibodies?
Yes
Consider low-dose aspirin
No
Symptomatic SLE?
No
Yes
Yes
Mild to moderate disease; non-organ-threatening
Evidence of photosensitivity?
Severe, life-threatening; or organ-threatening disease
Consider:
• NSAIDs
• Antimalarials
• Low-dose corticosteroids
No
Yes
Sunscreens and management of UV light exposure
Consider:
• High-dose corticosteroids and/or
• Cytotoxic drugs
Disease controlled and in remission?
Yes
No
Consider need for continued treatment
Consider alternative treatment

Treatment: Analgesics/Anti-inflammatory

- Acitaminophen, NSAIDS
- Used in lupus over for symptom relief particularly for arthritis/ arthralgias
- Acetaminophen may be a good strategy for its favourable side effect profile, but NSAIDs are more effective in some patients.

However, two major issues indicate caution in using NSAIDs:

- SLE patients are at increased risk for NSAID-induced aseptic meningitis, elevated serum transaminases, hypertension, and renal dysfunction.
- All NSAIDs, particularly those that inhibit cyclooxygenase-2 specifically may increase risk for myocardial infarction.

Treatment: Antimalarials

- hydroxychloroquine, chloroquine
- Prevent activation of toll like receptors 7 & 9
- Used in lupus over 50 years for dermatitis, arthritis
- FDA approved
- Prevents relapses
- Reduces risk for congenital heart block in neonatal SLE
- Reasonably safe, potential retinal toxicity
- Eye exam once yearly

Hydroxychlorquine

- Takes 6 weeks to kick in, up to 6 months for maximal effect
- Dose is 200-400 mg/day
- Reduces intensity of flares
- Increases time to flare
- Treats skin and joint manifestations
- Safe in pregnancy(?)

Corticosteroids

- Mainstay for organ/life threatening disease
- Work quickly and effectively; action starts within 24 hours
- Starting dose: Oral: Prednisone- 0.5-1mg/kg/day; taper over 4-6 weeks, by 10% q week; low dose: 0.07-0.3 mg/kg/day
- For life/ organ threatening conditions:

IV Methylprednisolone 0.5-1 gm/day * 3-5 days followed by oral tapering

- Maintenance dose of 5-10 mg prednisone after tapering
- Add a steroid sparing imunosuppresant
- Long term AE: hyperglycemia, hyperlipidemia, hypertension, accelerated atherosclerosis, osteoporosis, AVN, cataracts, glaucoma, PUD, skin thinning, emotional lability

Immunosuppressive agents

- Methotrexate: used for arthritis and skin
- Leflunomide: used for arthritis
- Azathioprine: useful for renal disease, autoimmune hepatitis, pulmonary disease, myositis, cutaneous manifestations
- Mycophenylate Mofetil: lupus nephritis
- Cyclosporine: membranous nephritis, aplasias
- Cyclophosphamide: used for severe disease- nepritis, CNS involvement, vasculitis
- Rituximab: used for severe organ threatening disease
- Belimumab: FDA Approved for Lupus

Doses of Immunosuppressive agents

- Methotrexate: 10–25 mg once a week, PO or SC
- Leflunomide: 10–20 mg/d
- Azathioprine: 2–3 mg/kg per day PO for induction; 1–2 mg/kg per day for maintenance
- Mycophenylate Mofetil: 2–3 g/d PO for induction therapy, 1–2 g/d for maintenance therapy

Doses of Immunosuppressive agents

- Cyclosporine:2.5 mg/kg/day orally in 2 equally divided doses. maximum dose of 5 mg/kg/day

- Cyclophosphamide:

Low dose: 500 mg every 2 weeks for 6 doses, then begin maintenance with MMF or AZA.

High dose: 7–25 mg/kg or 500-1000 mg/m2 q month × 6 doses

- Rituximab:375 mg/m2 q wk × 4 doses **or** 1 g q 2 wks × 2

What new medications are available for treating systemic lupus?

- Belimumab (10 mg/kg dose) wks 0,2,and 4, then monthly
  - Monoclonal antibody targeting B lymphocyte stimulator
  - FDA approved for treatment
  - Improves musculoskeletal, mucocutaneous manifestations
  - Improves immunological parameters
  - Fewer patients had worsening hematological parameters

Trials excluded patients with severe lupus nephritis or severe CNS manifestations

On the horizon...

Studies of highly targeted experimental therapies for SLE are in progress

- 1. Agents that target activated B lymphocytes with anti-CD22 or TACI-Ig
- 2. Agents that inhibits of IFN-α
- 3. Agents that inhibits of B/T cell second signal coactivation with CTLA-Ig
- 4. Agents that inhibits innate immune activation via TLR7 or TLR7 and 9
- 5. Agents that induces regulatory T cells with peptides from immunoglobulins or autoantigens
- 6. Agents that suppresses T cells, B cells, and monocyte/macrophages with laquinimod
- 7. inhibition of lymphocyte activation by blockade of Jak/Stat

On the horizon…

- Only four FDA approved medications for lupus- prednisone, hydroxychloroquine, aspirin, belimumuab
- Many clinical trials ongoing looking at innovative biologic therapies

How should clinicians choose therapy for a patient who is having a flare?

- IV glucocorticoids + immunosuppressive medications
  - For severe manifestations (lupus nephritis, alveolar hemorrhage, CNS vasculitis)
  - Withdraw glucocorticoids once remission achieved

- Oral prednisone or methlyprednisolone
  - For arthritis, pleuropericarditis, cutaneous vasculitis, uveitis

How should clinicians choose and dose drug therapy for lupus nephritis?

- Class I or II: no immunosuppressive therapy
- **Class III or IV: treat aggressively**
  - Standard therapy: cyclophosphamide + IV glucocorticoids
  - Newer regimen: mycophenolate mofetil + glucocorticoids
- **Class V: prednisone 0.5 mg/kg/d + mycophenolate mofetil**
- **If overlap with III/IV or having nephrotic range proteinuria:**
- **treat aggressively as Class III or IV**
- **Class VI: preparation for renal replacement therapy**

- Maintenance therapy
  - Mycophenolate mofetil
  - Azathioprine
  - Both superior to cyclophosphamide
- For patients who don't respond to either
  - Calcineurin inhibitors (cyclosporine, tacrolimus)
  - Rituximab (monoclonal antibody against CD20)
  - Either in combination with glucocorticoids

How should clinicians choose therapy for neuropsychiatric lupus?

- Treatment relatively empirical
  - IV glucocorticoids, immunoglobulin, cyclophosphamide
  - Relapse may be more common in glucocorticoid vs cyclophosphamide treatment
  - Rituximab may be beneficial, but relapse rate seems high

How should clinicians choose therapy for respiratory manifestations?

- Pleuritis
  - NSAIDs, low- to moderate-dose glucocorticoids
- **Abrupt diffuse alveolar hemorrhage**
  - **IV glucocorticoids + immunosupressants; consider plasmapheresis**
- **Pulmonary hypertension**
  - **PDE-5 inhibitors, ERAs, and prostacyclin analogs may be used; with or without immunosuppressants**
  - **In interstitial lung disease: glucocorticoids, and, if poor response, cyclophosphamide or azathioprine**
- **Acute lupus pneumonitis**
  - **High doses of glucocorticoids and cyclophosphamide**

How should clinicians choose therapy for ocular manifestations?

- Depends on severity and disease activity
  - Antimalarials
  - NSAIDs
  - Oral or IV glucocorticoids
- Scleral or retinal involvement
  - Concomitant use of pulse glucocorticoids
  - Then 1 mg/kg prednisone equivalent + immunosuppressants
- Retinal vasculitis and arterial or venous retinal occlusion with antiphospholipid antibodies
  - **IV glucocorticoids +** Immunosuppressants + antiplatelet agents / anticoagulation

How should clinicians monitor patients who are being treated for lupus?

- Routinely test: CBC,KFT, LFT, urinalysis
  - Allows evaluation of target-organ manifestations
- In impending flare: dsDNA antibodies + C3 & C4 levels
- Controversial for clinically stable patients

Treatment with prednisone of clinically stable but serologically active patients may avert severe flare

- Monitor individual disease manifestations
- Monitor for immunosuppressant toxicity
- If treated with hydroxychloroquine: ophthalmological evaluation annually (particularly if >40y and treated for a long time)
- Monitor for osteoporosis, osteonecrosis
- Consider periodic lipid testing, ECHO

What should clinicians do about immunizations in people with lupus?

- All patients with SLE should receive
  - Influenza vaccine
  - Pneumococcal vaccine
- Consider quadrivalent HPV vaccine
  - Well-tolerated, reasonably effective in stable SLE
- No live attenuated vaccines if immunocompromised
  - If on >20mg/d prednisone or immunosuppressants
  - Including: herpes zoster, Flumist, MMR, smallpox
- Tuberculin skin test recommended
  - If glucocorticoids or immunosuppressive use prolonged

How should clinicians modify treatment for pregnant patients?

- Treat active lupus manifestations
  - Use hydroxychloroquine and prednisone
  - Discontinuation associated with increased flare risk
  - If severe, consider IV glucocorticoids + azathioprine
  - Contraindicated: mycophenolate mofetil, methotrexate, cyclophosphamide

When should patients with lupus be hospitalized?

- Severe thrombocytopenia
- Severe or rapidly progressive renal disease
- Suspected lupus pneumonitis or pulmonary hemorrhage
- Chest pain or severe cardiovascular manifestations
- CNS and neurological manifestations
- Unexplained fever

Prognosis

- Has dramatically improved over time
- Normal life expectancy for patients with *drug induced lupus*

  cutaneous lupus

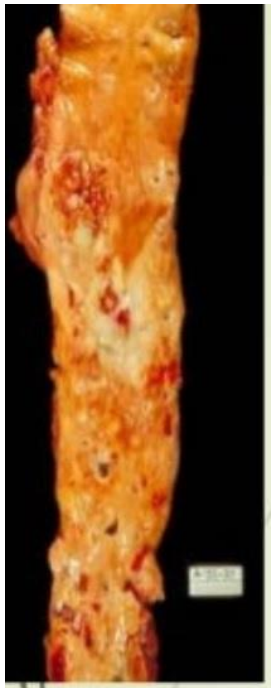
  lupus without organ involvement
- Possible increased risk of NHL

Prognosis

Year	5 yr survival	10 yr survival
Prior 1948	50%	
1949	Steroids widely	accessible
1969	Dialysis widely	accessible
1971	77%	60%
1980-present	Increase use of	immunosupp
2000-2007	95%	90%

Poor Prognostic Factors

- High serum creatinine levels (>124 µmol/L [>1.4 mg/dl])
- Hypertension
- Nephrotic syndrome (24-h urine protein excretion >2.6 g)*
- Anemia (haemoglobin <124 g/L [<12.4 g/dl])
- Hypoalbuminemia
- Hypocomplementemia
- Antiphospholipid antibodies
- Male sex
- Ethnicity (african american, hispanic with mestizo heritage)
- Low socioeconomic status



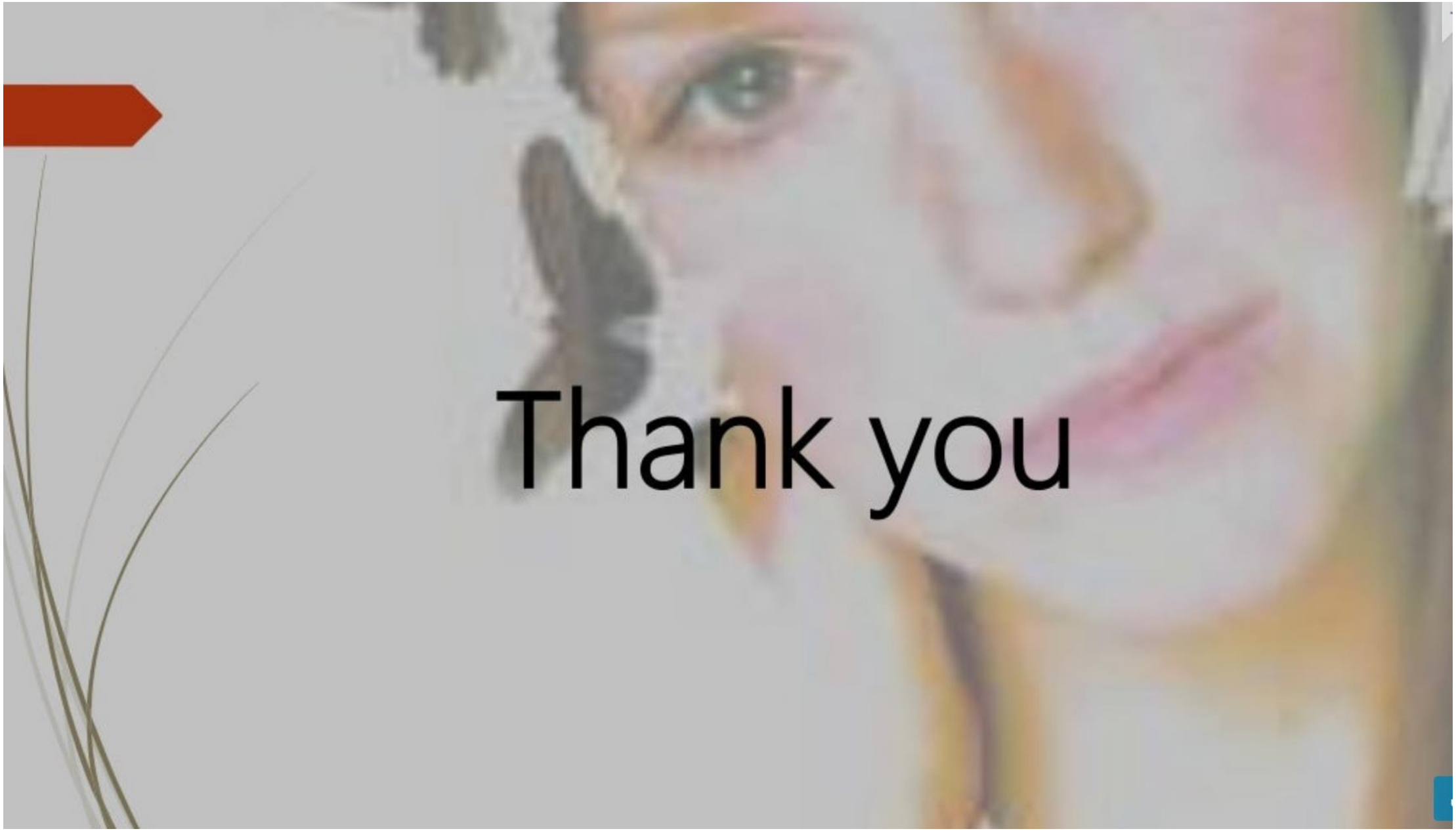
Mortality

- Bimodal mortality
- Early deaths: infection and renal involvement
- Later deaths: atherosclerotic disease

- Premenopausal women with lupus have 30-50x higher risk of CAD than their non-lupus counterparts

SLEDAI

- SLEDAI is a widely used measure of SLE disease activity
- scores >3 reflect clinically active disease.


Thank you