Rheumatology Pearls 2023

Erin M. Bauer MD

Virginia Mason Franciscan Health™

Disclosures

None

Virginia Mason Franciscan Health™

Topics Today

Inflammatory vs. Non-Inflammatory Arthritis

+ ANA / SLE classification criteria

2022 Peri-operative guidelines

2023 Vaccination Updates

Anti-inflammatory diet

Virginia Mason Franciscan Health™

© 2014 Virginia Mason Medical Center

Inflammatory vs. Non-inflammatory joint pain

Feature	Inflammatory Joint Pain	Noninflammatory Joint Pain	Soft Tissue Injury Tendon/Bursa, etc.
Symptoms			
Morning stiffness	Usually > 30 min	Local usually < 30 min	Localized and brief
Constitutional symptoms	Present (fever, malaise)	None	None
Time of major discomfort	After prolonged inactivity	After prolonged use	During and after use
Locking/instability	Unlikely in acute joint disease	Suggests internal joint derangement	Unusual unless tendon damage/tear present
Signs			
Swelling	Common	Can be bone	Unusual
Tenderness	Diffuse over joint space	Mild over joint line	Localized periarticular
Inflammation	Common	Unusual	Over tendon/bursa
Instability	Uncommon	Occasional	Uncommon
Multisystem disease	More common	No	Unusual

*Adapted from 1996 ACR guidelines for evaluation of adults with acute musculoskeletal symptoms.
From Schmerling R, Fuchs H: Guidelines for the initial evaluation of the adult patient with acute musculoskeletal symptoms, *Arthritis Rheum* 39:1–8, 1996.

HPI:

Age, occupation, and social, drug, travel and sexual history
Time of day when pain is the worst
Aggravating and relieving factors
Swelling/redness/warmth?
Presence of systemic symptoms
Ocular, oral, respiratory, gastrointestinal or skin symptoms
Recent infection or trauma?

Virginia Mason Franciscan Health

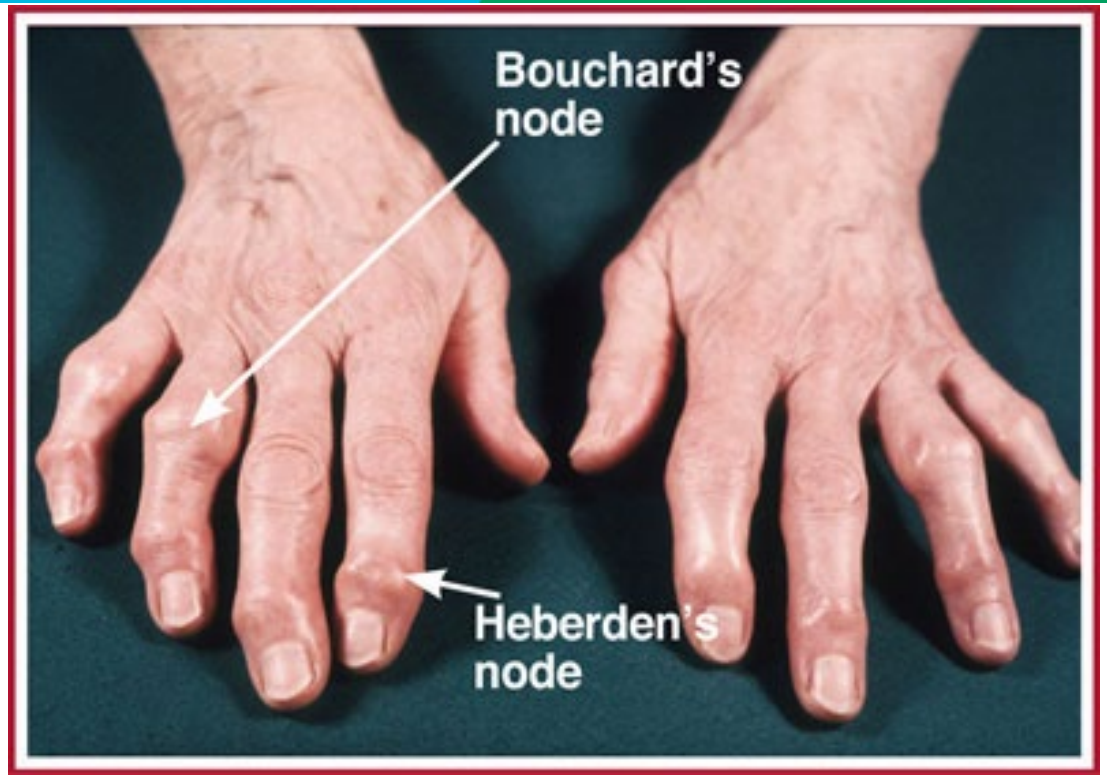
© 2014 Virginia Mason Medical Center

Physical Exam

https://www.hopkinsarthritis.org/arthritis-info/rheumatoid-arthritis/ra-symptoms/

© 2014 Virginia Mason Medical Center

Physical Exam



Osteoarthritis!

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Copyright 2011 American College of Rheumatology

Synovial fluid analysis

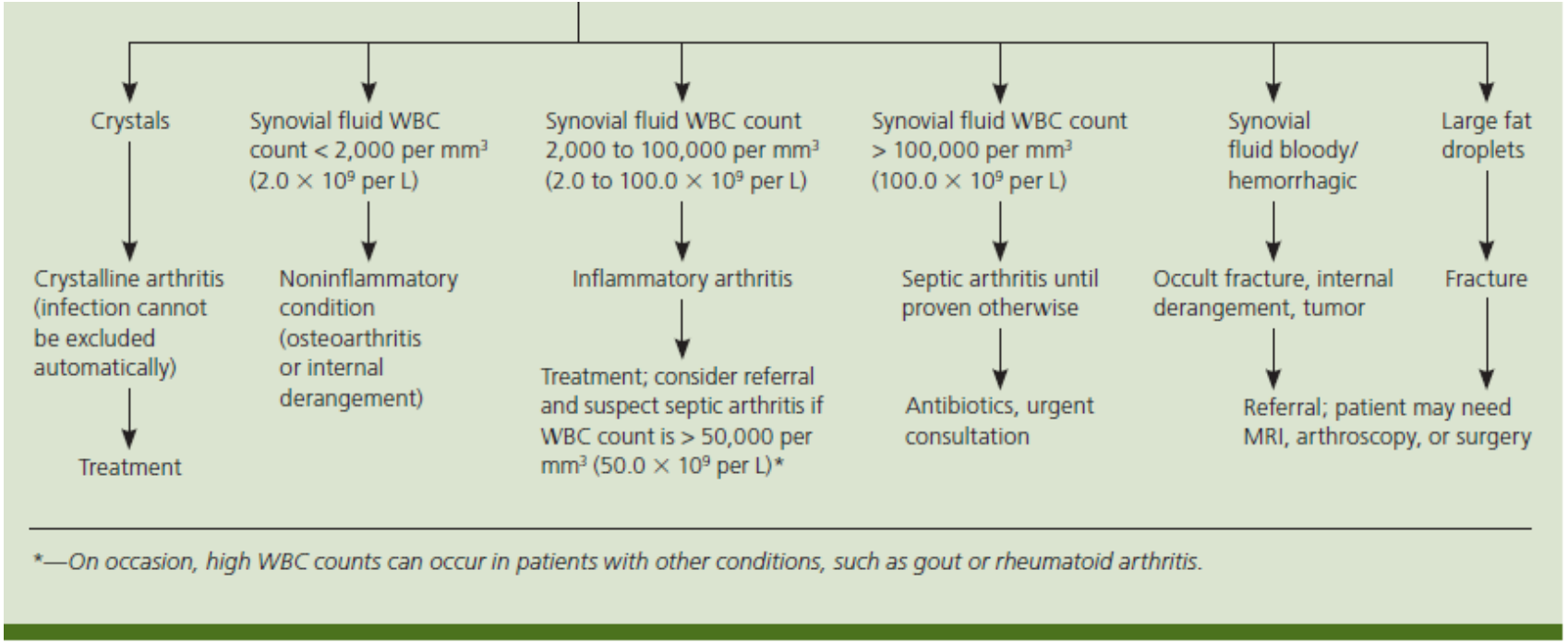


Figure 2. Algorithm for diagnosing acute monoarthritis. (MRI = magnetic resonance imaging; WBC = white blood cell.)

Adapted with permission from Siva C, Velazquez C, Mody A, Brasington R. Diagnosing acute monoarthritis in adults: a practical approach for the family physician. Am Fam Physician. *2003;68(1):84.*

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Initial Radiographic Work Up

X-Ray: 2 view of both hands, both feet + additional affected joint(s)

Specify eval for inflammatory arthritis

Findings:

- Soft tissue swelling
- Erosions
- Juxta-articular osteopenia
- Subluxation
- Fusion
- Calcifications

igure 1A demonstrates erosions at the metacarpal phalangeal and proximal interphalange of both hands. **Figure 1B** is a magnified view of the left 2nd through 5th digits. Note the dis absence of the distal interphalangeal joint involvement.

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Table 1. Radiographic features of erosive osteoarthritis, rheumatoid arthritis and psoriatic arthritis

Features	Erosive osteoarthritis	Rheumatoid arthritis	Psoriatic arthritis
Involved joints	DIP, PIP, first CMC (MCP, wrist; preserved)	PIP, MCP, wrist (DIP; preserved)	DIP, PIP, MCP, wrist
Erosion type	Central erosions causing gull-wing or saw-tooth appearance	Marginal erosions	Marginal erosions causing mouse-ear appearance
Eburnation	Present	Absent	Absent
Periarticular osteoporosis	Absent	Present	Sometimes present
New bone formation	Present (Marginal osteophytes in the distal plate of IP joints)	Absent	Present (Marginal periostitis in the distal plate of IP joints)

DIP: Distal interphalangeal joint; PIP: Proximal interphalangeal joint; CMC: Carpometacarpal joint; MCP: Metacarpophalangeal joint; IP: Interphalangeal joint; OP: Osteoporosis.

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

https://www.ajronline.org/doi/pdf/10.2214/ajr.134.1.125

Erosive Osteoarthritis

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Inflammatory vs. Non-inflammatory joint pain

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	*Evidence rating*	*References*
Joint swelling, erythema, prolonged morning stiffness (more than one hour), and symmetric pain even at rest are suggestive of inflammatory conditions.	C	3-6
Noninflammatory and inflammatory conditions can be differentiated with C-reactive protein and erythrocyte sedimentation rate tests; however, in the acute phase, erythrocyte sedimentation rate is less reliable than C-reactive protein.	C	7, 8
In the diagnosis of gout, a high serum uric acid level has little diagnostic value. The standard of diagnosis is the presence of intracellular monosodium urate crystals on polarized microscopy.	C	14, 15
Osteoarthritis is noninflammatory; is typically pauciarticular; and often involves the spine and weight-bearing joints, such as the hips and knees.	C	3-6

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to http://www.aafp.org/afpsort.

Pujalte G, Albano-Aluquin S. Differential Diagnosis of Polyarticular Arthritis. Am Fam Physician. 2015;92(1):35-41

https://www.aafp.org/afp/2015/0701/p35.html

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Table 1. Clinical Patterns of Polyarticular Arthritis

	Autoimmune connective tissue disease			*Spondyloarthritis*	
Characteristic	*Rheumatoid arthritis*	*Systemic lupus erythematosus*	*Vasculitis (including polymyalgia rheumatica, polyarteritis nodosa)*	*Ankylosing spondylitis*	*Psoriatic arthritis*
Symmetry					
Symmetric	+	+	+		
Asymmetric				++	++
Inflammatory	+	+	+	+	+
Noninflammatory					
Number					
Pauciarticular				+	+
Polyarticular	+	+	+		
Joint involvement					
Spine-cervical/ thoracic/lumbar	+			++	+
Sacroiliac joint	+			++	++
Small joints					
Wrists	+	+	+		
Carpometacarpals					
Metacarpophalangeals	++	+			
Proximal interphalangeals	++	+	+		+
Distal interphalangeals					++
Ankle	+			++	++
Metatarsophalangeals	+				++
Medium and large joints					
Shoulders	+	+		+	+
Elbows	+	+		+	+
Hips/knees	+		+	+	+

Pujalte G, Albano-Aluquin S. Differential Diagnosis of Polyarticular Arthritis. Am Fam Physician. 2015;92(1):35-41

https://www.aafp.org/afp/2015/0701/p35.html

Virginia I
Francisc

Case 1

65 yo patient with minimal past medical history, presenting with 2-3 months of progressive hand pain.

Quality: deep stiffness, ache, burning, non-radiating

Location: most focally over the 2nd MCPs on both hands, some degree of PIP discomfort, over the ulnar aspect of the wrists

Aggravating/Alleviating factors: most painful for 2 hours in the AM, improves with heat, stretching, much better by lunch time. Mild improvement with NSAIDs

© 2014 Virginia Mason Medical Center

Causes of MCP2 swelling/erosions:

1. Rheumatoid Arthritis
2. Chondrocalcinosis (CPPD)
3. Hemochromatosis
4. Trauma (Boxer's knuckle)

Case 1

65 yo patient with minimal

Exam: Bogginess, tenderr
tenderness. Tender of MT

Laboratory:

CBC notable for a
ESR: 46 (<40)
Rheumatoid Facto
CCP antibodies: r

Radiographic:

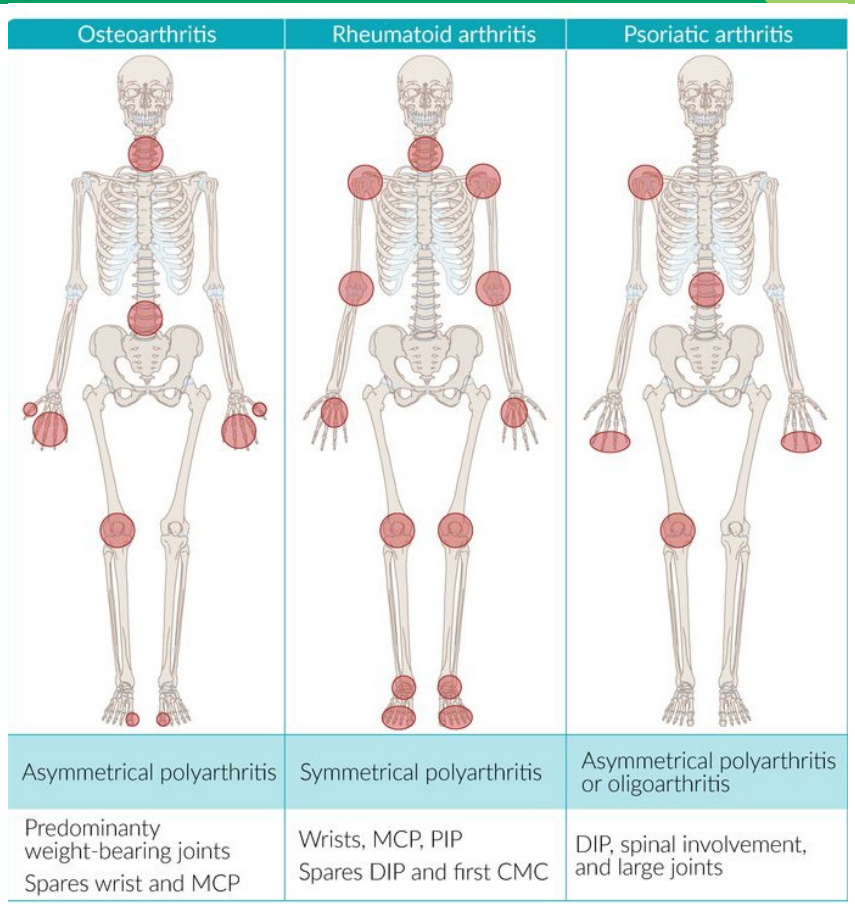
Virginia Mason Franciscan Health

© 2014 Virginia Mason Medi

Classification Criteria (ACR/EULAR 2010)

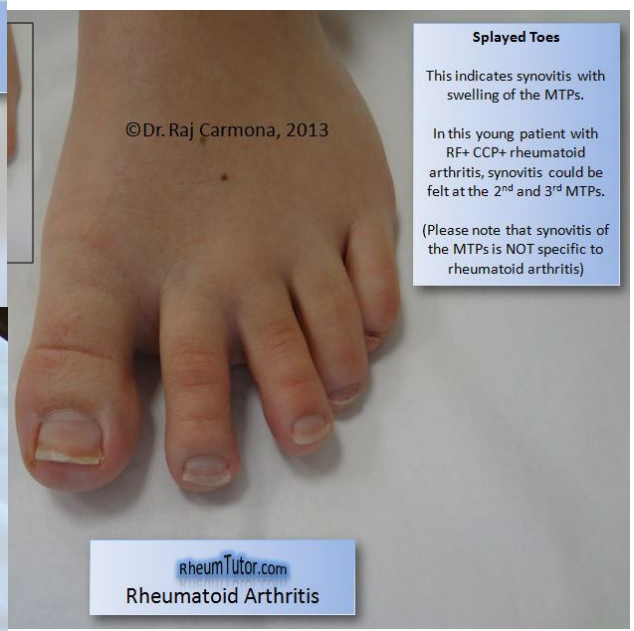
Criteria	Score
Joint distribution	
1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5
Serology	
Negative RF AND negative ACPA	0
Low positive RF OR low positive ACPA	2
High positive RF OR high positive ACPA	3
Symptom duration	
<6 weeks	0
≥6 weeks	1
Acute phase reactants	
Normal CRP AND normal ESR	0
Abnormal CRP OR abnormal ESR	1

A score of six or more equates to definite RA. This requires that the patient has at least one joint with definite synovitis and that the synovitis is not better explained by another disease. The score may be retrospective or prospective.
ACPA, anti-citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.



Volar subluxation of MCPs
Metacarpal heads appear prominent because proximal phalanges have subluxed under them.
Swan Neck Deformity
Extension of PIP, flexion of DIP (4th finger)
Z-deformity of Thumb
Flexion of MCP, extension of IP
©Dr. Raj Carmona, 2013

Dorsal subluxation of Ulnar head (due to interruption of radioulnar ligament).
Radial deviation of hand at the wrist
Ulnar deviation of fingers at MCPs
©Dr. Raj Carmona, 2013


©Dr. Raj Carmona, 2013
Splayed Toes
This indicates synovitis with swelling of the MTPs.
In this young patient with RF+ CCP+ rheumatoid arthritis, synovitis could be felt at the 2nd and 3rd MTPs.
(Please note that synovitis of the MTPs is NOT specific to rheumatoid arthritis)
RheumTutor.com
Rheumatoid Arthritis

Classification Criteria

Criteria	Score
Joint distribution	
1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5
Serology	
Negative RF AND negative ACPA	0
Low positive RF OR low positive ACPA	2
High positive RF OR high positive ACPA	3
Symptom duration	
<6 weeks	0
≥6 weeks	1
Acute phase reactants	
Normal CRP AND normal ESR	0
Abnormal CRP OR abnormal ESR	1

A score of six or more equates to definite RA. This requires that the patient has at least one joint with definite synovitis and that the synovitis is not better explained by another disease. The score may be retrospective or prospective. ACPA, anti-citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.

The major nonrheumatic diseases associated with rheumatoid factor (RF)-positivity

Condition	Frequency of RF, percent
Aging (>age 60)	5 to 25
Infection	
Bacterial endocarditis*	25 to 50
Hepatitis B or hepatitis C*	20 to 75
Tuberculosis	8
Syphilis*	Up to 13
Parasitic diseases	20 to 90
Leprosy*	5 to 58
Other viral infection*	15 to 65
Pulmonary disease	
Sarcoidosis*	3 to 33
Interstitial pulmonary fibrosis	10 to 50
Silicosis	30 to 50
Asbestosis	30
Miscellaneous diseases	
Primary biliary cholangitis*	45 to 70
Malignancy*	5 to 25
After multiple immunizations	10 to 15

* Refers to disorders that may cause symptoms suggestive of rheumatoid arthritis. The best-documented examples of viral infection (in addition to hepatitis B and C) are rubella, mumps, influenza, and HIV. Chagas' disease, Leishmaniasis, onchocerciasis, and schistosomiasis are major parasitic diseases. B cell neoplasms are the most common malignancies.

Reprinted by permission from the publisher from: Shmerling RH, Delbanco TL. The rheumatoid factor: An analysis of clinical utility, Am J Med 1991; 91:528. Copyright © 1991 by Excerpta Medica Inc.

Classification Criteria

Criteria	Score
Joint distribution	
1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5
Serology	
Negative RF AND negative ACPA	0
Low positive RF OR low positive ACPA	2
High positive RF OR high positive ACPA	3
Symptom duration	
<6 weeks	0
≥6 weeks	1
Acute phase reactants	
Normal CRP AND normal ESR	0
Abnormal CRP OR abnormal ESR	1

A score of six or more equates to definite RA. This requires that the patient has at least one joint with definite synovitis and that the synovitis is not better explained by another disease. The score may be retrospective or prospective. ACPA, anti-citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.

Although ACPA (CCP) testing is more specific than RF for RA, positive results can occur in other diseases:

- Primary Sjogren's Syndrome, Psoriatic Arthritis
- Tuberculosis
- Chronic lung disease (alpha-1 antitrypsin deficiency, chronic obstructive pulmonary disease)

Classification Criteria

Criteria	Score
Joint distribution	
1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5
Serology	
Negative RF AND negative ACPA	0
Low positive RF OR low positive ACPA	2
High positive RF OR high positive ACPA	3
Symptom duration	
<6 weeks	0
≥6 weeks	1
Acute phase reactants	
Normal CRP AND normal ESR	0
Abnormal CRP OR abnormal ESR	1

A score of six or more equates to definite RA. This requires that the patient has at least one joint with definite synovitis and that the synovitis is not better explained by another disease. The score may be retrospective or prospective. ACPA, anti-citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.

Viral Pathogen	Characteristic Clinical Features
Chikungunya	History of travel to endemic area + history of acute febrile illness with severe polyarthritis and or tenosynovitis
Rubella	Intensely erythematous maculopapular rash that migrates from head to toes/fingers
Parvovirus	Migratory, often additive, arthralgia and arthritis with flu-like illness and variable presence of transient erythematous rash on face or extremities
Hepatitis B	HBV transmission risk factors with polyarthritis and variable presence of pruritis, urticaria
Hepatitis C	HCV transmission risk factors with tenosynovitis, arthralgia, variable presence of purpura (usually affecting lower extremities)
HIV	HIV risk factors associated with features of psoriasis or reactive arthritis

Classification Criteria

Criteria	Score
Joint distribution	
1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5
Serology	
Negative RF AND negative ACPA	0
Low positive RF OR low positive ACPA	2
High positive RF OR high positive ACPA	3
Symptom duration	
<6 weeks	0
≥6 weeks	1
Acute phase reactants	
Normal CRP AND normal ESR	0
Abnormal CRP OR abnormal ESR	1

A score of six or more equates to definite RA. This requires that the patient has at least one joint with definite synovitis and that the synovitis is not better explained by another disease. The score may be retrospective or prospective. ACPA, anti-citrullinated peptide antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; RF, rheumatoid factor.

Erythrocyte sedimentation rate (ESR)
The rate (expressed in mm/hour) at which erythrocytes suspended in plasma fall when placed in a vertical tube
Indirect measure of acute phase response- fibrinogen

Influenced by:
- immunoglobulins
- changes in erythrocyte size, shape, and number
- age, sex, adipose tissue

Increased ESR:
- Systemic and localized inflammatory and infectious diseases
- Malignant neoplasms
- Tissue injury/ischemia
- Trauma

$$\text{ESR } (mm/h) \leq \frac{\text{Age } (in\ years) + 10\ (if\ female)}{2}$$

C-reactive protein
Influenced by age, sex, and ethnicity

Markedly elevated levels of CRP are strongly associated with infection

CRP both rises and falls more rapidly than the ESR

Case 2

24 yo female with hypothyroidism presenting with 3-4 months of hand pain

Quality: mild to moderate, achy, stiff. Weakness sensation

Location: most focally over the PIPs, wrists

Aggravating/Alleviating factors: most painful for 2 hours in the AM, improves with heat, stretching, much better by lunch time. Mild improvement with NSAIDs

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

Case 2

Exam: Mildly tender some PIP fullness. No DIP swelling or tenderness. No larger joint swelling or tenderness. Increased erythema along nail fold capillaries and some red patches on the fingers, mild erythema over the face

Radiographic: normal hand XRs, no erosions

Laboratory:

CBC notable for a leukopenia, mild anemia, thrombocytopenia

ESR: 46 (<40) CRP: 0 (<0.5)

ANA: 1:320 (homogenous)

Rheumatoid Factor: negative, CCP antibodies: negative

Virginia Mason Franciscan Health™

© 2014 Virginia Mason Medical Center

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

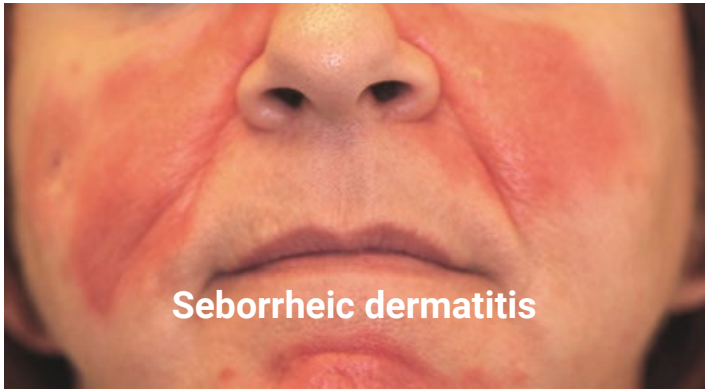
Pelechas, E., Kaltsonoudis, E., Voulgari, P.V., Drosos, A.A. (2019). Systemic Lupus Erythematosus. In: Illustrated Handbook of Rheumatic and Musculo-Skeletal Diseases. Springer, Cham. https://doi.org/10.1007/978-3-030-03664-5_7

Malar Rash

Erythematous flat or raised rash across the bridge of the nose and cheeks
Usually spares nasolabial folds

Malar rash may occur in several systemic and local diseases:
Common causes of malar rash are as follows:

1. Erysipelas
2. Cellulitis
3. Systemic lupus erythematosus
4. Rosacea
5. Pellagra
6. Dermatomyositis



Rheumatic Diseases Therapeutic Principles,
Editor(s): Donald Y.M. Leung, Stanley J. Szefler, Francisco A. Bonilla, Cezmi A. Akdis, Hugh A. Sampson,
Pediatric Allergy: Principles and Practice (Third Edition),
Elsevier, 2016, Pages 112-123.e

2019 European League Against Rheumatism/ American College of Rheumatology classification criteria for systemic lupus erythematosus

Martin Aringer,[1] Karen Costenbader,[2] David Daikh,[3] Ralph Brinks,[4] Marta Mosca,[5] Rosalind Ramsey-Goldman,[6] Josef S Smolen,[7] David Wofsy,[8] Dimitrios T Boumpas,[9,10] Diane L Kamen,[11] David Jayne,[12] Ricard Cervera,[13] Nathalie Costedoat-Chalumeau,[14] Betty Diamond,[15] Dafna D Gladman,[16] Bevra Hahn,[17] Falk Hiepe,[18] Søren Jacobsen,[19] Dinesh Khanna,[20] Kirsten Lerstrøm,[21] Elena Massarotti,[22,23] Joseph McCune,[20] Guillermo Ruiz-Irastorza,[24] Jorge Sanchez-Guerrero,[25,26] Matthias Schneider,[27] Murray Urowitz,[28] George Bertsias,[29] Bimba F Hoyer,[18,30] Nicolai Leuchten,[1] Chiara Tani,[31] Sara K Tedeschi,[23,32] Zahi Touma,[33] Gabriela Schmajuk,[3] Branimir Anic,[34] Florence Assan,[35] Tak Mao Chan,[36] Ann Elaine Clarke,[37] Mary K Crow,[38] László Czirják,[39] Andrea Doria,[40] Winfried Graninger,[41] Bernadett Halda-Kiss,[39] Sarfaraz Hasni,[42] Peter M Izmirly,[43] Michelle Jung,[37] Gábor Kumánovics,[39] Xavier Mariette,[44,45] Ivan Padjen,[34] José M Pego-Reigosa,[46] Juanita Romero-Diaz,[47] Íñigo Rúa-Figueroa Fernández,[48] Raphaèle Seror,[35] Georg H Stummvoll,[49] Yoshiya Tanaka,[50] Maria G Tektonidou,[51] Carlos Vasconcelos,[52] Edward M Vital,[53,54] Daniel J Wallace,[55] Sule Yavuz,[56] Pier Luigi Meroni,[57] Marvin J Fritzler,[58] Ray Naden,[59] Thomas Dörner,[18] Sindhu R Johnson[60,61]

Handling editor David S Pisetsky

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136annrheumdis-2018-214819).

For numbered affiliations see end of article.

ABSTRACT

serosal, musculoskeletal, renal) and three immunological

Entry criterion

Antinuclear antibodies (ANA) at a titer of ≥1:80 on HEp-2 cells or an equivalent positive test (ever)

↓

If absent, do not classify as SLE
If present, apply additive criteria

↓

Additive criteria

Do not count a criterion if there is a more likely explanation than SLE.
Occurrence of a criterion on at least one occasion is sufficient.
SLE classification requires at least one clinical criterion and ≥10 points.
Criteria need not occur simultaneously.
Within each domain, only the highest weighted criterion is counted toward the total score§.

Clinical domains and criteria	Weight	Immunology domains and criteria	Weight
Constitutional		***Antiphospholipid antibodies***	
Fever	2	Anti-cardiolipin antibodies OR	
Hematologic		Anti-β2GP1 antibodies OR	
Leukopenia	3	Lupus anticoagulant	2
Thrombocytopenia	4	***Complement proteins***	
Autoimmune hemolysis	4	Low C3 OR low C4	3
Neuropsychiatric		Low C3 AND low C4	4
Delirium	2	***SLE-specific antibodies***	
Psychosis	3	Anti-dsDNA antibody* OR	
Seizure	5	Anti-Smith antibody	6
Mucocutaneous			
Non-scarring alopecia	2		
Oral ulcers	2		
Subacute cutaneous OR discoid lupus	4		
Acute cutaneous lupus	6		
Serosal			
Pleural or pericardial effusion	5		
Acute pericarditis	6		
Musculoskeletal			
Joint involvement	6		
Renal			
Proteinuria >0.5g/24h	4		
Renal biopsy Class II or V lupus nephritis	8		
Renal biopsy Class III or IV lupus nephritis	10		

Total score:

↓

Classify as Systemic Lupus Erythematosus with a score of 10 or more if entry criterion fulfilled.

Figure 2 Classification criteria for systemic lupus erythematosus. §Additional criteria items within the same domain will not be counted. *Note: In an assay with at least 90% specificity against relevant disease controls.

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

When to Order an ANA

- Do you think this patient has an ANA associated Rheumatologic condition?
    1. SLE / drug induced lupus (ds-DNA, Sm / anti-histone)
    2. Scleroderma (SCL-70, anti-centromere, RNA Polymerase III)
    3. Autoimmune Myositis (elevated CPK/aldolase, JO-1)
    4. Sjogren's (SSA, RF, hypogammaglobinemia)

[MCTD: two of the above overlapping conditions + high titer RNP]

- Is this a young person with Raynaud's or older person with new Raynaud's

- New JIA diagnosis

Virginia Mason Franciscan Health™

© 2014 Virginia Mason Medical Center

Diseases associated with a positive ANA

	Percent with positive ANA
Systemic autoimmune diseases	
SLE	
Active	98 to 100 percent
Remission	90 percent
Scleroderma	95 percent
Rheumatoid arthritis	45 percent
Sjögren's syndrome	60 percent
Mixed connective tissue disease	100 percent
Drug-induced LE	80 to 95 percent
Raynaud's phenomenon	40 percent
Polymyositis/dermatomyositis	35 percent
Juvenile idiopathic arthritis	15 to 40 percent

Diseases associated with a positive ANA

Organ-specific autoimmune diseases	
Hashimotos thyroiditis	50 percent
Graves' disease	50 percent
Autoimmune hepatitis	70 percent
Primary biliary cirrhosis	50 to 70 percent

Infectious diseases*
Viral:
EBV
HIV
HCV
Parvovirus 19
Bacterial:
SBE
Syphilis
Malignancies*
Lymphoproliferative diseases
Paraneoplastic syndromes
Miscellaneous diseases*
Inflammatory bowel disease
Interstitial pulmonary fibrosis

Center

Courtesy of Donald B Bloch, MD.

UpToDate®

When not to order an ANA

- Known prior positive ANA
- Joint pain with no other concerning clinical or laboratory features for SLE, Sjogren's
- Concern for PMR or GCA
- Concern for fibromyalgia
- Concern for a spondyloarthropathy (ankylosing spondylitis, psoriatic arthritis, reactive arthritis)
- If you aren't sure which autoimmune disease you're looking for

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center

What to do with that + ANA

If you have a real clinical concern for SLE:

CBC, CMP, ds-DNA, C3, C4, UA with urine protein/Cr

+/- antiphosphlipids

Young person with Raynaud's or older person with new Raynaud's + ANA:

Pulmonary screening

Skin exam

Clinical concern for autoimmune myositis (proximal muscle weakness, CPK elevation, +/- rash):

Jo-1, HMGCoAR Ab

Pulmonary screening

Virginia Mason Franciscan Health™

© 2014 Virginia Mason Medical Center

AMERICAN COLLEGE of RHEUMATOLOGY
Empowering Rheumatology Professionals

AAHKS
AMERICAN ASSOCIATION OF HIP AND KNEE SURGEONS

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

Guideline Summary

Updated March 17, 2022

This updated guideline includes changes in the recommendations regarding rituximab and belimumab for patients with severe SLE, and now includes anifrolumab and voclosporin. For patients with spondyloarthritis, recommendations have been added on management of ixekizumab and guselkumab. The recommendations have changed for management of JAK inhibitors and suggest withholding for 3 days before surgery; tofacitinib, upadicitinib, and baricitinib are now included.

This updated guideline addresses the perioperative management of disease modifying medications for adults with rheumatic diseases, specifically inflammatory arthritis (IA) and systemic lupus erythematosus (SLE) undergoing elective total hip arthroplasty (THA) and total knee arthroplasty (TKA). A panel of rheumatologists, orthopaedic surgeons, and infectious disease specialists updated the systematic literature review and included currently available medications for the clinically relevant population, intervention, comparator, and outcomes (PICO) questions, updating the 2017 recommendations*. As patients with IA and SLE are at increased risk of infection after THA and TKA, these recommendations aim to balance the risk of perioperative infection and the risk of disease flares, recognizing that all flares have an impact on quality of life but a flare in a patient with severe SLE at risk for organ damage warrants unique considerations. This updated guideline includes recently introduced immunosuppressive medications to help decision-making by clinicians and patients regarding perioperative disease modifying medication management for patients with IA and SLE at the time of elective THA or TKA.

MEDICATIONS TO CONTINUE THROUGH SURGERY		
DMARDs: CONTINUE these medications through surgery. (All patients)	**Dosing Interval**	**Recommended timing of surgery since last medication dose**
Methotrexate	Weekly	Anytime
Sulfasalazine	Once or twice daily	Anytime
Hydroxychloroquine	Once or twice daily	Anytime
Leflunomide (Arava)	Daily	Anytime
Doxycycline	Daily	Anytime
Apremilast (Otezla)	***Twice daily***	***Anytime***
SEVERE SLE-SPECIFIC MEDICATIONS††: CONTINUE these medications in the perioperative period in consultation with the treating rheumatologist.	**Dosing Interval**	**Recommended timing of surgery since last medication dose**
Mycophenolate mofetil	Twice daily	Anytime
Azathioprine	Daily or twice daily	Anytime
Cyclosporine	Twice daily	Anytime
Tacrolimus	Twice daily (IV and PO)	Anytime
Rituximab (Rituxan)	***IV Every 4-6 months***	***Month 4-6***
Belimumab (Benlysta)	***Weekly SQ***	***Anytime***
Belimumab (Benlysta)	***Monthly IV***	***Week 4***
Anifrolumab (Saphnelo)†	***IV Every 4 weeks***	***Week 4***
Voclosporin (Lupkynis)†	***Twice daily***	***Continue***

MEDICATIONS TO WITHHOLD PRIOR TO SURGERY***		
BIOLOGICS: WITHHOLD these medications through surgery		**Recommended timing of surgery since last medication dose**
Infliximab (Remicade)	Every 4, 6, or 8 weeks	Week 5, 7, or 9
Adalimumab (Humira)	Every 2 weeks	Week 3
Etanercept (Enbrel)	Every week	Week 2
Abatacept (Orencia)	Monthly (IV) or weekly (SQ)	Week 5 Week 2
Certolizumab (Cimzia)	Every 2 or 4 weeks	Week 3 or 5
Rituximab (Rituxan)	2 doses 2 weeks apart every 4-6 months	Month 7
Tocilizumab (Actemra)	Every week (SQ) or every 4 weeks (IV)	Week 2 Week 5
Anakinra (Kineret)	Daily	Day 2
IL-17-Secukinumab (Cosentyx)	Every 4 weeks	Week 5
Ustekinumab (Stelara)	Every 12 weeks	Week 13
Ixekizumab (Taltz)†	***Every 4 weeks***	***Week 5***
IL-23 Guselkumab (Tremfya)†	***Every 8 weeks***	***Week 9***
JAK inhibitors WITHHOLD this medication 3 days prior to surgery*		
Tofacitinib (Xeljanz):	***Daily or twice daily***	***Day 4***
Baricitinib (Olumiant)†	***Daily***	***Day 4***
Upadacitinib (Rinvoq)†	***Daily***	***Day 4***
NOT-SEVERE SLE: WITHHOLD these medications 1 week prior to surgery	**Dosing Interval**	**1 week after last dose**
Mycophenolate mofetil	Twice daily	**1 week after last dose**
Azathioprine	Daily or twice daily	1 week after last dose
Cyclosporine	Twice daily	**1 week after last dose**
Tacrolimus	Twice daily (IV and PO)	**1 week after last dose**
Rituximab (Rituxan)	Every 4-6 months	Month 7
Belimumab IV (Benlysta)	***Monthly***	***Week 5***
Belimumab SQ (Benlysta)	***Weekly***	***Week 2***

Virginia Mason Franciscan Heal

Arthritis & Rheumatology
Vol. 75, No. 3, March 2023, pp 333–348
DOI 10.1002/art.42386
© 2023 American College of Rheumatology

American College of Rheumatology
Empowering Rheumatology Professionals

2022 American College of Rheumatology Guideline for Vaccinations in Patients With Rheumatic and Musculoskeletal Diseases

Anne R. Bass,[1] Eliza Chakravarty,[2] Elie A. Akl,[3] Clifton O. Bingham,[4] Leonard Calabrese,[5] Laura C. Cappelli,[4] Sindhu R. Johnson,[6] Lisa F. Imundo,[7] Kevin L. Winthrop,[8] Reuben J. Arasaratnam,[9] Lindsey R. Baden,[10] Roberta Berard,[11] S. Louis Bridges Jr.,[1] Jonathan T. L. Cheah,[12] Jeffrey R. Curtis,[13] Polly J. Ferguson,[14] Ida Hakkarinen,[15] Karen B. Onel,[1] Grayson Schultz,[16] Vidya Sivaraman,[17] Benjamin J. Smith,[18] Jeffrey A. Sparks,[10] Tiphanie P. Vogel,[19] Eleanor Anderson Williams,[20] Cassandra Calabrese,[5] Joanne S. Cunha,[21] Joann Fontanarosa,[22] Miriah C. Gillispie-Taylor,[19] Elena Gkrouzman,[12] Priyanka Iyer,[23] Kimberly S. Lakin,[1] Alexandra Legge,[24] Mindy S. Lo,[25] Megan M. Lockwood,[26] Rebecca E. Sadun,[27] Namrata Singh,[28] Nancy Sullivan,[22] Herman Tam,[29] Marat Turgunbaev,[30] Amy S. Turner,[30] and James Reston[22]

Virginia Mason Franciscan Health

https://pubmed.ncbi.nlm.nih.gov/36597810/

Table 3. Medication management at the time of non–live attenuated vaccine administration. Color table can be viewed in the online issue,which is available at http://onlinelibrary.wiley.com/doi/10.1002/art.42386/abstract.

	Influenza vaccination	Other non–live attenuated vaccinations
Methotrexate	Hold methotrexate for 2 weeks *after* vaccination*	Continue methotrexate
Rituximab	Continue rituximab†	Time vaccination for when the next rituximab dose is due, and then hold rituximab for at least 2 weeks after vaccination
Immunosuppressive medications other than methotrexate and rituximab	Continue immunosuppressive medication	Continue immunosuppressive medication

□ = Conditional recommendation.
* Hold only if disease activity allows. Non-rheumatology providers, e.g., general pediatricians and internists, are encouraged to give the influenza vaccination and then consult with the patient's rheumatology provider about holding methotrexate to avoid a missed vaccination opportunity.
† Give influenza vaccination on schedule. Delay any subsequent rituximab dosing for at least 2 weeks after influenza vaccination if disease activity allows.

Recommendations	Level of evidence†	PICO	numbers
Expanded indications for specific vaccines in patients with RMDs receiving immunosuppression			
Influenza vaccination			
For patients with RMD age ≥65 years and patients with RMD age >18 and <65 years who are taking immunosuppressive medication, giving high-dose or adjuvanted influenza vaccination is **conditionally** recommended over giving regular-dose influenza vaccination.	PICO 9. Very low (indirect evidence only)‡	PICO 9. In patients with RMD age ≥65 years, is high-dose influenza vaccine more effective than seasonal regular-dose influenza vaccine?	728
	PICO 10. Very low (indirect evidence only)‡	PICO 10. In patients with RMD age ≥65 years, is adjuvanted influenza vaccine more effective than seasonal regular-dose influenza vaccine?	728

Franciscan Health

© 2014 Virginia Mason Medical Center

https://onlinelibrary.wiley.com/doi/epdf/10.1002/art.42386

Table 5. Immunosuppressive medication management at the time of live attenuated virus vaccine administration*

	Hold before live attenuated virus vaccine administration	Hold after live attenuated virus vaccine administration
Glucocorticoids†	4 weeks	4 weeks
Methotrexate, azathioprine‡	4 weeks	4 weeks
Leflunomide, mycophenolate mofetil, calcineurin inhibitors, oral cyclophosphamide	4 weeks	4 weeks
JAK inhibitors	1 week	4 weeks
TNF, IL-17, IL-12/23, IL-23, BAFF/BLyS inhibitors	1 dosing interval§	4 weeks
IL-6 pathway inhibitors	1 dosing interval¶	4 weeks
IL-1 inhibitors		
Anakinra	1 dosing interval¶	4 weeks
Rilonacept	1 dosing interval¶	4 weeks
Canakinumab	1 dosing interval¶	4 weeks
Abatacept	1 dosing interval§	4 weeks
Anifrolumab	1 dosing interval§	4 weeks
Cyclophosphamide, intravenous	1 dosing interval§	4 weeks
Rituximab	6 months	4 weeks
IVIG#		
300–400 mg/kg	8 months	4 weeks
1 gm/kg	10 months	4 weeks
2 gm/kg	11 months	4 weeks

Pneumococcal vaccination

For patients with RMD age <65 years who are taking immunosuppressive medication, pneumococcal vaccination is **strongly** recommended.

Recombinant VZV vaccination

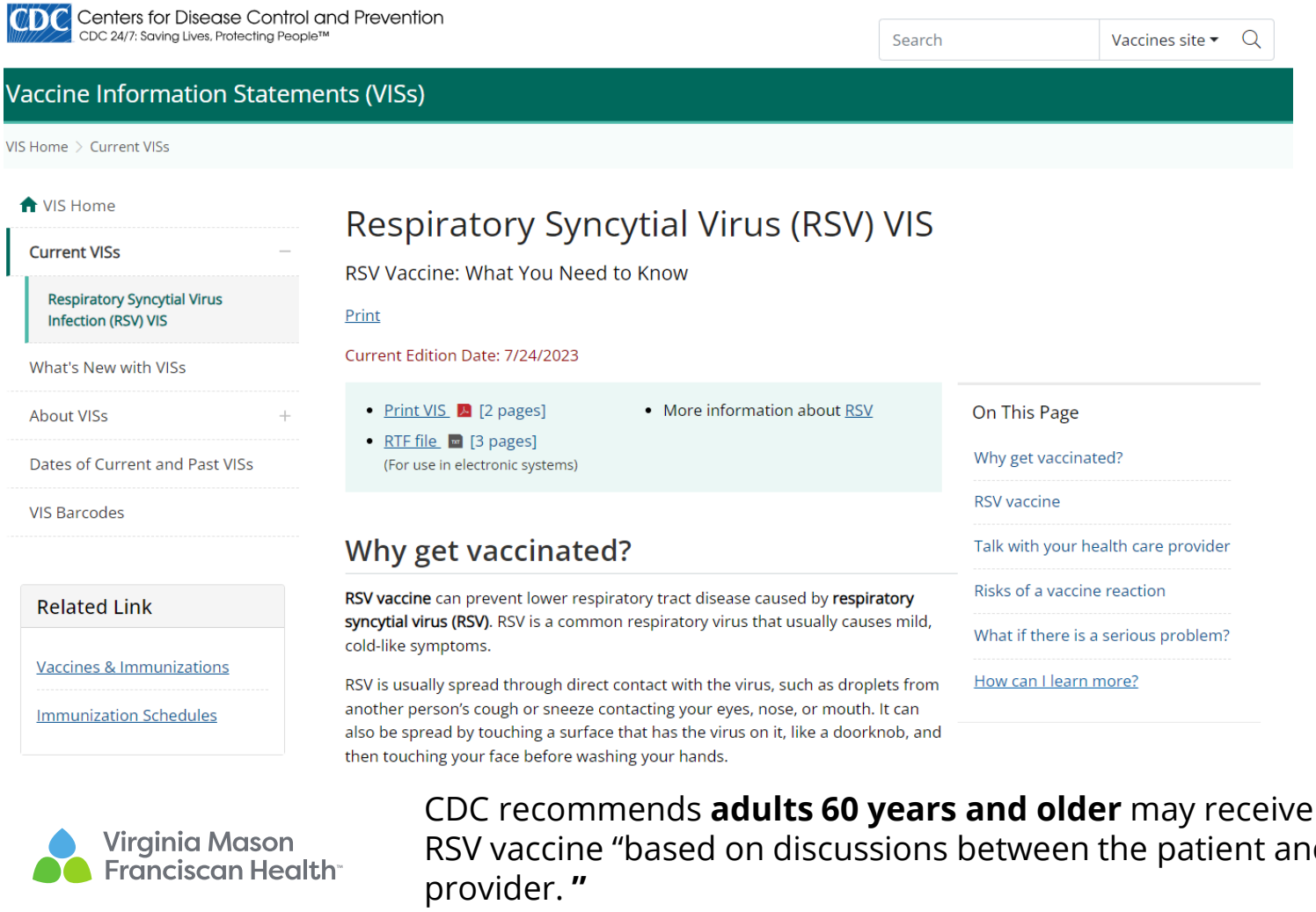
For patients with RMD age >18 years who are taking immunosuppressive medication, administering the recombinant VZV vaccine is **strongly** recommended.

HPV vaccination

For patients with RMD age >26 and <45 years who are taking immunosuppressive medication and are not previously vaccinated, vaccination against HPV is **conditionally** recommended.

Whether to hold immunosuppressive medication at the time of non–live attenuated vaccination to maximize vaccine immunogenicity, although holding medications could be associated with disease flare

For patients with RMD, *holding* methotrexate for 2 weeks after influenza vaccination is **conditionally** recommended, assuming disease activity allows.



Virginia Mason Franciscan Health

CDC recommends **adults 60 years and older** may receive a single dose of RSV vaccine "based on discussions between the patient and health care provider. **"**

Contents lists available at ScienceDirect

Contemporary Clinical Trials Communications

journal homepage: http://www.elsevier.com/locate/conctc

Research paper

Design of an anti-inflammatory diet (ITIS diet) for patients with rheumatoid arthritis

Marta F. Bustamante [a], Meritxall Agustín-Perez [a], Francesca Cedola [a], Roxana Coras [a,c], Rekha Narasimhan [a], Shahrokh Golshan [b], Monica Guma [a,c,*]

[a] Department of Medicine, University of California San Diego, San Diego, CA, USA
[b] Department of Psychiatry, University of California San Diego, San Diego, CA, USA
[c] Department of Medicine, Autonomous University of Barcelona, Plaça Cívica, 08193, Bellaterra, Barcelona, Spain

ARTICLE INFO

Keywords:
Rheumatoid arthritis
Diet design
Anti-inflammatory diet
ITIS diet
Microbiome

ABSTRACT

Background: Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease that affects synovial joints, leading to inflammation, joint destruction, loss of function, and disability. Although recent pharmaceutical advances have improved treatment of RA, patients with RA often inquire about dietary interventions to improve RA symptoms, as they perceive rapid changes in their symptoms after consumption of certain foods. There is evidence that some ingredients have pro- or anti-inflammatory effects. In addition, recent literature has shown a link between diet and microbiome changes. Both diet and the gut microbiome are linked to circulating metabolites that may modulate inflammation. However, evidence of the effects of an anti-inflammatory and probiotic-rich diet in patients with RA is scarce. There is also a need for biological data to support its anti-inflammatory effects.

Methods: The main goal of this study is to delineate the design process for a diet tailored to our RA population. To achieve this goal, we collected information on diet, supplements, cooking methods, and intake of different ingredients for each patient. Different groups were interviewed, and their feedback was assessed to design a diet that incorporates suggested anti-inflammatory ingredients in a manner that was easy for patients to adopt based on their lifestyles and backgrounds.

Results: We designed a diet that includes a high intake of potential anti-inflammatory ingredients. Feedback from highly motivated patients was critical in constructing an anti-inflammatory diet (ITIS diet) with elevated adherence.

Conclusion: In order to tailor our diet, we surveyed our patients on several different parameters. We obtained important feedback on how feasible our ITIS diet is for RA patients. Using this feedback, we made minor improvements and finalized the design of the ITIS diet. This diet is being used in an on-going pilot study to determine their anti-inflammatory effect in pain and joint swelling in RA patients.

Trial registration: Not applicable.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6997513/pdf/main.pdf

Table 1
Strategies and recommendations in the ITIS diet.

Main recommendations (WHAT/WHAT FOR)	Based on (WHY)	Diet strategies (HOW)
• Lower the omega6/3 PUFA ratio to 2:1 • Increase intake of MUFA • Decrease intake of pro-inflammatory FA such as trans-FA and saturated FA (present in dairy products, red meat and processed food)	• A low omega 6/3 PUFA ratio reduces inflammation and improves autoimmunity symptoms [28–32]. • MUFA found in nuts, avocado, sesame and olive oil have beneficial effect in RA [33,34] • Industrially produced trans-FA increase inflammatory markers and saturated FA increase inflammation [15–17].	• The diet must contain fatty fish such as sardines, tuna, twice per week, daily intake of chia seeds and flaxseed oil. • Daily intake of nuts, avocado, and/or sesame seeds or tahini • Avoid pre-cooked food, red meat and processed meat. Cook by baking, boiling or vapor. Avoid frying for long periods since it modifies PUFA to trans-FA [60].
• High intake of prebiotics • Daily intake of probiotics	• Dietary fiber, whole-grain complex carbohydrates, and sugar alcohols present in fruits are prebiotics that support healthy microbiome [11,12] and increases SCFA production improving immunity [13]. • Probiotics including yogurt reduce the levels of the pro-inflammatory cytokines and improves disease activity in RA [10,52,53]	• Daily green leafy vegetables (arugula, lettuce, broccoli, zucchini, Green beans) and fruits (prebiotic source). • Daily home-made green juice (made of fruits and green vegetables) (prebiotic source). • Promote whole grains and avoid refined flours (prebiotic source). • Daily yogurt (a brand that contains *Lactobacillus Casei* among other species (Chobani) and miso
• Help digestion of large proteins in the gut and avoid unnecessary fermentation	• Fiber consumption and enzymatic fruits will reduce colonic transit, and will help protein digestion • Bromelain and papain were shown to have an anti-inflammatory effect as well [40–42]. • Large proteins in dairy products are not completely digested and can feed proteolytic bacteria, resulting in the production of pro-inflammatory metabolites [66].	• Daily enzymatic fruit: pineapple, mango or papaya (source of bromelain, papain and other proteolytic enzymes) • Disassociate consumption of proteins from grains • Increase fiber intake • Substitute plant-based milks (almond, rice, coconut) for dairy.
• Condiment with anti-inflammatory spices • Eliminate salt	• Turmeric, black pepper and ginger have antioxidant and anti-inflammatory actions [43–46] • Black pepper increases bioavailability of curcuma [46,47] • High salt intake is associated with the risk of arthritis and has been related to autoimmunity [67,68].	• Condiment with turmeric, black pepper and ginger. • Turmeric and black pepper should be used at the same time. • Low salt intake by eliminating precooked food
• Substitute vegetables with potential anti-inflammatory	• *Solanaceae* vegetables contain glycoalkaloids. Glycoalkaloids have been reported to affect	• Avoid the consumption of eggplant, tomatoes and potatoes and increase consumption
• Decrease consumption of red meat.	• It contains high levels of choline, which is the precursor of the inflammatory metabolite TMAO [5,6] and saturated FA.	• Introduce legumes (red, white beans, lentils or garbanzo), poultry and white fish, 2–3 days a week each. Avoid red meat.
• Reduce consumption of gluten	• Gluten has been associated with inflammatory states [14]. • Pseudocereals and whole grains reduce inflammation [69,70]	• Substitute whole grains such as rye, corn, oats or quinoa for refined wheat.
• Avoid sugars, sugary foods and sugary beverages	• Sugary foods and beverages are associated to obesity, microbiome changes and low-grade inflammatory state [71].	• Substitute honey for sugar. Avoid soda and juices.
• Substitute green tea for coffee	• Green tea contains polyphenols which decrease pro-inflammatory cytokines in animal models and in *vitro* models of RA) [48–50,72,73] • Some studies suggest that coffee consumption may increase the risk of developing RA [74].	• Daily green tea
• Increase the intake of antioxidants, phytochemicals vitamins and flavonoids	• Antioxidants, phytochemicals, flavonoids and vitamins were suggested to have anti-inflammatory properties [35–39].	• Vegetables, fruits, apple cider vinegar, whole grains contain high amounts of antioxidants, phytochemicals vitamins, and flavonoids. • Daily home-made green juice (made of fruits and green vegetables)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6997513/pdf/main.pdf

Virginia Mason Franciscan Health

Table 2
Final version of the ITIS diet.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
7–8 am	SMOOTHIE	Coconut milk, mango, papaya, pineapple	Pear, lemon, yogurt, vanilla, water	Grapes, celery, spinach, cucumber, lime, water	Almond or oat milk, spinach, strawberries, pear, ginger, chia seeds, cinnamon	Spinach, ginger, turmeric, papaya, flaxseeds, banana, water	Papaya, spinach, almond milk, turmeric, chia seeds, honey	Parsley, pineapple, strawberries, water
7–8 am	BREAKFAST	1-2 spoonful of oats with non-dairy milk (oat milk, almond milk or rice milk). Add berries (optional). Green tea infusion.	1-2 corn tortillas, spread with avocado, sesame seeds, and flaxseed oil. Green tea infusion.	1 -2 corn tortillas with tahini (sesame seed extract) with ¼ teaspoon of honey. Green tea infusion	1-2 spoons of oat with non-dairy milk (oat, almond or rice milk. Add berries (optional). Green tea infusion.	1-2 corn tortillas, spread with avocado, sesame seeds, and flaxseed oil. Green tea infusion.	1 -2 corn tortillas with tahini (sesame seed extract) with ¼ teaspoon of honey. Green tea infusion	1-2 corn tortillas, spread with avocado, sesame seeds, and linseed oil. Green tea infusion.
10–11 a.m.	SNACK	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)	Plain yogurt (Chobani Brand, no sugar added)
12-1 pm	LUNCH	OPTION 1: Salad (generous plate) OPTION 2: Grains with vegetables OPTION 3: Legumes with vegetables						
4 p.m.	SNACK	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts	Mango, papaya, pineapple, apple, pear or banana +4 walnuts
6–7 pm	DINNER	OPTION 1: Vegetable soup/cream + protein OPTION 2: Miso soup + baked/steamed/grilled vegetables + protein OPTION 3: Salad + protein						

ITIS: A Supercharged Mediterranean Diet for RA

A new approach to a popular diet shows a positive effect on the microbiome, a key player in inflammatory arthritis severity and outcomes.

By Linda Rath

Diets fall in and out of favor, but the Mediterranean diet has stood the test of time. Decades of research have shown that a plant-based mix, including vegetables, fruit, legumes, olive oil, fish and whole grains, can improve or prevent many chronic diseases, including heart disease, type 2 diabetes and arthritis.

Scientists trace the diet's benefits in part to its positive effect on the microbiome — the rich ecosystem of microbes, or microorganisms, that inhabit our bodies, especially the gut.

What you eat can encourage or inhibit the growth of certain types of gut bacteria, increase or decrease overall diversity and influence metabolites the microbes produce, which are key players in activating inflammation. An unhealthy microbiome — one that's less diverse and unbalanced — is associated with autoimmune diseases like rheumatoid arthritis (RA) in susceptible people.

Mediterranean Diet 2.0

"We know the Mediterranean diet is good for patients with rheumatoid arthritis," says Monica Guma, MD, a rheumatologist and researcher at the University of California, San Diego. "But there also might be something better." That something is what she calls the ITIS diet. It's the Mediterranean diet supercharged with anti-inflammatory foods and herbs that may improve gut health and arthritis symptoms.

She and her colleagues spent a year designing the diet. At four different stages, they consulted patients to make sure the diet was affordable and was one they could stick with for the two-week study period. They made a few changes as needed.

https://www.arthritis.org/health-wellness/healthy-living/nutrition/anti-inflammatory/itis-a-supercharged-mediterranean-diet-for-ra

Questions?

Erin.Bauer@virginamason.org

Phone: (206) 223-6824

Fax: (206) 625-7288

Pager: (206) 540-3499

Virginia Mason Franciscan Health

© 2014 Virginia Mason Medical Center