

UNDERWRITING AUTOIMMUNE CONDITIONS WITH PRESCRIPTION DATA AND MEDICAL DATA

WAHLU

Kyle Schimek, PharmD, BCPS

October 2023

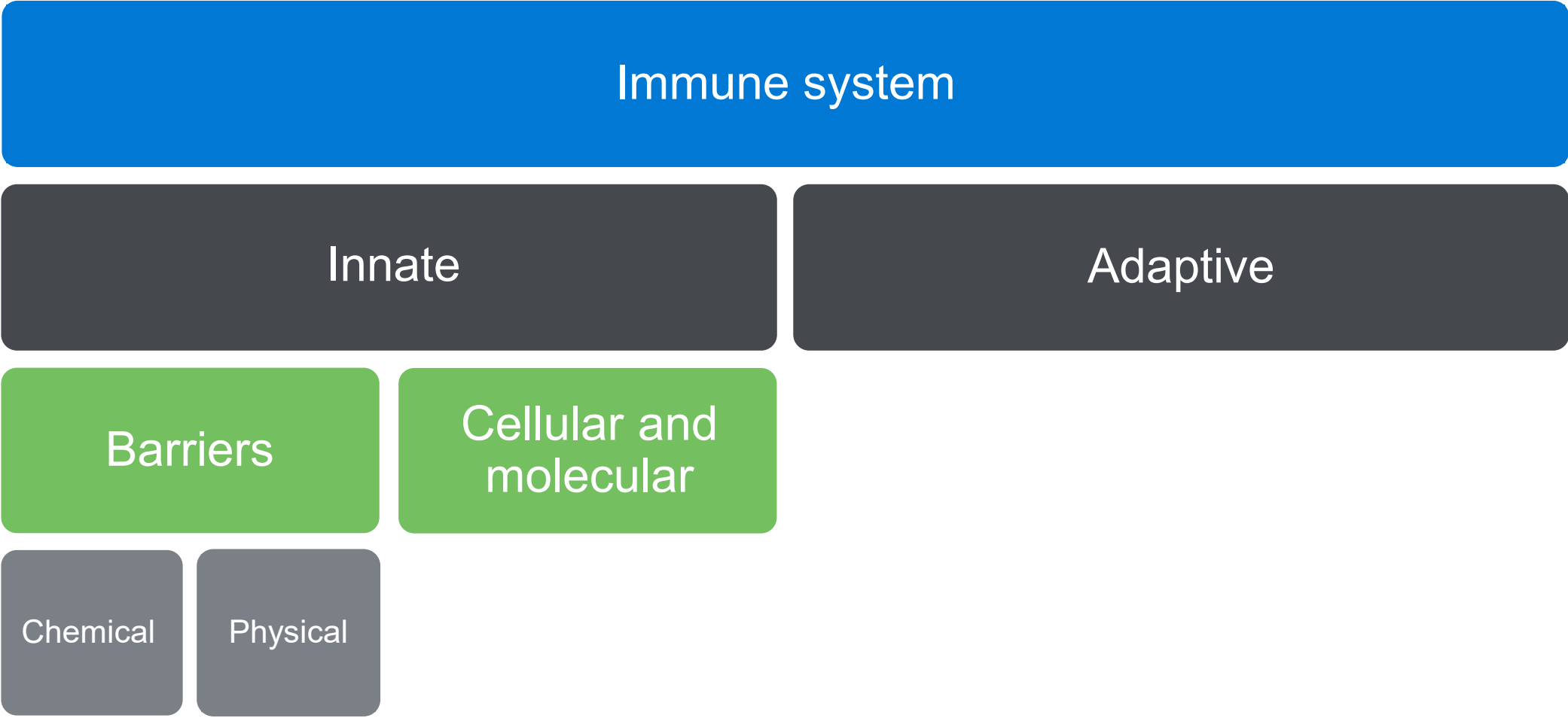
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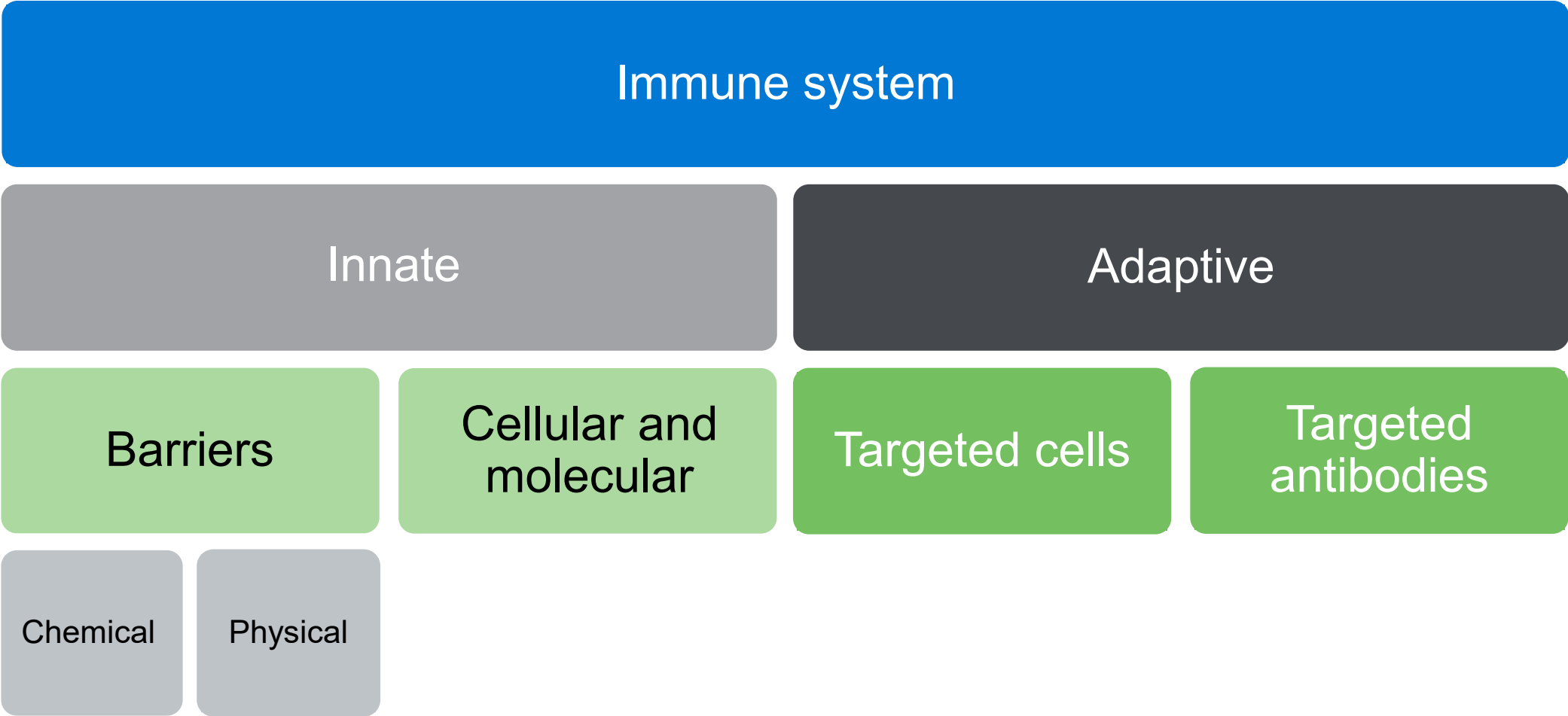
AGENDA

- Immune system
- Autoimmune overview and mortality
- Select autoimmune diseases
- Underwriting autoimmune disorders
- Medications and disease activity

THE IMMUNE SYSTEM DEFENDS YOUR BODY AGAINST INFECTION.

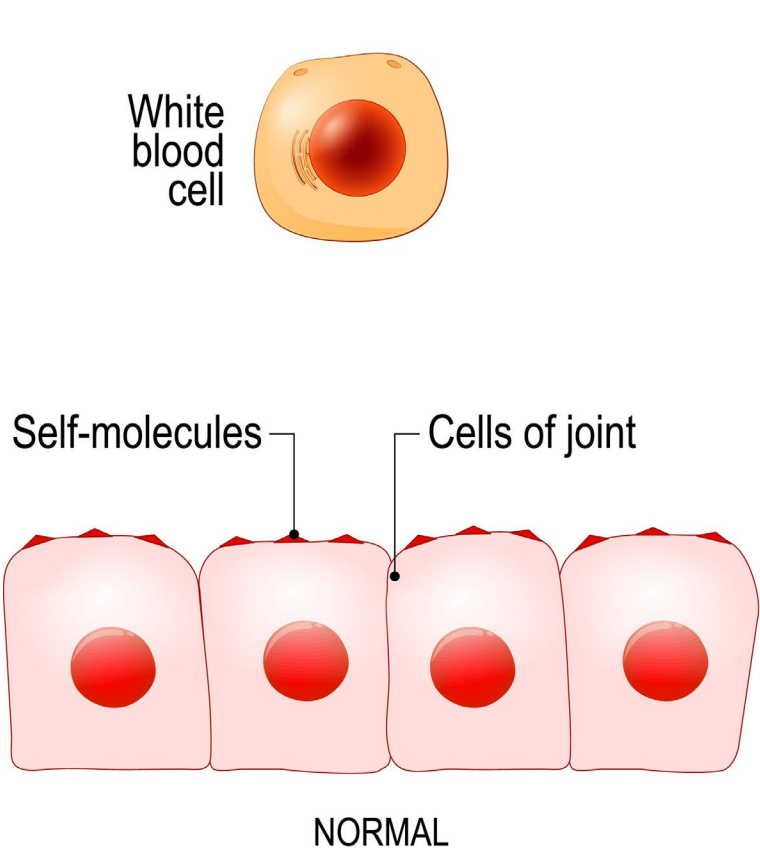


THE ADAPTIVE IMMUNE SYSTEM LEARNS FROM PREVIOUS INFECTIONS.

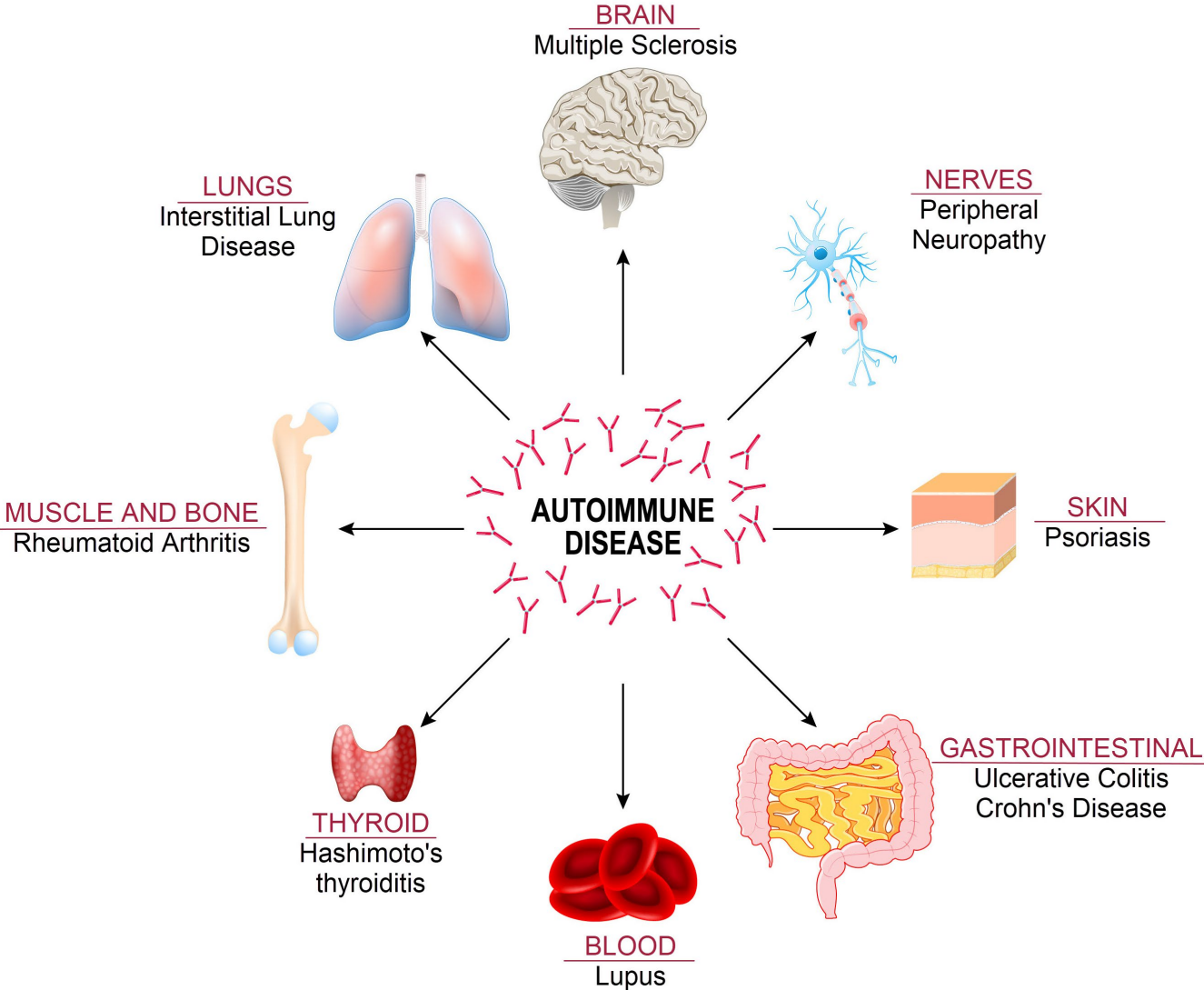


AUTOIMMUNE OVERVIEW AND MORTALITY

AUTOIMMUNE DISEASES CAUSE HARMFUL INFLAMMATION.

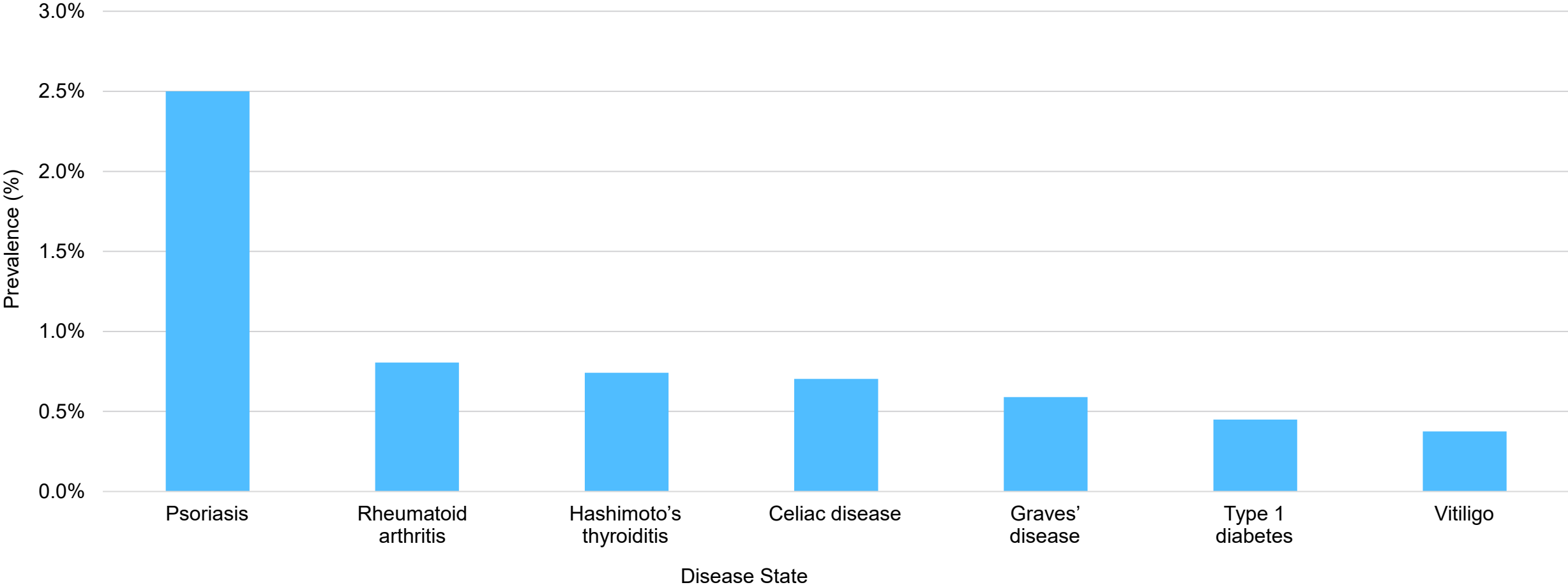


AUTOIMMUNE DISEASES MAY AFFECT ANY PART OF THE BODY.

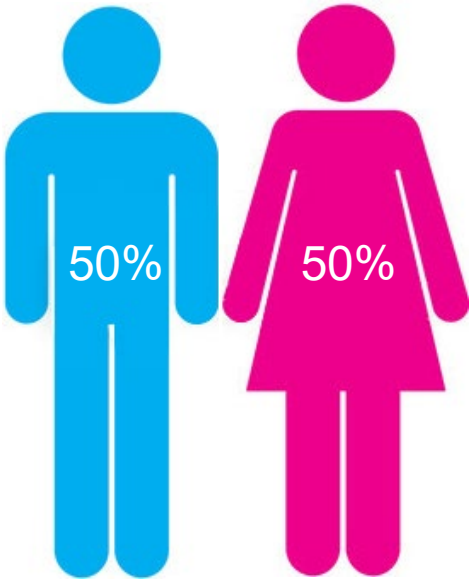


AUTOIMMUNE DISEASES ARE COMMON.

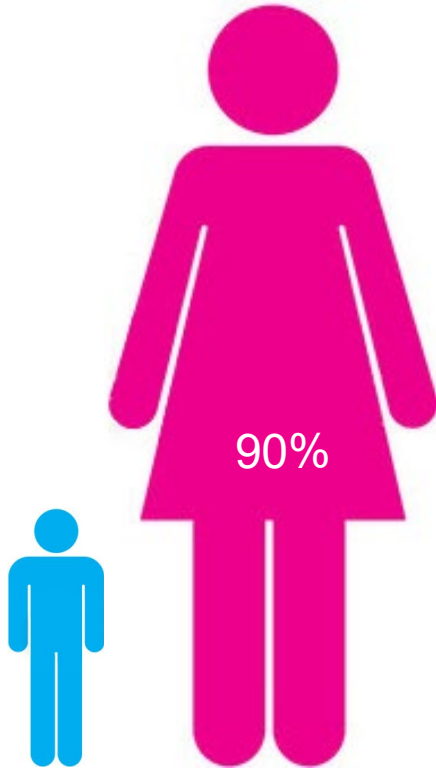
Prevalence of Autoimmune Diseases in the U.S.



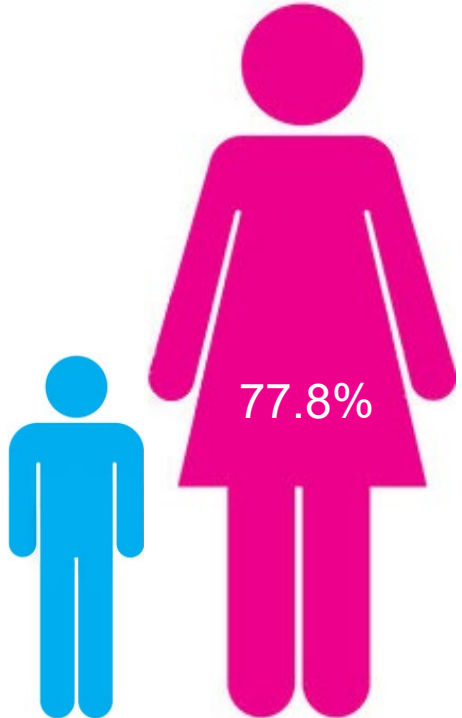
AUTOIMMUNE DISEASES DISPROPORTIONATELY AFFECT WOMEN.



Ulcerative colitis

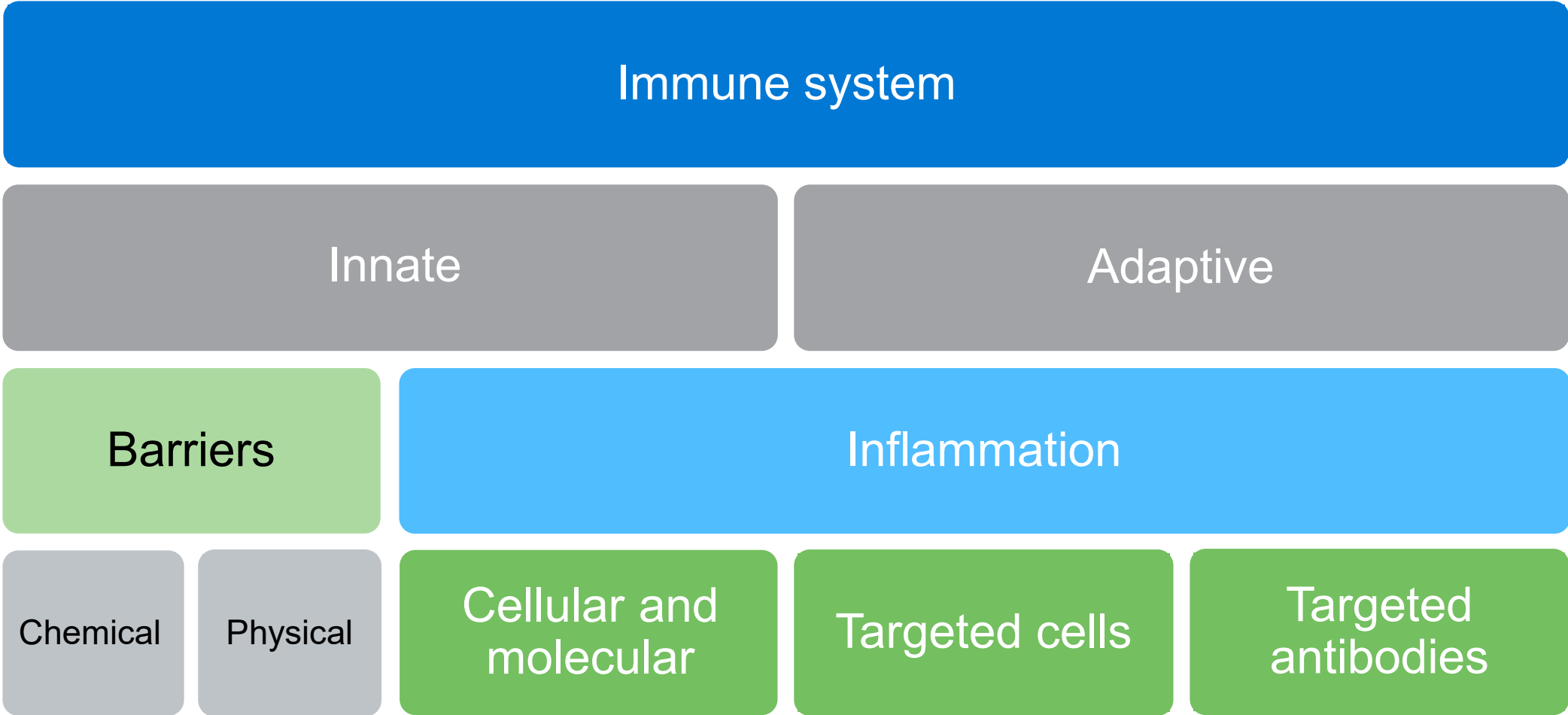


Lupus



All autoimmune diseases

THE IMMUNE SYSTEM RELIES ON INFLAMMATION.



AUTOIMMUNE INFLAMMATION INCREASES RISK OF COMORBIDITIES.

INFLAMMATION



Immune-mediated inflammation

- Local
- Systemic
- Tissue damage and proliferation

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COMORBIDITIES

Increased risk of

AUTOIMMUNE INFLAMMATION INCREASES RISK OF COMORBIDITIES.

INFLAMMATION

Immune-mediated inflammation

- Local
- Systemic
- Tissue damage and proliferation

COMORBIDITIES

Increased risk of

- Pulmonary disease
- Anemia
- Cancer
- Heart disease

Medical claims data	% CAD diagnosis
Autoimmune disease	10.8%
No autoimmune disease	3.9%

AUTOIMMUNE INFLAMMATION INCREASES RISK OF COMORBIDITIES.

INFLAMMATION

Immune-mediated inflammation

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- Systemic
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- Pulmonary disease
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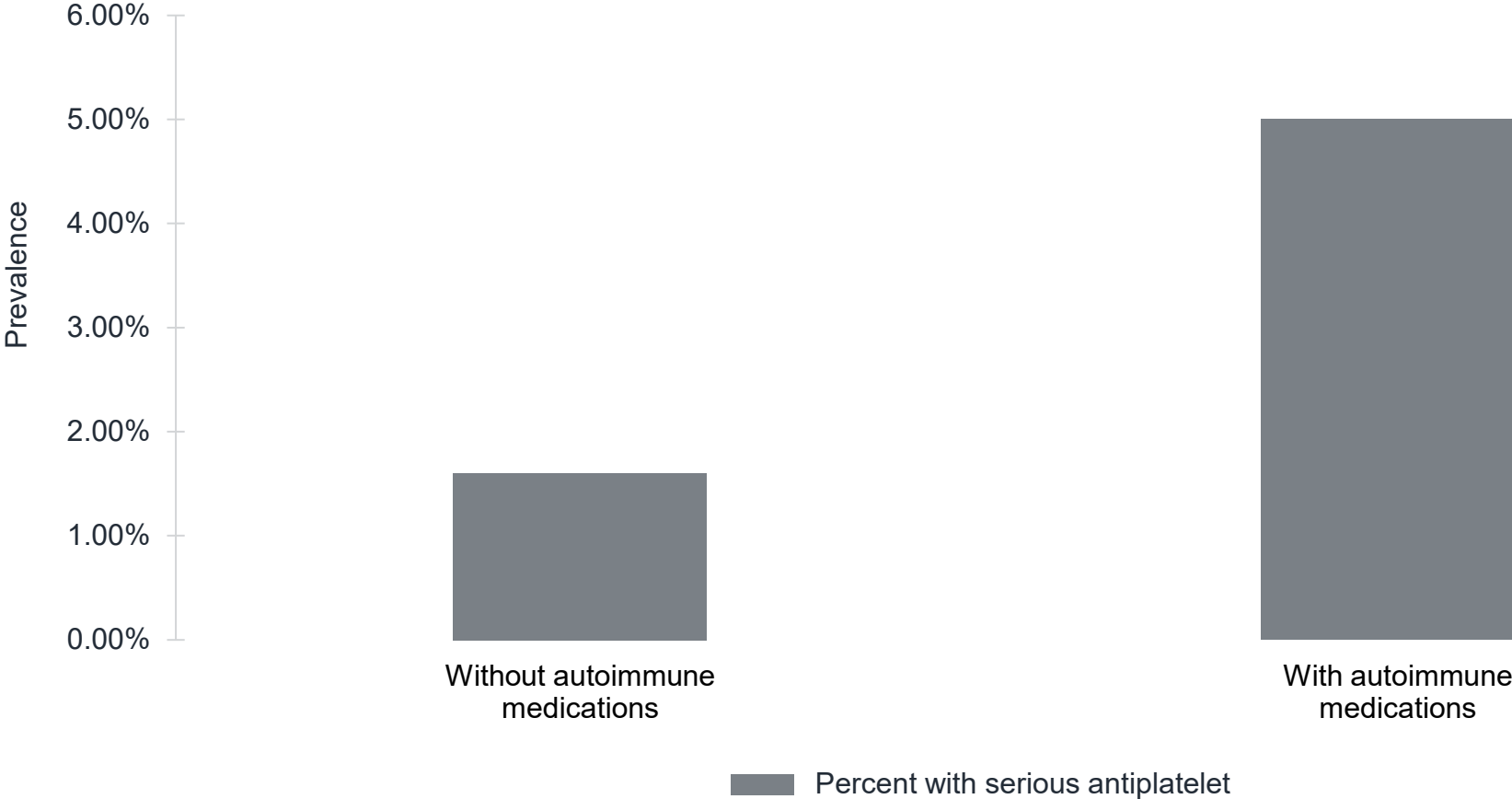
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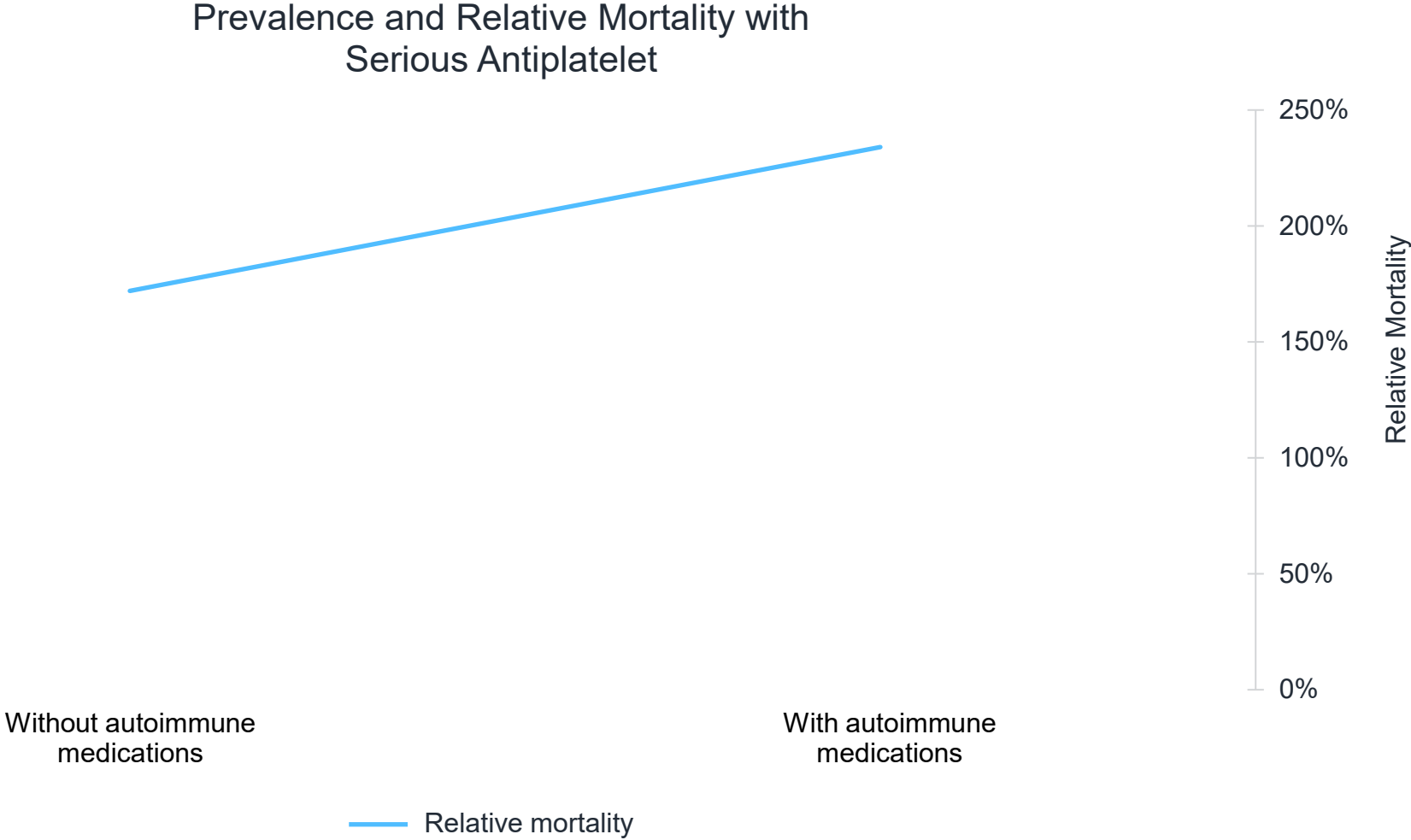
INCREASED MORTALITY

AUTOIMMUNE MEDICATIONS ARE ASSOCIATED WITH CARDIOVASCULAR RISK.

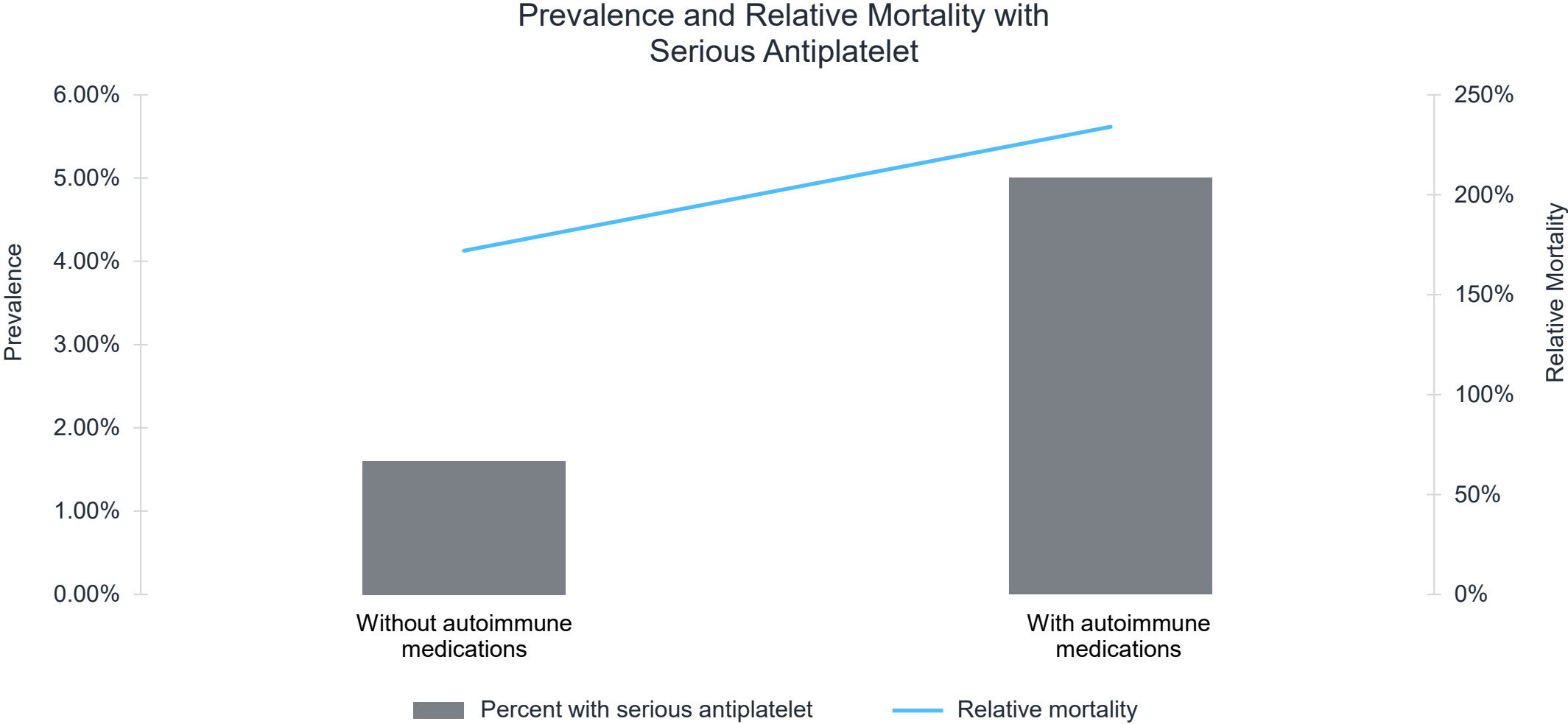
Prevalence and Relative Mortality with Serious Antiplatelet



AUTOIMMUNE MEDICATIONS ARE ASSOCIATED WITH CARDIOVASCULAR RISK.

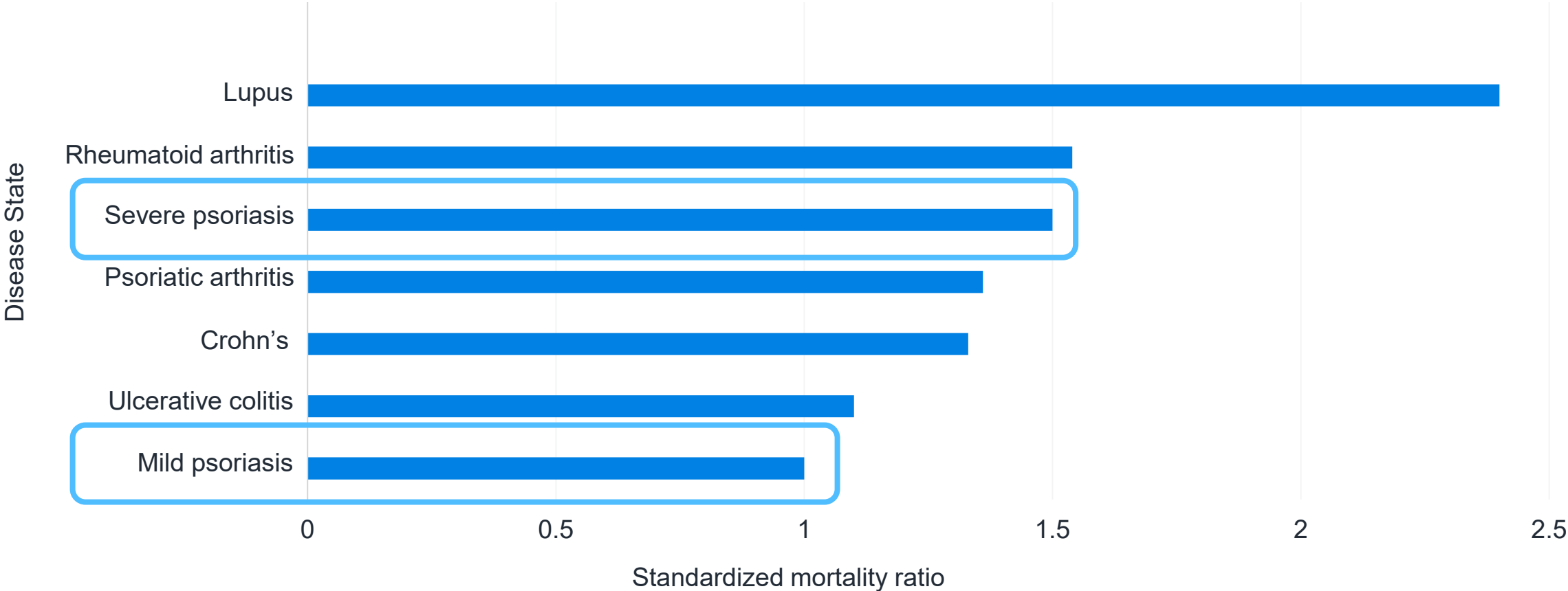


AUTOIMMUNE MEDICATIONS ARE ASSOCIATED WITH CARDIOVASCULAR RISK.



AUTOIMMUNE DISEASES INCREASE MORTALITY.

Mortality of Autoimmune Conditions

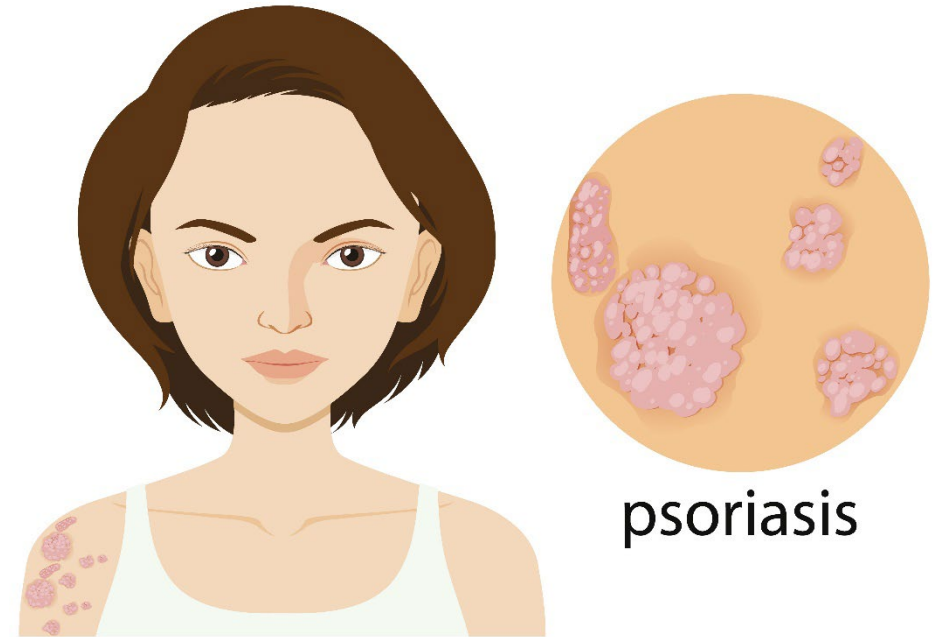


van den Hoek J, et al. *Rheumatol Int.* 2017 Apr;37(4):487-493.
Gelfand JM, et al. *Arch Dermatol.* 2007;143(12):1493-1499.
Jussila A, et al. *J Crohns and Colitis.* 2014; 8(9):1088-1096.

SELECT AUTOIMMUNE DISEASES

PSORIASIS IS NOT JUST A BENIGN SKIN CONDITION.

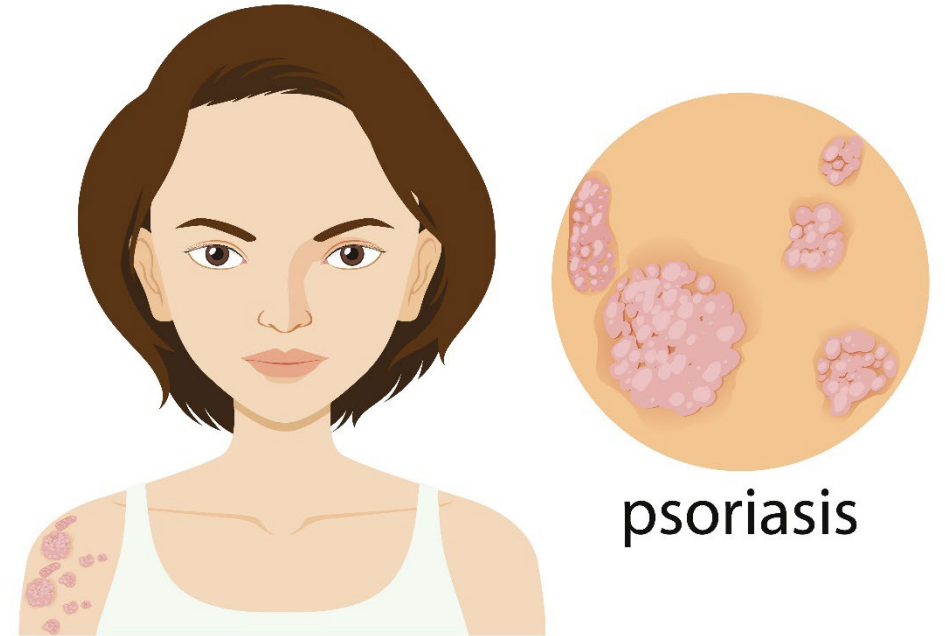
- Characterized by flaky, irritated skin plaques
- Peak incidence in 30-year-olds
- Increased risk of myocardial infarction
- As a group, mortality risk not increased



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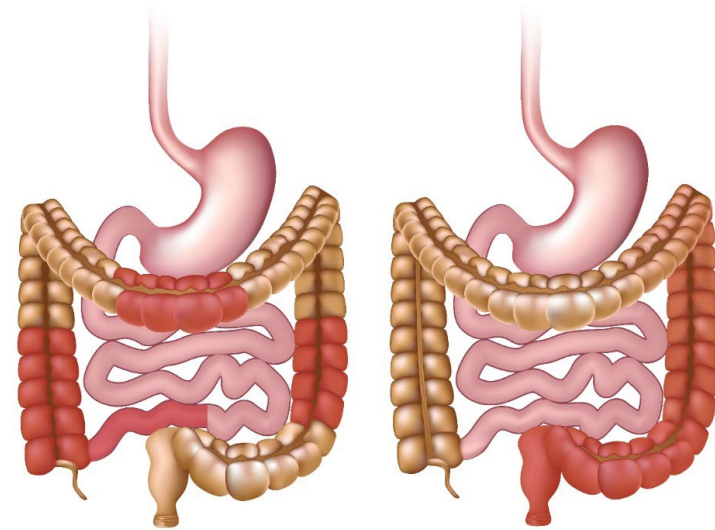
Disease activity	Relative mortality
Mild	~100%
Severe	~150%



INFLAMMATORY BOWEL DISEASE COMPRISES TWO SEPARATE DISEASES.

- Characterized by pain, bleeding, diarrhea
- Peak incidence between 15–30 years old
- Increased comorbid anxiety and depression
- Relative mortality ~120%

Inflammatory Bowel Disease



Crohn's disease

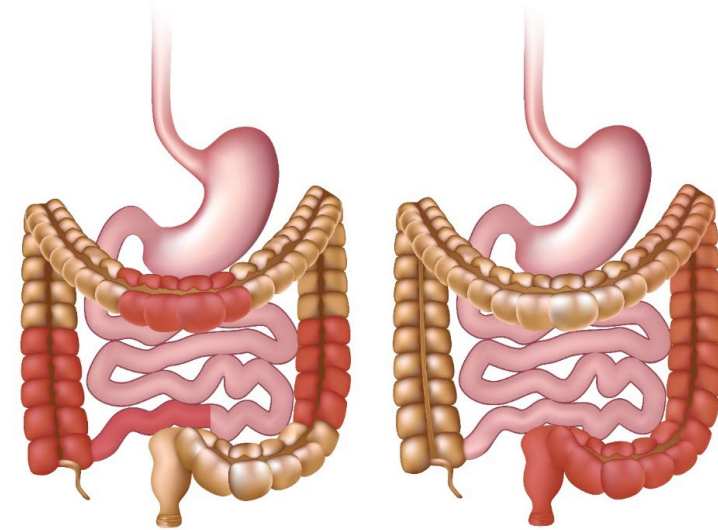
Ulcerative colitis

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- Increased comorbid anxiety and depression
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Disease activity	Relative mortality
Mild	~110%
Severe	~160%

Inflammatory Bowel Disease



Crohn's disease

Ulcerative colitis

LUPUS IS ASSOCIATED WITH ELEVATED MORTALITY.

- Characterized by fatigue, arthralgia, rash
- Primarily affects women of childbearing age
- Increased risk of infection, renal disease, MI
- Five-year survival rate = 40% without treatment



Wallace DJ. *UpToDate*. 2019.

LUPUS IS ASSOCIATED WITH ELEVATED MORTALITY.

- Characterized by fatigue, arthralgia, rash
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- Increased risk of infection, renal disease, MI
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Disease activity	Relative mortality
Mild-Moderate	130-220%
Severe	>400%

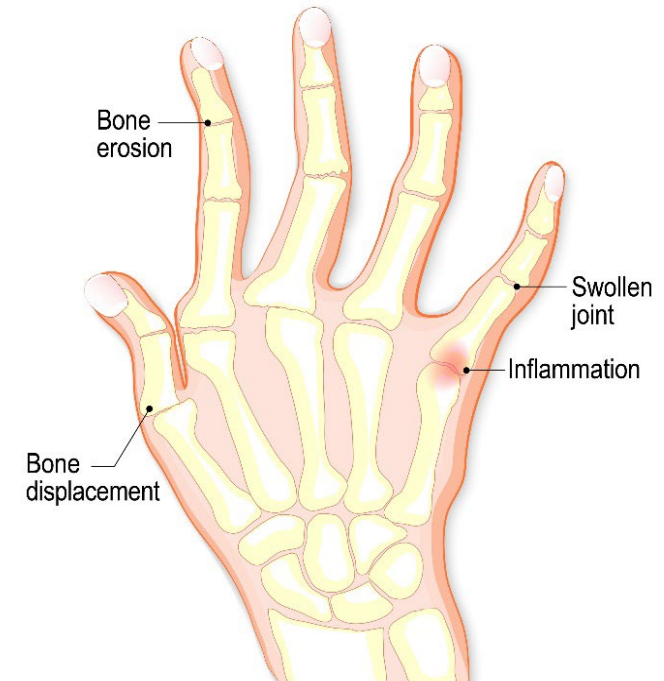


Wallace DJ. *UpToDate*. 2019.

RHEUMATOID ARTHRITIS PRIMARILY AFFECTS OLDER INDIVIDUALS.

- Symmetrical joint pain, stiffness, and swelling
- Inflammation leads to erosion of the bone
- Women > men, incidence peaks in 50s
- Relative mortality of ~150-200%

Rheumatoid arthritis

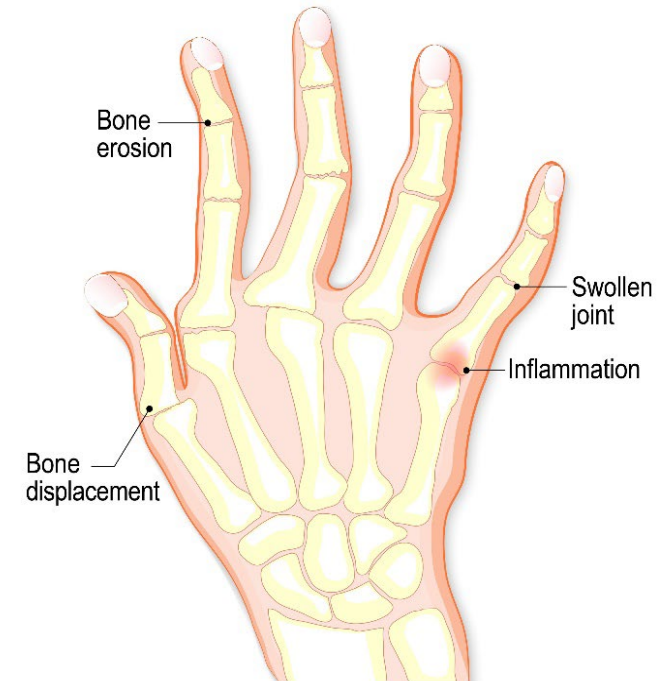


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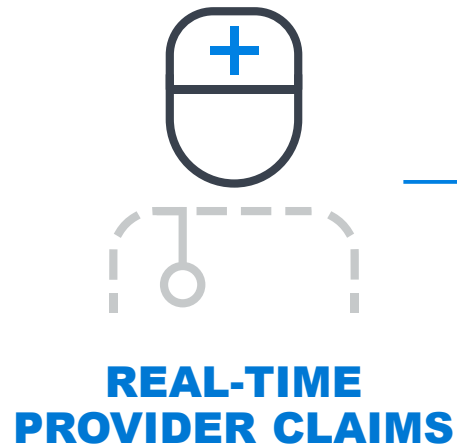
Disease activity	Relative mortality
Mild	~140%
Severe	>200%

Rheumatoid arthritis



UNDERWRITING AUTOIMMUNE DISORDERS

CLAIMS CODES REVEAL VALUABLE HEALTH CARE INFO.



ICD CODES

Diagnosis codes | Procedure codes

CPT CODES – CATEGORY I AND II

Procedure codes (clinic visits, surgery, etc.)

HCPCS CODES

Facility-administered drugs | Medical equipment

REV CODES

Revenue codes (additional procedure details)

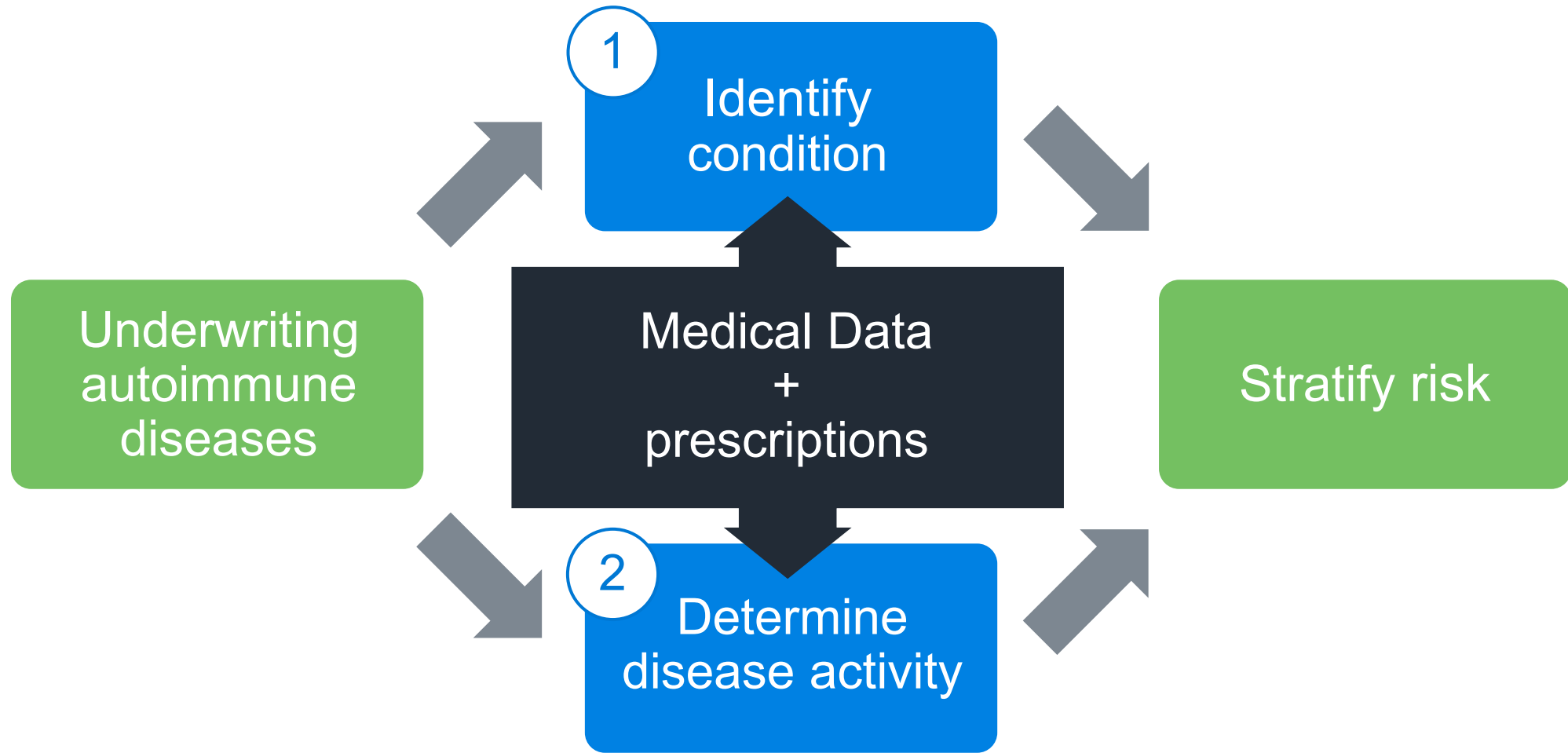
PROVIDER

Specialty | Contact information | Place of service

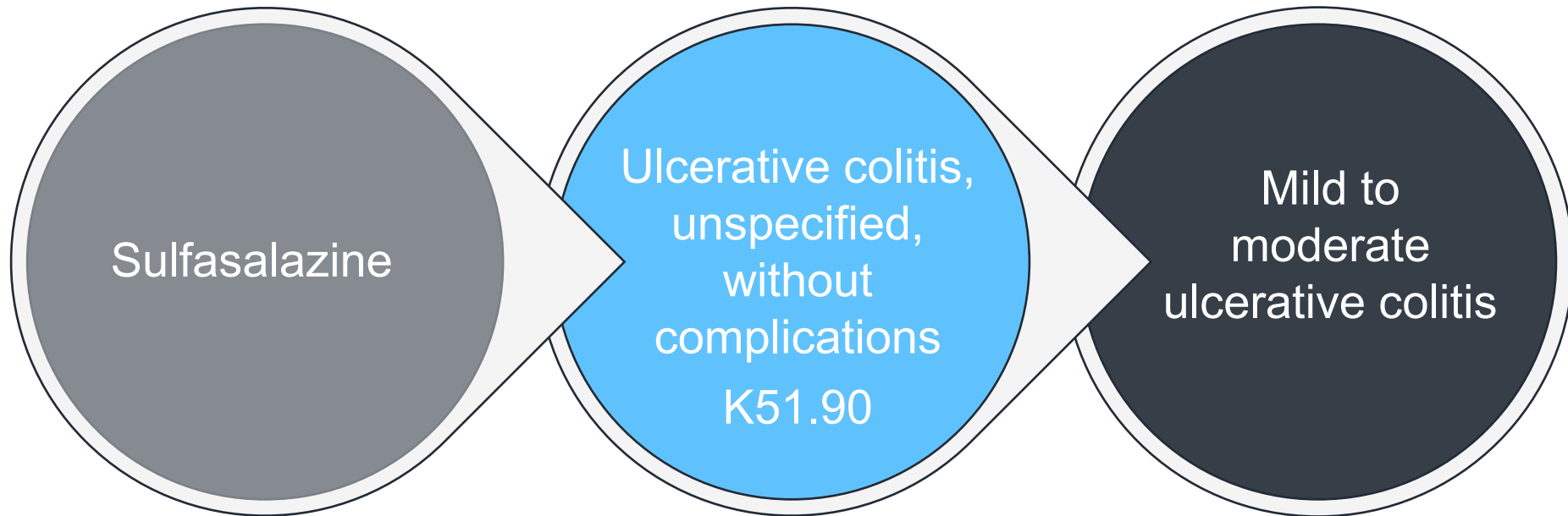


- Interpreted by Irix Rules Engine
- FCRA-compliant

UNDERWRITING AUTOIMMUNE DISORDERS REQUIRES MULTIPLE DATA POINTS.



PRESCRIPTION DATA PLUS MEDICAL DATA STRATIFY AUTOIMMUNE RISK.



MEDICATIONS AND DISEASE ACTIVITY

AUTOIMMUNE MEDICATIONS CAN BE DIVIDED INTO TWO MAIN TARGETS.

Medications for autoimmune conditions

Anti-inflammatory

Immunomodulators

AUTOIMMUNE MEDICATIONS CAN BE DIVIDED INTO TWO MAIN TARGETS.

Medications for autoimmune conditions

Anti-inflammatory

Immunomodulators

NSAIDs

Naproxen
Ibuprofen
Meloxicam

AUTOIMMUNE MEDICATIONS CAN BE DIVIDED INTO TWO MAIN TARGETS.

Medications for autoimmune conditions

Anti-inflammatory

Immunomodulators

NSAIDs

Steroids

Prednisone
Methylprednisolone
Dexamethasone

AUTOIMMUNE MEDICATIONS CAN BE DIVIDED INTO TWO MAIN TARGETS.

Medications for autoimmune conditions

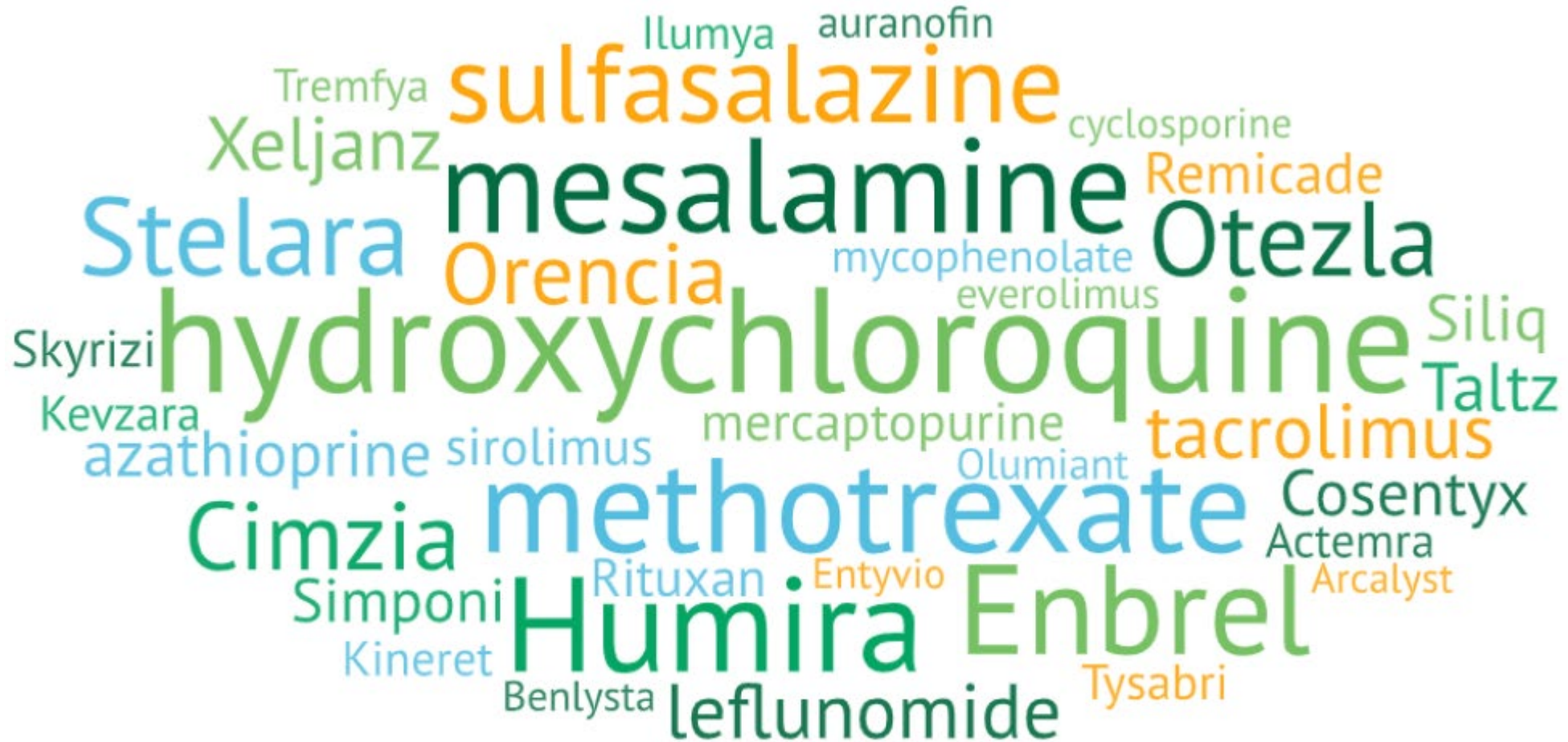
Anti-inflammatory

Immunomodulators

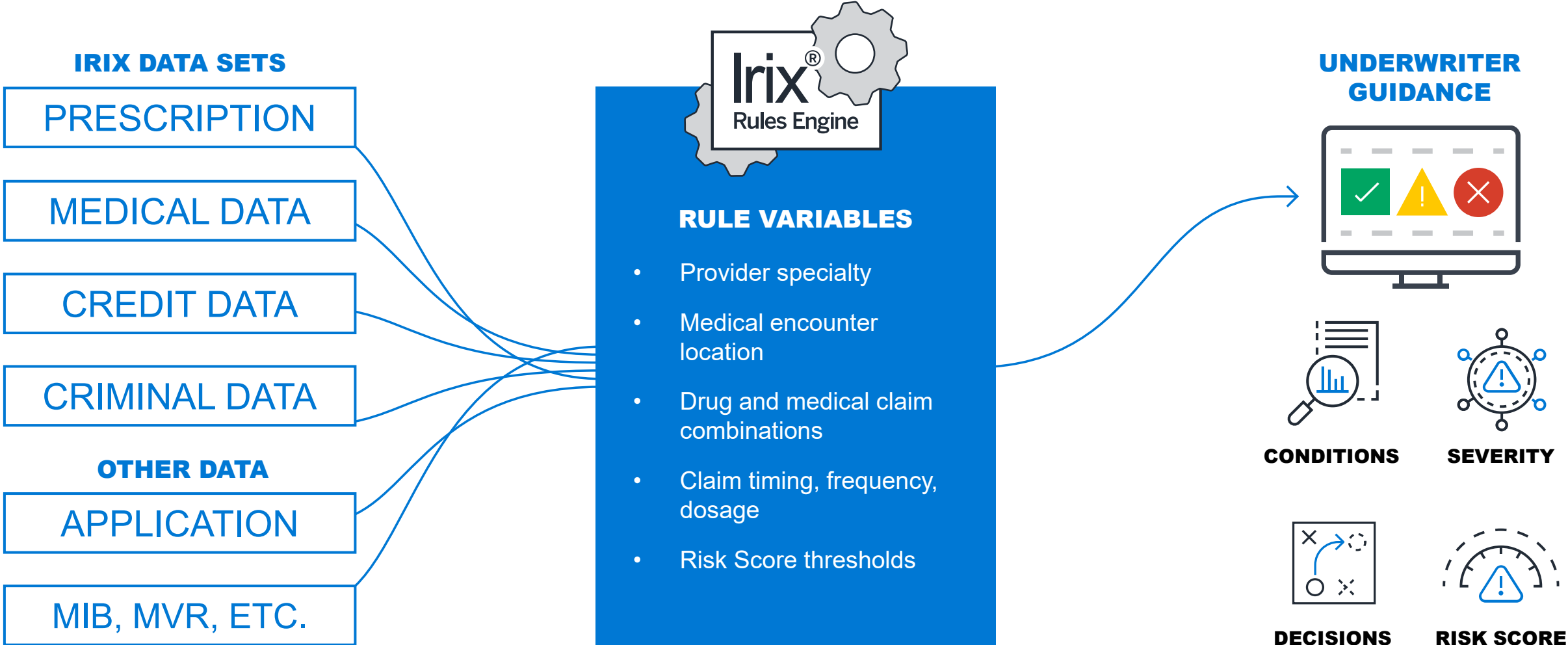
NSAIDs

Steroids

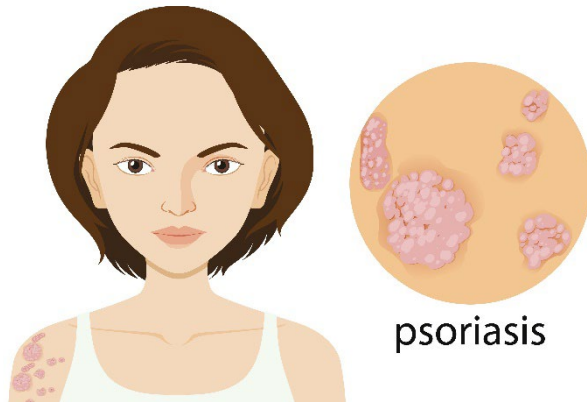
IMMUNOMODULATORY MEDICATIONS ARE NUMEROUS.



IRIX MAKES UNDERWRITING FASTER, EASIER, AND MORE ACCURATE.



KEY MEDICATIONS REVEAL LIKELY CONDITIONS.



PSORIASIS

Topical vitamin D analogs

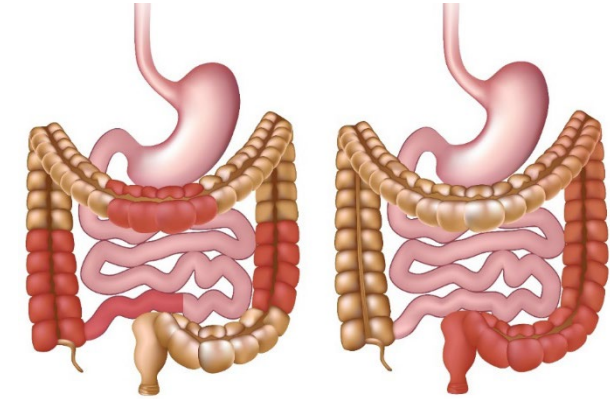
- Calcipotriene
- Calcitriol



LUPUS

Hydroxychloroquine + one of the following

- Azathioprine
- Mycophenolate
- Tacrolimus
- Cyclosporine



INFLAMMATORY BOWEL DISEASE

Any of the following

- Mesalamine
- Budesonide (oral)
- Mercaptopurine



SEVERE PSORIASIS CAN BE DIFFERENTIATED USING MEDICATIONS.

Mild to moderate activity

Topical treatments
(creams, lotions, ointments)

Steroids
(clobetasol, fluocinonide)

Retinoids
(tazarotene)

Vitamin D analogs
(calcipotriene)



Relative mortality ~100%

Moderate to severe activity

Topical treatments



Oral therapy

Mycophenolate, methotrexate,
cyclosporine

Injection therapy

Taltz, Cosentyx, Siliq,
Humira, Enbrel

Relative mortality ~150%

WHAT IS THE AUTOIMMUNE DISEASE AND ACTIVITY?

Age: 84 | Gender: M
 Application Date: 1/7/20
 Rx Fills: 198

DOCTORS

Dermatology

DRUGS

- CLOBETASOL PROPIONATE
- FLUOCINONIDE
- MYCOPHENOLATE MOFETIL
- TRIAMCINOLONE ACETONIDE



MILD TO MODERATE IBD IS ASSOCIATED WITH LOWER RISK.

Mild to moderate activity

aminosalicylates

mesalamine

sulfasalazine

budesonide (oral)

Relative Mortality ~110%

Additional Maintenance Therapies

azathioprine

mercaptopurine

Moderate to Severe Activity

Oral + Injection Therapy

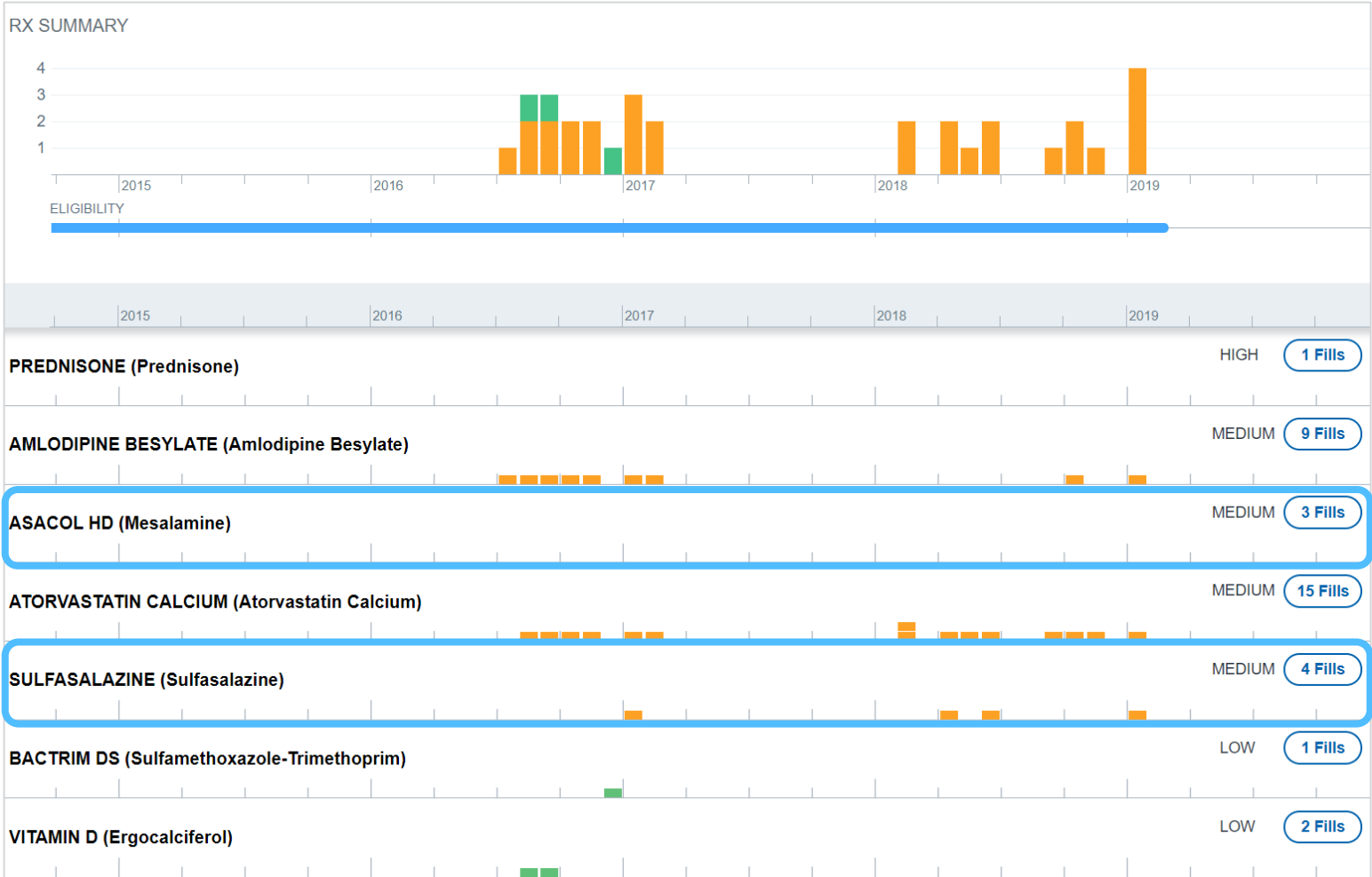
tofacitinib (Xeljanz)

Relative Mortality ~160%

WHAT IS THE AUTOIMMUNE DISEASE AND ACTIVITY?

Age: 48 | Gender: M
 Application date: 2/9/19
 Rx Fills: 40

DOCTORS	
Internal Medicine - Gastroenterology	DRUGS
	ASACOL HD
	CIPROFLOXACIN HCL
	METRONIDAZOLE
	PREDNISONE
	SULFASALAZINE



DRUG THERAPIES CAN BE USED TO DIFFERENTIATE LUPUS SEVERITY.

Mild to moderate lupus

Topical steroids

+ / -

Hydroxychloroquine

Disease activity	Relative mortality
Mild	~130%
Moderate	~200%
Severe	~270%

Signs of advanced disease

Hydroxychloroquine

+ any

Azathioprine

Mycophenolate

Cyclosporine

Belimumab (Benlysta)



MEDICAL DATA IDENTIFIES THE CONDITION.

Age: 52 | Gender: F

Application date: 9/23/21

Rx Fills: 412

SERVICE DATES	PROVIDER	CLAIM DETAILS
02/12/2018 - 02/12/2018	CURRENT PROVIDER [REDACTED] Rheumatology	DIAGNOSIS Systemic lupus erythematosus, organ or system involvement unspecified ICD-10 M32.10 Myalgia, other site ICD-10 M79.18 Other fatigue ICD-10 R53.83
	SUBMITTED PROVIDER [REDACTED] 011 - Office	PROCEDURE Office or other outpatient visit for the evaluation and management of an established patient, usually the presenting problem(s) are of moderate to high severity. Typically 25 minutes are spent face-to-face with the patient and/or family. CPT-4 99214

WHAT IS THE LUPUS ACTIVITY?

Age: 52 | Gender: F
 Application date: 9/23/21
 Rx Fills: 412

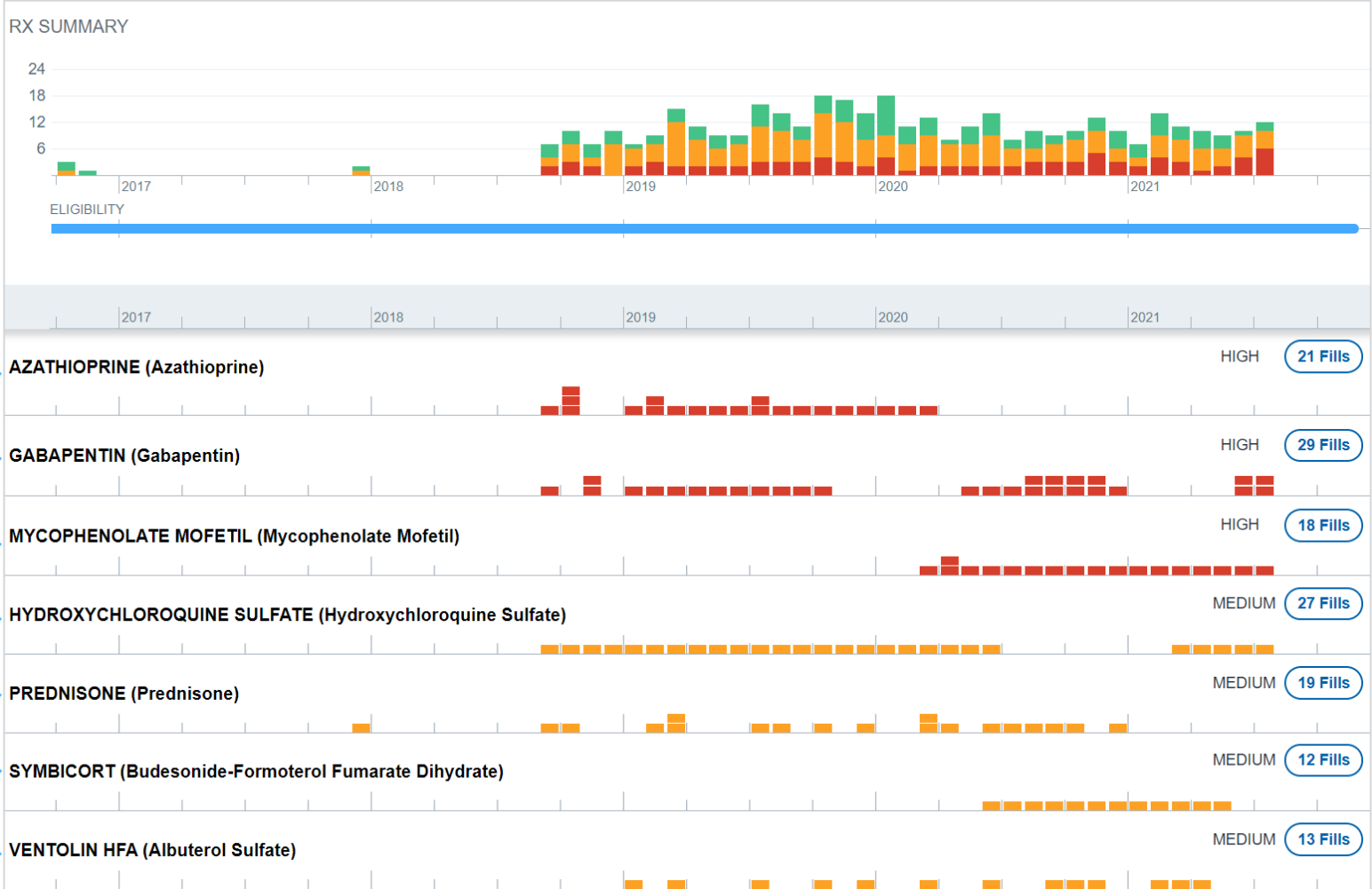


WHAT IS THE LUPUS ACTIVITY?

Age: 52 | Gender: F
 Application date: 9/23/21
 Rx Fills: 412

Rule names

Rx—Lupus likely
 Dx—Systemic lupus
 Persistent asthma
 Unmanaged rescue inhaler use

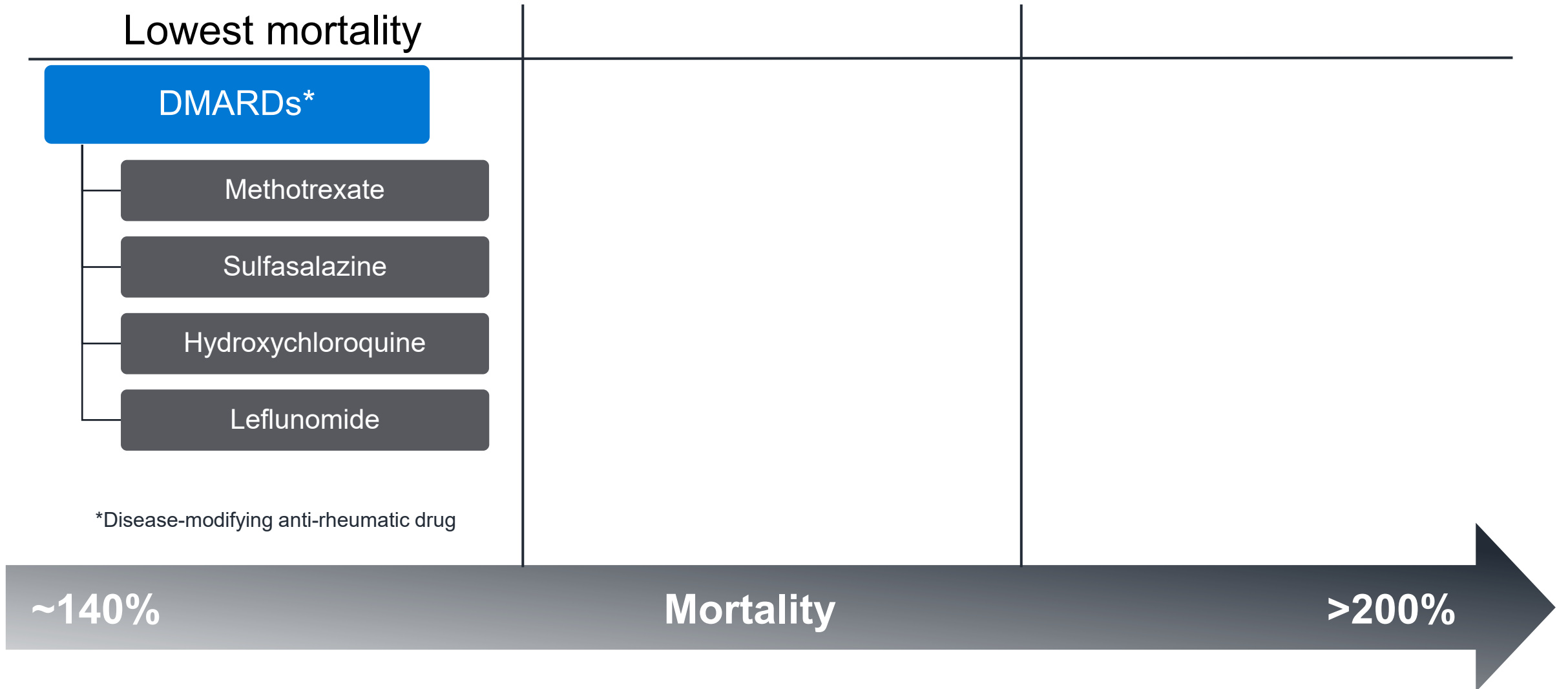


WHAT IS THE LUPUS ACTIVITY?

Age: 52 | Gender: F
 Application date: 9/23/21
 Rx Fills: 412

SERVICE DATES	PROVIDER	CLAIM DETAILS
01/06/2021 - 01/06/2021	CURRENT PROVIDER	DIAGNOSIS
	[REDACTED] Emergency Medicine	Encounter for observation for suspected exposure to other biological agents ruled out ICD-10 Z03.818
	[REDACTED]	Pneumonia, unspecified organism ICD-10 J18.9
	023 - Emergency room - hospital	PROCEDURE
	SUBMITTED PROVIDER	Emergency department visit for the evaluation and management of a patient, usually the presenting problem(s) are of high severity and pose an immediate significant threat to life or physiologic function.(COST-SHARING WAIVED) CPT-4 99285
	[REDACTED] 023 - Emergency room - hospital	
01/07/2021 - 01/07/2021	CURRENT PROVIDER	DIAGNOSIS
	[REDACTED] Infectious Disease Medicine	Pneumonia, unspecified organism ICD-10 J18.9
	[REDACTED]	Pleural effusion, not elsewhere classified ICD-10 J90
	021 - Inpatient hospital	Systemic lupus erythematosus, unspecified ICD-10 M32.9
	SUBMITTED PROVIDER	PROCEDURE
	[REDACTED] 021 - Inpatient hospital	Subsequent hospital care per day for the evaluation and management of a patient, usually the patient is responding inadequately to therapy or has developed a minor complication, typically 25 minutes CPT-4 99232

MEDICATIONS CAN BE USED TO STRATIFY MORTALITY IN RA.



MEDICAL DATA CONFIRMS THE DIAGNOSIS.

Age: 59 | Gender: M

Application date: 1/20/20

Rx Fills: 156

SERVICE DATES	PROVIDER	CLAIM DETAILS
07/19/2017 - 07/19/2017	Rheumatology	DIAGNOSIS
		Rheumatoid arthritis without rheumatoid factor, multiple sites ICD-10 M06.09
	011 - Office	Raynaud's syndrome without gangrene ICD-10 I73.00
08/06/2017 - 08/06/2017	Clinical Medical Laboratory 011 - Office	PROCEDURE
		Office or other outpatient visit for the evaluation and management of a new patient, usually the presenting problem(s) are of moderate to high severity. Typically 60 minutes are spent face-to-face with the patient and/or family. CPT-4 99205
		Hepatitis B surface antibody (HBsAb) CPT-4 86706
		Blood count complete (CBC) automated (Hgb Hct RBC WBC and platelet count) and automated differential WBC count CPT-4 85025
		Extractable nuclear antigen antibody to any method (eg nRNP SS-A SS-B Sm RNP Sc170 J01) each antibody CPT-4 86235
		Rheumatoid factor quantitative CPT-4 86431
		Tuberculosis test cell mediated immunity antigen response measurement gamma interferon CPT-4 86480
		Comprehensive metabolic panel CPT-4 80053
		Iron binding capacity CPT-4 83550
		Uric acid blood CPT-4 84550
Antinuclear antibodies (ANA) CPT-4 86038		

WHAT IS THE RHEUMATOID ARTHRITIS ACTIVITY?

Age: 59 | Gender: M
 Application date: 1/20/20
 Rx Fills: 156



CASE EXAMPLE











WHAT IS THE AUTOIMMUNE DISEASE AND ACTIVITY?

Age: 29 | Gender: F
 Application date: 12/12/18
 Rx Fills: 113



WHAT IS THE AUTOIMMUNE DISEASE AND ACTIVITY?

Age: 29 | Gender: F
Application date: 12/12/18
Rx Fills: 113

IRIX SUMMARY		
 		
 	#741	Moderate to Severe Ulcerative Colitis or Crohn's likely
 	#9109	Dx - Coronary Artery Disease
 	#9112	Dx - Crohn's Disease
 		Notes

AUTOIMMUNE SUMMARY

**The immune system
relies on
inflammation**

**Autoimmune
inflammation
increases
comorbidities and
mortality**

**Prescription Data
and Medical Data
stratify autoimmune
risk**

**Rules engines
automate
differentiation of
autoimmune
diseases**

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See more. Fear less.

THANK YOU!

Kyle Schimek, PharmD, BCPS

kyle.schimek@milliman.com