

DIABETES AND ASSOCIATED AUTOIMMUNE DISEASES

Normal Immune Response:

1. An invader, like a virus, enters body
2. Immune cells called lymphocytes create antibodies to fight invader



Autoimmune Disease:

Immune system creates antibodies that attack your own cells. This happens because:

A foreign substance resembles bodily substances



Normal body cells become altered

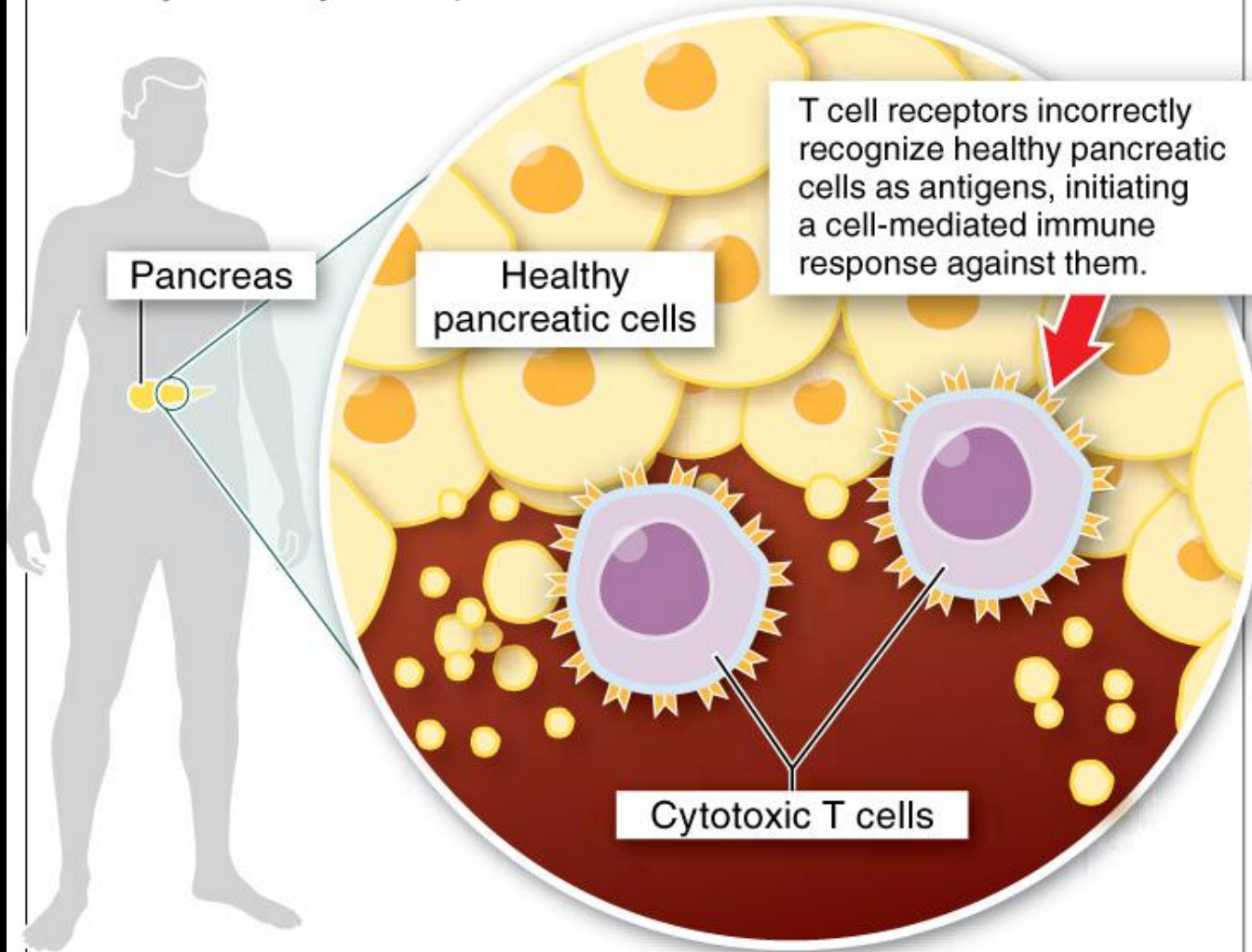


Lymphocytes malfunction and make abnormal antibodies



AUTOIMMUNITY: TYPE 1 DIABETES

Type 1 diabetes is an autoimmune disorder in which cytotoxic T cells destroy the body's own pancreatic cells.



#AutoimmuneAwarenessMonth

34.2M
have a form
of diabetes

1.6M
HAVE
TYPE 1
DIABETES

23.5M
Americans
have
autoimmune
diseases

JDRF IMPROVING
LIVES.
CURING
TYPE 1
DIABETES.

Where can autoimmune diseases affect you?



Joints



Muscles



Skin



**Blood
vessels**



**Digestive
system**



Endocrine system

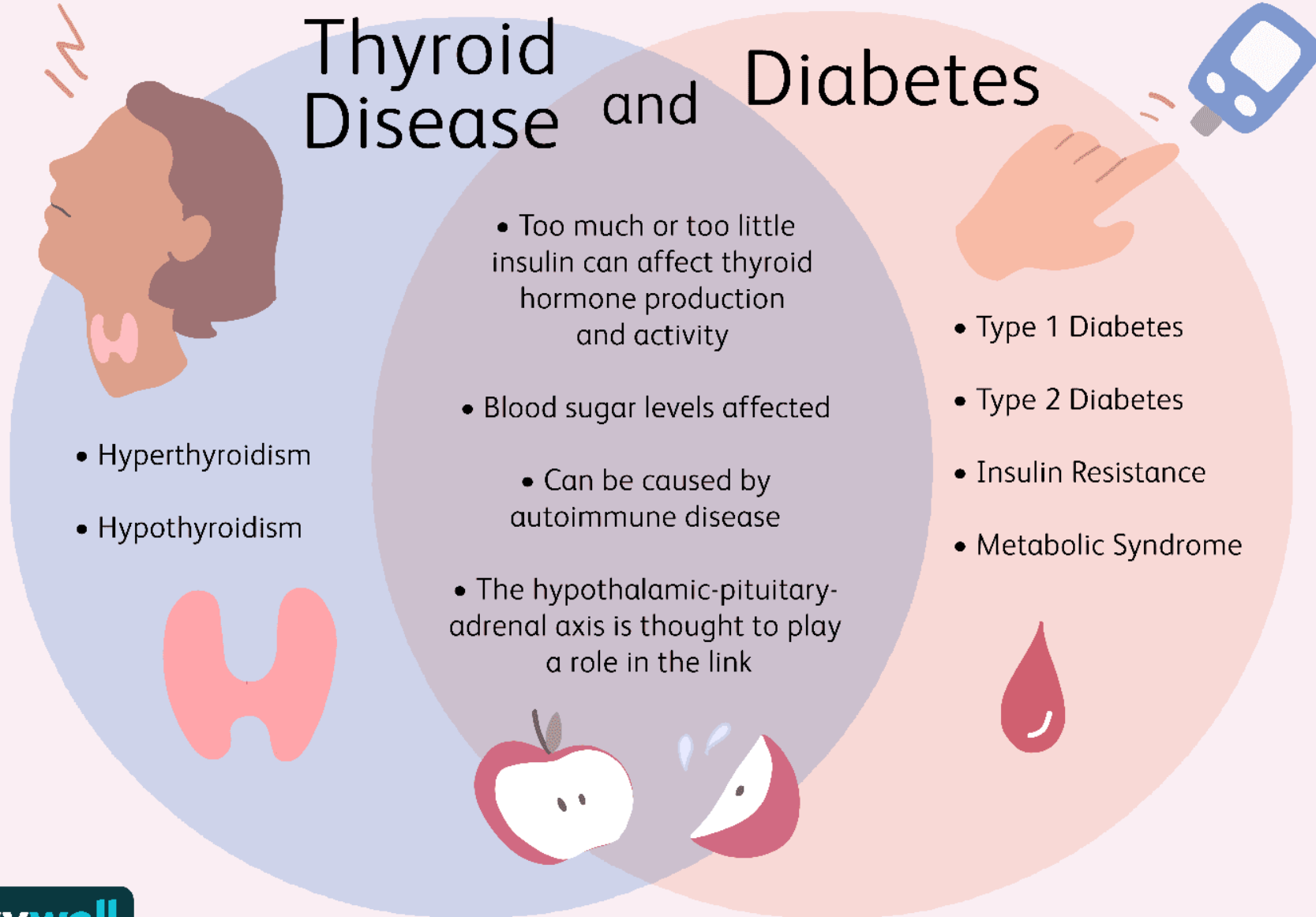


Nervous system

MOST COMMON AUTOIMMUNE DISEASES ASSOCIATED WITH DM-I

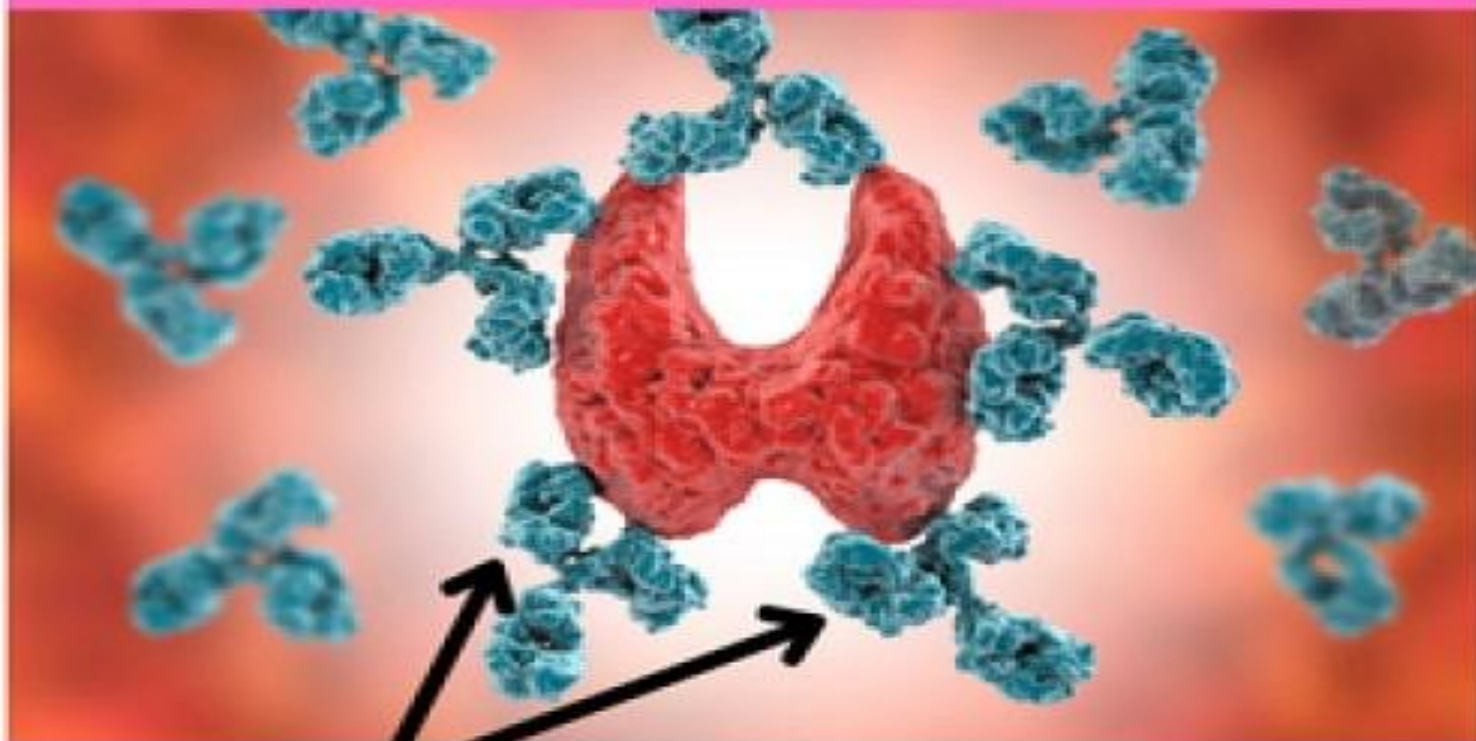
- THYROID
 - HASHIMOTOS THYROIDITIS
 - GRAVES DISEASE
- RHEUMATIC RHEUMATOID ARTHRITIS
 - SYSTEMIC LUPUS ERYTHEMATOSIS
 - SJOGRENS SYNDROME
- CELIAC DISEASE
- SKIN DISORDERS

Thyroid Disease and Diabetes

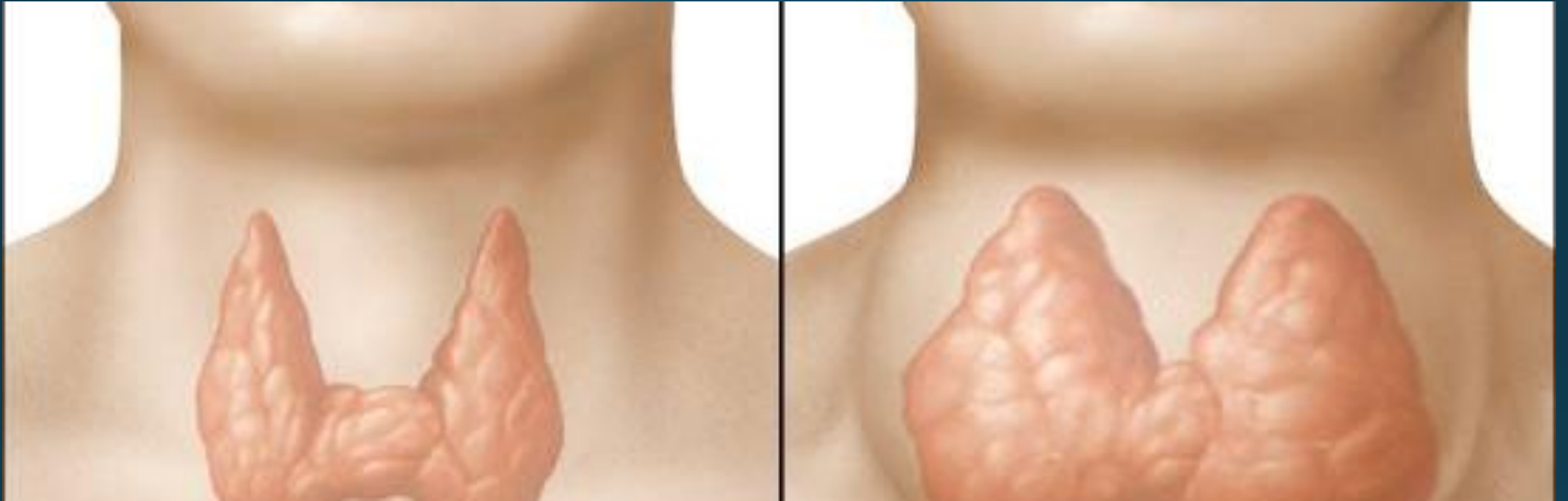


HASHIMOTOS THYROIDITIS

HASHIMOTO'S THYROIDITIS



Antibodies attacking the
thyroid gland



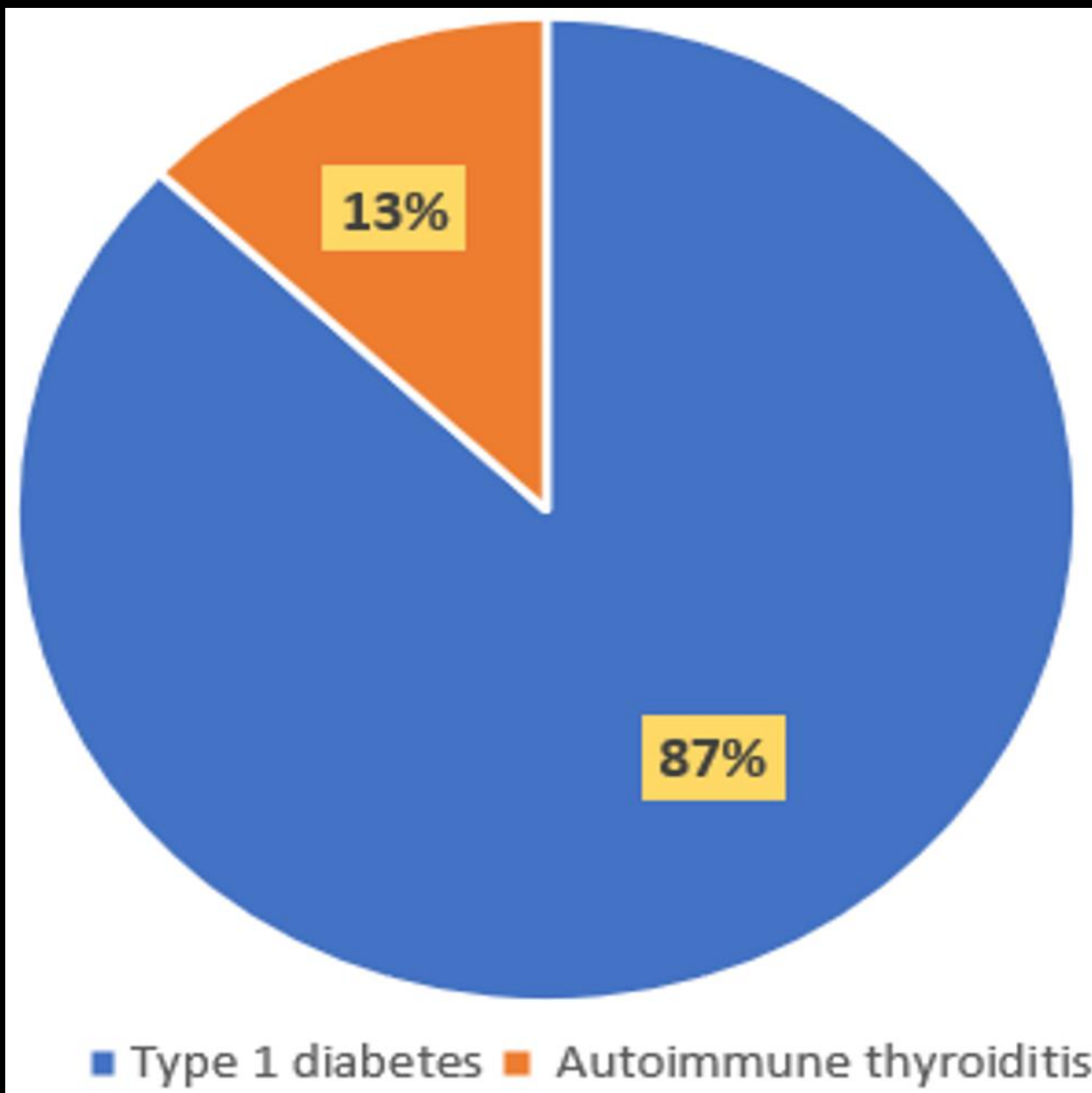
HASHIMOTOS THYROIDITIS



HASHIMOTOS THYROIDITIS



HASHIMOTOS THYROIDITIS



GRAVES DISEASE



GRAVES DISEASE



GRAVES DISEASE



GRAVES DISEASE

RHEUMATIC DISEASES

RHEUMATOID ARTHRITIS

SYSTEMIC LUPUS ERYTHEMATOSIS

SJOGRENS SYNDROME

RHEUMATOID ARTHRITIS



SYSTEMIC LUPUS ERYTHEMATOSIS

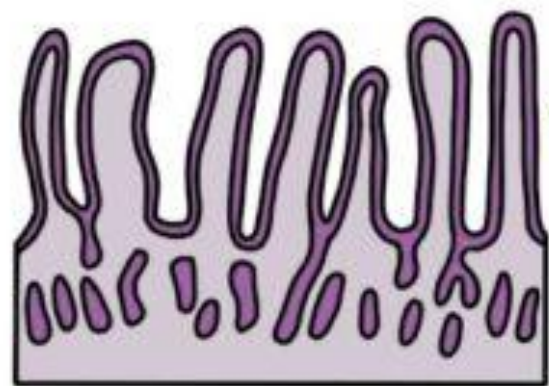
SYSTEMIC LUPUS ERYTHEMATOSIS



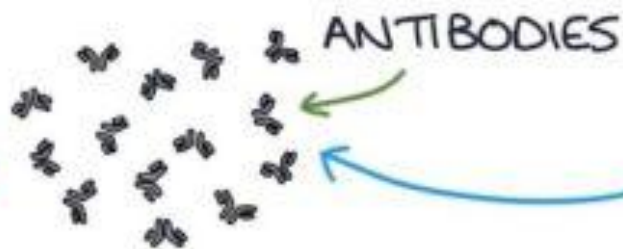
CELIAC DISEASE

Definition

- Celiac disease is an inherited, lifelong intolerance to gluten.
- Gluten is the protein found in wheat, rye and barley.



INTESTINAL
VILLI

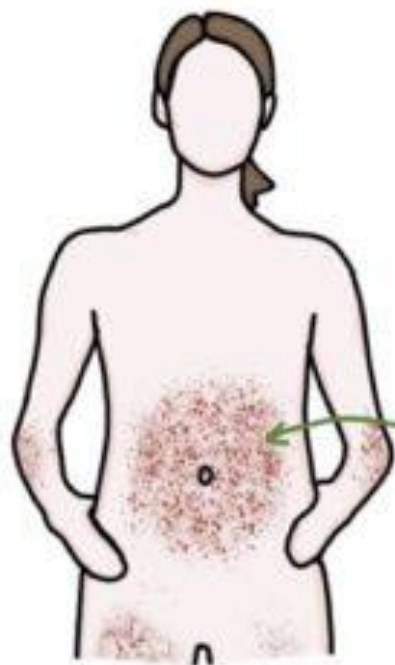


ANTIBODIES

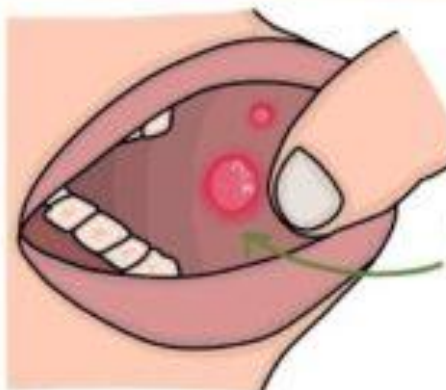


GLUTEN

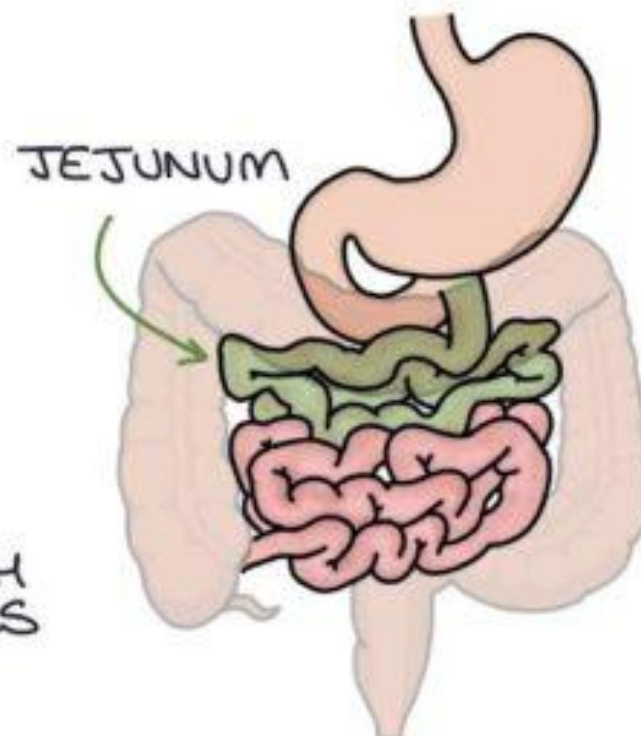
COELIAC DISEASE



DERMATITIS
HERPETIFORMIS



MOUTH
ULCERS



JEJUNUM



Normal villi



Celiac disease



Gluten Intolerance

- Not autoimmune
- No damage to small intestine
- No identified biological markers
- Symptoms triggered by consuming gluten
- Treated by a gluten free diet

VS



Celiac Disease

- Autoimmune
- Causes damage to small intestine
- Genetic
- Symptoms triggered by consuming gluten
- Treated by a gluten free diet

Crohn's Disease vs. Celiac Disease

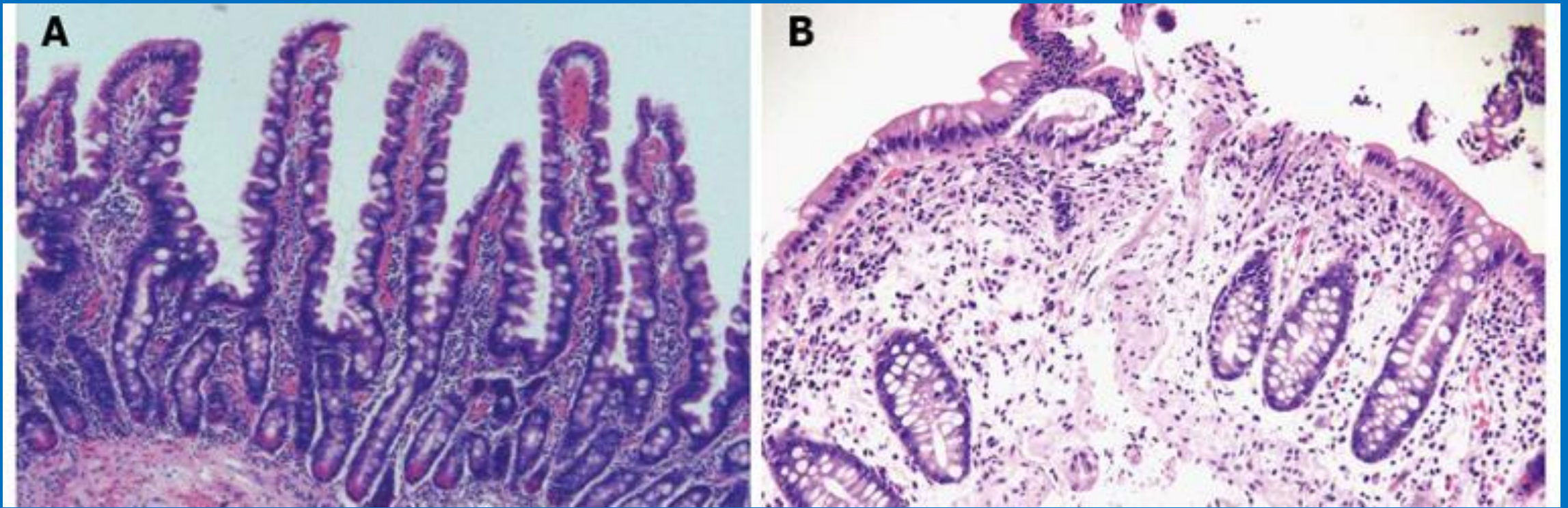
Both are autoimmune diseases involving the inflammation of the GI tract

Treatment for Crohn's may include medications, surgery, and management of diet or nutrition

Celiac disease is treated by a lifelong adherence to a gluten-free diet (and symptom should disappear)



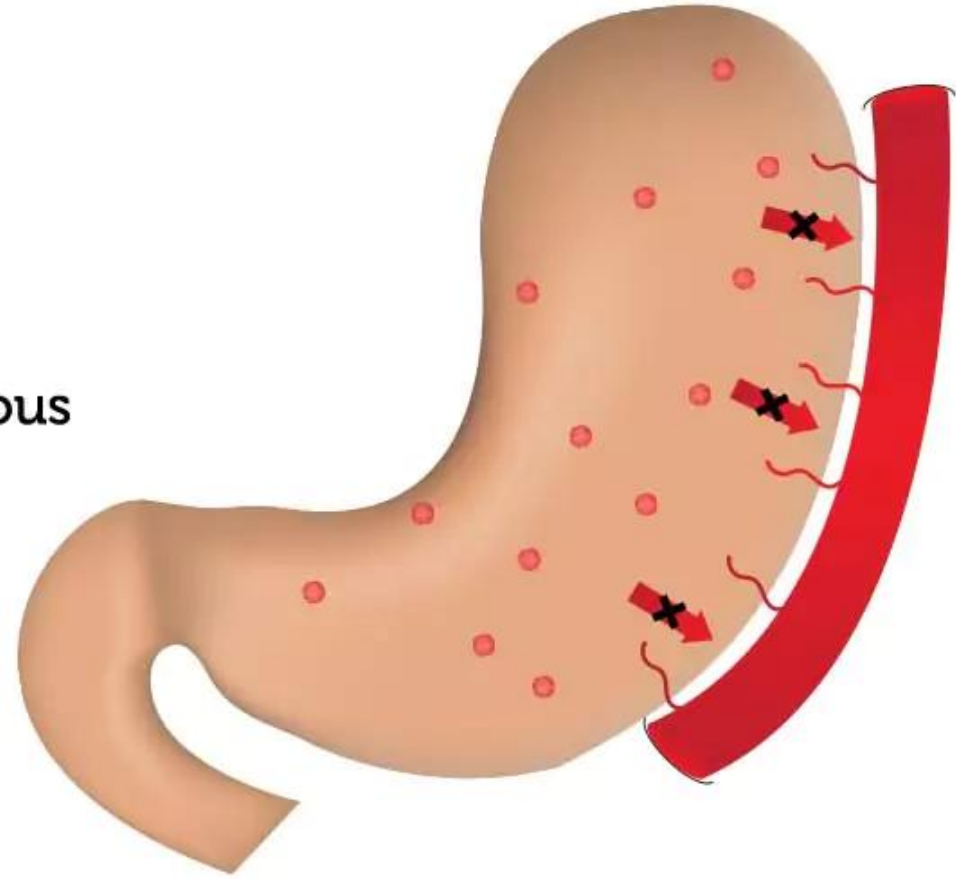
INFLAMMATORY BOWEL DISEASE



- PATHOLOGY OF CELIAC DISEASE

Pernicious Anemia

A lack of vitamin B12 can result in a specific type of anemia called pernicious anemia.



AUTOIMMUNE SKIN DISEASES

VITELIGO



PSORIASIS



ALOPECIA AREATA







SKIN DISORDERS

DIABETIC DERMOPATHY



CANDIDA ALBICANS





NECROBIOSIS
LIPOIDICUS
DIABETICORUM

BULLOSIS DIABETICORUM



Brain
Multiple Sclerosis
Guillain-Barre Syndrome
Autism



Thyroid
Thyroiditis
Hashimoto's Disease
Graves' Disease



Blood
Leukemia
Lupus Erythematosus
Hemolytic Dysglycemia



GI Tract
Celiac's Disease
Crohn's Disease
Ulcerative Colitis
Diabetes Type I



Nerves
Peripheral Neuropathy
Diabetic Neuropathy



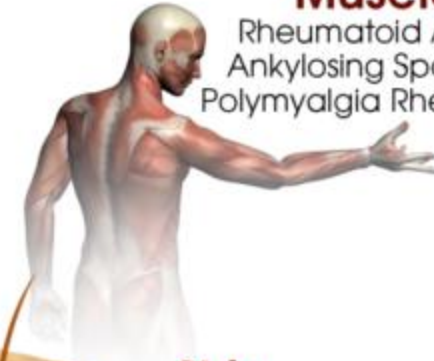
Lung
Fibromyalgia
Wegener's Granulomatosis



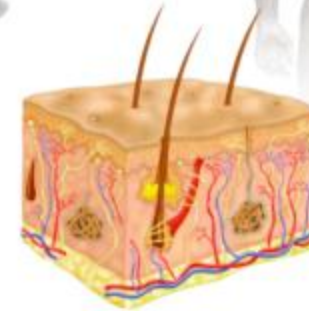
Bones
Rheumatoid Arthritis
Ankylosing Spondylitis
Polymyalgia Rheumatica



Muscles
Rheumatoid Arthritis
Ankylosing Spondylitis
Polymyalgia Rheumatica



Skin
Psoriasis
Vitiligo
Eczema
Scleroderma



Over 100 Different Types of Autoimmune Disorders

MULTIPLE SCLEROSIS

Main symptoms of Multiple sclerosis

Central:

- Fatigue
- Cognitive impairment
- Depression
- Unstable mood

Visual:

- Nystagmus
- Optic neuritis
- Diplopia

Speech:

- Dysarthria

Throat:

- Dysphagia

Musculoskeletal:

- Weakness
- Spasms
- Ataxia

Sensation:

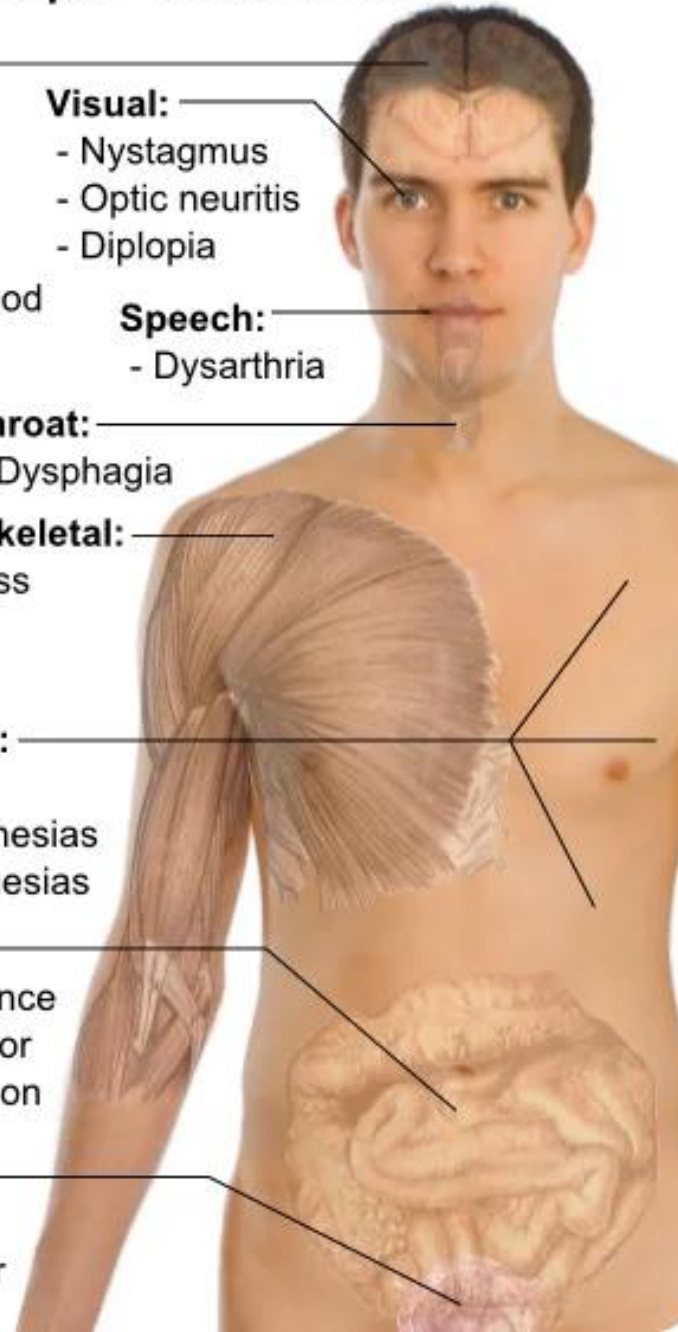
- Pain
- Hypoesthesias
- Paraesthesias

Bowel:

- Incontinence
- Diarrhea or constipation

Urinary:

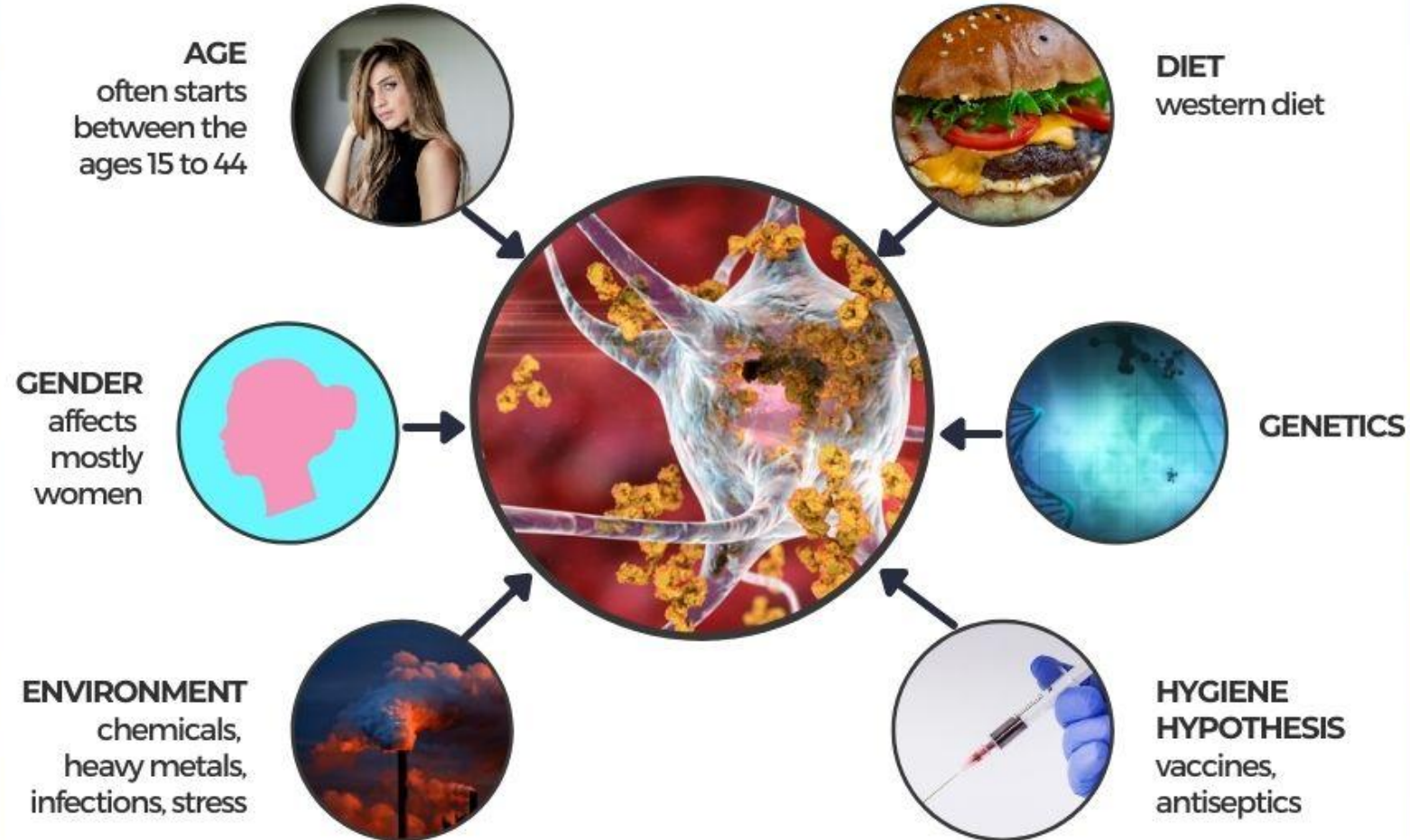
- Incontinence
- Frequency or retention






POSSIBLE CAUSES OF AUTOIMMUNE DISEASE

AUTOIMMUNE DISEASES

POSSIBLE CAUSES & RISK FACTORS



Common misconceptions about autoimmune diseases

-  They are rare
-  They are fatal as opposed to chronic
-  There is a cure for it



Many are unaware:



It's more prevalent among **women**



There are **over 80 autoimmune diseases** known to the medical community today



Autoimmune diseases can affect **nearly every organ** in your body



"I'm afraid neither your insurance nor your immune system will cover it."

SYSTEMIC LUPUS ERYTHEMATOS IS



© MAYO CLINIC

Multiple Autoimmune Syndrome (MAS)

Type 1

- Myasthenia Gravis
- Thymoma
- Polymyositis
- Giant cell myocarditis

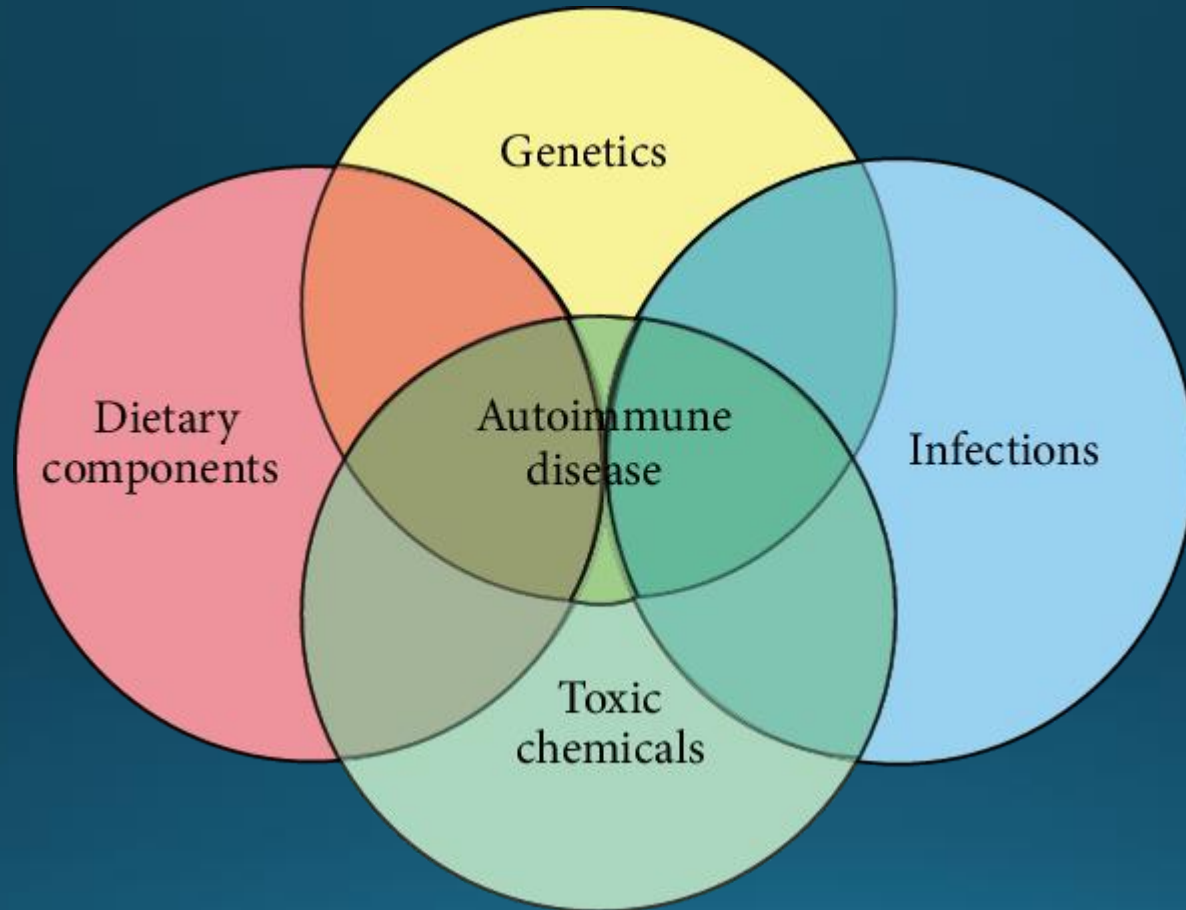
Type 2

- Sjögren's syndrome
- Rheumatoid arthritis
- Primary biliary cirrhosis
- Scleroderma
- Autoimmune thyroid disease

Type 3

- Autoimmune thyroid disease
- Myasthenia gravis and/or thymoma
- Sjögren's syndrome
- Pernicious anemia
- Idiopathic thrombopenic purpura
- Addison's disease
- Type 1 diabetes mellitus
- Vitiligo
- Autoimmune hemolytic anemia
- Systemic lupus erythematosus
- Dermatitis herpetiformis

MAS is categorized into three groups, each corresponding to specific diseases that tend to occur with one another



Thyroid and Diabetes



What are Sjögren's syndrome symptoms?



Dry eyes or itchy eyes.



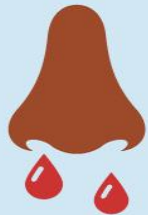
**Dry mouth, mouth sores
or thickened spit.**



Vaginal dryness.



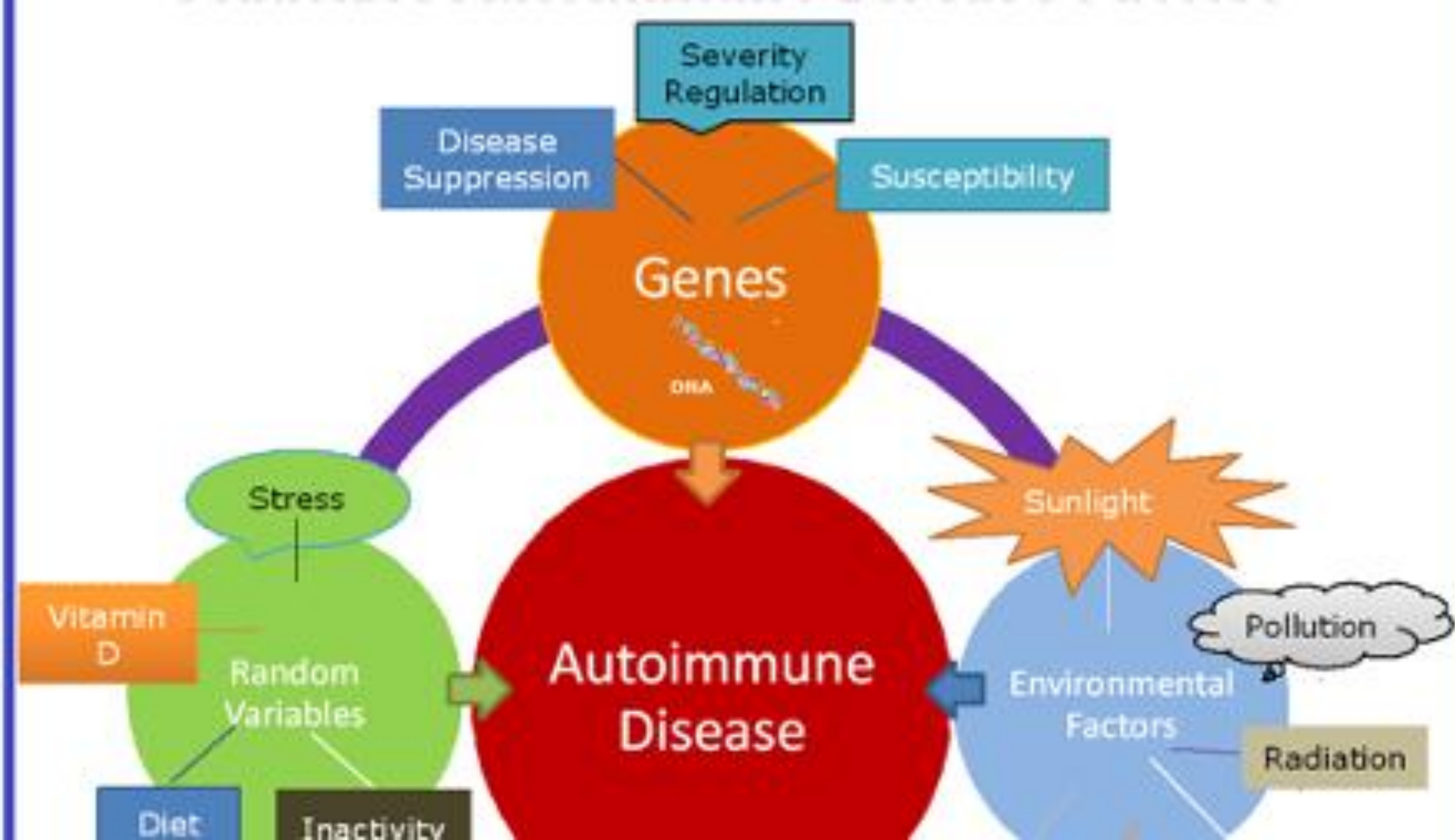
Dry skin.



**Dry nose and frequent
nosebleeds.**

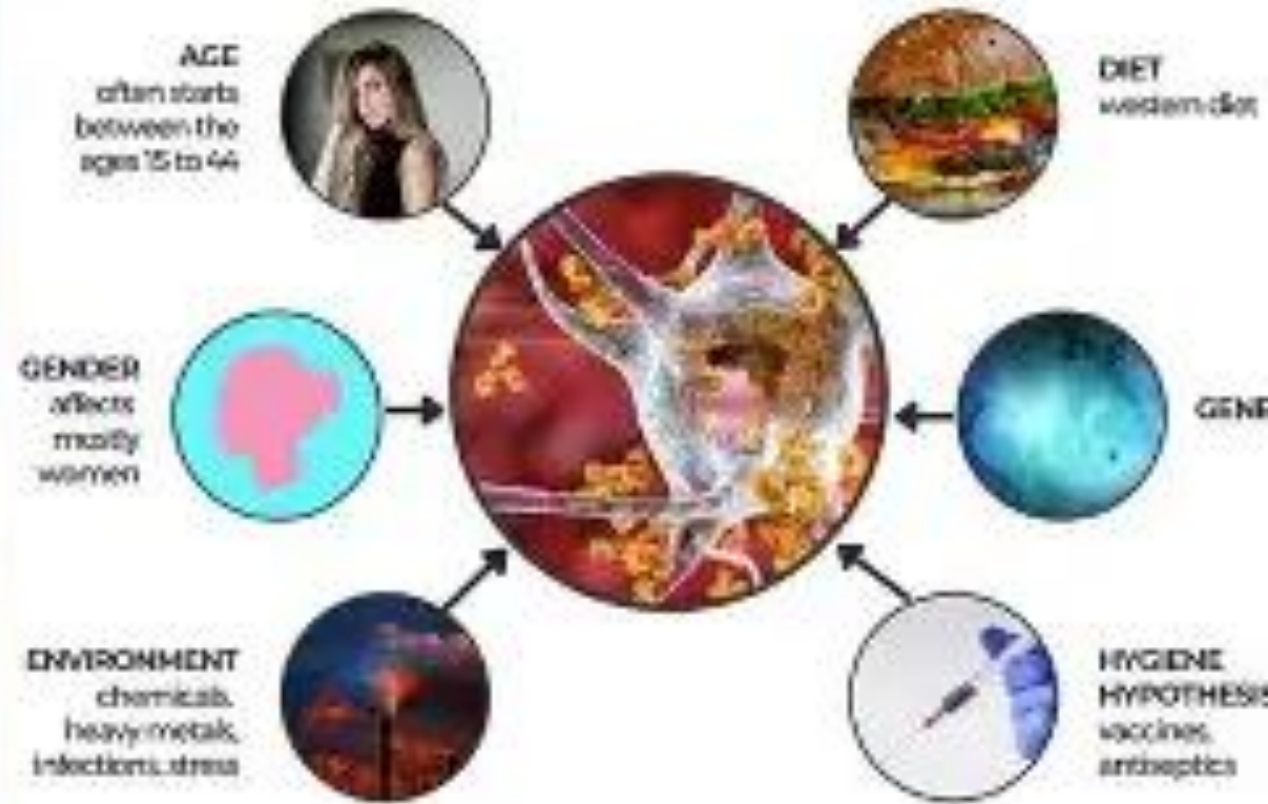


**Dry throat (including
coughing frequently).**



AUTOIMMUNE DISEASES

POSSIBLE CAUSES & RISK FACTORS



The Gut Microbiota and Autoimmune Diseases

Nervous System

- Multiple sclerosis
- Guillain-Barre syndrome

Digestive Tract

- Crohn's disease
- Celiac disease
- Ulcerative colitis

Skin

- Psoriasis
- Vitiligo

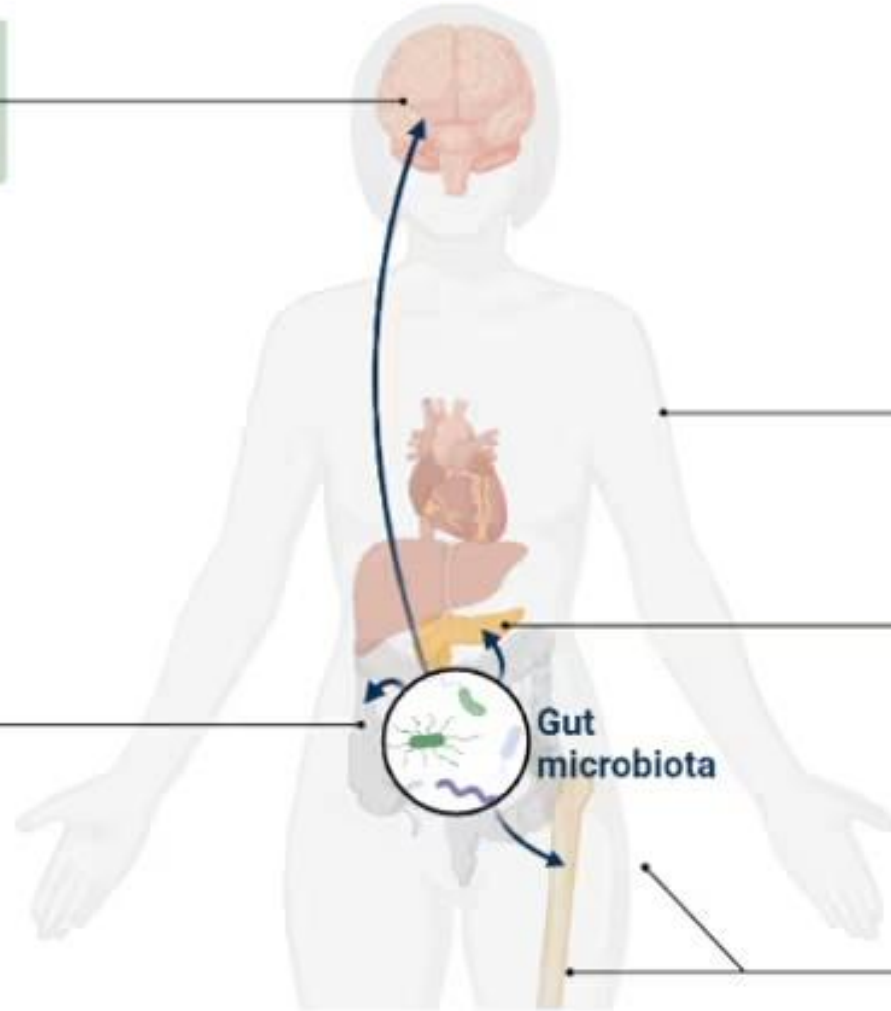
Pancreas

- Type 1 Diabetes

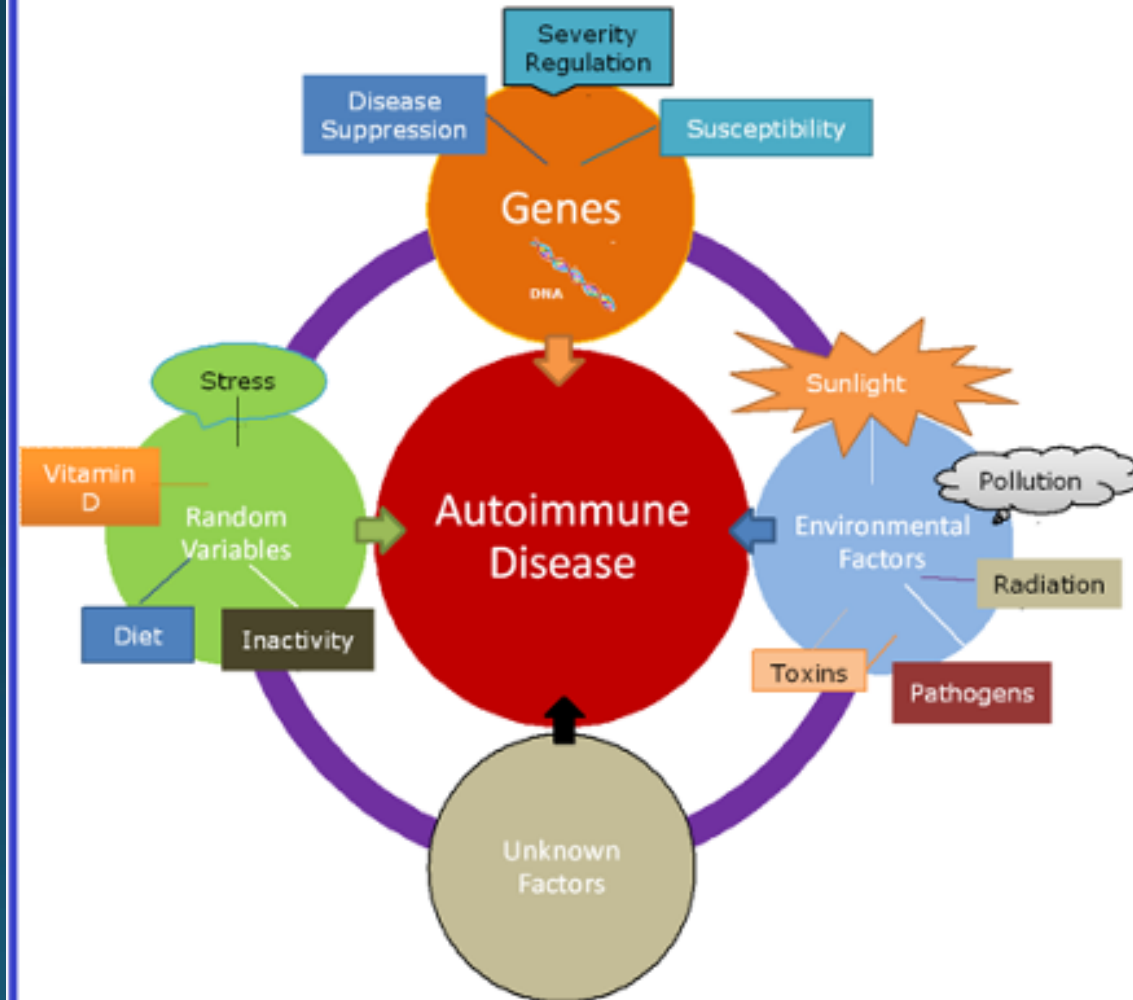
Gut
microbiota

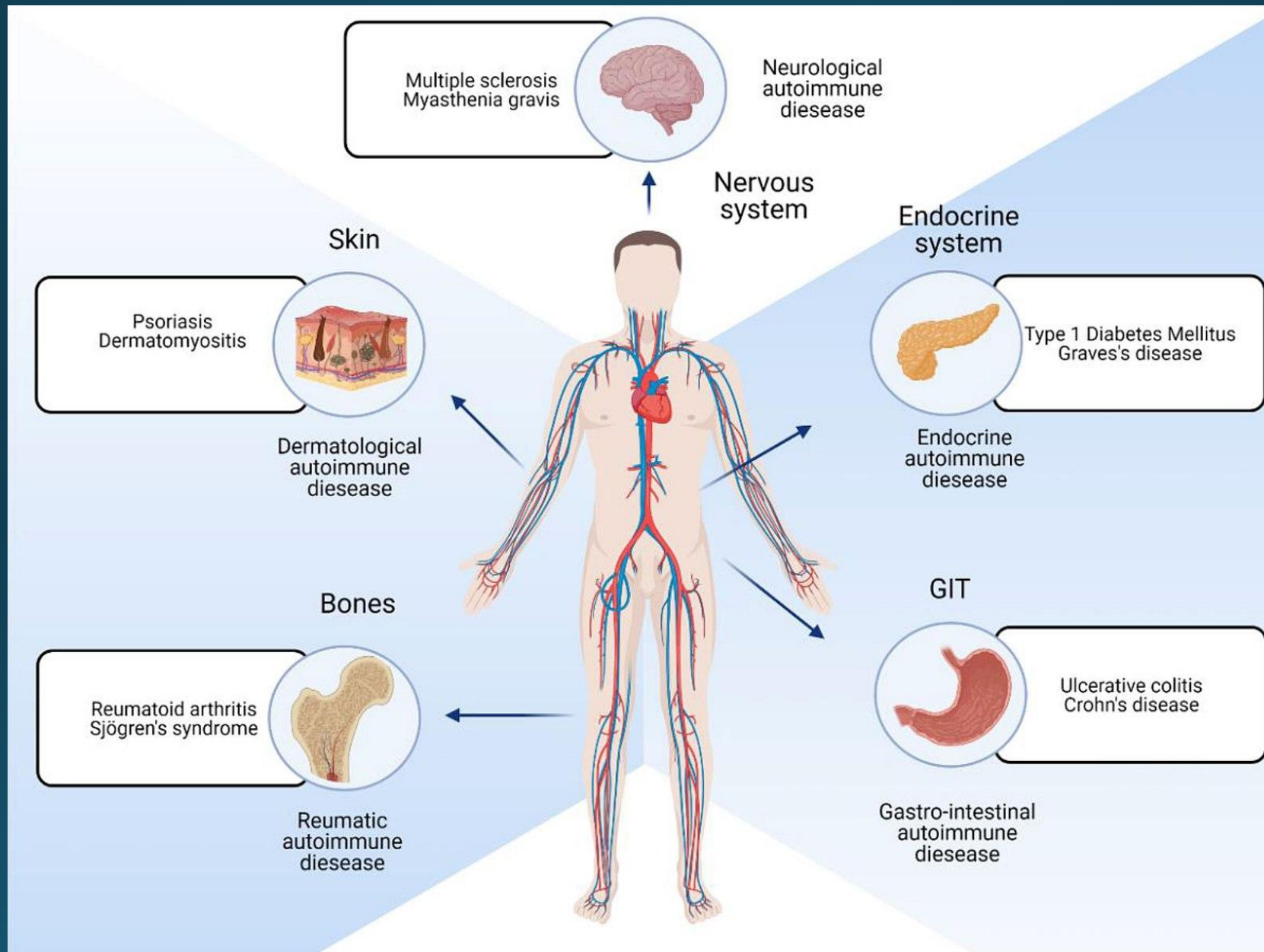
Joints & Muscles

- Rheumatoid Arthritis
- Lupus



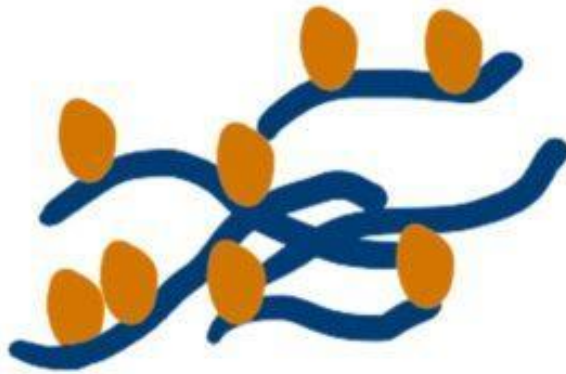
Plausible Autoimmune Disease Factors



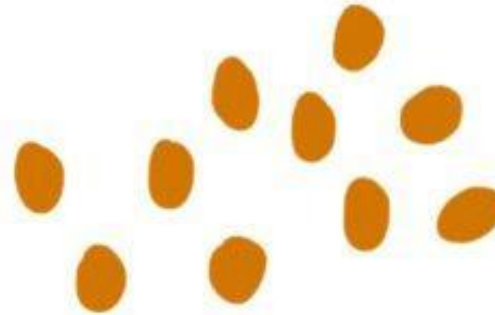


Gluten

gluten is made up of two proteins called **gliadin** and **glutenin**.



Gluten



Gliadin

Alcohol soluble

Gives plasticity
and elasticity



Glutenin

Water soluble

Strength and
structure

Gliadin, contains most of the disease-producing components

Visual disturbances
(blurred vision, color distortions,
loss of vision in one eye, eye pain)

Mental changes
(decreased concentration,
attention deficit, memory loss)

Loss of sensation,
speech impediment,
tremors, or dizziness

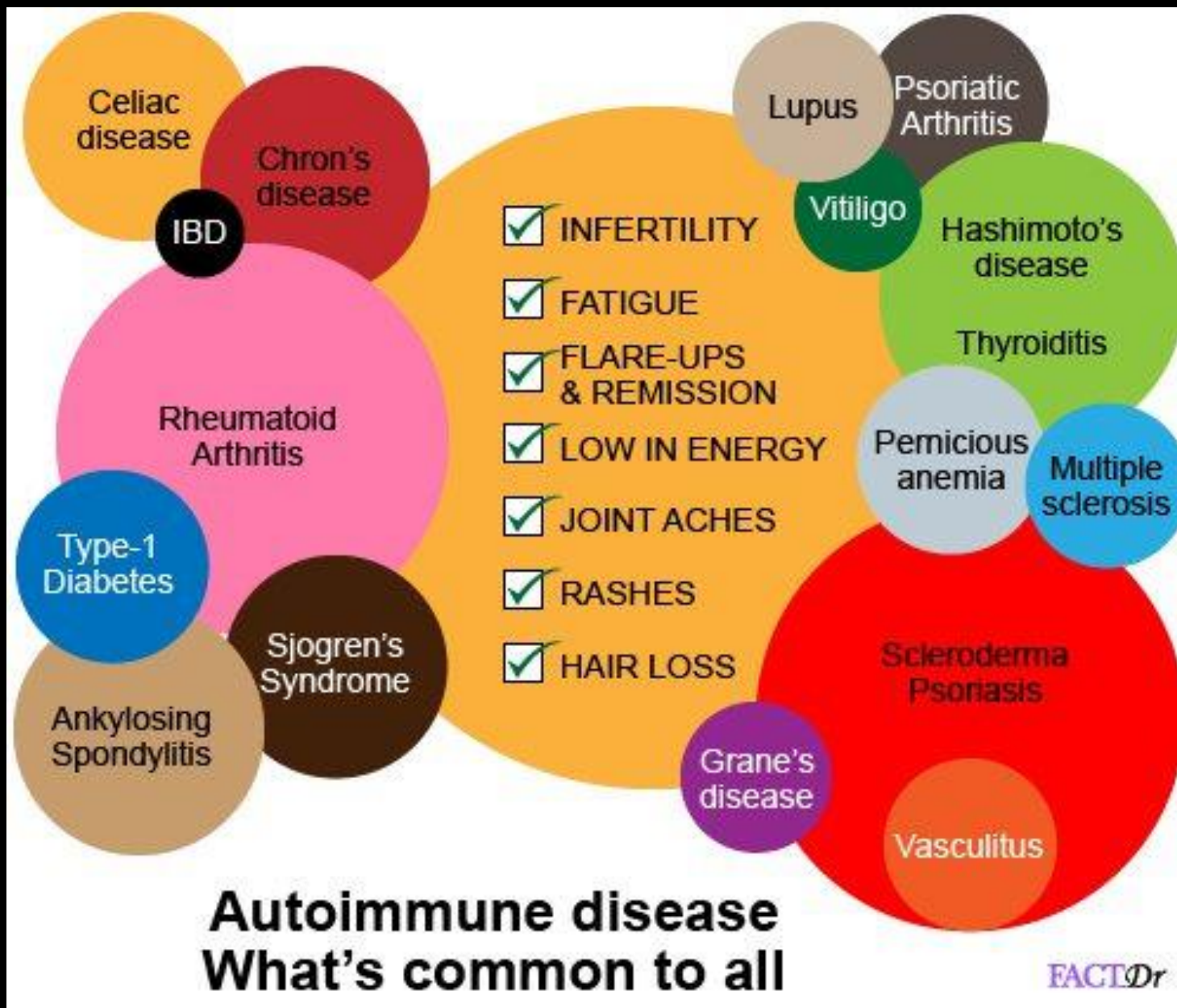
Depression
Paranoia
Uncontrollable laughter
and weeping

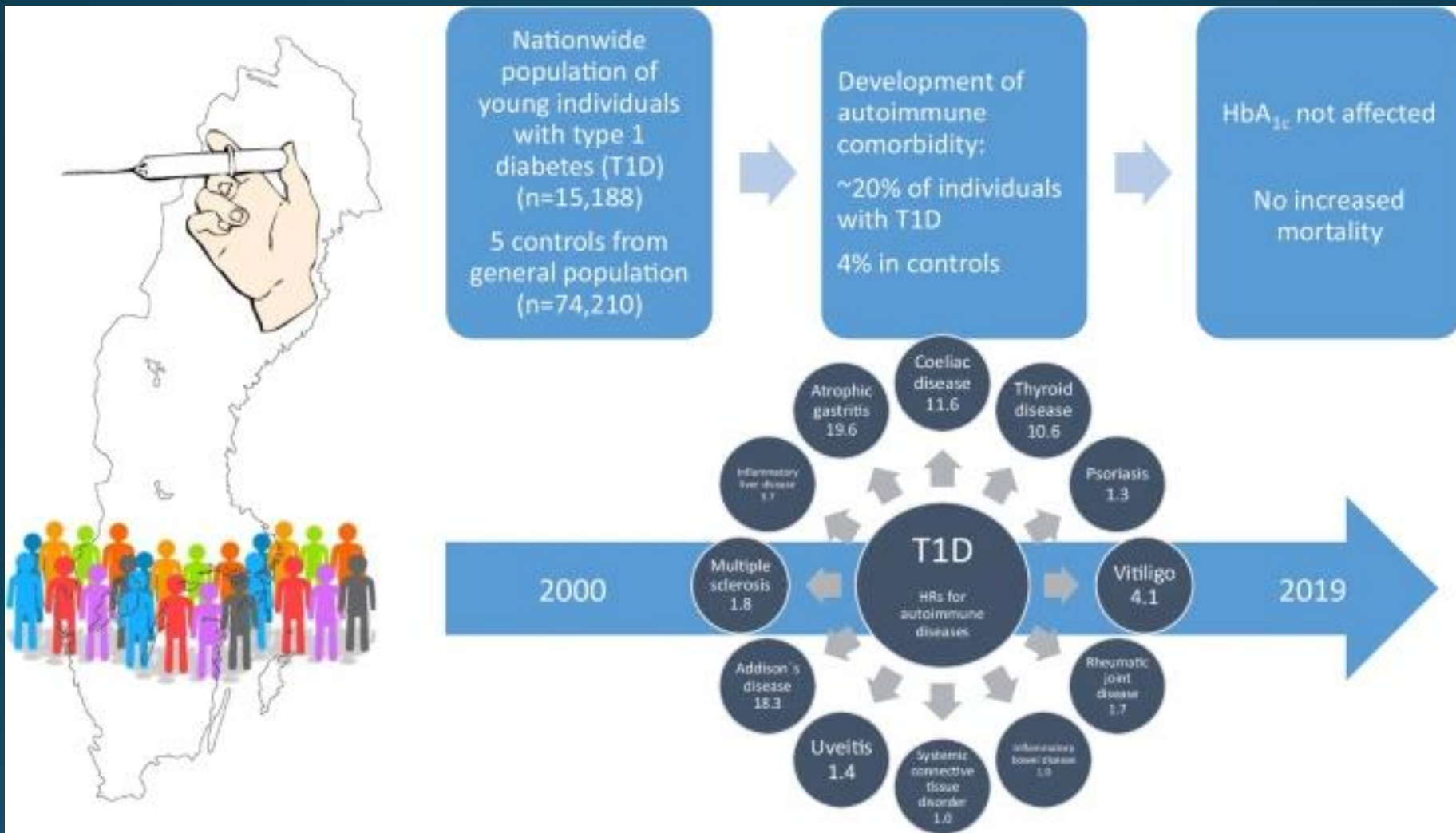
Limb weakness,
loss of coordination
and balance

Muscle spasms,
fatigue, numbness,
prickling pain

Bladder and
bowel dysfunction





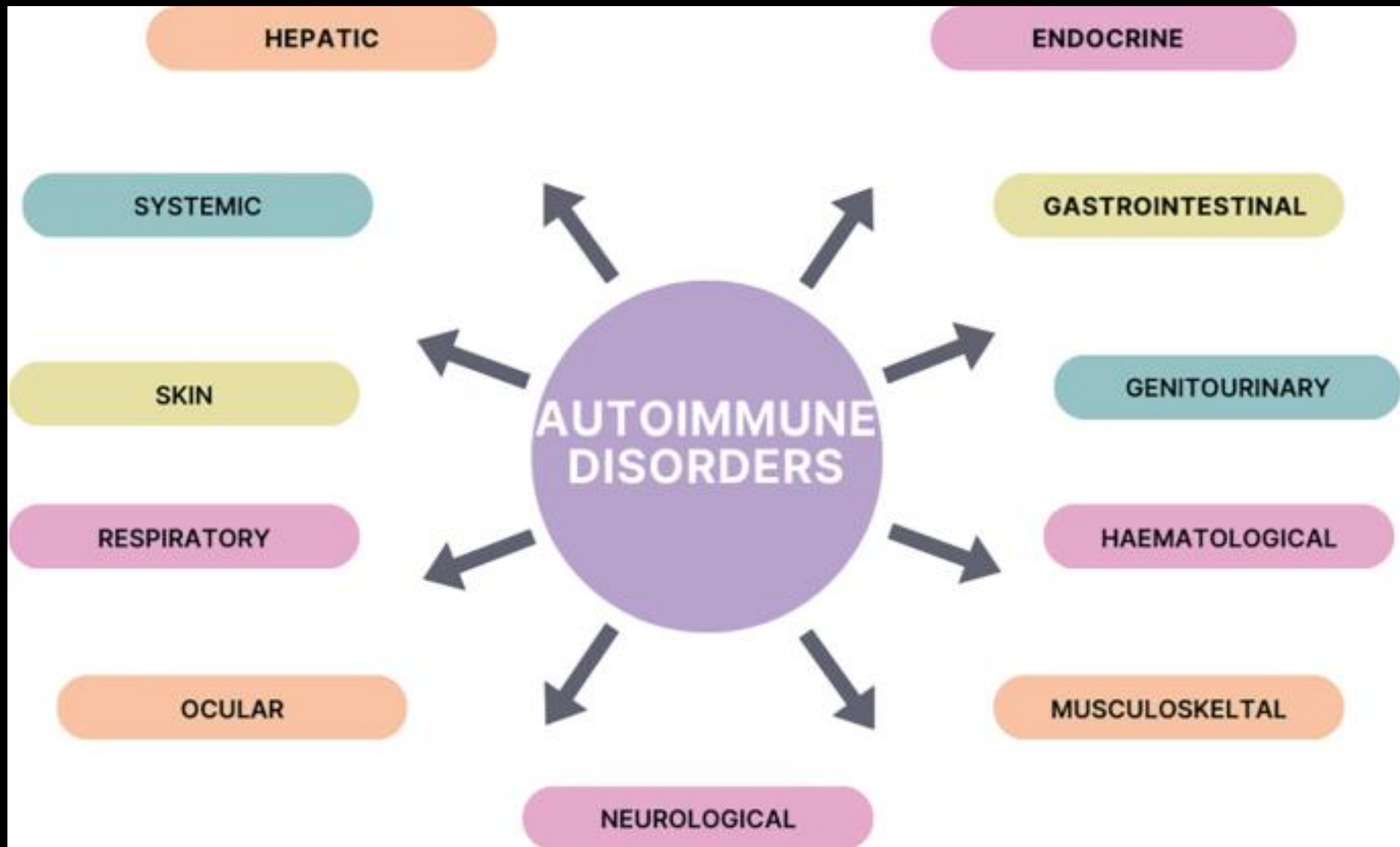


AUTOIMMUNE DISEASES

- Lupus
- multiple sclerosis
- type 1 diabetes
- rheumatoid arthritis
- Parkinson's
- Fibromyalgia
- Chronic Fatigue Syndrome
- ASD's ???
- nearly a hundred other known autoimmune diseases.

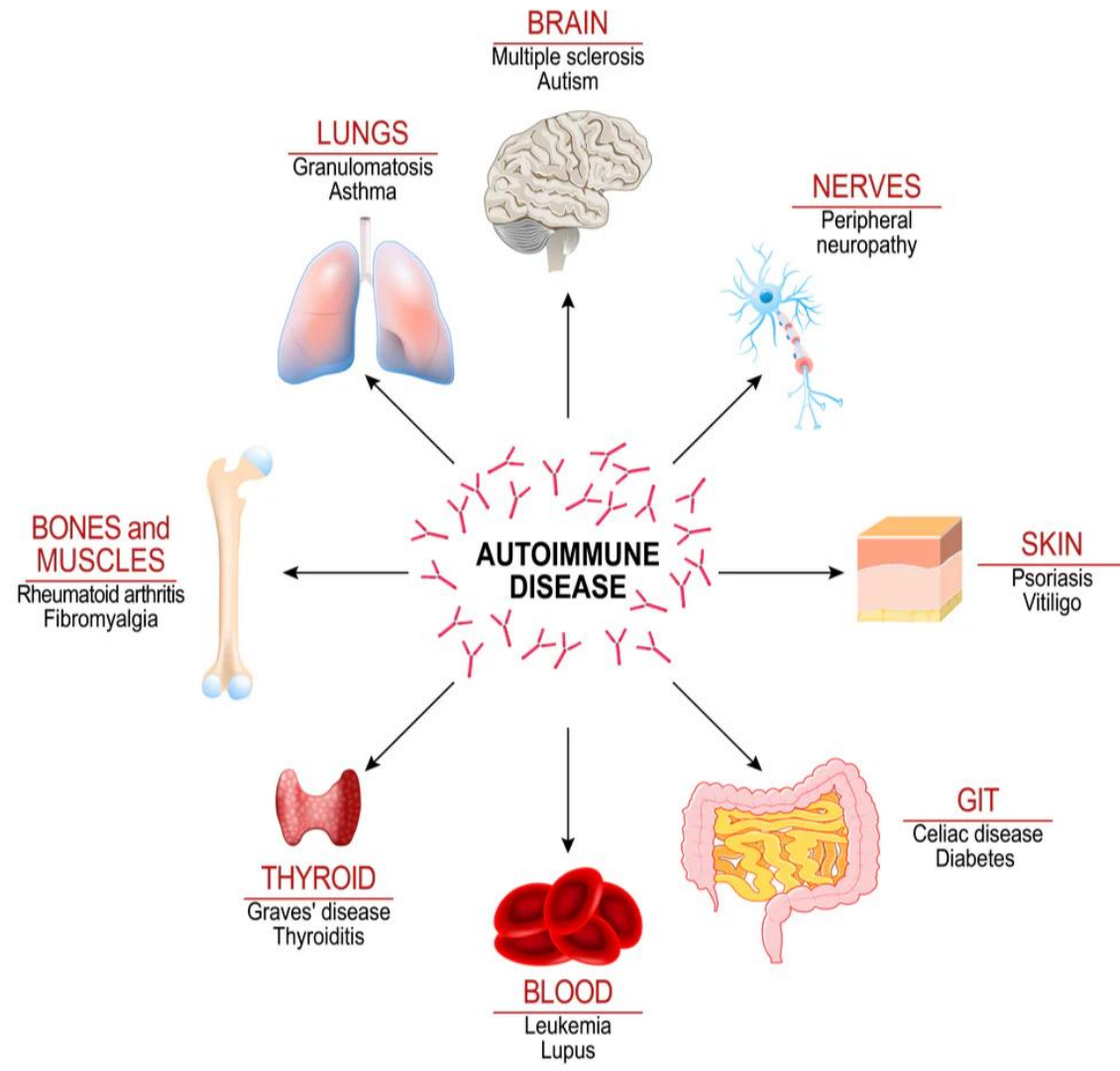
autoimmune diseases

- One in 12 people
- one in 9 women
- 24 million Americans
- double the number of people who have cancer
- woman is 8 times more likely to have an autoimmune disease than breast cancer
- 90 percent of Americans say they can't name a single autoimmune disease



5 THINGS TO KNOW ABOUT
Autoimmune
Diseases





AUTOIMMUNE DISEASES



Multiple sclerosis
Nerve cells



Addison's disease
Adrenal glands



Rheumatic fever
Heart



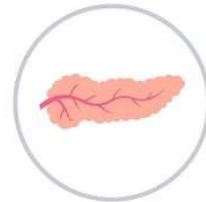
Graves' disease
Thyroid gland



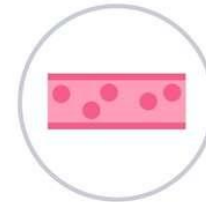
Rheumatoid arthritis
Joints



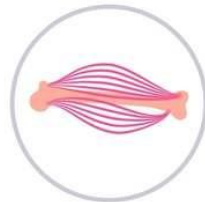
Lupus
Skin, joints, brain



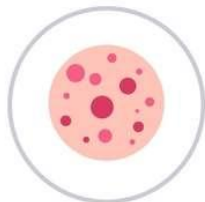
Diabetes
Pancreas



Vasculitis
Blood vessels



Guillain-Barre syndrome
Muscles in the legs



Psoriasis
Skin

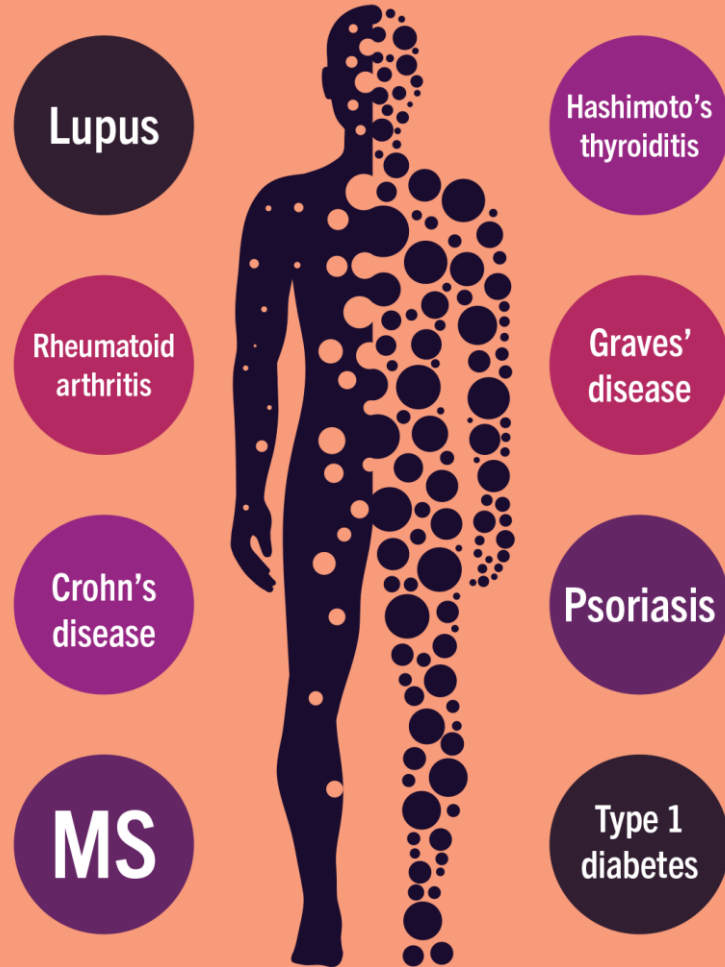


Hashimoto's thyroiditis
Thyroid gland



IBD, Celiac disease
Intestines

Most-common autoimmune diseases

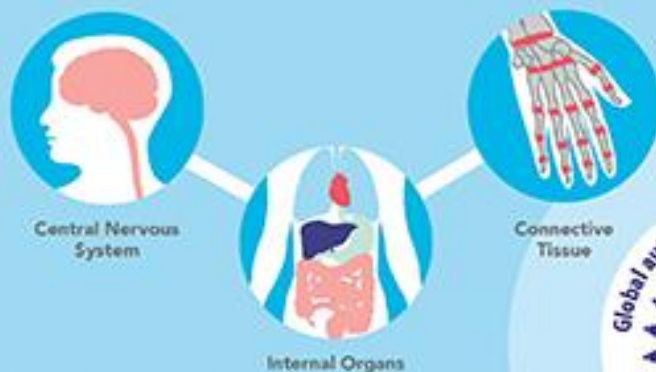


Fighting autoimmune disease

The need for a personalized approach

1 Autoimmune disease takes many forms, with varying levels of severity

Disease is initiated when the body incorrectly mounts an immune response against its own tissues



AUTOIMMUNE DISEASE AFFECTS A RANGE OF BIOLOGICAL SYSTEMS AND HAVE FLUCTUATING PATTERNS OF ACTIVITY AND REMISSION

Over 80 different forms of autoimmune disease

- Rheumatoid Arthritis (RA)
- Systemic Lupus Erythematosus (SLE)
- Ankylosing Spondylitis (AS)
- Systemic Sclerosis (SSc)
- Multiple Sclerosis (MS)
- Neuromyelitis Optica (NMO)
- Addison's disease
- Celiac disease
- Dermatomyositis
- Graves' disease
- Hashimoto's thyroiditis
- Myasthenia gravis
- Pernicious anemia
- Reactive arthritis
- Sjogren syndrome
- Type 1 diabetes
- ...



2 The prevalence of autoimmune disease is widespread and significant



VS

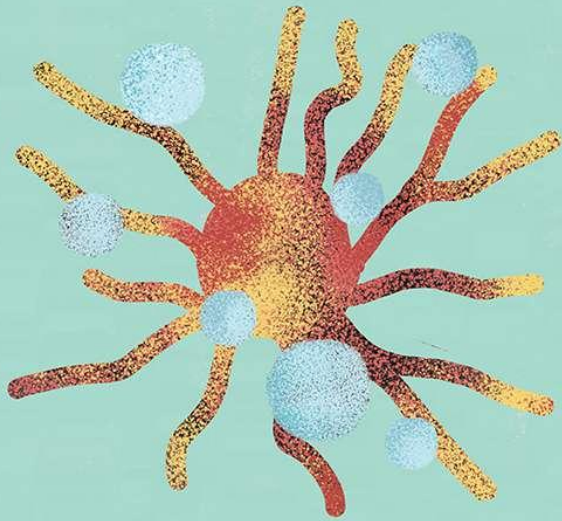


VS



AIDS vs. Autoimmune Disease

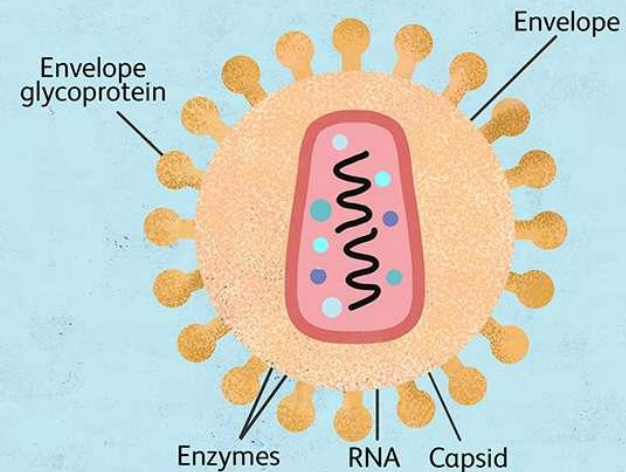
Autoimmune Disease



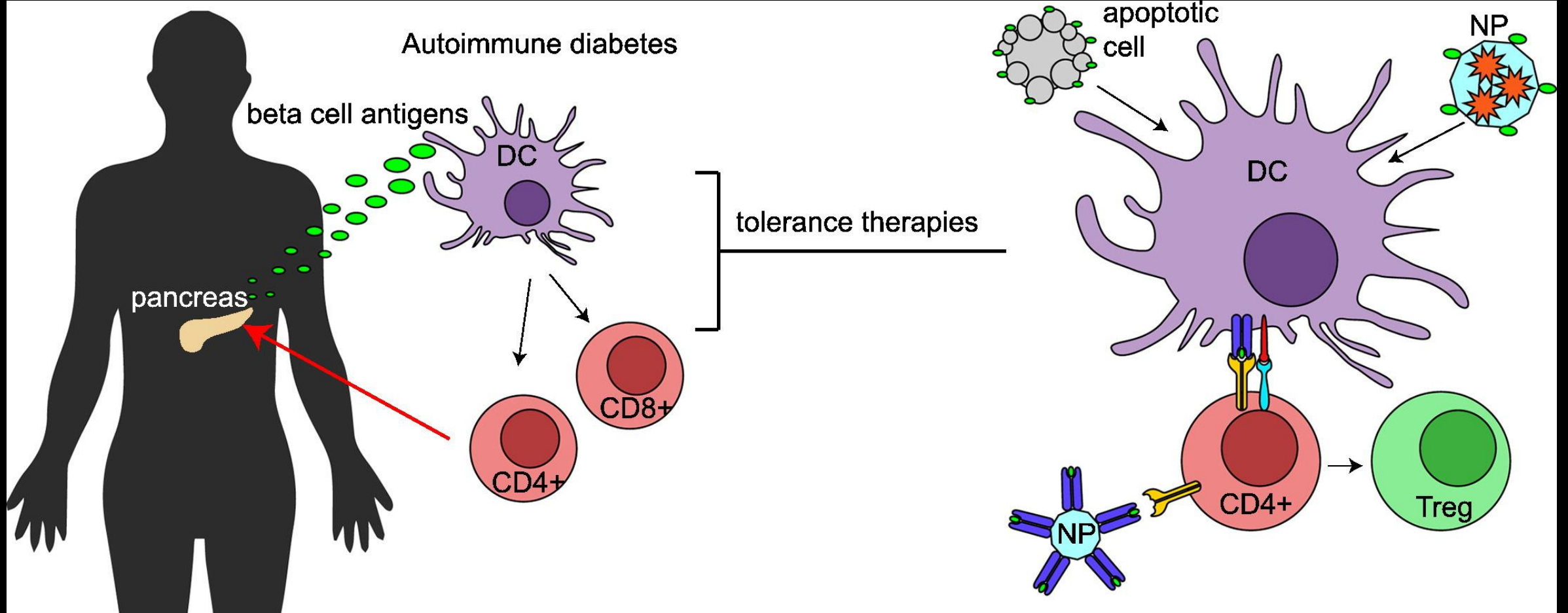
Immune system can't distinguish between healthy and harmful cells
Both types of cells and tissues are attacked
Attack is never called off

verywell

AIDS



Immune system is weakened or ineffective
Acquired immunodeficiency disorder caused by HIV
A type of immunosuppression



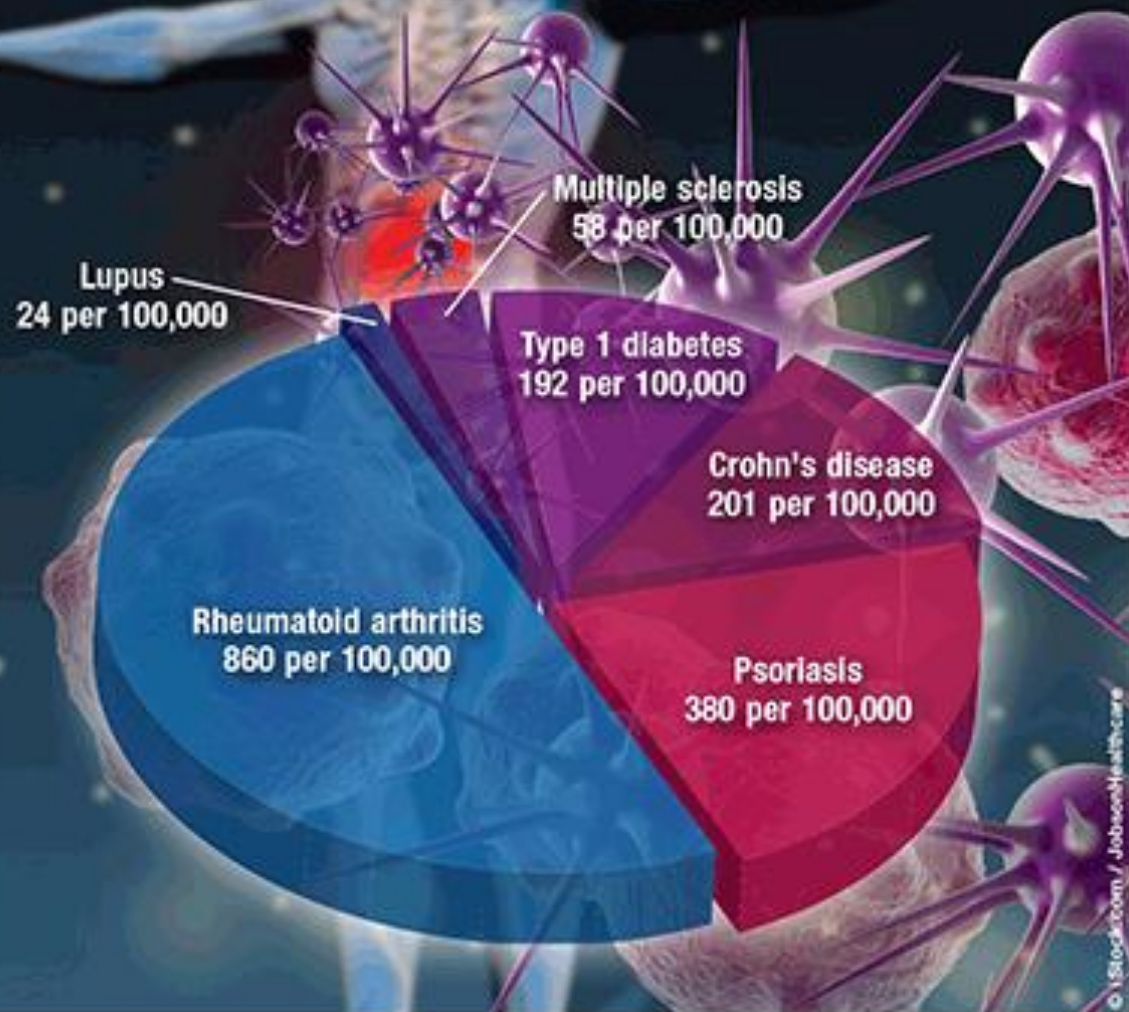


REGENERATION
Center of Thailand



STEM CELLS FOR AUTOIMMUNE DISORDERS

Prevalence of Selected Autoimmune Diseases



Types of **AUTOIMMUNE DISEASES**



BRAIN

Multiple Sclerosis
Guillain-Barre Syndrome
Autism



THYROID

Thyroiditis
Hashimoto's Disease
Grave's Disease



BONES

Rheumatoid Arthritis
Ankylosing Spondylitis
Polymyalgia Rheumatica



MUSCLES

Rheumatoid Arthritis
Ankylosing Spondylitis
Polymyalgia Rheumatica

**OVER 100 DIFFERENT
TYPES OF AUTOIMMUNE
DISORDERS** thedempsterclinic.com



NERVES

Peripheral Neuropathy
Diabetic Neuropathy



SKIN

Psoriasis
Vitiligo
Eczema
Scleroderma



LUNG

Fibromyalgia
Wegener's Granulomatosis



GI TRACT

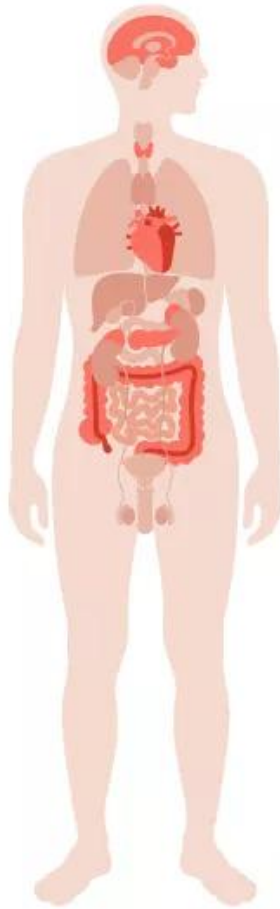
Celiac's Disease
Crohn's Disease
Ulcerative Colitis
Diabetes Type I



BLOOD

Leukemia
Lupus Erythematosus
Hemolytic Dysglycemia

AUTOIMMUNE DISEASES



Multiple sclerosis
Nerve cells



Addison's disease
Adrenal glands



Rheumatic fever
Heart



Rheumatoid arthritis
Joints



Lupus
Skin, joints, brain



Type 1 diabetes
Pancreas



Guillain-Barre syndrome
Muscles in the legs



Hashimoto's thyroiditis
Thyroid gland



Psoriasis
Skin



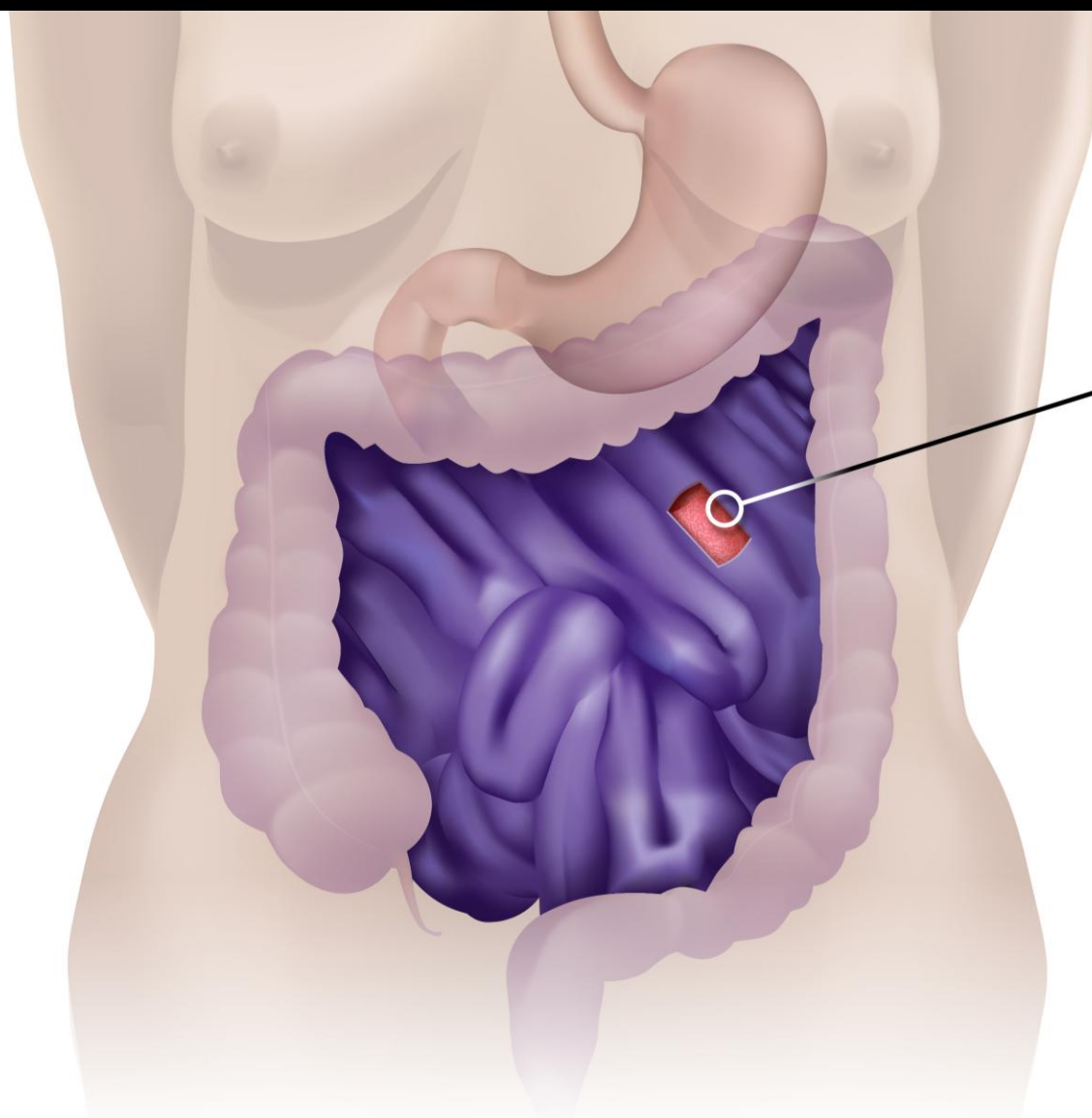
IBD, Celiac disease
Intestines



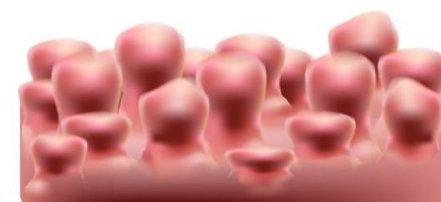
Vasculitis
Blood vessels



Graves' disease
Thyroid gland



Healthy Villi



Unhealthy Villi

Crohn's Disease vs. Celiac Disease

Both are autoimmune diseases involving the inflammation of the GI tract

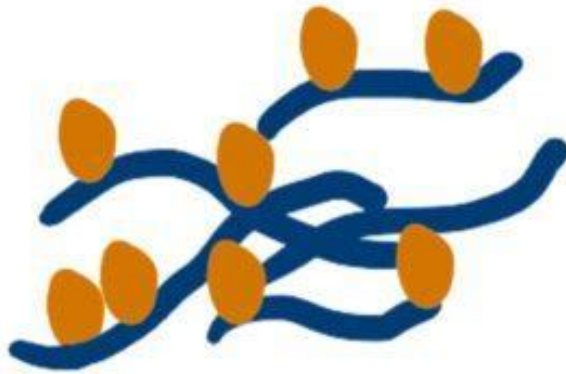
Treatment for Crohn's may include medications, surgery, and management of diet or nutrition

Celiac disease is treated by a lifelong adherence to a gluten-free diet (and symptom should disappear)

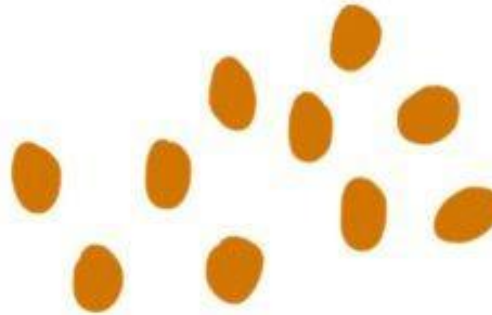


Gluten

gluten is made up of two proteins called **gliadin** and **glutenin**.



Gluten



Gliadin

Alcohol soluble

Gives plasticity
and elasticity



Glutenin

Water soluble

Strength and
structure

Gliadin, contains most of the disease-producing components



Normal villi



Celiac disease

Definition

- Celiac disease is an inherited, lifelong intolerance to gluten.
- Gluten is the protein found in wheat, rye and barley.

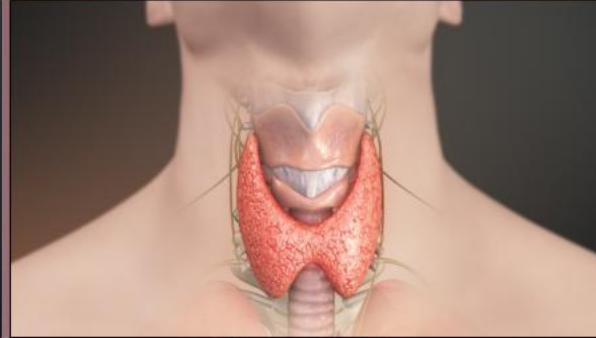
Autoimmune Diseases



Multiple Sclerosis
Guillaun-Barre
Syndrome



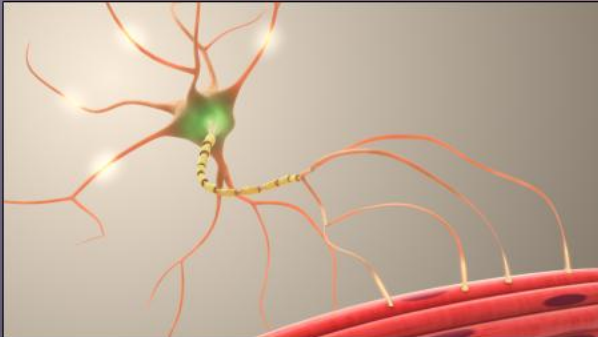
Fibromyalgia
Wegner's
Granulomatosis



Thyroiditis
Hashimoto's Disease
Graves Disease



Psoriasis
Vitiligo
Eczema



Peripheral Neuropathy
Diabetic Neuropathy



Celiac's Disease
Crohn's Disease
Ulceratic Colitis
Type 1 Diabetes



Rheumatoid Arthritis
Ankylosing Spondylitis
Polymyalgia Rheumatica

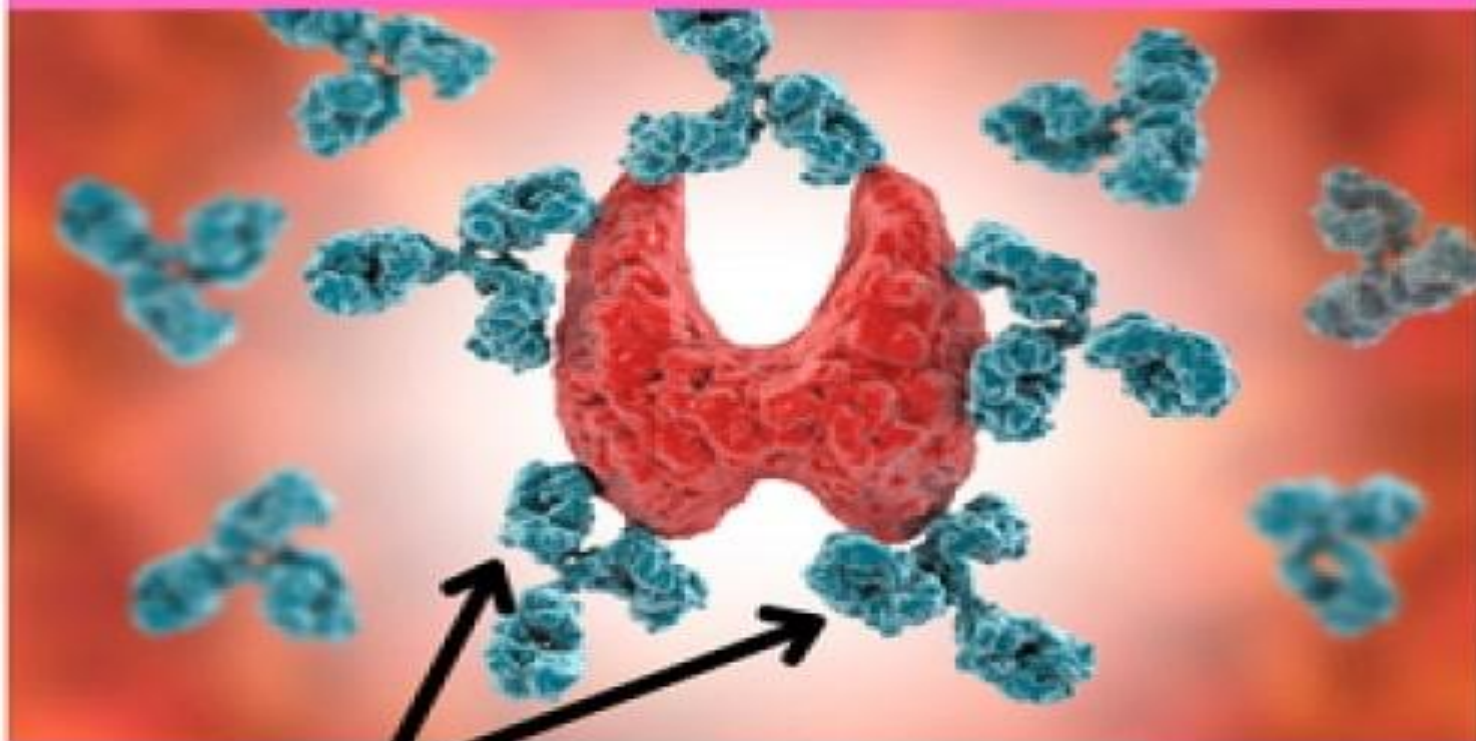


Hemolytic Anemia
Lupus Erythematosus



HASHIMOTOS THYROIDITIS

HASHIMOTO'S THYROIDITIS



Antibodies attacking the
thyroid gland

Rheumatoid Arthritis (Late stage)

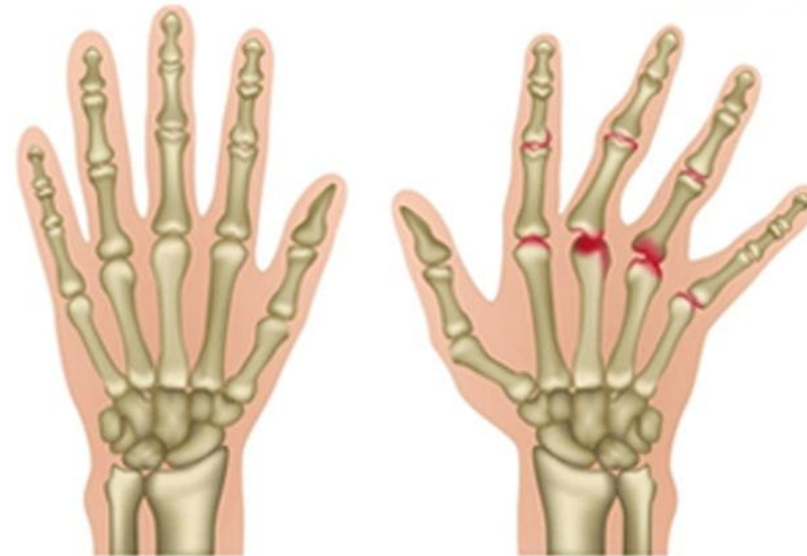
Boutonniere deformity of thumb

Ulnar deviation of metacarpophalangeal joints

Swan-neck deformity of fingers



Rheumatoid nodules



Arthritis

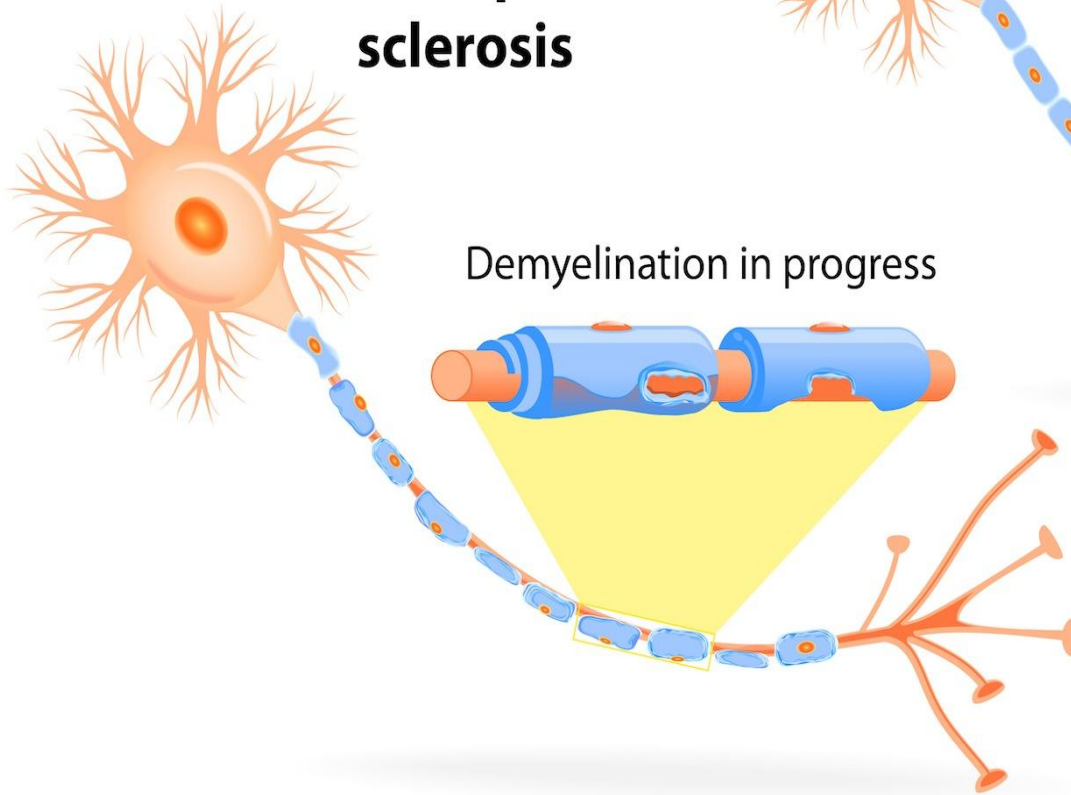


Creates a tumor in the joint



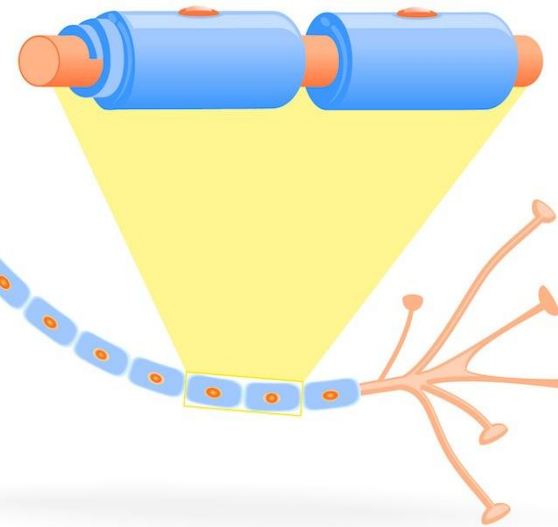
The cartilage and bones begin to self destruct

Nerve affected by multiple sclerosis



Healthy nerve

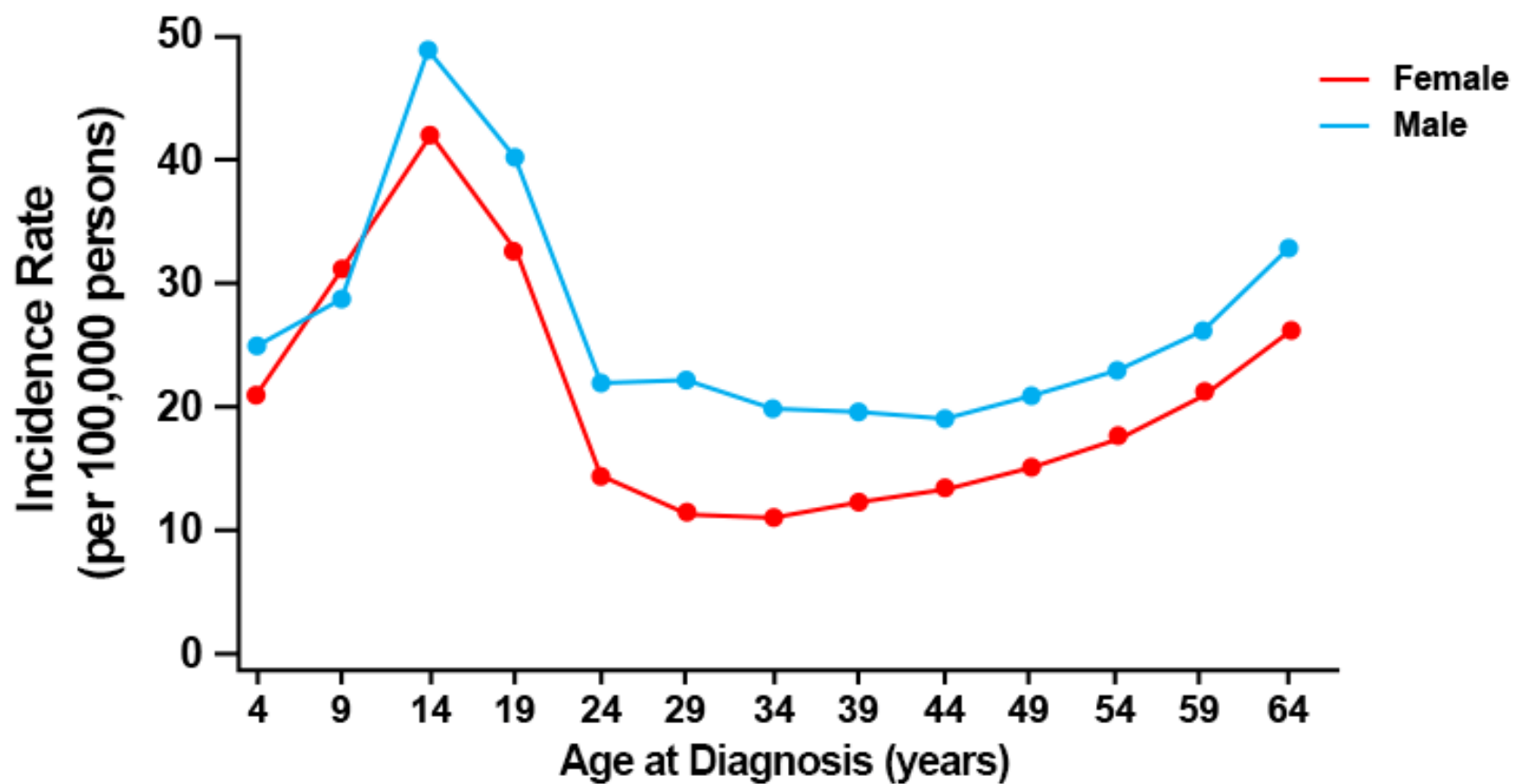
Myelin sheath intact



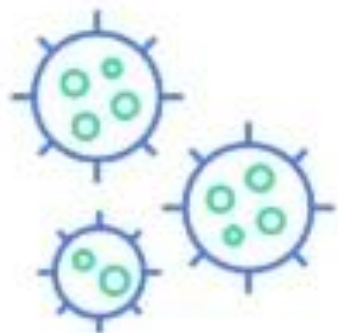


HASHIMOTOS THYROIDITIS

Type 1 Diabetes Incidence by Age at Diagnosis 2001-2015¹²



Autoimmune disease increases LADA risk, but does not affect diabetic retinopathy risk



**Autoimmune
diseases**



LADA



Diabetic retinopathy

LADA = latent autoimmune diabetes in adults

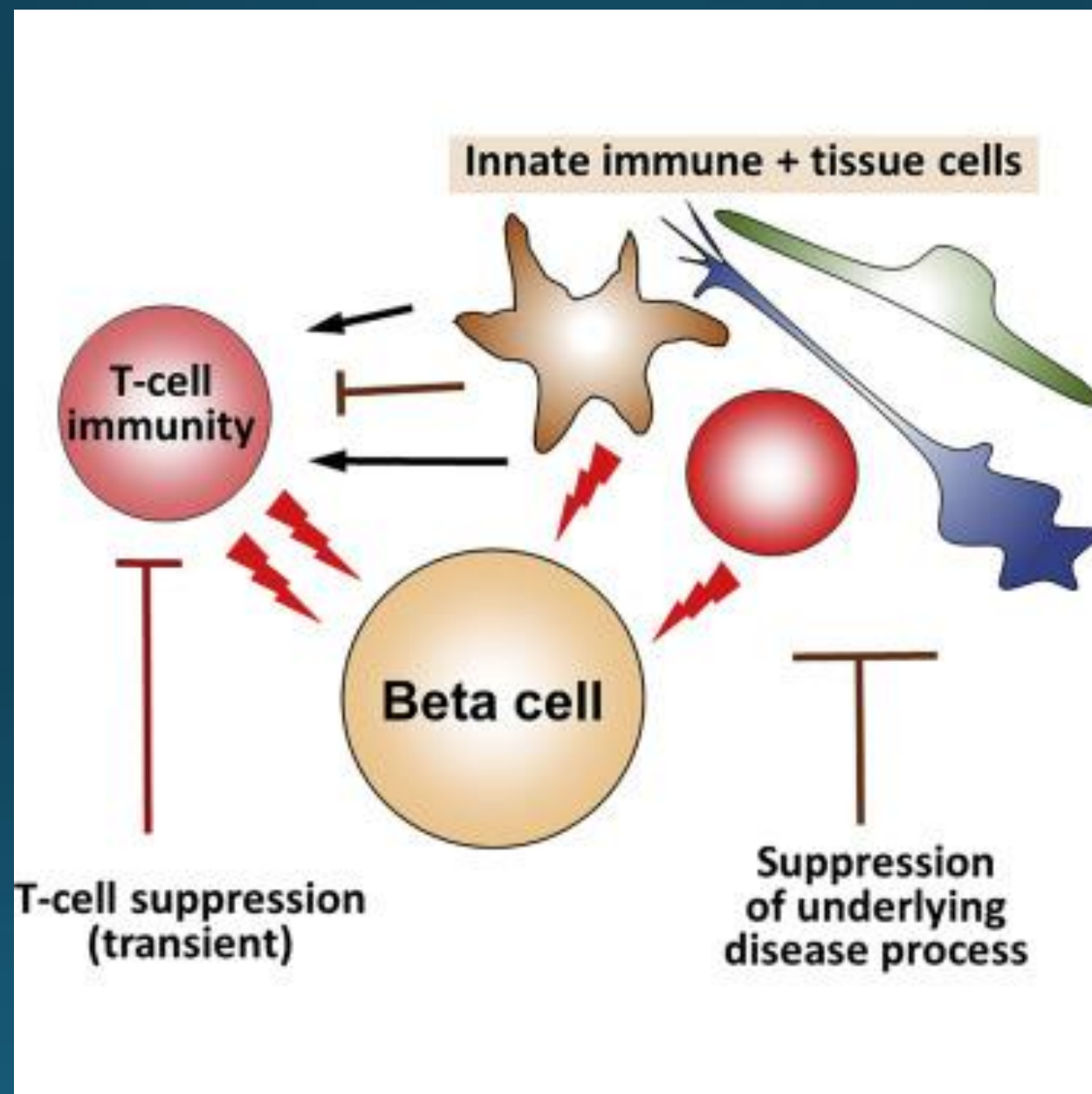
Source: Icons downloaded from Vecteezy.com under free license



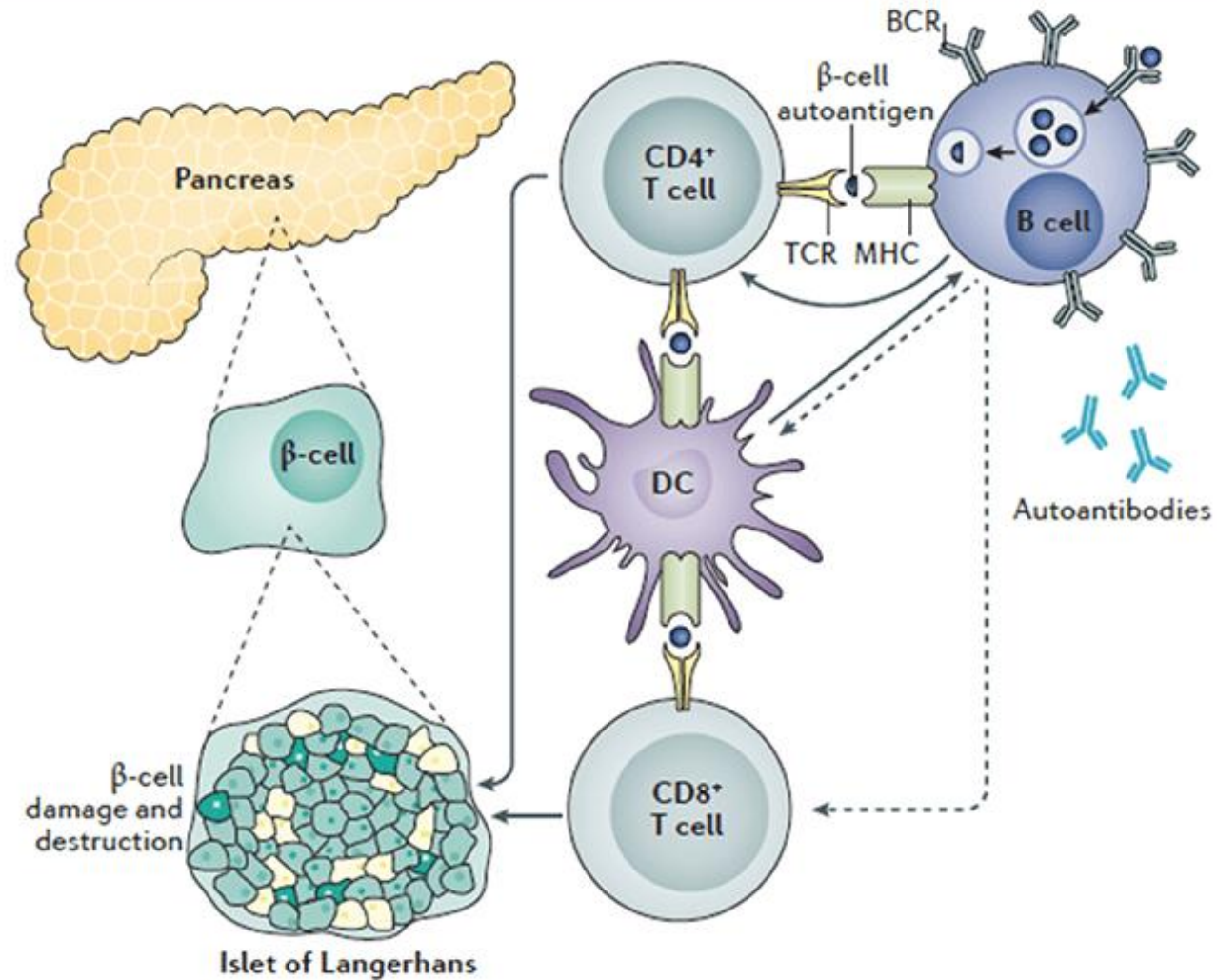
GRAVES DISEASE

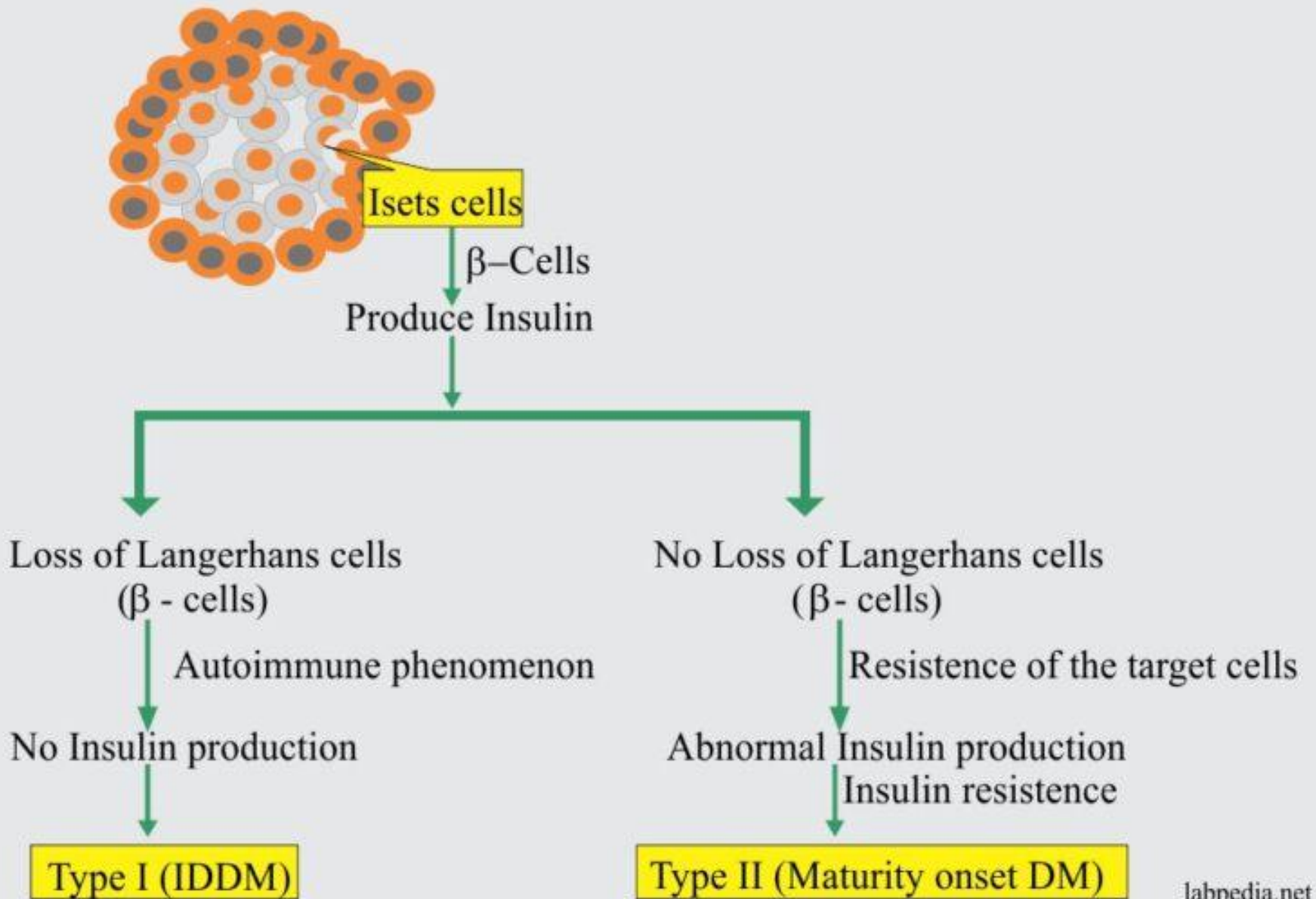
Risk of Type 1 Diabetes^{3,9}

General Population	0.4%	1/250
Father with T1D	4%-7%	1/25-1/14
Mother with T1D	1.5%-3%	1/67-1/33
Sibling with T1D	6%-7%	1/17-1/14
Identical twin with T1D	30%-70%	1/3-1/1.4

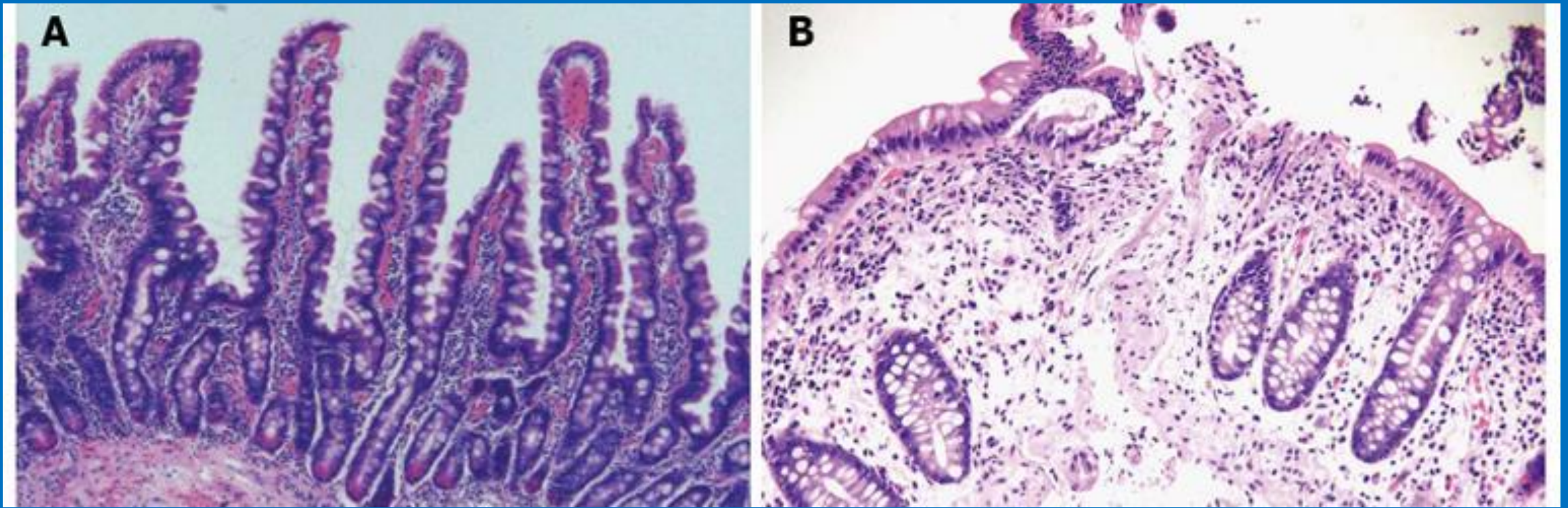


Pathogenesis of Type 1 Diabetes²



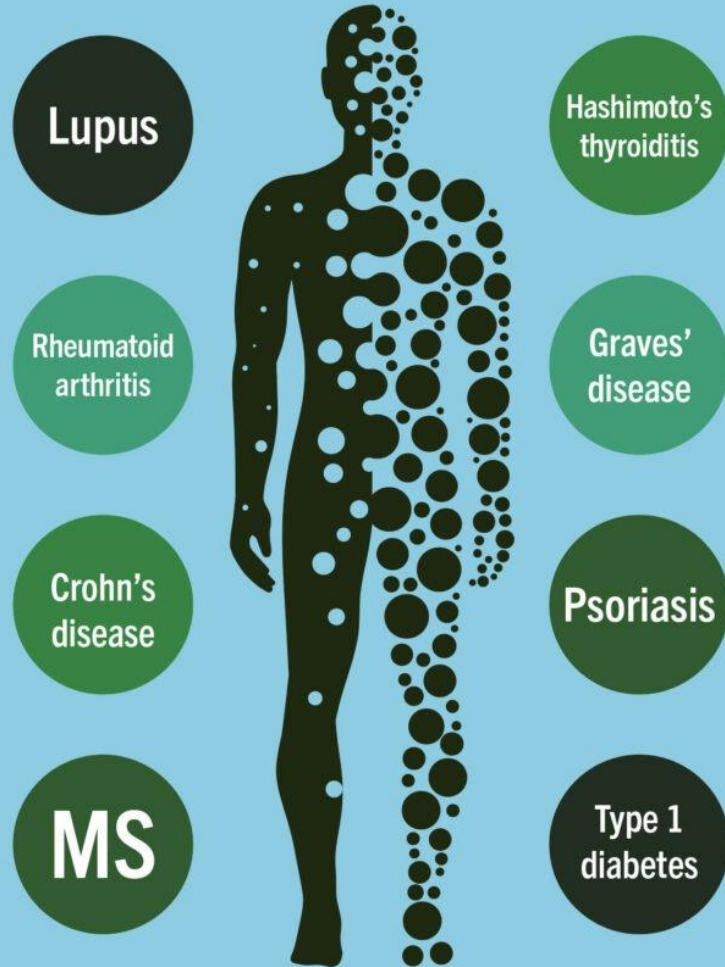


VITELIGO

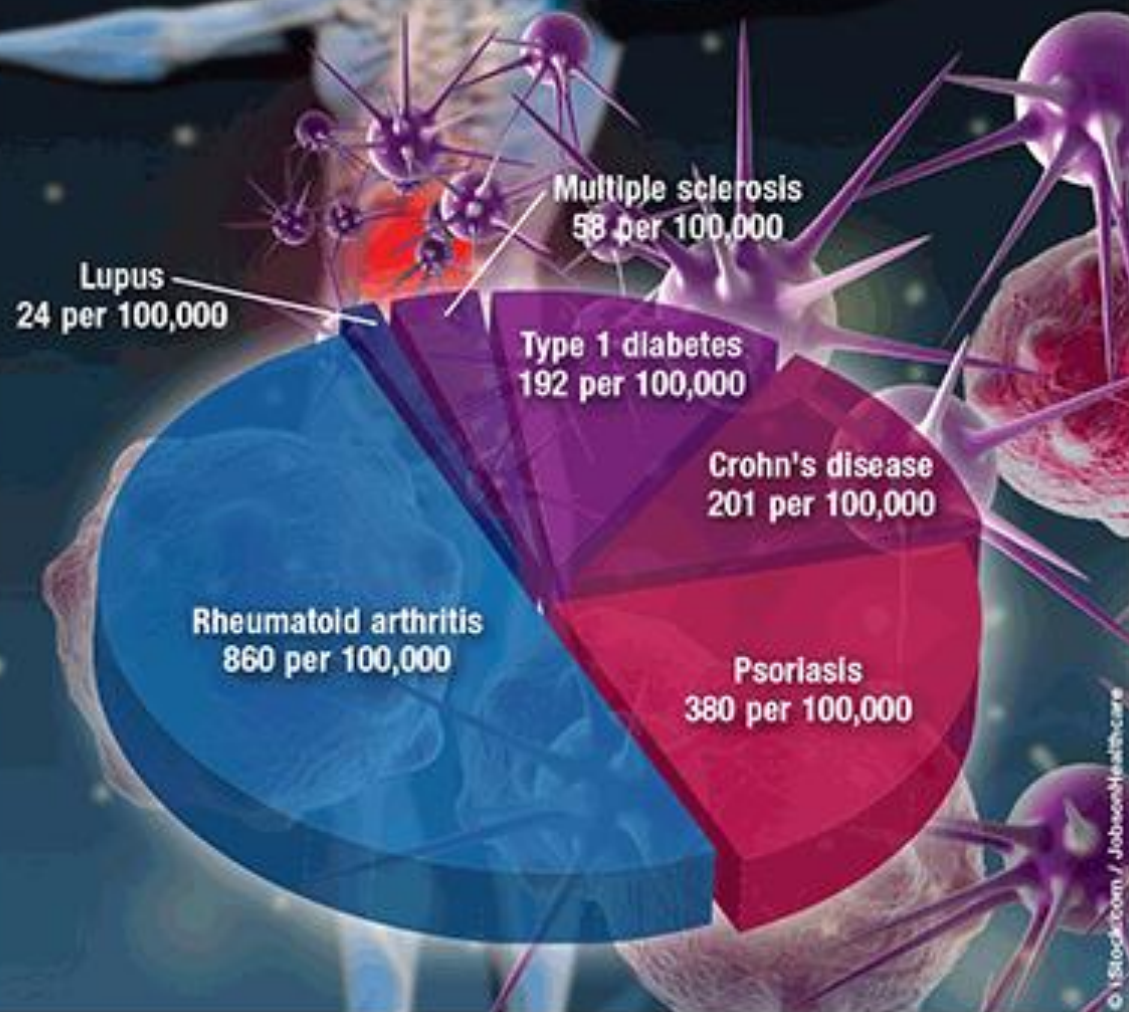


- PATHOLOGY OF CELIAC DISEASE

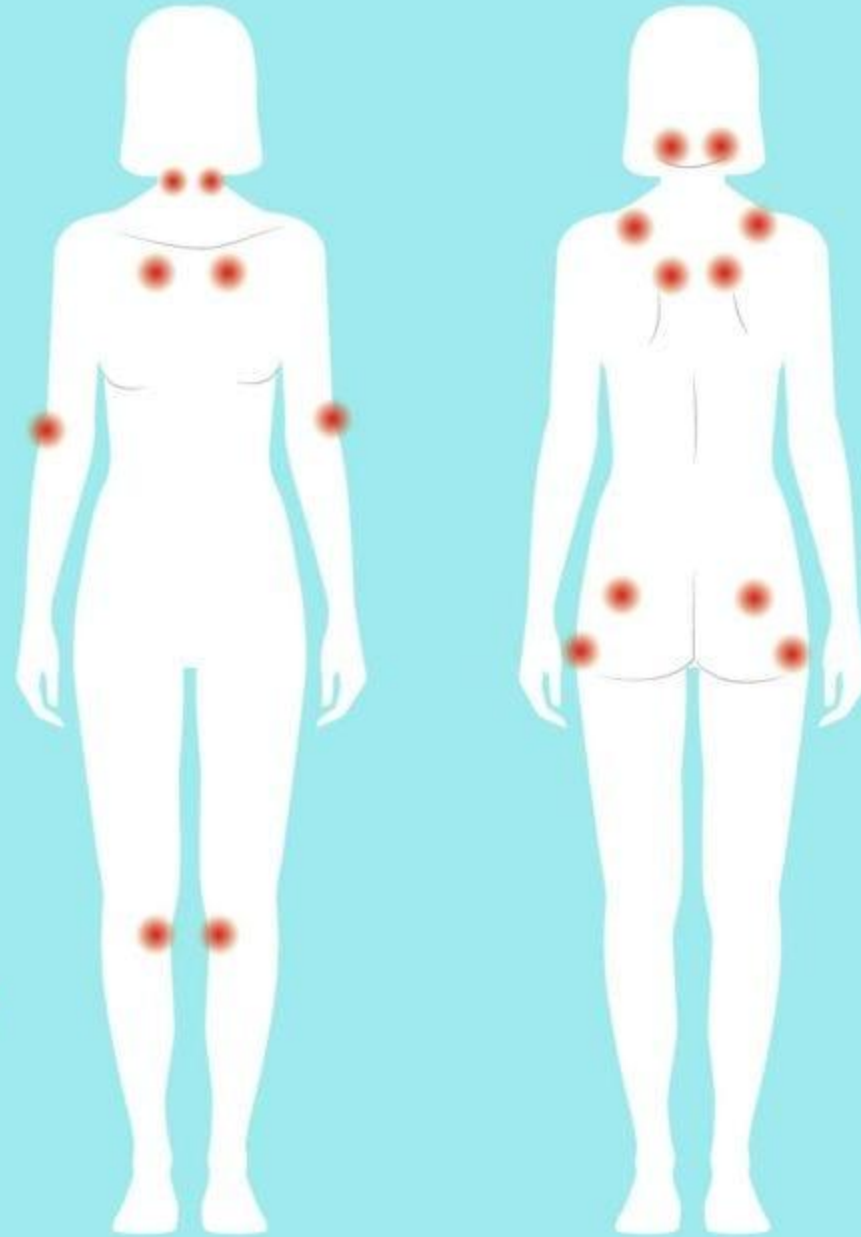
Most-common autoimmune diseases



Prevalence of Selected Autoimmune Diseases

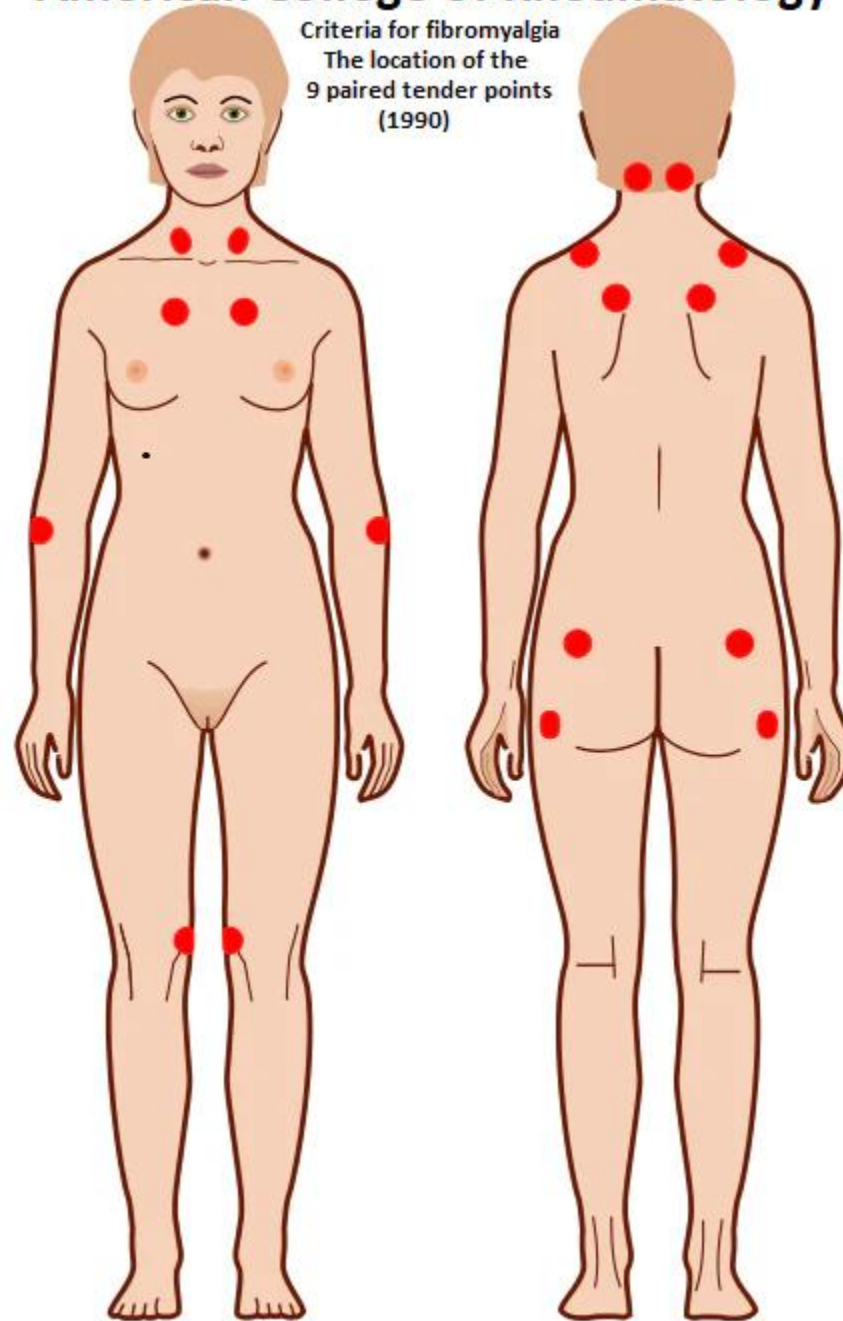


Fibromyalgia Tender Points



American College of Rheumatology

Criteria for fibromyalgia
The location of the
9 paired tender points
(1990)



FIBROMYALGIA

SPATIAL DISORIENTATION

MEMORY PROBLEMS

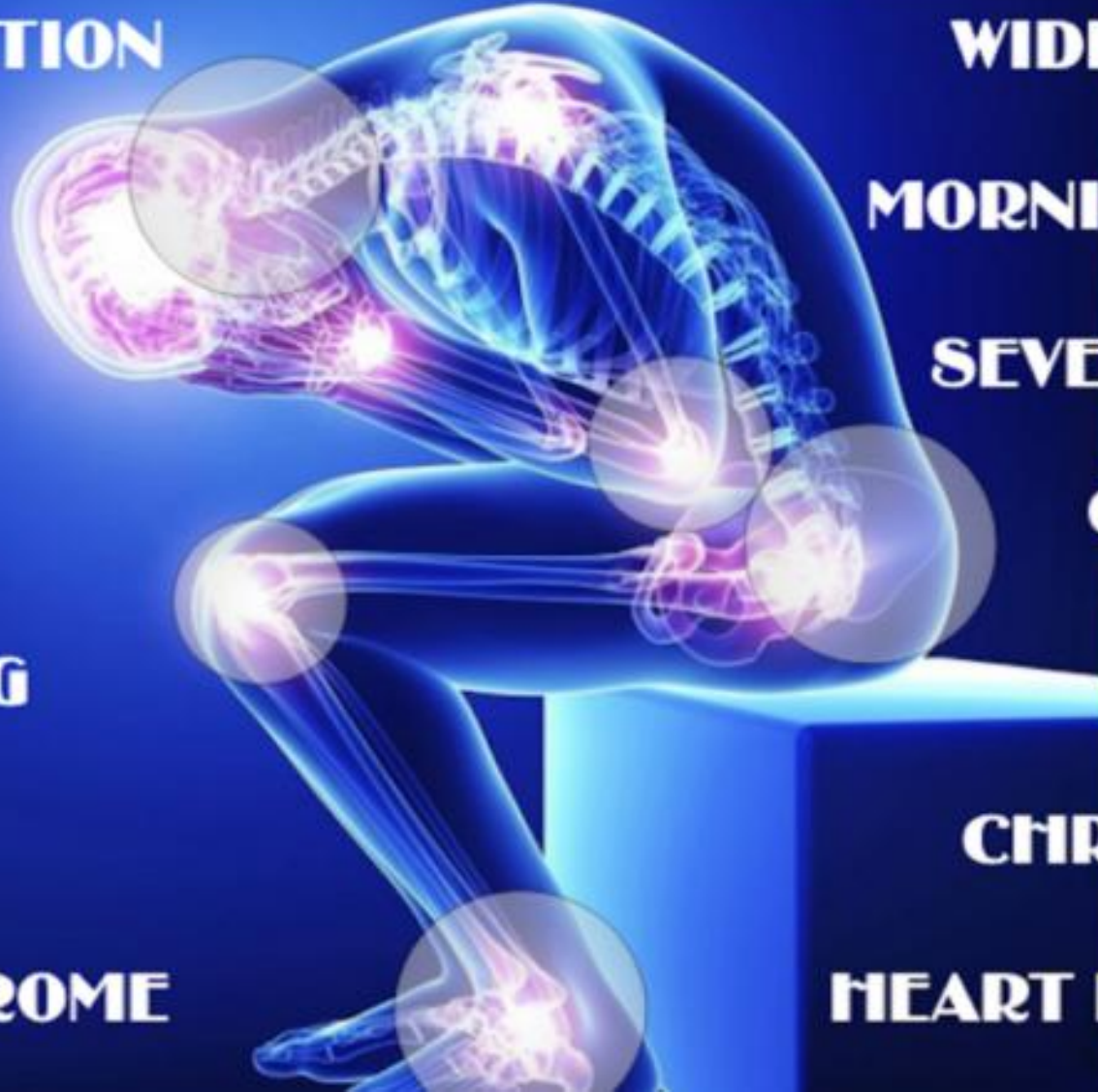
IRRITABLE BOWEL

ATTENTION DEFICIT

RASHES AND ITCHING

CHANGES IN VISION

RESTLESS LEG SYNDROME



WIDESPREAD PAIN

MORNING STIFFNESS

SEVERE ALLERGIES

CHRONIC PAIN

BRAIN FOG

CHRONIC FATIGUE

HEART PALPITATIONS

