

## A. Instructions for Running the System

The graphical user interface for the system was implemented by connecting the Prolog knowledge base to a Java interface. While the data and logic are located in the knowledge base, the system can be built and run like a Java application.

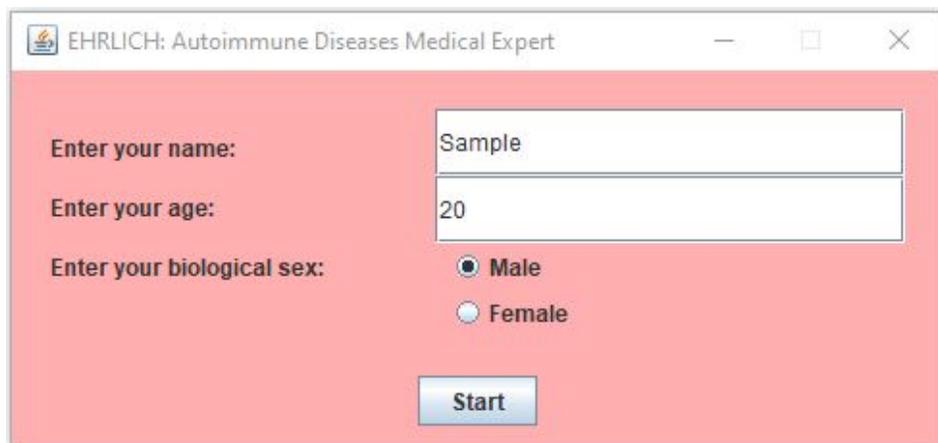
To run the system, open the following JAR file:

**[Gonzales & Lee S13] Medical Expert System**

## B. Running System Screenshots

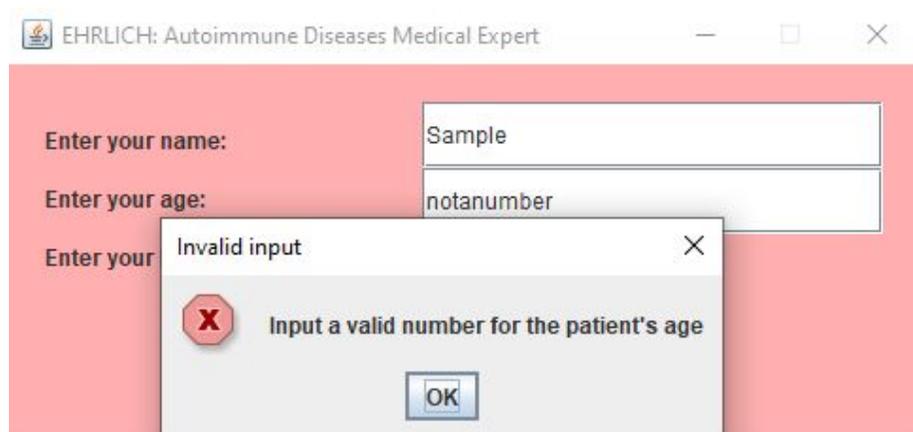
### 1. Initialization Screen

The diagnosis system begins with the initialization screen, where the patient is prompted to enter their name, age, and biological sex.



The screenshot shows a window titled "EHRlich: Autoimmune Diseases Medical Expert". The window has a light red background. It contains three input fields and a "Start" button. The first field is labeled "Enter your name:" and contains the text "Sample". The second field is labeled "Enter your age:" and contains the number "20". The third field is labeled "Enter your biological sex:" and has two radio buttons: "Male" (which is selected) and "Female". The "Start" button is located at the bottom center of the window.

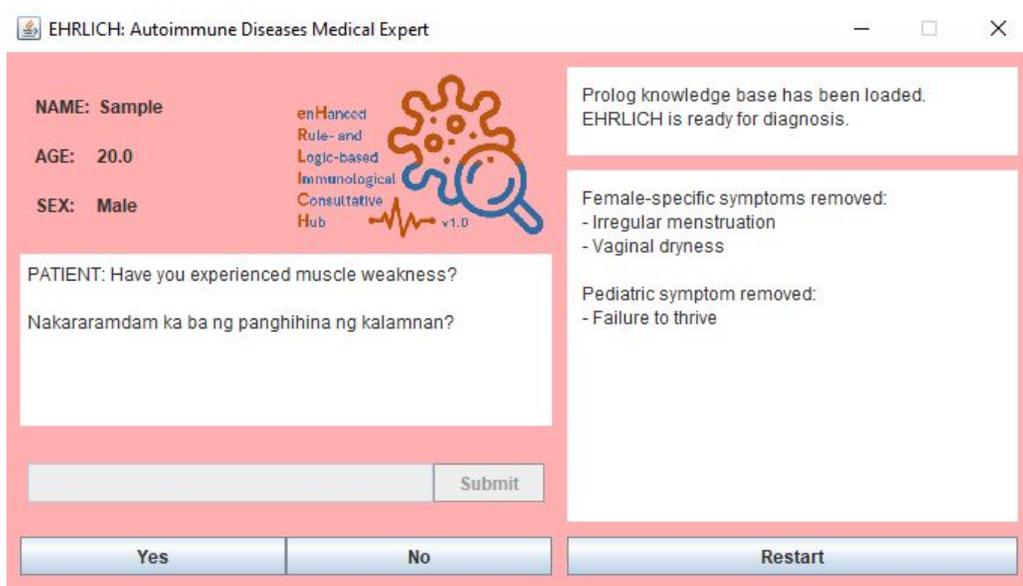
Basic error handling was also implemented to catch invalid inputs.



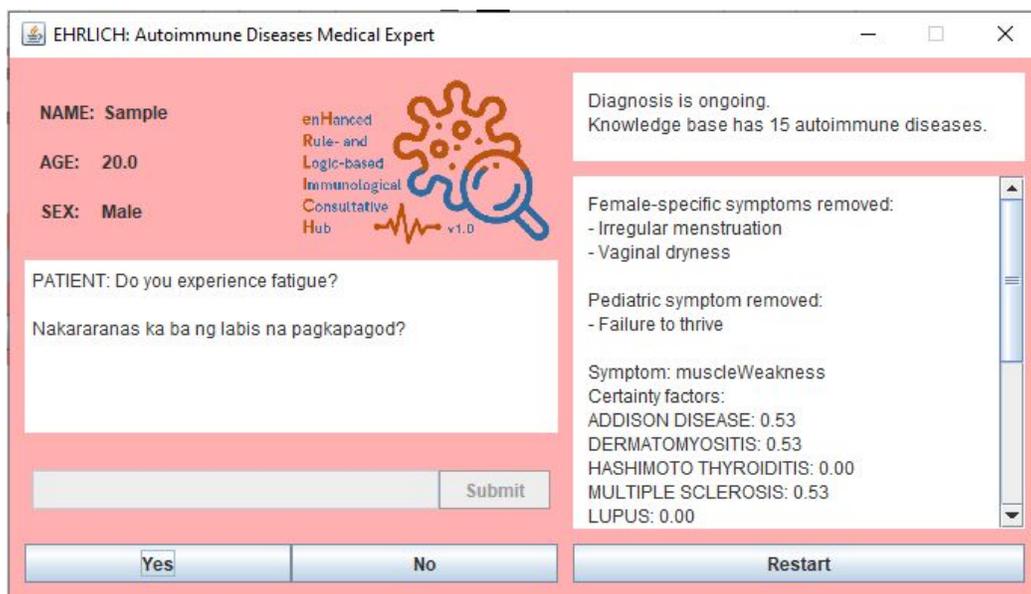
The screenshot shows the same window as above, but with an error message displayed. The "Enter your age:" field now contains the text "notanumber". An error dialog box is overlaid on the window, titled "Invalid input". The dialog box has a red "X" icon and the text "Input a valid number for the patient's age". There is an "OK" button at the bottom of the dialog box.

## 2. Main Screen

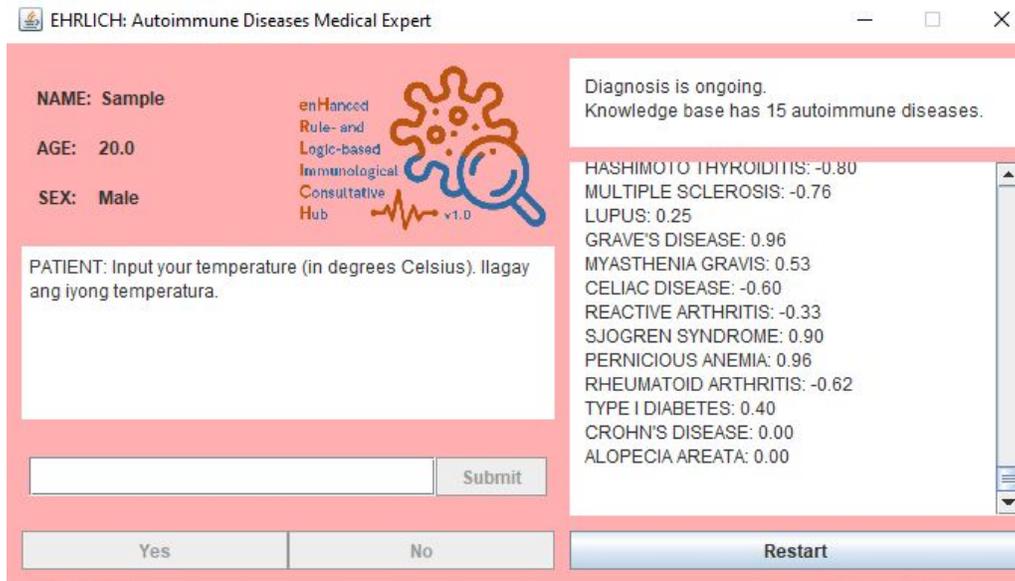
The main screen is composed of the main panel, which displays the patient's details, the diagnosis system logo, the current inquiry, and the text field and buttons for the user input, and the side panel, which stores text areas detailing the current diagnosis status, the diagnosis log, and a RESTART button for conducting a new diagnosis process.



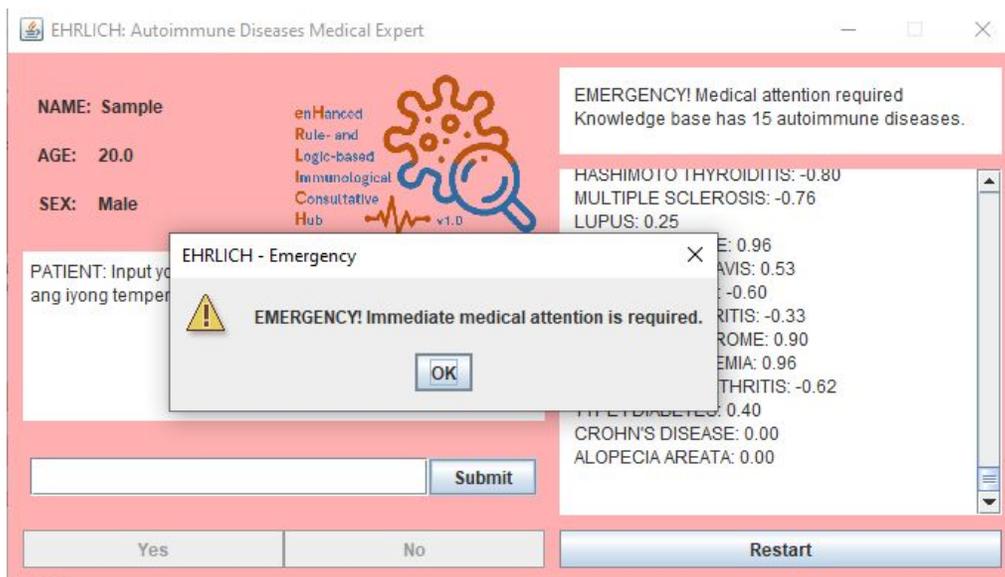
When the user enters their input (either by choosing the YES or NO button or through the text field for some inquiries), the diagnosis log is updated and displays the latest symptom and the current confidence factors for each of the diseases calculated using the symptom's weight.



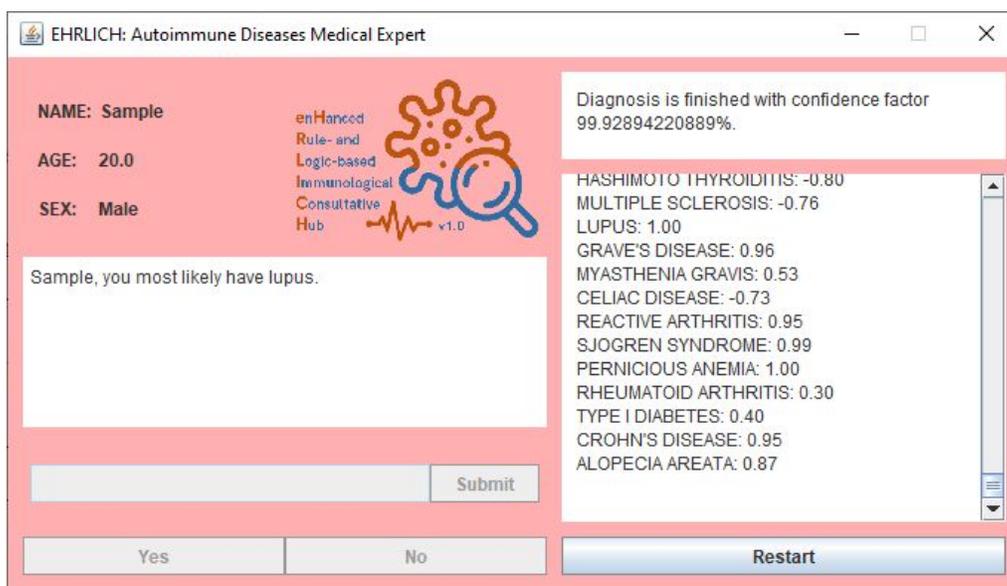
For some symptoms (fever and heart rate), the patient or healthcare worker is prompted to enter the measured vital sign through the input text field.



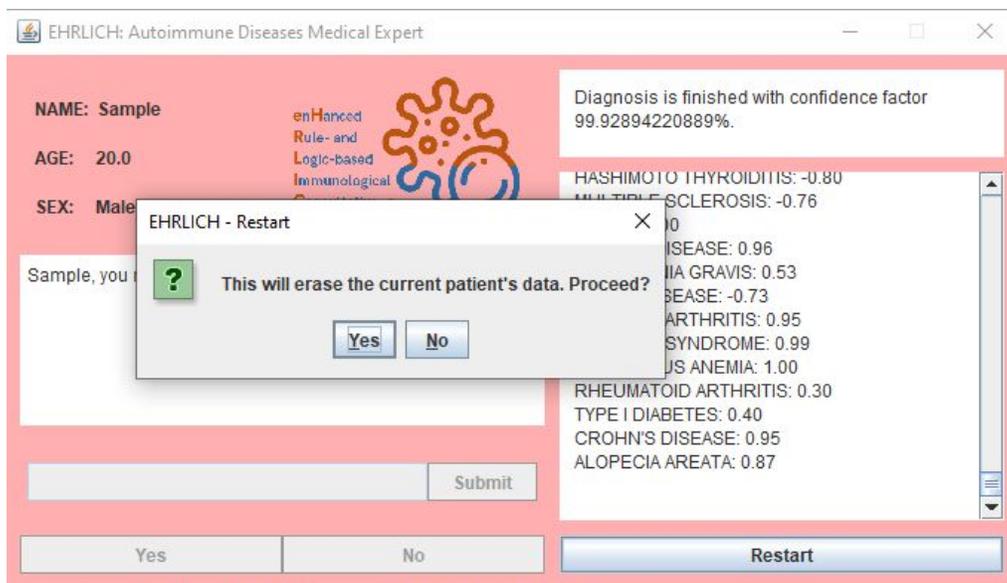
When responses to some queries exceed certain thresholds (e.g., the patient has a temperature of more than 40 degrees Celsius), the system registers an emergency and displays a popup window; this is also reflected in the diagnosis status text area.



When the diagnosis process is finished, the system chooses the most likely diagnosis and displays the final diagnosis message on the inquiry text area.

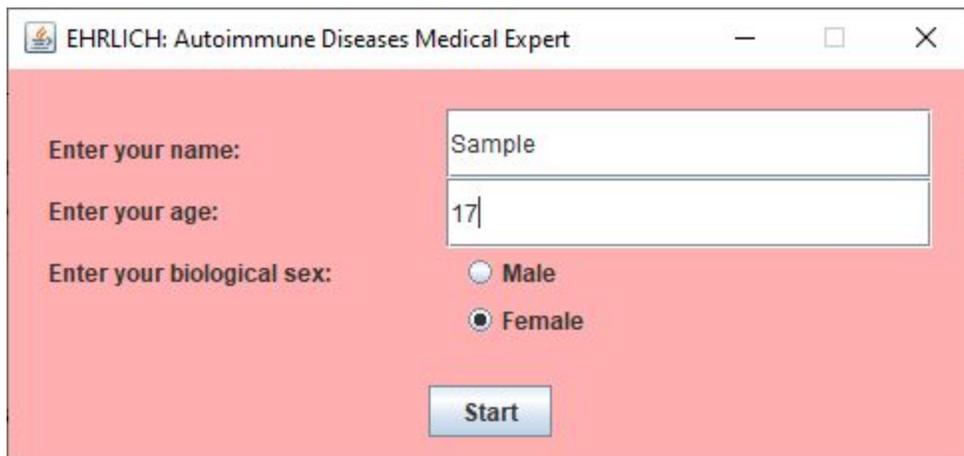


Lastly, the RESTART button allows users to begin a new diagnosis process, discarding the current patient's data.



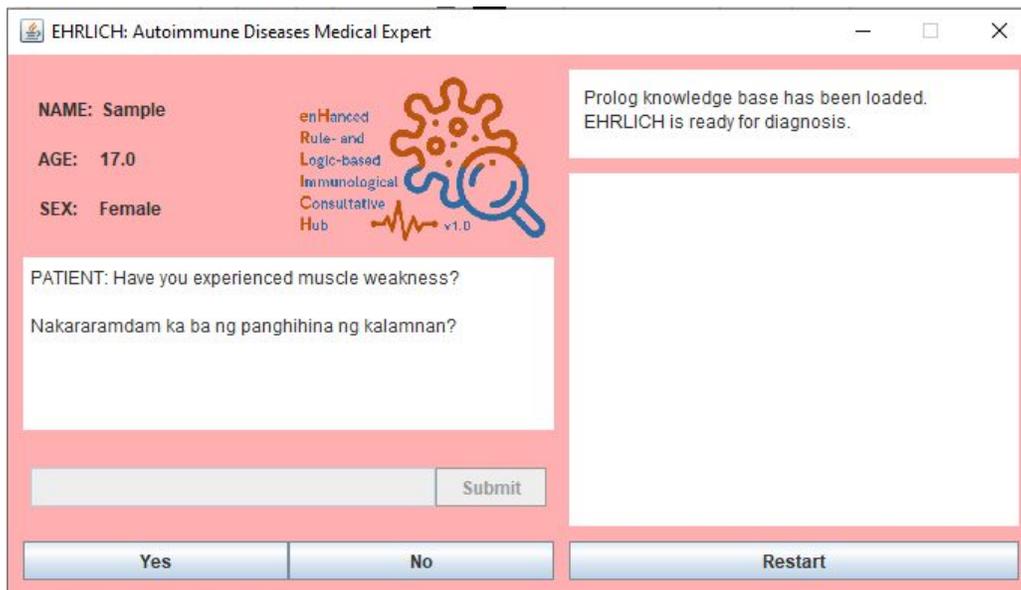
### 3. Sample Run

This section contains a sequence of screenshots of a sample run of the diagnosis system. User responses were chosen using a random number picker and are listed below each of their corresponding images.



The screenshot shows the application window titled "EHRlich: Autoimmune Diseases Medical Expert". The interface is pink and contains the following fields and controls:

- Enter your name:** A text input field containing "Sample".
- Enter your age:** A text input field containing "17".
- Enter your biological sex:** Two radio buttons, "Male" (unselected) and "Female" (selected).
- Start:** A blue button at the bottom center.



The screenshot shows the application window titled "EHRlich: Autoimmune Diseases Medical Expert" after the user has entered their information. The interface is pink and contains the following elements:

- NAME:** Sample
- AGE:** 17.0
- SEX:** Female
- Logo:** A logo for "enHanced Rule- and Logic-based Immunological Consultative Hub v1.0" featuring a magnifying glass and gears.
- Message:** "Prolog knowledge base has been loaded. EHRlich is ready for diagnosis."
- PATIENT:** "Have you experienced muscle weakness?" and "Nakararamdam ka ba ng panghihina ng kalamnan?"
- Submit:** A button to the right of a text input field.
- Response Buttons:** "Yes", "No", and "Restart" buttons at the bottom.

Response: No

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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Diagnosis is ongoing.  
 Knowledge base has 15 autoimmune diseases.

PATIENT: Do you have a reddish-purple rash around your eyelids?  
 Mayroon bang mapula o lilang pagpapantal sa palibot ng takipmata?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: 0.00  
 MULTIPLE SCLEROSIS: -0.53  
 LUPUS: 0.00  
 GRAVE'S DISEASE: -0.53  
 MYASTHENIA GRAVIS: -0.53  
 CELIAC DISEASE: 0.00  
 REACTIVE ARTHRITIS: 0.00  
 SJOGREN SYNDROME: 0.00  
 PERNICIOUS ANEMIA: -0.53  
 RHEUMATOID ARTHRITIS: -0.53  
 TYPE I DIABETES: 0.00  
 CROHN'S DISEASE: 0.00  
 ALOPECIA AREATA: 0.00

Response: Yes

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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Diagnosis is ongoing.  
 Knowledge base has 15 autoimmune diseases.

PATIENT: Do you have red or violet lumps on your knees or elbows?  
 Mayroon ka bang napapansing mga pula o lilang bukol sa iyong tuhod o siko?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: 0.00  
 MULTIPLE SCLEROSIS: -0.53  
 LUPUS: 0.00  
 GRAVE'S DISEASE: -0.53  
 MYASTHENIA GRAVIS: -0.53  
 CELIAC DISEASE: 0.00  
 REACTIVE ARTHRITIS: 0.00  
 SJOGREN SYNDROME: 0.93  
 PERNICIOUS ANEMIA: -0.53  
 RHEUMATOID ARTHRITIS: -0.53  
 TYPE I DIABETES: 0.00  
 CROHN'S DISEASE: 0.00  
 ALOPECIA AREATA: 0.00

Response: No

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Have you experienced a tingling sensation or numbness on your limbs, trunk, or the side of your face?  
May nararamdaman ka bang sensasyong parang tinutusok o pagkamanhid sa iyong braso, binti, katawan, o sa bandang gilid ng iyong mukha?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.53  
LUPUS: 0.00  
GRAVE'S DISEASE: -0.94  
MYASTHENIA GRAVIS: -0.53  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.00  
SJOGREN SYNDROME: 0.93  
PERNICIOUS ANEMIA: -0.53  
RHEUMATOID ARTHRITIS: -0.53  
TYPE I DIABETES: 0.00  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

Response: No

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Consultative  
Hub v1.0

Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Do you experience fatigue?  
Nakararanas ka ba ng labis na pagkapagod?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.97  
LUPUS: 0.00  
GRAVE'S DISEASE: -0.94  
MYASTHENIA GRAVIS: -0.53  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.00  
SJOGREN SYNDROME: 0.93  
PERNICIOUS ANEMIA: -0.53  
RHEUMATOID ARTHRITIS: -0.53  
TYPE I DIABETES: 0.00  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

Response: Yes

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Have you noticed swelling on your joints?  
Nakararanas ka ba ng pamamaga sa iyong mga kasukasan?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.95  
LUPUS: 0.40  
GRAVE'S DISEASE: -0.90  
MYASTHENIA GRAVIS: -0.53  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: -0.22  
RHEUMATOID ARTHRITIS: -0.22  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

Response: No

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

HCW: Does the patient have an irregular heartbeat?  
Iregular ba ang pagtibok ng puso ng pasyente?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.95  
LUPUS: -0.56  
GRAVE'S DISEASE: -0.90  
MYASTHENIA GRAVIS: -0.53  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: -0.22  
RHEUMATOID ARTHRITIS: -0.79  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

Response: No

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.95  
LUPUS: -0.56  
GRAVE'S DISEASE: -0.99  
MYASTHENIA GRAVIS: -0.53  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: -0.22  
RHEUMATOID ARTHRITIS: -0.79  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

HCW: Does the patient have drooping eyelids?  
Lumalawlaw ba ang takipmata ng pasyente?

Submit

Yes No Restart

Response: Yes

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.95  
LUPUS: -0.56  
GRAVE'S DISEASE: -0.99  
MYASTHENIA GRAVIS: 0.86  
CELIAC DISEASE: 0.00  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: -0.22  
RHEUMATOID ARTHRITIS: -0.79  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: 0.00  
ALOPECIA AREATA: 0.00

PATIENT: Do you experience double vision?  
Nakararanas ka ba ng pagdoble ng paningin?

Submit

Yes No Restart

Response: No

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Do you experience abdominal bloating?  
Nakararanas ka ba ng pamamaga sa bandang tiyan?

Submit

Yes No Restart

- HASHIMOTO THYROIDITIS: -0.87
- MULTIPLE SCLEROSIS: -0.95
- LUPUS: -0.56
- GRAVE'S DISEASE: -1.00
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 0.00
- REACTIVE ARTHRITIS: 0.40
- SJOGREN SYNDROME: 0.96
- PERNICIOUS ANEMIA: -0.22
- RHEUMATOID ARTHRITIS: -0.79
- TYPE I DIABETES: 0.40
- CROHN'S DISEASE: 0.00
- ALOPECIA AREATA: 0.00

Response: Yes

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Do you experience abdominal pain?  
Nakararanas ka ba ng pananakit sa bandang tiyan?

Submit

Yes No Restart

- MULTIPLE SCLEROSIS: -0.95
- LUPUS: -0.56
- GRAVE'S DISEASE: -1.00
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 0.93
- REACTIVE ARTHRITIS: 0.40
- SJOGREN SYNDROME: 0.96
- PERNICIOUS ANEMIA: -0.22
- RHEUMATOID ARTHRITIS: -0.79
- TYPE I DIABETES: 0.40
- CROHN'S DISEASE: 0.00
- ALOPECIA AREATA: 0.00

Response: No

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Do you experience constipation?  
Nakararanas ka ba ng pagtitibi?

Submit

Yes No Restart

HASHIMOTO THYROIDITIS: -0.87  
MULTIPLE SCLEROSIS: -0.95  
LUPUS: -0.91  
GRAVE'S DISEASE: -1.00  
MYASTHENIA GRAVIS: -0.07  
CELIAC DISEASE: 0.67  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: -0.22  
RHEUMATOID ARTHRITIS: -0.79  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: -0.80  
ALOPECIA AREATA: 0.00

Response: Yes

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

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Logic-based  
Immunological  
Consultative  
Hub v1.0

Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

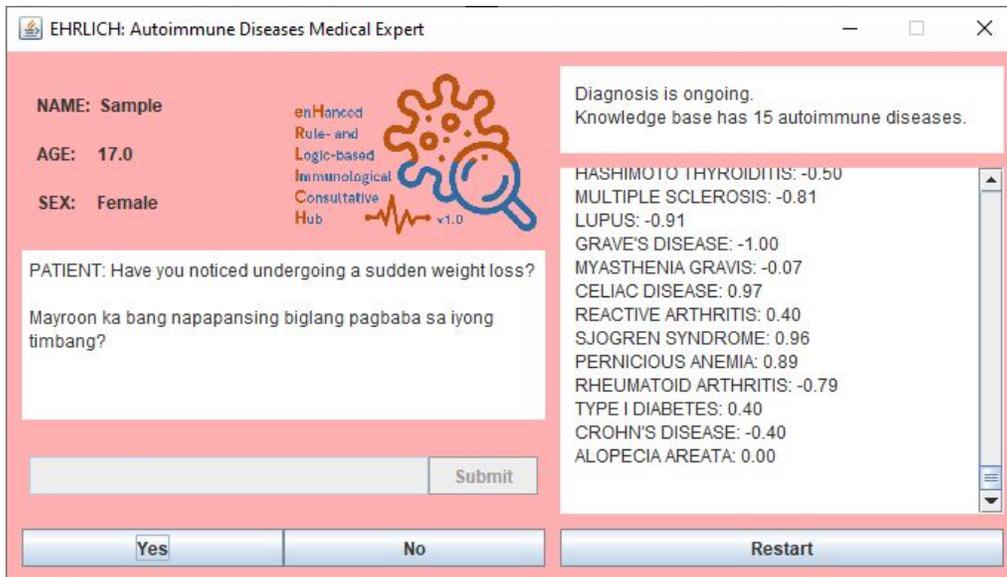
PATIENT: Do you experience diarrhea?  
Nakararanas ka ba ng pagtatae?

Submit

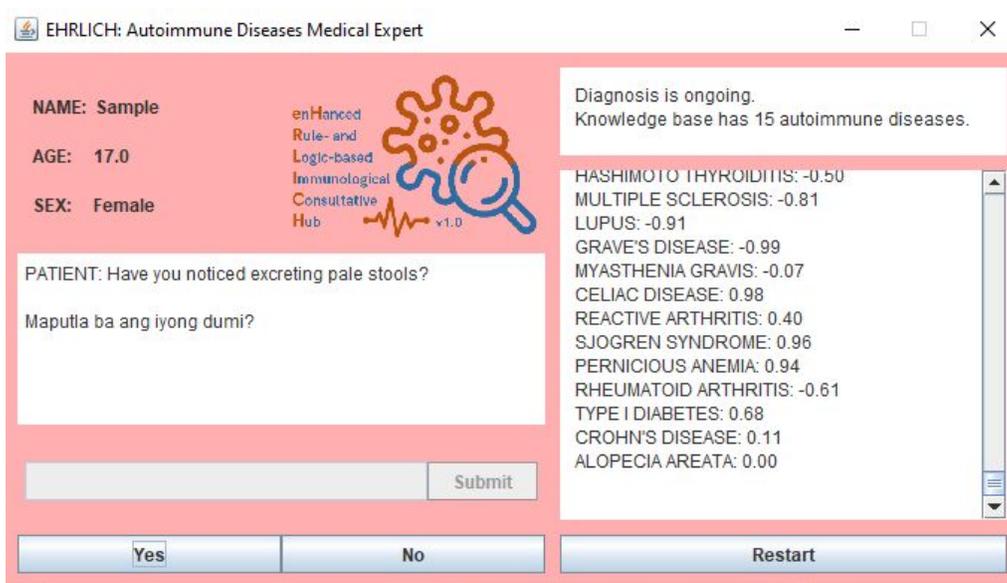
Yes No Restart

HASHIMOTO THYROIDITIS: -0.50  
MULTIPLE SCLEROSIS: -0.81  
LUPUS: -0.91  
GRAVE'S DISEASE: -1.00  
MYASTHENIA GRAVIS: -0.07  
CELIAC DISEASE: 0.91  
REACTIVE ARTHRITIS: 0.40  
SJOGREN SYNDROME: 0.96  
PERNICIOUS ANEMIA: 0.66  
RHEUMATOID ARTHRITIS: -0.79  
TYPE I DIABETES: 0.40  
CROHN'S DISEASE: -0.80  
ALOPECIA AREATA: 0.00

Response: Yes



Response: Yes



Response: Yes

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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**PATIENT:** Do you have a skin rash that causes blisters?  
Mayroon ka bang mga pantal sa balat na maaaring magpaltos?

Submit

Yes No Restart

Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

- HASHIMOTO THYROIDITIS: -0.50
- MULTIPLE SCLEROSIS: -0.81
- LUPUS: -0.91
- GRAVE'S DISEASE: -0.99
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 1.00
- REACTIVE ARTHRITIS: 0.40
- SJOGREN SYNDROME: 0.96
- PERNICIOUS ANEMIA: 0.94
- RHEUMATOID ARTHRITIS: -0.61
- TYPE I DIABETES: 0.68
- CROHN'S DISEASE: 0.11
- ALOPECIA AREATA: 0.00

Response: No

**EHRlich: Autoimmune Diseases Medical Expert**

**NAME:** Sample  
**AGE:** 17.0  
**SEX:** Female

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**PATIENT:** Do you have mouth sores?  
Mayroon ka bang mga singaw sa bibig?

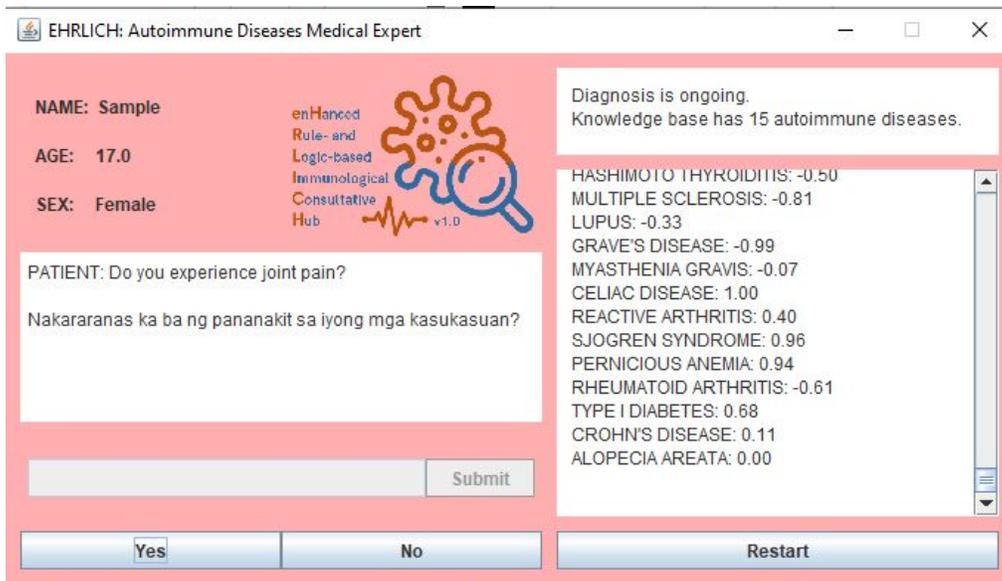
Submit

Yes No Restart

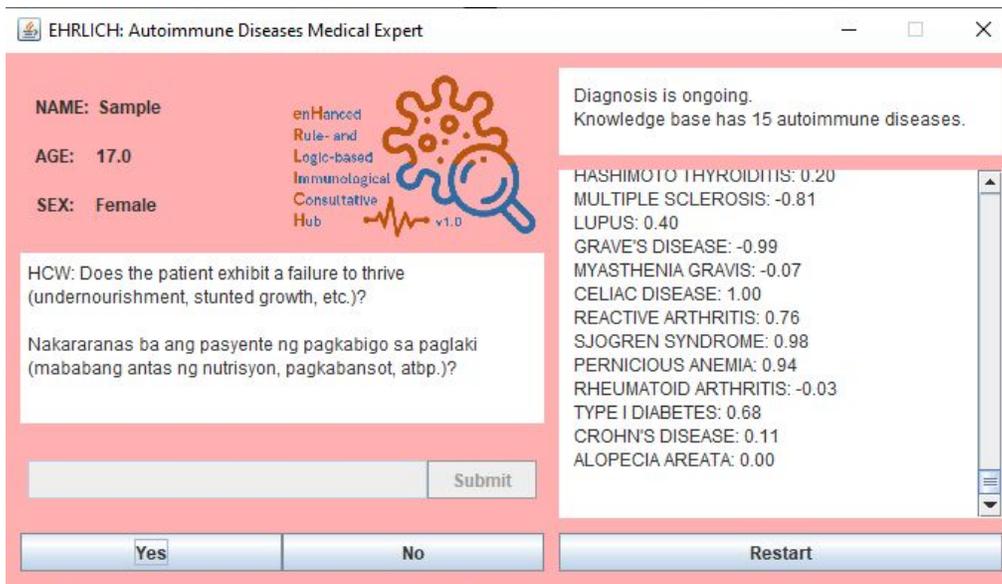
Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

- HASHIMOTO THYROIDITIS: -0.50
- MULTIPLE SCLEROSIS: -0.81
- LUPUS: -0.91
- GRAVE'S DISEASE: -0.99
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 0.98
- REACTIVE ARTHRITIS: 0.40
- SJOGREN SYNDROME: 0.96
- PERNICIOUS ANEMIA: 0.94
- RHEUMATOID ARTHRITIS: -0.61
- TYPE I DIABETES: 0.68
- CROHN'S DISEASE: 0.11
- ALOPECIA AREATA: 0.00

Response: Yes



Response: Yes



Response: Yes

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

enHanced Rule- and Logic-based Immunological Consultative Hub v1.0

Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Have you experienced a tingling sensation in your legs?  
Nakararamdam ka ba ng sensasyong parang tinutusok sa iyong mga binti?

Submit

Yes No Restart

- HASHIMOTO THYROIDITIS: 0.20
- MULTIPLE SCLEROSIS: -0.81
- LUPUS: 0.40
- GRAVE'S DISEASE: -0.99
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 1.00
- REACTIVE ARTHRITIS: 0.76
- SJOGREN SYNDROME: 0.98
- PERNICIOUS ANEMIA: 0.94
- RHEUMATOID ARTHRITIS: -0.03
- TYPE I DIABETES: 0.68
- CROHN'S DISEASE: 0.11
- ALOPECIA AREATA: 0.00

Response: Yes

EHRlich: Autoimmune Diseases Medical Expert

NAME: Sample  
AGE: 17.0  
SEX: Female

enHanced Rule- and Logic-based Immunological Consultative Hub v1.0

Diagnosis is ongoing.  
Knowledge base has 15 autoimmune diseases.

PATIENT: Have you noticed irregularities in your menstrual cycle?  
Mayroon ka bang napapansing iregularidad sa iyong regla?

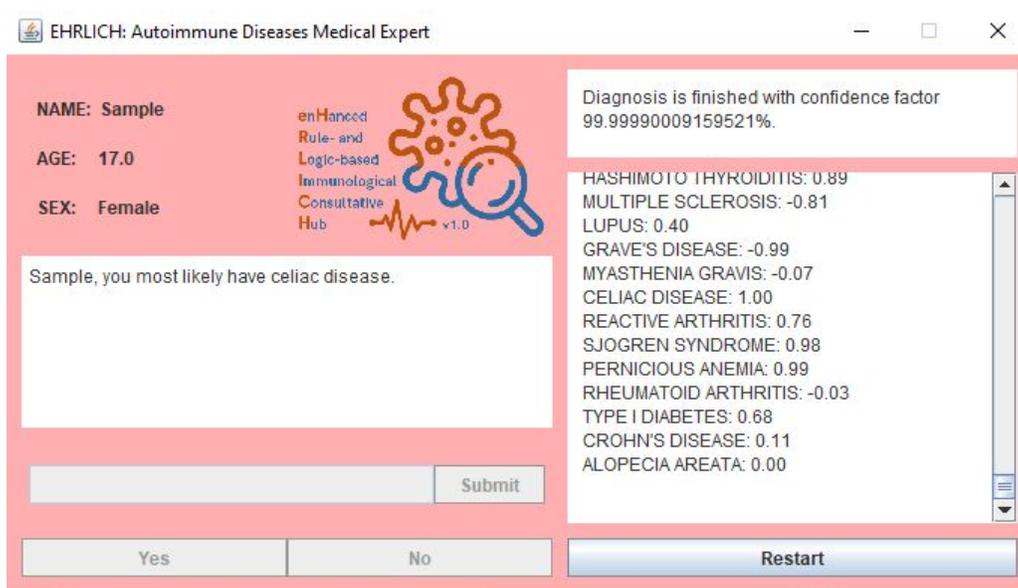
Submit

Yes No Restart

- HASHIMOTO THYROIDITIS: 0.20
- MULTIPLE SCLEROSIS: -0.81
- LUPUS: 0.40
- GRAVE'S DISEASE: -0.99
- MYASTHENIA GRAVIS: -0.07
- CELIAC DISEASE: 1.00
- REACTIVE ARTHRITIS: 0.76
- SJOGREN SYNDROME: 0.98
- PERNICIOUS ANEMIA: 0.99
- RHEUMATOID ARTHRITIS: -0.03
- TYPE I DIABETES: 0.68
- CROHN'S DISEASE: 0.11
- ALOPECIA AREATA: 0.00

Response: Yes

As the confidence factor associated with one of the diseases exceeded a set threshold after all of its unique associated symptoms have been inquired about (celiac disease registered a confidence factor of 99.99%), the diagnosis process was terminated and a final diagnosis was made.



### C. List of Diseases and Symptoms

Listed below are the symptoms and corresponding weights of each of the fifteen (15) diseases the system is able to diagnose:

Disease	Symptoms	Weight
Addison Disease	Muscle weakness	0.5333
	Fatigue	0.4
	Orthostatic hypotension	0.9333
	Hyperpigmentation near scars, skin folds, or joints	0.9333
	Black freckles on the forehead, neck, face, or shoulders	0.9333
	Bluish-black discolorations around the lips, mouth, or rectum	0.9333
	Nausea	0.8667
	Vomiting	0.8667

	Diarrhea	0.6667
	Increased sensitivity to cold	0.8667
	Unexplained weight loss	0.4667
	Dehydration	0.9333
Dermato- myositis	Reddish-purple rash around the eyelids	0.9333
	Red or violet bumps on the knees or elbows	0.9333
	Gottron papules (red or violet bumps on the joints of the hand)	0.9333
	Muscle weakness	0.5333
	Joint pain	0.6
	Joint swelling	0.7333
	Discolored skin around the shoulders, neck, or upper back	0.9333
	Thickened skin on the bases and sides of fingernails	0.9333
Hashimoto thyroiditis	Presence of a goiter (swelling of the neck caused by an enlarged thyroid)	0.8667
	Tiredness	0.9333
	Unexplained weight gain	0.9333
	Increased sensitivity to cold	0.8667
	Joint pain	0.6
	Muscle pain	0.9333
	Constipation	0.7333
	Thinning hair	0.9333
	Memory problems	0.9333
	Slow heart rate	0.9333
	Irregular menstrual periods	0.8667

Multiple sclerosis	Paresthesia (tingling sensation or numbness on the limbs, trunk, or side of the face)	0.9333
	Clumsiness of a hand or leg	0.9333
	Partial loss of vision	0.8667
	Muscle weakness	0.5333
	Vertigo	0.9333
	Fatigue	0.4
	Decreased bladder control	0.9333
	Shortened attention span	0.9333
	Difficulty processing new information	0.9333
	Increased anxiety	0.9333
	Constipation	0.7333
	Difficulty chewing (dysphagia)	0.8
Lupus	Fatigue	0.4
	Joint swelling	0.7333
	Joint pain	0.6
	Headaches	0.8667
	Fever	0.7333
	Increased sensitivity to sunlight or fluorescent light	0.9333
	Chest pain	0.8667
	Butterfly-shaped rash on the cheeks or nose	0.9333
	Hair loss	0.8667
	Mouth sores	0.8667

	Raynaud's disease (fingers and toes turn white or blue and feel numb)	0.8667
	Abdominal pain	0.8
Grave's disease	Irregular heartbeat	0.9333
	Diarrhea	0.6667
	Presence of a goiter	0.8667
	Increased sensitivity to heat	0.9333
	Increased irritability	0.9333
	Muscle weakness	0.5333
	Fatigue	0.4
	Trembling hands	0.9333
	Difficulty sleeping	0.9333
	Unexplained weight loss	0.4667
	Bulging eyes	0.9333
	Double vision	0.8667
Swelling around the eyes	0.9333	
Myasthenia gravis	Drooping eyelids	0.9333
	Double vision	0.8667
	Difficulty making facial expressions	0.9333
	Difficulty chewing	0.8
	Difficulty swallowing	0.9333
	Slurred speech	0.9333
	Muscle weakness	0.5333
	Difficulty breathing	0.9333

Celiac disease	Abdominal bloating	0.9333
	Abdominal pain	0.8
	Constipation	0.7333
	Diarrhea	0.6667
	Unexplained weight loss	0.4667
	Pale stools	0.9333
	Skin rash that causes blisters	0.9333
	Mouth sores	0.8667
	Unexplained weight loss	0.4667
	Failure to thrive (in children)	0.9333
	Tingling sensation in the legs	0.8667
	Irregular menstrual periods	0.8667
Reactive arthritis	Joint pain	0.6
	Heel pain	0.9333
	Back pain	0.9333
	Conjunctivitis (redness of the eyes)	0.9333
	Eye pain	0.9333
	Blurred vision	0.8667
	Painful urination	0.9333
	Frequent urination	0.8667
	Fever	0.7333
	Fatigue	0.4
	Hair loss	0.8667

	Mucocutaneous lesions (small ulcers) inside the mouth or tongue	0.9333
	Keratoderma blennorrhagicum (reddish crusts on the palms, soles, or around the nails)	0.9333
Sjögren syndrome	Dry eyes	0.9333
	Dry mouth	0.9333
	Difficulty chewing	0.8
	Difficulty swallowing	0.9333
	Raynaud's syndrome	0.8667
	Fatigue	0.4
	Vaginal dryness	0.6667
	Muscle pain	0.9333
	Joint pain	0.6
	Swollen salivary glands (swelling between the jaw and ears)	0.9333
	Rashes after exposure to sunlight	0.9333
Pernicious anemia	Fatigue	0.4
	Shortness of breath	0.9333
	Dizziness	0.9333
	Headaches	0.8667
	Chest pain	0.8667
	Tingling sensation in the legs	0.8667
	Muscle weakness	0.5333
	Loss of balance	0.9333
Nausea	0.8667	

	Vomiting	0.9333
	Constipation	0.7333
	Diarrhea	0.6667
	Loss of appetite	0.9333
	Unexplained weight loss	0.4667
	Tongue appears smooth, thick, or red	0.9333
Rheumatoid arthritis	Joint pain	0.6
	Joint stiffness	0.9333
	Joint swelling	0.7333
	Pain, stiffness, or swelling of joints on both sides of the body simultaneously	0.9333
	Unexplained weight loss	0.4667
	Fever	0.7333
	Fatigue	0.4
	Muscle weakness	0.5333
Type I diabetes	Extreme thirst	0.9333
	Frequent urination	0.8667
	Fatigue	0.4
	Unexplained weight loss	0.4667
	Recurrent oral thrush (patches in the mouth accompanied by soreness or mouth pain)	0.8667
	Blurred vision	0.8667
	Cuts or grazes that do not heal	0.9333

Crohn's disease	Abdominal pain	0.8
	Diarrhea	0.6667
	Fever	0.7333
	Loss of appetite	0.9333
	Unexplained weight loss	0.4667
	Skin tags	0.9333
	Rectal bleeding	0.9333
	Anal fissures	0.9333
Alopecia areata	Round or oval patches of baldness of the spot	0.9333
	Itching on bald areas	0.9333
	Pits, dents, grooves, or redness on the fingernails	0.9333
	Hair loss	0.8667