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It should be noted that most of the pages are identifiable as having been processed by me.

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I put a lot of time into producing these files which is why you are met with this page when you open the file.

In order to generate this file, I need to scan the pages, split the double pages and remove any edge marks such as punch holes, clean up the pages, set the relevant pages to be all the same size and alignment. I then run Omnipage (OCR) to generate the searchable text and then generate the pdf file.

Hopefully after all that, I end up with a presentable file. If you find missing pages, pages in the wrong order, anything else wrong with the file or simply want to make a comment, please drop me a line (see above).

It is my hope that you find the file of use to you personally – I know that I would have liked to have found some of these files years ago – they would have saved me a lot of time !

Colin Hinson

In the village of Blunham, Bedfordshire.



# TEXAS INSTRUMENTS HOME COMPUTER

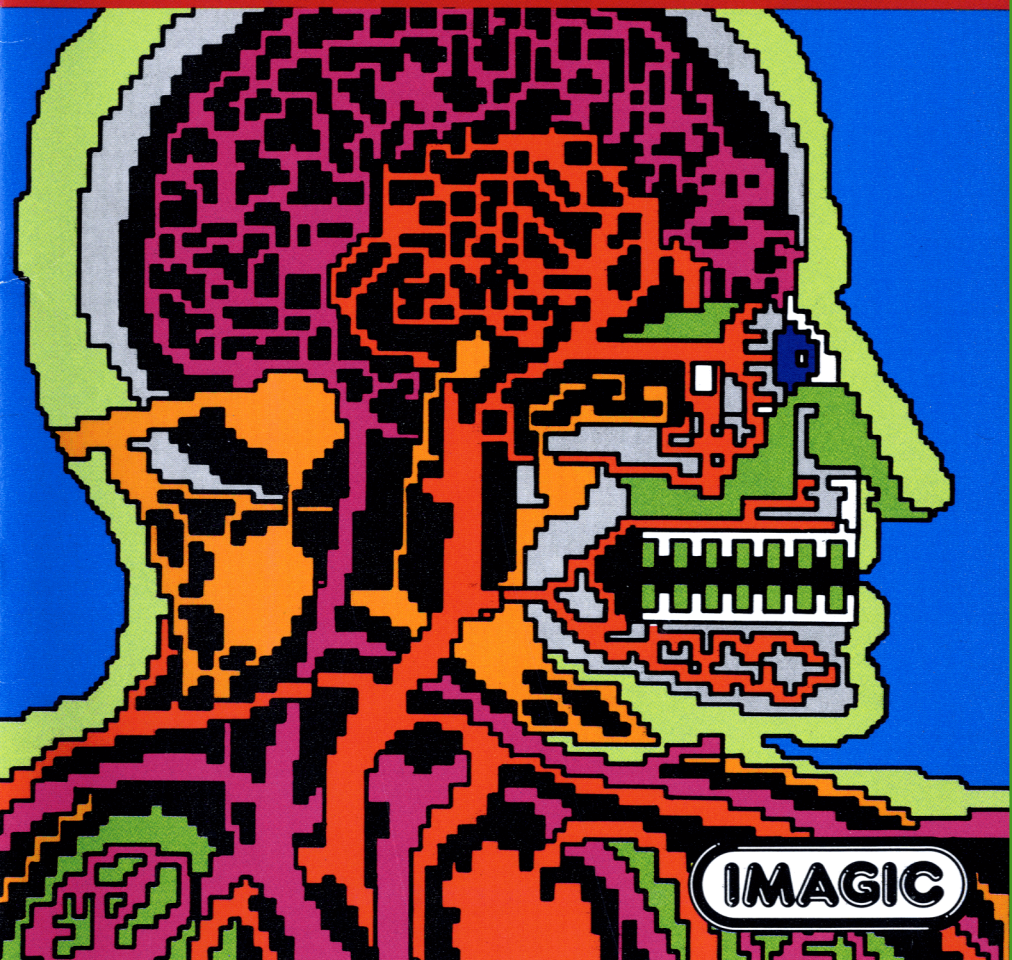
## MICROSURGEON™

ARCADE ENTERTAINMENT

### SOLID STATE SPEECH™ CARTRIDGE

This cartridge is designed to be used with the Texas Instruments TI-99/4A Home Computer only. Optional **Solid State Speech™ Synthesizer** must be attached to the computer to activate the speech capabilities of the cartridge.

Pilot the robot probe through arteries, veins, and the lymphatic system. Eliminate deadly bacteria, tumors, cholesterol, tapeworms, tar deposits, and other life threatening diseases as you go!



## **Microsurgeon**

Programmed by: Rick Levine for Imagic

Voice by: Mary Joyce

Book developed and written by:  
Dennis Lamb for Imagic in conjunction  
with staff members of Texas  
Instruments Instructional  
Communications.

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Solid State Cartridge program and data  
base contents copyright © 1983 by  
Imagic.

See important warranty information at  
back of book.

## Introduction

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**Do you ever dream of being an expert surgeon? Microsurgeon places you in an imaginary operating room where you work against time to save patients in critical need of treatment. In this fantasy setting, you perform experimental surgery to cure a variety of conditions. Each imaginary medical case presents a**

**new challenge to your surgical skills. You gain satisfaction from curing patients and accumulating funds for medical research. Use this manual as your guide to successful microsurgery.**

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In Microsurgeon, you

- Develop your skills in microsurgery by first performing experimental surgery at the student level on practice patient 0
- Treat a variety of different conditions and diseases as you select from 1000 patients
- Use an experimental Robot Probe as your surgical tool
- Diagnose the patient's condition and direct the Probe through the body toward threatening conditions
- Eliminate the conditions with medications from the Probe

With Microsurgeon, you

- Play alone or with a friend
- Use Wired Remote Controllers (joysticks) or keyboard control
- Enjoy multi-screen graphics
- Choose from three levels of difficulty—student, intern, or surgeon
- Have more fun with synthesized speech that simulates the action and excitement of microsurgery

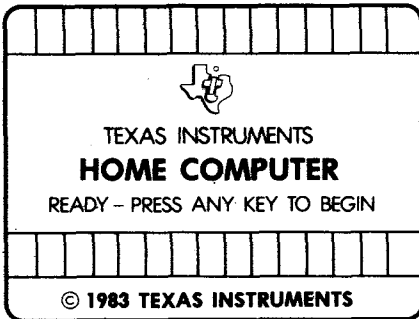
**Note:** Microsurgeon is designed to work with or without the Texas Instruments **Solid State Speech**<sup>™</sup> Synthesizer (sold separately). However, the Speech Synthesizer must be attached to activate the voice of the computer.

## Using the Solid State Cartridge

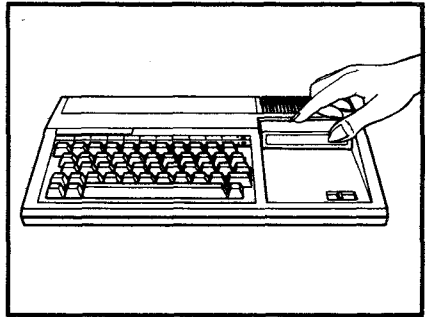
**Inserting Solid State Cartridges is easy. If you have any problem inserting the cartridge, or if it is accidentally removed from the slot while in use, please see the "In Case of Difficulty" section in this booklet.**

### Inserting the Cartridge

1. If you have been programming in BASIC, save your data before inserting a cartridge. When you insert a cartridge into the console, the computer automatically erases all data or program material you have entered and returns to the master title screen to begin the new program.
2. Be sure the cartridge is free of static electricity before inserting it into the computer (see the "Maintenance and Service" section in this booklet).
3. Turn the computer ON, and wait for the master title screen to appear.



4. Slide the cartridge into the slot on the console.



5. Press any key to make the master selection list appear. Then, press the appropriate number key for your selection.

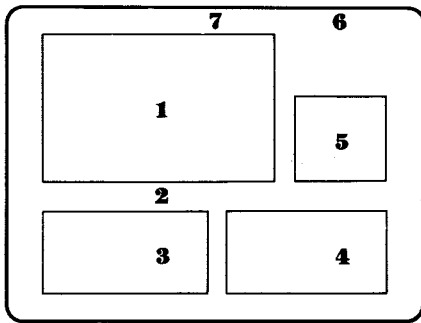
### Removing the Cartridge

1. To remove the cartridge at the end of play, press **QUIT** to return to the master title screen.
2. Remove the cartridge from the slot.

# Preparing for Microsurgery

You see four small screens during microsurgery. They show the exact position of the Robot Probe in the body, monitor the condition of each organ and the overall status of the patient, and display activity in the patient's room. During microsurgery, the Robot Probe gains and loses power. The amount of

power, your accumulated research funds, and the name of the organ in which the Probe is located appear on screen. The number of your patient and level of expertise also appear.



### 1. Surgical Screen with Robot Probe

Shows the area of the body with the Robot Probe. The Probe is located within a white-bordered square. You see

- Red arteries
- Purple veins
- Orange lymphatic system

### 2. Patient Number and Level

Show the number of the patient and your selected level of surgical expertise. These appear below the Surgical Screen throughout the game.

### 3. Status Screen

Lists each organ and overall status of the patient. The length of the arrows indicates the condition of the individual organs and the patient's overall status.

Arrow Length	Status
No arrow	Good
Between 1st and 3rd dot	Fair
Between 4th and 6th dot	Serious
Between 7th and 10th dot	Critical
Red arrow	Terminal

If you successfully treat an organ, its arrow grows shorter and eventually disappears, signaling a cure. If you neglect to treat an organ, its arrow grows longer, eventually reaching the right side of the Status Screen.

When an organ becomes terminal, its name is framed in red. In general, when two or more organs become terminal, the overall status line is framed in red. Then, the patient's condition is terminal and the game ends.

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#### **4. Patient's Room**

Shows a hospital room with the patient lying in bed. A doctor or visitor occasionally appears.

#### **5. Close-Up Scanner**

Shows a magnified view of the exact position of the Robot Probe. Use the Scanner to stay within veins, arteries, and lymphatic systems for safe and fast travel. The Scanner does not scan bacteria, viruses, and white blood cells.

#### **6. Robot Probe Location and Power**

Shows the name of the organ in which the Robot Probe is located. The organ's name appears when the Probe is centered in the organ. The name of an organ does not appear on the Surgical Screen when the Robot Probe is between organs.

Beneath the name you see the number of power units you have to operate the Robot Probe.

#### **7. Research Funds**

Shows the amount of your research funds. The amount is updated periodically.

## Getting Started

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When the **Microsurgeon** title screen appears, press any key to begin or press the **FIRE** button on your **Wired Remote Controllers** (joysticks). First, select your patient number. Second, select the level of play suited to your surgical expertise. Then, navigate the **Probe** through the

patient's body to areas that need treatment.

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### Developing Your Skills for Microsurgery

Microsurgery is complex, and your patient's health is in your hands. Follow these steps to develop your skills before advancing to more complicated medical cases.

- Study the manual before you begin.
- Press **AID** to see a preview of game play functions.
- Select patient number 0, a practice patient, as your first case.
- Select the student level of surgical expertise until your skills improve.
- If you do not yet have the skills to save a rapidly deteriorating organ, treat as many diseases as possible to stabilize the patient's overall condition.

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### Selecting Your Patient

Patients are numbered 0 to 999, giving you a variety of surgical challenges.

Type a number to select your patient and press **ENTER**. To change your selection, press **ERASE** before pressing **ENTER**.



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### Choosing Surgical Expertise Level

Select one of the following:

Press	Level
<b>0</b>	Student
<b>1</b>	Intern
<b>2</b>	Surgeon

### Special Keys

Press	Function
<b>4</b>	To hear EKG sound in Intensive Care Unit room.
<b>5</b>	To hear heart sound.
<b>6</b>	To turn off sensors, producing quiet in the operating room.
<b>P</b>	To pause action during surgery. The word PAUSE appears in place of Robot Probe location. Press any key to resume action. Press key <b>4</b> or <b>5</b> to resume sound.
<b>AID</b>	To see a preview of game play functions.

## Moving the Robot Probe

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**You can move the Robot Probe through the body at two speeds. Stay within areas that allow you to travel swiftly and avoid white blood cell attacks. After treating the patient, leave the body carefully through an approved exit. You can play**

**Microsurgeon with one or two players using the joysticks or the keyboard.**

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### Moving through the Body

Control the speed of the Probe by pressing the **7** key (Slow) or **8** key (Fast). Your quickest route is through the arteries, veins, and lymphatic system. Stay within these routes to avoid constant attack by white blood cells (phagocytes).

Stationary white blood cells (lymphocytes), located in the arteries, veins, and lymphatic system, cannot be destroyed. When moving through lymphocytes, the Robot Probe slows down and can be attacked by phagocytes.

To move from one part of the body to another, move the Probe in the desired direction. The Surgical Screen automatically shows the new section of the body as you proceed.

To leave the body, pilot the Robot Probe slowly through an approved exit to prevent damaging your Probe.

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### Identifying the Wired Remote Controllers

Each Wired Remote Controller (joystick) serves a different function in Microsurgeon. The primary joystick controls movement and issues medication. The secondary joystick only issues medication. Be sure to identify and use the primary joystick for one-player games.

In two-player games, the player moving the Robot Probe uses the left side of the keyboard or primary joystick. The player issuing medication uses the right side of the keyboard or the secondary joystick.

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### Using the Wired Remote Controller for Movement

To pilot the Probe, move the lever of the primary joystick in the desired direction.

Lever Position	Direction
Forward (toward the <b>FIRE</b> button)	Up
Backward (away from the <b>FIRE</b> button)	Down
Left	Left
Right	Right
Diagonal	Diagonal

**Note:** The **ALPHA LOCK** must be in the OFF (up) position when using the Wired Remote Controllers (joysticks).

### Using the Keyboard for Movement

Movement of the Robot Probe is controlled by the following keys:

Key	Direction
(↑) <b>E</b>	Up
(↓) <b>X</b>	Down
(←) <b>S</b>	Left
(→) <b>D</b>	Right
(↖) <b>W</b>	Diagonally left, up
(↙) <b>Z</b>	Diagonally left, down
(↗) <b>R</b>	Diagonally right, up
(↘) <b>C</b>	Diagonally right, down

## Treatments

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There are three medications for the eight conditions that can attack the body. Each condition is treated by one medication. Three medications are contained in the Probe. You must select the right medication to treat each condition. Once a medication has been selected, you can use it repeatedly until you select another

medication. Because the Surgical Screen shows only a small portion of the body, a map is provided to assist you in maneuvering during surgery.

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### Selecting Medications

To select medications, use these keys:

Press	Medication
1	Ultrasonic Rays
2	Antibiotics
3	Aspirin

Select the appropriate medications to treat each condition.



#### Ultrasonic Ray



cholesterol buildup (gray, in arteries)



gallstones (dark green, in gall bladder)



kidney stones (light green, in kidneys)



tapeworms (red, in intestine)



tar deposits (black, in both lungs)



tumor (gray, in brain)

**Note:** Ultrasonic Rays also destroy attacking white blood cells (phagocytes).



#### Antibiotics



infection from bacteria (green, appears throughout body)



#### Aspirin



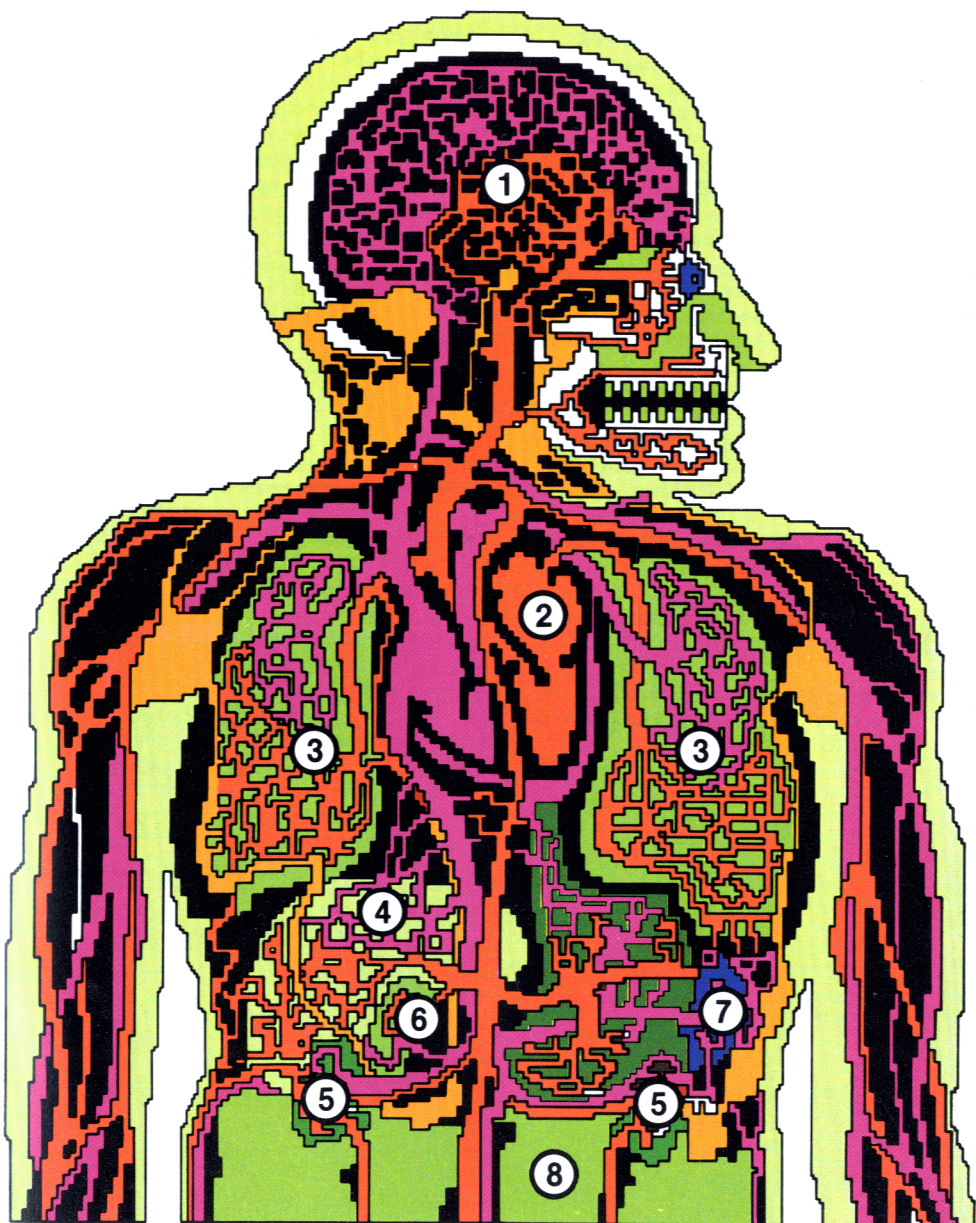
viruses (red, appear and disappear throughout body)

**Note:** Aspirin slows down viruses, but does not destroy them.

### Body Map

The numbers shown below correspond to the body map on the next page.

- 1 Brain
- 2 Heart
- 3 Lung
- 4 Liver
- 5 Kidney
- 6 Gall Bladder
- 7 Spleen
- 8 Intestine



## Playing the Game

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You help your patient by issuing medication to destroy dangerous conditions. Use the convenient joysticks or keyboard to maneuver your Robot Probe carefully into position. Select the correct medication. Fire medication at the condition. Some conditions require repeated medications for a cure.

If you perform surgery with a friend, you have a better chance of curing difficult cases. Try to save your patient and exit the body before the Robot Probe runs out of power. When the game ends, you can play again at the same level of expertise and with the same patient, or you can choose a new challenge.

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### Using the Wired Remote Controllers for Issuing Medication

To release medications from the Robot Probe using the primary joystick:

- Hold the **FIRE** button down, move the lever in the direction you wish to fire, and release the **FIRE** button.
- Press the **FIRE** button again to issue medication in the same direction.

To release medications from the Robot Probe using the secondary joystick:

- Move the lever in the desired direction. (It is not necessary to press the **FIRE** button.)

---

### Using the Keyboard for Issuing Medication

To release medications from the Robot Probe, use these keys:

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Key	Direction
(↑) <b>I</b>	Up
(↓) <b>M</b>	Down
(←) <b>J</b>	Left
(→) <b>K</b>	Right
(↖) <b>U</b>	Diagonally left, up
(↙) <b>N</b>	Diagonally left, down
(↗) <b>O</b>	Diagonally right, up
(↘) <b>,</b>	Diagonally right, down

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### Ending the Game

The game ends when one of the following happens:

- Patient's general status becomes terminal
- Robot Probe exhausts power supply while still in patient
- Robot Probe exits the body properly through the ear, eye, nose, or mouth
- Robot Probe exits the body improperly through any other point

### Playing Again

- Press **REDO** to play using the same options.
- Press **BACK** to select new options before starting a new game.

## Earning Power Units and Research Funds

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**As a microsurgeon, your primary goal is to save your patient. For your services, you are awarded funds to promote medical research. The total amount of research funds and power units appears on the screen.**

**Research funds are recalculated periodically. Your level of expertise and your patient's initial and final**

**conditions influence the number of power units and research dollars you accumulate.**

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### Robot Power Units

You receive power units to operate the Robot Probe. You gain and lose Robot Probe power units—and research funds—as you play the game. At the end of the game, your power units increase if you exit properly.

Action of Robot Probe	Result in Power Units
Operate at normal speed	Use 1 every 20 seconds
Operate at faster speed	Use 4 every 20 seconds
Issue medication	Lose 1
Hit virus	Gain 3
Touched by virus or phagocyte	Lose 1
Hit other condition	Gain 1
Exit improperly with the Robot Probe	Lose all

**Note:** The Robot Probe loses additional power units the longer it is touched by a virus or phagocyte (an attacking white blood cell).

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### Student Level

1. You receive \$1 for each power unit at the beginning of surgery.
2. You receive additional research funds based on the patient's initial status.

• Good	\$ 0
• Fair	100
• Serious	200
• Critical	300

3. As you play, you:

- Gain or lose \$1 as you gain or lose power units
- Earn \$200 for each organ saved
- Earn \$200 for piloting the Robot Probe through an approved exit

4. At the end of the game, you earn points for having improved your patient's condition from the initial status.

• Good	\$4,000
• Fair	3,000
• Serious	2,000
• Critical	0
• Terminal	0



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### Intern Level

1. You receive \$10 for each power unit at the beginning of surgery.

2. You receive additional research funds based on the patient's initial status.

- Good       \$    0
- Fair         1,000
- Serious     2,000
- Critical    3,000

3. As you play, you:

- Gain or lose \$10 as you gain or lose power units
- Earn \$2,000 for each organ saved
- Earn \$2,000 for piloting the Robot Probe through an approved exit

4. At the end of the game, you earn points for having improved your patient's condition from the initial status.

- Good       \$40,000
- Fair        30,000
- Serious    20,000
- Critical     0
- Terminal    0

### Surgeon Level

1. You receive \$100 for each power unit at the beginning of surgery.

2. You receive additional research funds based on the patient's initial status.

- Good       \$    0
- Fair         10,000
- Serious     20,000
- Critical    30,000

3. As you play, you:

- Gain or lose \$100 as you gain or lose power units
- Earn \$20,000 for each organ saved
- Earn \$20,000 for piloting the Robot Probe through an approved exit

4. At the end of the game, you earn points for having improved your patient's condition from the initial status.

- Good       \$400,000
- Fair        300,000
- Serious    200,000
- Critical     0
- Terminal    0

## Surgical Tips

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**As you play Microsurgeon, you discover strategies to help you become a stronger player. As you become more experienced, you may wish to play at more advanced levels that challenge your new skills. Watch your playing ability improve with each successful game.**

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### The Skilled Surgeon

1. A skilled microsurgeon
  - Treats the most dangerous conditions first
  - Avoids phagocyte attacks by staying within red, purple, or orange areas
  - Uses the Close-up Scanner to navigate the avenues of the body safely
  - Watches the status lines to detect changing conditions of individual organs and of the patient
2. Some conditions on the Status Screen require special diagnosis and treatment. A skilled microsurgeon
  - Cures infection by destroying bacteria
  - Treats heart trouble by eliminating cholesterol buildup in arteries throughout the body
  - Destroys cholesterol buildup and tumors in the brain
  - Improves the status of the lungs by treating both of them

### Challenges of the Game

Watch out for these special challenges for microsurgeons.

- The Robot Probe and Scanner are experimental surgical tools and are slow to find and display diseases. When the Status Screen indicates disease in an organ, wait in the organ until the disease appears, and then destroy it with proper treatment.
- Lymphocytes impede the movement of the Probe and allow phagocytes to attack.
- Lymphocytes increase as the patient's condition becomes more serious.
- The Robot Probe cannot destroy lymphocytes.
- Viruses are disabled, not destroyed, by aspirin.
- Tumors reappear more quickly than other conditions.
- Phagocytes violently attack the Probe if you stay outside the safe travel routes for too long.

## Glossary

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**The following is a glossary of terms used in Microsurgeon. These may be helpful to you in playing the game. The definitions are only related to the game and are not necessarily standard medical terms.**

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### **Antibiotic**

A chemical substance used to treat bacterial infections.

### **Artery**

Blood vessels of the circulatory system that carry blood away from the heart to other parts of the body. The Robot Probe moves through arteries smoothly.

### **Aspirin**

Temporary reliever of symptoms caused by viruses.

### **Bacteria**

Microscopic organisms, some of which produce disease.

### **Bone**

Hard tissue making up the skeleton of the body.

### **Brain**

Center of human thought and part of the central nervous system protected by the skull.

### **Cholesterol**

Substance gradually blocking arteries, leading to high blood pressure and other medical problems.

### **Ear**

Delicate system of bones, fluid, and hair cells that allows hearing. The Robot Probe can safely exit through the ear.

### **Eye**

Sensitive organ that allows sight by detecting light intensity and color. The Robot Probe can safely exit through the eye.

### **Gall Bladder**

Part of the liver system that concentrates and stores bile.

### **Gallstones**

Hard pellets forming in the gall bladder and causing extreme discomfort.

### **Heart**

Keeps oxygenated blood circulating throughout the body by a series of rhythmic contractions.

### **Intestines**

Absorb water and nutrients and eliminate waste material.

### **Kidneys**

Filter wastes and excess water from the blood.

### **Kidney Stones**

Hard pellets forming in the kidneys and causing extreme pain.

## Glossary

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### **Liver**

Filters toxic wastes from the blood and secretes bile.

### **Lungs**

Allow blood to exchange carbon dioxide for oxygen.

### **Lymph**

Plasma-like fluid containing white blood cells.

### **Lymphatic System**

System of vessels that carries lymph to the bloodstream. The Robot Probe moves easily through the lymphatic system.

### **Lymphocytes**

White blood cells found in the lymphatic and circulatory systems. They slow the movement of the Probe.

### **Mouth**

Opening through which food and drink pass into the body. The Robot Probe can safely exit through the mouth.

### **Neck**

Connects the head and trunk.

### **Nose**

Allows inhalation and detects odors. The Robot Probe can safely exit through the nose.

### **Phagocytes**

White blood cells that roam through the circulatory system, destroying foreign bodies or organisms.

### **Stomach**

Begins the digestive process.

### **Tapeworms**

Parasites that live in the intestines, robbing the body of nutrients.

### **Tar Deposits**

Dark patches on the lungs resulting from the inhalation of smoke and interfering with the exchange of gases in the lungs.

### **Tumor**

Abnormal masses of tissue.

### **Ultrasonic Rays**

A Robot Probe treatment using sound waves to eliminate affected tissue.

### **Veins**

Vessels carrying blood from all parts of the body back to the heart.

### **Virus**

An ultramicroscopic organism causing disease.